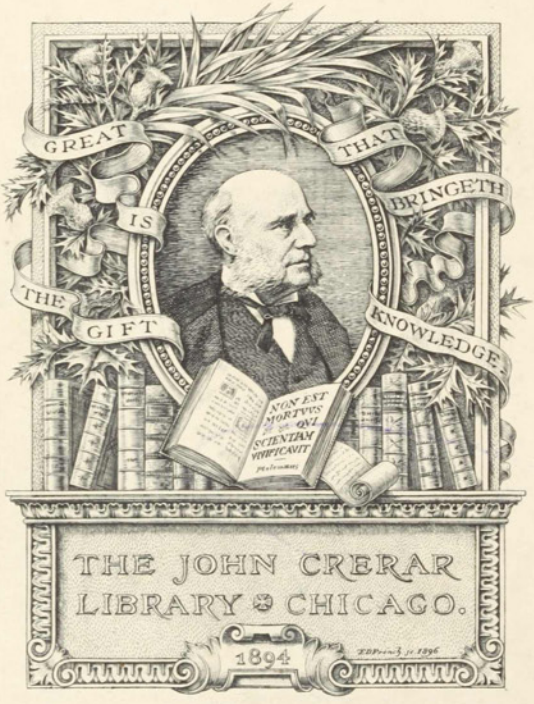

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1894

United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

AMERICAN BELL TELEPHONE CO. ET AL.

v.

THE PEOPLE'S TELEPHONE CO. ET AL.

EVIDENCE FOR COMPLAINANTS.

Vol. I.—EVIDENCE.

BOSTON:
ALFRED MUDGE & SON, LAW PRINTERS, 34 SCHOOL STREET.
1882.

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Circuit Court of the United States,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

AMERICAN BELL TELEPHONE COMPANY ET AL.

v.

THE PEOPLE'S TELEPHONE COMPANY ET AL.

BILL OF COMPLAINT.

To the Honorable the Justices of the Circuit Court of the United States for the Southern District of New York:

The American Bell Telephone Company, a corporation duly established under the laws of the Commonwealth of Massachusetts, and the Metropolitan Telephone and Telegraph Company, a corporation duly established under the laws of the State of New York, bring this their bill of complaint against The People's Telephone Company, a corporation organized under the laws of the State of New York, Joseph Loth, Julius Bien, Marcus Marx, Auguste H. Girard, John N. Goodwin, Frank A. Klemm, and Ernest Marx, all of the city and State of New York; Edgar W. Chellis, of Harrisburg, in the State of Pennsylvania, Richard C. McCormick, of the Territory of Arizona, Henry D. Cook, Jr., of the city of Washington, in the District of Columbia, Max L. Gutmann, of Rochester, in the State of New York, Moritz Loth, of Cincinnati, in the State of Ohio, and Simon Wolf, of Washington, in the District of Columbia. And thereupon your orators complain and say, that before the seventh day of March, 1876, Alexander Graham Bell, then of

2 Salem, in said Commonwealth, being the original and first inventor of a new and useful improvement in telegraphy, which was never known or used before his invention thereof, and which had not at the time of his application been in public use or on sale for more than two years, made application according to law for Letters Patent of the United States to be granted to him therefor, upon which application, due proceedings being had in all respects, said Letters Patent were on the seventh day of March, 1876, granted, issued and delivered to said Alex-
3 ander Graham Bell, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and numbered 174,465, whereby there was secured to said Alexander Graham Bell, his heirs, administrators or assigns, for the term of seventeen years from the said seventh day of March, 1876, the full and exclusive right and liberty of making, constructing, using and vending to others to be used, the said improvement, a description whereof is given in the words of the said Bell, in the schedule annexed to said patent, and forming a part thereof, as by said patent,
4 numbered 174,465, or a copy thereof here in court to be produced, will fully appear.

That before the thirtieth day of January, 1877, the said Alexander Graham Bell, being the original and first inventor of another new and useful improvement in electric telegraphy, which was never known or used before his invention thereof, and which had not at the time of his application been in public use or on sale for more than two years, made application according to law for Letters Patent of the United States to be granted to him therefor; upon
5 which application, due proceedings being had in all respects, said Letters Patent were, on said thirtieth day of January, 1877, granted, issued and delivered unto said Bell, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and numbered 186,787, whereby there was secured to said Bell, his heirs, administrators or assigns, for the term of seventeen years from the said thirtieth day of January, 1877, the full and exclusive right

and liberty of making, constructing, using and vending to others to be used, the said improvement, the description whereof is given in the words of said Bell in the schedule 6
annexed to said last-named patent, and forming a part thereof, as by said patent, numbered 186,787, or a copy thereof, here in court to be produced, will fully appear.

That said Alexander Graham Bell assigned said Letters Patent, numbered respectively 174,465 and 186,787, to Gardiner G. Hubbard, trustee, by deed of assignment dated July 9, 1877, and recorded at the Patent Office July 28, 1877, liber R^{21}, page 399 of Transfer of Patents. That said Gardiner G. Hubbard, trustee, assigned said Letters Patent, numbered respectively 174,465 and 186,787, 7
to the Bell Telephone Company, by assignment dated July 20, 1878, and recorded at the Patent Office, Oct. 3, 1878, liber Y^{22}, page 460 of Transfers of Patents.

That said Bell Telephone Company has granted the same to your orator, the American Bell Telephone Company, by an instrument in writing, dated June 22, 1880, and recorded at the Patent Office, June 24, 1880, liber I^{25}, page 282 of Transfers of Patents.

That the sole right to manufacture electro-speaking telephones under said patents thereby became and still is 8
vested in the said American Bell Telephone Company; that the only right granted to or possessed by any persons other than the said American Bell Telephone Company under said patents has been and is the right to use telephones procured from said American Bell Telephone Company, and its predecessors, upon payment of stated royalties under said two patents to the said American Bell Telephone Company.

That by license under said American Bell Telephone Company, the Metropolitan Telephone and Telegraph 9
Company, a corporation organized under the laws of the State of New York, has acquired the sole and exclusive right to use and to license others to use telephones within a territory which includes all the States of New York and New Jersey within thirty-three miles of New York City

Hall, and all of Monmouth County, New Jersey, and all of Long Island, and is now engaged in the business of supplying electric speaking telephones and erecting telephone lines in said territory; which telephones it receives from
10 said American Bell Telephone Company, and for the use of which it pays a yearly license fee and royalty to said American Bell Telephone Company, and receives a yearly royalty and license fee from its sub-licensees.

That electric speaking telephones had never been publicly known or used before the grant of said patent, and were first publicly made known and first introduced into public use by said Bell and his licensees under said Bell patent, and but for the unlawful acts of the defendants and their associates, hereinafter complained of, your orators
11 would be in the full and exclusive enjoyment of said rights.

Your orators further show, that after the grant of said Letters Patent, the inventions therein described and claimed, or substantial and material parts of the same, embodied in instruments known as Bell telephones, and in instruments known as Blake transmitters, were, before July, 1877, introduced into general public use by the said Bell, the said Hubbard, trustee, the said Bell Telephone Company and your orators. That many thousands of persons have put the said invention into daily use
12 under the authority and license of the said Hubbard and your orators and their predecessors and those holding rights or licenses under them, and have paid for such use of said inventions the amount fixed by the owners of said patents as a reasonable compensation therefor, such payments amounting in the aggregate to many thousands of dollars. That telephone exchanges now exist in more than two hundred and seventy-five towns and cities of the United States, and in every State thereof, and exist in substantially every city in the United States having more than
13 15,000 inhabitants, and in many smaller places; and all said exchanges use telephones licensed by your orators, the American Bell Telephone Company, and its predecessors, as owners of said Bell patents, and pay royalty therefor

to your said orators. That the fact that said Bell was the original and first inventor of said inventions, and that the patents above named are good and valid patents, has been generally recognized and acknowledged by those who have used the inventions and the public generally, in all parts of the United States, and the claims of the said Bell, Hubbard, and your orators and their said prede- 14
cessors to the exclusive right to the said inventions under said patents have been generally acknowledged and acquiesced in. That from time to time several persons have attempted to make, sell and use telephones, or parts thereof, embracing said inventions, but that in such cases said Hubbard while owner of, and your orators, and their said predecessors, since they have owned said patents, have immediately, upon hearing of such acts or attempts, notified such parties to desist therefrom, and that such parties have generally, upon receiving such notices, complied therewith, 15
and acquiesced in and recognized as valid the claims of said Hubbard and your orators under said patents; and said Bell, said Hubbard and your orators have always asserted and maintained, and but for the wrongful acts of the defendants would and have hitherto almost universally enjoyed the sole and exclusive right to practise said inventions; that they have not acquiesced in any infringement of their exclusive rights; and that the said exclusive rights of your orators are of great value to them.

That there are now in use more than 100,000 electric 16
speaking telephones licensed by and paying royalty to your orators, the American Bell Telephone Company; that the owners of said Bell patents, and those who now are or heretofore have been licensed by them, have devoted great time and attention and large sums of money to the development of the telephone and the introduction thereof into extensive use, and to the proper construction of the most suitable telephone lines and systems, and telephonic appliances, and have constructed many thousand miles of telephone lines for use with telephones owned by your orators, 17
the American Bell Telephone Company, and licensed by it

for such use, and that nothing which the defendants, or F. A. Klemm, A. G. Tisdel and D. A. Drawbaugh (hereinafter named), have done, has contributed in any substantial way to the development of the telephone, or the introduction thereof into use.

That in the year 1878 Addison D. Hard, of Boston, electrician, infringed said Bell patents by making and selling telephones, or by making and selling the material
18 and substantial parts thereof for the purpose of being put together and used as telephones; that thereupon the said Bell Telephone Company brought their bill in equity against him, in the Circuit Court of the United States for the District of Massachusetts; that an injunction was issued against him to desist from such infringement; and afterwards, and after hearing, the defendant was adjudged in contempt for violating said injunction, and was ordered to pay a sum of money into court, which sum was afterwards, to wit, Feb. 4, 1879, ordered to be paid, and was
19 paid to said Bell Telephone Company.

That in the year 1878 one Jerome C. Redding also infringed said patents, and a bill in equity was brought against him in said court to restrain said infringement, and no defence was made, and an injunction issued, and said Redding desisted from further infringement.

That in the year 1878 one Jesse H. Bunnell, manufacturing electrician, did, in the city of New York, in like manner infringe said Bell patents; that thereupon the said Bell Telephone Company brought their bill in equity
20 against him in the Circuit Court of the United States for the Southern District of New York; that he appeared thereto by counsel; that thereafter he submitted to the claims of the plaintiff; and that on the eighth day of February, 1879, an injunction was issued against him, restraining him from further infringement of said patents, and no further proceedings have been had in said cause.

That in the year 1878 Charles E. and William H. Jones, manufacturing electricians, did, in the city of Cincinnati, in like manner infringe said Bell patents; that thereupon the

said Bell Telephone Company brought their bill in equity 21
against them in the Circuit Court of the United States for the Southern District of Ohio, on said two patents; that they appeared thereto by counsel; that thereafter they submitted to the claims of the plaintiff; and that on the thirteenth day of December, 1878, a decree and injunction was issued against them, declaring the validity of said two Bell patents, and restraining them from further infringement thereof, and ordering an account of damages and profits; and no further proceedings have been had in said cause.

That in the year 1880, Pearce & Jones, manufacturing 22
electricians, did in the city of New York, infringe said Bell patents, by making and selling instruments of the form and character known as magneto-telephones, and which operated by varying the electro-motive force by magnetic induction, and by making instruments of the form and character known as battery telephonic transmitters, which operated by varying the resistance of a circuit supplied with electro-motive force from a battery; that thereupon your orators brought their bill in equity against them in the Circuit Court of the United States for the 23
Southern District of New York, and moved for a preliminary injunction on said two patents; that they appeared thereto by counsel, and asked for additional time to prepare affidavits in defence to said motion; that the Court thereupon ordered an injunction or restraining order to issue, and allowed said defendants further time to file affidavits, with leave to have a hearing thereon on a day named; that on said day named, to wit, Aug. 10, 1880, the said defendants appeared by counsel and declined to contest said case further, and submitted to a decree declaring the 24
validity of said two patents, and perpetually enjoining said defendants from infringing the same, and ordering an account of damages and profits; and that such decree was made by order of said Court, on or about the tenth day of August, A. D. 1880; and such injunction was ordered and issued accordingly by order of said Court, on the eleventh day of September, A. D. 1880; and no further proceedings have been had in said cause.

That in the year 1880, the Eaton Telephone Company,
25 a corporation established under the laws of the State of New York, did in the city of New York in like manner infringe said Bell patents, by making and selling instruments known as magneto-telephones or telephonic battery transmitters as aforesaid; that thereupon your orators brought their bill in equity against it and others in the Circuit Court of the United States for the Southern District of New York on said patents, and moved for a preliminary injunction; that said motion came up for hearing on Aug. 10, 1880; that thereupon said defendants appeared
26 by counsel and asked for further time to file affidavits in defence to said motion, which time was allowed them until Sept. 15, 1880; and on said day said defendants declined to file and did not file affidavits, and declined to contest said motion, and thereupon a preliminary injunction was ordered and issued against them restraining them, their agents and servants, from infringing said patents; and no further proceedings have been had in said cause.

And at or about the same time your orators the American Bell Telephone Company brought their bill in equity on
27 said two patents in the Circuit Court of the United States for the District of Massachusetts, against Albert Spencer, an agent and employé of said Eaton Telephone Company, and against Enoch Waite, a user of telephones made by said Eaton Telephone Company; said Waite declined to contest said suit; said Spencer appeared by counsel and asked for and obtained time to prepare and file affidavits, and thereafter declined to file affidavits, and submitted to a preliminary injunction in like manner as said Eaton Telephone Company did as aforesaid.

28 That in the year 1880, one J. L. Lazelle, a manufacturer of electrical apparatus in the city of New York, did, in the city of New York, in like manner infringe said patents by making and selling magneto-telephones called the Lazelle telephone, and by making and selling battery transmitting telephones, called the Little Gem Transmitters; that thereupon your orator brought its bill in equity against

said Lazelle, in the Circuit Court of the United States for the Southern District of New York, on said patents, and moved for a preliminary injunction; that said motion came up for hearing on the day of October, 1880; that the said 29
defendant made default, and thereupon an injunction was ordered and issued against him, restraining him, his agents and servants, from infringing said patents; and no further proceedings have been had in said cause.

That all said orders and decrees stand in full force and effect.

That none of said parties so enjoined as aforesaid have been licensed under said Bell patents, and, as your orators believe, they have entirely refrained from making and selling and using telephones, or in any way infringing said patents 30
since the making of said decrees respectively.

That the said exclusive rights of said Bell, and your orators and their predecessors as his assigns and grantees, have never been openly or publicly violated, except at one time and in the year 1878, by the Western Union Telegraph Company, and by the Gold and Stock Telegraph Company, and by the American Speaking Telephone Company, said three corporations having associated themselves together for that purpose; that said Bell Telephone Company brought its bill in equity in the Circuit Court of the United States for 31
the District of Massachusetts, against Peter A. Dowd, an agent of said associated companies, engaged in the business of using their infringing telephones, and in said suit complained of the defendant that he had infringed the fifth claim of said patent 174,465; and also complained that he had infringed the third, sixth, seventh and eighth claims of said patent 186,787; the said associated corporations assumed the defence of said suit, and employed in said defence their counsel and experts learned in the law and skilled in the art; in said suit evidence was 32
taken and completed by the complainants in chief, and by the defendant in defence, and by the complainants in reply; and thereupon, upon consideration of said proof, and the opinions of their professional advisers, the defendant and

said corporations became satisfied that said Bell was the true, original and first inventor of the electric speaking telephone, and the inventions covered by said patents; whereupon they submitted to the said claims of the complainants, and agreed to desist from further infringements,
33 and have since desisted from further infringements, and placed and caused to be placed all telephones within their power or control under license under said Bell patents, and paid, or caused to be paid, the usual and customary yearly royalties therefor habitually charged by the assigns of said Bell to other parties for like uses, and agreed that they would not thereafter make electric speaking telephones, and would not thereafter use electric speaking telephones, except such as should be made and furnished to them by your orators or the assigns of said Bell, and under license
34 under said Bell patents, and that for the use of the same they should pay not less than the usual and accustomed royalties from time to time charged to others by your orators.

And your orators show that the telephones made by your orators and the infringing telephones of the defendants are small instruments, and easily concealed, and easily used in private, and easily transferred from one person to another, so that it is generally extremely difficult for your orators to detect all instances of such use, and extremely
35 difficult to prove the use thereof by persons not licensed by your orators, and the extent of such use, and would be extremely onerous and burdensome for your orators to bring separate suits against each user to restrain said infringing use; and so, if the defendants, or any of them, shall be allowed to continue to manufacture and supply such instruments for use during the pendency of this suit, your orators will be wholly without adequate remedy in the premises.

Yet the defendants, well knowing the premises and
36 the exclusive rights of your orators as aforesaid, but contriving to injure your orators and to deprive them of the benefit and advantage which might and otherwise would

accrue to them from said inventions, without the license or consent of your orators, and in infringement of the said patents, have, as your orators are informed and believe, made, sold and used telephones embracing the inventions secured to your orators in said Letters Patent, or substantial and material parts of them, and have used the several improvements secured to your orators by said patents, and are still using the said several improvements at the city of 37
New York, and divers other places within said district, and have furnished electric speaking telephones made by them to a considerable number of persons within this district, to be connected up, and used as electric speaking telephones for the transmission of articulate speech, by and according to the method secured to said Bell and to your orators by said patents, and still continue so to do; but precisely how long the defendants have made, sold and used the said several improvements, and to what extent they have made, sold and used them, your orators, for want of a discovery 38
thereof, do not know and cannot set forth, and they pray that the defendants may be compelled to set forth the same in their answer.

Your orators, upon information and belief, aver and charge that F. A. Klemm and A. G. Tisdel claimed to have made certain alleged improvements in electric speaking telephones, and applied for patents therefor; that the defendants Klemm, Wolf, Ernest Marx, and Moritz Loth acquired the ownership of said alleged inventions; that thereafter patents of the United States issued on said appli- 39
cations, or some of them, to wit, patent 227,270, dated May 4, 1880, to said four defendants on an improvement in telephonic battery transmitters, alleged to have been invented by said Klemm, and patent 227,861, dated May 18, 1880, to the same persons, on an improvement in magneto-telephones, alleged to have been invented by said Tisdel; that after said purchase of said inventions the said defendants, being well aware that any electric speaking telephone apparatus which would embody said improvements would infringe your orators' said patents, and particularly the first 40

Bell patent 174,465, and thereafter, hearing that one Daniel Drawbaugh, of or near Harrisburg, Pa., claimed that he had made some experiments relating to electric speaking telephones (which experiments if made were incomplete, imperfect, unfruitful, and were long before abandoned), entered into an arrangement with him to set up and claim that he was the first inventor of the speaking telephone, and to make application for a patent therefor. And thereafter alleging and pretending that said Drawbaugh
41 was the original and first inventor of the electric speaking telephone, and that electric speaking telephones had not before such application been in public use or on sale for more than two years with the knowledge and consent of said Drawbaugh, they did, on or about the twenty-first day of July, 1880, induce him to make and cause to be filed in the Patent Office of the United States, an application for a patent to issue to them as assignees of said Drawbaugh as the first and original inventor of the electric-speaking telephone, the said defendants well knowing at the time
42 that electric speaking telephones had been in public use by your orators and the licensees of your orators for more than two years before said application; all of which claims and pretences your orators charge to be wholly unfounded and untrue.

And further to carry out their plans, the said defendants, or some of them, did associate with themselves the other individual defendants, and did, on or about the thirty-first day of August, 1880, form or undertake to form a corporation, under the laws of the State of New York, having
43 its principal place of business and office in the city of New York, with a nominal capital of $5,000,000, called "The People's Telephone Company," of which, by the articles of association, the defendants, Edgar W. Chellis, Joseph Loth, Julius Bien, Marcus Marx, Auguste H. Girard, John N. Goodwin, Richard C. McCormick, Henry D. Cooke, Jr., and Max L. Gutmann, are declared to be and in fact became the trustees and directors, for the declared purpose of manufacturing, selling and using telephones, under and in accordance with what they pretend

are the inventions and improvements of said Klemm, Tis- 44
del and Drawbaugh.

Your orators aver and charge that the infringing telephones made and sold and threatened to be made and sold by the defendants conform to the improvements and forms alleged to have been devised by said Klemm and Tisdel before they knew of said Drawbaugh's alleged inventions, and do not copy or conform to the forms experimented with by said Drawbaugh as of his own invention.

And your orators aver that said pretended inventions of said Drawbaugh (if ever made by him) have not been 45
by him, or any one claiming under him, introduced into public use, and that knowledge thereof has been withheld from your orators, and from the public, except so far as they have been disclosed within the three months last past by certain newspaper publications.

Your orators aver and charge that the defendants, or some of them, caused to be published the following newspaper articles, or furnished for publication the matter therein contained, on or about the date of the publication thereof:

[*From the Cincinnati Commercial of July* 22, 1880.] 46

"TELEPHONE COMBINATION.

"*Special to Cincinnati Commercial.*

"WASHINGTON, D. C., July 21. — An application for a patent was filed to-day that, in consequence of its vastness of interest, as well as wealth of prospect, renders it a subject of national interest. A company of leading business men has been formed, that has bought up all the telephone patents antedating those now in use, and known as the Bell, Gray and Edison patents. The company is composed of leading business men from all parts 47
of the country, Cincinnati being largely represented and interested. The cash capital of the company is $5,000,000, with headquarters in New York, and in about sixty days they will open up the telephone, which will certainly result in the driving out of all telephones in the market,

save the ones they hold, or else the compelling the Gray, Bell and Edison lines to pay the new company a munificent royalty. It appears from the testimony now on file and in the possession of the new company, which is con-
48 clusive and exhaustive, that the inventor of the telephone is a poor mechanic, living near Harrisburg, Pa., named Daniel Drawbaugh. Owing to his poverty, he was unable to push his patent on the market. The new company have secured and are sole possessors of this invention, antedating those now in use. They are also owners of four patents for telephones issued to Mr. Klemm, of New York. A large number of capitalists were here to-day to see the filing of the application, and they assert, with a positiveness that is almost convincing, that it will not be long till
49 they have entire charge of the telephones, not only in this country but in the world, and that they will be able to establish lines by which messages can be transmitted for almost a song."

"Mr. Lipman Levy, of the law firm of Moulton, Johnson & Levy, of Cincinnati, was here to-day in the interest of the Cincinnati parties, who, as already stated, are among the most prominent financial men of our city."

[*From the New York Journal of Commerce of Monday, Aug.* 23, 1880.]

50 "A NEW TELEPHONE COMPANY. — A company has recently been formed in this city with a capital of $5,000,000, for the purpose of manufacturing telephones. The company is to be known as The People's Telephone Company, and a number of leading capitalists in this city and Cincinnati are interested in it. The telephones are to be manufactured under the patents of Frank A. Klemm and Abner G. Tisdel, and the application for patents of David Drawbaugh, of Eberly's Mills, Cumberland County, Pa., filed July 21, 1880. It is claimed by those interested in
51 the new enterprise that Drawbaugh is really the inventor of the telephone, and had completed one years before Professor Bell or any one else had manufactured one. He

was, however, in very humble circumstances, and his neighbors who knew of his experiments looked upon him as a harmless lunatic. He continued improving his original telephone, and it is claimed that the one which the new company proposes to furnish is superior to any now in use. The company has fitted up a factory in Brooklyn, and in three months will be prepared to supply 1,000 of the new telephones. As soon as operations are actively commenced, 52
it is expected that legal proceedings will be begun against the new company by the Gold and Stock Telegraph Company, which holds most of the existing patents, and a long and interesting legal fight is anticipated."

Your orators have requested the said defendants to acknowledge their rights in the premises, and to desist and refrain from the said acts, and from disregarding and infringing your orators' said rights, and to account with and pay to your orators what is justly due to your orators by reason of said infringement. 53

But now so it is, may it please your Honors, that the defendants wholly refuse so to do; but, on the contrary, continue and threaten to continue said infringement of the rights of your orators aforesaid, and particularly threaten to make and put out other like instruments, and thereby cause irreparable injury to your orators' lawful business. All which is contrary to equity and good conscience.

To the end, therefore, that the said defendants may if they can show why your orators should not have the relief herein prayed, and may upon their oaths, and according to their 54
best and utmost knowledge, remembrance, information or belief, full, true, direct and perfect answer make to all and singular the matters hereinbefore stated and charged, as fully and particularly as if the same were here repeated, and they especially interrogated as to each and every of said matters, and more especially may answer, discover and set forth whether during any and what period of time, and whether at said New York or elsewhere, and when and where they used said improvements, or either of them;

55 and whether they manufactured or sold any electric speaking telephones or apparatus to transmit speech by electricity, or the various parts of such telephones, and how many they have made or sold, and to whom they have sold the same, and how the said telephone and the several parts of the same are constructed and used.

And your orators show that they are entitled to restrain all further use of telephones which have been or shall be manufactured and disposed of by the defendants or either of them, and to receive and collect from each user thereof
56 a suitable sum as and for damages and profits in consequence of and growing out of such use by each person who has used the same; and not waiving said rights, but wholly insisting thereon, and asserting that they intend to pursue and enforce said rights against said users, your orators aver that the defendants are also liable to pay to your orators other sums as and for profits by them actually realized by and from said infringement and unlawful acts. Wherefore your orators pray that the defendants may be decreed to account for and pay over to your orators all such gains and
57 profits resulting to them from said infringements; and may be restrained, together with their servants and agents, by an injunction, to be issued out of this honorable court, or by one of your Honors, according to the law in such case provided, from making, selling or using the said improvements, patented as aforesaid, or either of them; and that they may also be enjoined and restrained as aforesaid, during the pendency of this suit, and for such other and further relief in the premises as the nature of the case may require and to your Honors shall seem meet.

58 May it please your Honors to grant unto your orators not only a writ of injunction but also a writ of *subpœna*, to be directed to the said defendants and each of them, commanding them and each of them, at a certain time and under a certain penalty, therein to be limited, personally to be and appear before your Honors and this honorable Court, then and there to answer unto this bill of com-

plaint, and to do and receive what to your Honors shall seem meet in the premises.

AMERICAN BELL TELEPHONE CO.
W. H. FORBES, *President.*

METROPOLITAN TELEPHONE AND TELEGRAPH CO.
W. H. FORBES, *President.* 59

DICKERSON & DICKERSON,
Solicitors.
E. N. DICKERSON,
CHAUNCEY SMITH,
J. J. STORROW,
Of Counsel.

UNITED STATES OF AMERICA,
STATE OF MASSACHUSETTS, } ss.
SUFFOLK COUNTY, OCT. 19, 1880.

Personally appeared William H. Forbes, above named, 60
and, having been duly sworn, doth depose and say, that he is president of said American Bell Telephone Company, and of said Metropolitan Telephone and Telegraph Company, and of said Bell Telephone Company; that he has read the foregoing bill and knows the contents thereof; that all the matters therein stated as to the acts of said three corporations he knows to be true; that all other matters therein stated he believes to be true; and believes the said Bell to be the true, first and original inventor of the improvements in said two patents set forth and claimed; 61
and that the same had not been in public use or on sale two years before his respective applications for said two patents.

Sworn to before me,
[SEAL] GEO. WILLIS PIERCE,
Notary Public.

Filed Oct. 20, 1880.

REPLICATION.

CIRCUIT COURT OF THE UNITED STATES,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

62 AMERICAN BELL TELEPHONE COMPANY ET AL.

v.

PEOPLE'S TELEPHONE COMPANY ET ALS.

The replication of the above-named complainants to the answer of the People's Telephone Company, Marcus Marx, Auguste H. Girard, John N. Goodwin, Frank A. Klemm, Richard C. McCormick, Julius Bien and Simon Wolf.

These repliants, saving and reserving unto themselves all and all manner of advantage of exception to the manifold
63 insufficiencies of the said answer, for replication thereunto say that they will aver and prove their said bill to be true, certain and sufficient in the law to be answered unto; and that the said answer of the said defendants is uncertain, untrue and insufficient to be replied unto by these repliants; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true.

All which matters and things these repliants are and will
64 be ready to aver and prove as this Honorable Court shall direct, and humbly pray as in and by their said bill they have already prayed.

DICKERSON & DICKERSON,
Complainants' Solicitors.

Filed Feb. 7, 1881.

United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

AMERICAN BELL TELEPHONE CO. ET AL.

v.

PEOPLE'S TELEPHONE CO. ET ALS.

EVIDENCE FOR COMPLAINANTS.

TAKEN PURSUANT TO THE SIXTY-SEVENTH RULE OF THE SUPREME COURT OF THE UNITED STATES IN EQUITY, AS AMENDED, BEFORE ME,

CHARLES H. SWAN, *Examiner.*

BOSTON, Feb. 16, 1881.

PRESENT: JAMES J. STORROW, Esq., *of Counsel for Complainants;* LEWIS ABRAHAM, Esq., *of Counsel for such Defendants as have been served with Subpœna in this Cause, or have heretofore appeared or answered.*

Counsel for complainants offers in evidence the following documentary evidence: —

An Office copy of Letters Patent No. 174,465, granted Alexander Graham Bell, March 7, 1876, and marked "Exhibit Bell Patent, No. 174,465."

An Office copy of Letters Patent No. 186,787, granted Alexander Graham Bell, Jan. 30, 1877, and marked "Exhibit Bell Patent, No. 186,787."

A certified copy of assignment, Alexander Graham Bell to Gardiner G. Hubbard, dated July, 1877; recorded in Book R^{21}, page 399, of Assignments of Patents.

A certified copy of assignment, Gardiner G. Hubbard to Bell Telephone Company, dated July 20, 1878; recorded Book Y^{22}, page 460, of Assignments of Patents.

A certified copy of assignment, Bell Telephone Company to American Bell Telephone Company, dated June 22, 1880; recorded Book I^{25}, page 285, of Assignments of Patents; marked "Exhibit Assignments."

[*Defendants' counsel admits the execution of the above assignments.*]

A certified copy of the charter of the American Bell Telephone Company, and a certified copy of the certificate of its organization, from the secretary of the Commonwealth of Massachusetts.

Complainants' counsel also puts in evidence the instruments: "Complainants' Exhibit Klemm Battery Telephone, E. L. Bradley," and "Complainants' Exhibit Tisdel Magneto Telephone, E. L. Bradley," heretofore filed in this case, and referred to in the affidavit of Edward L. Bradley, and in the affidavit of Charles R. Cross, heretofore filed in this case, to be used upon an application for a preliminary injunction.

DEPOSITION OF CHARLES R. CROSS.

Direct Examination by JAMES J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. State your name, age, residence, and occupation.

Ans. Charles R. Cross; I am thirty-two years old; I live in Boston, and am Thayer Professor of Physics in the Massachusetts Institute of Technology.

Int. 2. State how long and to what extent you have been engaged in the study of the physical sciences; and to what extent, if at all, you have been accustomed to make experiments in the several branches of physics, especially those relating to electricity and acoustics.

Ans. I have been an instructor at the Institute of Technology

during the past ten years, and during that time I have been constantly engaged in the study of various branches of physics. During the past eight years I have especially investigated the subjects of acoustics and certain branches of electricity. In the prosecution of my studies during this time I have constantly been engaged in the experimental study of the subjects mentioned, and have been practically familiar with all the apparatus ordinarily used by scientific men in the investigation of sound and electricity.

Int. 3. What attention have you given to the speaking telephone and to its principles and mode of operation?

Ans. I have been familiar with the rise and development of the speaking telephone from its very beginning, having been in frequent communication with Professor Bell ever since the winter of 1873–4. I am familiar with Mr. Bell's patents, have investigated with great care the theory upon which these patents are based; and am practically familiar with the construction and use of the various forms of instruments constructed in accordance with said patents. During the past two years, I have conducted a very extensive series of experiments relating to the different branches of telephony, in the capacity of expert for the Bell Telephone Company.

Int. 4. State whether or not you have testified as a witness in any cases in the courts of the United States upon the principles of the invention embodied in patents, and in machines or apparatus.

Ans. I have done so frequently.

Int. 5. You say you have been familiar with Mr. Bell's patents. State whether or not among these patents are those which have been introduced in evidence in this case marked "Exhibit Bell Patent No. 174,465," and "Exhibit Bell Patent No. 186,787."

Ans. The patents No. 174,467 and No. 186,787 are among those which I have had frequent occasion to examine.

Int. 6. Referring to the patent No. 174,465, will you explain the mode of operation of the apparatus referred to in the fifth claim of the patent; explaining, as far as may be necessary, the character of sounds, their action upon the apparatus, and the manner in which the apparatus operates to produce the results which are ascribed to it in the patent?

Ans. The sensation of sound is produced by the action upon

the ear of the vibrating particles of air which are set into a vibratory, or to-and-fro motion, by the vibrations of the sounding body. The primary impulse given by the sounding body to those particles of air immediately in contact with it, is gradually transmitted from particle to particle, in consequence of the elasticity of the air, or other medium through which the sound passes. In consequence of the mode of action of the elasticity of the air, the motion originally communicated to the particles of air in contact with the sounding body is not transferred instantaneously to all the other particles; but in consequenc of their *inertia*, as the sounding body vibrates to and fro, a similar movement is impressed upon one after the other of the particles surrounding it. This to-and-fro motion of the vibrating body generates a similar minute to-and-fro motion of the air particles, so that they are alternately crowded more closely together, and separated more widely from each other, thus producing alternate condensations and rarefactions in the air. It is to these alternate condensations and rarefactions that the term "sound wave" is given. It will be observed that each particle vibrates to and fro in a straight line in the direction in which the wave motion is propagated. If we consider that the vibration of the air particles is produced immediately by the vibration of the sounding body, we see that the motions of the air particles must be a perfect copy of the motions of the particles of the vibrating body. Such vibrations may differ in three separate ways, viz., in the extent of the path of the vibrating particle, in the frequency of its vibration, and in the character of its vibration. It is evident, in the first place, that the vibrating particle may, in its to-and-fro motion, traverse a longer or shorter path; in the second place, it may traverse this path a greater or less number of times in each second, that is, its rate of vibration may differ; in the third place, while traversing its path it may move according to different laws of acceleration or retardation of its velocity: for example, its acceleration during a part of its course may be, and in some cases is constant, or the rate of acceleration may constantly change, and the law of its change may vary in different ways. To the changes in motion thus caused, what I have called the peculiar character of the vibration is due. If we consider these three kinds of variation, in

their effect upon the senses, we find that variations in the extent of the path or amplitude of vibration of the particle determine, other things being the same, the loudness of the sound; the variations in the frequency of vibration determine the pitch of the sound; and variations in the character of the vibration determine what is known as the quality, or *timbre*, of the sound.

In the statements which I have just made I have spoken of the motion of a single particle; but it is evident, from the mode of transmission of sound, that all of the particles of the air through which the sound is conveyed partake of the various characteristics of vibration which I have discussed.

I have used the term "quality or *timbre*"; quality is that peculiarity of a sound by which, independently of its pitch or loudness, we are enabled to determine the instrument by which the sound is produced; thus, for example, the note of a violin differs from the note of a flute in quality, even though the two are the same in pitch and loudness.

It is well known to scientific men that these differences in quality, which, as I have said, are due to differences in the character of the motions of the vibrating particle, are produced acoustically by the combination of a number of separate or partial tones, which can be shown to be produced when a particle is in vibration; and which partial tones differ in number, in pitch and in intensity or loudness, in accordance with differences in the character of the motion of the vibrating air particles.

The lowest of these partial tones is called the "fundamental," the other and higher notes "overtones." Hence it is evident that the quality of a sound depends upon the relative pitch, intensity and number of partial tones present. In a very few exceptional cases only the fundamental is present, and what is called a simple sound is produced. In general, the pitch of a note is determined by the fundamental, the overtones determining the quality. These facts, constituting what is known as Helmholtz's Theory of Quality, were first discovered by the physicist whose name the theory bears. The human voice owes its peculiar quality to the presence of great numbers of these partial tones; and very slight changes in the partial tones will produce very considerable changes in the voice.

From what I have said thus far, it will be seen, that in order to reproduce articulate speech, we must be able to reproduce, in the air, vibrations which shall possess all these characteristics of pitch, intensity and quality; and which shall, moreover, possess those same characteristics of pitch, intensity and quality; that is, of rate of vibration, amplitude of vibration, and character of vibration, which are possessed by the vibrating particles which are set in vibration directly by the organs of speech. If we can determine the speed and direction of motion of an air particle at each instant, and hence, also, the extent of its path, we can evidently impress upon it all three of the characteristics that I have mentioned; and hence can produce any desired sound at will.

In Mr. Bell's patent No. 174,465, a method is described by which the motions which are produced in the air at one place, the transmitting station, can be reproduced by an electrical method of intercommunication at the receiving station. By means of his invention he is able, by the use of certain electrical apparatus, to impress upon the particles of air at a distant place, the receiving station, motions substantially identical with those which are immediately impressed by the voice upon the particles of air at the transmitting station.

According to the specification, he effects this result by the use of the transmitter, which takes up from the air at the transmitting station the motions which are impressed upon it by the voice of the speaker, and the vibrating portion of which transmitter moves in substantial accordance with the movements of the air particles themselves. This transmitter, being connected with a line wire joining the two stations between which speech is to be transmitted, is enabled, by its electrical connection with that wire, to produce in it electrical variations which correspond to and are similar in form to the motions of the movable part of the transmitter, and hence to the motions of the air particles which have actuated the movable part of the transmitter. These electrical variations, in their turn, set in motion a movable part of a receiving instrument with which the line wire is connected, and in their turn produce in this movable part of the receiver vibrations corresponding to and similar in form to those electrical vibrations by which they are produced, and hence to the motions of the air particles at the transmitting station. The movable part of

the receiving instrument, thus vibrating, impresses upon the air at the receiving station vibrations similar in form and corresponding to its own motions.

The motions thus produced in the air particles at the receiving station are therefore evidently similar in form, and correspondent to the original vibrations impressed upon the air at the transmitting station by the voice of the speaker at that station. This being the case, it is evident, from what I have said, that the sound uttered by the speaker at the transmitting station will be reproduced at the receiving station.

It appears from these facts that Mr. Bell's apparatus consists essentially of a transmitter adapted to take up the vibrations of the air at the transmitting station; a line wire connecting the transmitting with the receiving station, together with a battery or some other form of electrical apparatus, which is capable of furnishing a supply of electricity; which line wire shall serve to transmit the electrical variations produced by the transmitter from one station to the other; and a receiver which, actuated by the electrical variations thus transmitted by the line wire, shall be caused to reproduce the motions of the transmitter and of the air particles by which that transmitter is actuated. It is true that the receiving instrument may not always reproduce the vibrations of the air particles at the transmitting station in every minute detail, but the instrument is a speaking telephone only so far as it is adapted to reproduce those motions with substantial fidelity; and its practical construction and reproduction must be such that these vibrations shall be substantially reproduced.

It is evident that when the transmitter is in operation, variations in the electrical current may take place in three ways, — there may be a variation in either the direction of the current; the rate or violence of change of the current; and the frequency of change of the current: and from these three kinds of variations similiar variations in the direction, rate and frequency of change of the motion of the movable part of the receiver will result. And hence, from these different electrical variations, differences in the quality, intensity and pitch of the sound produced by the receiving instrument will follow. Therefore, to reproduce articulate speech or any other sound

in all its characters of pitch, intensity and quality, it is necessary that the movable portion of the receiving instrument should be constantly under the guidance of, and controlled by, the movable portion of the transmitting instrument; and in case this constant control is not exercised, and in precisely that degree in which it ceases to be exercised, the instrument becomes incapable of transmitting articulate speech.

No form of transmitter which operates by making and breaking an electrical circuit can possibly transmit articulate speech, or any other sound in its different characteristics of pitch, intensity and quality; for the reason that the constant control of which I have spoken is not exercised in such an instrument. With any circuit-breaking instrument the loudness and quality of the sound produced at the receiving station are dependent solely upon the physical construction and action of the receiving instrument itself, and of the battery or other source of electricity by which the transmitter is acted upon. The intensity and quality of the sound produced at the receiving station are therefore, with such an instrument, entirely independent of the intensity and quality of the original sound produced at the transmitting station. It is for this reason that an instrument of this class, such as, for example, the well-known Reis instrument, is incapable of transmitting either intensity or quality; and hence is incapable of transmitting articulate speech.

As will be seen from what I have already said, the Reis transmitter, or any other transmitter which operates by making and breaking the circuit, is capable of transmitting pitch, and pitch only.

There is also another reason which prevents a Reis transmitter, or other circuit-breaking instrument, from transmitting articulated speech; this is the effect of the interruptions of the current, in producing a loud and disagreeable noise in the receiver, which, of itself, would be sufficient to overpower and obliterate those fine shades of variation upon which differences in quality depend.

In fact this noise is so marked, that an ordinary battery transmitter can be used as a telephonic call by so operating it as to cause it to actually make and break the electrical circuit. Under these circumstances, the noise which proceeds from the receiving instrument, which, when the transmitter is used in a normal and proper manner,

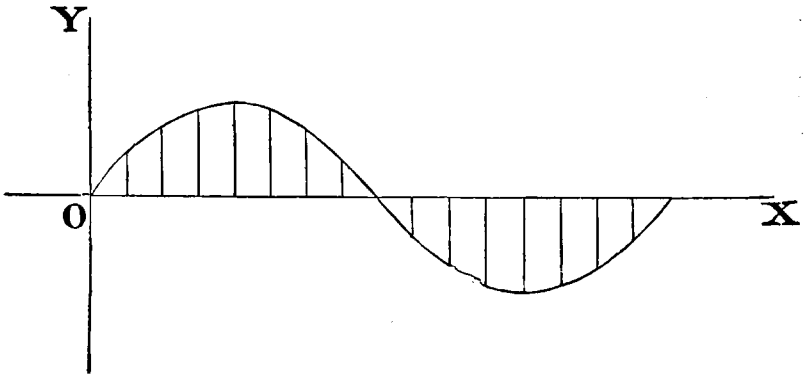
can be heard only by one close to the instrument, is capable of being heard throughout a large room.

Int. 7. You speak of the sound waves, and explain the mode in which they are produced. Do you understand that the actual existence of these sound waves has been demonstrated, or is accepted as a fact by scientific men?

Ans. The existence of such sound waves has been accepted as a fact by scientific men for several hundred years. Within a few years past, they have been visibly shown to exist by a method which demonstrates the existence of alternate condensations and rarefactions to the eye.

Int. 8. Has any method of representing such waves been adopted; and if so, what is it?

Ans. It is customary among physicists to represent the motions of the particles of a sound wave, and also the variations in condensation and rarefaction at different points in a sound wave by a graphical method. I can best illustrate this by reference to a diagram which I produce, to be incorporated in my answer.



The curve in the diaphragm is what is called a sinusoidal curve, such as corresponds to the sound waves produced by a simple sound, consisting of a single note without overtones. (Such a sound can be produced by a tuning-fork, mounted on a resonant case, and bowed in a manner suitable for this purpose.) O X is divided into a number of equal spaces to represent equal periods of time. The length of these spaces is purely arbitrary. The distances from O to the beginning of any one of these divisions

are called *abscissas*. From each of these points on O X, representing successive intervals of time, lines are drawn parallel to O Y, and proportional in their relative lengths to the distances of the particle from the point of rest at the successive periods of time. In the case of the particle pursuing a simple vibration, these magnitudes will increase to a maximum which will be attained at the instant when it reaches the extremity of its path; they will then diminish, as it comes back to the starting point; and as it passes beyond it, moving in the other direction, they will be indicated by distances measured off below the line O X. Joining then the extremities of the perpendicular lines, we obtain a broken line somewhat resembling a curve; and if we put the perpendicular lines close enough together, the broken line joining their extremities becomes a curve. This curve is determined by the length of two sets of lines or distances, — the *abscissas* measured on O X; and the *ordinates* measured parallel to O Y. In the case stated, the starting point is assumed to be in the middle of the path (*e. g.*, the position of a pendulum when at rest), and the motion is measured in both directions from it; *i. e.*, the curve is on both sides of the line, and part of the ordinates have one direction, part the other. But the point from which the measurements are taken is purely arbitrary; and the line O X, which represents this point, might be placed lower down and tangent to the lowest part of the curve. In that case the curve would not change its character, but the ordinates would all be measured in one direction and on one side of O X. Algebraically expressed, they would all be + quantities, instead of being alternately + and — quantities in the two branches of the curve; only the + quantities would be greater than shown in the diagram. In the case indicated by the diagram we should consider that an increase in the length of the ordinates, in passing from one to the next, signified motion in one direction, and a decrease signified motion in the other direction. In this method of representation one set of lines, measured along O X, corresponds to the period in which the movement is executed, or its frequency; and the other, measured along O Y, to the amplitude or extent and also to the direction of the motion; and these measurements express frequency, amplitude and direction. The same curve will represent the extent

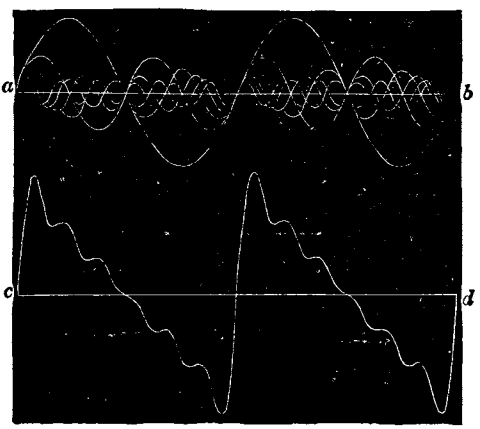
of rarefaction and of condensation of the air produced by the movement of the particles, and also, when correctly interpreted, the motion and the varying velocity of the particles.

It is from this habit of graphical expression that a vibration is commonly spoken of among physicists as having "form"; form of vibration is a phrase used to signify the "character" of a vibration, as I have explained it.

It must be remembered that this curve does not represent the path of the moving particle; that always moves to and fro in a straight line. This curve is merely a convenient form of expressing to the eye the character and variation of the motion.

Int. 9. If you can produce from any scientific work a diagram representing the manner in which overtones are combined with a fundamental to give quality to sound different from that due to the fundamental alone, and representing the form given to the curve as the result of all the vibrations, will you do so, stating the source from which you derive it, and explaining, as far as you think necessary, the diagram?

Ans. The following diagram, taken from Mayer on "Sound," p. 153, represents the motion of a particle under the influence of sound waves: —



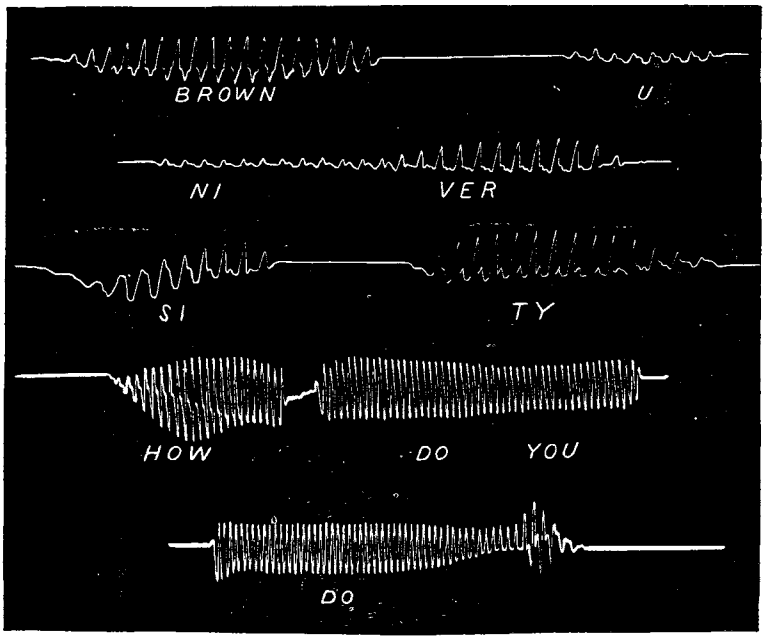
The curves at *a b* represent six sound waves of six simple sounds. When these are sounded together as fundamental and overtones, and with relative intensities corresponding to the amplitude of the

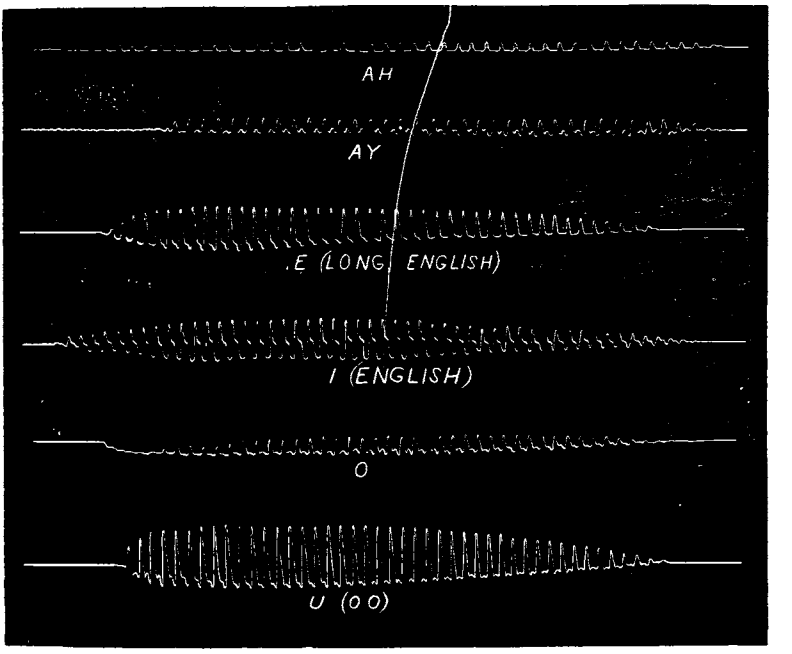
curves, as drawn, so as to produce a sound having the quality due to this combination, the vibrational "form," as it is called, of the sound perceived by the ear is represented by the curve at *c d*. The set of vibrations which constitutes one complete vibration is shown twice between *c* and *d*. The entire "form" or character of this curve can be determined and controlled, as already stated, by determining or controlling for each point the length of the abscissa and of the ordinate for that point, or in other words, determining or controlling the elements of time or frequency, amplitude or intensity, and direction; but it is obvious that it will require very many measurements of abscissas and ordinates to determine or control the "form" of each complete set of vibrations.

The curve representing one set of vibrations is about three inches long; and it is apparent, even to a casual observer, that by taking the ordinates as little as one eighth of an inch apart, we should miss the little twists which most strikingly represent to the eye the "quality" or the effect of the overtones in this vibrational form, and which are equally important to the "quality" of the sound as perceived by the ear; and as in the articulate speech of a woman there are twenty-four thousand of these *complete* sets in a minute, it will be obvious that in order to reproduce this vibration the control must be exercised not merely twenty-four thousand times a minute, but really without any interruption or cessation whatever.

Int. 10. If observations have been made upon the curves produced by spoken words, and you can produce a diagram representing the results of such observations, will you do so, giving the authority from which they were made?

Ans. The minute changes which take place during articulation are well shown in a series of curves made by Prof. E. W. Blake, Jr., of Brown University, and described in "Silliman's Journal" for July, 1878. These curves were produced by reflecting a ray of light from a mirror, so attached to the plate of a speaking telephone that the vibrations of this plate were communicated to the mirror. The reflected ray is caused to act photographically upon a sensitized plate of glass, the mirror at the same time being caused


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to vibrate by the action of the voice upon the telephone plate. On rapidly moving the plate of glass in a direction at right angles to that in which the reflected ray was caused to vibrate by the vibrations of the mirror, a photographed representation of the complex vibrations of the mirror was produced. In Prof. Blake's figures the vibrations characteristic of different vowels, and the rapidly changing vibrations produced in the case of a spoken sentence, are very beautifully shown. According to the statement made by Prof. Blake in the article referred to, the vibrations are magnified in the accompanying cuts one hundred and twelve times. Notwithstanding the accuracy of Prof. Blake's drawings, the mere thickness of the lines in the wood-cut is sufficient to obliterate many of the more delicate variations in those vibrations which characterize articulate speech.

Int. 11. Referring again to the first Bell patent (No. 174,465) to which your attention has been called, will you state what the moving parts are which you have referred to as being put in motion by sound waves or by variations of current produced by sound waves?

Ans. In Fig. 7 the transmitter possesses a movable armature, *c*, one end of which is hinged, while the other is so attached to a membrane at *a* that when this membrane is set in vibration by the utterance of a sound into the cone A, the armature shall be caused to take up the vibrations of the membrane. By the vibration of this armature, as it approaches nearer to or recedes from the pole of the electro-magnet *b*, in accordance with the well-known laws of magneto-electric induction, electrical undulations or waves are produced in and transmitted by the line wire *e*. The receiving instrument which is in electrical connection with the line wire possesses an electro-magnet, *f*, whose magnetic strength varies in accordance with the electrical variations produced in the line wire, in the manner described. In front of this electro-magnet of the receiver and opposite its pole is a vibratory armature of inductive metal hinged at *k* and connected at *i* with a membrane stretched over the larger end of the cone L, so that variations in the magnetic strength of the electro-magnet *f*, produced by electrical variations in the line wire *e*, produce vibrations in the armature *h*, and consequently in the attached membrane, so that this attached membrane vibrates in cor-

respondence with the motions of the membrane of the transmitting instrument, and therefore in correspondence with the vibrations of a voice by which the membrane of the transmitter is actuated. I should have said that the vibrating armatures of both the transmitting and receiving instruments are of iron or other inductive metal; and I would also call attention to the fact that the hinged end of each of these vibratory armatures is in magnetic connection with that pole of the electro-magnet which is farthest from the vibrating part of the armature itself; this mode of connection serving to increase to a certain degree the magnetic strength of the apparatus.

Int. 12. Will you explain a little more in detail the function of the battery represented in Fig. 7 of the Bell patent of which you have been speaking, and the manner in which the undulations in the current are produced in the apparatus represented in that figure; and in what way the undulatory current acts in the receiving instrument to produce the proper results?

Ans. The magnets *b* and *f* in Fig. 7 are electro-magnets having soft iron cores, which cores are magnetic only when a current of electricity is passing through the coils surrounding them. The object of the battery shown in Fig. 7 is simply to produce this current, which shall cause the cores to be kept magnetized. The armature *c* of the transmitter, which is of iron or other inductive metal, will, as it moves to and fro, alternately increase and diminish the magnetic strength of the magnet *b*. These variations of magnetic strength will correspond to the various changes in motion of the vibrating armature. In accordance with the well-known laws of magneto-induction, as discovered by Faraday, every change in the magnetic strength of the core of the electric magnet *b* will produce corresponding changes in the current of electricity which passes through the line wire *e*. These variations in the strength of the current will cause corresponding variations in the magnetic strength of the electro-magnet *f*, and these variations in the strength of the magnet will act immediately upon the vibratory armature at *h*. An increase of strength in the magnet *f* will cause the armature to approach to the magnet, while diminution of magnetic strength will allow the armature, under the influence of the tension of the membrane to which it is attached, to recede farther from the pole *f*. Hence,

under the influence of the varying magnetic strength of *f*, the vibratory armature at *h* will execute vibrations corresponding to these changes in magnetic strength, and therefore corresponding to the changes in the electric current in the line wire *e*, to the changes in the magnetic strength of the magnet *b*, and therefore corresponding to the variations in the motion of the vibratory armature at *c*, when moved by the vibrations of the membrane with which it is in contact. The membrane of the receiving instrument at *i* will therefore vibrate in correspondence with the membrane *a* of the transmitting instrument.

Int. 13. Do you find any method suggested in the patent as an alternative one to that you have described for producing the variations or undulations in the current between the transmitter and receiver; if so, will you quote from the specification the language which refers to such other mode?

Ans. It was well known to electricians, long before the date of Mr. Bell's first patent, that the strength of electrical current can be varied, either by increasing its electro-motive force, or by diminishing the resistance of the circuit, in accordance with the well-known law of Ohm, $\text{Current} = \frac{\text{Electromotive force}}{\text{Resistance.}}$

In the apparatus which I have described, Mr. Bell explains a method of producing these electrical undulations by varying the electro-motive force of the current. He also clearly recognizes the possibility of producing such undulations by varying the resistance of the circuit. In his specification, No. 174,465, I find the following: —

"Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit. . . . The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them farther apart. The reciprocal vibration of the elements of a battery, therefore, occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit; then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current. Hence the vibration of the conducting wire in mercury or other liquid included in the circuit, occasions undulations in the current. The vertical vibrations of the elements of a battery in the liquid in which they are

immersed, produce an undulatory action in the current, by alternately increasing and diminishing the power of the battery."

Int. 14. If electricians have been in the habit of stating the law to which you have referred in algebraic terms, will you give the form of expression which has been used, explaining the symbols; and state how long that law has been known, and whether or not it is one which has been found of use in the practical application of electricity?

Ans. The law of Ohm is usually expressed by a formula $C = \frac{E}{R}$, in which C is the strength of the current, E, the electro-motive force, that is the force producing the current; and R, the total resistance of the circuit. Ohm's law was, if I recollect rightly, first stated by him about the year 1830. For the last thirty years its importance has been fully recognized by physicists, and it has been applied by constructors of electrical apparatus in determining the dimensions and arrangement of the different parts of such apparatus.

Int. 15. State whether or not, in your judgment, the substitution of one of these ways of varying the current for the other, changes substantially the character of the described apparatus as an apparatus for transmitting sounds; or changes substantially the method by which sounds are transmitted or reproduced.

[*Objected to by counsel for defendants as incompetent, on the ground that the question involves, in part, a question of law and a legal construction of the patent of Bell.*]

Ans. Speaking as a scientific man, I should say that it does not.

Int. 16. If you have examined the two instruments which have been produced in evidence, marked respectively Exhibits "Klemm Battery Transmitter" and "Tisdel Magneto Telephone," and find them adapted to be used for any purpose when connected in electrical circuit with a battery, state what you find their purpose to be.

Ans. I find that the instruments referred to are, from their construction and method of operation, adapted, when suitably connected with a battery, to transmit articulate speech.

Int. 17. State whether or not, in your judgment, when so connected and used for that purpose, they constitute an apparatus sub-

stantially like that described in the Bell patent of which you have been speaking, and referred to in the fifth claim, and which will operate in transmitting sounds by substantially the same method; and whether or not, in your judgment, they embody, when so used, the invention described in said patent and referred to in said claim?

[*Same objection as to Int.* 15.]

Ans. The apparatus to which I have referred in my last answer, Exhibits "Klemm Battery Transmitter" and "Tisdel Magneto Telephone," when connected and so operated as to transmit articulate speech, use the method invented by Mr. Bell, and described in his specification No. 174,465, for transmitting vocal or other sounds telegraphically, by causing electrical undulations similar in form to the vibrations of the air accompanying such sound. The instruments in question most certainly embody the invention which Mr. Bell describes in his specification referred to; and when used in the transmission of articulate speech, constitute an apparatus which is substantially that described by Prof. Bell.

Int. 18. Will you compare these instruments, when so connected and used, with Mr. Bell's apparatus to which you have referred, pointing out the functions and mode of operation of the several parts; and if you find that these instruments differ specifically from the Bell apparatus, explain the nature of the differences, and give your judgment as to their affecting the substantial likeness of this apparatus to the Bell apparatus, and its method of operation.

Ans. In Mr. Bell's patent No. 174,465, I find a transmitting instrument, a receiving instrument, a line wire connecting these and a battery or other source of electricity. In the apparatus described the transmitter possesses a movable part which is capabable of being set in vibration by the agency of the voice. This movable part is so arranged that it shall cause electrical variations in the current traversing the line wire. The receiver is so arranged that the variations of current referred to shall communicate motion to a movable part, which shall in its turn communicate motion to the air about it. As I have already shown, at some length, the vibrations of this movable portion, when actuated by the sound waves produced by the voice, correspond to these in form; and by their action upon the receiving instrument cause it to vibrate in a similar manner, and hence

produce corresponding vibrations in the air about the receiver. The function of the transmitter, it is evident, is simply to produce in the line wire electrical undulations similar in form to the vibrations of the air particles through whose agency they are produced. The function of the receiver is simply to translate, so to speak, the electrical undulations produced by the transmitting instrument and conveyed to the receiving instrument by the line wire, into vibrations of the air at the receiving instrument. Mr. Bell indicates that these electrical undulations may be produced either by varying the electromotive force of the current, or by varying the resistance of the circuit.

In the exhibits specified I find a transmitter and a receiver, which, when placed in electrical connection with each other by means of a line wire, and provided with a battery as a source of electricity, are adapted to transmit, and will transmit articulate speech from one station to another.

In the Klemm battery transmitter, I find an instrument which, from its construction, is adapted to produce, and when properly operated by the voice, will produce electrical undulations in the current traversing the circuit, similar in form to the air waves by which these electrical variations are produced.

In the Tisdel receiver, I find an instrument which is adapted to produce vibrations in the air, similar in form to vibrations originally produced in the air, at the transmitting station, by the voice; as I have already explained. The defendants' apparatus, like the Bell apparatus, contains a transmitter, which from its construction is adapted to produce electrical undulations as described, and a receiver which is adapted to retranslate these electrical undulations into vibrations of the air.

The Klemm battery transmitter adopts one of the methods mentioned by Mr. Bell, as suitable for the production of electrical undulations similar in form to the air waves produced by the voice; namely, by varying the resistance of the circuit. The precise method adopted in the Klemm transmitter for varying the resistance of the circuit is different from the particular method referred to by Mr. Bell, inasmuch as it utilizes the property of variation in resistance with variation in pressure possessed by various substances.

In my opinion, however, the adoption of one rather than another

particular method of varying the resistance of the circuit does not materially affect the substantial likeness of the apparatus of Mr. Bell and the defendants, or its method of operation.

Int. 19. Will you state whether the fact to which you refer, that the resistance of substances may be varied by pressure, was one known before the date of Mr. Bell's patent, and recognized in the construction of electrial apparatus; and if you can refer to any electrial works of authority, where this fact is referred to, will you do so, and quote the references to the fact?

Ans. It was known long before the date of Mr. Bell's patent, that the resistance of a circuit is varied, without being broken, by variations in the intimacy of contact or amount of pressure between two electrodes in contact, from one to the other of which a current is passing. This fact was noted and recorded by Du Moncel in his book, "Applications de l'Electricité," Vol. II., page 246, edition of 1856, published at Paris in that year. In "Comptes Rendus," for July, 1874, a communication from the same writer described some experiments as to the resistance offered to the current in passing from one electrode to another, in the case where one was a good conductor and the other a poor conductor, and showed that a moderate increase of pressure at the contacts would materially increase the conductivity and thereby the current; and he gave his explanation for this phenomenon.

In Du Moncel, "Applications de l'Electricité," ed. 1856, Vol. I., p. 246, I find the following: —

"Une chose assez curieuse, et qui paraît être au premier abord en contradiction avec la théorie que l'on s'est faite de l'électricité, c'est que la plus ou moins grande pression exercée entre les pièces de contact des interrupteurs influe considérablement sur l'intensité du courant qui les traverse. Cela tient souvent à ce que les métaux de l'interrupteur ne sont pas toujours dans un état parfait de décapage au point de contact, mais peut-être aussi à une cause physique encore mal appréciée. Ce qui est certain, c'est que, dans les interrupteurs où la pièce mobile de contact est sollicitée par une force extrêmement minime, le courant éprouve souvent des affaiblissements assez notables pour faire manquer la réaction électrique qu'on attend d'eux."

Which I translate as follows: —

"A somewhat curious fact, which at first sight appears to be in

contradiction to the views ordinarily received as to the action of electricity, is that the greater or less pressure exercised between the contact pieces of interrupters has an important influence upon the strength of the current which traverses them. This often happens because the metal of the interrupter is not perfectly free from rust at the point of contact, but perhaps also because of a physical cause as yet but little appreciated. This is certain, that with interrupters in which a movable contact piece is acted upon by a very slight pressure, the current often sustained such an enfeeblement as to cause a failure in the electrical action which was expected."

The same writer describes, in "Comptes Rendus" for July 6, 1874, a series of experiments in which he measured the current in a circuit, part of which consisted of a platinum electrode and a piece of wood, more or less damp, kept in constant contact, but with varying pressure and says, page 41, in an article entitled "Récherches sur les transmissions électriques a travers les corps ligneux," as follows: —

"Les expériences que j'avais à faire pour avoir une constatation exacte des effets produits, étaient assez délicates, car une foule de causes étrangères peuvent intervenir, et changer les résultats fournis. Ainsi le dégré de serrage des plaques metalliques de communication avec le bois, son isolement plus ou moins parfait du sol et des murs de l'appartement, où l'on expérimente, la grandeur des surfaces mises en communication avec le circuit métallique, la masse du bois, l'état plus ou moins humide de l'air du cabinet expériences, le contact fortuit des doigts sur les fils de communication avec le galvanometre, et l'état d'isolement de ces fils sont autant de causes qui peuvent modifier les résultats que l'on obtient.

. . . . . .

"6. Que le dégré de la pression de la plaque de platine contre le bois a tellement influé sur l'intensité du courant ainsi transmis, qu' étant de 12 dégrés avec un serrage maximum elle est devenue à zéro quand la plaque était abandonné a son propre poids, et a 5 dégrés seulement avec un faible serrage."

This I translate as follows: —

"The experiments that I have had to make in order to have an exact proof of the effects produced were very delicate, because a number of foreign elements might enter and change the results. Thus *the amount of pressure upon the metallic plates in communication with the wood* is more or less perfect insulation from the earth or the walls of the room, the size of the surfaces put in communication with the metallic circuit, the mass of the wood, the greater or

less humidity of the air, the accidental contact of the fingers with the wires leading to the galvanometer, and the condition of the insulation of these wires were causes which might modify the results that would be obtained.

. . . . . .

"6. That the amount of the pressure of the platinum plate against the wood has so much influence on the strength of the current thus transmitted, that from twelve degrees, with a maximum pressure, it became reduced to zero when the plate was pressed only by its own weight, and to five degrees only with a slight pressure."

In Du Moncel's "Traité de Telegraphie Electrique," Paris, 1864, Part IV., page 559, in speaking of apparatus designed to establish electrical contact, the author says,

"L'expérience montre que plus la pression des contacts est grande, plus est énergique l'intensité du courant qui les traverse," that is, in English, "Experiment shows that the greater the pressure of the contact pieces, the stronger is the current passing through them."

This fact was also constantly acted upon in the practical use of electrical apparatus; care was always taken that contacts should be firm and with considerable pressure, for otherwise the full and desired strength of current was not obtained.

Int. 20. In the Exhibit Klemm Magneto Telephone the magnet, as I understand it, is a permanent magnet and differs somewhat in form from the electro-magnet shown in the Bell receiver. State whether or not these differences affect the substantial likeness of the two instruments in respect to their function and mode of operation, and the work they do in the transmission of sounds.

Ans. They do not, since the function of the battery represented in Fig. 7, of Mr. Bell's specification, is merely to keep the cores of the electro-magnets magnetic. When permanent magnets are employed the permanent magnetism of such magnets is substituted for the magnetization produced by the battery current.

Int. 21. Will you refer to the second Bell patent, No. 186,787, which has been produced in evidence, and describe briefly so much of the apparatus therein described as is referred to in the fifth, sixth and eighth claims, pointing out the functions or results which are attributed to the parts of the apparatus referred to in those claims?

Ans. Claim 5 relates to the special form of magnet suited for use in an electric telephone; the coil being placed about the end or

ends of the magnet nearest the plate. The object of thus placing the coil is to render the magnet quicker in its working, that is, more ready to respond with the requisite rapidity to the variations in the strength of the current passing through the coil. A magnet with the coil thus placed responds more quickly by changes in its strength to slight changes in the strength of the current, and hence it is better adapted for use in the speaking telephone than a magnet in which the coil surrounds the whole length of the magnet, and which consequently acts more slowly.

In claim 6 is mentioned the sounding box, which is combined with the telephone. This sounding box has an important influence in screening the plate of the instrument from the effect of extraneous sounds. The thin air space in front of the plate also exercises an important influence.

In claim 8 I find mentioned the combination of a permanent magnet, with coils upon its end or ends, as described, with a plate of iron or other material, capable of inductive action. The use of the plate of iron, in connection with the magnet, as described in a system of electric telephony, furnishes a most excellent method of causing the electrical and magnetic variations of the apparatus to produce corresponding vibrations in the air.

Int. 22. Referring to the defendants' instruments which have been introduced in evidence, will you compare them with the apparatus described in the patent last referred to, and state how far, if at all, you find them to embrace the features or combinations described in the patent and referred to in the claims above specified?

Ans. In the defendants' magneto-telephone, I find a magnet with a coil upon the end nearest the plate, as described in claim 5. This magnet is placed within a sounding box, as described in claim 6. I find, also, a permanent magnet as described in claim 8. The mouthpieces of both instruments are so arranged as to leave a thin space filled with air in front of the vibrating plate.

Int. 23. Do you find in the defendants' Klemm battery transmitter that the diaphragm is protected from the action of extraneous sounds by a box substantially like that described in the Bell patent?

Ans. I do find that it is thus protected.

Int. 24. I find, in the second Bell patent, a statement that the same instrument is used both as a transmitter and a receiver; and I

understand that the electrical portion of the apparatus described in Bell's first patent is the same both in the transmitter and receiver. Will you state whether the exhibit marked "Klemm Magneto Telephone" is, when properly connected in line with another instrument of the same kind, capable of being used as a transmitter as well as a receiver?

[*Objected to as immaterial and as not relating to any issue in this case.*]

Ans. It is.

Int. 25. You referred, I believe, to the fact that in the Klemm battery transmitter the reduced space is present, shown in front of the plate in Bell's second patent. State whether or not you also find in that transmitter the reduced orifice which admits the sound waves to the plate directly at its centre.

Ans. I do.

Int. 26. Please to examine the instrument complainants' Exhibit Tisdel Magneto Telephone, and look particularly at the armature tongue there found; and state how it is connected with the magnet; and what kind of effect that magnetic connection between the armature plate and the magnet has upon the condition of the armature plate, and upon the operation of the apparatus.

Ans. In the instrument mentioned the armature tongue is attached to that pole of the magnet opposite the pole which carries the soft iron pole piece and coil. The armature tongue is attached by means of a screw; and on account of the flexibility of the tongue the portions of this nearer its extremity are capable of vibrating when acted upon either by the diaphragm or the magnet.

The effect of the attachment of the armature tongue to the pole of the magnet is to so polarize it that that portion of the tongue which is opposite the pole piece and coil shall be of an opposite polarity to that of the pole piece itself. The effect of this polarization, provided it has any practical effect, would be to cause slightly stronger currents in the coil than would otherwise be produced.

Int. 27. Please to examine the two Bell patents, which you have already referred to, and state whether you do or do not find in either of them a speaking telephone apparatus, in which the armature tongue is polarized by magnetic connection with the uncovered leg

of the operating magnet, the other end of which carries the operating coil; and, if you do, point out where you find that feature.

Ans. In Mr. Bell's first patent, No. 174,465, Fig. 7 represents an instrument of this kind. The armatures marked *c* and *h* respectively, in that figure, are fastened loosely at one extremity of the magnets *d* and *k*, so that they can vibrate readily, and so that the vibrating tongues shall be opposite the other pole of the corresponding magnet. These armatures are evidently polarized by induction; and, in consequence, tend to produce greater variations of the current in the coils than would be produced if they were not thus polarized.

Int. 28. In your twenty-sixth answer you indicate that part of the Tisdel instrument which is inclosed in the coil, as a soft iron pole piece mounted on one pole of the permanent steel magnet. Please state what effect that arrangement has on the condition of the said soft iron core, and whether or not you find such an arrangement for the same purpose in either of said Bell patents; and if so, point out the figure which shows it.

Ans. The soft iron pole piece, from its position in connection with the permanent magnet, is constantly polarized, without the necessity of connecting the coil with a battery. A magnet made in this way is much quicker in its action; and, owing to this increased sensitiveness, much better fitted for use in a speaking telephone than if the coil covered a greater portion of the magnet.

This construction of a pole piece surrounded by a coil in contact with and continually polarized by a permanent magnet, is shown in Fig. 5 of Mr. Bell's second patent No. 186,787.

Int. 29. I observe that the said Tisdel instrument contains an armature tongue which operates upon or is operated by the electromagnet; and also a diaphragm of insignificant inductive capacity, which acts upon the air or is acted upon by sound waves in the air, according as the instrument is used as a receiver or transmitter.

Will you please state what connection the vibrations of the one have upon the vibrations of the other, if any, and how that connection is secured, if it exists?

[*Objected to as leading; assuming a condition and state of facts by counsel; and not interrogative; and assuming the operation of the device without any demonstration.*]

Ans. The armature tongue is so placed in relation to the diaphragm, that a small piece of rubber which is attached to the tongue (being inserted in a hole drilled in the tongue) shall constantly be in contact with the diaphragm. Hence the armature tongue is, in consequence of this attachment, forced to follow the motions of the plate in its vibration, when the instrument is used as a transmitter; and the plate is forced to follow the vibrations of the armature tongue when the instrument is used as a receiver.

In the instrument exhibited, the armature seems to be mounted so that the rubber shall always be in contact with the plate throughout its whole vibration.

[*Adjourned.*]

FEB. 17.

Cross Examination by LEWIS ABRAHAM, Esq., *of Counsel for Defendants as aforesaid.*

Cross-Int. 30. In answer to Int. 3, in your examination in chief, you say you are practically familiar with the construction and use of the various forms of instruments made in accordance with the Bell patents. Please describe the various forms to which you refer.

Ans. I refer to instruments in general in which "the undulatory current" produced through the action of the voice upon the transmitter is used to reproduce this motion in the receiver. As special forms of the instrument constructed and operated in accordance with the claims of Prof. Bell, I would mention, among others, those represented in Fig. 7 of Mr. Bell's first patent, and those represented in the various figures of Mr. Bell's second patent; also the various forms of microphone transmitter as used by Berliner, Edison, Hughes, Blake and others.

Cross-Int. 31. Are the speaking telephones, now in general use, built in exact accordance with the specifications and claims of patent No. 174,465, without any additions or improvements either of Bell or others?

Ans. There have been various improvements upon the particular form of apparatus shown in Fig. 7 of that patent; and certain modifications in the precise manner of varying the resistance of the circuit, in cases when this one of the two methods mentioned by Mr.

Bell for producing the undulatory current is used; but all of these variations are intended to accomplish more perfectly the result mentioned in claim 5 of said patent, and operate in the manner there set forth.

[*Answer objected to as not responsive, and the question is repeated.*]

Cross-Int. 32. [*Cross-Int.* 31 *reread.*],

Ans. They are not.

Cross-Int. 33. You state also in your answer to Int. 3, that during the last two years, in the capacity of expert for the American Bell Telephone Company, you have conducted a series of experiments relating to the different branches of the telephone. Please state when your employment commenced, and what duties you have performed as an employé of that company.

Ans. I was first employed by the company in the spring of 1879, in connection with one of the patent cases then in progress; since that time I have been employed by them quite frequently in connection with various cases. I have also frequently been consulted by them with regard to improvements and modifications in the operation of the telephone.

Cross-Int. 34. Are you generally retained as expert for the American Bell Telephone Company?

Ans. They have frequently called upon me when issues have arisen involving the discussion of scientific facts. As I know nothing about the legal operations of the company beyond those specific cases in which I have been asked to testify, I can give no more definite reply than what I have already indicated.

Cross-Int. 35. In whose behalf and at whose request have you testified as a witness in the cases of the courts of the United States, or in cases in the United States Patent Office, upon the principles of inventions embraced in patents or apparatus relating to what is known as the telephonic art?

Ans. At the request of the attorneys of the American Bell Telephone Company, and in behalf of that company.

Cross-Int. 36. Please name, as nearly as you can recollect, the several cases in which you have testified on behalf of that company, either in the courts or before the Patent Office.

Ans. I have testified in connection with the Dowd case, in 1879; and with cases involving the alleged inventions of Messrs. Chinnock, Eaton, and others; I have also given affidavits in connection with the People's Telephone Company, Messrs. Pearce and Jones, and a number of others. The only interference controversies I have testified in relation to, in the Patent Office, relate to certain improvements embodied in the instrument known as the Blake transmitter.

Cross-Int. 37. Referring to claim 5, in patent No. 174,465, do you understand that the electric undulations therein claimed are similar in form, and pass over the line wire similar in form from end to end of said wire, to the form of the sound waves that set the transmitter in motion?

Ans. I do.

Cross-Int. 38. Please explain what you denominate as "continuous voltaic current." Does such a current flow as a continuously uninterrupted flash along the wire without any reference to what distance there is between the *ter nini*, without any aberration, undulation, pulsation or sinuosity?

Ans. By a "continuous voltaic current," I understand such a current as flows through a conducting wire connecting the two poles of an ordinary galvanic battery. On making or breaking, or in any way electrically altering the battery, conducting wire, or any part of the circuit, electrical changes are of course produced whose nature and the rapidity of whose propagation depend, among other things, on the electrical condition, size, length, etc., of the conducting wire. But when a steady condition of flow has been reached, this flow will continue unchanged so long as the conditions of the circuit remain unchanged. Such a current would be a continuous current.

Cross-Int. 39. In your last answer you speak relatively of the length of the circuit wire. Please approximate the maximum length over which you say a continuous current can practically pass, without any aberration or change.

Ans. Under the conditions supposed, of freedom from disturbing influences, acting to produce an electric change in the circuit, I do not see any limit to the length of the wire.

Cross-Int. 40. In practice, are not all circuit wires affected by atmospheric or other influences?

Ans. I suppose that there is always a certain influence from disturbing causes; sometimes it is too slight to be detected; sometimes it is so considerable as to produce great annoyance.

Cross-Int. 41. You have testified very learnedly and at great length, on the law of physics relating to the transmission of ordinary sounds. If I correctly understand you, each sound wave acts on an elastic particle of air, and moves it or expands it forward, which, in turn, acts upon its next adjacent particle, and so on continuously, similarly affecting successive adjacent particles, that in consequence of their *inertia* or normal state of rest, they rebound in a direction contrary to that in which they were first impelled by the force of sound; and that, therefore, there is a constant and successive to-and fro motion imparted to these chains of connecting air particles.

Please explain, if I am correct; and if not, the particular method in which chains of air particles transmit sound from point to point, and thence to a finality.

Ans. Your supposition is correct, so far as the propagation of the original forward motion of each particle, that is, so far as the production of a condensed wave is concerned. The backward motion of the particles is brought about in the following manner: When the sounding body in the course of its vibration moves backward, its motion tends to produce a partial vacuum, the neighboring particles rush in to fill up this space, producing in their turn a diminshed pressure a little frather on, and in this way the backward motion or rarefied wave is propagated.

Cross-Int. 42. Is the transmission between these particles a continuity of repeated physical blows, or an expansion and contraction of the several particles of air or their interstices?

Ans. The modern theory of gases which is universally accepted among scientific men, supposes all gaseous pressure to be caused by the perpetual "bombardment" of the walls of the containing vessel by the gaseous molecules. By "bombardment," I mean a series of blows very rapid and forcible, produced at almost infinitesimal intervals by the molecules of the gas as they strike against each other, and the vessel containing them.

Cross-Int. 43. Is the sound wave you allude to, and place in in-

verted commas, in your answer to Int. 6, a sinuous, curved, bent; or simply a plane and rectilinear motion.

Ans. The particles composing the sound wave move to and fro in straight lines in the direction in which the sound progresses. A graphical representation of this sound wave is a sinuous line constructed as I have explained in my answer to Int. 8.

Cross-Int. 44. In further answer to said interrogatory, you say that all the particles of air through which the sound progresses partake of the various characteristics which you had previously named. What are these characteristics? Does each particle in succession partake of all these characteristics?

Ans. The three characteristics of the motion of the air particle mentioned are stated in my answer to Int. 6, in the sentence beginning, "It is evident in the first place" [page 22 of this printed record]. The variations in the sound produced are pitch, intensity, and quality or *timbre*. Each particle in succession partakes in its motion of the three characteristics mentioned.

Cross-Int. 45. Further on you speak of difference in quality being due to difference in character of the motions. Describe the different character of motions to which you refer. Please explain fully the course, direction and contour of these motions; whether spherical, curvilinear, angular or otherwise.

Ans. The motions of the air particles are always to and fro in the same straight line. Difference in quality depends upon the manner in which the rate, frequency and direction of this to-and-fro motion change. This fact will be more clearly understood by reference to the figure given in my answer to Int. 9. Any one of the series of upper curves represents graphically, as previously described, a simple sound of a certain quality. The lower curve represents graphically the complex sound of a different quality. The curves in question are simply graphical or geometrical statements of the algebraic equation which represents the more or less complex motion of the vibrating air particle. As I have already said, the motion of the particle itself is always a rectilinear to-and-fro motion.

Cross-Int. 46. In what manner have you demonstrated that the receiving instrument in a telephone moves in exact unison with the

movements of the several particles of air that have been set in motion at the starting point?

Ans. The only practical demonstration that I know of this perfect correspondence between the motions of the two, lies in the fact that the receiver is practically able to reproduce the various characteristics of the voice itself.

Cross-Int. 47. Are not the diaphragms of the transmitting and receiving instruments, as described in the Bell patents, at right angles, or nearly so, to the line wire?

Ans. In Fig. 7 of the first patent, the diaphragms are substantially at right angles to the line wire. In the diagrams on sheet 2 of the second patent, the diaphragms are parallel to the general direction of the line wire.

Cross-Int. 48. Do I understand you to say that no form of transmitter which operates by making and breaking an electric current, can possibly transmit articulate speech; and that any transmitter which operates by making and breaking an electric circuit is capable of transmitting pitch, and pitch only?

Ans. That is my statement.

Cross-Int. 49. You have testified to the receiving instruments, as described in the Bell patents, vibrating or moving in correspondence with the sound motions propelled or carried over a line of wire; and you have particularly referred to a membrane stretched over the larger end of the cone L. Please state the thickness of this membrane, and at what degree of thickness would it cease to give responsive vibrations.

Ans. I have used membranes as thin as goldbeater's skin; and in some auxiliary experiments I have used a thin soap film, not more than from $\frac{1}{30000}$ to $\frac{1}{50000}$ of an inch thick. Of course this last was not directly in a telephone. The thickest membrane I have ever used was heavy sheepskin. I do not know at what limit of thickness the membrane would cease to respond to sounds of ordinary intensity.

Cross-Int. 50. At what degree of thickness would the membrane, or what is known as the diaphragm, in a transmitting telephone, fail to convey forward on a line wire sound waves or sound impulses?

Ans. Prof. Bell has used heavy iron boiler plate as a diaphragm, and found it sufficiently responsive to transmit the voice. I know of no experiments in which diaphragms thicker than this have been used.

Cross-Int. 51. Do you know of any speaking telephones in common use, built in exact accordance with the specification and claims of patent No. 186,787, without any additions or improvements either by Prof. Bell or others?

Ans. The box telephone, which I think is still occasionally used, is built in accordance with that patent. The only alteration is that the speaking tube, marked E in the figures, is greatly reduced in length. I mean to indicate by this answer, simply that I do not know that the box telephone is entirely disused; although various improvements have caused the original form to be superseded.

Cross-Int. 52. Do not the telephones placed upon the market by the American Bell Telephone Company, and the Metropolitan Telephone and Telegraph Company, consist of and combine several other improvements and inventions besides those of Prof. Bell?

Ans. They do.

Direct Examination resumed.

Int. 53. Please to look at the instrument now shown you, and tell me whether it is or is not the instrument commonly known as the "Bell hand magneto-telephone"; whether it is or is not the form of magneto-telephone commonly put out by the American Bell Telephone Company, except that this particular instrument has been cut open to show its interior?

Ans. It is.

Int. 54. Will you state about how long, so far as your knowledge extends, hand telephones of this particular form, style and construction have been put out for general commercial use by Mr. Bell and his licensees. I mean to include in this question instruments with wooden handles as well as hard rubber handles, if you have ever known of any such distinction in material.

Ans. My impression is that I first knew of their use either late in 1877 or early in 1878.

Int. 55. Please state whether any patented invention relating to telephones or improvements in telephones is embodied in

that instrument, other than those set forth in the two Bell patents (No. 174,465 and No. 186,787), the dates of which are stamped on the face of it; and if you know of any other such patents, please name them.

Ans. I do not find in the instrument exhibited any patented improvements beyond those mentioned.

[*The instrument referred to is put in evidence and marked "Complainants' Exhibit Bell Hand Magneto-Telephone."*]

CHAS. R. CROSS.

Attest: CHAS. H. SWAN, *Examiner.*

Counsel for defendants calls upon counsel for complainants for copies of the agreements dated March 20, 1879 and May 8, 1880, referred to in the assignment of the Bell Telephone Company, dated June 2, 1880, and now in evidence as an exhibit; and requests that the same be filed in evidence.

Complainants put in evidence Office copy of patent No. 235,635, dated Dec. 21, 1880, issued to Frank A. Klemm, assignor, by mesne assignments, to the People's Telephone Company, of New York; application filed Nov. 18, 1879.

Also Office copy of patent No. 227,861, dated May 18, 1880, issued to Abner G. Tisdel, assignor to Frank A. Klemm, Ernest Marx, Simon Wolf and Moritz Loth; application filed May 18, 1880.

Also certified copy Patent Office Digest of assignments, agreements, etc., up to Dec. 18, 1880, under or relating to Letters Patent granted to, or inventions of, Daniel Drawbaugh, Frank A. Klemm and Abner G. Tisdale, relating to telephones.

Also certified copies either already filed or herewith filed in this cause of the following:

Agreement Klemm *et al.*, March 6, 1880.

Agreement Klemm *et al.*, March 8, 1880.

Deed Klemm *et al*, to The People's Telephone Company, dated Sept. 4, 1880.

Deed Mary S. Marx *et al.*, to People's Telephone Company, dated Oct. 11, 1880.

Deed Drawbaugh to Klemm *et al.*, dated July 21, 1880.

Articles of association of The People's Telephone Company, dated Aug. 30, 1880, filed in the office of the clerk of the city and county of New York.

Counsel for defendants gives notice that he will hereafter call upon counsel for complainants for certain documents and agreements referred to in said defendants' answer in this cause, especially those referred to in paragraph 8 in said answer.

The complainants offer to call Eward L. Bradley.

Whereupon it is admitted and agreed by the respondents that said Bradley would testify as he has already testified in the annexed affidavit heretofore filed in this cause; it is also admitted by the complainants that the interviews with Klemm, Marx, and others were had at the express request of the complainants, in whose employ he was at the time, and thereupon cross-examination is waived, and it is agreed that said affidavit, with the foregoing admissions by the complainants, shall stand as the testimony of the same Bradley, subject to all legal objections to its relevancy and effect.

Whereupon the complainants rest their case.

LEWIS ABRAHAM,
for Respondents.
J. J. STORROW,
for Complainants.

AFFIDAVIT OF EDWARD L. BRADLEY.

CITY AND COUNTY OF NEW YORK, ss.

I, Edward L. Bradley, on oath depose and say: —

My name is Edward L. Bradley, age forty-two, residence Jersey City, New Jersey. I am familiar with electric speaking telephones. I produce herewith, as part of this affidavit, a magneto telephone, which I have marked "Complainants' Exhibit Tisdel Magneto Telephone, E. L. Bradley." I also produce herewith, as part of this affidavit, a battery transmitting telephone, which I have marked "Complainants' Exhibit Klemm Battery Telephone, E. L. Brad-

ley." On or about June 11, 1880, I purchased of Frank A. Klemm, personally, at his residence, No. 234 West 4th Street, New York, a pair of magneto telephones, of which said Exhibit Tisdel Telephone is one. On that occasion Mr. Klemm told me that he and those associated with him intended to make, and put out for use by the public generally, electric speaking telephones, and to establish by themselves and those whom they would supply with telephones, telephonic exchanges; that he was making said telephones at his said premises; that he was endeavoring to perfect a battery-transmitting telephone, to be also sold and put out in the same way. I annex hereto a copy of the bill for said magneto telephones, and will produce the original at the hearing of the case for which this affidavit is taken. On July 31, 1880, I also purchased of said Klemm, at his said residence, the said Exhibit Klemm Battery Telephone. I annex a copy of the bill for said instrument, and will produce the original at the hearing. He told me then that this was the kind that he and his associates intended to put out. That he expected to supply such telephones for use as electric speaking telephones in Harlem and elsewhere, in New York City. That such telephones, both battery and magneto, furnished by him and his associates, were in use in New York City and at Harlem, and that they were arranging to sell them to be used in other parts of the United States. That a line equipped with said telephones, furnished by him, could be found at the place of Mr. Groesman, No. 211 Canal Street, New York City. I went to said Groesman's place, No. 211 Canal Street, and there found one station of a telephone line, and talked over it. On Sept. 11, 1880, I again saw Mr. Klemm at his said residence. He told me that a company got up for the purpose was about to manufacture and sell electric speaking telephones like those I had purchased of him; that he was interested in said company; that Mr. Richard McCormick, of New York, was its president, Mr. Loth, of Cincinnati, was treasurer, and that Mr. Marx, of New York, was its manager; that an executive office for it was being fitted up at No. 4 East 14th Street, New York; that as soon as arrangements could be completed, they should endeavor to establish exchanges and sell telephones. I understood from him that they had applied for patents on some alleged inventions of Drawbaugh. The building No. 4

East 14th Street, New York, has at the street door a sign, "People's Telephone Co." Up one flight of stairs there is an office with the same name on the door. About the middle of September, 1880, I called at that office and found Mr. Marcus Marx there. In conversation he told me that The People's Telephone Co. had begun to furnish telephones and were putting in a few, but he refused to tell me where. He handed me a business card, which is as follows: "The People's Telephone Co. Marcus Marx, manager, New York. Office, 4 East 14th Street." I have the original ready to be produced. I asked him to let me see one of the telephones they were putting in and he said he would do so later. I called on him again on Sept. 25, 1880, at the same office. He declined to show me any telephones, or to tell me where he or his company had put them up, or to give me any information about the subject, stating as a reason that he knew I was employed by the Bell Telephone Company.

E. L. BRADLEY.

Sworn to before me this twelfth day of October, 1880.

RICHARD E. O'BRIEN,
[SEAL] *Notary Public, Kings' County.*

(Cert. filed in N. Y. C.)

NEW YORK, June 11, 1880.

MR. CASH,

To F. A. KLEMM, DR.

1 pair telephones $14 00

Rec'd payment,

F. A. KLEMM.

NEW YORK, July 31, 1880.

MR. CASH.

To F. A. KLEMM, DR.

To (1) telephone transmitter $9 00

Rec'd payment,

F. A. KLEMM.

A. G. BELL.

TELEGRAPHY.

No. 174,465. Patented March 7, 1876

Fig. 1.

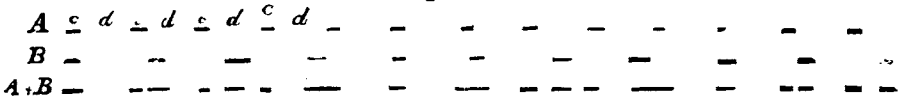


Fig. 2.

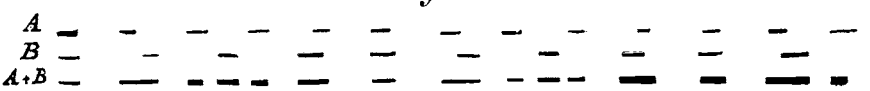


Fig. 3

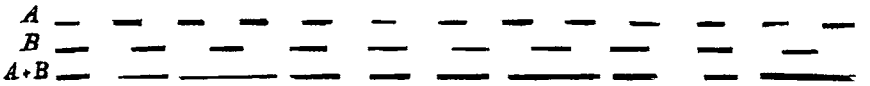


Fig. 4.

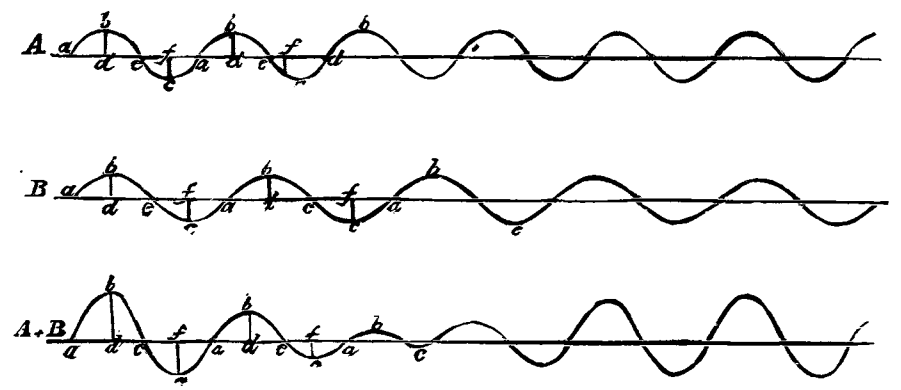
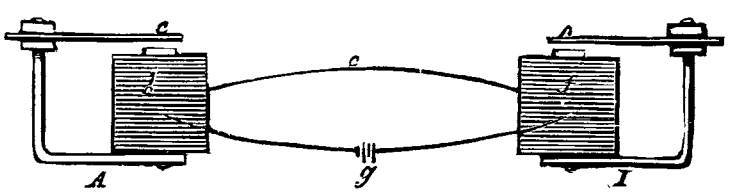


Fig. 5.



Witnesses:

Ewell Storck

W. J. Hinkelmann

Inventor:

A. Graham Bell

by Atty Pollock & Bailey

—THE—
JOHN CRERAR
LIBRARY

2 Sheets—Sheet 2

A. G. BELL.

TELEGRAPHY

No. 174,465. Patented March 7, 1876

Fig. 6.

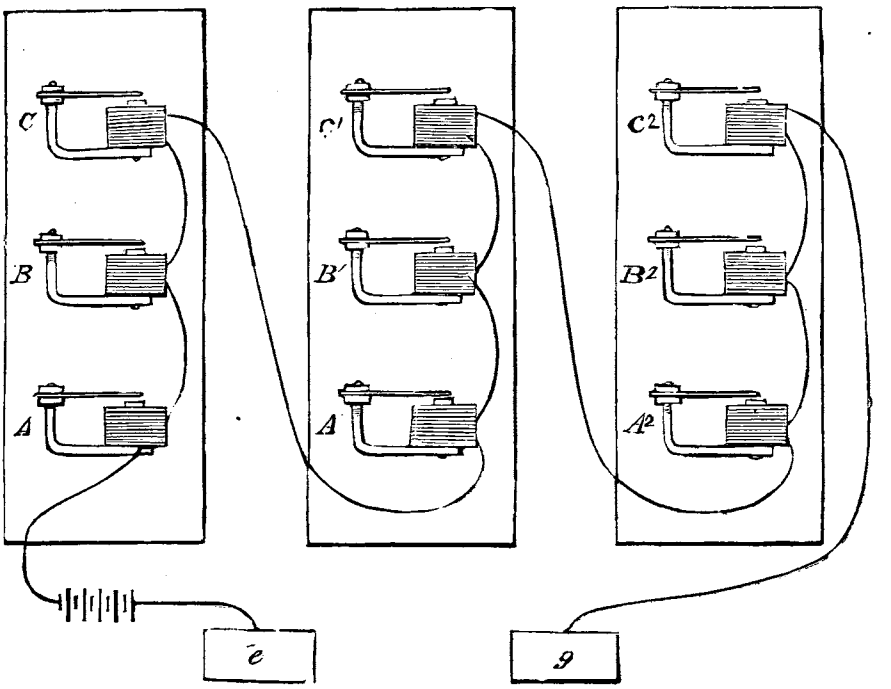
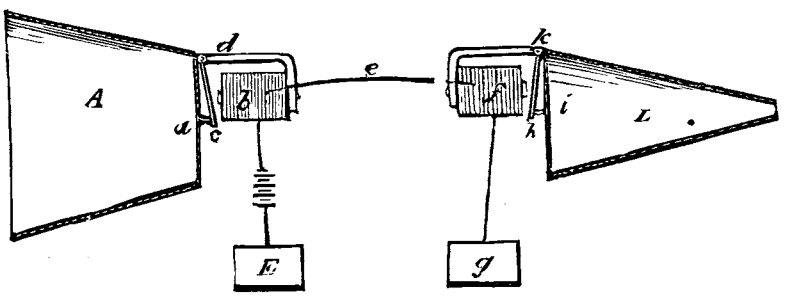


Fig. 7



Witnesses:

Everett Stock.

H. J. Antetmann

Inventor:

A. Graham Bell

by attys Pollock & Bailey

—THE—
JOHN CRERAR
LIBRARY

UNITED STATES PATENT OFFICE.

ALEXANDER GRAHAM BELL, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN TELEGRAPHY.

Specification forming part of Letters Patent No. 174,465, dated March 7, 1876; application filed February 14, 1876.

To all whom it may concern:

Be it known that I, ALEXANDER GRAHAM BELL, of Salem, Massachusetts, have invented certain new and useful Improvements in Telegraphy, of which the following is a specification: —

In Letters Patent granted to me April 6, 1875, No. 161,739, I have described a method of, and apparatus for transmitting two or more telegraphic signals simultaneously along a single wire by the employment of transmitting-instruments, each of which occasions a succession of electrical impulses differing in rate from the others; and of receiving-instruments, each tuned to a pitch at which it will be put in vibration to produce its fundamental note by one only of the transmitting-instruments; and of vibratory circuit-breakers operating to convert the vibratory movement of the receiving-instrument into a permanent make or break (as the case may be) of a local circuit, in which is placed a Morse sounder, register, or other telegraphic apparatus. I have also therein described a form of autograph-telegraph based upon the action of the above-mentioned instruments.

In illustration of my method of multiple telegraphy I have shown in the patent aforesaid, as one form of transmitting-instrument, an electro-magnet having a steel-spring armature, which is kept in vibration by the action of a local battery. This armature in vibrating makes and breaks the main circuit, producing an intermittent current upon the line-wire. I have found, however, that upon this plan the limit to the number of signals that can be sent simultaneously over the same wire is very speedily reached; for, when a number of transmitting-instruments having different rates of vibration are simultaneously making and breaking the same circuit, the

effect upon the main line is practically equivalent to one continuous current.

In a pending application for Letters Patent, filed in the United States Patent Office February 25, 1875, I have described two ways of producing the intermittent current — the one by actual make and break of contact, the other by alternately increasing and diminishing the intensity of the current without actually breaking the circuit. The current produced by the latter method I shall term, for distinction sake, a "pulsatory current."

My present invention consists in the employment of a vibratory or undulatory current of electricity in contradistinction to a merely intermittent or pulsatory current, and of a method of and apparatus for producing electrical undulations upon the line-wire.

The distinction between an undulatory and a pulsatory current will be understood by considering that electrical pulsations are caused by sudden or instantaneous changes of intensity, and that electrical undulations result from gradual changes of intensity exactly analagous to the changes in the density of air occasioned by simple pendulous vibrations. The electrical movement, like the aerial motion, can be represented by a sinusoidal curve or by the resultant of several sinusoidal curves.

Intermittent or pulsatory and undulatory currents may be of two kinds, accordingly as the successive impulses have all the same polarity or are alternately positive and negative.

The advantages I claim to derive from the use of an undulatory current in place of a merely intermittent one are, first, that a very much larger number of signals can be transmitted simultaneously on the same circuit; second, that a closed circuit and single main battery may be used; third, that communication in both directions is established without the necessity of special induction-coils; fourth, that cable-despatches may be transmitted more rapidly than by means of an intermittent current or by the methods at present in use, for, as it is unnecessary to discharge the cable before a new signal can be made, the lagging of cable-signals is prevented; fifth, and that as the circuit is never broken a spark-arrester becomes unnecessary.

It has long been known that when a permanent magnet is caused to approach the pole of an electro-magnet a current of electricity is

induced in the coils of the latter, and that when it is made to recede a current of opposite polarity to the first appears upon the wire. When, therefore, a permanent magnet is caused to vibrate in front of the pole of an electro-magnet an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond, in rapidity of succession, to the vibrations of the magnet, in polarity to the direction of its motion, and in intensity to the amplitude of its vibration.

That the difference between an undulatory and an intermittent current may be more clearly understood, I shall describe the condition of the electrical current when the attempt is made to transmit two musical notes simultaneously — first upon the one plan, and then upon the other. Let the interval between the two sounds be a major third; then their rates of vibration are in the ratio of 4 to 5. Now, when the intermittent current is used, the circuit is made and broken four times by one transmitting-instrument in the same time that five makes and breaks are caused by the other. A and B, Figs. 1, 2, and 3, represent the intermittent currents produced, four impulses of B being made in the same time as five impulses of A. *c c c*, &c., show where and for how long time the circuit is made, and *d d d*, &c., indicate the duration of the breaks of the circuit. The line A and B shows the total effect upon the current when the transmitting-instruments for A and B are caused simultaneously to make and break the same circuit. The resultant effect depends very much upon the duration of the make relatively to the break. In Fig. 1 the ratio is as 1 to 4; in Fig. 2, as 1 to 2, and in Fig. 3 the makes and breaks are of equal duration. The combined effect, A and B, Fig. 3, is very nearly equivalent to a continuous current.

When many transmitting-instruments of different rates of vibration are simultaneously making and breaking the same circuit the current upon the main line becomes for all practical purposes continuous.

Next, consider the effect when an undulatory current is employed. Electrical undulations, induced by the vibration of a body capable of inductive action, can be represented graphically, without error, by the same sinusoidal curve which expresses the vibration of the inducing body itself and the effect of its vibration upon the air; for, as above stated, the rate of oscillation in the electrical current

corresponds to the rate of vibration of the inducing body — that is, to the pitch of the sound produced. The intensity of the current varies with the amplitude of the vibration — that is, with the loudness of the sound; and the polarity of the current corresponds to the direction of the vibrating body — that is, to the condensations and rarefactions of air produced by the vibration. Hence, the sinusoidal curve A or B, Fig. 4, represents graphically the electrical undulations induced in a circuit by the vibration of a body capable of inductive action.

The horizontal line *a d e f*, &c., represents the zero of current. The elevations *b b b*, &c., indicate impulses of positive electricity. The depressions *c c c*, &c., show impulses of negative electricity. The vertical distance *b d* or *c f* of any portion of the curve from the zero-line expresses the intensity of the positive or negative impulse at the part observed, and the horizontal distance *a a* indicates the duration of the electrical oscillation. The vibrations represented by the sinusoidal curves B and A, Fig. 4, are in the ratio aforesaid, of 4 to 5 — that is, four oscillations of B are made in the same time as five oscillations of A.

The combined effect of A and B, when induced simultaneously on the same circuit, is expressed by the curve A×B, Fig. 4, which is the algebraical sum of the sinusoidal curves A and B. This curve A×B also indicates the actual motion of the air when the two musical notes considered are sounded simultaneously. Thus, when electrical undulations of different rates are simultaneously induced in the same circuit, an effect is produced exactly analogous to that occasioned in the air by the vibration of the inducing bodies. Hence, the co-existence upon a telegraphic circuit of electrical vibrations of different patch is manifested, not by the obliteration of the vibratory character of the current, but by peculiarities in the shapes of the electrical undulations, or, in other words, by peculiarities in the shapes of the curves which represent those undulations.

There are many ways of producing undulatory currents of electricity, dependent for effect upon the vibrations or motions of bodies capable of inductive action. A few of the methods that may be employed I shall here specify. When a wire through which a continuous current of electricity is passing is caused to vibrate in the

neighborhood of another wire, an undulatory current of electricity is induced in the latter. When a cylinder upon which are arranged bar-magnets is made to rotate in front of the pole of an electro-magnet, an undulatory current of electricity is induced in the coils of the electro-magnet.

Undulations are caused in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration of the conducting-wire itself in the neighborhood of such bodies. Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery. The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them farther apart. The reciprocal vibration of the elements of a battery, therefore, occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting-wire is immersed in the mercury or other liquid the less resistance does the liquid offer to the passage of the current. Hence, the vibration of the conducting-wire in mercury or other liquid included in the circuit occasions undulations in the current. The vertical vibrations of the elements of a battery in the liquid in which they are immersed produces an undulatory action in the current by alternately increasing and diminishing the power of the battery.

In illustration of the method of creating electrical undulations, I shall show and describe one form of apparatus for producing the effect. I prefer to employ for this purpose an electro-magnet, A, Fig. 5, having a coil upon only one of its legs *b*. A steel-spring armature, *c*, is firmly clamped by one extremity to the uncovered leg *d* of the magnet, and its free end is allowed to project above the pole of the covered leg. The armature *c* can be set in vibration in a variety of ways, one of which is by wind, and, in vibrating, it produces a musical note of a certain definite pitch.

When the instrument A is placed in a voltaic circuit, *g b e f g*, the armature *c* becomes magnetic, and the polarity of its free end is opposed to that of the magnet underneath. So long as the armature *c* remains at rest, no effect is produced upon the voltaic current;

but the moment it is set in vibration to produce its musical note, a powerful inductive action takes place, and the electrical undulations traverse the circuit *g b e f g*. The vibratory current passing through the coil of the electro-magnet *f* causes vibration in its armature *h* when the armatures *c h* of the two instruments A I are normally in unison with one another; but the armature *h* is unaffected by the passage of the undulatory current when the pitches of the two instruments are different.

A number of instruments may be placed upon a telegraphic circuit, as in Fig. 6. When the armature of any one of the instruments is set in vibration all the other instruments upon the circuit which are in unison with it respond, but those which have normally a different rate of vibration remain silent. Thus if A, Fig. 6, is set in vibration, the armatures of A^1 and A^2 will vibrate also, but all the others on the circuit will remain still. So if B^1 is caused to emit its musical note the instruments B B^2 respond. They continue sounding so long as the mechanical vibration of B^1 is continued, but become silent with the cessation of its motion. The duration of the sound may be used to indicate the dot or dash of the Morse alphabet, and thus a telegraphic dispatch may be indicated by alternately interrupting and renewing the sound. When two or more instruments of different pitch are simultaneously caused to vibrate, all the instruments of corresponding pitches upon the circuit are set in vibration, each responding to that one only of the transmitting-instruments with which it is in unison. Thus the signals of A, Fig. 6, are repeated by A^1 and A^2, but by no other instrument upon the circuit; the signals of B^2 by B and B^1, and the signals of C^1 by C and C^2 — whether A, B^2, and C^1 are successively or simultaneously caused to vibrate. Hence by these instruments two or more telegraphic signals or messages may be sent simultaneously over the same circuit without interfering with one another.

I desire here to remark that there are many other uses to which these instruments may be put, such as the simultaneous transmission of musical notes, differing in loudness as well as in pitch, and the telegraphic transmission of noises or sounds of any kind.

When the armature *c*, Fig. 5, is set in vibration the armature *h* responds not only in pitch but in loudness. Thus, when *c* vibrates with little amplitude, a very soft musical note proceeds

from *h*; and when *c* vibrates forcibly, the amplitude of the vibration of *h* is considerably increased, and the resulting sound becomes louder. So, if A and B, Fig. 6, are sounded simultaneously, (A loudly and B softly,) the instruments A^1 and A^2 repeat loudly the signals of A, and B^1 B^2 repeat softly those of B.

One of the ways in which the armature *c*, Fig. 5, may be set in vibration has been stated above to be by wind. Another mode is shown in Fig. 7, whereby motion can be imparted to the armature by the human voice or by means of a musical instrument.

The armature *c*, Fig. 7, is fastened loosely by one extremity to the uncovered leg *d* of the electro-magnet *b*, and its other extremity is attached to the centre of a stretched membrane, *a*. A cone, A, is used to converge sound-vibrations upon the membrane. When a sound is uttered in the cone the membrane *a* is set in vibration, the armature *c* is forced to partake of the motion, and thus electrical undulations are created upon the circuit E *b efg*. These undulations are similar in form to the air vibrations caused by the sound—that is, they are represented graphically by similar curves. The undulatory current passing through the electro-magnet *f* influences its armature *h* to copy the motion of the armature *c*. A similar sound to that uttered into A is then heard to proceed from L.

In this specification the three words "oscillation," "vibration," and "undulation" are used synonymously, and in contradistinction to the terms "intermittent" and "pulsatory." By the term "body capable of inductive action," I mean a body which, when in motion, produces dynamical electricity. I include in the category of bodies capable of inductive action brass, copper, and other metals, as well as iron and steel.

Having described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. A system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity, substantially as set forth.

2. The combination, substantially as set forth, of a permanent magnet or other body capable of inductive action, with a closed circuit, so that the vibration of the one shall occasion electrical undulations in the other, or in itself, and this I claim whether the permanent magnet be set in vibration in the neighborhood of the

conducting-wire forming the circuit, or whether the conducting-wire be set in vibration in the neighborhood of the permanent magnet, or whether the conducting-wire and the permanent magnet both simultaneously be set in vibration in each other's neighborhood.

3. The method of producing undulations in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration or motion of the conducting-wire itself in the neighborhood of such bodies, as set forth.

4. The method of producing undulations, in a continuous voltaic circuit by gradually increasing and diminishing the resistance of the circuit, or by gradually increasing and diminishing the power of the battery, as set forth.

5. The method of and apparatus for transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth.

In testimony whereof I have hereunto signed my name this twentieth day of January, A. D. 1876.

ALEX. GRAHAM BELL.

Witnesses:

THOMAS E. BARRY,

P. D. RICHARDS.

A. G. BELL.

ELECTRIC TELEGRAPHY.

No. 186,787. Patented Jan. 30, 1877.

Fig. 1.

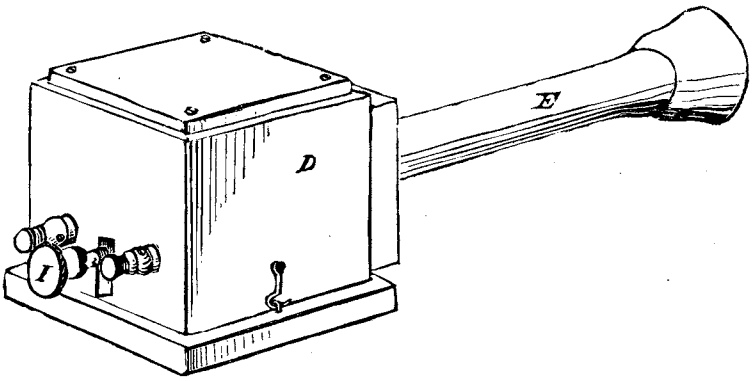


Fig. 2.

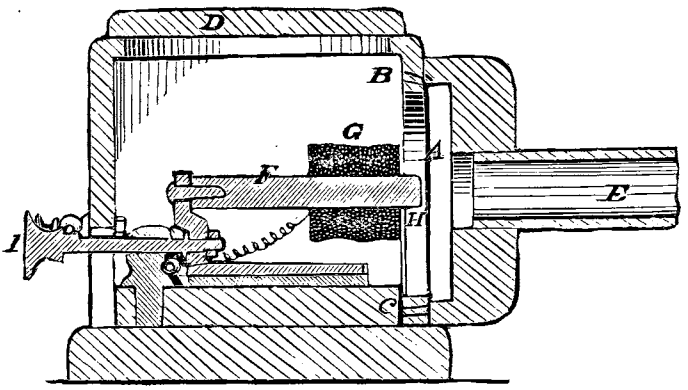
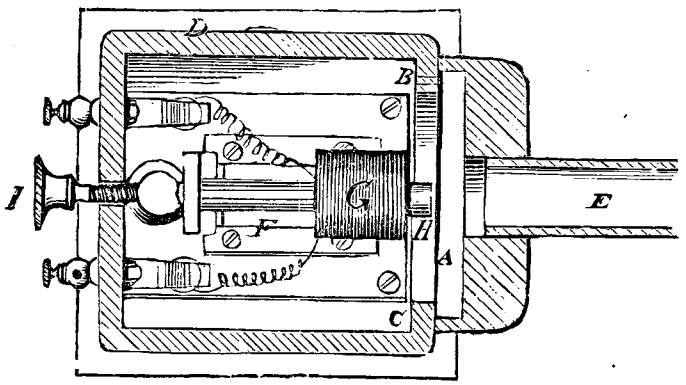


Fig. 3.



Attest:

P. Pollok
Wm. A. Dick

Inventor

Alexander Graham Bell

—THE—
JOHN CRERAR
LIBRARY

A. G. BELL.

ELECTRIC TELEGRAPHY.

No. 186,787. Patented Jan. 30, 1877.

Fig. 4.

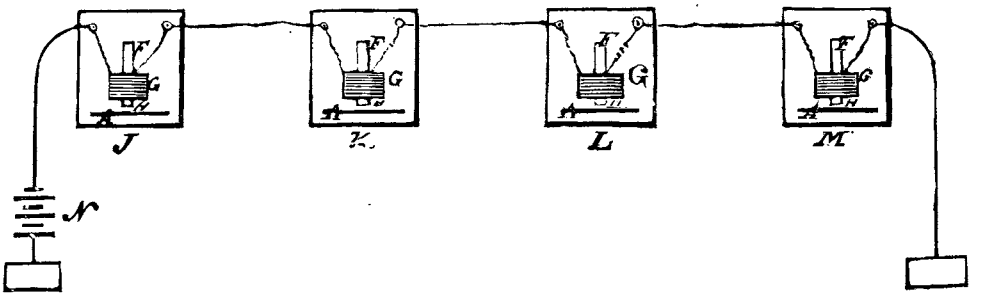


Fig 5.

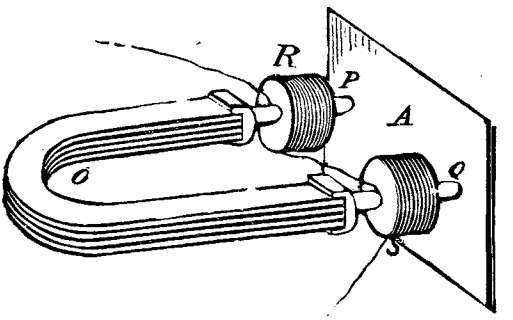
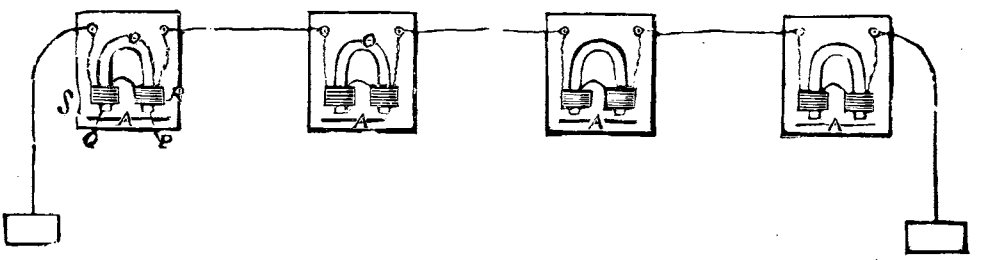


Fig. 6.



Attest:

P. Pollok
Ewell a Sick

Inventor:

Alexander Graham Bell

—THE—
JOHN CRERAR
LIBRARY

UNITED STATES PATENT OFFICE.

ALEXANDER GRAHAM BELL, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC TELEGRAPHY.

Specification forming part of Letters Patent No. 186,787, dated January 30, 1877; application filed January 15, 1877.

To all whom it may concern:

Be it known that I, ALEXANDER GRAHAM BELL, of Boston, Massachusetts, have invented certain new and useful Improvements in Electric Telephony, of which the following is a specification:

In Letters Patent granted to me on the 6th day of April, 1875, No. 161,739, and in an application for Letters Patent of the United States now pending, I have described a method of and apparatus for producing musical tones by the action of a rapidly-interrupted electrical current, whereby a number of telegraphic signals can be sent simultaneously along a single circuit.

In another application for Letters Patent now pending in the United States Patent Office, I have described a method of and apparatus for inducing an intermittent current of electricity upon a line-wire, whereby musical tones can be produced and a number of telegraphic signals be sent simultaneously over the same circuit, in either or in both directions; and in Letters Patent granted to me March 7, 1876, No. 174,465, I have shown and described a method of an apparatus for producing musical tones by the action of undulatory currents of electricity, whereby a number of telegraphic signals can be sent simultaneously over the same circuit, in either or in both directions, and a single battery be used for the whole circuit.

In the applications and patents above referred to, signals are transmitted simultaneously along a single wire by the employment of transmitting-instruments, each of which occasions a succession of electrical impulses differing in rate from the others, and are received without confusion by means of receiving-instruments, each tuned to

a pitch at which it will be put in vibration to produce its fundamental note by one only of the transmitting-instruments. A separate instrument is therefore employed for every pitch, each instrument being capable of transmitting or receiving but a single note, and thus as many separate instruments are required as there are messages or musical notes to be transmitted.

My invention has for its object, first, the transmission simultaneously of two or more musical notes or telegraphic signals along a single wire, in either or both directions, and with a single battery for the whole circuit, without the use of as many instruments as there are musical notes or telegraphic signals to be transmitted; second, the electrical transmission by the same means of articulate speech, and sound of every kind, whether musical or not; third, the electrical transmission of musical tones, articulate speech, or sounds of every kind, without the necessity of using a voltaic battery.

In my patent No. 174,465, dated March 7, 1876, I have shown as one form of transmitting-instrument a stretched membrane to which the armature of an electro-magnet is attached, whereby motion can be imparted to the armature by the human voice, or by means of a musical instrument, or by sounds produced in any way.

In accordance with my present invention I substitute for the membrane and armature shown in the transmitting and receiving instruments alluded to above a plate of iron or steel capable of being thrown into vibration by sounds made in its neighborhood.

The nature of my invention and the manner in which the same is or may be carried into effect will be understood by reference to the accompanying drawings, in which —

Figure 1 is a perspective view of one form of my electric telephone. Fig. 2 is a vertical section of the same, and Fig. 3 is a plan view of the apparatus. Fig. 4 is a diagram illustrating the arrangement upon circuit.

Similar letters in the drawings represent corresponding portions of the apparatus.

A in said drawings represents a plate of iron or steel, which is fastened at B and C to the cover or sounding-box D. E represents a speaking-tube, by which sounds may be conveyed to or from the

plate A. F is a bar of soft iron. G is a coil of insulated copper wire, placed around the extremity of the end H of the bar F. I is an adjusting-screw, whereby the distance of the end H from the plate A may be regulated.

The electric telephones J, K, L, and M are placed at different stations upon a line, and are arranged upon circuit with a battery, N, as shown in diagram, Fig. 4.

I have shown the apparatus in one of its simplest forms, it being well understood that the same may be varied in arrangement, combination, general construction, and form, as well as material of which the several parts are composed.

The operation and use of this instrument are as follows:

I would premise by saying that this instrument is and may be used both as a transmitter and as a receiver — that is to say, the sender of the message will use an instrument in every particular identical in construction and operation with that employed by the receiver, so that the same instrument can be used alternately as a receiver and a transmitter.

In order to transmit a telegraphic message by means of these instruments, it is only necessary for the operator at a telephone (say J) to make a musical sound, in any way, in the neighborhood of the plate A — for convenience of operation, through the speaking-tube E — and to let the duration of the sound signify the dot or dash of the Morse alphabet, and for the operator who receives his message (say at M) to listen to his telephone, preferably through the speaking-tube E. When two or more musical signals are being transmitted over the same circuit all the telephones reproduce the signals for all the messages; but as the signals for each message differ in pitch from those for the other messages, it is easy for an operator to fix his attention upon one message and ignore the others.

When a large number of despatches are being simultaneously transmitted it will be advisable for the operator to listen to his telephone through a resonator, which will re-enforce to his ear the signals which he desires to observe. In this way he is enabled to direct his attention to the signals for any given message without

being distracted or disturbed by the signals for any other messages that may be passing over the line at the time.

The musical signals, if preferred, can be automatically received by means of a resonator, one end of which is closed by a membrane, which vibrates only when the note with which the resonator is in unison is emitted by the receiving-telephone. The vibrations of the membrane may be made to operate a circuit-breaker, which will actuate a Morse sounder or a telegraphic recording or registering apparatus.

One form of vibratory circuit-breaker which may be used for this purpose I have described in Letters Patent No. 178,399, June 6, 1876. Hence, by this plan the simultaneous transmission of a number of telegraphic messages over a single circuit in the same or in both directions, with a single main battery for the whole circuit and a single telephone at each station, is rendered practicable. This is of great advantage in this, that for the conveyance of several messages, or signals, or sounds over a single wire simultaneously, it is no longer necessary to have separate instruments correspondingly tuned for each given sound, which plan requires nice adjustment of the corresponding instruments, while the present improvement admits of a single instrument at each station; or if, for convenience, several are employed, they are all alike in construction, and need not be adjusted or tuned to particular pitches.

Whatever sound is made in the neighborhood of any telephone — say at J, Fig. 4 — is echoed in fac-simile by the telephones of all the other stations upon the circuit; hence this plan is also adapted for the use of the transmitting intelligibly the exact sounds of artic ulate speech. To convey an articulate message it is only necessary for an operator to speak in the neighborhood of his telephone, preferable through the tube E, and for another operator at a distant station upon the same circuit to listen to the telephone at that station. If two persons speak simultaneously in the neighborhood of the same or different telephones, the utterances of the two speakers are reproduced simultaneously by all the other telephones on the same circuit; hence, by this plan a number of vocal messages may be transmitted simultaneously on the same circuit in either or both directions. All the effects noted above may be produced by the

same instruments without a battery by rendering the central bar F H permanently magnetic. Another form of telephone, for use without a battery, is shown in Fig. 5, in which O is a compound permanent magnet, to the poles of which are affixed poll-pieces of soft iron, P Q, surrounded by helices of insulated wire, R S.

Fig. 6 illustrates the arrangement upon circuits of similar instruments to that shown in Fig. 5.

In lieu of the plate A in above figures, iron or steel reeds of definite pitch may be placed in front of the electro-magnet O, and, in connection with a series of such instruments of different pitches, an arrangement upon circuit may be employed similar to that shown in my patent No. 174,465, and illustrated in Fig. 6 of Sheet 2 in said patent. The battery, of course, may be omitted.

This invention is not limited to the use of iron or steel, but includes within its scope any material capable of inductive action.

The essential feature of the invention consists in the armature of the receiving-instrument being vibrated by the varying attraction of the electro-magnet, so as to vibrate the air in the vicinity thereof in the same manner as the air is vibrated at the other end by the production of the sound. It is therefore by no means necessary or essential that the transmitting-instrument should be of the same construction as the receiving-instrument. Any instrument receiving and transmitting the impression of agitated air may be used as the transmitter, although for convenience, and for reciprocal communication, I prefer to use like instruments at either end of an electrical wire. I have heretofore described and exhibited such other means of transmitting sound, as will be seen by reference to the Proceedings of the American Academy of Arts and Sciences, Volume XII.

For convenience, I prefer to apply to each instrument a call-bell. This may be arranged so as to ring, first, when the main circuit is opened; second, when the bar F comes into contact with the plate A. The first is done to call attention; the second indicates when it is necessary to readjust the magnet, for it is important that the distance of the magnet from the plate should be as little as possible, without, however, being in contact. I have also found that the electrical undulations produced upon the main line by the vibration of the plate A are intensified by placing the coil G at the end of the

bar F nearest the plate A, and not extend it beyond the middle, or thereabout.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is, —

1. The union upon and by means of an electric circuit of two or more instruments, constructed for operation substantially as herein shown and described, so that if motion of any kind or form be produced in any way in the armature of any one of the said instruments, the armatures of all the other instruments upon the same circuit will be moved in like manner and form, and if such motion be produced in the former by sound, like sound will be produced by the motion of the latter.

2. In a system of electric telegraphy or telephony, consisting of transmitting and receiving instruments united upon an electric circuit, the production, in the armature of each receiving-instrument, of any given motion by subjecting said armature to an attraction varying in intensity, however such variation may be produced in the magnet; and hence I claim the production of any given sound or sounds from the armature of the receiving instrument by subjecting said armature to an attraction varying in intensity, in such manner as to throw the armature into that form of vibration that characterizes the given sound or sounds.

3. The combination, with an electro-magnet, of a plate of iron or steel, or other material capable of inductive action, which can be thrown into vibration by the movement of surrounding air or by the attraction of a magnet.

4. In combination with a plate and electro-magnet, as before claimed, the means herein described, or their mechanical equivalents, of adjusting the relative position of the two so that, without touching, they may be set as closely together as possible.

5. The formation, in an electric telephone such as herein shown and described, of a magnet with a coil upon the end or ends of the magnet nearest the plate.

6. The combination, with an electric telephone such as described, of a sounding-box, substantially as herein shown and set forth.

7. In combination with an electric telephone, as herein described,

the employment of a speaking or hearing tube for conveying sounds to or from the telephone, substantially as set forth.

8. In a system of electric telephony, the combination of a permanent magnet with a plate of iron or steel, or other material capable of inductive action, with coils upon the end or ends of said magnet nearest the plate, substantially as set forth.

In testimony whereof I have hereunto signed my name this 13th day of January, A. D. 1877.

A. GRAHAM BELL.

Witnesses:

HENRY R. ELLIOTT,
EWELL A. DICK.

BELL TO HUBBARD, TRUSTEE. — ASSIGNMENT OF PATENT RIGHT.

Liber R[21], p. 399. [Record, page 20.]

To all whom it may concern:

Whereas, Alexander Graham Bell, of Boston, in the county of Suffolk and State of Massachusetts, did obtain three several Letters Patent of the United States, for an improved system of telegraphy, telephony and telephonic apparatus, which Letters Patent bear date respectively, March seventh, A. D. eighteen hundred and seventy-six, and numbered 174,465, June sixth, A. D. eighteen hundred and seventy-six, and numbered 178,399, and January thirtieth, A. D. eighteen hundred and seventy seven, and numbered 186,787.

And whereas, Gardiner G. Hubbard, of Cambridge, in the county of Middlesex and State of Massachusetts, trustee, is desirous of acquiring an interest therein; now this indenture witnesseth that for a valuable consideration, viz., one dollar and other valuable consideration to me in hand paid, the receipt of which is hereby acknowledged, I have assigned, sold and set over, and by these presents do assign, sell and set over unto the said Gardiner G. Hubbard, trustee, all the right, title and interest I have in the above described invention, as secured to me by Letters Patent, for, to and in the United States and Territories, and in no other place or places. The same to be held and enjoyed by the said Gardiner G. Hubbard, trustee, for his own use and behoof, and for the use and behoof of his legal representatives, to the full end of the term for which said letters were granted, as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

In testimony whereof, I have hereunto set my hand and affixed my seal this day of July, in the year of our Lord one thousand eight hundred and seventy-seven.

ALEXANDER GRAHAM BELL. [SEAL]

Sealed and delivered in presence of

CHAS. EUSTIS HUBBARD.

Recorded July 28, 1877.

HUBBARD TRUSTEE, TO BELL TELEPHONE COMPANY.

ASSIGNMENT OF PATENT RIGHT.

Liber Y[22], p. 460. [Record, page 20.]

To all whom it may concern:

Whereas, Alexander Graham Bell, of Salem, Massachusetts, as assignor to himself, Thomas Sanders and Gardiner G. Hubbard, did obtain Letters Patent of the United States, bearing date April 6, 1875, and numbered 161,739, and whereas said Alexander Graham Bell did obtain Letters Patent of the United States, bearing date March 7, 1876, and numbered 174,465, bearing date June 6, 1876, and numbered 178,399, and bearing date Jan. 30, 1877, and numbered 186,787, all of said Letters Patent being for improvements in "Telegraphy, Telephony and Telephonic Apparatus" invented by said Alexander Graham Bell; and whereas all of said Letters Patent have been assigned to Gardiner G. Hubbard, trustee, said letters numbered 161,739, by deed of assignment, delivered July 9, 1877, and recorded in Liber T[21], page 448 of Transfers of Patents; and said letters numbered 174,465, 178,399 and 186,787, by deed of assignment, delivered July 9, 1877, and recorded in Liber R[21], page 399 of Transfers of Patents; and said Hubbard, trustee, is now the owner of the above-described inventions secured by said Letters Patent; and whereas the Bell Telephone Company, a corporation duly established under the laws of the Commonwealth of Massachusetts, and located at Boston, is desirous of acquiring the ownership of said inventions secured by said Letters Patent.

Now, this indenture witnesseth that I, Gardiner G. Hubbard, trustee, in consideration of one dollar and other valuable consideration to me in hand paid by said Bell Telephone Company, the receipt whereof is hereby acknowledged, have assigned, sold and set over, and by these presents do assign, sell and set over unto the said Bell Telephone Company all my right, title and interest in the above-described inventions and in and to said Letters Patent, each and all of them, the same to be held and enjoyed by the said Bell Telephone Company for its own use and behoof, and for the use and behoof of its legal representatives, to the full end of the term for which said letters were granted, and any extension or reissue there-

of, as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

In testimony whereof, I have hereunto set my hand and seal this twentieth day of July, in the year eighteen hundred and seventy-eight, being thereto duly authorized.

GARDINER G. HUBBARD, *Trustee.* [SEAL]

In presence of
C. E. HUBBARD,
R. W. DEVONSHIRE.

Recorded Oct. 3, 1878.

BELL TELEPHONE CO. TO AMERICAN BELL TELEPHONE CO.

Liber I[25], p. 282. [Record, page 20.]

Know all men by these presents:

That the Bell Telephone Company, a corporation established under the laws of the Commonwealth of Massachusetts, in consideration of one dollar, to it paid by the American Bell Telephone Company, a corporation established under the laws of said Commonwealth, the receipt whereof is hereby acknowledged, does hereby grant and convey unto said American Bell Telephone Company the exclusive right, under the following patents, to all the territory of the United States except the State of Massachusetts, viz.: Letters Patent No. 174,465, issued March 7, 1876, to Alexander Graham Bell, for an improvement in telegraphy, and Letters Patent No. 186,787, issued January 30, 1877, to said Alexander Graham Bell, for an improvement in electric telegraphy, and in and to the inventions therein described or intended to be described. To have and to hold the same to the said American Bell Telephone Company, its successors and assigns, to their own use and behoof forever. This instrument is made at the request of the National Bell Telephone Company, in pursuance of an agreement between said Bell Telephone Company and said National Bell Telephone Company, dated March 20, 1879, said American Bell Telephone Company being the appointees of said National Bell Telephone Company to receive this conveyance, and in

pursuance of an agreement between said National Bell Telephone Company and said American Bell Telephone Company, dated May 8, 1880.

In witness whereof, said Bell Telephone Company has caused its corporate seal to be hereto affixed, and these presents to be signed in its name and behalf, by William H. Forbes, its president, and William R. Driver, its treasurer, thereto duly authorized; this twenty-second day of June, A. D. 1880.

THE BELL TELEPHONE COMPANY.

{L. S. Bell Telephone Company, Incorporated 1878.}

By W. H. FORBES, *Prest.*

WM. R. DRIVER, *Treas.*

Recorded June 24, 1880. *Ex'd, S. P. P., H. M. L.*

ACT INCORPORATING THE AMERICAN BELL TELEPHONE COMPANY.

[RECORD PAGE 20.]

Chapter 117.

COMMONWEALTH OF MASSACHUSETTS.

IN THE YEAR ONE THOUSAND EIGHT HUNDRED AND EIGHTY.

AN ACT

TO INCORPORATE THE AMERICAN BELL TELEPHONE COMPANY.

Be it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, as follows: —

SECTION 1. Alexander Graham Bell, William H. Forbes, George Z. Silsbee, Richard S. Fay, Alexander Cochrane, George L. Bradley, Francis Blake, Jr., Thomas Sanders and Charles Eustis Hubbard, and their associates, may associate themselves and organize a corporation according to the provisions of chapter two hundred and twenty-four of the Acts of the year eighteen hundred and seventy, and the Acts in amendment thereof and addition thereto, for the purpose of manufacturing, owning, selling, using and licensing other to use, electric speaking telephones and other apparatus and appliances pertaining to the transmission of intelligence by electricity, and for that purpose constructing and maintaining by itself and its licensees public and private lines and district exchanges, with a capital stock exceeding one million of dollars, and not exceeding ten millions of dollars.

SECTION 2. For the purposes aforesaid, said Corporation may become a stockholder in or become interested with other corporations hereafter organized for like purposes, or already established for the transaction of telephonic business under its patents and no others; provided, that said Corporation shall not become a stockholder in any other corporation doing business in this State to an amount exceeding thirty per cent of the capital stock of said last named corporation. And it and its licensees may, with this Commonwealth, enjoy the rights given by chapter sixty-four of the

General Statutes and Acts amendatory thereof, and shall be subject to the liabilities therein imposed; but section ten of said chapter shall only apply to their public lines; and the apportionment provided by section five of chapter two hundred and eighty-three of the Acts of the year eighteen hundred and sixty-five and Acts amendatory thereof, shall be made upon the number of telephones in use by it, or under its authority, or with its permission, or under letters patent owned or controlled by it within and without this Commonwealth respectively; and the returns to be made under said Act shall state the facts required for such apportionment in such form as the Tax Commissioner may determine; and it shall be the duty of said Tax Commissioner, or his deputy, to annually examine the books, accounts and papers of said corporation, so far as may be necessary for the verification of said returns.

SECTION 3. When an injury is done to a person or to property by the posts, wires, telephones, or other apparatus of the Corporation, caused by any negligence on the part of itself or its officers, or on the part of any of its agents, servants, employees or operatives, the Corporation shall be responsible in damages to the party injured.

SECTION 4. The franchise or charter of said Corporation shall not be sold or offered for sale, or leased, to any company, or to any person or association of persons, without the consent of the Legislature; and any contract made contrary to the provisions of this Act shall be void. And this charter may be revoked by the Legislature for any cause which they deem sufficient.

SECTION 5. The provisions of the first and second sections of the three hundred and tenth chapter of the Acts of the year eighteen hundred and sixty-eight shall apply to said telephone company and its licensees.

Said Corporation shall be subject to all general laws that now are, or that may be hereafter in force, relating to similar corporations, so far as the same shall not be inconsistent with the provisions of this Act.

SECTION 6. This Act shall take effect upon its passage.

HOUSE OF REPRESENTATIVES, March 12th, 1880.

Passed to be enacted.

CHAS. J. NOYES,
Speaker.

IN SENATE, March 17th, 1880.

Passed to be enacted.

ROBERT R. BISHOP,
President.

MARCH 19th, 1880.

Approved.

JOHN D. LONG.

SECRETARY'S DEPARTMENT,
BOSTON, Jan. 6, 1881.

A true copy.

Witness the seal of the Commonwealth.

[SEAL] HENRY B. PEIRCE
Secretary of the Commonwealth of Massachusetts.

CERTIFICATE OF INCORPORATION OF THE AMERICAN BELL TELEPHONE COMPANY.

[RECORD PAGE 20.]

No. 1077.

COMMONWEALTH OF MASSACHUSETTS.

Be it known that whereas W. H. Forbes, George L. Bradley, G. Z. Silsbee, Charles Eustis Hubbard, Francis Blake, W. G. Saltonstall, Richard S. Fay, R. W. Devonshire, Charles Emerson, Thomas B. Bailey, and C. M. Whitcomb have associated themselves with the intention of forming a corporation under the name of the American Bell Telephone Company, for the purpose of manufacturing, owning, selling, using and licensing others to use, electric speaking telephones and other apparatus and appliances pertaining to the transmission of intelligence by electricity, and for that purpose constructing and maintaining by itself and its licensees public and private lines and district exchanges with a capital of seven million three hundred and fifty thousand dollars, and have complied with the provisions of the Statutes of this Commonwealth in such case made and provided, as appears from the certificate of the President, Treasurer and Directors of said corporation, duly approved by the Commissioner of Corporations, and recorded in this office:

Now, therefore, I, Henry B. Peirce, Secretary of the Commonwealth of Massachusetts, do hereby certify that said W. H. Forbes, G. L. Bradley, G. Z. Silsbee, C. E. Hubbard, F. Blake, W. G. Saltonstall, R. S. Fay, R. W. Devonshire, C. Emerson, T. B. Bailey and C. M. Whitcomb, their associates and successors, are legally organized and established as and are hereby made an existing corporation under the name of the American Bell Telephone Company, with the powers, rights and privileges, and subject to the limitations, duties and restrictions, which by law appertain thereto.

Witness my official signature hereunto subscribed, and the [SEAL] seal of the Commonwealth of Massachusetts hereunto affixed this seventeenth day of April, in the year of our Lord one thousand eight hundred and eighty.

(Signed)

HENRY B. PEIRCE,

Secretary of the Commonwealth.

COMMONWEALTH OF MASSACHUSETTS.

SECRETARY'S DEPARTMENT.

BOSTON, December 24, 1880.

I hereby certify, that the foregoing is a true copy of the Certificate of Incorporation of the American Bell Telephone Company, organized under the provisions of chapter two hundred and twenty-four of the Acts of the year eighteen hundred and seventy, (and Act 1880, 217,) having "the force and effect of a special charter,' as appears by the records of this Department.

Witness the seal of the Commonwealth.

[SEAL] HENRY B. PEIRCE,
Secretary of the Commonwealth.

COMMONWEALTH OF MASSACHUSETTS.

SECRETARY'S DEPARTMENT.

BOSTON, December 24, 1880.

EXTRACT FROM SECTION 11 OF CHAPTER 224 OF THE ACTS OF THE YEAR 1870.

"The Secretary of the Commonwealth shall sign the same and cause the seal of the Commonwealth to be thereto affixed, and such certificate shall have the force and effect of a special charter, and be conclusive evidence of the organization and establishment of such corporation. The secretary shall also cause a record of such certificate to be made, and a copy of such record, duly certified, may, with like effect as the original certificate, be given in evidence to prove the organization and establishment of such corporation."

I hereby certify that the foregoing is a true copy of a portion of Section 11 of Chapter 224 of the Acts of 1870; that the said section is in force, and that the certificate of incorporation of which the annexed is a copy, is a certificate issued under and in pursuance of said section of said Act.

Witness the seal of the Commonwealth.

[SEAL] HENRY B. PEIRCE,
Secretary of the Commonwealth.

—THE—
JOHN CREAR
LIBRARY

F. A. KLEMM.

Telephone-Transmitter.

No. 235,635. Patented Dec. 21, 1880.

Fig: 1.

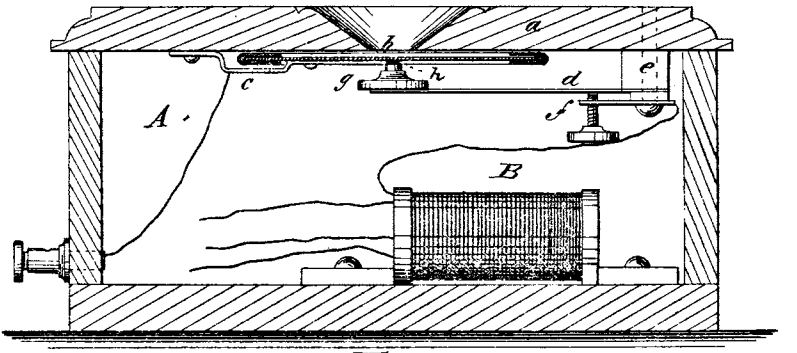
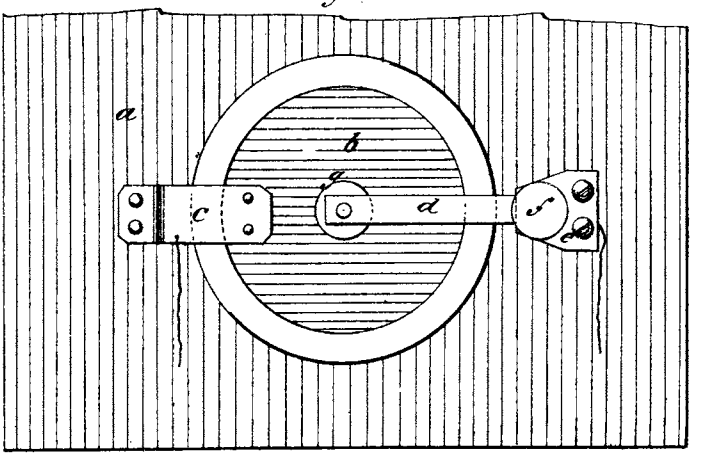


Fig: 2.



WITNESSES:

Chas. Nida.

C. Sedgwick

INVENTOR:

F. A. Klemm

Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK A. KLEMM, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PEOPLE'S TELEPHONE COMPANY, OF SAME PLACE.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 235,635, dated December 21, 1880.

Application filed November 18, 1879.

To all whom it may concern:

Be it known that I, FRANK A. KLEMM, of the city, county, and State of New York, have invented a new and useful Improvement in Telephone-Transmitters, of which the following is a specification.

The object of my invention is to simplify the construction and connections of transmitting-instruments for telephone-lines, and to obtain a more perfect operation than heretofore; and the invention consists in a diaphragm suspended upon an arm, or as a spring-tongue, and an adjustable spring-arm carrying the carbon contact-point, combined together. These features will be particularly described with reference to the accompanying drawings, wherein—

Figure 1 is a sectional elevation of the transmitter. Fig. 2 is a back view of the mouth-piece and diaphragm.

Similar letters of reference indicate corresponding parts.

A is the box of the instrument, which may be of any desired form, and is fitted at the top with the mouth-piece *a*. B is the induction-coil. *b* is the diaphragm, attached to the under side of piece *a* by the metal arm *c*. *d* is a spring-arm fixed upon a post, *e*, that is attached to the under side of piece *a*. *f* is the adjusting-screw, sustained in an extension from post *e* and bearing on the spring *d*. *g* is the carbon-holder attached upon the outer end of spring *d*.

The connections to the local circuit with battery are from the arm *c* to a binding-post at the side of the box A, and from the post *e* to the primary of coil B, and from thence to a second binding-post. The secondary of coil B is connected to the main line.

The arm *c*, sustaining the diaphragm *b*, is constructed of spring metal, and tends to press the diaphragm in contact with the piece *a*. The diaphragm is damped by a ring of rubber or other material attached upon its edges, and is fitted at its center with a point of platinum.

The spring-arm *d*, carrying the carbon-holder, tends to separate the contact points, and its position is regulated by screw *f*.

It will be seen that this construction is very simple. The diaphragm is substantially a spring-tongue, its vibrations being upon its support *c*, and its movement vibrates the arm *d*. The movements of *b* would be naturally more sluggish than the movements of *d*, and the change of resistance is due to that difference, regulated by the pressure given by screw *f*.

It will be observed that, the diaphragm *b* having a platinum point arranged in its center, as shown at *h*, Fig. 1, and connected by a metallic spring-arm, *c*, to the mouth-piece, and said arm having connection in the manner described with the local circuit, the diaphragm becomes in itself one of the electrodes, and that the spring-arm *c* permits the diaphragm to vibrate freely, even though it is in constant contact with the carbon point secured to the end of the spring-electrode *d*.

I disclaim a spring forming or carrying one electrode of the circuit of a telephone and constantly pressing against the other electrode, to maintain the required initial pressure between the electrodes and yield to the movements of the diaphragm.

I also disclaim a yielding weight carried by a spring connected with the movable electrode, to resist the movements of the diaphragm and modify by its inertia the variations of pressure between the electrodes; and I further disclaim the application of a band of rubber or other similar plastic material to the disk of a telephone to cover the edge and lap over upon both faces.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The diaphragm *b*, connected with the mouth-piece by a spring-arm, *c*, substantially as and for the purpose set forth.

2. In telephone-transmitters, the diaphragm *b*, attached to the mouth-piece by the spring-arm *c*, and the adjustable spring-arm *d*, carrying the carbon-holder, combined and operating substantially as shown and described.

3. In telephone-transmitters, the spring carbon-holder *d* and adjusting-screw, combined with the diaphragm *b*, hung as a spring-tongue, substantially as described and shown.

FRANK A. KLEMM.

Witnesses:
GEO. D. WALKER,
C. SEDGWICK.

—THE—
JOHN CRERAR
LIBRARY

A. G. TISDEL.
Magnet-Telephone.

No. 227,861. Patented May 18, 1880.

Fig. 1.

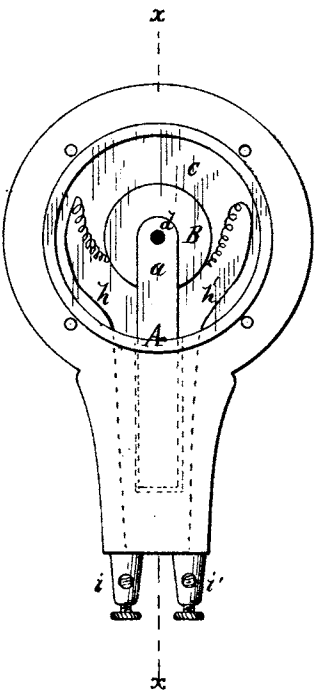
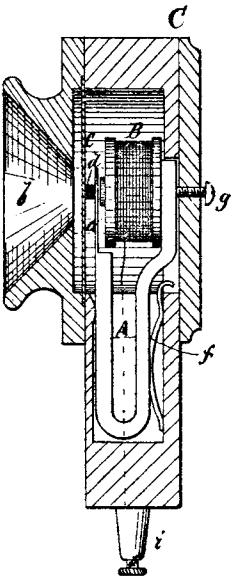


Fig. 2.



WITNESSES:
Henry N. Miller
C. Sedgwick

INVENTOR:
A. G. Tisdel
BY Munn & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

ABNER G. TISDEL, OF ILION, ASSIGNOR TO FRANK A. KLEMM AND ERNEST MARX, OF NEW YORK, N. Y., SIMON WOLF, OF WASHINGTON, D. C., AND MORITZ LOTH, OF CINCINNATI, OHIO.

MAGNET-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 227,861, dated May 18, 1880.

Application filed November 14, 1879.

To all whom it may concern:

Be it known that I, ABNER G. TISDEL, of Ilion, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Speaking-Telephones, of which the following is a specification.

My improvements relate to the class of telephones using a permanent magnet and induction-coil, whereby the magnetic vibrations of the poles caused by the induced current and vibrations in magnetic force produce the sound-waves by action upon a diaphragm, or, reversely, the variations in magnetic force and vibration of the magnet are produced by the sound-waves acting on the diaphragm.

My invention consists in the combination and construction of parts, as hereinafter described and claimed, whereby freedom of vibration of the diaphragm of a telephonic transmitter and receiver is controlled so that the effect of the force of the magnetic current may be easily regulated at will.

Figure 1 is a front elevation of the instrument, the mouth-piece being removed. Fig. 2 is a cross-section on the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A is a permanent magnet of U form, having one pole surrounded by the induction-coil B, and its other pole terminating in a thin metallic tongue, *a*. The coil B is upon a right-angled extension of the pole which projects contiguous to the tongue *a*, so that both poles of the magnet are within the magnetic field. These parts are fitted in a case, C, having a mouth-piece, *b*, beneath which is clamped the diaphragm *c*, of mica or other non-conducting material.

Upon the tongue *a* is a small block or point, *d*, of metal, rubber, or other material, which is in mechanical contact with diaphragm *c*.

The magnet A extends into a recess of the case B, in which is a spring, *f*, that tends to press the other end of the magnet away from the diaphragm *c*, and in the back of the case a screw, *g*, is fitted, bearing upon the magnet against the pressure of spring *f*, so that by turning screw *g* the pressure of the block *d* upon the diaphragm may be regulated.

The connecting-wires *h h'* from coil B connect with the binding-posts *i i'*, respectively, for connection with the circuit that is to contain a similar instrument.

The instrument in the form shown is adapted for transmitting or receiving.

In operation as a transmitter the vibrations of the diaphragm will cause the vibration of the tongue *a* to and from the other pole of the magnet. Such vibrations being entirely within the magnetic field, the magnetic force and induced current will vary with the extent of vibration. These variations in the induced current act in the receiving-instrument to vary the magnetic force of the induction-coil, and the tongue *b* and diaphragm *c* of the receiver will be vibrated in harmony with the transmitter to produce articulate sounds.

I am aware that in telephones a permanent magnet has been used with one pole fitted with a helix and the other pole formed as a vibrating diaphragm. In such instruments, to obtain the required amplitude of vibration, the magnet-bar must be shortened to admit a diaphragm of the size required, while in my instrument the vibrating tongue may be short and the poles of the magnet brought closely together. The tongue, being also protected, may be of the most delicate construction.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In speaking-telephones, the spring *f* and adjusting-screw *g*, combined with the magnet A, diaphragm *c*, block *d*, and case C, substantially as and for the purposes set forth.

ABNER G. TISDEL.

Witnesses:
GEO. D. WALKER,
C. SEDGWICK.

CERTIFIED COPY DIGEST ASSIGNMENTS, ETC., TO DEC. 18, 1880, RELATING TO TELEPHONE PATENTS AND INVENTIONS OF DRAWBAUGH, KLEMM & TISDEL.

[RECORD, PAGE 51.]

UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, Greeting:

This is to certify that the annexed is a true copy from the Digest of this Office of all Assignments, Agreements, Licenses, Powers of Attorney, and other instruments of writing found of record up to and including Dec. 18, 1880, under or relating to Letters Patent granted to, or inventions of Daniel Drawbaugh, Frank A. Klemm and Abner G. Tisdel, relating to Telephones.

In Testimony whereof, I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-third day of December, in the year of our Lord one thousand eight hundred and eighty, and of the Independence of the United States the one hundred and fifth.

[SEAL]

E. M. MARBLE,
Commissioner.

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
F. A. Klemm.	F A. Klemm, Marx & Sons, of New York City, and Abner G. Tisdel, of Ilion, N. Y.	Nov. 14, '79	Nov. 17, '79	Telephone Transmitter, oath signed and about to make application [May 4, 1880, 227,270].	His right. The patent to issue to the assignees.	W. 24	85
Same.	Ernest Marx, of New York, N. Y.	Mar. 4, '80	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879, and subsequent improvements [Dec. 21, 1880, 235,-635]. Specifications dated about Feb. 14, 1880, and now on file in Patent Office [May 4, 1880, 227,270]. And induction coils filed about Jan. 12, 1880, and Telephone Repeaters about to make application, and Telephone Receivers about to make application, and Telephones, Telephone Transmitters, Telephone Repeaters and other apparatus appertaining to Telephones for which improvements when completed, intends to make application.	His right. The patent to issue to the assignee.	H. 25	29
Abner G Tisdel. Frank A. Klemm, Marx & Son.	Same.	May 4, '80	Mar. 10, '80	Telephone Transmitters, application pending [May 4, 1880, 227,270].	Their right. The patent to issue to the assignee. See Liber. W. 24, page 85.	H. 25	31

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Ernest Marx.	F. A. Klemm, of New York City.	Mar. 6, '80	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879, and Telephone Transmitters, filed about Feb. 1880. And Induction coils about Jan. 12 1880 [May 4, 1880, 227,270]; and Telephone Repeaters and Transmitters about to make application, and Telephone Transmitters, Repeaters, Receivers, and other apparatus relating to Telephones — applications intended to be made; and Abner G. Tisdel, Speaking Telephones.	One undivided three tenths part in each and all of said improvements and inventions, and in and to all and any patents that may be granted therefor. Patents to issue to assignee for his interest.	H. 25	32
Ernest Marx.	Moritz Loth, of Cincinnati, O.	Mar. 6, '80	Mar. 10, '80	Telephone Transmitters filed about Nov. 17, 1879. Dec. 21, 1880, 235,635. Telephone Transmitters filed about Feb., 1880 [May 4, 1880, 227,270]; and Induction coils about Jan. 12, 1880 [May 11, 1880, 227,546]. Telephone Repeaters and Transmitters about to make application, and Telephone Transmitters, Repeaters, Receivers, and other apparatus relating to Telephones applications intended to be made, and Abner G. Tisdel, Speaking Telephones.	One undivided one fifth part in each and all of said improvements and inventions, and one undivided one fifth part in any and all patents that may be granted therefor. Patents to issue to assignee for his interest.	H. 25	34

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Ernest Marx.	Simon Wolf, Washington, D. C.	Mar. 6, '80	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879. Dec. 21, 1880, 235,635. Telephone Transmitters, filed about Feb., 1880; May 4, 1880, 227, 270. And Induction coils filed about Jan. 12, 1880; May 11, 1880, 227,546. Telephone Repeaters and Transmitters about to make application, and Telephone Transmitters, Repeaters, Receivers, and other apparatus relating to Telephones. Applications intended to be made, and Abner G. Tisdel, Speaking Telephones.	One undivided one fifth part, in each and all of said improvements and inventions, and a like interest in any and all patents that may be granted therefor. Patents to issue to assignee for his interest.	H. 25	37
Mutual agreement between	Ernest Marx and Frank A. Klemm, of New York City, Moritz Loth, of Cincinnati, O., and Simon Wolf, of Washington, D. C.	Mar. 6, '80	Mar. 10, '80	Telephone Repeaters, Telephone Receiver and Transmitters, Induction coils and Improvements in Telephones, May 4. 1880, 227,270; and Abner G. Tisdel, Speaking Telephones.	Said parties mutually covenant and agree, one and all each with the other, that each and all of their interests in said improvements and inventions, and the Letters Patent to be issued therefor shall be merged and consolidated as common stock in a corporate body, under the laws of either of the States of Ohio, New York, or the general laws of the United States, relating to the formation of incorporations in the Dist. of Columbia, or of such other States or territories as may be found necessary hereafter. See record for particulars of the mutual covenants as entered into and agreed upon.	H. 25	39

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Same.	Same.	Mar. 8, '80	Mar. 10, '80	Same.	Mutual agreement between said parties relative to the disposition of any share of stock before the same is issued but that a joint contract may be made of some of said stock upon the conditions that whatever is realized therefor, shall be divided in proportion to their respective interests, to wit, said Klemm and Marx 3-10 each and Wolf and Loth 1-5 each.	H. 25	42
Frank A. Klemm.	Ernest Marx, of New York, N. Y., Moritz Loth, of Cincinnati, Ohio, and Simon Wolf, of Washington, D. C.	Aug. 12, '80	Aug. 16, '80	Telephone Switch, July 20, 1880, 230,288.	Assigns the undivided three fourths of the whole right, title, and interest in said invention and the Letters Patent therefor, in the proportion of an undivided one fourth to each of said assignees, to the full end of the term for which said Letters Patent are or may be granted.	U. 25	231
Moritz Loth, Frank A. Klemm, Ernest Marx, Simon Wolf.	The Peoples' Telephone Company.	Sept. 4, '80	Oct. 15, '80	Telephone Transmitters, May 4, 1880, 227,270; and Induction coil, May 11, 1880, 227,546; and Abner G. Tisdel, Magnet Telephone,	Assign the whole right, title, and interest in each and all of the patents granted to said Tisdel and Klemm, and to all the inventions of	V. 25	253

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
				May 11, 1880,227, 861; and Frank A. Klemm, Telephone Switch, July 20. 1880, 230. 288; and Telephones and Telephone apparatus, patents pending Dec. 21, 1880, 235,635; and Daniel Drawbaugh, Telephones, applications made on or about July 21, 1880.	said Klemm, for which applications are now pending, and to all said Klemm's inventions for telephones, for which applications may be made, and to all patents that may be granted therefor; and request that said patents may issue to said company. Also assign the exclusive right to the inventions of Daniel Drawbaugh and to the patents that may be granted therefor, and request that said patents may issue to said company. See Liber. W. 25, page 85 of Transfers of Patents.		
Mary S. Marx, Ernest Marx Marx & Son, by Ernest Marx, a member of the firm.	Same.	Oct. 11, '80	Oct. 15, '80	Telephone Transmitters. Specifications dated Feb. 14, 1880, and now on file in the Patent Office, May 4, 1880, 227.270; and Induction coil filed about Jan. 12, 1880; and Telephone Repeater about to make application; and Telephone Receiver about to make application; and Telephones. Telephone apparatus, for which improvements, when completed, he intends to make application.	Assign all their right, title and interest both as individuals, and as the firm of Marx & Son, in said inventions and patents, acquired by deeds recorded in Liber. H. 25, pages 29 and 31 of Transfers of patents, and in all patents that may be issued hereafter; and request that said Patents issue to said company.	V. 25	256

Assignors.	Assignees.	Date of Assignment.	Date of Record.	Invention.	Territory Assigned.	Liber.	Page.
Daniel Drawbaugh	Frank A Klemm and Ernest Marx, both of New York, N.Y.,and Simon Wolf of Washington,D. C. and Moritz Loth of Cincinnati O.	July 21, '80	July 22, '80	Transmission of Vocal Speech and apparatus to be used for such purpose. About to make appl'n. Spec'n dated July 21, 1880.	His right. The patent to issue to the assignees in the proportion an undivided one fourth part to each.	U. 25	85
Abner G. Tisdel.	Abner G. Tisdel of Ilion, N. Y., Marx & Sons, Frank A. Klemm, of New York, N. Y.	Nov. 11, '79	Nov. 13, '79	Speaking Telephone,application made.	His right. The patent to issue to the assignees.	P. 24	465
Same.	Ernest Marx, of New York, N. Y.	Mar. 4, '80	Mar. 10, '80	Speaking Telephones, application now pending. Also improvement in Speaking Telephones or in apparatus relating to Telephones and Telegraphy.	All his right, title, and interest in said invention, also in all improvements and inventions he may hereafter make in Speaking Telephones, or in apparatus relating to Telephones and Telegraphy. "The patents to issue to the said Marx as the assignee of his entire right, title, and interest in the same." See also Liber P. 24 page 465 of Transfers of Patents.	F. 25	319

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Abner G. Tisdel.	Same.	Sept. 16,'80	Oct. 4, '80	Telephone Transmitter application. Made oath Sept. 16, 1880.	His right. The patent to issue to the assignee.	S. 25	429
Mary S. Marx, Ernest Marx, comprising the firm of Marx & Son By Ernest Marx, "a member of the firm"	The Peoples' Telephone Company.	Oct. 11, '80	Oct. 15, '80	Magnet Telephone, May 18, 1880, 227, 861.	All their right, title, and interest, both as individuals and as a firm in said Letters Patent.	V. 25	250

CERTIFIED COPY AGREEMENT BETWEEN MARX, KLEMM, WOLF AND LOTH.

[Record, page 51.]

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, greeting:

This is to certify, that the annexed is a true copy from the records of this Office, of an agreement recorded in Liber H 25, p. 39, and that said annexed copy has been compared by me with the original, and that it is a correct transcript thereof, and of the whole of said original.

In testimony whereof, I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-first day of January, in the year of our Lord one thousand eight hundred and eighty-one, and of the Independence of the United States the one hundred and fifth.

[SEAL] E. M. MARBLE,
Commissioner.

Liber H[25], p. 39.

Whereas, Ernest Marx, of the city, county and State of New York, is sole owner of an undivided three tenths part of certain improvements in Speaking Telephones, the invention of Abner G. Tisdel, of Ilion, in the county of Herkimer and State of New York, and of the Letters Patent to be issued therefor; and is also sole owner of an undivided three tenths part of certain improvements in Telephone Repeaters, Telephone Receiver and Transmitters, Induction Coils, and certain improvements in Telephones, the inventions of Frank A. Klemm, of the city, county and State of New York, and in the Letters Patent to be obtained therefor. And whereas Frank A. Klemm, of the city, county and State of New York, is sole owner of a like undivided three tenths part in all of said improvements and inventions, and in the Letters Patent to be issued therefor. And whereas Moritz Loth, of the city of Cincinnati, county of Hamilton and State of Ohio, is sole owner of one undivided one fifth part in all

of said improvements and inventions, and in the Letters Patent to be issued therefor. And whereas Simon Wolf, of the city of Washington, in the District of Columbia, is sole owner of one undivided one fifth part in all of said improvements and inventions, and in the Letters Patent to be issued therefor. Now this agreement witnesseth, That the said Ernest Marx, Frank A. Klemm, Moritz Loth and Simon Wolf, each and all mutually covenant and agree, one and all, with each other, that each and all of their interests in said improvements and inventions, and in the Letters Patent to be issued therefor, shall be merged and consolidated as common stock in a corporate body, to be formed and created and incorporated under the general laws either of the State of New York, the State of Ohio, or the general laws of the United States relating to the formation of incorporations in the District of Columbia, or of such other States or Territories as may be found necessary hereafter; and each of the parties to this agreement mutually covenant and agree, one and all, with each other, that they will each and all of them retain intact their respective shares, titles and interests in all of said improvements and inventions, and in the Letters Patent to be issued therefor; and that they, each and all of them, will not sell, transfer or assign their respective titles and interests in and to said improvements and inventions, and in the Letters Patent to be issued therefor, except to said corporation or corporations to be hereafter formed and created in accordance with this agreement; and it is further understood and agreed upon by each and all of the parties hereto, that the gross capital of the corporations to be created and formed in accordance with the stipulations hereinbefore set forth shall be represented by stock to be issued for five millions of dollars ($5,000,000), in shares of one hundred dollars each ($100 each), to be distributed to each of the parties hereto in proportions equal to their respective interests in the improvements, inventions and Letters Patent, as hereinbefore set forth, — that is to say, three tenths ($\frac{3}{10}$ths) to Frank A. Klemm, three tenths ($\frac{3}{10}$ths) to Ernest Marx, one fifth ($\frac{1}{5}$ th) to Moritz Loth, and one fifth ($\frac{1}{5}$th) to Simon Wolf, — and that each of said parties is at full liberty to dispose of any or all of said stock so issued to him, in accordance with the rules and laws of said corporation or corporations and not otherwise; and each and all of the parties

hereto covenants and agrees to surrender, assign, transfer and set over to said corporation or corporations each and all of their respective titles and interests in said improvements, inventions and Letters Patent hereinbefore mentioned and referred to; and that they will, each and all of them, hereafter make, execute and deliver all such deeds, assignments, and other instruments, undertakings and writings that may be found necessary in the premises for the purpose of carrying out the provisions of this agreement.

In testimony of the whole of which the said Ernest Marx, the said Frank A. Klemm, the said Moritz Loth and the said Simon Wolf, have each of them hereunto set their respective hands and seals, this sixth day of March, 1880.

ERNEST MARX. [SEAL]
FRANK A. KLEMM. [SEAL]
M. LOTH. [SEAL]
S. WOLF. [SEAL]

In presence of
JOHN SLOTE,
MARTIN LIPPMANN,
As to the signature of Ernest Marx, the words "and Transmitters," inserted on page 1, before signature and execution.
LEWIS ABRAHAM,
R. B. LAWRENCE,
As to signature of Frank A. Klemm.
LEWIS ABRAHAM,
MARCUS MARX,
As to signature of M. Loth.
MARTIN LIPPMANN,
JOSER LOTH,
As to signature of M. Wolf.

Recorded March 10, 1880.
Ex'd H. M. H. E. A. M.

CERTIFIED COPY OF AGREEMENT BETWEEN MARX KLEMM, WOLF AND LOTH.

[Record, page 51.]

Liber H[25], page 42.

NEW YORK March 8th 1880.

Frank A. Klemm, Earnest Marx, Simon Wolf, and M. Loth, each and all agree one with the other and all others, that they will not either of them without the consent of all the others assign or make any contract to assign any share of stock before said stock is issued, but that a joint contract may be made to dispose of some of the stock to be issued to such party or parties hereafter agreed upon, with the distinct understanding that whatever is realized therefor shall be divided in equal proportions in accordance with their respective interests viz; 3/10 to Frank A. Klemm, 3/10 to Earnest Marx, 1/5 to Simon Wolf, 1/5 to Morits Loth.

EARNEST MARX.
FRANK A. KLEMM.
M. LOTH.
S. WOLF.

Recorded March 10, 1880. Ex'd H. M. H. E. A. M.

ASSIGNMENT KLEMM ET AL. TO PEOPLE'S TELEPHONE COMPANY.

[Record, page 51.]

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of two (2) assignments recorded in the volumes as stated on the margins of each copy, respectively, and that said annexed copies have been compared by me with the originals, and that they are correct transcripts thereof, and of the whole of said originals.

In testimony whereof, I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this ninth day of November, in the year of our Lord one thousand eight hundred and eighty, and of the Independence of the United States the one hundred and fifth. .

E. M. MARBLE,

[L. S.] *Commissioner.*

Whereas, Frank A. Klemm, of the city, county and State of New York, Moritz Loth, of the city of Cincinnati, county of Hamilton, and State of Ohio, Ernest Marx, of the city, county and State of New York, and Simon Wolf, of the city of Washington, District of Columbia, are now owners of the following patents, that is to say : No. 227,270, granted to Frank A. Klemm, dated May, 1880 ; No. 227,546, granted to Frank A. Klemm, dated May 11th, 1880 ; No. 227,861, granted to Abner G. Tisdel, dated 11th May, 1880, and No. 230,288, granted to Frank A. Klemm, dated July 20th, 1880, which four patents have been duly assigned to us, as will more fully appear by reference to deeds of assignment, now on record in the United States Patent Office.

And whereas we are also owners of certain improvements in telephones, and telephone apparatuses, the inventions of the said Frank A. Klemm, for which applications for patents are now pending in the United States Patent Office, and further, are owners of all inventions of the said Frank A. Klemm relating to telephones, and for the patents that may be issued therefor. And whereas we are also owners of the inventions in telephones made by Daniel Drawbaugh, of Eberly's Mills, Cumberland County, in the State of Pennsylvania, for which applications for patents was made on or about the twenty-first day of July, 1880, and which was assigned to us on the first day of July, 1880, as more particularly appears in a certain deed of assignment recorded in the United States Patent Office, in Liber W. 25, page 85, in the book of transfers of patents.

And whereas The People's Telephone Company, a corporation formed under the laws of the State of New York, is desirous of acquiring the entire interest in each and all of said inventions and in

the patents that may be issued therefor, and in each and all of the patents that have been issued as hereintofore recited, and in each and all of the applications that are pending hereintofore recited and referred to and in the patents that may be issued therefor;

Now, therefore, to all whom it may concern, be it known that for and in consideration of the sum of four million nine hundred and ninety-nine thousand five hundred and fifty dollars ($4,999,550), represented by ninety-nine thousand nine hundred and ninety-one shares (99,991) in the stock of the said The People's Telephone Company, the receipt whereof is hereby acknowledged, we, the said Frank A. Klemm, Moritz Loth, Ernest Marx and Simon Wolf, have sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said The People's Telephone Company, the whole right, title and interest in, and to each and all of the patents granted to the said Abner G. Tisdel, and the said Frank A. Klemm, as hereinbefore recited, and in and to each and all of the inventions of the said Frank A. Klemm, for which applications are now pending in the United States Patent Office, and in and to the inventions of the said Frank A. Klemm, hereintofore referred to, and in and to the inventions of the said Frank A. Klemm, for which applications for patents may be hereinafter made, and in and to all patents that may be granted therefor; and we hereby authorize and request the Commissioners of Patents to issue any and all patents that may be granted to the said Frank A. Klemm for the inventions hereintofore referred to, to the said The People's Telephone Company, as the assignee, our entire right, title and interest in and to the same for the sole use and behoof of The People's Telephone Company and their legal representatives as fully and entirely as the same would have been held and enjoyed by us had this assignment and sale not been made.

And it is further understood and agreed upon that for the consideration hereinbefore mentioned, and the receipt of which is hereby further acknowledged, we, the said Frank A. Klemm, Moritz Loth, Ernest Marx and Simon Wolf, have sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said The People's Telephone Company the full and exclusive right to the nventions of Daniel Drawbaugh, of Eberly's Mills, Cumberland

County, State of Pennsylvania, and in and to the patents that may be granted therefor as fully set forth and described in the application for Letters Patent filed on or about the twenty-first day of July, 1880, and which is assigned to us as hereinbefore recited; and we hereby authorize and request the Commissioner of Patents to issue any and all Letters Patent that may be granted on the said application of the said Daniel Drawbaugh to the said The People's Telephone Company, as the assignee of the entire right, title and interest in and to the same, for the sole use and behoof of the said The People's Telephone Company and their legal representatives, as fully and as entirely as the same would have been held and enjoyed by us had this assignment and sale not been made. In testimony of which, each of the parties hereunto have affixed their hands and seals, this fourth day of September, 1880, in the city of New York.

MORITZ LOTH. [L. S.]
FRANK A. KLEMM. [L. S.]

Witnesses:
E. P. AHERN.
J. S. VOSBURG.

ERNEST MARX. [L. S.]
SIMON WOLF. [L. S.]

Witnesses:
EDWD. P. AHERN.
J. S. VOSBURG.
EMANUEL BLOUT.
CHARLES HERZBERGER, to S. WOLF.

Recorded October, 15, 1880.
Ex'd F. C. F.

ASSIGNMENT MARY S. AND ERNEST MARX TO PEOPLE'S TELEPHONE COMPANY.

[Record, page 51.]

Know all men by these presents that Mary S. Marx and Ernest Marx, of the city, county and State of New York, composing the firm of Marx & Son, for and in consideration of the sum of one hundred dollars to us in hand paid, the receipt whereof is hereby acknowledged, have sold, assigned and transferred, and by these

presents do sell, assign and transfer unto the People's Telephone Company, a corporation formed under the laws of the State of New York, all our right, title and interest, both as individuals and as the firm of Marx & Son, in and to the inventions and patents of Frank A. Klemm in telephone transmitters and telephone apparatus described and set forth in a certain deed of assignment from Frank A. Klemm to Ernest Marx, dated March 4th, 1880, and now of record in the United States Patent Office in Liber H, 25, page 29, one of the books of record of the Patent Office, and in and to the inventions and improvements of the said Frank A. Klemm, as described and set forth in a certain deed of assignment from Abner G. Tisdel to Frank A. Klemm and Marx & Son, dated fourth day of March, 1880, now of record in the United States Patent Office, in Liber H, 25, page 31, one of the books of record of the Patent Office, and all of our rights, title and interest in and to all patents that may be issued hereafter, the inventions of the said Frank A. Klemm, set forth and referred to in said two deeds of assignment now of record before recited; and we do hereby authorize and request the Commissioner of Patents to issue all Letters Patent hereafter granted on the applications of said Klemm, on the inventions and improvements set forth and referred to in said deeds of assignment to the said "The People's Telephone Company," as the assignees of our entire right, title and interest (either as individuals or as a firm), in and to the same, for the sole use and behoof of the said "The People's Telephone Company," and their legal representatives.

In testimony of which we have each of us signed our individual names and placed our seals, and the said Ernest Marx has signed the firm name this eleventh day of October, 1880.

MARY S. MARX. [L. S.]
ERNEST MARX. [L. S.]

Witness:
ADELE MARX.
MARCUS MARX.

MARX & SON,

Witness: *By Ernest Marx, a member of the firm.*
LEWIS ABRAHAM,
A. J. SOLOMONS,

As to the signatures of Ernest Marx and Marx & Son.

CERTIFIED COPY OF AN ASSIGNMENT FROM DANIEL DRAWBAUGH TO KLEMM ET AL., RECORDED IN LIBER U[26], PAGE 85.

[Record, page 52.]

Whereas, I, Daniel Drawbaugh, of Eberly's Mills, in the County of Cumberland, and State of Pennsylvania, have invented certain new and useful improvements in the transmission of vocal speech, and the apparatus to be used for such purpose for which I am about to make application for letters patent of the United States. And Whereas Frank A. Klemm, of the City, County and State of New York, Ernest Marx, of the same place, Simon Wolf, of the City of Washington, District of Columbia, and Moritz Loth, of the City of Cincinnati, County of Hamilton, State of Ohio, are each of them desirous of acquiring an interest in said invention, and in the letters patent to be obtained therefor.

Now, therefore, to all whom it may concern, be it known that for and in consideration of the sum of Twenty Thousand Dollars to me in hand paid, the receipt of which is hereby acknowledged, I, the said Daniel Drawbaugh, have sold, assigned and transferred, and by these presents, do sell, assign and transfer, unto the said Frank A. Klemm, Ernest Marx, Simon Wolf and Moritz Loth, the full and exclusive right to the said invention as fully set forth and described in the Specification prepared and executed by me, dated the 21st day of July, 1880, preparatory to obtaining letters patent of the United States therefor, and I do hereby authorize and request the Commissioner of Patents to issue the letters patent for my said invention to the said Frank A. Klemm, Ernest Marx, Simon Wolf, and Moritz Loth each as assignee of one undivided fourth part thereof, for the sole use and behoof of my said named Assignees and each of their legal representatives. In Testimony of which I have hereunto set my hand and affixed my seal this twenty first day of July, 1880.

DANIEL DRAWBAUGH. [SEAL

In Presence of
M. W. JACOBS,
E. W. CHELLIS.

Recorded July, 22d, 1880.
Ex'd V. E. L.

ARTICLES OF ASSOCIATION OF THE PEOPLE'S TELEPHONE COMPANY.

[Record, page 52.]

STATE OF NEW YORK,
COUNTY OF NEW YORK, ss.

We, Joseph Loth, of the city of New York, in the county and State of New York, Julius Bien, of the said city of New York, Richard C. McCormick, of the territory of Arizona, Marcus Marx, of the said city of New York, and Auguste H. Girard, of the said city of New York, do, by these presents, pursuant to and in conformity with the *Act* of the *Legislature* of the *State of New York*, passed on the seventeenth day of February, one thousand eight hundred and forty-eight, entitled "An Act to authorize the formation of Corporations for manufacturing, mining, mechanical, or chemical purposes," and the several acts of the said legislature amendatory thereof, associate ourselves together and form a *Company* under the name and style of The People's Telephone Company; and the following are hereby declared to be

The corporate name of the said company.

The objects for which the company is formed.

The amount of the capital stock of the said company.

The number of shares of which the said capital stock of the company shall consist.

The term of existence of the company.

The number of trustees and their names.

The names of those who shall manage the concerns of the said company for the first year.

The names of the town and county in which the operations of the said company are to be carried on: —

1. The corporate name of the said company is hereby declared to be The People's Telephone Company.

2. The objects for which the company is formed are as follows: The manufacturing, constructing, owning, furnishing, maintaining, letting, and selling telephones, and the apparatus used therewith, under the inventions and patents of Abner G. Tisdel, Frank A. Klemm, Daniel Drawbaugh, and other inventions and patents which

may hereafter be assigned to said company, and the doing all things to said business or necessarily connected therewith.

3. The capital stock of the said company shall be five million dollars, which shall be divided into one hundred thousand shares of fifty dollars ($50) each.

4. The said company shall commence on the thirty-first day of August, in the year one thousand eight hundred and eighty ('80), and shall continue in existence for the term of fifty (50) years.

5. The number of trustees shall be nine (9). Their names are: Joseph Loth, of the said city of New York, Edgar W. Chellis, of Harrisburg, in the State of Pennsylvania, Julius Bien, of the said city of New York, Richard C. McCormick, of the Territory of Arizona, Marcus Marx, of the said city of New York, Henry D. Cooke, Jr., of Washington, in the District of Columbia, Max D. Gutmann, of Rochester, in the State of New York, Auguste H. Girard, of said city of New York, and John N. Goodwin, of the said city of New York.

The names of those who shall manage the concerns of the said company for the first year are: the said Joseph Loth, Edgar W. Chellis, Julius Bien, Richard C. McCormick, Marcus Marx, Henry D. Cooke, Jr., Max L. Gutmann, Auguste H. Girard, and John N. Goodwin.

6. The name of the town and county in which the operations of the said company are to be carried on: the principal place or business and office of said company will be in the city of New York, in the county and State of New York. The operations of the company will also be carried on in Brooklyn, in the county of Kings, in said State.

Witness our hands and seals this thirtieth day of August, 1880.

[SEAL]	JOSEPH LOTH.
[SEAL]	JULIUS BIEN.
[SEAL]	RICHARD C. McCORMICK.
[SEAL]	MARCUS MARX.
[SEAL]	AUGUSTE H. GIRARD.

Attest:

WILLIAM H. CLARKSON.

STATE OF NEW YORK,
CITY OF NEW YORK, } ss.
COUNTY OF NEW YORK,

On the thirtieth day of August, in the year one thousand eight hundred and eighty, before me personally came Joseph Loth, Julius Bien, Richard C. McCormick, Marcus Marx, and Auguste H. Girard, known to me to be the individuals described in and who executed the foregoing instrument, and severally acknowledged that they executed the same, they having first signed and sealed the same in my presence.

In witness whereof, I have hereunto set my hand and affixed my notarial seal this thirtieth day of August, A. D. 1880.

[L. S.] WILLIAM H CLARKSON,
Notary Public.
State of New York, New York,
117 Broadway, N. Y. City.

STATE OF NEW YORK,
CITY AND CONNTY OF NEW YORK, ss.

I, William A. Butler, clerk of the said city and county, and clerk of the Supreme Court of said State for said county, do certify that I have compared the preceding with the orignal certificate of incorporation on file in my office, and that the same is a correct transcript therefrom, and of the whole of such original.

In witness whereof, I have hereunto subscribed my name and affixed my official seal on this fourteenth day of September, 1880.

[SEAL] WM. A. BUTLER, *Clerk.*

EVIDENCE FOR COMPLAINANTS IN REPLY.

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK, IN EQUITY.

American Bell Telephone Company et al. v. *The People's Telephone Company* et al.

The plaintiffs propose to take the deposition of Mr. T. A. Watson (of Everett, near Boston); whereupon it is agreed that the depositions heretofore given by Mr. Watson, and copies of which are hereto annexed, be put in evidence as his deposition in this cause with the same effect as if given herein before the examiner, and stand as evidence accordingly.

It is also agreed that the deposition of Alexander Graham Bell, referred to by Mr. Watson in his said deposition, also stand as evidence in this cause as if herein taken and sworn to, and a copy shall be filed accordingly. But the complainants shall recall said Bell for further examination or cross-examination, if either party shall so desire and request.

If Mr. Watson shall return from Europe before testimony is closed, the complainants will recall him for further examination or cross examination, if either party shall so desire and request.

L. HILL, *for Defendants.*

J. J. STORROW, *for Complainants.*

JUNE 1, 1881.

DEPOSITION OF ALEXANDER GRAHAM BELL.

BOSTON, July 8, 1879.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. Please state your name, age, residence, and occupation, and whether you are the Mr. Bell who is mentioned in the bill of complaint in this case.

Ans. I am the Alexander Graham Bell alluded to in the bill of

complaint; age, thirty-two years; residence, Cambridge; occupation, electrician.

Int. 2. How early and why was your attention called to the composition and production of vocal sounds?

Ans. My father was a teacher of articulation, and as he intended me to follow his own profession, he very early gave me instruction in the anatomy of the vocal organs, the functions of the various organs of speech, and in subjects bearing generally upon the science of vocal physiology.

Int. 3. Did you, at an early age, begin to make experiments in the artificial production of vocal sounds, or speech, and in the construction of apparatus for that purpose; and if so, what did you do?

Ans. I remember when I was quite a child that my father spoke to me of some automaton speaking machine that he had seen, and aroused so much interest in me that I determined to attempt the construction of such an apparatus. I invented a speaking machine, and constructed it, as a boy, and was able to make it articulate one or two simple words.

Int. 4. When and how did you first become acquainted with Helmholtz's discoveries relating to the quality of vocal sounds?

Ans. While in the city of Elgin in Scotland, I made what I deemed to be the first discovery that the elements of speech were really compound in their nature. My father and I had been struck by the fact that whispered sounds seemed to have a pitch of their own, and we had arranged vowels in musical series. In Elgin I discovered that the position of the vocal organs for any vowel sound yielded a double resonance, and that the resonance tones, proper to the mouth cavities, could be heard mingling with the tones of the voice during the articulation of speech. I made a series of experiments to determine the characteristic tones of the vowels, and communicated the result to Mr. Alexander J. Ellis, of London, who was then, as now, considered an authority in all matters relating to speech. Mr. Ellis replied that my discovery had already been made by Helmholtz, and that Helmholtz had proved the compound nature of speech sounds, by producing such sounds synthetically, by compounding the tones of tuning forks of different pitches, which were kept in continuous vibration by means of an electrical current.

Int. 5. Are the statements contained in Prof. Cross's twentieth to twenty-fourth answers, inclusive, pages 391 and 392 [*printed record in Dowd suit*], a part of the discoveries of Helmholtz, to which you have just alluded?

Ans. They are.

Int. 6. The synthesis of vowel sounds made by Helmholtz was performed by means of an apparatus consisting of a series of tuning forks of different pitches, all of which were kept in vibration by an electro-magnet placed near their prongs, and through the coils of which intermittent currents were passed by a circuit-breaker, so that each tuning fork produced its own tone; and then by means of resonators which could be brought into action at pleasure, Helmholtz intensified these partial tones, more or less, or left some of them inaudible at the distance at which the hearer was placed, and thereby produced the quality of sound of whichever vowel he pleased, as stated in the answers of Mr. Cross just referred to; and this apparatus is shown on pages 176, 178, and 606 of Mr. Ellis's translation of Helmholtz's book. Is it not so? And when, if ever, was this apparatus first described to you?

Ans. It is so. The apparatus was described to me by Mr. Ellis somewhere about the year 1867.

Int. 7. What led you to take an interest in the subject of the production of sound by means of electrical currents?

Ans. I felt that it was my duty as a student of speech to master all the researches of others that bore upon what was to be my professional study, and I therefore desired to witness the results obtained by Helmholtz, and investigate speech for myself in the manner shown by him.

Int. 8. When did you begin to study and experiment upon the production of sound by electricity, and to what extent did you carry your study and experiments before 1870? State generally.

Ans. Immediately after the conversation with Mr. Ellis in 1867, I formed the resolution of reproducing Helmholtz's synthetical experiments, and finding that my knowledge of electricity was insufficient to enable me fully to understand his arrangement, I took up seriously the study of electricity. In the city of Bath, England, I made electrical experiments with a friend, and attempted to set a

tuning fork in vibration by an electro-magnet. I do not remember the date of my visit to Bath, but I think it was in the year 1868; but it might have been earlier. From the year 1867 to 1870, I made numerous electrical inventions based upon Helmholtz's vowel apparatus, and before I left England, in 1870, I had made up my mind to pursue one of these inventions to a practical end. The invention to which I allude is now known as harmonic telegraphy or multiple telegraphy.

Int. 9. Did you, at that time, have any ideas as to the practicability of transmission of speech by means of electricity; and if so, to what extent?

Ans. From the moment that I became aware that Helmholtz had been able to produce vowel sounds with the aid of electricity, I believed that the other elements of speech might also be produced in a similar manner. I did not, while in England, form any idea of the details of an apparatus for producing speech in this way, but I did very distinctly have the belief that it was possible to construct such an apparatus. I am sure that I stated to friends in England, before 1870, my belief that we should one day speak by telegraph, but I had no idea that I would ever myself be connected with the realization of such a plan.

Int. 10. When did you and the rest of your father's family come to America to live?

Ans. In August, 1870, we went to Canada, to Brantford, Ontario, where my parents still reside.

Int. 11. When did you first come to Boston, and for what purpose?

Ans. I came to Boston on the 1st of April, 1871, at the invitation of the Boston School Board, for the purpose of carrying on experiments with my father's system of physiological symbols in the Boston School for the Deaf. The object of the experiments was to test the practicability of teaching those who are usually called "deaf and dumb" to use their vocal organs so as to articulate intelligibly.

Int. 12. When did you come to Boston to live permanently?

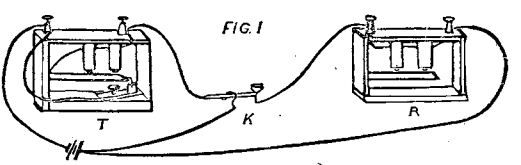
Ans. On the 1st of October, 1872.

Int. 13. While you were in Canada and Boston, say up to the year 1873 or 1874, how much attention did you pay to the subject

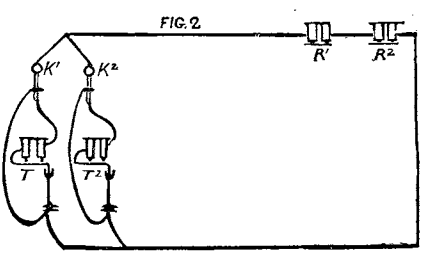
of electricity, and what particular use of electricity did you study and experiment upon?

Ans. From the moment of my arrival in Canada in 1870, up to the commencement of 1874, my mind was full of the scheme for the multiple transmission of telegraphic messages by means of musical tones to which I have already alluded. Up to October, 1872, I resided at my father's house in Canada, paying only occasional visits to the United States, each visit continuing for about two months. I had few facilities for experiment in Canada during that time, and none in the United States. I occupied myself chiefly during my leisure time in studying the subjects of electricity and sound, and in developing theoretically the practical details of my system of harmonic telegraphy. I also made such experiments as I could with the limited facilities at my command, at my father's house in Canada. From October, 1872, up to the commencement of 1874, I devoted all my spare time to practical experiments relating to the production of sounds by electrical means, with the object of reducing to practice the system of harmonic telegraphy. My daytime was completely occupied with professional work, and I carried on my electrical experiments chiefly at night.

Int. 14. I call your attention to Figs. 1 and 2 in the drawing now shown you: when did you construct and use the apparatus therein shown?



(NOV. 1873)



(NOV. 1873)

Ans. In November, 1873.

Int. 15. Where?

Ans. In Salem, Mass.

Int. 16. Have you one of the originals of the apparatus there shown? If so, please produce it and state which of those figures it is like.

Ans. I have, and I now produce it. It is a portion of a transmitting instrument like that shown at T, Fig. 1. All the parts are there except the mercury cup and wire to dip into it; one screw cup and a connecting wire also missing.

Int. 17. When and upon what occasion were Figs. 1 and 2, or the figures of which these are lithographic reproductions, drawn by you?

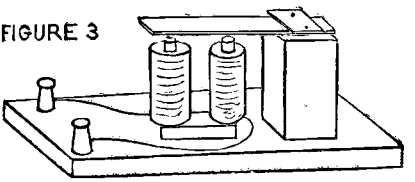
Ans. They were drawn by me some time before the 27th of April, 1876, as part of the illustrations of my preliminary statement in an interference at the Patent Office upon harmonic telegraphy.

Int. 18. State whether you used at that time, in 1873, similar reeds and electro-magnets as receivers, attaching the reed directly to the base or a standard coming from the base instead of using the large box shown in these figures?

Ans. I did, in November, 1873. The receiving instrument usually employed by me at that time consisted of an arrangement almost identical with the instrument now shown. This very instrument was frequently used by me at that time as a receiver, by untwisting the wires which connect the electro-magnet with the steel plate armature and passing the intermittent current from one of the interrupters through the coils of the electro-magnet, without passing through the plate. During the month of November, 1873, I varied the shape and size of the frame holding the receiver so as more conveniently to get at the plate in order to tune it to its proper transmitter. One of my favorite forms of receivers consisted of an arrangement substantially like the model shown, turned upside down, with the bottom of the box (then forming the top) removed, so that the reed was attached to a standard coming from the base. I found this form especially advantageous, as I could remove the plate and substitute others of different lengths and thickness.

I now make a drawing of my favorite form of receiving instrument in November, 1873.

FIGURE 3



Int. 19. If you ever heard, from a single one of those receivers, tones of different pitches transmitted by transmitters of different pitch, please state when you first did so, describe what you heard, and the circumstances under which you heard it.

Ans. In November, 1873, I arranged two current-interrupters and two harmonic receivers upon a single circuit, as shown in Fig. 2. The details of the instruments will be understood from Fig. 1. The plate armature of the receiver R^1 was intended to have the same normal rate of vibration as that of the interrupter T^1, and the plate armature of R^2 was intended to have the same rate as that of T^2. It was expected that upon depressing the key K^1, the intermittent current from the interrupter T^1 would traverse the circuit in which the receivers R^1 and R^2 were placed, and cause the reed of R^1 to be thrown violently into vibration, so as to produce its musical tone, and that the reed of R^2 would not respond in the same manner. It was also anticipated that upon depressing the key K^2, the reed of R^2 would be thrown violently into vibration, but that that of R^1 would not. And that upon depressing both keys K^1 and K^2 simultaneously, the reeds of both receiving instruments R^1 and R^2 would be thrown violently into vibration, producing musical tones at the receiving station of similar pitch to the tones produced at the transmitting station by the vibration of the interrupters T^1 and T^2. Upon making the experiment, the results were as follows: Upon depressing K^1, the reed of R^1 was thrown violently into vibration, as had been anticipated, producing a musical tone similar in pitch to that produced by T^1, and R^2 was not sensibly affected, save by a slight trembling, which was perceptible to the sense of touch. Upon depressing the key K^2, neither of the reeds R^1 and R^2 was thrown into violent vibration, but both were affected by a slight trembling,

which could be felt with the finger. Upon depressing K^1 and K^2 simultaneously, the reed R^1 was thrown into violent vibration, but that of R^2 was not. The results were in accordance with the theory upon which my system of harmonic telegraphy was based, only upon the supposition that the reed of R^2 was not in unison with that of T^2. Upon placing my teeth against the frame to which the reed R^2 was attached and plucking the reed with my finger, I clearly perceived that its pitch was different from that of its proper transmitter T^2. I tried many experiments to tune the reed of R^2, and in the course of these experiments I remodelled the receiving instrument R^2, as shown in Fig. 3, and shifted the position of the reed upon its support, so as to make its free portion longer or shorter, in the attempt to cause its normal rate of vibration to correspond to that of its proper transmitter. I also made the free portion of the reed purposely too short, so that it should have a higher rate of vibration than that of its proper transmitter, and sought to lower its tone by weighting it with lumps of wax. During the course of these experiments, while I happened to have the keys K^1 and K^2 simultaneously depressed, the idea occurred to place my ear against the receiving reed shown in Fig. 3, which was trembling perceptibly to the sense of touch, but which had not been properly adjusted, so as to correspond with its proper transmitter. Upon placing my ear against the reed, I heard two musical tones, the unisons respectively of those produced by T^1 and T^2, seemingly proceeding from that one reed. The reed of R^1, however, was vibrating with great violence in another part of the same room, producing a tone of similar pitch to that produced by T^1, so that I was uncertain whether that tone was produced from the instrument at my ear, or whether it had been mechanically communicated to my ear through the air from the receiver R^1. To test this point, I removed the receiver R^1 from the circuit, leaving R^2, which was then in the condition shown in Fig. 3, in circuit with the two transmitters T^1 and T^2. Upon placing my ear against the receiver R^2, I then clearly perceived two tones proceeding from it, which were similar in pitch to the tones produced by the transmitters T^1 and T^2, and different from that normally produced by the reed of R^2 when plucked by the finger. This experi-

ment was made in Salem, Mass., during the month of November, 1873.

Int. 20. Whether or not, afterward, in the ordinary course of your operations in harmonic telegraphy or with vibrating reed receivers, you availed yourself of this phenomenon of the production in the receiving reed of feeble forced vibrations of the same rate as the rate of the circuit interrupter, but differing in rate from the more ample vibrations which took place when the impulses came with periods corresponding to the normal rate of the receiving reed; and if so, to what extent, and how often, and for what purposes?

[*Question objected to and withdrawn.*]

Int. 20*a*. Did you afterwards in your ordinary operations in the vibrations of reeds, when used as receivers, avail yourself of the phenomenon described in your last answer; and if so, to what extent and for what purpose?

Ans. It was constantly my custom after November, 1873, to observe the feeble forced vibrations produced in the reed of a receiver by the action of a current interrupter of different rate from its own, by placing my ear against the reed. It was my usual method of ascertaining whether to shorten or lengthen the reed of the receiver. When the tone electrically produced was lower in pitch than that produced by plucking the reed by the finger, I lengthened the free portion of the reed, but when the forced vibrations were of higher rate than the free vibrations of the reed, I shortened the vibratory portion of the reed, and thus adjusted its pitch to correspond to that produced by its proper interrupter.

Int. 21. How early did you arrange your multiple telegraph instruments with an induction coil placed between the interrupter and the receiver?

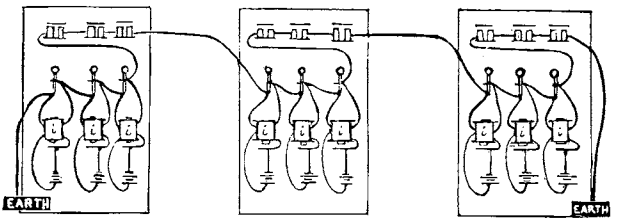
Ans. In the winter of 1873, I think about December.

Int. 22. State whether the drawing now shown you is a correct representation of the manner in which you arranged the apparatus with an induction coil, and state when and for what purpose this drawing, Figs. 4, 5 and 6, was made.

Ans. Figs. 4 and 5 represent correctly the manner in which I arranged the apparatus with induction coils, in December, 1873, and Fig. 6 represents an improvement of the arrangement, devised about

the commencement of the year 1874. This drawing, Figs. 4, 5 and 6, was made previously to April 27, 1876, and formed part of the illustrations of my preliminary statement in the harmonic-telegraph interference before referred to.

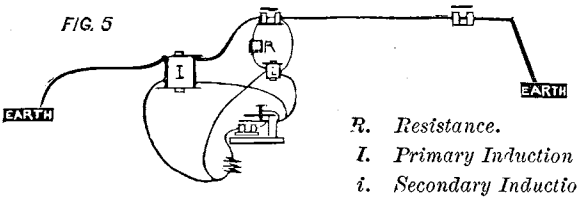
FIG.4 (DECEMBER 1873)



i,i,&c INDUCTION COILS

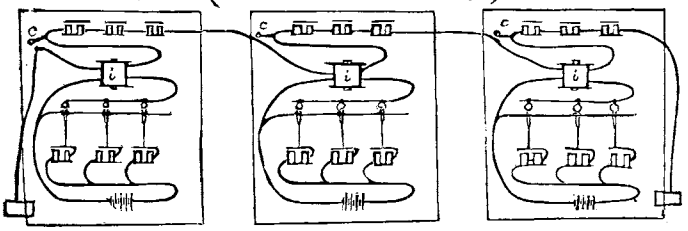
(DECEMBER 1873)

FIG. 5



R. *Resistance.*
I. *Primary Induction Coil.*
i. *Secondary Induction Coil.*

FIG.6 (JANUARY OR FEBRUARY 1874)



i i. *Induction Coils.* *c c.* *Cut-offs.*

Int. 23. When, if ever, did you become familiar with the Scott phonautograph, referred to in Prof. Cross's twenty-eight answer, page 395?

Ans. In the winter of 1873–74.

Int. 24. Did you during that winter construct any phonautographs yourself?

Ans. I did; early in 1874.

Int. 25. In those that you constructed, how was the rod which

carried the style attached to the phonautograph frame, and how was it moved by the membrane?

Ans. One end of the rod was hinged by means of a piece of leather or calico to the edge of the circular frame carrying the membrane. A small piece of cork was fastened to the centre of the membrane and to the rod. Upon uttering a sound in the neighborhood of the membrane it was caused to vibrate, and force the rod to vibrate also. The free end of the rod projected considerably beyond the opposite edge of the membrane, and its vibrations were recorded on smoked glass.

Int. 26. Did you use in your phonautographs a paraboloidal mirror to concentrate the sound waves between the speaker and the membrane; if not, what form did you give to that part of the apparatus which conducted the sound waves from the mouth of the speaker to the membrane?

Ans. I did not use the paraboloidal mirror excepting in experiments with Prof. Cross, at the Institute of Technology, with the instrument he has described in his deposition. In all the phonautographs constructed by myself in the early part of 1874, I used a rubber tube, with a mouthpiece similar to those employed in speaking tubes.

Int. 27. Whether or not during that winter you devised any apparatus for reproducing, by means of phonautograph sound tracings, sounds similar to those which had made the tracings; and if so, describe what it was and how it was to operate.

Ans. I did. A phonautograph tracing was to be drawn on a hollow metallic cylinder, so arranged as to be capable of rotating on a vertical axis. The tracing was then to be cut so as to form a sinuous slit, and air was to be blown through the tracing from a pipe whose nozzle was contracted to a vertical slit. A pencil of air would thus be expelled at the points of intersection, and the rotation of the cylinder would cause this pencil of air to vibrate in the same manner as the air had been moved by the voice of the speaker when the original tracing had been made. I presumed, therefore, that the rotation of the cylinder would cause a sound to be heard similar in quality to that which had produced the tracing.

Int. 28. Did you construct such an apparatus at any time?

Ans. I did not.

Int. 29. Did you, during the year 1874, use any phonautograph of an entirely different character from those which you have described; and if so, what was it?

Ans. I used during the year 1874 a phonautograph which was made from a human ear. The middle ear was exposed by dissection, and a style of hay was attached to the end of the *incus* in place of the *stapes*. Upon uttering sounds into the external ear, I found that the hay attached to the *incus* vibrated sufficiently to enable me to obtain tracings of vocal sounds upon smoked glass.

Int. 30. Did you, during the year 1873 or 1874, devise a receiver in which there was a polarized reed and an electro-magnet? And if so, describe it, and state when you devised it.

Ans. In the winter of 1873-74 I devised a receiver in which the reeds were to be polarized by being attached to the poles of permanent magnets, and they were to be placed opposite the poles of electro-magnets. My method was to attach one reed to each pole of a permanent horseshoe magnet, the free end of each reed projecting over one pole of a horseshoe electro-magnet. Upon this plan, I had one permanent magnet and one electro-magnet for each pair of reeds.

Int. 31. Where did you spend your summer vacation in 1874?

Ans. In Brantford, Ontario, at my father's house.

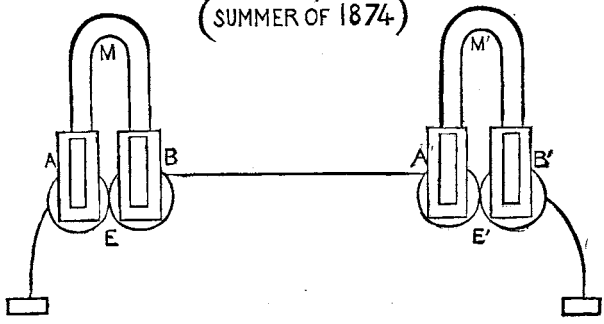
Int. 32. During that summer, did you devise a magneto-electric transmitter to work without a battery? And if so, describe it.

Ans. I did. I saw that the receiver with polarized reeds, which I have just described, could be made to produce electrical currents if the reeds were caused to vibrate mechanically. I therefore devised an arrangement whereby each reed should be enclosed in a bed, so arranged that the reed could be set in vibration by wind in the ordinary manner, as in organ reeds.

Int. 33. Is the arrangement you have just referred to shown in the drawing Fig. 7; and if so, when and for what purpose was the drawing Fig. 7 made?

Ans. Two pairs of reeds, arranged in the manner referred to, are shown in Fig. 7. This drawing was made as part of the preliminary statement above referred to.

FIG. 7
(SUMMER OF 1874)



Int. 34. What characteristics of sound did you then understand that that transmitter would produce from the receiver in the apparatus Fig. 7?

Ans. I understood that the vibration of one of the reeds of the transmitter would not only cause the forcible vibration of the reed of the receiver of similar pitch to itself, but that the amplitude of the vibration of the transmitting reed would control the amplitude of the vibration of the receiving reed, and hence control the loudness of the sound produced from the receiver.

Int. 35. Why and how would the amplitude of the vibration of the transmitting reed control the amplitude of the vibration of the receiving reed?

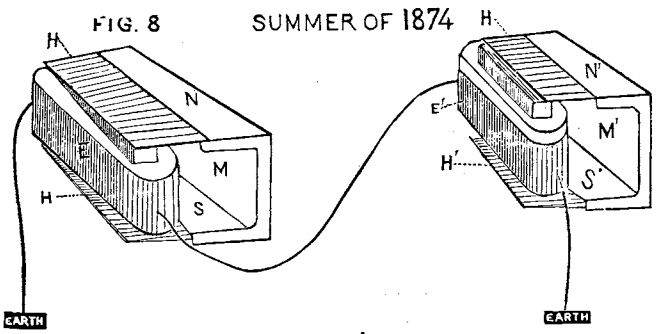
Ans. I understood from the well-known laws of magneto-electricity that a current of electricity would be induced in the coils of the electro-magnet E, Fig. 7, when any one of the transmitting reeds A moved downwards or upwards, and that the strength of the current would be proportional to the velocity of the motion of the reed. I therefore inferred that as the velocity of motion of the reed was increased when the amplitude of its vibration was increased, that the strength of the current produced by the vibration was also increased. In considering the effect upon the corresponding reed A′ of the receiver, it was evident that the violence of its vibration depended upon the strength of the electrical impulses passed through the coils of the electro-magnet E. I therefore reasoned that the more violent the vibration of any transmitting reed, the more violent would be the vibration of the corresponding receiving reed, and the less

violent the vibration of the one, the less violent the vibration of the other.

Int. 36. In the apparatus with polarized reeds which you have been describing, you appear to have had one horseshoe permanent magnet and one horseshoe electro-magnet for each pair of reeds: did you during the same summer of 1874 devise any plan for reducing the number of magnets employed; and if so, what apparatus did you devise for that purpose? Please illustrate your answer by a diagram of it.

Ans. I did.

FIG. 8 SUMMER OF 1874



In the apparatus shown in Fig. 8, which is one of the illustrations to the preliminary statement referred to before, all the reeds were to be attached to the poles of a single horseshoe magnet, and a single elongated straight bar electro-magnet was to be employed. This arrangement was devised during my summer vacation in 1874.

Int. 37. If during that summer you had any ideas concerning the transmission of articulate speech by electricity, state by what kind of an apparatus you thought to do it and how you expected to operate such an apparatus.

Ans. I was at that time acquainted with Helmholtz's theories and experiments, and believed that any of the sounds of speech could be produced by producing the musical tones of which such sounds were known to be composed, with their proper relative intensities. I was also familiar with the well-known experiment of articulating to an undamped piano. I had frequently pronounced vowel sounds in the neighborhood of an undamped piano, and had observed that an

approximation to the vowel uttered was produced by the vibration of the strings of the piano after my voice has ceased. I knew that those strings of the piano which corresponded in pitch to the fundamental and upper partials or overtones of the vowel uttered had been set sympathetically into vibration with amplitudes corresponding to the loudness of the component tones, and that they continued vibrating with the proper relations of force for a perceptible time after the voice had ceased, as evidenced by the reproduction from the piano of the quality of the sound which had been uttered into it. I therefore conceived that a similar apparatus to that shown in Fig. 8 could be operated by the voice of a speaker, and that a sound would be produced by the receiving apparatus shown in Fig. 8, similar in quality to that which had operated the transmitting apparatus. For those reeds or springs of the transmitting telephone H, Fig. 8, which corresponded in pitch to the fundamental and upper partials of any sound uttered in their neighborhood would, like the strings of the piano, be thrown sympathetically into vibration, the amplitude of the vibration of the different reeds corresponding to the loudness of the corresponding partial tones. And the reeds of the receiving telephone H′, corresponding in pitch to the fundamental and upper partials of the sound uttered at the transmitting end, would be thrown into vibration with corresponding relations of force, and a sound would be produced from the receiving instrument H′ of similar composition to that uttered at the transmitting end. Hence the quality of the original sound would be reproduced. I therefore conceived if the reeds or rods of the instruments shown in Fig. 8 were made very numerous, and the differences of pitch between adjoining reeds very slight, that a person might speak in the neighborhood of one of the instruments shown in Fig. 8, and his articulation be reproduced by the other instrument; and that thus vocal utterance could be electrically transmitted.

Int. 38. Did you ever build such an apparatus as Fig. 8; and if not, why not?

Ans. I did not, because of the great number of reeds that would be required, and because I saw that the instrument could be very much simplified.

Int. 39. Did you at any time during that summer conceive of

any plan by which you could materially reduce the number of reeds required in such an apparatus for the transmission of speech? and if so, what was your conception, and what modification, if any, did you expect to make in the arrangements for vibrating the transmitting reeds which you did retain?

[*Objected to as incompetent.*]

Ans. In considering the action of the apparatus shown in Fig. 8, I saw, however numerous might be the reeds which were set in vibration by the voice of a speaker, that as there was only one electro-magnet, an effect would be produced in that magnet which would be a resultant of the vibration of the reeds; and I saw that this resultant effect might be produced in the electro-magnet by a single reed vibrated in such a manner as to represent the resultant of all the vibrations. I conceived that a single reed could be moved by the voice of a speaker in this manner by attaching it to a stretched membrane, and speaking against the membrane.

Int. 40. What experience had you had in vibrating, by means of the human voice, membranes which were so loaded or arranged that some work had to be done by the sound waves besides moving the membrane itself?

Ans. I had made many experiments with phonautographs in which membranes operated by the human voice had not only moved levers of considerable length, at a mechanical disadvantage, but had caused such levers to perform considerable mechanical work in scraping lampblack from glass slides so as to form enlarged tracings of the aerial vibration. I was also familiar with Koenig's Manometric Flame Apparatus, the membrane of which was caused by the voice to vibrate against the pressure of gas admitted into the capsule from the ordinary gas pipes, so as to create a sensible vibration in the flame at the orifice of a capillary tube. At the very time also when this conception occurred to me, I was obtaining tracings of the vibrations of the bones of a human ear, and I reasoned that the disproportion in mass between the tympanic membrane and the bones that were moved by it was much greater than that existing between a membrane like that used in the phonautograph and the reed which I proposed to operate by it.

[*Adjourned to July* 9, 1879, *at* 11 *A. M.*]

BOSTON, July 9, 1879.

Int. 41. What is the size of the membrane of the human ear?

Ans. The specimen used by me was about the size of a silver half-dime.

Int. 42. Did you, at that time, construct the apparatus described in your fortieth answer?

Ans. I did not.

Int. 43. Why not?

Ans. Because I had the idea that the magneto-electric currents produced by the operation of the voice would be too feeble to produce practically useful results.

Int. 44. Did you, during that summer and while in Canada, describe to any one that apparatus and communicate to them your idea as to the transmission of articulate speech by it; and if so, to whom?

Ans. I did. I had many conversations on the subject with my father, and I believe with friends, and I distinctly recollect making drawings of the harp arrangement to illustrate the subject to some person or other at my father's house in Canada, during the summer of 1874; and I remember directing some person's attention to the human ear, with which I was experimenting, as a proof of the correctness of my membrane idea. I also have some recollection of having a discussion regarding the membrane idea, and directing attention to the massive nature of the bones of the ear when compared to the tympanic membrane. I cannot remember these discussions with any detail, but simply remember holding this human ear in my hand and directing attention to it, as an illustration of some theory I was discussing concerning the reproduction of speech by electrical means.

Int. 45. When did you return to Boston after your vacation in that summer of 1874?

Ans. About the end of September or the first of October.

Int. 46. Did you, after your return to Boston, describe to any one in Boston your harp arrangement or your plan for the transmission of articulate speech; and if so, to whom, when and where?

Ans. I did. I described my method for the transmission of

articulate speech to Dr. Clarence J. Blake, at his office in the Hotel Berkeley, a few days after the 21st of October, 1874. I also described this method to Mr. Moses G. Farmer, to Prof. Lovering, and to one of the professors of the Institute of Technology, during the latter part of 1874. I also spoke of it to Mr. Thomas Sanders, in Salem, Mass., and to Mr. Gardiner G. Hubbard, in Cambridge, during October, 1874.

Int. 47. Did you at Dr. Blake's, upon the occasion referred to in your last answer, make any sketches to illustrate your description of your inventions; if so, will you please produce them?

Ans. I did, and I now produce them.

Int. 48. One of these sheets, which is marked "Nor 7," contains figures on both sides: please to state what the figures on the first side represent.

Ans. The larger figure on that side, which for convenience I will call Fig. 1, though the figures are not numbered in this drawing, refers to my apparatus for inducing currents of electricity by the vibration of polarized reeds, arranged like organ reeds, to be blown by wind, and is the same arrangement shown before in Fig. 7, and referred to in my thirty-third answer. The other figure on that side, which I shall call Fig. 2, represents an arrangement for increasing the effect produced by the vibration of the reeds. I had the idea that magneto-electric currents generated by the vibration of a polarized tongue were very feeble, and therefore sought to increase the effect by combining together three permanent horseshoe magnets, as illustrated in this figure. Two of these permanent magnets, the poles of which are marked respectively N, S, N, S, are represented as covered with coils of insulated wire, and between the poles of the opposite magnets are shown in section the ends of the polarized reeds illustrated in plan in Fig. 1 of that side.

Int. 49. What do the drawings on the other side of this sheet represent?

Ans. One of them, which I will call Fig. 3, represents a galvanometer in circuit with a straight bar electro-magnet, over the pole of which a polarized or magnetical tongue is placed. This drawing was made for the purpose of explaining to Dr. Blake the peculiarities of the electrical current produced by the vibration of a mag-

net in front of an electro-magnet. The other illustration, which I shall term Fig. 4, represents the first apparatus I had conceived for the transmission of vocal utterance electrically. This is the same harp instrument shown before in Fig. 8 and referred to in my thirty-sixth answer.

[*Complainants put in the sheet referred to in the last two answers, and it is marked "Complainants' Exhibit* 30,* *Dr. C. J. Blake Drawings, W. P. Preble, Jr., Examiner," and the figures on it are numbered by the examiner as mentioned by the witness.*]

Int. 50. Did you have any conversation on that occasion with Dr. Blake as to whether the human voice could vibrate the membrane with attached armature; and if so, state what, and whether any drawings were made by either of you to illustrate that topic.

Ans. I have a recollection of asking Dr. Blake's opinion on this point, and the impression that I got from his remarks was that it could if the membrane were made concave, like that in the human ear, and if the end of the armature were attached, not to the centre of the membrane, but to a point a little to one side, corresponding to the point of attachment of the malleus and tympanic membrane of the ear. I do not recollect whether any drawing was made of this idea at that time, but I remember our discussing the operation of the harp arrangement, marked "Fig. 4" in Exhibit 30, and comparing the apparatus to the organ of Corti in the human ear. I remember also that Dr. Blake suggested that a damping arrangement would have to be attached to the harp arrangement, and that he made a drawing of the manner in which the rods of Corti were damped in the ear.

Int. 51. You say that this first conversation on this subject with Dr. Blake was soon after the 21st of October, 1874; how do you fix that date?

Ans. By reference to a letter that I received from him, dated Oct. 21, 1874, in which he referred to some letter that he had received from Mr. Elisha Gray concerning experiments in telegraphing "vocal" sounds. [I visited Dr. Blake within a day or

*The exhibits have been renumbered for the pending case of American Bell Telephone Company *v.* People's Telephone Company, and the number of said exhibit in said pending case is No. 18.

two after receiving his letter, and told him that I did not wish to see Elisha Gray's letter, as I was then engaged upon the problem of the transmission of articulate speech by electricity, and did not wish to be indebted to any one for information upon the subject.] I then explained to him my method and made the drawings that have been put in evidence, and made other drawings illustrating my system of harmonic telegraphy, for which I was then applying for protection in the Patent Office. I know that all these drawings were made within a few days after receiving Dr. Blake's letter referred to.

[*Passage in brackets objected to as incompetent.*]

Int. 52. When did Mr. Sanders and Mr. Hubbard become interested in your inventions for multiple telegraphy?

Ans. In the autumn of 1874, shortly after my return from Canada.

Int. 53. Did you have some conversations with Prof. Henry at the Smithsonian Institute in Washington, in February or March, 1875, upon the subject of your electrical inventions?

Ans. I had.

Int. 54. Did you at or about the time of that conversation make any memorandum of it; and if so, in what form and for what purpose did you write down the substance of it?

Ans. I did. I wrote an account of my conversation with Prof. Henry in the form of a letter for the information of my parents in Canada.

Int. 55. Was that letter sent to your parents at the time it was written?

Ans. It was.

Int. 56. Whether or not the statements contained in that letter as to your conversations with Prof. Henry are correct?

Ans. They are.

Int. 57. Will you please produce that letter, and read from it as part of your answer what relates to those conversations, omitting the personal and family matters?

[*Objected to as incompetent.*]

Ans. I produce it, and read from it the following: —

"292 Essex Street, Salem, March 18, 1875.

"*Dear Papa and Mamma:*

"I have just returned from my trip to New York, thoroughly worn out. Found your letters of the 14th inst. awaiting me. I am now beginning to realize the cares and anxieties of being an inventor. In order to complete the apparatus as thoroughly as possible, I have decided to give up all professional work for some weeks. I have put off all pupils and classes until the 12th of April. Flesh and blood could not stand much longer such a strain as I have had upon me. Professional work is all in confusion, and the only way is to cut the Gordian knot and throw up everything till the end is achieved. I long to write full accounts to you, and I have delayed writing in order to give a connected narrative of the whole. You seem to think that my anxieties are over, when in truth they are really only beginning.

"Before entering upon explanations, let me ask you first to hunt over all my old letters that you have preserved for everything bearing on the Telegraph. Forward to me at once as evidence. I must take action at once in regard to foreign patents. Will you or uncle help me in this?

"What I would like is this. I have written to my lawyers in Washington to make application for foreign patents on my own responsibility.

"Should I prove unable to pay for these applications at once, will you help me? While these applications are being got out I shall write to the Herdmans, offering them a share if they will take the pecuniary burden of any interference, etc., that may arise abroad from Mr. Gray. Should they decline, — which I should think unlikely, — I should of course relinquish a foreign contest. . . .

"Whenever I am free to dispose of my interest in the invention I shall do so, and then you may expect to see Visible Speech go ahead. I can then take up the electro-motor, which I think as valuable an idea as this telegraph.

" . . . Now, to resume telegraphy. When I was in Washington I had a letter of introduction to Prof. Henry, who is the Tyndall of America. I had found on inquiry at the Institute of Technology

that some of the points I had discovered in relation to the application of acoustics to telegraphy had been previously discovered by him. I thought I would, therefore, explain all the experiments, and ascertain what was new and what was old. He listened with an unmoved countenance, but with evident interest, to all; but when I related an experiment that at first sight seems unimportant, I was startled at the sudden interest manifested.

"I told him that on passing an intermittent current of electricity through an empty helix of insulated copper wire, a noise could be heard proceeding from the coil, similar to that heard from the telephone. He started up, said, 'Is that so? Will you allow me, Mr. Bell, to repeat your experiments, and publish them to the world through the Smithsonian Institute, of course giving you the credit of the discoveries?'

"I said it would give me extreme pleasure, and added that I had apparatus in Washington, and could show him the experiments myself at any time. He asked if I could do it *then*, if he went with me, and I told him that I had everything in readiness at Mr. Hubbard's house. He said, 'I will go with you now. Have you a carriage here?' I had not, and so he put on his coat and was about to order his carriage, when I offered to save him the trouble of going out on such a raw, damp day, by bringing the apparatus to the Smithsonian Institute. (He was suffering from a cold, and besides is very aged, — I believe about eighty years old.)

"We appointed noon next day for the experiment. I set the instrument working, and he sat at a table for a long time with the empty coil of wire against his ear, listening to the sound. I felt so much encouraged by his interest that I determined to ask his advice about the apparatus I have designed for the transmission of the human voice by telegraph. I explained the idea and said, 'What would you advise me to do: publish it and let others work it out, or attempt to solve the problem myself?' He said he thought it was the germ of a great invention, and advised me to work at it myself instead of publishing. I said that I recognized the fact that there were mechanical difficulties in the way that rendered the plan impracticable at the present time. I added that I felt that I had not the electrical knowl-

edge necessary to overcome the difficulties. His laconic answer was, 'GET IT.'

"I cannot tell you how much these two words have encouraged me. I live too much in an atmosphere of discouragement for scientific pursuits. Good ——— is unfortunately one of the *cui bono* people, and is too much in the habit of looking at the dark side of things. Such a chimerical idea as telegraphing *vocal sounds* would indeed to *most minds* seem scarcely feasible enough to spend time in working over. I believe, however, that it is feasible, and that I have got the cue to the solution of the problem.

"Prof. Henry seemed to be much interested in what I told him, and cross-questioned me about my past life, and specially wanted to know where I had studied physics. . . .

"Having left Prof. Henry and Washington, I proceeded to New York, where I saw Mr. Orton, and Mr. Prescott the electrician. Arrangements are made for me to bring my instruments to New York and experiment on a real line wire.

"I left Boston last Sunday and called at the office of the Western Union on Monday. Mr. Orton and Mr. Prescott both devoted a large portion of their time in discussing with me the whole plan from its theoretical point of view. Mr. Smith, the manager of the experimental room, was absent from town, but was telegraphed for. He replied that he could not come till next morning. Tuesday forenoon we had batteries connected, and I tuned up my instruments. They went like clockwork. I have come to the conclusion that by a happy chance they are much more perfect than I thought at first. The signals are as clear, sharp and rapid as with the ordinary Morse sounder. I connected two transmitters and two receivers on only one line, and two messages were sent simultaneously.

"We had 100 cells of a battery, and all went well on our artificial circuit. Mr. Prescott then said he would like to see them tried on a real line wire. He telegraphed to Philadelphia to have two wires crossed there so as to give us (practically) a continuous wire from New York to Philadelphia and back. The electro-magnets I employed were not intended for trial on a long line. They were wound with coarse wire and the 'resistance' was only '3 ohms.' Ordinary electro-magnets for actual service on a line have a resistance of about

200 to 600 ohms. None of us, therefore, expected the instruments to work without stronger magnets. But they *did work*. The signals, though feeble, came sharply and concisely through the 200 miles of line wire!!! I suggested trying stronger magnets, so Mr. Prescott ordered the instruments to be taken to the workshop and stronger magnets placed on them. They were to be ready in the afternoon, so I went out to dinner and returned in a couple of hours.

"Rest will form subject for next letter.

"With fond love,

"Your ever affectionate son,

"ALECK.

"PROF. A. M. BELL,
Brantford, Ontario."

[*The original letter is marked for identification by the examiner, with his initials and the date, July 9, 1879, on each of the five leaves.*]

Int. 58. What do you mean by the phrase "visible speech" in that letter?

Ans. "Visible speech" is the name of my father's system of physiological symbols, which I was using as a means of teaching articulation to the deaf, and has no reference to electricity or telegraphy.

Int. 59. The letter refers to an interference with Mr. Gray: were you then in interference with him at the Patent Office; and if so, upon what subject?

Ans. I was then in interference with Mr. Elisha Gray upon the subject of harmonic multiple telegraphy.

Int. 60. The letter refers to an exhibition which you made in the presence of Mr. Orton and Mr. Prescott, of the Western Union Telegraph Company: what kind of apparatus or system was the subject of that exhibition?

Ans. The experiment was made to illustrate my method of multiple transmission of telegraphic messages.

Int. 61. Whether or not you occupied yourself in studying and experimenting upon your electrical inventions during the spring and summer of 1875?

Ans. I did.

Int. 62. Did you, at the time of its date, May 4, 1875, write and send to Mr. Gardiner G. Hubbard a letter which is now shown you, and which was referred to and identified in the deposition of Mr. Hubbard on pages 431* and 440 of the record?

Ans. I did.

Int. 63. Please to read from it, as part of your answer, that part of it which begins at the top of the third page, and from thence to the end.

[*Objected to as incompetent.*]

Ans. I do so. It is as follows: —

"SALEM, MASS., May 4, 1875.

"*Dear Mr. Hubbard:*

" . . . Letter received from Mr. Pope, with directions for preparing paper. Letter received from Prof. Henry of the Smithsonian Institute, in answer to one I wrote him some time ago telling him of recent experiments undertaken in order to determine the cause of the sound heard from the empty helix of wire.

"The deduction I had made from the experiments was that an intermittent current of electricity creates a molecular vibration in the conductor through which it is passed. Prof. Henry writes that he believes that my experiments are new, and that my explanation of the cause of the sound is in his opinion correct.

"An experiment which I have long desired to make is at last within my reach. My friend, Don Manuel Fenollosa, whose music rooms are next door to this house, is to allow me to experiment with his pianos. I shall carry a wire from my study into his room tomorrow, and try the effect of passing an intermittent current through the strings of a piano. Unless I am greatly mistaken, the string, whose rate of movement coincides with the molecular vibration induced in the wires by one of my transmitters, will resound loudly.

"Another experiment has occurred to me which, if successful, will pave the way for still greater results than any yet obtained. The strings of a musical instrument in vibrating undergo great

* These references are to the pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

changes of *molecular tension*. In fact, the vibration represents the struggle between the tension of the string and the moving force impressed upon it. I have read somewhere that the resistance offered by a wire to the passage of an electrical current is affected by the *tension of the wire*. If this is so, a *continuous current of electricity* passed through a vibrating wire should meet with a varying resistance, and hence a pulsatory action should be induced in the current. If this turns out to be the case, the oscillations of the current should correspond in *amplitude*, as well as in the rate of movement, to the vibrations of the string. One consequence would be that the *timbre* of a sound could be transmitted. The plan for transmitting *timbre* that I explained to you before — viz., causing permanent magnets to *vibrate* in front of electro-magnets — is chiefly defective on account of the feebleness of the induced currents. If the other plan is successful, the strength of the current can be increased *ad libitum*, without destroying the *relative intensities of the vibrations*.

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Cambridge, Mass."

Int. 64. In the letter of May 4, you speak of certain experiments which you propose to try, one of which you supposed would cause pulsations or oscillations in the electrical current by means of varying the resistance of its conductors, and you say that one consequence would be that the *timbre* of a sound could be transmitted: how did you expect that this variation of resistance would reproduce the *timbre* of a sound?

Ans. The experiment referred to was tried a day or two after the 4th of May. I expected that an instrument constructed with a large number of wires, arranged as in a piano, could replace the transmitting harp arrangement shown in Fig. 8, and referred to in my thirty-sixth answer. I had the idea that magneto-electric currents, generated in the way shown in Fig. 8, would be too feeble for practical purposes, and conceived that a more powerful and similar effect could be produced by keeping the electro-motive force of my circuit constant, and interposing a varying resistance. I thought

that upon speaking to a harp arrangement of stretched wires, through which a continuous current of electricity was passed, that the strings corresponding in pitch to the musical constituents of the sound uttered would be thrown sympathetically into vibration, and that the amplitude of the vibration of each string would correspond to the loudness of the corresponding partial tone of the sound uttered, and that the battery current would meet with a varying resistance on account of the varying tension of the wires through which the current was passed, and that the variations in the strength of the current thus produced would cause the vibration of those reeds of the receiving-harp arrangement, shown in Fig. 8, which corresponded to the stretched strings which were vibrated by the voice; and that the amplitude of the vibration of each reed would be dependent upon the amplitude of the vibration of the corresponding stretched string, and that thus the quality of the sound produced from the receiving-reed arrangement would be similar to the quality or *timbre* of the sound uttered in the neighborhood of the stretched-string harp arrangement. I also thought that it might be possible to dispense altogether with the reed arrangement shown in Fig. 8, and that a stretched-string harp arrangement might be used as a receiver; for I believed at the time this letter was written that the passage of a varying current through a conducting wire occasioned a molecular vibration in that conductor, and I therefore thought that the varying current from a stretched-string harp transmitter would, when passed through the strings of another similar apparatus, occasion a molecular vibration in those strings, and that the strings of the receiver which were in unison with the vibrating strings of the transmitter would be thrown into sympathetic vibration by the molecular changes, and that the amplitude of the vibration of each of those strings would be dependent upon the amplitude of the vibration of the corresponding strings of the transmitter, and that thus a sound would be produced from the receiver of similar quality or *timbre* to that which occasioned the vibration of the wires of the transmitter. I further thought that a single wire could be used in place of the single reed of my membrane arrangement. My idea was to stretch a wire parallel to the surface of my stretched membrane, and to attach the centre of the

membrane to the wire. I presumed that upon speaking to the membrane, the wire would be forced into vibration, and that the changes of tension would produce an effect upon the continuous current passed through the wire similar to the resultant effect produced by the stretched-string harp transmitter, and that the quality or *timbre* of the sound uttered against the membrane could be produced from a reed membrane receiver, or from a stretched-wire receiver similar to the transmitter employed. I was quite familiar with the fact that the elements of speech differ from one another in *timbre;* and when I speak in this letter of my "plan for transmitting *timbre*," I mean my method of transmitting articulate speech.

Int. 65. What advantage is it in a system of multiple harmonic telegraphy to transmit quality as well as pitch of sound?

Ans. No advantage whatever.

Int. 66. This letter of May 4, 1875, speaks of having received a letter from Mr. Pope about some prepared paper. Was that Mr. Frank L. Pope, the electrician of the Western Union Telegraph Company, and what did you want prepared paper for at that time?

Ans. I believe that was Mr. Frank L. Pope, electrician of the Western Union Telegraph Company. I wanted to obtain chemically prepared paper for use in my system of autographic telegraphy, for which I obtained Letters Patent of the United States in April 6, 1875.

Int. 67. Please look at the letter now shown you, dated May 24, 1875. State whether you wrote it and sent it to your father at the time of its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and I now read it.

"SALEM, MASS., May 24, 1875.

"*Dear Papa and Mamma:*

"I am so immersed in telegraphy and science that I find it impossible to write freely about anything else; but I feel that at the present time you can scarcely be inclined to listen to anything I have to say on such subjects.

"Since I gave up professional work and devoted myself exclusively to telegraphy, I have been steadily gaining health and strength,

and am now in a fit state to encounter Mr. Gray or any one else. The patents that have been granted to me without opposition are, —

"1st. The principle of converting a vibratory motion into a permanent make or break of a local circuit.

"2d. The special form of 'vibratory circuit breaker' put in illustration.

"3d. The autograph telegraph.

"The autograph arrangement is rapidly approaching completion. Already I can copy handwriting *quite legibly*, though not yet neatly. The rate of transmission by means of my instrument will be exactly ten times more rapid than 'Bakewell's Autograph Telegraph,' in which the rate is 300 letters per minute. When 3,000 letters per minute can be sent, my telegraph will be the most rapid as well as the cheapest.

"Every moment of my time is devoted to study of electricity and to experiments. The subject broadens. I think that the transmission of the human voice is much more nearly at hand than I had supposed. However, this is kept in the background just now, as every effort is to be made to complete the autograph arrangement, so as to have it used on some line.

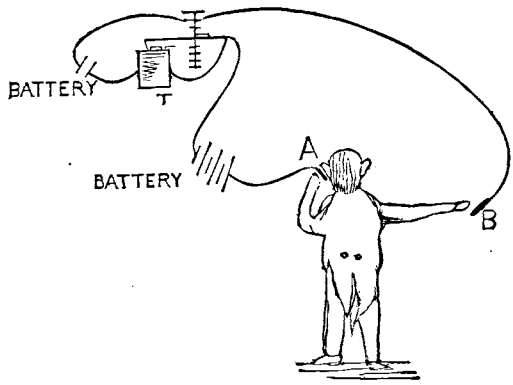
"The two patents for the transmission of musical notes are not decided yet. I can't understand why the interference should not have been declared before this. Here are some late discoveries: 1. The current from one of my instruments passed through an iron wire causes a musical note to issue from the wire. 2. The same effect is produced by passing the current through a piece of carbon. 3. Ditto when it is forced through the plumbago of an ordinary lead pencil! ! ! No similar effects noted yet with copper, brass, or mercury.

"A still more curious phenomenon is the following: —

"Two thin strips of brass (A and B) are connected with the wires coming from my transmitting instrument, T, and from the battery. On holding A to my ear I hear nothing, but the moment that I touch B with my finger a musical note is heard to proceed from A!!

"Truly, the more I study electricity and magnetism the more I feel the truth of Hamlet's saying, 'There are more things,' etc.

"I fear that this telegraphic business may force me to remain the



greater portion of the summer here, but I cannot tell yet, so many details have to be worked out. My inexperience in such matters is a great drawback. However, Morse conquered his electrical difficulties although he was only a painter, and I don't intend to give in either till all is completed.

"With dear love,

"Your affectionate son,

"ALECK."

[*The original is marked by the examiner with his initials and the date July* 9, 1879, *for identification.*]

Int. 68. Did you try at Mr. Fenollosa's rooms the experiment proposed in your letter to Mr. Hubbard of May 4; and if so, with what results?

Ans. I tried the experiments proposed within a day or two of the letter to Mr. Hubbard. I first passed an intermittent current from a current interrupter through that string of a piano which seemed to be in unison with the interrupter, and observed whether the string was thrown into sympathetic vibration. It was not. I then listened very closely to the piano, for the purpose of ascertaining whether any noise proceeded from the wire. I heard the pitch of the interrupter, but whether the sound was transmitted through the air from the adjoining house, or proceeded from the string in question, I was not able to satisfy myself. A continuous current was then passed through one of the wires of the piano, and through

the coils of an electro-magnet in the adjoining house. Over the pole of that electro-magnet projected the free end of a steel reed which was tuned to the pitch of the string. The string of the piano was then set in vibration by depressing the proper key of the piano, and the effect upon the reed noted. The reed was not thrown sympathetically into vibration. Upon placing my ear against the steel reed, I could hear very faintly the tone of the string, but I was unable to satisfy myself whether the sound I heard was electrically produced, or had been transmitted mechanically to my ear. The piano was in an adjoining house, and the sound was faintly audible in the room where I tried the experiment.

Int. 69. Have you since that day ever tried to work a telephonic receiver by vibrating a stretched wire through which a continuous current of electricity was passing on to the main line in the manner proposed in your letter of May 4? And if so, describe such experiment with its results, and state when you made it.

Ans. I have made the experiment, but I cannot at the present moment fix the exact date. My impression is it was during the month of February of the present year; at any rate, it was during this present year. I passed a continuous current through a fine stretched iron or steel wire which was placed in one of the rooms in Mr. Williams's building, 109 Court Street. The circuit was continued into another room, and the current passed through the coils of an ordinary hand telephone. While I listened at the telephone, Mr. Edward Wilson kept plucking the stretched wire. I heard distinctly from the telephone a musical tone each time the wire was plucked, and recognized, moreover, the peculiar quality or *timbre* of the wire. I satisfied myself, by short-circuiting the telephone and by breaking the circuit, that the sound I heard had been electrically produced.

Int. 70. Please look at the letter now shown you, dated June 2, 1875, which is one of those identified in the deposition of Mr. Hubbard, pages 431* and 440. State whether you wrote it and sent it to Mr. Hubbard at the time of its date; and if so, read it as a part of your answer.

[*Objected to as incompetent.*]

*These references are to pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

Ans. I did, and I now read it: —

"SALEM, MASS., June 2, 1875.

"*Dear Mr. Hubbard:*

"I have accidentally made a discovery of the very greatest importance in regard to the transmitting instruments. Indeed, so important does it seem to me that I have written to the organ factory to delay the completion of the reed arrangement until I have had the opportunity of consulting you.

"I have succeeded to-day in transmitting signals *without any battery whatever!*

"The musical note produced at the receiving end was sensibly the equivalent of that at the transmitting end in *loudness* as well as pitch.

"I shall call upon you to-morrow (Wednesday) evening, as there are several matters I wish to talk over with you.

"In haste,

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Brattle Street, Cambridge."

Int. 71. Did you, on the 2d of June, 1875, perform the experiment stated in that letter? And if so, state where, and describe the experiment fully.

Ans. I did. The experiment was made in the upper part of Mr. Williams's building, No. 109 Court Street, in two small rooms that Mr. Williams had allowed me to use for experimental purposes. I was carrying on a series of experiments for the purpose of perfecting for practical use my system of autograph telegraphy, which was a development of my harmonic telegraph. I had arranged three experimental stations upon a single line wire, which for convenience of reference I shall designate A, B and C. At station A were arranged a number of current interrupters, whose rates of vibration were different, and a number of telegraph keys corresponding to the interrupters. By the depression of any key, the intermittent current from the corresponding interrupter was directed on to the line wire to the stations B and C. At each station, B and C,

were placed harmonic receivers corresponding in pitch to the interrupters at station A. Each receiver consisted of a horseshoe electro-magnet, to one pole of which was clamped one end of a steel reed, the free end of which projected over the other pole of the magnet. A coil of insulated wire surrounded that leg of the magnet which was presented to the free end of the reed. Stations A and B were in one room, and station C in the adjoining room. I took charge of stations A and B during the experiment referred to, and Mr. Thomas A. Watson took charge of station C. We were making an experiment to ascertain whether the receiving reeds were properly tuned to their corresponding interrupters, and whether the operation of one interrupter interfered with that of the others when the keys were simultaneously depressed. I pressed down one key at station A and observed whether the proper reed at station B was thrown into forcible vibration, and Mr. Watson observed whether the proper reed of station C was similarly affected. Upon trying all the keys in succession it was found that one of the receivers at station C failed to respond. As we very often found that the magnets of the receivers were so closely adjusted to the reeds that the reeds would stick to the pole when a powerful current was passed, I thought that this might be the cause of the failure in the present case. I therefore called out to Mr. Watson to pluck the reed with his finger. He did so, and I imagined that the corresponding reed of station B was thrown momentarily into vibration. I was struck by this, as I had not depressed the key of the corresponding interrupter, and could not see where the current came from to operate that receiver. I therefore requested Mr. Watson to pluck the reed at station C a number of times, and found that I had not been mistaken in my observation. To test the matter still further I removed station A from the circuit altogether, and connected the receivers of B and C upon a closed circuit without any battery. Upon plucking with the finger any reed of station C, it was found that the corresponding reed of station B was thrown into sympathetical vibration, and *vice versa*. I then requested Mr. Watson to pluck one of the reeds of station C a number of times, while I placed my ear against all the reeds of station B in succession; I could hear from each reed the peculiar

tone of the reed plucked at station C, and recognized that the *timbre* of the plucked reed had been reproduced. We then placed a single receiver at station C in circuit with a single receiver at station B, and repeated the experiments. The results were much more marked. Upon plucking the reed at station C, its sound was reproduced by that at station B; and upon plucking the reed at station B, its sound was reproduced by that at station C. When the two reeds employed were in unison with one another, the plucking of one resulted in the visible vibration of the other, the amplitude of vibration often being considerable. No battery was used. Upon placing a battery in the circuit, the same effects were observed and the results were more marked.

[*Adjourned to July* 10, 1879, *at* 10 *A. M.*]

BOSTON, July 10, 1879.

Int. 72. When you used the apparatus without a battery, as stated in your last answer, what generated the electrical impulses which went over the line wire and vibrated the receiver?

Ans. I presumed that the electro-magnets and reeds were weak permanent magnets, on account of the residual magnetism caused by the passage of heavy battery currents through the coils, and that the vibration of the reed, when plucked by the finger, had occasioned a magneto-electric current upon the circuit similar to that which I had intended to produce by the vibration of the reeds of the harp arrangement devised in Canada.

Int. 73. Did you at that time, in June, 1875, attempt to generate these currents by vibrating a regular permanent steel magnet in front of a soft iron core, wound with coils of wire, when there was no battery on the circuit? And if you have the permanent magnet which you used, please produce it.

Ans. I did, upon the 2d of June, 1875; and I produce the permanent magnet then employed. The framework now attached to the magnet was not used at that time. The instrument was arranged in its present condition for the Centennial Exhibition at Philadelphia in 1876.

Int. 74. Did you, subsequently to this experiment of June 2, 1875, construct any apparatus for the purpose of vibrating a reed by the human voice in front of the poles of an electro-magnet? And

if so, describe the first apparatus of that kind which you constructed, and state what induced you to construct it. If you have that instrument or any part of it, please produce it.

Ans. I did. The experiments made on the 2d of June, 1875, referred to above, solved the difficulty that had been in my mind since the summer of 1874, in regard to the practical operation of the various instruments I had devised for the reproduction of vocal utterance by electrical means. I had had the idea that magneto-electric currents generated by the vibration of permanent magnets or reeds would be too feeble to produce any useful practical results. But the experiments above described assured me that I had been mistaken in this idea, and I immediately, upon this same 2d of June, 1875, gave instructions to Mr. Watson to have my membrane arrangement constructed. One of the reeds employed in our experiments upon that day was to have been hinged to the pole of its electro-magnet, instead of being clamped, and the free end of the reed was to have been attached to the centre of a stretched membrane; a duplicate was to have been constructed as a receiver. One of the instruments was constructed within the next few days; but instead of hinging the steel reed, as I had intended, Mr. Watson used a thick armature which was pivoted to the pole of its electro-magnet. Portions of this instrument are still in existence, and I now produce them. I produce a duplicate of the original instrument. This duplicate has recently been constructed. The armature now upon the duplicate instrument is thinner than the original armature, and I now produce a duplicate of the original armature. The parts of the original instrument which I have are as follows: The wooden ring and wooden tube upon which the membrane was stretched, the original armature and electro-magnet and the cross bar to which the magnet was attached. The uncovered leg of the magnet, to which the armature was attached, was removed a day or two after the original instrument was constructed and another substituted for it. The pole of the uncovered leg was filed to an edge, and a steel reed was hinged to it by means of a strip of leather. This substitute is the one now attached to the original magnet produced.

Int. 75. Please state whether the uncovered leg of the electro-magnet, now on the duplicate, is constructed like either of those described in your last answer; and if so, which.

Ans. It is constructed like the original first made.

Int. 76. Please look at the wooden ring and stretched membrane now shown you, and state what difference, if any, there is between that and the ring and membrane now on the duplicate.

Ans. The rings are precisely similar. The membrane shown is made of sheepskin, and is somewhat thicker than the goldbeater's skin in the duplicate; and it is fastened to the ring by a wire tied round the groove of the ring instead of a string.

[*The duplicate and the extra armature, and the extra ring and membrane referred to by the witness in the last three answers, are put in evidence by the complainants, marked respectively* "*Exhibit* 19,* *Bell Telephone of* 1875, *Duplicate*," "*Exhibit* 20, *Bell Telephone of* 1875, *Sheepskin Diaphragm*," *and* "*Exhibit* 21, *Bell Telephone of* 1875, *Heavy Armature, W. P. Preble, Jr., Examiner.*"]

Int. 77. How soon after the 2d of June was the instrument described in your seventy-fourth answer made, when and where was it tried, and with what results?

Ans. I was anxious to try the instrument at once, and could not wait to have the duplicate receiver made; so, immediately upon its construction, I attempted to use it with one of my harmonic receivers. Upon passing a battery current through the coils of the instruments however, the attraction of the magnet was so great as to tear the heavy armature away from the membrane. Mr. Watson and I made a number of experiments with other membranes in place of the original, and I remember that we were enabled to use the instruments for a practical experiment at least upon one occasion. The stretched-membrane arrangement was placed in one of the rooms in the top part of Mr. Williams's building, and an ordinary harmonic reed receiver in the lower workshop. I do not now remember whether any battery was used, but it is my impression that in consequence of the accidents to our membranes we made the experiment without a battery. I distinctly remember shouting into the stretched membrane instrument, while Mr. Watson was down stairs listening with his ear pressed against the reed of the harmonic receiver. I do not

* These are the new numbers adopted for the suit *American Bell Telephone Company* v. *People's Telephone Company*. The original numbers were 31, 32, 33.

remember definitely what the results were, excepting that I was encouraged by them to reconstruct the instrument with a lighter armature. I cannot fix the exact date of the experiment, and only know that it was during the month of June, 1875.

Int. 78. What difficulty did you find from the heavy armature which led you to try a lighter one?

Ans. The armature was so strongly attracted by the electro-magnet as to be frequently torn from the membrane, and I presumed that a lighter armature would not only be less attracted, but would also be more easily moved by the membrane and would not be so liable to become detatched.

Int. 79. Please look at the letter dated June 28, 1875, which is now shown you and which was one of those which were identified in Mr. Hubbard's deposition, pages 431 and 440.* State whether you wrote and sent it to him at or about its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and I now read it.

"SALEM, MASS., June 28, 1875.

"*Dear Mr. Hubbard:*

"Mr. Hutchings (the organ builder) kindly devoted the whole of this afternoon to the construction of a steel reed for me.

"One of the latest receiving instruments was enclosed in a wooden box, and had its armature so arranged as to be set in vibration by a current of air passed through the box. The instrument was completed this evening in time for trial. Mr. Hutchings operated the reed in a little room upstairs (Williams's office), while I observed the effect upon a receiving instrument placed in the basement of the building. The sound was so perceptible that I found it unnecessary to place my ear against the instrument. The vibration of the armature could also be seen and felt.

"No battery nor permanent magnet was used.

"I feel sure that a study of Ladd's or Wilde's magneto-electric machine will reveal a means of increasing the intensity of the in-

* These references are to pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

duced currents. I am told that Prof. Lovering has one of Wilde's instruments in his possession, so I shall call upon him to-morrow for information concerning it.

"Prof. Pickering has left town for the summer. I propose having the steel reed still further altered to-morrow, so shall probably be at the organ factory (Hutchings, Plaisted & Co., Cambridge Street, near Charles Street) most of the afternoon instead of at Williams's. Shall call in the evening and report progress.

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD,
Brattle Street, Cambridge.

"P. S. The experiment referred to above was repeated when a single cell of a battery had been placed in the circuit. The amplitude of vibration of the armature downstairs was quite large enough to work the vibratory circuit-breaker. We were unable to try higher battery power on account of the sticking of the generating armature. When the instrument is altered to-morrow, I shall try higher battery power and test the resistance through which the current will pass.

"A. G. B."

Int. 80. Did you, before writing that letter, perform the experiments therein described with the results therein stated?

Ans. I did.

Int. 81. The letter speaks of the production of sound when no battery and no permanent magnet was used: what generated the electric current or impulse in that case?

Ans. The vibration of the armature acting upon the residual magnetism of the electro-magnet and armature. The instrument had been previously used in connection with a battery, and the core of the electro-magnet and the armature retained a slight magnetic condition.

Int. 82. During the month of June, 1875, and before the construction and use of the second membrane telephone, did you try any experiments in which electric currents were generated or effected by the vibration of a reed in front of an electro-magnet; and if so, to what extent and for what purpose?

Ans. I was constantly occupied during the month of June, 1875, in experimenting to ascertain the best arrangement of coil, magnet and armature for generating electric currents in the manner indicated.

Int. 83. Please look at the letter now shown you, dated July 1, 1875, which is one of those identified in Mr. Hubbard's deposition, pages 431* and 440, and state whether you wrote it and sent it to Mr. Hubbard at or about its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did; and I now read it:—

"SALEM, MASS., July 1, 1875.

"*Dear Mr. Hubbard:*

"The experiment to which I alluded when I saw you last promises to be a grand success. On singing this afternoon in front of a stretched membrane attached to the armature of an electro-magnet, the varying pitch of the voice was plainly perceptible at the other end of the line, no battery nor permanent magnet being employed. When the vibrations are received upon another stretched membrane in place of a steel spring, it is possible, nay, it is probable, that the 'timbre' of the sound will be perceived. I hope to try the experiment to-morrow afternoon.

"This morning, in dipping into a French work upon telegraphy, I came across a full description of the 'Typo-Télégraphe de M Bonelli.' I find it to be *identical* with our autograph arrangement, save that five telegraph wires are required instead of one for transmission.

"Bonelli gets over the difficulty of *prepared ink* by setting up his message in type. The brush of wires is passed over the raised surfaces of the letters, securing perfect contact at the proper places.

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* These references are to pages of the printed record of the suit *Bell Telephone Company* v. *Dowd.*

"I have an engagement to meet Prof. Lovering to-morrow morning at ten o'clock, and shall call upon you before returning to town.

"With kind regards,

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Brattle Street, Cambridge."

Int. 84. Did you, at or about the date of that letter, cause to be constructed a second membrane telephone; and if so, when, and have you any of the parts of it?

Ans. The same day I wrote this letter, namely, July 1, 1875, I gave instructions to Mr. Watson to have constructed a second membrane telephone. The instrument was completed a day or two afterwards, and some parts of it are still in existence, and I produce them.

Int. 85. Have you a duplicate recently constructed in accordance with said original second membrane telephone? If so, please produce it.

Ans. I have, and I now produce it.

Int. 86. Please look at the wooden ring and membrane now shown you, and state wherein it resembles or differs from the wooden ring and membrane now on said duplicate second instrument.

Ans. It differs from it in the membrane being made of sheepskin instead of goldbeater's skin.

Int. 87. Did your second instrument have the armature hinged to the uncovered leg of the magnet, like said duplicate, or did it have it attached with a leather hinge, as described in your seventy-fourth answer?

Ans. I am not sure, but my impression is that it was hinged with a leather hinge.

[*The duplicate instrument and the extra ring and membrane are put in evidence by complainants, marked "Complainants' Exhibit* 22,* *Second Bell Telephone of* 1875, *Duplicate," and "Exhibit* 23, *Second Bell Telephone of* 1875, *Sheepskin Membrane."*]

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* The original numbers were 34, 35.

Int. 88. What were the membranes made of in your original telephones of June and July, 1875?

Ans. Of goldbeater's skin used in single and sometimes double thicknesses.

Int. 89. What is the diameter of the inside ring over which the membrane was strained in those two original telephones?

Ans. The first one is about two and three quarters inches in the clear, the second about two and five eighths in the clear.

Int. 90. Did you try these two telephones in July, 1875, — one as transmitter, and one as receiver; and if so, where and with what results?

Ans. I did. One of the instruments was placed in the room at the top of Mr. Williams's building, and the other in the workshop below. I spoke to one of the instruments while Mr. Watson listened at the other, and *vice versa*. I do not remember with any great distinctness the details of the experiment, but I have a distinct recollection that during the course of the experiments Mr. Watson rushed up to the room at the top of the building where I was and informed me that he could distinctly hear me speaking, although he could not quite make out what I said. He had satisfied himself that the sounds he heard had been produced by the membrane telephone to which he had been listening.

[*Objected to.*]

Int. 91. Was Mr. Williams's workshop a quiet place or a noisy place at the time that you tried these experiments?

Ans. A very noisy place.

Int. 92. What conclusion did you at that time draw from these experiments with regard to the practicability of transmitting articulate speech by instruments having the same mode of operation and principle as these stretched membrane instruments that you had so experimented with?

[*Objected to.*]

Ans. I considered that the experiments demonstrated the practicability of transmitting articulate speech by instruments having the same mode of operation and principle as these stretched membrane instruments, and that it was only necessary to make further experiments to ascertain the best arrangement of the parts.

Int. 93. Please look at the letter now shown you, which is addressed to Mr. Hubbard, dated July 7, 1875, and is one of those identified upon pages 431* and 440 of the record. State whether you wrote and sent it to him at or about the time of its date; and if so, read it as part of your answer, omitting any parts that relate to family matters.

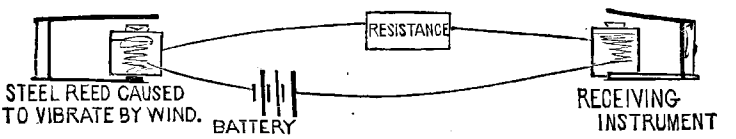
[*Objected to as incompetent.*]

Ans. I did, and I now read it: —

"SALEM, MASS., Wednesday, July 7, 1875.

"*Dear Mr. Hubbard:*

"I forgot to mention this evening the gratifying results obtained with the steel reed.



"When three cells of a battery were introduced into the circuit (as shown in the figure), the armature of the receiving instrument vibrated with considerable amplitude. When a damper was adjusted for it to strike against, the sound could be heard at a distance from the instrument.

"The helix at transmitting end had a resistance of about two ohms, and yet the vibration of the armature of the receiving instrument could be detected when a resistance of 100 ohms was introduced into the circuit. This seems to me to indicate more power than can possibly be due to magneto-electric currents, generated by the vibration of the reed.

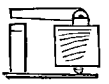
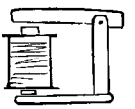
"May not a pulsatory action be induced in *the voltaic current itself* by the motion of the reed? I can imagine the current alternately weakened and strengthened according to the distance of the armature from the pole underneath.

"In this case the pulsations would certainly be available for our

* These references are to the pages of the printed record in the suit *Bell Telephone Company* v. *Dowd*.

purpose, by merely increasing the battery power sufficiently to overcome the resistance of the line. Magneto-electric currents are, however, evidently present, for a sound is perceptible at the receiving end when the battery is omitted altogether.

"I think also that the effects are in some way dependent upon the peculiar form of electro-magnet employed. I hope to get some light on the subject from Moncel. He devotes several pages to the discussion of peculiarities observed in the one-legged or 'lame' magnet (*boiteux*), shown in his work, as follows: —

( AND )

"He says, 'Ce genre d'électro-aimant, que j'ai beaucoup étudié et le premier employé dans les applications électriques, a beaucoup d'avantages dont nous parlerons plus tard, et *une force beaucoup plus considérable qu'on ne semblerait le croire à première vue.*' . . .

"With kind regards, yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Brattle Street, Cambridge."

Int. 94. Please look at the letter now shown you, addressed to Mr. Hubbard, and dated Aug. 14, 1875, which is one of those identified on pages 431* and 440 of the record. State whether you wrote and sent it to him at or about the time of its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and I now read it

"SALEM, MASS., Aug. 14, 1875.

"*Dear Mr. Hubbard:*

"On glancing back over the line of electrical experiments, I recognize that the discovery of the magneto-electric current generated by the vibration of the armature of an electro-magnet in front of one of

* These references are to the pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

the poles is the most important point yet reached. I believe that it is the key to still greater things.

"The effects produced, though slight in themselves, appear to me so great in proportion to their cause that I feel sure that the future will discover means of utilizing currents obtained in this way on actual telegraph lines.

"So important does it seem to me to protect the idea that I think some steps should be taken immediately towards obtaining a caveat or patent for the use of a magneto-electric current, whether obtained in the way stated above (by the vibration of permanent magnets in front of electro-magnets), or in any other way. I should wish to protect it specially as a means of transmitting simultaneously musical notes differing in *intensity* as well as in pitch.

"I can see clearly that the magneto-electric current will not only permit of the actual copying of *spoken utterance*, but of the simultaneous transmission of *any* number of musical notes (hence messages) without confusion.

"The more I think of it, the more I see that the method of making and breaking contact so many times per second is only the *first stage* in the development of the idea.

"When we can create a pulsatory action of the current which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results. *Any number of sounds* can travel through the same air without confusion, and any number should pass along the same wire.

"It should even be possible for a number of spoken messages to traverse the same circuit simultaneously; for an attentive ear can distinguish one voice from another, although a number are speaking together.

"Don't you think it would be well to take out a *caveat* for the use of the magneto-electric current?

"In its present undeveloped state, it might be unwise to let Gray know anything about it, unless indeed we could secure the *principle* of it in a patent.

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Cambridge."

Int. 95. In that letter you say, "The more I think of it, the more I see that the method of making and breaking contact so many times per second is only the first stage in the development of the idea": to which of your inventions, or to what class of apparatus, does that clause refer?

Ans. It refers to my method of harmonic multiple telegraphy, in which Mr. Hubbard was pecuniarily interested.

Int. 96. Have you within the past fortnight attempted to transmit articulate speech with the duplicate telephones Exhibits 19, 20, 21, 22 and 23? And if so, state when and where and with what results. If you used more than one membrane or more than one armature with each instrument, state what you used each time.

Ans. Last Saturday, July 5, I made an experiment with the duplicate telephones Exhibits 19 and 22, at No. 40 State Street, in the two rooms and with the arrangement of circuits described in Mr. Cross's third answer, page 383. The rings with the sheepskin membranes were used in the instruments and heavy armatures similar to that shown in Exhibit 21. I believe the exhibit is one of the armatures used. Mr. Watson and I were enabled to carry on a conversation by means of the membrane telephones. On Monday, the 7th of July, the same instruments were taken to Mr. Williams's workshop and placed under as nearly as possible the same conditions as the original membrane telephones used in July, 1875. Mr. Watson and I attempted to carry on a conversation by means of the instruments, but were unable to do so. I could hear sounds proceeding from the membrane telephone at my ear while Mr. Watson was speaking at the other end of the circuit, but I could not make out what he said. We could not find a quiet place in Mr. Williams's building to repeat the experiment under favorable conditions, and so carried the instruments to 40 State Street, and arranged them as we had done on Saturday, the 5th. We then found that we could carry on conversation by means of them. During the course of our experiment at 40 State Street, on Monday, the 7th, a fire alarm was struck; and while the bells were ringing, and during the intervals between the strokes, we were unable to carry on conversation. The results obtained during the ringing of the fire bell were similar to those obtained just before, at

Mr. Williams's workshop. The battery used at 40 State Street consisted of three small carbon and zinc cells with bichromate of potassium solution. The battery used at Mr. Williams's was of the same kind, but consisted of two large cells. Mr. Watson, Mr. Storrow, Mr. Berliner, Mr. J. B. Henck, Jr., and Dr. Clarence J. Blake were present at the experiments at Mr. Williams's workshop, and at No. 40 State Street, on Monday, the 7th inst. The sheepskin membranes and heavy armatures alone were used on the 5th and 7th instants. On Wednesday, the 9th inst., the goldbeater's skin membranes and light armatures were used in an experiment at No. 40 State Street. The instruments were then in the same condition in which they are now, and the arrangement of circuit was the same as has been already described in Mr. Cross's deposition. Mr. Watson and I spoke to one another by means of the instruments. I could hear the sound of Mr. Watson's voice very plainly, and could make out a number of words. The articulation was not so distinct as with the sheepskin membranes. The articulation of the instruments when first used was pretty distinct, but the membranes soon became damp by the action of the breath, and the articulation was then much less distinct. When the distinctness was least, however, I could still make out a word here and there of what Mr. Watson said at the other end of the circuit.

Int. 97. In these recent experiments which you have just described, did you hold the instrument so that the armature was substantially perpendicular with its hinged end upwards, or in what position did you hold it?

Ans. I held it in the position indicated, and in every other position I could think of, and observed that the position in which the instrument was held did not affect the audible results obtained.

Int. 98. Did you go to Canada for a vacation in the summer of 1875? If so, when did you go, and when did you return?

Ans. I did. I went to Canada in the early part of September, and returned to Boston about the first of October. When I speak of returning to Boston in this and other answers, I mean to the neighborhood of Boston, where my professional work was, though I lived out of town.

Int. 99. While in Canada in that vacation, did you apply to any

one to assist you in obtaining patents in England, for any inventions you had made relating to the use of electricity; and if so, whom did you apply to?

Ans. I did. I applied to the Hon. George Brown in Toronto, on or about the twenty eighth day of September.

Int. 100. Please look at the letter now shown you, addressed to Mr. Hubbard, dated Sept. 28, 1875, and which was identified in Mr. Hubbard's deposition, pages 431* and 440, and state whether you wrote and sent it to him at or about its date; and if so, read such parts of it as relate to your electrical inventions.

[*Objected to as incompetent.*]

Ans. I did, and I now read from it as follows: —

"IMPERIAL BANK OF CANADA, TORONTO, Sept. 28, 1875.

"*Dear Mr. Hubbard:*

"You must not think that I have been neglecting telegraphy during my visit to Canada. I brought a couple of instruments with me, and have discovered a method of annihilating the spark that has caused me so much trouble, without the necessity of using a condenser. I have felt very anxious in the matter of foreign patents, and as I have not heard anything from the friends on the other side to whom I applied for assistance in the matter, I thought I would see friends in Toronto and Montreal. My idea was to get a letter of introduction to Sir Hugh Allan, and seek his aid in the matter. On consulting my friend, Hon. George Brown (ex-Premier of Canada), he became much interested, and offers, if the scheme seems likely to be a good thing, either to take up the matter himself or get two or three gentlemen to do so. I have arranged to write particulars at once to him in confidence, and if we come to an arrangement they will telegraph to England to set matters afoot there and on the Continent at once. I must be in Belleville tomorrow, but shall not delay in Montreal to see Sir Hugh. . . .

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* The references are to pages of the printed record in the case *Bell Telephone Company* v. *Dowd.*

"I shall try to see you as soon as possible. I cannot reach Boston before Friday or Saturday.

"With kind regards,

"Yours respectfully,

"A. GRAHAM BELL."

Int. 101. When did you begin to prepare the specification for your patent No. 174,465, of March 7, 1876?

Ans. During the month of September, 1875, in Canada, and I continued it in Boston when I returned, during the early part of October.

Int. 102. Have you any of the sheets on which your rough draft of that specification was made in October, 1875? And if so, please produce them.

Ans. I have, and I now produce them.

Int. 103. Please read from them as part of your answer the passages which I will point out to you on the sheets, which I will ask the examiner to number and mark for identification.

Ans. I read from Sheet 1: —

"My present invention consists in the employment of a vibratory or undulatory current of electricity in place of a merely intermittent one, and of a method of and apparatus for producing electrical undulations upon the line wire."

And the sentence ends there, and the next line consists of the word "Phono-telegraphy." The foregoing is written in pencil.

On the opposite side of the same sheet the page begins: —

"by inducing undulations in (upon) a continuous voltaic circuit by the motion of bodies capable of affecting the current, such as the armature of an electro-magnet, a permanent magnet or a body through which a continuous current of electricity is passed."

This is accompanied by a drawing substantially like A, Fig. 5 of said patent. This paragraph and the drawing are in ink.

I read from Sheet 2: —

"It has long been known that when a permanent magnet is caused to approach the pole of an electro-magnet, a current of electricity is induced in the coils of the latter, and that when it is made to recede, a current of electricity of opposite polarity to the first appears upon

the wire. When, therefore, a permanent magnet is caused to vibrate in front of the pole of an electro-magnet, an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond in number per second to the vibrations of the magnet, in polarity to the direction of motion of the permanent magnet, and in intensity to the amplitude of the vibration of the permanent magnet."

The portion I have just read is written in pencil.

On the same side of the same sheet there is also written in pencil the following: —

"CLAIMS.

"1. In a system of telegraphy in which the receiver is set in vibration by the action of the electrical current, the employment of vibratory or undulatory currents of electricity as distinct from merely intermittent currents.

"2. The method of inducing (impressing) undulations in a continuous voltaic current by the vibration or motion of bodies capable of affecting the current, whether such bodies be permanent magnets, the armatures of electro-magnets, or bodies through which a continuous current of electricity is passing.

"3. The phono-telegraph, whereby two or more vocal or other sounds, differing in pitch, loudness and *timbre*, can be transmitted singly or simultaneously along a single wire, by causing electrical undulations upon the wire, similar in *form* to the aerial vibrations accompanying said vocal or other sounds."

From Sheet 3 I read the following in pencil: —

"4. The method of producing an undulatory current by the vibration of a body through which a continuous current of elect. is passed . . . "

On the other side of the same sheet, in continuation of what I have just read, I find also in pencil the following: —

"6. The method of and apparatus for transmitting simultaneously sounds differing in 'timbre' as well as in pitch and in loudness.

"7. The method of and apparatus for transmitting vocal utterance telegraphically, substantially as herein set forth."

On Sheet 2 I find written in ink the following: —

"In illustration of the method of creating a vibrat. current of elect., I shall show and describe one form of apparatus designed to produce undulations in a continuous voltaic current. But I wish to state here that the same effect may be produced in many other ways, all that is necessary being to influence the current by the vibration or motion of bodies capable of affecting the current."

On Sheet 4 I find the following, written in ink: —

"CLAIMS.

"1. In a system of telegraphy in which the receiver is set in vibration by the passage of the electrical current, the employment of vibratory or undulatory currents of electricity as distinct from merely intermittent currents.

"2. The method of impressing (inducing) undulations upon a continuous voltaic current by the vibration or motion of bodies capable of affecting the current, whether such bodies be permanent magnets, armatures of electro-magnets, or bodies through which a continuous current of electricity is passing.

"3. The phono-telegraph, whereby the exact pitch, loudness and *timbre* of vocal or other sounds can be transmitted telegraphically, by causing the body, by whose motion undulations are induced upon the line wire, to copy exactly the aerial vibrations accompanying said vocal or other sounds, and hence to induce upon the line wire electrical undulations similar in *form* to those occurring in the air."

On the other side of the same sheet the page begins with the following, written in pencil: —

"In another application for Letters Patent I have described a method of and apparatus for transmitting two or more telegraphic . . ."

Int. 104. On that side of Sheet 4 from which you have just read something written in pencil, I find some writing in ink, the last few words of which are written over a few words of the pencil writing which you have just read: what is that which is written in ink?

Ans. It is a portion of the rough copy of a letter that I wrote to the secretary of the Philadelphia Institution for the Deaf and Dumb, relating to the proposed introduction of my father's system of visi-

ble speech into that institution, and the exhibition of that system at the Centennial Exhibition.

Int. 105. Please state when you wrote the said letter of which said sheet contains the rough draft, and state also whether you have any means of fixing the date.

Ans. I wrote the letter during the latter part of October, 1875, or the commencement of November, 1875. I can fix the date as earlier than the 4th of November, by a letter which I wrote on the 13th of November, 1875, to Mr. James J. Barclay, secretary of the Institution for Deaf-Mutes, Philadelphia, in which the following occurs:—

"*My Dear Sir*, — Many thanks for your kind note of the 4th inst. I am sorry that the institution cannot consider my terms," etc.

The letter of the 4th inst., to which I refer, was in answer to the letter I wrote to Mr. Barclay, a portion of the rough copy of which appears upon Sheet 4.

Int. 106. The reverse side of Sheet 3 has some writing in ink which does not refer to electricity: please state what it is.

Ans. It is a portion of a rough copy of the same letter to the secretary of the Philadelphia Institution, to which I have referred, as written before the 4th of November, 1875.

Int. 107. The reverse side of Sheet 1, from which you have read something written in ink, contains something written in pencil which does not appear to relate to electricity: please state what it is.

Ans. It is a portion of the rough copy of a letter giving the supposititious history of a "Book of Ornamental Art."

Int. 108. Have you that letter, and when was it written?

Ans. I have; it was written and dated Oct. 26, 1875.

Int. 109. How many sheets did you produce in answer to my one hundred and second question?

Ans. Seven.

[*The seven sheets are marked for identification.*]

Int. 110. Are these all the original rough drafts made in preparing that specification which you now have?

Ans. They are.

Int. 111. Are they all that you made?

Ans. By no means.

Int. 112. Have you made search for the others, and have you been able to find them?

Ans. I have made search, but have been unable to find any others than those produced.

[*Adjourned to July* 11, 1879, *at* 10 *A. M.*]

BOSTON, July 11, 1879.

Int. 113. Please state whether the rough drafts for your specification, or the seven sheets of them which you produced yesterday, read consecutively, or in what condition they are as to roughness, rewriting, etc.

Ans. They do not read successively, and are merely fragmentary remains of my first attempts to put into correct language the ideas embodied in my specification. Some passages are written in pencil, others in ink, and many of them are so disfigured by the corrections and recorrections that I made in the language at the time, that it is difficult in some cases now to read them.

Int. 114. Was a specification prepared from these drafts for Mr. G. G. Hubbard to take to Washington and have examined by Mr. Pollok, your patent solicitor?

Ans. It was.

Int. 115. Did you learn from Mr. Hubbard at any time that Mr. Pollok had examined this specification with him, and found it satisfactory; and if so, when did you learn this? If you have any means of fixing the date with precision, please state what means you have.

Ans. I heard from Mr. Hubbard to this effect upon the 18th of January, 1876. I fix this date by reference to a letter that I wrote to Mr. Hubbard's daughter on the 18th of January, 1876, in which the following passage occurs: —

"I received a nice letter from your father this morning, in which he says how well pleased he is with the new specification, and that it promises to be of great value if I *prosecute my researches diligently;* if not, others may supplant me. He says, 'I have been over your specification with Mr. Pollok. He is very much pleased with it, and says he does not think it will require any alteration.'"

Int. 116. Have you in your possession the letter from Mr. Hubbard to you, referred to in your last answer?

Ans. I have not.

Int. 117. Have you made careful search for it?

Ans. I have, but have been unable to find it.

Int. 118. What day of the week was the 18th of January, 1876?

Ans. It appears by the calendar that it was Tuesday.

Int. 119. Please state when, if ever, you received from Mr. Pollok's office a fair copy of the specifications to be signed and sworn to; and if you have any means of fixing the date, please produce it.

Ans. I received a fair copy of the specification from Mr. Pollok's office either on the nineteenth or twentieth day of January, 1876, and I took oath to it in Boston on the twentieth day of January, 1876. I fix the date of receiving it by a memorandum which has been given to me, which I am informed and believe is a press copy of Mr. Pollok's letter to me accompanying the specification. It is as follows: —

"JANUARY 18, 1876.

"MR. A. GRAHAM BELL:

"*Dear Sir*, — Herewith find applic., papers, etc., for your new improvements in telegraphy. We have left blank for title of invention in the Oath, which you can fill in.

"Please execute the papers as indicated in pencil, and return them to me.

"Very truly yours."

Int. 120. Have you got the original of the letter just read?

Ans. I have not.

Int. 121. Do you know where it is?

Ans. I do not.

Int. 122. In whose handwriting was the fair copy of the specification which was sent you from Washington, as you stated?

Ans. I do not know. It was in a strange handwriting. I presumed it was written by some of Mr. Pollok's clerks.

Int. 123. Please look at the certified copy of the specification now shown you, and state when and where the *jurat* is dated.

Ans. Suffolk County, State of Massachusetts, the 20th of January, 1876.

Int. 124. It appears from this certified copy that said application

was filed in the Patent Office, Feb. 14, 1876: why was it not filed sooner?

Ans. I had made arrangements to have the specification filed simultaneously in England and the United States, and delayed making the application in the United States Patent Office in the expectation of receiving a cablegram from England informing me when to file it.

[*Complainants put in evidence a certified copy of file wrapper and contents of Bell patent of March* 7, 1876, *marked* "*Complainants' Exhibit* 24, *Bell's Application of* 1876."]

Int. 125. Please look at the paper now shown you; state who made it.

Ans. I did.

Int. 126. When and where and for what purpose?

Ans. I made it at the Queen's Hotel, Toronto, on the twenty-eighth day of December, 1865, for the information of the Hon. George Brown.

Int. 127. What occasion had you to give him information on the matters shown in that paper?

Ans. I expected to conclude arrangements for having him take out patents in England for me, and made this drawing to illustrate certain of my inventions.

Int. 128. Is that the same Mr. George Brown spoken of in your letter to Mr. Hubbard of Sept. 28, 1875, which was read as part of your one hundredth answer?

Ans. It is.

Int. 129. State generally what inventions or what apparatus that paper shows.

Ans. The invention and apparatus described in my United States patent, dated March 7, 1876.

Int. 130. There appears to be a memorandum on the back of it not in your handwriting: who wrote that?

Ans. The Mr. George Brown referred to.

Int. 131. In whose possession did you leave it after you made it, and when did you next see it?

Ans. I left it in the possession of the Hon. George Brown, in Toronto, on the twenty-ninth day of December, 1875, and I next

saw it in Toronto on the 12th of November, 1878, and requested Mr. Brown to intrust it to Mr. Thomas A. Watson, who brought it on to Boston.

[*Complainants put in evidence the paper referred to, and it is marked "Complainants' Exhibit 25, Bell's Toronto Drawing, W. P. Preble, Jr., Examiner."* [*Original number* 37.]

Counsel for defendant objects to the memorandum on the back of the drawing as evidence of any fact stated in it.]

Int. 132. After the grant of your patent, March 7, 1876, did you or did you not continue study or experiments on the subject of transmitting articulate speech or other sounds; and if so, for what purpose?

Ans. I did; for the purpose of introducing my invention into public use.

Int. 133. Did you exhibit any of your electrical inventions at the Centennial Exhibition at Philadelphia; and if so, what apparatus did you carry there for that purpose?

Ans. I did. I exhibited my method of harmonic multiple telegraphy, and my method of transmitting articulate speech electrically. The apparatus exhibited consisted of a telephonic organ, two current interrupters and two vibratory reed receivers, having attached to them what I termed vibratory circuit-breakers for working Morse instruments by my musical telegraphic signals. I also had the permanent horseshoe magnet which has already been produced, arranged over a single pole electro-magnet. Four forms of speaking telephones, which were briefly as follows: Two membrane telephones, which could be used either as transmitters or receivers. A single pole electro-magnet was used for one and a double pole electro-magnet for the other. The armature of each electro-magnet consisted of a small piece of steel spring glued to the centre of the membrane. A third form of speaking telephone was shown, intended to be used only as a receiving instrument. The electro-magnet was enclosed in a hollow box of iron, and a lid of iron or steel, I forget which, was used as an armature. This lid formed a thin circular metallic diaphragm, resting by its edge upon the rim of the iron box, its central portion not quite touching the pole of the electro-magnet underneath. The instrument was intended to be arranged upon a

circuit with either of the membrane telephones referred to before. Upon placing the ear against the lid of the box, the articulation of the person speaking into the membrane telephone was audible, proceeding from the lid. A fourth form of speaking telephone was shown, intended to be used only as a transmitter. It consisted of a metallic ring supported horizontally, carrying a stretched membrane to the centre of which was fastened either a platinum wire or a thin rod of carbon, I forget which, dipping into a little cup containing acidulated water. In addition to these instruments, a form of apparatus was shown for studying optically the peculiarities of the electrical current produced by my telephones. It consisted of one of Koenig's manometric capsules, to the membrane of which was glued a thin piece of steel, which formed the armature of an electro-magnet.

Int. 134. Did you operate before the judges of the Centennial Exhibition any of your apparatus for the transmission of articulate speech which you had on exhibition there; and if so, what instruments did you so operate, when, and with what results?

Ans. I did. I exhibited in operation the two membrane telephones with electro-magnets referred to in my last answer, and the iron box receiver, to the judges of that section, on Sunday, the twenty-fifth day of June, 1876. The result was that the articulation of the person speaking into the membrane telephone was audibly reproduced by the iron box receiver, and the person who placed his ear against the lid of the instrument heard and understood what was said at the other end of the circuit.

Int. 135. Name some of the persons who were present at that exhibition.

Ans. Sir William Thomson, the Emperor of Brazil, Prof. Hilgard, Prof. James C. Watson, Dr. Draper, Dr. Koenig, Mr. Elisha Gray, Prof. Sterry Hunt, Mr. William H. Hubbard, and many others whose names I do not now recall.

Int. 136. Did you receive any letter written on that day by any gentleman present at that exhibition, referring to the results obtained? And if so, please read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and now read it. It is from Prof. Sterry Hunt: —

"CONTINENTAL HOTEL, PHILA., June 25, 1876.

"*Dear Mr. Bell:*

"I am informed that you leave to-night for Boston, so I take this way of congratulating you on your success to-day. I returned to my hotel with Sir Wm. Thomson, and dined with him. He speaks with much enthusiasm of your achievement. What yesterday he would have declared impossible he has to-day seen realized, and he declares it the most wonderful thing he has seen in America. You speak of it as an embryo invention, but to him it seems already complete; and he declares that before long, friends will whisper their secrets over the electric wire.

"Your undulating current he declares a great and happy conception.

"All this he discussed partly with Dr. Bache, and more at length with Sir Redmond Barry and Sir John Hawkshaw. Sir William leaves here on Friday for Montreal, and will visit Boston for a day or two before sailing, which will be from New York, July 19.

"Thinking you would be glad to hear the judgment of one so eminent, I have written you this, and I am, my dear Mr. Bell,

"Always truly yours,

"T. STERRY HUNT.

"P. S. — Do you know anything of Brücher's system of visible speech, of which one of the Austrian judges spoke to-day? It seems very like your father's.

"GRAHAM BELL, Esq."

Int. 137. How soon after that did you leave Philadelphia?

Ans. I left Philadelphia the same night.

Int. 138. Did you receive a visit from Mr. Gray in Philadelphia; and if so, when and where was it, and in whose presence?

Ans. I did. Mr. Gray visited me at my hotel on that Sunday afternoon or evening, after our exhibitions, and just before I left for Boston. Mr. William Hubbard was visiting me at the same time, and was present when Mr. Gray came.

Int. 139. How sure are you that it was after your exhibition, and

not the day before? And state what, if anything, confirms your recollection on that point.

Ans. I remember that Mr. William Hubbard was present at the time of Mr. Gray's call, and that Mr. Hubbard did not reach Philadelphia until about twelve o'clock at night the evening before. A telegram had been sent to Mr. Hubbard, in Boston, requesting him to come to Philadelphia to assist me in operating my apparatus on Sunday. He arrived, as stated, just in time to take part in the experiments, and I left for Boston on Sunday night. I am therefore absolutely sure that Mr. Gray's visit to me was on Sunday, June 25, 1876, and I remember that it was after our respective exhibitions and before I left for Boston.

Int. 140. Was the visit from Mr. Gray a friendly and pleasant one, or not?

Ans. It was a very friendly and pleasant visit.

Int. 141. Did Mr. Gray at that visit say to you that he had invented a speaking telephone?

Ans. I have no recollection of such a remark, and I am quite sure that he did not; for under the circumstances, I should have been certain to have remembered it.

Int. 142. What receiver did you design to use with the liquid transmitter you say you exhibited at Philadelphia?

Ans. I had intended to use the iron box receiver with the liquid transmitter at the Centennial Exhibition, but I had also been in the habit of using the membrane telephones with electro-magnets for that purpose.

Int. 143. Had you or had you not transmitted articulate speech by means of that liquid transmitter before sending it to Philadelphia?

Ans. I had.

Int. 144. Please produce the three membrane telephones and the iron box telephone which you had at Philadelphia.

Ans. I now produce them. The membranes of all the membrane telephones are broken, and the armature of one magneto instrument is gone. The mouthpiece of the double-pole magnet telephone is also injured. The mouthpiece of the liquid transmitter has been disfigured by being used for subsequent experiments. The platinum wire or carbon rod of the liquid transmitter, with its connecting

wire, is missing. The lid or diaphragm of the iron box receiver is wanting, and the coil in this instrument is not the one used at the Centennial Exhibition.

Int. 145. What is the size of the diaphragm in each of these four instruments?

Ans. In the three membrane instruments the diameter of the membrane was two and three quarters inches. In the iron box receiver the diameter of the metallic diaphragm was one inch and a half.

[*Complainants put in evidence the telephones referred to, and they are marked respectively* "*Complainants' Exhibit* 26, *Bell's Single Pole Centennial Membrane Telephone*"; "*Complainants' Exhibit* 27, *Bell's Double Pole Centennial Membrane Telephone*": "*Complainants' Exhibit* 28, *Bell Centennial Iron Box Magnet Receiver*"; "*Complainants' Exhibit* 29, *Bell Centennial Liquid Transmitter*," *W. P. Preble, Jr., Examiner.*] [*Original Nos.* 38, 39, 40, 4 .]

Int. 146. Please look at the letter now shown you, dated July 2, 1876; state to whom it is written, and read it as part of your answer, omitting the personal and family matters. State when you wrote and sent it.

[*Objected to as incompetent.*]

Ans. It is a letter written by me to Mr. William H. Hubbard, on the 2d of July, 1876, although by inadvertence it was dated July 2, 1867. I sent it on or about the 2d of July, 1876; I now read it:—

"CAMBRIDGE, MASS., July 2, 1867.

"*My dear Willie:*

". . . Willie Winlock and Bert Eustace went in to Boston to help me on Thursday in case it was decided to work my instruments between Boston and Philadelphia. They were to sing for me. . . .

"Having completed my list of messages, I must really now speak of my telegraphic instruments. I can't tell you how glad I was to receive your telegram about your exhibit before Sir William. Mrs. Hubbard and *all the family* feel very proud of you for being able to exhibit so successfully my electrical apparatus. I had no idea that you would have to remove the apparatus to the judge's hall. Poor

fellow, what a time you must have had! I really do feel very proud of you that you should have made everything go smoothly. I am very anxious about Saturday. What should I have done without you, or rather what should I do now without you? I am afraid you must think me very ungrateful for not having written; but the fact is, that in preparing for transmitting sounds to Philadelphia from here, I made such a startling discovery that I have been unable to do anything else since but experiment. In order to attempt the transmission of speech to Philadelphia, it was necessary to have a telephone constructed the magnet of which should have a resistance equivalent to a considerable portion of the total resistance of the telegraph line between here and Philadelphia. The resistance of the line is over 5,000 ohms. Now I have had two magnets made, the coils of which offer a resistance of 3,250 ohms both together. It would require a battery of many cells in order to operate a Morse sounder through such a resistance. It is as great a resistance as 325 miles of well-insulated telegraph wire! My discovery was that I could work my apparatus with *one cell of battery* through this resistance. I am sure by substituting a *permanent magnet* for the pole of the electro-magnet, I could work it *without a battery at all.* . . .

"With love and best wishes,

"Yours sincerely,

"A. GRAHAM BELL.

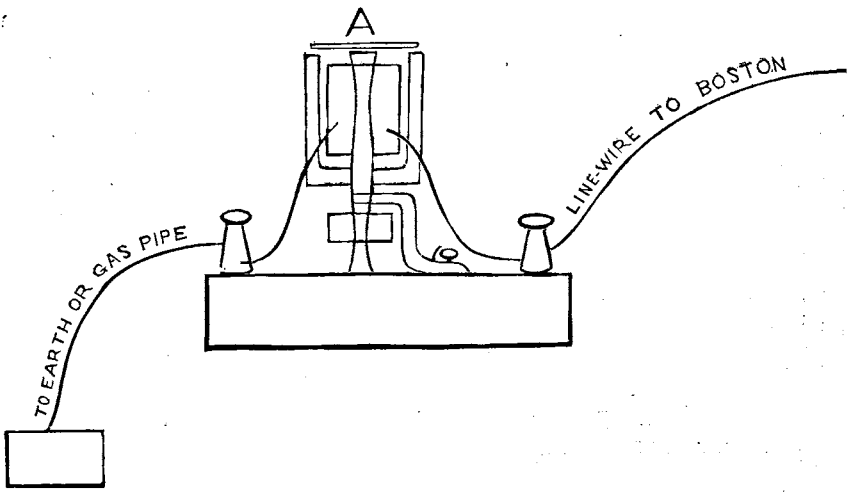
"MR. WILLIAM HUBBARD,
East Gall., M. B.,
Exhibition Building, Phila.

"P. S. — Should I send on apparatus to Philadelphia and you make the connections, simply connect the instr. with the line wire and the earth like this: —

"A. G. B.

"You can increase musical sounds by resting bridge of violin against A."

Int. 147. In this letter you say, "I am sure by substituting a permanent magnet for the pole of the electro-magnet, I could work it



without a battery at all": state when you first thought of transmitting sounds without a battery.

[*Objected to as incompetent.*]

Ans. My original idea in the summer of 1874 was to transmit sounds by means of magneto-electric currents without a battery; and from the time of the first conception of the speaking telephone I had the belief that the apparatus could be operated by substituting a permanent magnet for the soft iron core of the electro-magnet.

Int. 148. Then why did you use a battery with your speaking telephone?

Ans. Because the effects obtained were much more powerful with a battery than without; and because I had the idea that in operating the instruments through any considerable resistance, as upon a real telegraph line, the battery would produce the most practically useful results.

Int. 149. Have you a memorandum of experiments made by you on the transmission of sounds June 30, 1876? If so, please produce it and state when you made the memorandum.

[*Objected to as incompetent.*]

Ans. I have. The memorandum was made on the 30th of June, 1876, and I now produce it.

Int. 150. State whether you made the experiment on that day as there described.

Ans. I did.

Int. 151. Answer the same questions as to experiments made July 3, 1876, on the same subject.

[*Objected to as incompetent.*]

Ans. I made the memorandum of the experiments referred to upon the 3d of July, 1876, and the experiments related were made upon that day, and I now produce the memorandum.

Int. 152. Answer the same questions as to experiments made July 6, 1876, on the same subject.

[*Objected to as incompetent.*]

Ans. I made the memorandum of the experiments referred to upon the 9th of July, 1876. The experiments themselves were made on Thursday, the 6th of July, and I produce the memorandum.

Int. 153. What is the Fig. 2, page 17, referred to in the first line of the experiments of July 6?

Ans. It is Fig. 2, under date of July 3, 1876.

Int. 154. Please answer the same questions as to experiments of July 7, 1876, which are numbered 5, 6 and 7, in the same note book referred to in your last answers.

[*Objected to as incompetent.*]

Ans. The notes of these experiments were written by me upon the 9th of July, 1876, and the experiments themselves were made on the evening of Friday, the 7th of July, and I produce the notes.

Int. 155. Did you, during the summer of 1876, have made for you a two-pole permanent magnet with a coil of wire wound round each leg, after the manner of a horseshoe electro-magnet; if so, who made it, and when was it made?

Ans. I did. It was made at Mr. Williams's workshop, in July, 1876, — on or before the fifteenth day of July, 1876.

Int. 156. Please read from Mr. Williams's book the charge for making it.

Ans. "JULY 15, 1876.

"A. G. BELL & Co., Dr.

"To making mag. 3⅜ in. long of steel, coils or 38 D. C. Wire,

"1740 ohms. $14.75."

Int. 157. Have you a memorandum of experiments made July 11, 1876? And if so, please produce the memorandum. State when and by whom it was made, and whether on said day you tried the experiments therein described.

[*Objected to as incompetent.*]

Ans. I have. The memorandum was made by me upon the 12th of July, 1876, and the experiments narrated were made the day before, and I now produce the memorandum.

Int. 158. Have you a memorandum made on or about July 12, 1876, of modifications of the speaking telephone which you devised on or before that day? If so, state when you made that memorandum, and produce it.

[*Objected to as incompetent.*]

Ans. I have. I made the memorandum upon the twelfth day of July, 1876, and I now produce it.

Int. 159. Have you a memorandum of experiments made between Oct. 2 and 7, 1876? If so, state by whom the memorandum was made, and when, and produce it.

[*Objected to as incompetent.*]

Ans. I have. I made the memorandum on the 14th of October, 1876, and I now produce it.

Int. 160. Have you a memorandum as to certain experiments made by you between Oct. 12 and Nov. 12? And if so, state when and who made them, and produce them.

[*Objected to as incompetent.*]

Ans. I have. I made the memorandum on the 12th of November, 1876, and I now produce it.

Int. 161. Did you, on the dates stated in these several memoranda, make the experiments therein described as having been made?

Ans. I did.

[*Copies of all the memoranda above referred to are introduced by the complainants, and marked "Complainants' Exhibit* 30, *Bell's Memoranda of Experiments of* 1876, *W. P. Preble, Jr., Examiner."*] [*Original No.* 42.]

Int. 162. Please state when you first used the permanent magnet made for you by Mr. Williams on or before July 15, 1876.

Ans. I used it immediately upon its construction.

Int. 163. Please produce that magnet.

Ans. I now produce it.

[*Complainants put in evidence the permanent magnet referred to, and it is marked "Complainants' Exhibit* 31, *Bell's Permanent Magnet of* 1876, *W. P. Preble, Jr., Examiner."*] [*Original No.* 43.]

Int. 164. Did you, on or about October or November, 1876, work a telephone between Boston and Cambridge without a battery and by means of a permanent magnet? And if you have any memorandum of such an exhibition, please state what it is and read it.

[*Objected to as incompetent.*]

Ans. I did, and I have a memorandum of such an exhibition. It is contained in a letter written by me on the 12th of November, 1876, and is as follows: —

"18 Beacon Street, Boston, Mass.,
Sunday, Nov. 12, 1876.

" . . . The telephone once more comes out triumphant from a severe test. Prof. Rogers and Mr. Waldo of the Observatory and I carried on conversations with Mr. Watson through the telegraph line between Boston and Cambridge with perfect ease. The articulation was perfectly distinct, and even a whisper was intelligible. The length of the circuit was about seven miles; but as there were no less than six electro-magnets upon the line, the resistance of the line was fully equivalent to fifteen or sixteen miles. We cut out the battery, and could distinctly hear the tones of Mr. Watson's voice singing one of Moody and Sankey's hymns, without any battery at all. This evening we have made another discovery of a very important kind, which will lead to the reduction of the battery required or to the omission of batteries altogether."

Int. 165. If you have any memorandum or letter which will enable you to fix the date when you made the Toronto drawing, Exhibit 37, referred to in your one hundred and twenty-sixth answer, please read from it the portions which refer to that drawing.

Ans. I have such a letter, dated Queen's Hotel, Toronto, Dec. 28, 1875, which I wrote upon that date. In it I find the following: —

"It is pretty evident that George Brown intends taking up telegraphy abroad for me; still I don't allow myself to indulge in too many hopes, lest I should be disappointed.

"He asked me to state definitely what interest I would be willing to give him; so I offered him one half interest in any patents he would take out abroad for me. He stated that the proposition was satisfactory, and that he would take the night to think of it. I am to meet him to-morrow at eleven o'clock. In the mean time I intend to employ myself upon telegraphy.

"I shall make drawings of the instruments and line connections, and think the whole subject over very carefully, so as to be prepared to state exactly what I want done for me."

The Exhibit 25 is one of the drawings referred to in the letter.

Int. 166. Please look at the official copy of your English patent, No. 4,665, dated Dec. 9, 1876, and state when the provisional specification for that patent was drawn, and where and by whom it was drawn.

Ans. It was drawn by Mr. G. W. Gregory and myself in Boston. I do not remember the exact date, but my impression is that it was commenced in September or the beginning of October, 1876, that there was a delay of two or three weeks in completing it, and that it was completed about the end of October or the commencement of November.

[*Complainants produce an official copy of said patent and put in extracts from it as follows: The title and date of filing the provisional specification (to wit, Dec. 9, 1876), and the "fourth plan" and "fifth plan" found on pages 8 and 9 of said printed copy of the provisional specification, and the drawings Figs. 19 to 26 inclusive, in said extracts referred to. It is marked "Complainants' Exhibit 32, Extract from Bell's English Provisional Specification."*]

[*Adjourned to July 12, 1879, at 11 A. M.*]

BOSTON, July 12, 1879.

Int. 167. Please look at the instrument now shown you; state when it was made, and if it is one of the instruments referred to in any of the memoranda of experiments which have been put in evidence, Exhibit 30, please point out under what date in those memoranda it is first referred to.

Ans. I have no means of fixing the date when it was made,

excepting that it was before the 30th of June, 1876. My impression is that it had been made at least a month before, but of this I cannot be sure. The first note I have of its use is in the memorandum Exhibit 30, dated June 30, 1876, where it is referred to as "a flat disk of Tagger's iron," and is shown in the first figure as the diaphragm Z.

Int. 168. Please describe generally what this instrument is.

Ans. It is a disk of soft sheet iron, known as Tagger's iron, mounted on a stout metallic ring or rim about four inches and a half interior diameter, the whole supported on three legs like a tripod. In use it was placed upon a base, and magnets of different kinds were placed under the diaphragm, with some arrangement for adjusting their distance from the diaphragm.

Int. 169. Was that instrument used as a transmitter on any occasion other than June 30, 1876?

Ans. It was so used on a number of subsequent occasions.

[*Complainants put in evidence said instrument, and it is marked "Complainants' Exhibit 33, Bell's Speaking Telephone Metallic Diaphragm, W. P. Preble, Jr., Examiner."*] [*Original No.* 45.]

Int. 170. I call your attention to the subject of the interview at which Prof. Dolbear, Mr. Hubbard and yourself were present, and which is referred to on page 304 * and subsequently, in Prof. Dolbear's deposition, and on page 436 * and subsequently, in Mr. Hubbard's deposition. Please state what, if anything, you said to Prof. Dolbear as to whether he or you had first invented the use of a permanent magnet as part of or attached to the core of the electro-magnet of a speaking telephone, or as to whether he or you had first invented the use of a metallic diaphragm in a speaking telephone.

Ans. I have no recollection of saying anything to Prof. Dolbear upon the subject. I was more a witness of the conversation between Prof. Dolbear and Mr. Hubbard than a participant in it.

Int. 171. In your fifty-first answer, you referred to a letter which you received from Dr. Clarence J. Blake, dated Oct. 21, 1874, in which he referred to a letter from Mr. Elisha Gray: have you since

* These references are to pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

seen that letter of Mr. Elisha Gray to Dr. Blake, and where is it now?

Ans. I have. Dr. Blake produced the letter as a part of his deposition in the harmonic telegraph interference case between Mr. Elisha Gray and myself, and a copy of it is to be found at page 121 of the printed evidence in that case.

Int. 172. Does that letter from Mr. Gray make any reference whatever to the transmission of vocal sounds, or make any statements as to the character of Mr. Gray's inventions, experiments or apparatus?

Ans. It does not.

Int. 173. Have you ever experimented to any considerable extent with diaphragms of different sizes, thicknesses and elasticity in speaking telephones? And if so, state what effect such differences have upon sounds produced at the receiving end.

Ans. I have made some hundreds of experiments for the purpose of ascertaining the effect of such differences upon the sound produced at the receiving end. When diaphragms of similar thickness were used, the following effects were noted: When the diameter was very large, say six inches, the articulation of the person speaking against it was reproduced by the receiving instrument distinctly, unchanged in pitch, but slightly peculiar in quality. A hollow resonant effect accompanied the articulation, somewhat as if the person were speaking with his head inside a barrel. When diaphragms of less diameter were used, the articulation of the speaker was not impaired, but the resonant effect accompanying the voice was less and less as smaller diaphragms were used, and a point was reached when the quality of the reproduced sound was not sensibly different from that of the speaker. When plates of still smaller diameter were employed, a nasal and slightly disagreeable effect accompanied the articulation. With extremely small diaphragms a sort of "Punch and Judy" effect was produced. Similar effects were noted with diaphragms of similar diameters, but of different thicknesses. A very thin diaphragm gave the hollow effect, a medium thickness gave a more natural quality of voice, and a thick diaphragm occasioned the nasal or "Punch and Judy" effect. In all these cases the pitch of the reproduced sound was the same as that which occasioned the

vibration of the transmitting diaphragm, and the articulation was equally distinct in every case. The quality accompanying the articulation was alone affected by the variations in the diameter and thickness of the transmitting diaphragms used.

[*Certain original papers and instruments have been produced by the witness, and have not been introduced as exhibits. The complainants offer them for inspection of the defendants' counsel, and will produce them upon cross-examination, if required.*]

[*Adjourned to Monday, July* 14, 1879.]

BOSTON, July 14, 1879.

Int. 174. I call your attention to your London lecture, delivered before the Society of Telegraph Engineers, extracts from which have been put in evidence for the defendant: please state the circumstances under which you delivered that lecture.

Ans. I was invited to deliver a lecture before the Society of Telegraph Engineers for the purpose of showing the various steps that had resulted in a speaking telephone. I accepted the invitation, and a special general meeting of the society was called. I delivered the lecture on the 31st of October, 1877, without notes, giving the various stages as well as I could from memory, as I had no memoranda with me to which to refer.

Int. 175. I call your attention to the extract on page 407 of that lecture, which the defendant has put in on page 183 of the record. State what experiment it was that you had in mind and which you there referred to in the following sentence: "My friend Mr. Thomas A. Watson, who assisted me in this first experiment, declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion."

[*Objected to as incompetent.*]

Ans. I gave my recollection of the result of the first experiment made with the membrane telephone referred to in my seventy-fourth answer.

Int. 176. At the time you gave your London lecture, what was your recollection as to the receiver used at that time, and as to whether your two first membrane telephones were made at the same time or at different times?

[*Objected to as incompetent.*]

Ans. It was my recollection that immediately upon performing the experiment illustrated by Fig. 22 and described in my seventy-first answer, I gave instructions to Mr. Watson to have two membrane telephones constructed; that they were constructed within a few days, and tried, with the results noted in the passage quoted in the preceding question. My impression at the time of my lecture was that my first two membrane telephones were constructed at the same time, and that one of them was used as a receiver in my first experiment.

Int. 177. State whether you did or did not, before the issue of your patent March 7, 1876, construct or use any membrane speaking telephones other than the two of which Exhibits 19, 22 [original Nos. 31, 34] (see your seventy-sixth and eighty-seventh answers) are duplicates.

Ans. I did not.

Int. 178. What did you mean by the following passage from page 407 of your London lecture: "The results, however, were unsatisfactory and discouraging"?

Ans. I expected so much that I was naturally disappointed to be unable myself to hear the results I had anticipated.

Int. 179. Were you or were you not discouraged by these discouraging results?

Ans. I was not. I never wavered in a full and firm belief that I had solved the problem of the transmission of articulate speech electrically, and that the apparatus we had constructed could be used for that purpose.

Int. 180. When did you first construct a membrane telephone with a piece of clock spring about the size and shape of your thumb nail, glued to the centre of the diaphragm?

Ans. Shortly after the granting of my patent of March 7, 1876; I think within the month of March.

Int. 181. I observe that the telephones constructed in June and July, 1875, of which Exhibits 19 and 22 have been put in evidence as duplicates, have a cylindrical and rather short tube between the membrane and the mouth of the speaker or ear of the listener. Had you ever, before your application for the patent of March 7, 1876,

used cones for the two telephones of the shape shown in Fig. 7 of that patent?

Ans. I had not.

Int. 182. Why did you show, in your patent, the cone A, which you there describe as "used to converge sound vibrations upon the membrane," and the cone L, from which the listener hears the sound proceed?

Ans. Because I believed such cones to be advantageous. These forms were well known in the state of the art at that time. I had become familiar with cones like that shown at A, for the purpose of conveying sound vibrations upon a membrane during the course of experiments with the phonautograph; and a cone of the form shown at L was known to be often used in the construction of hearing trumpets.

Int. 183. Why did you show in Fig. 19 of your English patent, as one form of telephone, two cones flaring out from the membrane, both like A in Fig. 7 of the United States patent, instead of one flaring one and one converging one?

Ans. I thought that the illustration of my United States patent, Fig. 7, might suggest the idea that one instrument was to be used only as a transmitter and the other only as a receiver; and I sought in my English specification, by making the two instruments of identical construction, to show that they could be used reciprocally.

Int. 184. Please look at Fig. 25, on page 408 of your London lecture, and which purports to be a drawing of an iron cylindrical box receiving telephone. The disk armature appears to be fastened to the box with a screw or rivet. Did you ever use one so fastened? State if you know how it happened that drawing was so made.

Ans. I presume that this drawing was made from an instrument which was presented to Sir William Thomson. I had the screw or rivet placed on the instrument, in order that the metallic disk should not be lost. It was not intended to be used so fastened. The instrument I gave to Sir William Thomson was not the one used at Philadelphia, and is different in shape, though essentially the same.

[*Adjourned to Thursday, July* 17, 1879.]

BOSTON, July 21, 1879.

Cross Examination by CAUSTEN BROWNE, Esq, *of Counsel for Defendant.*

Cross-Int. 185. In your sixtieth answer you speak of making an exhibition in March, 1875, in the presence of Mr. Doten and Mr. Prescott, of your "method of multiple transmission of telegraphic messages": do you here refer to the same invention which is mentioned in the fifty-ninth answer, where you say, "I was then in interference with Mr. Elisha Gray on the subject of harmonic multiple telegraphy"?

Ans. I do.

Cross-Int. 186. This invention so in interference with Mr. Gray was that for which you had filed application Feb. 25, 1875, as mentioned by you in your patent No. 174,465, on page 56 of the record, was it not?

Ans. I made several applications, and the one alluded to was one of these.

Cross-Int. 187. I suppose that you refer to the same invention, where you speak in your ninety-fifth answer of your method of harmonic multiple telegraphy in which Mr. Hubbard was pecuniarily interested?

Ans. I do.

Cross-Int. 188. And I suppose this is the same invention or method which is referred to by you under the expression "harmonic telegraphy or multiple telegraphy," used in your eighth answer, and "my system of harmonic telegraphy," used in the thirteenth and also in the nineteenth answer?

Ans. It is.

Cross-Int. 189. The method of multiple telegraphy in question is described in your interference application of Feb. 25, 1875, as consisting in the simultaneous transmission of signal sounds or tones telegraphically by the use of several tuned transmitting reeds and a like number of correspondingly tuned receiving reeds?

Ans. The method is not described in my application in the language of the question, but is sub-tantially described as a method of transmitting a number of electric signals, or telegraphic signals or

messages, simultaneously along a single wire by means of current interrupters and electro-magnetic receivers having vibratory armatures tuned to correspond to one another.

Cross-Int. 190. Is any allusion made in that specification to the use of any one of those tuned receivers for the purpose of hearing any tone except the tone of the transmitter tuned in correspondence with it?

Ans. There is no allusion to this unless the sentence "but other arrangements for the purpose may be devised," in illustration of which I describe a telephone as one form of common receiver, can be taken to allude to this.

Cross-Int. 191. Please describe a little more fully the telephone indicated in the passage referred to, "being a telephone from the rod of which silk threads may lead to a series of bodies, such as tuning forks," etc.; the construction of the telephone being such that "in case two or more different sets of impulses be transmitted simultaneously to the telephone, each will affect that one alone of the tuning forks whose vibrations are synchronous with the impulses."

Ans. I referred to the receiving instrument of Reis's telephone, consisting of a rod of iron about six inches in length, supported by its ends upon a sounding box, and placed in the interior of a helix of copper wire.

Cross-Int. 192. Referring to your nineteenth answer, where you say that in November, 1873, you heard from a single one of your tuned receivers, tones of different pitches transmitted by transmitters of different pitch, I understand the apparatus in the use of which this occurred to have been such an one as is represented in the drawing Figs. 1 and 2, put in evidence with your fourteenth answer, and to have had two transmitting reeds and two receiving reeds, each of the two transmitting reeds being vibrated by its own local battery, and the circuit being made and broken at every vibration of either of the transmitting reeds: was this so?

Ans. The experiment is not completely described in the question. The instruments were substantially like those shown in Figs. 11 and 12, and the arrangement upon the circuit is shown in Fig. 2, excepting that during the course of the experiments a single receiver was placed in the circuit instead of two receivers, as shown

in Fig. 2. The batteries also only formed local batteries when the keys were raised. When the keys were depressed, the batteries were introduced into the main circuit, and then formed a single battery divided into two parts, arranged for quantity. The receiving instrument, from which two musical tones were audible was similar to that shown in Fig. 3. Otherwise than this, the description in the question is correct.

Cross-Int. 193. It appears by the record of the harmonic multiple telegraph interference between you and Mr. Gray, that you prepared a caveat, sworn to Oct. 27, 1874: did you in that caveat describe or suggest the use of a common receiver of several different simultaneously transmitted tones; if so, will you quote the passage?

Ans. I did not.

Cross-Int. 194. You described in this caveat the apparatus you had used in November, 1873, as before referred to, in your answer to Int. 19, did you not?

Ans. I did.

Cross-Int. 195. In the printed record of your deposition in the multiple-telegraph interference case, you say after obtaining Mr. Sanders's pecuniary assistance, "we were advised to take out a caveat to protect the inventions during the period of having apparatus constructed for the purpose of applying for Letters Patent," and that Mr. Sanders's pecuniary assistance had been volunteered for the purpose of your obtaining Letters Patent for your inventions in the United States (I refer to your seventeenth and eighteenth answers in that interference): these things so stated were true, I suppose?

Ans. They were.

Cross-Int. 196. There appears in the same interference record what purports to be a copy of a letter from you to Mr. Gardiner G. Hubbard, dated Nov. 26, 1874: will you refer to the printed matter I refer to, and say whether it is a true copy of a letter written by you to him at that date?

Ans. It is.

[*The counsel for the defendant puts in evidence a copy of the printed letter of Nov.* 26, 1874, *just referred to, and it is marked "Defendant's Exhibit Bell Letter to Hubbard, Nov.* 26, 1874, *W. P.*

Preble, Jr., Examiner"; also a copy of the Bell caveat of Oct. 27, 1874, *as printed in said interference record, and it is marked "Defendant's Exhibit Bell Caveat, W. P. Preble, Jr , Examiner."*]

Cross-Int. 197. In the same interference record I find printed what is entitled a "caveat supplement": please look at it, and see whether that is a true copy of a paper prepared by you as a supplement to your caveat of October, 1874.

Ans. It is a true copy of a portion of the original caveat. At the time my deposition was first taken in the harmonic multiple telegraph interference, I was unable to produce this portion of the caveat, but it was subsequently found and put into the case.

Cross-Int. 198. When did you first furnish to any one a description of, or make a drawing of, or make a model of an apparatus in which a single plate of inductive metal was used for a transmitter and a single plate of inductive metal used for a receiver, the construction being such that the vibrations of the air produced by the human voice, directed against either of such plates, would be reproduced audibly by the other plate, so that the transmitting plate could be used to receive or the receiving plate to transmit, the operation being what is known as reciprocal transmission? Observe, I do not ask you when you conceived of it, but when, as matter of fact, you furnished to any one a description or made a drawing or made a model of it.

Ans. I furnished a description of such an apparatus for reciprocal transmission, in which the inductive plate was to be attached to a membrane, to Mr. Thomas A. Watson, on the 2d of June, 1875. Models were made soon afterwards.

Cross-Int. 199. Do you refer to the two telephones like those shown in your patent of 1876, having at each end of the line a hinged armature vibrated by a membrane?

Ans. I refer to the two telephones described in my seventy fourth and eighty-fourth answers, substantially like those shown in Fig. 7 of my patent, having membranes carrying hinged armatures.

Cross-Int. 200. I did not intend to include in my question that construction. I meant to inquire as to a construction in which the inductive plate at each end of the line received the vibrations of the air directly, or in which such vibrations were received upon a mem-

brane carrying as part thereof a piece or patch of inductive metal, as in the case of the membrane transmitter used at the Centennial.

Ans. I cannot give the exact date when such a construction of apparatus was first described or put into a drawing or model. I simply remember that it was not long after the granting of my patent of March 7, 1876; I think about the end of March or early in April, 1876.

Cross-Int. 201. Do you understand that you have put in evidence already the description or drawing or model to which you now refer?

Ans. I am not certain whether one of the models put in evidence, Exhibit 28, was not made about that time, and is the original. I think it is; and the other models, Exhibits 26 and 27, though not the identical instruments used at that time, are substantially similar to them. I think the earliest description put in evidence is to be found in paragraph 12, Exhibit 46, vol. ii., of the record.

Cross-Int. 202. In the case you are now speaking of, did you employ electro-magnets or permanent magnets?

Ans. Electro-magnets.

Cross-Int. 203. I understand you to have testified that in an experiment on or about June 2, 1875, you noticed that by the vibration of a tuned reed within the magnetic field of an electro-magnet, which was not at the time under the influence of a battery, but which was not yet discharged, the tone of the reed was reproduced at the receiving end by virtue of the residual magnetism in the core of the electro-magnet: that is so, is it not?

Ans. It is; the residual magnetism of the core and reed. The latter was of steel, and probably retained a greater amount of magnetism than the electro-magnet.

Cross-Int. 204. When did you first furnish to any one a description, or make a drawing, or make a model of an apparatus in which permanent magnets were used instead of electro-magnets (no battery being employed), the undulations being thrown upon the line wire by the vibration of inductive plates within the field of the permanent magnets?

Ans. I furnished a drawing of such an arrangement within a few days after the 27th of October, 1874. I described such an arrange-

ment previously to that date in Canada, at my father's house. The drawing referred to has been put in evidence in my forty-ninth answer, and is marked "Exhibit 18, Fig. 2," and is described in my forty-eighth answer.

Cross-Int. 205. Does this forty-eighth answer describe an apparatus in which a permanent magnet and an inductive plate are employed at each end of a line wire, for the purpose of the electrical transmission of the vibrations of the plates?

Ans. It does describe such an apparatus, more than one plate being used at each end of the circuit.

Cross-Int. 206. Do you mean that an arrangement of permanent magnets, such as is shown in Fig. 2 of Exhibit 18, was intended to be used at each end of the circuit?

Ans. Yes.

Cross-Int. 207. My Int. 204 was intended to inquire when you first furnished to any one a description, or made a drawing, or made a model of an apparatus in which a permanent magnet was used instead of the electro magnet at each end of the circuit, the undulations being thrown upon the line wire by the vibration of an inductive plate within the field of the permanent magnet at the transmitting end, and producing corresponding vibrations in the corresponding inductive plate vibrating within the field of the permanent magnet at the receiving end: will you tell me?

Ans. I think the question is fairly answered by reference to this same drawing, Figs. 1 and 2, Exhibit 18. The mode of operation of the apparatus shown was presumed to be as follows: Upon vibrating one of the polarized reeds, shown in plan in Fig. 1 and in section in Fig. 2, a magneto-electric current would be generated in the coils surrounding the permanent magnets N S, N S, Fig. 2; and this magneto-electro current, passed through the coils of a similar apparatus at the other end of the circuit, would occasion the forcible vibration of that reed at the receiving station which was in unison with it.

Cross-Int. 208. You did not notice that my question was limited to an apparatus in which *a* permanent magnet was used instead of the electro-magnet at each end of the circuit, and did not embrace in its terms an apparatus in which a pair of permanent magnets was

used at each end in the manner and for the purpose which you have been describing; with that explanation, please answer the question.

Ans. I must again refer to the same drawing, Exhibit 18. I described to Dr. Blake the effect of vibrating a polarized plate like those shown in this drawing in front of a permanent magnet, the poles of which were surrounded by coils of insulated wire. I drew such an arrangement and added on another permanent magnet arranged in the same way, to show him how the effect of the vibration could be increased by using a pair of magnets instead of a single one. The completed drawing is that shown in Fig. 2, Exhibit 18.

Cross-Int. 209. You are speaking, I suppose, of the same thing you described in your answer to the forty-eighth question?

Ans. I am.

Cross-Int. 210. Now please tell me when you first had an apparatus in which a single permanent magnet, with a single inductive plate vibrating in its field, was used or to be used at each end of the circuit.

Ans. I do not know. I know that I used such an apparatus early in July, 1876, and although I cannot now recall the use of any such apparatus at an earlier date, I feel confident that I must have tried it before.

Cross-Int. 211. You mean by your last answer that you know you used, early in July, 1876, an apparatus having a single permanent magnet, with a single inductive plate vibrating in its field at each end of the circuit, and using no battery?

Ans. I cannot be certain whether such an apparatus was used at each end of the circuit, but I am certain that such an apparatus was used as a transmitting and receiving telephone without any battery upon the circuit early in July, 1876, and the permanent magnet used has been placed in evidence in my one hundred and sixty-third answer, and marked "Exhibit 31."

Cross-Int. 212. When you say that you are "certain" that such an apparatus was used as a transmitting and receiving telephone, do you mean that the same permanent magnet and vibrating plate (the magnet being Exhibit 31) were used first to transmit and then to receive?

Ans. I do.

Cross-Int. 213. Now please name the earliest time when you are certain that a permanent magnet and vibrating plate at each end of the circuit was used or constructed for use by or for you, no battery being employed.

Ans. About the end of October, 1876. I am sure such an arrangement was used by me at a very much earlier date, although I cannot now recall the details or the date.

Cross-Int. 214. How do you explain this language, which I find in your preliminary statement, made under oath in the speaking-telephone interferences I and J, such statement being sworn to Nov. 20, 1878: "In the latter part of November, 1876, I dispensed altogether with the use of a battery in my working instrument, and used permanent magnets and metal diaphragms in both my transmitting and receiving instruments, the instruments being duplicates of each other"? This appears to me to be inconsistent with the statement you now make, that about the end of October, or much earlier, you had in use an apparatus with a permanent magnet and vibrating plate at each end of the circuit, and no battery. How do you reconcile them?

Ans. The passage in the preliminary statement refers to the time when I relinquished the use of a battery entirely in my experiments, and had permanently adopted the permanent magnet as a substitute. Previously to that time I had been using experimentally sometimes permanent magnets, sometimes batteries.

Cross-Int. 215 (*de bene*). In your letter dated Nov. 12, 1876, put in evidence in your one hundred and sixty fourth answer, you say, "This evening we have made another discovery of a very important kind, which will lead to the reduction of battery required, or to the omission of batteries altogether": what was that important discovery which you made in the evening of Nov. 12, 1876?

Ans. The discovery that a permanent magnet telephone could be practically used on a real line of considerable resistance without any battery on the circuit. I had been using permanent magnet telephones before in laboratory experiments; but this, I believe, was the first time I had practically tested such instruments upon a real

telegraph line, although I had constructed an instrument in July, 1876, intended to be used in attempting to transmit speech between Boston and Philadelphia, if the judges of the Centennial Exhibition had called for the experiment. The magnet of that instrument has already been referred to, and has been put in evidence as Exhibit 43.

Cross-Int. 216. I wish now to read you the sentence just quoted from your letter of Nov. 12, 1876, in connection with the sentence next preceding, the whole being as follows: "We cut out the battery, and could distinctly hear the tones of Mr. Watson's voice singing one of Moody and Sankey's hymns, without any battery at all. This evening we have made *another* discovery of a very important kind, which will lead to the reduction of the battery required or to the omission of batteries altogether." Do you still say that what is referred to as "another discovery" was the discovery that the magneto-electric impulse alone, without a battery, could be transmitted over a long line?

Ans. I said that the discovery was that a "permanent magnet telephone" could be practically used on a real line of considerable resistance. The first sentence quoted referred to an experiment without a battery, in which the magnets used were ordinary electro-magnets, which retained some residual magnetism. The latter sentence refers to an experiment in which a permanent magnet telephone was used, and the results were so much better than in the first experiment as to convince me that such telephones could be practically used upon real lines.

Cross-Int. 217. When I represented you in my last question as having said that what was referred to as "another discovery" was the discovery that the magneto-electric impulse alone, without a battery, could be transmitted over a long line, I did not observe that you had (properly, of course) struck out from your two hundred and fourteenth answer these words which fell from your lips, and were at first recorded with your answer: "And it took much time and many experiments to disabuse my mind of the idea that had been in my way from my first conception of the magneto-electric speaking telephone in 1874 up to that time; namely, that the currents generated in such an apparatus, without a battery, would be too

feeble for practical use upon real lines." It is true, is it not, that you had been under that impression?

Ans. It is true that I was fully under that impression up to July, 1876. I then began to doubt whether I had not been mistaken in this idea. Subsequent laboratory experiments served to strengthen the doubt, and the experiment referred to demonstrated that permanent magnet telephones could be practically used on real lines.

Cross-Int. 218. You mean the experiment of Sunday, Nov. 12, 1876, between Boston and Cambridge?

Ans. I do, although I believed that other experiments previously made, but not on real lines, had demonstrated this point.

Cross-Int. 219. Did you actually use a permanent magnet at each end of the line, in place of the electro-magnets and without a battery, in the experiment between Boston and Cambridge on Sunday, Nov. 12, 1876?

Ans. I am not sure; my impression is that a permanent magnet telephone was used at one end and an electro-magnet telephone at the other. I may, however, be mistaken in this, and it is quite possible that permanent magnet telephones were used at both ends.

Cross-Int. 220. Are you quite sure that a permanent magnet telephone was used at either end of the line in that experiment of Sunday, Nov. 12, 1876?

Ans. I am quite sure that a permanent magnet telephone was used at the Boston end.

[*Adjourned to July* 12, 1879, *at* 2.30 *P. M.*]

BOSTON, July 23, 1879.

Cross-Int. 221. Referring now to your twenty-first and twenty-second answers, in which you say that in the winter of 1873, you think about December, you arranged your multiple telegraph instruments with an induction coil placed between the interrupter and the receiver, and produce three drawings, Figs. 4, 5 and 6, which are copied at page 114 of the record, representing such arrangements and a modification of them: I will ask you to explain briefly the operation of what is shown in these drawings, first in Figs. 4 and 5 and afterwards as modified in Fig. 6.

Ans. Figs. 4 and 5 represent the arrangement devised in the

winter of 1873. At each station shown in Fig. 4 an interrupter is placed in the primary circuit of an induction coil with a local battery. The secondary circuit of each coil is normally short-circuited by a telegraph key. The depression of the key causes the secondary circuit of the coil to form a portion of the main current, and the impulses induced in the secondary coil by the operation of the interrupter in the primary circuit are thus caused to traverse the main circuit, passing through the coils of all the receiving instruments, and causing the forcible vibration of the armatures of such of those receivers whose rates of vibration correspond to that of the armature of the interrupter in the primary circuit. The instruments are so arranged that the depression of any key causes the forcible vibration of one and one only of the receiving instruments at each station, producing from it a loud musical tone, the duration of which depends upon the length of time the telegraph key is kept depressed. Thus the operation of any telegraph key in the ordinary manner to transmit a telegraph message by the Morse system causes a succession of loud musical tones from one of the receivers at each station, the duration of each sound corresponding to the dot or dash of the Morse alphabet, so that the message transmitted could be read by any skilled Morse operator listening to the receiving instrument. At each station the interrupters used were to have different rates of vibration, and the receivers at each station corresponded respectively to the interrupters in their normal rate of vibration. The advantage derived by the multiple arrangement of interrupters and receivers was that more than one telegraphic message could be transmitted and received simultaneously without confusion. It was only necessary that the messages should be transmitted by means of interrupters having different rates of vibration, the signals from the interrupters affecting different receivers at each station.

The arrangement shown in Fig. 5 illustrates a plan of doubling the carrying capacity of the wire under the harmonic multiple telegraphic system shown in Fig. 4. The current from an interrupter is shown in Fig. 5 to be divided between two induction coils, one portion of the intermittent current passing through the primary circuit of one of the coils, the other portion through the primary circuit of the other. The secondary circuit of one of the coils (which

is here designated as the primary induction coil) forms a portion of the main circuit, and the currents induced in it traverse the coils of the receiving instruments shown, which represent one receiver at the same station and another at a distant station, both corresponding in rate of vibration to that of the interrupter shown. The secondary circuit of what is here termed the secondary induction coil is connected with coils passing around the magnet of the receiving instrument at the same station, the wires being so connected that the induced currents from the secondary induction coil oppose those from the primary induction coil in the receiving instrument. Resistance is inserted at R, so as to make the currents from the secondary induction coil just powerful enough to neutralize the effect of the primary induction coil upon the receiving instrument at that station. Thus any signals sent by means of the interrupter shown in Fig. 5 would affect corresponding receivers at distant stations, but would not affect the corresponding receiver at its own station. But that receiver would be affected by impulses transmitted from a corresponding interrupter of a distant station; and thus, while the operator at the station shown in Fig. 5 could be sending a message by means of the transmitter shown, another operator at that same station could be receiving a different telegraphic message from a distant station, sent by the operation of an interrupter of similar rate of vibration to that operated at his own station. I propose to duplex each interrupter and corresponding receiver, as shown in this diagram, at each station.

In Fig. 6 is shown a modification of the plan shown in Fig. 4, in which a common induction coil is used at each station for all the interrupters and receivers. The secondary wires of the coil are permanently in circuit with the main line, but a switch or "cut-off" is arranged, by means of which the secondary coil may be short-circuited when the interrupters are not in use, so as to reduce the resistance of the main line. A single battery is employed to work all the interrupters at each station, and the depression of any key causes the current from any interrupter to pass through the primary circuit of the induction coil, and thus causes secondary impulses to appear upon the main line, occasioning the forcible vibration of the proper receiver at each station, and the audible production of the proper musical signal.

Cross-Int. 222. In your preliminary statement, sworn to May 8, 1876, in the multiple-telegraph interference, I find this passage: "I saw that one wire would suffice for communications simultaneously in both directions, if free earth communication could be secured at each end of the line. My first attempt to solve the problem was by the application of artificial resistance, as shown in Fig. 10. When the line was put to earth at the two extremities of the circuit A and N, any intermediate station (C) could cause half the intermittent current from its battery to pass to earth at A and the other half to the earth at N, by putting sufficient resistance on the shorter circuit. Study of the arrangement, however, convinced me that the problem could not be solved by any arrangement of artificial resistances, and I was for a time at a loss how to overcome the difficulty. Early in December, 1873, it flashed across me that the intermittent current might be induced upon the line wire, in which case there would be no difficulty in having free earth communication at both ends of the circuit. The arrangement, as conceived, is shown in Fig. 11. I saw also that the duplex principle could be applied, as in Fig. 12, so as to double the number of messages possible upon the acoustical plan." Does this passage refer to the same arrangement for inducing the intermittent current upon the line wire that you describe in your last answer?

Ans. A portion of it does, the part referring to Figs. 11 and 12. Figs. 4 and 5, on page 114 of the record, are reproductions of these.

Cross-Int. 223. When were these figures, as put in with the preliminary statement and as there designated Figs. 11 and 12, made?

Ans. They were drawn somewhere about the 27th of April, 1876, for my preliminary statement in the harmonic-telegraph interference; but similar drawings were made a very long time before that date, — certainly in January, 1874, if not earlier.

Cross-Int. 224. I understand you to say in effect that drawings such as Figs. 4 and 5, page 114 of the record, were made at or shortly after your conception in December, 1873, of the arrangement which such drawings show for inducing the intermittent cur-

rent upon the line wire, and for the application of the duplex system.

Ans. I do. Of course I cannot be sure that the drawings were identical in every particular as to form of apparatus, etc.; but I am sure that drawings were made at that time substantially similar to those in Figs. 4 and 5 of the record in arrangement upon circuit, and in every particular essential to the conceptions described in my two hundred and twenty-first answer.

Cross-Int. 225. Did you practically try the arrangement which you so conceived in December, 1873, for inducing the intermittent current on the line wire?

Ans. I did not at that time.

Cross-Int. 226. At what time did you?

Ans. I made numerous experiments with induction coils in the winter of 1874–75, but I cannot be certain that the full arrangement of circuit shown in Fig. 4 was tried, but I believe it was. I at all events remember experimenting with a single induction coil, having an interrupter and receivers arranged as in Fig. 4; and I remember changing the interrupter, substituting for it an interrupter of different rate of vibration. The point I am uncertain about is as to whether a number of induction coils were used, as in Fig. 4. The arrangement shown in Fig. 5 was not tried. I cannot fix the dates of these experiments otherwise than the winter of 1874–75. They might have been as early as the 1st of November, 1874.

Cross-Int. 227. Going back for a moment to the drawings or sketches which were made (similar to Figs. 4 and 5) in or shortly after December, 1873, when you conceived the idea of inducing the intermittent current on the line wire, did you preserve these sketches up to the time of preparing your caveat with similar ones, in October, 1874, or did you make the caveat sketches in October, 1874, from memory of the original ones or of the device which they were made to represent?

Ans. The drawings for my caveat were made some of them from memory, others from memoranda that had been made at an earlier time; but whether the particular drawings referred to were made from memory or from the original sketches, I do not now remember. Numerous sketches had been preserved that were made in January,

1874, but I cannot now remember whether these were among the number; my impression is that they were.

Cross-Int. 228. I suppose the original sketches which I inquired about are not now in existence?

Ans. I do not know. When my deposition was taken in the harmonic-telegraph interference, some original sketches made in the winter of 1873–74 were put in evidence, and I presume have been preserved. Others were not put in evidence, and I do not know what has become of them. It is probable they are still in existence, but I have not found any among my memoranda. I cannot say at the present moment whether the original sketches referred to were put in evidence in the harmonic-telegraph interference case or not.

Cross-Int. 229. After the experiments were tried in the winter of 1874–75 which you have mentioned, what did you ever do with a view to the practical trial of the arrangement you had conceived for inducing the intermittent current on the line wire, or for any use of the induction coil between the interrupter and the receiver?

Ans. I satisfied myself by practical experiment that an induction coil could be practically used, but my difficulty was to get interrupters so tuned as not to interfere with one another's action. A great portion of my time from February, 1875, to June, 1875, was taken up in experiments to overcome this difficulty.

Cross-Int. 230. With what result?

Ans. The experiments led me to the discovery made on the 2d of June, 1875, which has been described at length in my deposition.

Cross-Int. 231. Please now briefly describe that discovery again.

Ans. The discovery was that the magneto-electric current produced by the vibration of a steel reed or of a permanent magnet, in front of an electro-magnet, was sufficiently powerful to be utilized for the production of sounds by electric means.

Cross-Int. 232. And this discovery enabled you to induce currents as desired in a primary circuit, did it?

Ans. It did.

Cross-Int. 233. Did you at any time after that make any practical trials in reference to the use of an induction coil for inducing currents upon the line wire?

Ans. I did; many.

Cross-Int. 234. For what purpose and with what result?

Ans. For the purposes of multiple telegraphy. I found that the currents induced in the secondary circuit of an induction coil by the action of an interrupter in the primary circuit occasioned a much more powerful vibration of the tuned reeds of my harmonic receivers than the magneto-electric currents I was then able to produce.

Cross-Int. 235. Did you, in consequence of this observation, apply to practical use the induction coil with a secondary circuit?

Ans. I did not. I kept it in view in experiments relating to multiple telegraphy, but I believed that the magneto-electric currents possessed many advantages for this purpose if the strength of the magneto currents could be increased, and that they could be used in addition for the transmission of articulate speech electrically; and I therefore devoted most of my time to ascertaining the conditions under which the most powerful magneto currents were produced.

Cross-Int. 236. And in that direction you met with satisfactory success, did you not?

Ans. I met with encouraging success in this direction.

Cross-Int. 237. And at last with satisfactory success?

Ans. I did.

Cross-Int. 238. Did you ever describe or show in any patent of yours, in this country or abroad, the use of an induction coil for the purpose of inducing a current upon the line wire?

Ans. I did; in my English patent of Dec. 9, 1876, and in an application for a United States patent, filed March 10, 1875, and also referred to in defendant's Exhibit A, being an application of Feb 25, 1875, where I say, "A single wire for communication in both directions may be used. This will necessitate the employment of an induced current, and in this case the duplex principle can be applied to my system. The arrangement of apparatus for this purpose I do not, however, here describe, inasmuch as I make it the subject of separate application for Letters Patent."

Cross-Int. 239. Did this "separate application" proceed to patent, or was it stopped by interference; and if so, with what?

Ans. It was stopped by interference with an application or applications of Mr. Elisha Gray, and the interference has not yet been decided.

Cross-Int. 240. I hand you a printed copy of an American application for a patent by yourself, filed March 10, 1875, and ask you whether that is the "separate application" above referred to.

Ans. It is.

Cross-Int. 241. To identify the application just shown you, I will ask you if it contains the following from the preamble and the claim: "My present invention is directed to the adaptation of the system aforesaid to an *induced* current, whereby messages can be sent in both directions along a single line wire. To effect the transmission along the line wire of a succession of secondary or induced electrical impulses, I find it to be necessary that the successive and alternate makes and breaks of the primary circuit should be of equal and uniform duration. . . . What I claim and desire to secure by Letters Patent is, in a system of telegraphy in which the receiver is put in vibration by electrical impulses sent along the line wire from the transmitting station, as described, I claim the employment at the transmitting station, in connection with the line wire and an induction coil, of a primary circuit [and] apparatus for making and breaking said circuit a definite number of times per second or other unit of time, with makes and breaks of equal duration, substantially in the manner described, so that the positive and negative impulses thereby induced in the line wire shall succeed each other at equal intervals of time"?

Ans. It does.

Cross-Int. 242. Was this application of yours put in interference with the then pending application of Gray, filed June 27, 1874, on page 582 of Vol. II. of the printed record, and on which he obtained, July 27, 1875, his patent No. 166,095; or with the then pending application of Mr. Gray, filed April 18, 1874, on which he obtained a patent July 27, 1875, No. 166,096, which is found on page 621, Vol. II., of the printed record?

[*Objected to as immaterial and incompetent.*]

Ans. I do not know.

Cross-Int. 243. Do both of the patents of Mr. Gray to which I just referred, and for which his applications were pending in March, 1875, show a primary circuit and a secondary circuit, currents being induced in the secondary by an induction coil?

Ans. They do show a primary and secondary circuit, currents being induced in the secondary circuit by the rapid interruption of the primary circuit.

Cross-Int. 244. In your preliminary statement in the multiple-telegraph interference, I find these passages: "During the summer of 1874, doubts occurred as to the operation of the induced current. When the primary circuit of an induction coil is closed, a momentary impulse of positive electricity is induced upon the secondary circuit, and when it is opened, an impulse of negative electricity appears upon the wire. I feared that the induced current would be insufficient to set the armatures of the receiving instruments in operation, unless the negative impulses came exactly midway between the positive impulses, and unless the armatures of the receiving instruments were rendered permanently magnetic, so as to be alternately attracted and repelled by their electro-magnets. The thought occurred of inducing the impulses by means of a permanent magnet instead of a battery.

"Reflection convinced me that however feasible the scheme looked upon paper, it was impracticable, as the induced currents would be far too feeble to overcome any great resistance. For the same reason, the plan shown in Fig. 15 seemed impracticable save in theory, and I began to look about for some other method of inducing alternate positive and negative impulses, which should succeed each other at equal intervals of time, and at last I hit upon the plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17. In the autumn of 1874, Mr. Thomas Sanders, of Haverhill, Mass., offered to assist me in obtaining patents. It was decided to file a caveat," etc.

Was the "plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17," an apparatus similar to that mentioned in the claim of your application of March 10, 1875, for making and breaking the circuit a definite number of times per second, or other unit of time, with makes and breaks of equal duration; if not, how did it differ substantially from it?

Ans. It was such an apparatus. I should like to remark in reference to the first part of the question, that the scheme which I stated appeared to me in the summer of 1874 as "impracticable,"

on account of the supposed feebleness of the induced currents, referred to my method of inducing currents by the vibration of magnetized reeds, and did not refer to the currents induced by an induction coil and battery alluded to in the first part of the quotation.

Cross-Int. 245. I will ask your attention again to the subject of the experiment in which, being engaged in the transmission of the tones of two tuned transmitting reeds, for the purpose of vibrating two correspondingly tuned receiving reeds, you observed that the tones of both the transmitting reeds were audible from one of the receiving reeds, which happened to be out of tune with its mate: did you satisfy yourself at that time that the sound of two transmitted notes which you heard did not proceed from the core of the magnet? I refer to the experiment of November, 1873, mentioned in your nineteenth answer.

Ans. I did not. The idea did not occur to me under the circumstances of the experiment; for I felt the trembling of the armature with my finger, and I did not know at that time that a sound was produced by a core under the circumstances of the experiment.

Cross-Int. 246. Did you ever satisfy yourself on that point, either as to that experiment or as to any subsequent one conducted under exactly similar conditions?

Ans. I did.

Cross-Int. 247. Will you describe how you so satisfied yourself and when it was, and state the circumstances?

Ans. In November, 1874, I discovered that a sound proceeded from the core of an electro-magnet which was placed in circuit with a current interrupter, and shortly afterwards I compared the sound produced in this manner with the sound produced from a reed subjected to the attraction of that same electro-magnet. I cannot recall the details of any particular experiment made to test this point, but can give the general results of a number of experiments made during the winter of 1874–75, which satisfied me upon the point alluded to. I found that a musical tone was audible upon placing the ear in close contact with the reed when it was held at a considerable distance from the pole of the electro-magnet, but still within its field. Upon gradually bringing the reed nearer to the magnet the loudness of the

sound increased, but upon touching the pole of the magnet the sound changed its character altogether. It was much feebler and different in quality. It was also noticed that the sound audible from the core of the magnet when the reed was removed was materially different in quality from that heard from the reed when it was held a short distance from the pole. The sound audible from the core partook more of the nature of a *noise* than a musical note, and was accompanied by a curious crackling effect; while that heard from the reed had more of a musical quality about it, and no crackling effect accompanied it.

Cross-Int. 248 (*de bene*). In your letter of March 18, 1875, put in evidence with your fifty-seventh answer, you speak of telling Prof. Henry "that on passing a current of intermittent electricity through an empty helix of insulated copper wire, a noise could be heard proceeding from the coil similar to that heard proceeding from the telephone": did you never afterwards learn that that fact had been observed already by some one before you?

Ans. I did. I found that this fact had been discovered by De la Rive. It is referred to in a paper by him in the *Annales de Chimie et de Physique*, 3d series, Vol. XVI. page 104.

Cross-Int. 249 (*de bene*). In this same letter you speak of an exhibition which you made shortly before the date of the letter at the office of the Western Union Company, in New York: do you mean to be understood by what you say in the letter on that subject, that Messrs. Orton and Prescott received what you then communicated to them as new and valuable in comparison with what they already knew?

Ans. Such was the impression I derived from my conversations with them.

Cross-Int. 250. Will you state any particular thing which Mr. Prescott said, or which Mr. Orton said in his presence, that gave you this impression?

Ans. Mr. Prescott devoted a considerable portion of his time to questioning me concerning the details of my scheme of harmonic multiple telegraphy, and seemed much interested in the subject on the occasion of my first visit to the Western Union office; and on the occasion of my second visit, which was next day, I requested the

return of the apparatus which I had left at the office, for the purpose of exhibiting the same to the president of the Atlantic and Pacific Telegraph Company. Mr. Prescott seemed much disturbed at this, and requested me to wait while he talked with Mr. Orton concerning the matter. I did so. Mr. Prescott was gone a very long time, — my impression is about an hour; and when he returned, he stated that Mr. Orton was anxious to see me upon the subject. I thereupon saw Mr. Orton, and had some conversation with him, which I do not give, as it was not in Mr. Prescott's presence, and I understand is not called for by the question. I left my instruments at the Western Union office, where I presume they are now. I do not remember any particular remark made by Mr. Prescott that gave me the impression that he considered my invention novel and valuable, but his whole conduct and manner referred to above led me to believe so.

[*Adjourned to July* 24, 1879, *at* 10 *A. M.*]

BOSTON, July 24, 1879.

Cross-Int. 251. There is in the record, at page 150,* a letter of yours to Mr. Gray, dated March 2, 1877, in which you say, "I do not know the nature of the application for a caveat to which you have referred as having been filed two hours after my application for a patent, except that it had something to do with the vibration of a wire in water," etc.: how did you come to know as much as that about the nature of a paper in the confidential archives of the Patent Office?

Ans. When I found that my application was in interference with some other application filed in the Patent Office, I went to Washington to examine into the matter, for I understood that an applicant in interference had a right to see that portion of the interfering application which conflicted with his invention. I therefore went to the Patent Office and requested the examiner to explain to me the exact points of interference between my application and the other. I found that there had been two interferences declared with my application. The first was with a caveat filed the same day as my

* The reference is to the printed record in the suit *Bell Telephone Company* v. *Dowd*.

application, and had already been dissolved. The examiner declined to show me the caveat, as it was a confidential document, but he indicated to me the particular clause in my application with which it had conflicted. I therefore knew it had something to do with the vibration of a wire in a liquid. I do not now remember what it was that led me to suppose that that liquid was water.

Cross-Int. 252. You mean to be understood, I suppose, that you did not see either the description or the drawings making part of that caveat, or any part of that description or the drawings?

Ans. I do.

Cross-Int. 253. I understand that when you speak of the examiner's indicating to you what part of your application it was that interfered with the caveat, you speak of an indication given by him in conversation with you and not by official letter: am I right?

Ans. Yes; he simply pointed to a clause in my application and stated that the caveat had interfered with that.

Cross-Int. 254. Was the clause which he pointed to one of the claims of your application, or some passage in the body of the application?

Ans. A passage in the body of the application.

Cross-Int. 255. Please read the passage that he pointed to, telling you that that was the passage where the interference lay.

Ans. "Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery. The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them further apart. The reciprocal vibration of the elements of a battery occasions an undulatory action in the voltaic current. The external resistance may also be varied; for instance, let mercury, or some other liquid, form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid the less resistance does the liquid offer to the passage of the current; hence the vibration of a conducting wire in mercury or other liquid, included in the circuit, occasions undulations in the current. The vertical vibration of the elements of a battery in the liquid in which they

are immersed produces an undulatory action in the current by alternately increasing and diminishing the power of the battery."

The examiner indicated the clause just quoted as the passage where the interference lay. I do not remember whether he pointed to any particular sentence in this clause or not. My impression is that I asked the examiner whether the point was the "vibration of the conducting wire in mercury or other liquid." At all events, I carried away the impression that this had been the point at issue.

Cross-Int. 256. Who was the examiner; was it Mr. Wilbur?

Ans. I do not know. I think it was Mr. Wilbur, but I am not perfectly certain.

Cross-Int. 257. In your answer to Int. 73, you say that on the 2d of June, 1875, you attempted to generate magneto-electric currents by vibrating a regular permanent steel magnet in front of a soft-iron core wound with coils of wire, there being no battery on the circuit: did the apparatus you used consist in a permanet magnet formed like a tuning fork and set in vibration by a blow, like a tuning fork, and held near the core so that the vibrations would induce currents upon the line?

Ans. It did.

[*By agreement of counsel, the whole of the provisional specification and drawings of Mr. Bell's English patent, dated Dec.* 9, 1876, *is put in, and marked "Complainants' Exhibit* 32, *Bell's English Provisional Specification," instead of the extract from it put in after Mr. Bell's one hundred and sixty-sixth answer, page* 168 *of the record.*]

Cross-Int. 258. Does your preliminary statement in the speaking-telephone interference, sworn to Nov. 20, 1878, contain the following: "Another instrument with stretched membrane was immediately constructed, and the experiment spoken of in said letter was tried of transmitting speech. One instrument was placed in my experimental room at the top of the building, and the other in the workshop below. I spoke from my room to Mr. Watson, and he spoke to me from below. I heard nothing, but Mr. Watson soon rushed up stairs, and said he could hear my voice but could not make out what I said. We then changed places, but with the same results. He heard my voice, but I could not hear his"?

Ans. It does.

Cross-Int. 259. The apparatus used in the experiment described in this quotation was the apparatus described in your patent of 1876, on which this suit is brought, and delineated in Fig. 7 of the drawings, was it not?

Ans. It was substantially similar.

Cross-Int. 260. Do you remember any difference between the apparatus used in that experiment and the apparatus described and shown in the patent?

Ans. I do. The transmitting and receiving cones shown in the patent were not employed. The armatures used in the experiment referred to were hinged to the uncovered leg of the magnet by a strip of leather. The coils used in the experiment were not specially adapted for use upon a line. I am not sure also whether any battery was used in the experiment.

Cross-Int. 261. Do you remember anything more in regard to the construction of that experimental instrument, either as to what it did contain and the patent does not, or to what it did not contain and the patent does?

Ans. The experimental instrument had an arrangement for straining the membrane and a framework for holding the magnet which are not shown in the patent.

Direct Examination resumed.

Int. 262. Please look at the quotation from your preliminary statement given in Int. 222; are the facts stated in that quotation true?

[*Objected to.*]

Ans. Yes.

Int. 263. Please look at the quotation contained in Cross-Int. 241, and state whether the "induced current," referred to in the quotation, is induced by a magneto-electric apparatus or by an induction coil, battery and circuit-breaker.

Ans. An induction coil, battery and circuit-breaker.

Int. 264. Please look at the two passages quoted in Cross-Int. 244, and produced to be put in evidence, all the paragraphs in which those quotations are found and all that intervene between them.

Ans. I produce them.

[*Complainants put in evidence said passages, and they are marked "Complainants' Exhibit 34, Extract Bell's Preliminary Statement in Harmonic Interference."*]

Int. 265. Please look at your Cross-Int. 193 and answer; state why you did not in your caveat of Oct. 27, 1874, describe or suggest the use of a common receiver of several different simultaneously transmitted tones.

[*Objected to.*]

Ans. Because it was not relevant to the subject matter of my invention, my object being to have a receiver which should respond markedly to one tone only.

Int. 266. Please look at Exhibit 18 and state whether any of the sketches in that exhibit, except Fig. 1 and Fig. 2, do or do not represent an apparatus in which the core of the electro-magnet was kept continuously polarized, when not under the influence of a battery, by induction from a permanent magnet.

Ans. Fig. 4 of Exhibit 18 shows such an apparatus.

Int. 267. Did your original idea of using permanently magnetized cores, around which to wind the coils in your telephones, contemplate the use of such polarized cores for the transmitters, or for the receivers, or for both?

[*Objected to.*]

Ans. For both.

Int. 268. What was the objection in your mind to that form of apparatus which led you at one time to prefer the use of a battery instead of depending upon permanent magnetization of the cores?

[*Objected to.*]

Ans. I thought at that time that the currents produced by the vibration of an armature in front of such core would be too feeble to produce practically useful results upon a line of any considerable resistance.

Int. 269. Did that difficulty in your mind relate to the use of polarized cores in the transmitter, or in the receiver, or both?

[*Objected to.*]

Ans. In the transmitter simply.

Int. 270. What difficulty occurred in your mind at that time in

using the polarized core for an instrument intended merely for a receiver?

[*Objected to.*]

Ans. No difficulty. I thought at that time that a polarized core in the receiver made the instrument more sensitive.

Int. 271. What led you to entertain that opinion?

[*Objected to.*]

Ans. I understood at that time that the most sensitive telegraphic instruments were polarized relays in which such a core was employed.

Int. 272. What difficulty occurred to your mind as to the use of such an instrument at one end of a line over which reciprocal transmission — that is, transmission sometimes in one direction and sometimes in the other — was to take place?

[*Objected to.*]

Ans. I feared that when such an instrument was used as a transmitter by speaking to it, the currents produced by the action of the voice would be too feeble for practical purposes.

ALEXANDER GRAHAM BELL.

Attest: W. P. PREBLE, Jr., *Examiner.*

DEPOSITION OF THOMAS A. WATSON.

BOSTON, July 14, 1879.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. Please state your name, age, residence, and occupation.

Ans. Thomas A. Watson; twenty-five; Boston, Mass.; general inspector of the National Bell Telephone Company.

Int. 2. When and how did you first become acquainted with Mr. A. G. Bell?

Ans. By making instruments for experimental purposes for him, in the winter of 1874–75, at Charles Williams, Jr.'s, manufactory, 109 Court Street, Boston.

Int. 3. What knowledge or experience had you then relating to electricity and electrical apparatus?

Ans. What I had gained by nearly two years' practical experience in Mr. Williams's manufactory, making electrical instruments, and also by study of various works on electricity and telegraphy.

Int. 4. During the winter of 1874-75 did Mr. Bell speak to you about any plans for the transmission of articulate speech; if so, what did he say to you about it, and how often did he speak to you upon the subject?

Ans. He did. On one occasion in January, 1875, he told me that he had plans by means of which he would cause a telegraph instrument to utter spoken words instead of making dots and dashes, and told me of an instrument he had devised for doing this. I do not remember how this instrument was to be constructed. At another time, within a month or two of the above date, he told me about an experiment he had made at Moses G. Farmer's laboratory, where he had connected a coil of wire in circuit with a galvanometer and moved a permanent magnet to and fro in front of the pole of the coil of wire, thereby causing the needle of the galvanometer to move from side to side as he moved the magnet.

Int. 5. Whether or not, during your connection with Mr. Bell, you assisted him in making experiments in addition to making apparatus?

Ans. I did.

Int. 6. Do you remember using with him tuned reed receivers, substantially like that shown in the figures of his eighteenth answer?

Ans. I do.

Int. 7. Did you ever hear from a single one of such receivers tones of different pitches transmitted by transmitters of different pitch? If so, state how you used the receivers, and whether you did this more than once, and state when you first did it.

Ans. I have heard such tones from one of these receivers, by pressing the reed against my ear. I did this many times during the winter of 1874–75; certainly earlier than the middle of February.

[*Adjourned to July* 15, 1879, *at* 10 *A. M.*]

BOSTON, July 15, 1879.

Int. 8. Do you remember the experiment at Mr. Fenollosa's music rooms in May, 1875? If so, describe it.

Ans. I do. We had a line run between Mr. Bell's laboratory in Salem and the music room in the next building. We arranged a current interrupter on the line in the laboratory and passed the intermittent current through the strings of a piano at the music room. I remained at the laboratory during the entire experiment. Mr. Bell was at the music room during the first part of the experiment, but came to the laboratory afterwards. He told me that he could not be sure whether he heard a musical note on the piano string or not. We then arranged a harmonic receiver on the line at the laboratory, and he directed some one at the music room to sound continuously one of the strings of the piano, while he listened at the receiving instrument. My impression is that the result of the second experiment was the same as the first. I do not think I was able to hear anything in the second experiment.

Int. 9. Do you remember the incident referred to by Mr. Bell in his deposition of your plucking a reed, and thereby causing a receiver to sound, on June 2, 1875? And if so, please describe it.

Ans. I do perfectly. I do not remember the details of the connection, but we had a number of current interrupters and harmonic receivers arranged in circuit. Mr. Bell had charge of one station in one room, and I was in charge of the other station in an adjoining room. One of the reeds at my station would not vibrate, and on telling Mr. Bell, he called out to me to pluck it, which was a common way we had of starting a reed if it would not vibrate. This produced some effect at Mr. Bell's station that caused considerable excitement in his mind, as he immediately asked me what I had done, and desired me to do it again, which I did. He then showed me that the effect of this plucking was to produce a slight vibration in the receiving instrument at his station without a battery. We then changed the arrangement of circuit and instruments, and tried it in various ways, getting the best results for two harmonic receivers in the same circuit with or without a battery.

Int. 10. Do you remember, at or about that time, vibrating a permanent magnet in front of the core of an electro-magnet? If so, describe that experiment and the results observed in it.

Ans. I do perfectly. We arranged an ordinary electro-magnet in circuit with a harmonic receiver and vibrated a horseshoe perma-

nent magnet in front of the poles of the electro-magnet; and listening at the harmonic receiver, could hear the musical note of the permanent magnet loudly.

Int. 11. Please look at the permanent magnet now shown you, and which is the one produced by Mr. Bell in answer to Int. 73. State whether it is or is not the permanent magnet referred to in your last answer, and whether it is or is not in the same condition it was in when you so used it.

Ans. It is the identical magnet then used, but has since been mounted on a standard and painted.

Int. 12. When did Mr. Bell direct you to make the first membrane telephone you ever saw, and when did you make it?

Ans. June 2, 1875, the same day that the experiment noted in my ninth answer took place, and immediately after it. I think I completed the instrument the next day, but certainly within three days.

Int. 13. Describe the first experiment you tried with it.

Ans. We had a line running from the attic of Mr. Williams's factory to the third story. In the attic we connected to this line the membrane telephone. In the third story we connected a harmonic receiver. I shouted into the membrane telephone. Mr. Bell listened at the receiver. I think he heard nothing. We changed places. He shouted at the telephone and I listened at the receiver. I could hear a faint sound. We were not able to use the instrument but a very short time, as the membrane got torn. I do not remember whether there was a battery in circuit or not, but I think we tried it both with and without.

Int. 14. Did you afterwards make a second membrane instrument; and if so, when?

Ans. I did; some time during the following month or six weeks.

Int. 15. Do you remember trying two membrane telephones, using one instrument as a transmitter and the other as a receiver? If so, state where such experiment was made and the results obtained in it.

Ans. I do; the experiment was made on the line described in my thirteenth answer. I think the results were a slight improvement on what we had previously obtained. My recollection of this exper-

iment is confused with those that preceded, extending through the month of June, 1875.

Int. 16. Did Mr. Bell, at any time during the month of July, state to you the practical results which he expected to obtain by the use of apparatus similar in principle to the membrane telephones you have just spoken of; and if so, what did he state on that subject?

Ans. Yes; he told me, on June 2, that he considered he had solved the problem of transmission of speech by the accidental discovery made on that day, of the effect produced by plucking the reed.

Int. 17. Did he, after the 2d of June, 1875, at any other time during that summer, speak to you of the practical results which would be obtained from the invention or discovery he had made; if so, how often did he speak to you about it?

Ans. During June and July we experimented together almost daily. He was always confident that by utilizing the June 2 discovery he could not only transmit speech telegraphically, but could overcome the difficulties that prevented the practical use of a harmonic telegraph which he had been working on for the previous six months with my assistance.

Int. 18. Please look at the articles now shown you, which are the same referred to in Mr. Bell's seventy-fourth and eighty-fourth answers, and state what they are.

Ans. They are portions of the first membrane telephones that I constructed for Mr. Bell. They are the base board and membrane rings of one, and the membrane rings of the other with the cross bar that supported the magnet, — an electro-magnet and an armature.

Int. 19. Were the changes which were made, if any, in the month of June, 1875, in the uncovered leg and armature of the electro-magnet of the first membrane telephone, correctly described in Mr. Bell's seventy-fourth answer? If not, state how your recollection differs from his, if at all.

Ans. They are correctly described in that answer.

Int. 20. Please look at the complainants' Exhibit 19 and 22, put in evidence in Mr. Bell's seventy-sixth and eighty-seventh answers. State whether they are or are not duplicates of the two original membrane telephones which you have spoken of and of which you

have identified some of the parts. State also in what respects, if any, they differ from such original membrane telephones.

Ans. They are duplicates with the following exceptions: In Exhibit 19 the wooden framework is a little heavier, and the armature not so thick. In Exhibit 22 the framework is heavier, armature thinner, and a different method for adjusting the distance between the pole of the magnet and armature is supplied. In the original the adjustment was made by sliding the cross bar that supported the magnet up and down in the slots in the sides, as in Exhibit 19.

Int. 21. State how the armature Exhibit 21, and its mode of attachment to the pole of the magnet, compare with the armature and mode of attachment first used in the first telephone used in June, 1875.

Ans. I should say there is no essential difference. Exhibit 33 is about a sixteenth of an inch shorter, a thirty-second of an inch narrower, a thirty-second thicker, and the brass post by which it was attached to the membrane slightly longer and of greater diameter. The mode of attachment of the armature to the pole of the magnet is the same as used in that first experiment.

Int. 22. Please compare the armatures now on Exhibits 19 and 22 and their mode of attachment with the second armature which you put on to the membrane telephone of June 2, 1875, and described by Mr. Bell in his seventy-fourth answer.

Ans. The armatures of Exhibits 19 and 22 are a little thinner, and the armature is pivoted to the pole of the magnet instead of being hinged with leather.

Int. 23. Please look at complainants' Exhibits 20 and 23, and state whether they are correctly described in Mr. Bell's seventy-sixth and eighty-sixth answers.

Ans. They are correctly described in those answers.

Int. 24. Have you tried to transmit articulate speech with the instruments Exhibits 19, 20, 21, 22 and 23? If so, state when, where and how, and with what results.

Ans. I have. On Saturday, July 5, 1879, I tried the membrane telephones Exhibits 19 and 22 on a line between two parts of the building 40 State Street, with the circuits arranged as in Mr. Cross's third answer, using the sheepskin diaphragms Exhibits 20

and 23, and the heavy armatures Exhibit 21 and another one like it, which I now produce. I carried on conversation with Prof. Bell successfully, using three cells bichromate battery, the same that Mr. Cross described.

On Monday, July 7, I placed the instruments in circuit between the attic and third story of Mr. Williams's manufactory, under almost precisely the same conditions as the experiment of June 2, 1875. I could hear occasionally very faint sounds. The battery used was two large bichromate cells. We then carried the instruments to 40 State Street, and tested them again on the same circuit as on the 5th, with as good results as obtained that day. The experiments were made in the presence of Mr. Bell, Mr. Storrow, Mr. J. B. Henck, Jr., Dr. Clarence J. Blake and Mr. Berliner.

On the following Wednesday we tried the telephones at 40 State Street, with the goldbeater's skin diaphragms in place of the sheepskin diaphragms, and with thin clock-spring armatures, which are now on the exhibits. We succeeded in transmitting a few words, but I do not think the articulation was as distinct as with the thick diaphragms. The thin diaphragms also moistened and became flabby very quickly.

[*Complainants put in evidence the heavy armature produced by the witness, and it is marked "Complainants' Exhibit* 35, *Bell Telephone of* 1875, *Duplicate Heavy Armature."*]

Int. 25. Please state how the results which you obtained in the trials just mentioned compare with the results obtained in the trials of June and July, 1875. If there is any difference, state what, in your opinion, is the cause of it.

Ans. In the experiment of July 7, 1879, at Mr. Williams's workshop, I do not think the results were any better, if as good, as those obtained in June or July, 1875; but the results obtained at 40 State Street, on July 5, 7 and 9, 1879, were decidedly better. The reason why the results were better at 40 State Street is, in my opinion, due to the fact that we were in a very quiet place, and that we were more practised in listening for faint sounds than in 1875.

Int. 26. Do you, in your experience, find that practice in the use of telephones enables a person to hear articulate speech from an

instrument which without practice they cannot hear from? State what experience you have had on that subject.

Ans. In the experience derived from two years' work in practically introducing the telephone, I have found that it is almost invariably the case that a person listening to a telephone for the first time is unable to hear anything. The more powerful the transmitting instrument, the more readily do persons become expert in hearing the sound.

Int. 27. Whether or not you have found among persons who are not deaf, and who have had some practice in the use of telephones, any considerable difference in their ability to hear articulate speech from weak or imperfect telephones?

Ans. I have found a great difference.

Int. 28. Please look at the instrument now shown you; state who made it, what it was made for, and whether it was one of the instruments used in the experiments of June, 1875; and if so, state how it was then used.

Ans. I made it. It was made for a receiver for the harmonic telegraph that Mr. Bell was experimenting on during the winter of 1874–75. The whole of the instrument is not here: the reed and clamp are missing. It was used by clamping a reed on that pole of the electro-magnet to which the cross piece is attached, and allowing it to project over the other pole, but not in contact with it. The bobbin on the pole with the cross piece was put on in June, 1875, for the purpose of experimenting on the discovery made on the second day of that month.

Int. 29. How does it resemble the reed receivers which were used in the experiment of June 2, 1875, or that one which was used as a receiver with the first membrane telephone as a transmitter a few days afterward?

Ans. It is similar, and I think the same instrument.

Int. 30. What are the two tall brass posts in line in front of the electro-magnet there?

Ans. They are portions of what Mr. Bell called his vibratory circuit-breaker, which is shown in his patent of June 6, 1876.

Int. 31. How long is the core of the electro-magnet over which the free end of the reed projected?

Ans. About an inch and one quarter.

Int. 32. Will you please add to that instrument a reed and clamp such as were on it in June, 1875, in order that the whole may be put in evidence as an exhibit?

Ans. I will do so.

Int. 33. What was that blue coil on the leg which carries the clamp put on for, how was it used, and did you find any advantage in using it?

Ans. It was put on in order to ascertain the effect of magnetization of the reed by a local battery, the blue coil being connected directly with a battery and the other coil with the line wire. The battery current was continuous. On vibrating the reed, magneto-electric currents were induced in the coil connected to the main line. I do not exactly remember, but think it made no difference whether the battery was connected in the local coil or in the main line coil.

Int. 34. Did you know, in the fall of 1875, that Mr. Bell was preparing specifications for his patent of March 7, 1876? And if so, state what you knew about it.

Ans. I did. I remember hearing Mr. Gardiner G. Hubbard urging Mr. Bell to hurry in the preparation of that specification some time during the fall of 1875.

Int. 35. Did you, during that fall or winter, hear why the filing of the specification was delayed?

Ans. I did. Mr. Bell told me that unless he applied for a patent in England before he did in the United States, he was liable to lose his English patent, and I also knew that he was making arrangements with some one to take out the English patent for him.

Int. 36. Please look at the exhibits now shown you, marked 26, 27, 28 and 29, put in evidence at Mr. Bell's one hundred and forty-fifth answer. State who made them, and whether they were or were not exhibited at Philadelphia, at the Centennial Exhibition.

Ans. All four of the exhibits were made by me, and were exhibited at the Centennial. I knew they were going to be sent there, and I saw them there myself. The cone of the liquid transmitter,

Exhibit 29, has been broken. The straight part that fitted into the transmitter is missing, and it has been mutilated by being converted into a gas stove by myself.

Int. 37. Was articulate speech transmitted by the liquid transmitter, Exhibit 29, before it went to Philadelphia?

Ans. I think it was. If not by that instrument, by a similar one.

Int. 38. Exhibit 30, Bell's memoranda of experiments 1876, are copies of the memoranda which he produced in his one hundred and forty-ninth and subsequent answers: did you see those memoranda on or about the dates at which they were written?

Ans. I did.

Int. 39. Your name is mentioned in these memoranda in connection with a number of experiments: were those experiments performed by you or with your assistance at or about the times of their respective dates?

Ans. They were.

Int. 40. Did you know about the other experiments at the time; and if so, how did you come to know about them?

Ans. I did. Mr. Bell told me of them, and showed me the notes.

Int. 41. Please look at the Exhibit 31, referred to in Mr. Bell's one hundred and sixty-third answer. When was it made and first used, and for what purpose?

Ans. It was made on or about July 15, 1876, at Charles Williams, Jr.'s, workshop, and was intended to be used in the telephones Mr. Bell was using at that time. I know this from the fact that the shaft projecting from the back piece allowed it to be clamped in the ordinary holder in any of his telephones, and I also helped try it.

Int. 42. Mr. Bell, in his one hundred and sixty-fourth answer, speaks of the transmission of speech by telephone between Boston and Cambridge by the use of a permanent magnet and without a battery: do you remember that occasion? And if so, describe the part that you took in it.

Ans. I remember the occasion perfectly. I was at the Boston end of the line, and I think the permanent magnet used was Exhibit 31.

Int. 43. Did you both listen and speak?

Ans. I did; at the same instrument.

Int. 44. Did you hear articulate speech when you listened?

Ans. I did, perfectly.

Int. 45. Where was the battery which was used in any part of that experiment, if any was used?

Ans. At the Boston end of the line in my charge.

Int. 46. Did you at any time transmit or receive speech over the line upon that occasion when the battery was cut off from the circuit?

Ans. I did.

Int. 47. Please look at complainants' Exhibit 33, referred to in Mr. Bell's one hundred and sixty-seventh to one hundred and sixty-ninth answers; state who made it and when it was made.

Ans. I made it during June, 1876, and tested it with Mr. Bell about the first of July.

Int. 48. Did you ever see it used as a transmitter for articulate speech; if so, when?

Ans. I did, and used it for a transmitter about the first of July, 1876.

Int. 49. Have you ever tried, in the speaking telephone for the transmission of articulate speech, diaphragms of different size and thicknesses; if so, what effect did those differences have on the sound heard at the receiving end?

Ans. I have tried such diaphragms. Keeping the thickness of the diaphragms constant and increasing the diameter above a certain size causes what I term a drummy sound to accompany the articulation at the receiving end. Reducing the diameter causes a nasal sound at the receiving instrument. The same effects are produced by keeping the diameter of the diaphragms constant and decreasing and increasing the thickness.

Int. 50. Have you had any practical experience as to the effect of taking away in whole or in part the casing which, in the ordinary hand telephones, encloses the space immediately behind the diaphragm, and round the coil of the magnet? If yea, state what experience you have had on that subject, and what is the result of making that change.

Ans. I have. In the summer of 1877 I had some hand telephones made for practical use, with a portion of this casing removed.

About twenty-five of these were sent out to our agents. I received complaints shortly after that they did not work satisfactorily, on account of the holes back of the diaphragm, and that the agents were obliged to stop up the holes in order to make the instruments work successfully. I made a careful test myself, and saw that it would not do to leave the casing open, and had a number of telephones then in process of manufacture altered. In Indianapolis, in June of the present year, I was using a telephone in which our agent had made holes back of the diaphragm. Did not know at first that the holes were there, and was surprised at the difficulty with which I heard the voice of the distant speaker. On examining, I found what the trouble was. On stopping up these holes with my fingers I could hear much better. In my opinion, having the back of the diaphragm open would prevent the telephone from being used in many cases where there are outside noises; and I should consider that if two telephone companies were in competition, one using a closed diaphragm and the other a diaphragm open at the back, the former company would have a great advantage over the latter company.

Int. 51. Please look at the instruments now shown you, marked "Complainants' Exhibits 36 and 37," referred to in Prof. Cross's third answer; state whether they were made under your direction, and who made them.

Ans. They were made under my direction by Edward Wilson, one of Mr. Williams's workmen.

Int. 52. Where or how did you obtain directions as to the size of the instrument, of its armature, of its magnet, etc., as well as its general construction?

Ans. I made careful measurements of two instruments introduced as exhibits in Mr. E. S. Renwick's deposition in New York, and the instruments were constructed in accordance with these measurements.

Int. 53. What directions did you give the workman who made them?

Ans. I gave him rough drawings with the measurements marked on them. They were sufficient for him to work by.

Int. 54. Were the instruments 38 and 39, referred to in Prof.

Cross's fourth answer, made under your direction? If so, state what directions were given to you as to size, shape, arrangement, etc.

Ans. They were. A tracing of the drawings filed by Mr. Bell in the Patent Office, with his application for the patent of March 7, 1876, was given to me by counsel, with a request that I should have made a pair of instruments exactly like those shown in the tracing, and of the same size. The drawing was given to Edward Wilson by me and he was directed to make the instruments, which he did.

Int. 55. Please look at the instruments 40 and 41, referred to in Prof. Cross's fifth answer, and state whether they or any part of them were made under your direction, and where and how you procured the parts that were not made under your direction.

Ans. They were made under my directions, with the exception of the membranes and mouthpieces. The latter are the regular membranes and mouthpieces, known as the lovers' telegraph, which operate by a string stretched from one membrane to the other. I purchased them on the street during April or May of the present year.

Int. 56. Who made the parts that were made under your directions, and what directions did you give him about making them and about the size of the parts?

Ans. Edward Wilson. I gave him the size of the core, coil and armature; told him how I wanted it fastened to the tin mouthpiece, and left the rest to his discretion.

Int. 57. What determined you in fixing upon the size of core, coil and armature which is found in these instruments?

Ans. I made them in the same general proportion as those represented in Mr. Bell's March 7, 1876, patent. I took no measurements.

Int. 58. Please look at the instruments Exhibits 42 and 43; state whether they were made under your direction, and if so, what instructions were given you about making them.

Ans. They were made under my directions and were modeled after Exhibits 36 and 37, except as regards the method of adjusting the tension of the diaphragm and the omission of the slide which carries the mouthpiece of 36 and 37.

Int. 59. Who made them, and what directions did you give to the workmen about making them?

Ans. The mouthpieces were made by a tinsmith outside of Williams's shop, whose name I forget. The wooden rings were turned by a wood turner in Mr. Williams's employ, from a rough drawing which I furnished. The rest of the instruments were made by Oscar Ziegler, one of Charles Williams, Jr.'s, workmen. The latter worked from one of the instruments 36 or 37. The diaphragms were, I think, stretched by me.

Int. 60. Did you stretch any of these membranes except those of 42 and 43; if so, which?

Ans. I did not.

Int. 61. Of what material are these different membranes made?

Ans. The membranes of Exhibits 36 and 37, 42 and 43, are made of parchment such as is used for legal purposes. Exhibits 38 and 39 have membranes of goldbeater's skin. Exhibits 40 and 41 are, I think, made of bladder.

Int. 62. Please look at Exhibits 44 and 45. Were they made under your direction; and if so, what directions did you have about making them?

Ans. They were. I was told by counsel to make an armature attached to a diaphragm as represented in Mr. Bell's March 7, 1876, patent, that could be placed in an ordinary hand telephone; and I gave directions and a rough drawing to Edward Wilson, and he made the instruments.

Int. 63. What directions did you give about the size of the armature?

Ans. I do not remember, but it is my impression that I left it to Edward Wilson's discretion. The diaphragms are made of legal parchment.

Int. 64. Whether or not you had anything to do with making the telephones Exhibits 18, 19, 20, 21 and 22, — that is, the duplicate telephones of 1875?

Ans. The instruments were not made under my directions, but were made while I was absent on a trip West.

Int. 65. State whether or not these instruments 36 to 43, inclu-

sive, and 19 and 22, are made substantially in accordance with the specification of Mr. Bell's patent of March 7, 1876.

Ans. They are.

Int. 66. Did you take part in any or all of the experiments described in answers 3 to 10 inclusive of Prof. Cross's deposition? If yea, state whether these answers give a correct account of the experiments you witnessed.

Ans. I was present at all those experiments, and I consider the answers correct accounts of the results obtained. [Said answers are printed at the end of Mr. Watson's deposition, p. 223 *infra.*]

Int. 67. Please look at complainants' Exhibit 28, Bell's Centennial Iron Box Magnet Receiver, and state whether you know that that instrument, or one like it, was ever used as a transmitter of articulate speech, and if so, when for the first time.

Ans. I remember using this as a transmitter by placing my hand over an iron plate laid on the top of the tube and talking under my hand against this plate. This was some time during May, 1876. It was somewhere near the date of the presentation to the American Academy of the paper complainants' Exhibit 46. That paper appears to have been presented May 10, 1876. Mr. Bell was at the other end of the line listening at the receiving instrument.

[*Adjourned to Thursday, July* 17, 1879, *at* 10 *A. M.*]

BOSTON, July 24, 1879.

Int. 68. In the memoranda of trials, Exhibit 30, near the end, I find a drawing of a box telephone, which is described as follows: —

"4. Instruments shown in Fig. 3 were constructed somewhere about the 19th or 20th of October before Mr. Watson left for Philadelphia, and they are still the instruments preferred. The electromagnet was placed in a box B, of wood. The front of the box was then cut away and a sheet of thin steel, A, was screwed on to it by screws *s*, *s*, *s*, *s*."

Do you remember making that instrument; and if so, when?

Ans. I remember, perfectly, making the instruments about the middle of October, 1876. I made two that were almost precisely similar.

Int. 69. When you first made them, did you put in permanent magnets, or simply soft-iron cores without any permanent magnet?

Ans. I put in soft-iron cores without any permanent magnet.

Int. 70. Did you ever change them by putting in permanent magnets instead of the soft-iron cores; and if so, when?

Ans. I did; about the middle of November, 1876, I substituted for the soft-iron cores in these two instruments hardened steel permanent magnets.

Int. 71. After the middle of November, 1876, did you habitually use for your regular trials and experiments and other uses of speaking telephones, instruments with permanent magnets, and without a battery, or instruments with soft-iron core, electro-magnets and batteries?

Ans. I do not think we discarded the electro-magnets and battery altogether till about the first of December, but used one about as much as the other till that time.

Int. 72. Are you familiar with the various forms of telephone in practical use?

Ans. I am.

Int. 73. What kinds of telephones are in practical use which are not provided with a cover to enclose tightly the electro-magnet and back side of the diaphragm?

Ans. I know of none.

Int. 74. What kind of telephones are in practical use which are not provided with a perforated cover in front of the diaphragm, forming a thin chamber in front of the diaphragm, with an opening to speak into or to listen at?

Ans. I know of none.

Int. 75. Have you tried, in the speaking telephone, the use of an instrument which has a tube, of some considerable length, for the sound to travel through between the diaphragm and the operator, as compared with telephones in which the part in front of the disk is constructed like that part in complainants' Exhibit 25, Bell Hand Telephone?

Ans. I have.

Int. 76. What practical difference do you find with regard to the distinctness with which articulate speech is transmitted between these two forms?

Ans. I find there is no practical difference.

Int. 77. In the receiving instruments ordinarily used in speaking telephones, how close is the ear of the listener commonly placed to the diaphragm?

Ans. Rather less than half an inch.

Int. 78. Are there any speaking telephones in practical use in which, either in the transmitter or receiver, a diaphragm is placed in contact with or resting upon the pole of an electro-magnet?

Ans. I know of none.

Int. 79. What is the practical effect of having them in contact as compared with having them close to each other, but so that they never touch?

Ans. In all cases that have come under my observation, the instruments work so much more poorly when the diaphragm is in contact with the pole of the magnet as to render them impracticable for use and to necessitate readjustment.

[*Adjourned.*]

BOSTON, July 25, 1879.

Int. 80. Please look at the description of the trials of June 2, 1879, at No. 40 State Street, Boston, given in Dr. Blake's deposition in his eighth, ninth, tenth, eleventh and twelfth answers, and state generally whether that description is correct.

Ans. I have looked at the description, and think it substantially correct, except that a good many sentences were transmitted, and other parties listened and talked besides Dr. Blake.*

Int. 81. Please describe generally the construction, mode of operation and size of parts of the common Morse relays or sounders in common use.

* See Mr. Watson's Int. 113, page 307 *infra*, and Dr. Blake's deposition, page 335 *infra*.

Ans. A Morse relay consists of an electro-magnet, fastened to a base, having a lever pivoted at one end, to which is attached an armature of iron opposite the poles of an electro-magnet. This lever is pulled away from the electro-magnet by a spring, and its motion is limited by adjustable screws. The size of the parts varies greatly in different instruments. The length of the electro-magnet ranges from three fourths of an inch to four inches, the resistance from ten or less to three hundred or more ohms. The armature is usually about a sixteenth of an inch thick, half an inch wide and an inch and a half long, with the lever two or three inches long. Its operation is as follows: When the key is depressed at the transmitting station, an electric current passes through the coil of the electro-magnet, which draws the armature towards the cores. When the current ceases, the spring draws the armature back.

Int. 82. Please describe the difference between such a relay and a polarized relay.

Ans. In a polarized relay the cores and armature are magnetized by being fastened to a permanent magnet, and the retractile spring is usually omitted. It is usually operated by reversing instead of merely making and breaking the electric current. The armature is pivoted to one pole of the permanent magnet, and its free end plays between two prolongations of the cores of the electro-magnet. The length of the armature varies from an inch and a half to four inches, the length of the cores from about one inch to two inches and a half. These dimensions are of instruments that have come under my observation, but they are sometimes made greater or less. I believe that in some instruments the armatures and cores are polarized by a battery and coil instead of a permanent magnet, but the effect is the same in either case.

Int. 83. Are you acquainted with any electric bell in practical use, in which the moving portion consists of a lever pivoted at one end, and acted upon by an electro-magnet through the coils of which an electric current is passed? And if so, describe it and the size of its parts.

Ans. I am. The lever is about five inches long, and consists of a strip of iron about three inches long, one eighth thick, three eighths wide. This iron has attached to one end a wire about two inches long, with a metal ball on its end to strike the bell. The armature is pivoted at the other end on one pole of a permanent magnet, and plays between the two cores of an electro-magnet, which is fastened on the other pole of the permanent magnet. The current which actuates this armature is a reversed current produced by a small dynamo-electric machine. The effect of the current is to cause the armature to move rapidly to and fro, having an amplitude of motion of a quarter of an inch. This apparatus is an ordinary form of what is called a magneto bell.

Int. 84. Please state how rapidly the vibrating lever is caused to move in the ordinary operation of the instruments you have described, specifying as to each.

Ans. I should say about ten times per second; but it can be made to move more rapidly.

Cross Examination by CAUSTEN BROWNE, Esq., *of Counsel for Defendant.*

Cross-Int. 85. Describe what you mean by the harmonic receiver which was arranged on the line on the experiment at Mr. Fenollosa's music rooms in 1875, as mentioned in your eighth answer.

Ans. It consisted of an electro-magnet made by attaching a round core of soft iron, with a coil of wire round it, to one end of an L-shaped piece of iron, and to the other end of this piece of iron was clamped a piece of spring steel, projecting over the end of the core, about an inch and a half long, five eighths wide and a fifteenth of an inch thick.

Cross-Int. 86. In the making of the various membrane speaking telephones for experiment or for use as exhibits in this case, from the time that your employment with Mr. Bell began until now, what has been the course of proceeding as to the membranes to insure their having in the instrument the requisite stiffness and elasticity?

Ans. They were moistened, stretched over the ring upon which they were to be mounted in the instrument when in a moist condition, as tightly as possible, and tied with a string or wire.

Cross-Int. 87. Was anything else done to them?

Ans. Nothing, except to let them dry and attach the magnet; and on one occasion I gave directions to have them shellacked, in order to prevent their absorbing moisture from the breath. The only membranes that were shellacked are Exhibits 44 and 45, 38 and 39.

Cross-Int. 88. Why did not the others require to be shellacked for the same purpose?

Ans. Those that were shellacked were so treated to see if any benefit arose from it; and as no necessity arose for talking to the instruments any length of time, I did not have the others shellacked. Some of them were made before the idea struck me of shellacking the diaphragm.

Cross-Int. 89. The other instruments were, if I understand you, not subjected to any use which showed the necessity of shellacking, — showed no imperfection in working which might be remedied by shellacking, did they?

Ans. Yes; I think all of the instruments would have been improved if they had been shellacked, as it would have prevented their absorbing moisture, which I have always found has been an imperfection.

Cross-Int. 90. How long do you think a stretched membrane could be exposed to the moisture of the human breath by actual use in talking against it without becoming flabby so as to require to be replaced or restretched?

Ans. I think it would become somewhat flabby in rather less than half an hour.

Cross-Int. 91. I mean flabby to that degree to render it unsuitable for use in the instrument.

Ans. It depends upon the material of which the membrane is

composed. With a legal parchment diaphragm, which is as good as anything, I should say that one hour's constant use would render it inoperative.

Cross-Int. 92. How would it be with goldbeater's skin?

Ans. It would become useless very much more quickly.

Cross-Int. 93. When the membrane gets to this useless condition of flabbiness, what is to be done; does the instrument require a new one, or can you restore the old one to its efficiency, and how?

Ans. If it is provided with a means of adjustment, it can easily be tightened. If there are no means of adjustment, it is sufficient to let it dry, and it will then work as before.

Cross-Int. 94. And while it is drying you must get along without using the telephone, I suppose?

Ans. Certainly. It is necessary, in order to have it dry, to stop speaking to it.

Cross-Int. 95. In some of the experimental or exhibit membrane telephones which have been put in evidence in this case, the armatures are heavier than in the others. What do you understand to be the rule in the construction of membrane telephones, such as are supposed to be shown in the Bell patent of 1876, for determining within reasonable limits the weight of the armature for a membrane of one or another diameter, thickness or material?

Ans. I have no rule. The first armature, Exhibit 24, is about the size of the armature of an ordinary Morse relay, and I think I followed the relay as a model. I have found, however, that it makes very little difference, within reasonable limits, what the weight of the armature is.

Cross-Int. 96. Now please state what you understand by reasonable limits, outside of which it will make a difference.

Ans. I should expect to get good results out of an armature a sixteenth of an inch wide, one sixty-fourth thick, and an inch or two in length, and also from one two inches wide, a quarter of an inch thick and the same length or longer; the length of the armature to be a little greater than one half the diameter of the membrane to which it is to be attached.

Cross-Int. 97. Using, I suppose you mean, for each of these armatures one and the same membrane?

Ans. If the membrane was as large and thick as in Exhibits 20 and 35, any of these armatures could be used with good results. I do not think the difference in the results would be very great.

Cross-Int. 98. I suppose you mean that ordinarily a membrane large and thick enough to actuate a heavy armature will actuate a light one practically well?

Ans. That has been my experience.

Cross-Int 99. Now, as to the converse: a membrane thick and strong enough to properly actuate a light armature will not for that reason answer for a heavy armature, will it?

Ans. There is such a thing as getting an armature too heavy for a membrane, and I do not think the diaphragm of Exhibits 38 and 39, Baby Telephones, would actuate the heavy armature, Exhibit 21, while it might actuate one twice as heavy as that now attached to it.

Cross-Int. 100. Is there any way of determining beforehand the weight of the armature to be used relatively to the thickness and size of the membrane desired to be used?

Ans. I have no way, and know of none.

Cross-Int. 101. Do you know what conditions about a membrane affect or determine what is known as its fundamental rate of vibration?

Ans. I think the diameter, thickness, and material of which the membrane is composed determine the fundamental of the membrane.

Cross-Int. 102. Does its degree of tension also enter into the question?

Ans. It does.

Cross-Int. 103. Do you know what is the effect of subjecting a metallic diaphragm to tension as to its efficiency for the purposes of a speaking telephone?

Ans. I do, I think.

Cross-Int. 104. What is it?

Ans. If the tension is that produced by hammering the metallic diaphragm into a concave form, it does not work as well as if it were flat. If simply stretched laterally, I do not think it would make any difference. But if a metallic diaphragm is clamped very tightly, the transmitted speech is sometimes accompanied by over-

tones. This does not by any means render the instrument inoperative.

Cross-Int. 105. What effect does it have upon the transmitted speech?

Ans. It causes a disagreeable overtone to accompany the voice in the receiving instrument.

Cross-Int. 106. Has this accompanying overtone no effect upon the distinctness of the sound or articulation to the listener's ear?

Ans. If very strong, it renders the articulation somewhat indistinct; but if slight, it is not noticeable.

Cross-Int. 107. Upon what conditions of the clamped diaphragm does it depend whether the accompanying overtone be strong enough to make the articulation indistinct or not?

Ans. If the diaphragm is clamped very strongly between two metal surfaces, the overtone is stronger than if it is clamped loosely; but I have found where a telephone is very indistinct that it is due to some imperfection in the diaphragm, such as a dent or a warp.

Cross-Int. 108. Is Mr. E. L. Wilson, who has testified for the complainants here, in the employment of Prof. Bell?

Ans. He is not.

Direct Examination resumed.

Int. 109. In making the experimental instruments constructed by you or under your direction since the 1st of April of this year, as stated in your direct examination, did you or did you not change the armatures after the instruments were first made and tried?

Ans. I did not change any of the armatures.

[*Complainants put in evidence the harmonic receiver referred to by the witness above and taken by him for additions, and it is marked "Complainants' Exhibit* 48, *Bell's Harmonic Receiver, W. P. Preble, Jr., Examiner."*]

THOMAS A. WATSON.

Attest: W. P. PREBLE, Jr., *Examiner.*

ANSWERS OF PROF. CROSS IN THE DOWD SUIT REFERRED TO IN MR. WATSON'S ANSWER SIXTY-SIX, PAGE 214, *supra*.

Int. 3. Have you ever tried to transmit articulate speech with this pair of telephones, Nos. 36 and 37; and if so, under what circumstances, and with what result?

Ans. I have tried a large number of experiments with these, and certain other telephones of similar construction. The following are the general circumstances under which these experiments took place: The transmitter was placed in room No. 42, Union Building, on State Street, Boston; the receiver was placed in the office of Mr. J. J. Storrow, in the same building, a story lower. The two rooms are separated by an open court, about one hundred feet long, so that no sound was transmitted through the air. The windows were kept tightly closed during the experiments. I was at the receiving end through most of the experiments. My assistant in the department of physics in the Massachusetts Institute of Technology, Mr. J. B. Henck, Jr., was at the transmitter. The battery used was three Bunsen's cells, with chromic acid solution in the porous cups. The first experiments were made June 5, 1879. The messages were sent from the transmitting to the receiving end through a wire connecting the two instruments. A second wire was used for a return circuit. My results were verified by having the message repeated through a second circuit, embracing two ordinary hand telephones. Several different persons spoke into the transmitting instruments. With the telephones described, and marked 36 and 37, singing, laughing and articulate speech were transmitted so as to be clearly understood. Both sentences and regular and irregular counting were distinctly understood at the receiving end. In several cases I recognized the voice of the person speaking. Afterwards I went to the transmitting end and communicated with Mr. Henck at the receiving end.

Int. 4. Please look at the telephones now shown you, and marked "Complainants' Exhibits 38 and 39, Baby Membrane Telephones." Give a general description of them, and state whether you have ever attempted to transmit articulate speech with them, and under what circumstances and with what results.

[*Complainants' counsel puts in evidence two telephones, marked "Complainants' Exhibits Baby Membrane Telephones* 38 *and* 39, *W. P. Preble, Jr., Examiner.*"]

Ans. The transmitter is of the same general construction as the transmitter already described, but differs greatly in size. The same is true of the receiving instrument. The cone is of wood about an inch and a half in length, and the large end about an inch and a half in diameter, — the membrane not quite an inch in diameter. The vibrating armature is half an inch in length, and the electro-magnet is of proportionally small dimensions. The cone of the receiving instrument is also of wood, about an inch and a half in length; the large end, which is closed by a membrane, is not quite an inch in diameter. The armature and electro-magnet are of the same size as those of the transmitter. These instruments have the same dimensions as those represented in a certified tracing from the drawings in the original specification of Fig. 7 of Bell's patent, 174,465, March 7, 1876. The general arrangements for the experiments with these telephones in actual use were the same as those already described, the trial being made on the same day. Several distinct sentences were transmitted, until I was perfectly satisfied that they were capable of transmitting articulate speech.

Int. 5. Please to look at the pair of telephones now shown you, marked "Complainants' Exhibits 40 and 41, Lover's Electric Telephones." Give a description of them; and if you have ever tried to transmit articulate speech with them, state under what circumstances and with what result.

[*Complainants' counsel offers in evidence two telephones, marked "Complainanss' Exhibits* 40 *and* 41, *Lover's Electric Telephones, W. P. Preble, Jr., Examiner.*"]

Ans. Both the transmitter and receiver, which are of precisely similar construction, are made from the cylinders and attached membranes of the ordinary lover's telegraph as sold in the street. To these, magnets and vibrating armatures have been attached, as in the telephones already described. The membranes are about an inch and a half in diameter, and are mounted upon tin tubes about two inches long. The armature is an inch in length. The experiments in the transmission of speech with these instruments were conducted

in the same general manner as those already described. Sentences and counting were distinctly transmitted, and in both directions. The same experiments were repeated on a later day with even better results.

Int. 6. State whether or not you found any change in the facility with which articulate speech could be transmitted by the three pairs of telephones you have just described after you had used them continuously for any considerable length of time.

Ans. In several instances I found that as the membrane of the transmitter became moist from the breath, in which case it grew lax and lost its elasticity, the articulation became less distinct. I noticed on one occasion that in the lover's telegraph instrument the membrane of the transmitter grew damp and articulation was impaired. On transferring the magnet and armature to a new cylinder with a dry membrane, the articulation again became clear and distinct.

Int. 7. Please look at the pair of telephones now shown you, marked "Complainants' Exhibits 42 and 43, Adjustable Membrane Telephones." Describe them; and if you have ever tried to transmit articulate speech with them, state under what circumstances and with what results.

[*Complainants' counsel puts in evidence a pair of telephones, marked "Complainants' Exhibits* 42 *and* 43, *Adjustable Membrane Telephones, W. P. Preble, Jr., Examiner."*]

Ans. The general construction of both transmitter and receiver is the same as that of the telephones complainants' Exhibits 15 and 16. They differ, however, from the latter in having an arrangement whereby the tension of the membranes can be varied. The membrane in each is attached to a wooden ring which slides over a second wooden ring. By turning three screws connecting the two wooden rings, the membrane can have its tension increased or diminished at will. The instruments described were first experimented with June 9, 1879. I began by having the membranes of both instruments slightly stretched, in which case faint articulation was heard, the words being frequently understood. On slackening the membranes still further the words became indistinguishable. When the person at the transmitting instrument counted before it, a noise was heard which as nearly as I can represent it in words was as follows: "Boop, boop,

boop, boop-boop, boop-boop, a-hoop, a-hoop, a-hoop," — one sound for each syllable. I then asked the person at the transmitter to pluck the armature with his finger. The sound produced at the receiver can be represented by the words: "Boop, boop, boop, boop." The circuit was then made and broken by hand, giving noises, "Dub, dub, dub, dub." The magnet was then drawn so far from the membrane that even when the current passed, the membrane was still very lax. When my assistant spoke into the transmitter, I heard a noise which I recognized as a voice, but very faint. No words could be distinguished. As my assistant counted I heard the noise, "Boop, boop, boop-boop," — one word for each syllable.

On tightening the membrane, this effect ceased, and articulation was apparent. The membranes were then tightened and the metal cones removed from both instruments. Many sentences were then clearly transmitted between the two stations. In some additional experiments with this telephone performed June 10, 1879, a cornet was sounded before the membrane of the transmitter, the cones having been removed from both transmitter and receiver. The notes were heard at the receiver, but a difficulty arose, as the loud sound of the cornet could also be heard through the air, and it was somewhat difficult to distinguish the notes coming from the telephone from the notes thus heard through the air. On putting the iron cone on the receiving instrument to remedy this difficulty by shutting out extraneous sounds, the various tones of the cornet were heard very clearly in all their modulations. The best results with the cornet were reached when the cone was also on the transmitter. The cornet was also tried with the telephones 36 and 37, whose diaphragms are not adjustable, the various tones being perfectly audible when notes of different pitch were sounded.

Int. 8. State whether or not the method of straining the membrane, adopted in Exhibits 42 and 43, is or is not old and well known; and if so, give some instances of its use.

Ans. The method used in straining the membrane is very well known, being substantially that which is adopted in the kettle-drum, banjo, and most instruments in which membranes are used. It has also been largely used in instruments which, like the phonautograph,

are designed for experiments upon the various sounds produced by the voice.

Int. 9. Please to look at the instruments now shown you, marked "Complainants' Exhibits 44 and 45, Hand Telephone Membranes," and describe them. If you have ever attempted to transmit articulate speech with them, state in what manner, under what circumstances, and with what results.

[*Complainants' counsel offers in evidence two instruments, marked "Complainants' Exhibits 44 and 45, Hand Telephone Membranes, W. P. Preble, Jr., Examiner."*]

Ans. The instruments exhibited consist each of a membrane stretched over a wooden ring whose inner diameter is about an inch and three quarters. In each of these an armature a little over an inch in length is used, it being hinged at the extremity nearest the wooden ring, while the other end is about opposite the centre of the membrane and firmly connected with the membrane at that point, so that if the membrane is set in vibration the armature will vibrate with it.

The cover, mouthpiece, and diaphragm were removed from each of a pair of ordinary Bell hand telephones, the magnet being drawn backward so that when the metal plate was replaced by the membrane and attached armature, the armature could vibrate opposite the pole of the magnet without striking it. In the experiments performed with this apparatus the same general arrangements as to place, length of line wire, battery power, etc., were used as in the various experiments with different telephones previously described. One of the hand telephones, modified as described, was used as a transmitter, the other as a receiver. With these, messages were transmitted in both directions so as to be clearly understood.

I produce in evidence the two hand telephones used in this experiment, one of them with the cap piece lengthened out so that it can be screwed down over this membrane diaphragm, the other being left in its ordinary condition.

[*Marked "Complainants' Exhibits 46 and 47, Bell Hand Telephones, W. P. Preble, Jr., Examiner."*]

Int. 10. State whether in these experiments you tried to transmit

articulate speech through any or all of the membrane telephones put in evidence to-day, while holding the membrane and armature horizontal as well as perpendicular; and if so, with what results.

Ans. A number of experiments were tried with the adjustable membrane telephones, Nos. 42 and 43, in which both transmitter and receiver were so held that the membranes and armatures were horizontal, without producing any perceptible change in the distinctness of the articulation.

FURTHER EVIDENCE FOR A. G. BELL.

BOSTON, MASS., March 10, 1881.

Depositions of Witnesses examined pursuant to the Annexed Notice at Boston, Mass., March 10, 1881, *and thereafter by adjournments duly noted.*

Present: WILLIAM D. BALDWIN, *on behalf of Elisha Gray.*
J. J. STORROW, *on behalf of A. G. Bell.*
L. W. SERRELL, *on behalf of Thos. A. Edison.*
G. W. DYER, *on behalf of Voelker and Richmond.*
J. W. MCDONOUGH, *in person.*

DEPOSITION OF THOMAS A. WATSON.

THOMAS A. WATSON, *being duly sworn, deposes and says, in answer to interrogatories proposed to him by* J. J. STORROW, Esq., *of counsel for A. G. Bell, as follows:* —

Int. 1. State your name, age, residence, and ocaupation; and have you testified in the case of Bell Telephone Company *v.* Dowd, and is your testimony in that case true?

Ans. Thomas A. Watson; twenty-seven years old; I live in Everett, Mass., and am an electrical engineer. I have charge of the electrical and technical department of the American Bell Telephone Company, including the manufacture of instruments. I have testified in the case mentioned, and my testimony is true.

Int. 2. Will you state how long you have been engaged in manufacturing or superintending the manufacturing of electrical speaking telephones for Mr. Bell and his licensees, and how intimately you have been acquainted with the growth and development of that business?

Ans. I have been engaged in the manufacture of telephones since the summer of 1875. All telephones that have been made for Mr. Bell and his associates have been manufactured under my super-

vision, with the exception of those made by the American Speaking Telephone Company, which are now in my charge.

Int. 3. Will you state how many electric speaking telephone patents were issued in 1876 in the United States?

Ans. Only one; that of Mr. Bell, No. 174,465, of March 7, 1876.

Int. 4. How many in 1877?

Ans. Three: one of Bell, Jan. 30, 1877, No. 186,787; and two of McTighe, — one Nov. 20, 1877, and one Dec. 18, 1877.

Int. 5. Can you tell me about how many patents on or relating to speaking telephones have been issued in the United States since then?

Ans. About one hundred and fifty.

Int. 6. How many patents for appliances especially adapted to be used in connection with speaking telephones, such as telephone calls, switches, etc., have been issued in the United States since Mr. Bell's first patent?

Ans. About one hundred and thirty.

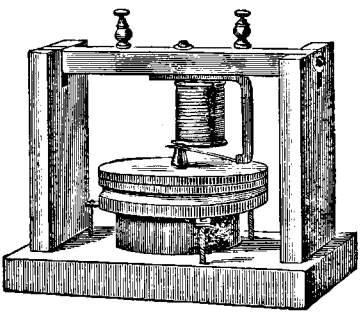
Int. 7. Please to state whether or not you assisted Mr. Bell in his early exhibitions or most of his exhibitions of his electric speaking telephone in 1876 and the first half of 1877; and whether you personally made or supervised the manufacture of the electric speaking telephones used by him on those occasions.

Ans. I assisted him at nearly all of his exhibitions during 1876 and 1877, and I made nearly all of the telephones used at these exhibitions.

Int. 8. Please state the principal exertions and progress made by Mr. Bell and his associates in 1876 in the use of his electric speaking telephone in public and in introducing it to public attention; and give as part of your answer any newspaper or other publications of that period, which mark or indicate the progress made, the publicity given to his invention, and the manner in which it was received by the community.

Ans. I first produce a drawing of the instrument made by me for Mr. Bell, according to his direction, June 2, 1875. It is referred to on pages 473 and 539 of the record in the Dowd suit (pp. 138, 203, *supra*): —

BELL TELEPHONE OF 1875.



DIMENSIONS.

Diameter of membrane	4	inches.
Diameter of spool	$1\frac{1}{4}$	"
Length of spool	$1\frac{1}{2}$	"
Length of armature	2	"
Width of armature	$\frac{1}{2}$	"
Depth of tube from mouth to membrane	3	"

May 10, 1876, a description by Prof. Bell of his researches in telephony was read before the American Academy of Arts and Sciences, at Boston. This paper was published soon afterwards, and contained a description of his electrical speaking telephone as shown in Fig. 7 of said patent No. 174,465, and described the transmission of speech by it. It also contained a description of an electrical speaking telephone made upon the plan of varying the resistance of an electrical circuit supplied with a constant electromotive force from a battery; the particular form indicated was that known as the liquid transmitter, referred to in said specification, and was described as follows: —

"A platinum wire, attached to a stretched membrane, completed a voltaic circuit by dipping into water. Upon speaking to the membrane, articulate sounds proceeded from the telephone in the distant room. The sounds produced by the telephone became louder when dilute sulphuric acid or a saturated solution of salt was substituted for the water. Audible effects were also produced by the vibration of plumbago in mercury, in a solution of bichro-

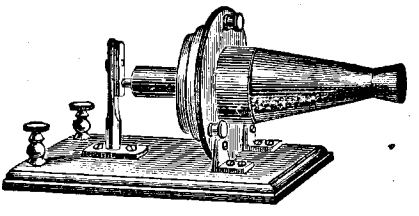
mate of potash in salt and water, in dilute sulphuric acid and in pure water."

This was published in Vol. XII. of their proceedings.

Two sets of Prof. Bell's speaking telephones were made by me for exhibition at the Centennial Exhibition in Philadelphia, and were exhibited there in June, 1876, before the judges of the group and many other persons. They consisted of a "magneto" transmitter and receiver, and of a liquid transmitter. I saw them there on exhibition.

They are referred to on pages 493, 544, 558, of the Dowd record (pp. 159, 208, *supra*). I produce drawings of these instruments as follows: —

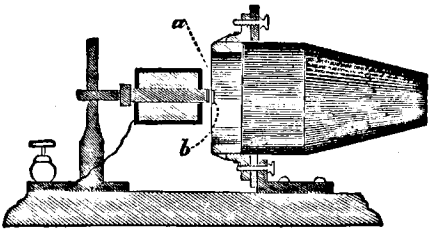
BELL'S SINGLE POLE CENTENNIAL MEMBRANE TELEPHONE.



DIMENSIONS.

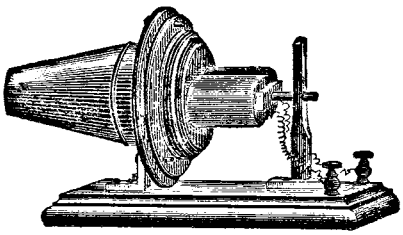
Length of cone	$5\frac{3}{4}$	inches.
Diameter of membrane	3	"
Length of spool	$1\frac{3}{4}$	"
Diameter of spool	$1\frac{3}{8}$	"

SINGLE POLE CENTENNIAL MEMBRANE TELEPHONE.
(Sectional View.)



a Stretched membrane.
b Steel spring armature.

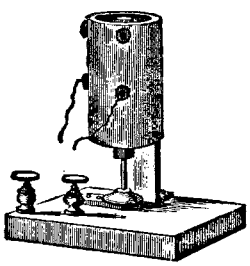
BELL'S DOUBLE POLE CENTENNIAL MEMBRANE TELEPHONE.



DIMENSIONS.

Length of cone	$4\frac{3}{4}$ inches.
Diameter of membrane	3 "
Length of spools	$1\frac{3}{4}$ "
Diameter of spools	$1\frac{3}{8}$ "

CENTENNIAL IRON BOX MAGNET RECEIVER.

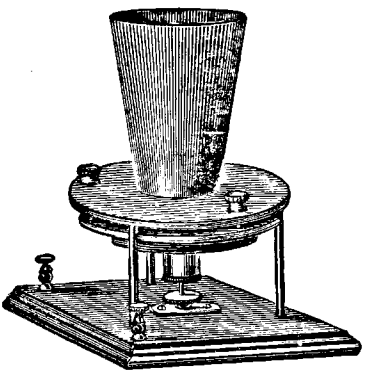


DIMENSIONS.

Diameter of tube	$1\frac{3}{4}$ inches.
Length of tube	3 "

The diaphragm consisted of a soft-iron disk laid loosely over the top. It has since been lost.

BELL'S CENTENNIAL LIQUID TRANSMITTER.



DIMENSIONS.

Diameter of membrane	3	inches.
Diameter of cup	$\frac{3}{4}$	"
Depth of cup	$\frac{1}{2}$	"
Length of cone	6	"

The depositions of Mr. A. G. Bell and of Mr. Willlam Hubbard and of Mr. Elisha Gray, in the suit *Bell Telephone Company* v. *Dowd*, in the United States Circuit Court for the District of Massachusetts, describe one public exhibition of the transmission of articulate speech by them, on June 25, 1876.

Two reports were made upon Mr. Bell's said exhibit. One, by Prof. Joseph Henry, in "General Report of Judges of Centennial Exhibition, Group XXV.," pages 20 and 21, describes the apparatus and the transmission of speech by it, and is as follows: —

"General Report of Judges of Centennial Exhibition, Group XXV., pages 20 and 21.

"THE ELECTRIC TELEPHONE AND MULTIPLE TELEGRAPH.

"The idea of transmitting sounds to a distance by means of electrical currents has been for several years before the world, and the idea of extension of this to telegraphy was evident, though no one had thought it could lead to practical results. But the idea of a multiple electrophonic telegraph transmitting simultaneously several different musical notes, for the simultaneous transmission of different

messages by one wire, is an invention of high scientific character promising admirable practicable results. For the honor of this invention there are two claimants: Mr. Elisha Gray, of Chicago, Ill., and Mr. Alexander G. Bell, of Salem, Mass. These inventions are independent of one another and different in the method of producing the result. In the telegraph of Mr. Gray several series of waves or impulses are simultaneously transmitted through a single wire. These impulses are excited by interruptions in the current produced by tuning forks of different pitches, and excite, at the farther extremity of the line, corresponding variations in tuning forks of the same pitch. Thus, if four or five tuning forks are vibrated at the same time at one end of a line, each will excite vibrations in its corresponding fork at the other end without affecting the other forks. The exhibitors of this telegraph inform the judges that they are now able to equip lines for actual business with a capacity for carrying, through one wire, eight messages simultaneously, and there is no reason why the number may not be increased to sixteen. This telegraph may be made self-recording, or may be worked forward by relays through greater lengths of line than the insulation allows in one circuit.

"The telephone of Mr. Bell aims at a still more remarkable result, — that of transmitting audible speech through long telegraphic lines. In the improved instrument the result is produced with striking effect, without the employment of an electrical current other than that produced by the mechanical action of the impulse of the breath as it issues from the lungs in producing articulate sounds. To understand this wonderful result, suppose a plate of sheet iron, about five inches square, suspended vertically before the mouth of the speaker so as to vibrate freely by the motion of the air due to the speech; and suppose also another iron plate, of the like dimensions, similarly suspended before the ear of the hearer of the sound: and between these, but not in contact with them, is stretched the long telegraphic wire. Each end of this wire is attached to two coils of insulated wire surrounding a core of soft iron, the ends of which are placed near the middle of the plate, but not in contact with it. These four cores are kept in a magnetic condition by being attached at each end of the line to the two poles of a permanent magnet.

Now, it is evident that in this arrangement any disturbance of the magnetism of one of the permanent magnets, increasing or diminishing it, will induce electrical currents, which, traversing the long wire, will produce a similar disturbance of the magnetism of the arrangement at the other end of the wire. Such a disturbance will be produced by the vibration of the plate of soft iron due to the words of the speaker; and the current thus produced, changing the magnetism of the soft-iron cores, will by reaction produce corresponding vibrations in the iron plate suspended before the ear of the hearer. The vibrations of the second plate, being similar to those of the first, will reproduce the same sounds. Audible speech has, in this way, been transmitted to a distance of three hundred miles, perfectly intelligible to those who have become accustomed to the peculiarities of certain of the sounds. All parts of a tune are transmitted with great distinctness and with magical effect.

"This telephone was exhibited in operation at the Centennial Exhibition, and was considered by the judges the greatest marvel hitherto achieved by the telegraph. The invention is yet in its infancy, and is susceptible of great improvements."

The other report was made by Sir William Thomson, and is as follows. It is found in —

"Reports on Awards, Group XXV., Centennial Exhibition, pages 130, 131.

"3. ALEXANDER GRAHAM BELL, SALEM, MASS., U. S.

"GRAHAM BELL'S ELECTRIC TELEPHONE AND MULTIPLE TELEGRAPH.

"*Report.* — The idea of an electric telephone, or apparatus for transmitting sounds to a distance by variations of electric current through a wire, has been for many years before the world, and has been realized in several ways, differing considerably in details as to the appliances at two points of the circuit for producing the variations of electric current and for deriving perceptible effects from them. An extension of this idea to some kind of electro-phonetic telegraphy was inevitable, even though no one had thought it might or could lead to practically useful results. But the idea of a multiple electro-phonetic telegraph transmitting simultaneously several

different musical notes, and using intermissions of these (like intermissions of currents in so many separate wires) for the simultaneous and independent transmission of different messages by one wire, is a very fine invention, of high scientific character, promising splendidly useful practical results.

"This invention is claimed by Mr. Graham Bell, and he is entitled to full credit for it, even though, as I believe is the case, it has been also independently invented by others, both in England and America.

"A very well worked-out realization of it is given in Mr. Bell's apparatus now exhibited. A great practical advantage of the electro-phonetic multiple telegraph over other methods of multiple telegraphy through one wire, is that no adjustment is required for varying conditions of the line to render the non-interference among the different messages perfect. Another even more important practical advantage is that it is indifferent between what points of the line and in which directions the different messages are being sent. The different messages can, in fact, be transmitted from any different points of the line, and each may be read at all other stations (whether stations from which others of the messages are being sent or not) with practically perfect non-interference. Another important advantage is that earth currents and lightning discharges will never disturb the signalling.

"Mr. Graham Bell's apparatus includes an ingenious and effective instrument for automatically making and breaking an electric contact every time one of his telegraphic musical notes commences and ceases to sound. Thus his multiple telegraph may be made self-recording (after the Morse or Bain method), or may be worked forward by relay through greater lengths of line than imperfectness of the insulation allows to be worked in one circuit. Mr. Bell showed me in action two of these electro-phonetic relays, recording quite independently the transmission of independent messages by two musical notes in one wire. In addition to his electro-phonetic multiple telegraph, Mr. Graham Bell exhibits apparatus by which he has achieved a result of transcendent scientific interest, — the transmission of spoken words by electric currents through a telegraph wire. To obtain this result, or even to make a first step toward it, — the transmission of different qualities of sounds, such

as the vowel sounds, — Mr. Bell perceived that he must produce a variation of strength of current in the telegraph wire as nearly as may be in exact proportion to the velocity of a particle of air moved by the sound; and he invented a method of doing so — a piece of iron attached to a membrane, and thus moved to and fro in the neighborhood of an electro-magnet — which has proved perfectly successful. The battery and wire of this electro-magnet are in circuit with the telegraph wire and the wire of another electro-magnet at the receiving station. This second electro-magnet has a solid bar of iron for core, which is connected at one end, by a thick disk of iron, to an iron tube surrounding the coil and bar. The free circular end of the tube constitutes one pole of the electro-magnet, and the adjacent free end of the bar core the other. A thin circular iron disk, held pressed against the end of the tube by the electro-magnetic attraction, and free to vibrate through a very small space without touching the central pole, constitutes the sounder by which the electric effect is reconverted into sound. With my ear pressed against this disk, I heard it speak distinctly several sentences, first of simple monosyllables, 'To be or not to be' (marvellously distinct); afterwards sentences from a newspaper, 'S. S. Cox has arrived' (I failed to hear the 'S. S. Cox,' but the 'has arrived' I heard with perfect distinctness); then 'City of New York,' 'Senator Morton,' 'The Senate has passed a resolution to print one thousand extra copies,' 'The Americans of London have made arrangements to celebrate the Fourth of July.' I need scarcely say I was astonished and delighted; so were others, including some other judges of our group, who witnessed the experiments and verified with their own ears the electric transmission of speech. This, perhaps the greatest marvel hitherto achieved by the electric telegraph, has been obtained by appliances of quite a homespun and rudimentary character. With somewhat more advanced plans, and more powerful apparatus, we may confidently expect that Mr. Bell will give us the means of making voice and spoken words audible through the electric wire to an ear hundreds of miles distant."

The judges were: Joseph Henry, Sir William Thomson, J. E. Hilgard, James C. Watson, H. K. Oliver, F. A. P. Barnard, J.

Schudmayer, E. Levasseur, P. F. Kupka, Ed. Favre-Perret, Chas. E. Emery.

This apparatus, and the transmission of speech by it, were noticed generally in the newspapers, and the invention attributed exclusively to Prof. Bell. I instance the *Scientific American* of Sept. 9, 1876, the Boston *Transcript* of July 8, 1876, and the New York *Evening Post* of Sept. 5, 1876.

The Boston *Evening Transcript* of July 8, 1876, contains the following: —

Notes at the Centennial. — " . . . Prof. Bell has also a telegraphic and telephonic apparatus in this department for the transmission of many messages over a single wire, and of musical and articulate sounds by telegraph. The experiments which have been made in presence of the Emperor of Brazil, Sir William Thomson, and others interested in the subject, have been highly interesting and satisfactory in their results."

The New York *Evening Post* of Sept. 5, 1876, contains the following: —

"Yet the telegraphic and telephonic apparatus invented by A. Graham Bell should reconcile us to this loss. . . . Prof. Bell has sent a valuable collection that well illustrates the mode by which many messages may be transmitted over a single wire, and also the ease with which musical and articulate sounds may be transmitted by telegraph. . . . Spoken words may be thus transmitted."

A set of these instruments was given to Sir William Thomson, and he is reported to have exhibited them, and explained them and the transmission of speech by them, on assuming the chair of the section of physical science at the Glasgow meeting of the British Association in August, 1876.

The Boston *Daily Advertiser* of Sept. 25, 1876, says: —

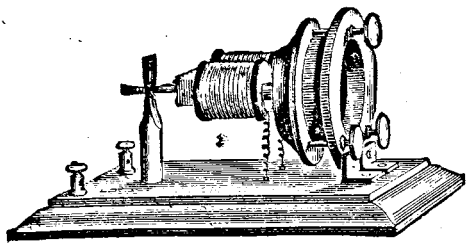
"The following passage, taken from the opening address of Prof. Sir William Thomson, on assuming the chair of the section of physical science at the Glasgow meeting of the British Association, will be read with interest, as showing the impression made upon an English student of science by our progress in discovery and in practical science: 'In the Canadian department, I heard, "To be or not to be," "There's the rub," through an electric telegraph wire; but,

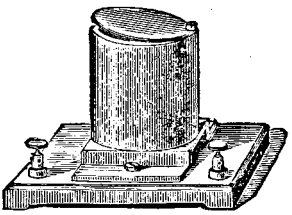
scorning monosyllables, the electric articulation rose to higher flights, and gave me passages taken at random from the New York newspapers: "S. S. Cox has arrived" (I failed to make out the "S. S. Cox"), "The City of New York," "Senator Morton," "The Senate has resolved to print a thousand extra copies," "The Americans in London have resolved to celebrate the coming Fourth of July." All this my own ears heard, spoken to me with unmistakable distinctness by the thin circular disk armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague judge, Prof. Watson, at the far end of the line, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform, in the neighborhood of an electro-magnet in circuit with the line, motions proportional to the sonorific motion of the air.

"'This, the greatest by far of all the marvels of the electric telegraph, is due to a young countryman of our own, Mr. Graham Bell, of Edinburgh and Montreal and Boston, now becoming a naturalized citizen of the United States. Who can but admire the hardihood of invention which devised such very slight means to realize the mathematical conception that if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and as nearly as may be in simple proportion to the velocity of a particle of air engaged in constituting the sounds?'"

This address, or portions of it, containing the foregoing in full or in substance, was published in various newspapers.

A description of the electric speaking telephone, with woodcuts of the apparatus given by Prof. Bell to Sir William Thomson, and the foregoing extracts from Sir William Thomson's address to the British Association, were published in *Engineering* for Dec. 22, 1876, and reprinted in the *Scientific American* supplement, Feb. 10, 1877. These publications attributed the invention to Prof. Bell exclusively. The drawings in *Engineering* are as follows: —





During the fall of 1876, and the following winter and spring, Mr. Bell continued to experiment and operate publicly with his speaking telephone, and these exhibitions were noticed very generally in the newspapers as matters of practical value. I assisted in most or all of these. The invention was invariably attributed to Prof. Bell alone.

The Boston *Daily Advertiser* of Oct. 14, 1876, says: —

"At a meeting of the American Academy on Wednesday evening, Prof. Bell exhibited his wonderful discovery by which sounds may be transmitted through wires by means of the electric current. By the invention of peculiar apparatus, conversation may be carried on through hundreds of miles of wires with the greatest ease."

The *Scientific American* of Sept. 9, 1876, contained the following: —

"The Human Voice Transmitted by Telegraph.

"Several weeks ago we gave a sketch and description of the thread telegraph, consisting of two small tin or wooden cylinders, each having a membrane stretched over one end, the two membranes connected by a stout thread. . . .

"Prof. Graham Bell, by a device somewhat analogous, has succeeded in transmitting the tones of the human voice by telegraph. Instead of the thread, he connects the membranes of the two cylinders or drums with the armatures of the electro-magnets, one drum being placed at each end of the telegraph wire. In fact, he not long ago demonstrated the possibility of conveying vocal sounds by means of the ordinary telegraph wires and special appliances for transmitting and receiving the sounds. The apparatus used by Prof. Bell is thus described: Two single-pole electro-magnets, each

having a resistance of ten ohms, were arranged in circuit with a battery of five carbon elements, the total resistance being about twenty-five ohms. A drumhead of goldbeater's skin, about two and three fourths inches in diameter, was placed in front of each electro-magnet, and a circular piece of clock spring was glued to the middle of the membrane of each drumhead. One of these telephones was placed in the experimental room, and the other in the basement of an adjoining house. Upon singing into the telephone the sounds of the voice were reproduced by the instrument in the distant room; and if two persons sang simultaneously, the two notes were audible at the other telephone.

"At the time of the lecture, an experiment was made to show the transmission of articulate speech, an assistant going into the adjoining building, where one of the telephones was placed. Several familiar questions were, it is said, understood after a few repetitions. The vowel sounds alone are those faithfully reproduced. Diphthongal sounds and rotund vowels are readily distinguished, but consonants are generally unrecognizable. Now and then, however, a sentence comes out with almost startling distinctness, the consonants as well as the vowels being clearly audible. Prof. Bell stated that telephonic effects can be produced with three varieties of currents, — the intermittent, the pulsatory and the undulatory. The first are characterized by the alternate presence and absence of electricity in the circuit, the pulsatory current by sudden changes in intensity, while undulatory currents are obtained by gradual changes analogous to the changes of density of air produced by vibrations of a pendulum.

"The most recent trial of Prof. Bell's instrument was at his residence, Brantford, Canada, Aug. 11. The Toronto *Globe* states that instruments were placed, one in the porch of the residence, and the other in an outhouse on the grounds, and communication between these made by ten miles of wire. Musical notes, the human voice, and songs spoken and sung before one instrument were plainly audible by placing the instrument to the ear at the other. By this invention, too, any number of messages can be conveyed over one wire in either direction, provided they have a different pitch; the tones of the voice can pass over the electric wire, enabling the hearer

at any distance to hear distinctly what is said, and to distinguish the voice of the speaker. On Aug. 10 the professor had communication made with his instrument on the common telegraph wire between Brantford and Mount Pleasant (five miles), and was spoken with, while in Mount Pleasant, by Prof. D. C. Bell and Mr. Griffin, from the *Dominion* office, in Brantford. On the evening of Aug. 12 the professor tried a new experiment, having had an instrument made so that three persons could sing different tunes, or different parts of the same tune, into the instrument at the same time. The trial was perfectly successful, the different voices coming distinctly over the wire at the same time, so that they could be separately distinguished by the listener. The practical exemplification of the lately discovered system of telephony made by the professor afforded much pleasure and information to those present."

The Boston *Daily Advertiser* of Oct. 19, 1876, contained the following: —

TELEPHONY.

Audible Speech conveyed Two Miles by Telegraph.

Prof. A. Graham Bell's Discovery. — Successful and Interesting Experiments. — The Record of a Conversation carried on between Boston and Cambridgeport.

The following account of an experiment made on the evening of Oct. 9 [1876], by Alexander Graham Bell and Thomas A. Watson, is interesting, as being the record of the first conversation ever carried on by word of mouth over a telegraph wire. Telephones were placed at either end of a telegraph line owned by the Walworth Manufacturing Company, extending from their office in Boston to their factory in Cambridgeport, a distance of about two miles. The company's battery, consisting of nine Daniell cells, was removed from the circuit, and another, of ten carbon elements, substituted. Articulate conversation then took place through the wire. The sounds, at first faint and indistinct, became suddenly quite loud and intelligible. Mr. Bell, in Boston, and Mr. Watson, in Cambridge,

then took notes of what was said and heard, and the comparison of the two records is most interesting, as showing the accuracy of the electrical transmission: —

Boston Record.	*Cambridge Record.*
MR. BELL. What do you think was the matter with the instruments?	MR. BELL. What do you think is the matter with the instruments?
MR. WATSON. There was nothing the matter with them.	MR. WATSON. There is nothing the matter with them.
B. I think we were both speaking at the same time.	B. I think . . . at the same time.
W. Can you understand anything I say?	W. Can you understand anything I say?
B. Yes; I understand everything you say.	B. Yes; I understand everything you say.
W. The reason why you did not hear at first was because there was a relay in the circuit.	W. The reason why it did not work at first was because there was a relay in the circuit.
B. You may be right, but I found the magnet of my telephone touching the membrane.	B. You may be right, but I find . . . that my . . . touches the membrane.
W. I cut this relay out, and then the sounds came perfectly.	W. I cut the relay out, and then the sounds came perfectly.
B. I hear every syllable. Try something in an ordinary conversational voice.	B. I hear every syllable. Try something in a conversational voice.
W. Shall I connect their battery in the circuit?	W. Shall I connect their battery in the circuit?
B. No; there is no necessity to connect their battery in the circuit, for the sounds come out quite loudly.	B. No; there is no necessity for putting their battery in the circuit, as the sounds come out quite loudly.
W. I am now talking in quite a low tone of voice.	W. I am now talking in quite a low tone of voice.
B. The sounds are quite as loud as before, and twice as distinct.	B. The sounds are quite as loud as before, and quite as distinct.
W. Cut out the battery and then talk.	W. Cut out the battery and then talk.
B. All right; I will cut out the battery now if you will keep listening.	B. All right; I will cut out the battery now if you will keep listening.

[Here an interruption occurred, and after a short time Mr. Bell said: —]

B. I thought you were going to say something.	B. I thought you were going to say something.
W. Is the battery cut out?	W. Is the battery cut out?
B. No; but I will do it now.	B. No; but I will do it now.

[Battery having been cut out, Mr. Bell continued: —]

B. Do you hear anything now?

[Battery replaced.]

B. Did you hear anything?

W. No; not a sound.

B. Say something to me when I cut out the battery again.

B. Did you hear anything?

W. No; not a sound.

B. Say something to me when I cut out the battery again.

[Battery cut out.]

W. ....

W. I could not hear a sound when the battery was cut out.

[Battery replaced.]

B. I fancy I heard a trace of your voice.

W. Shall I put on our battery, to see if it increases the effect?

B. I'll tell you what we'll do. We'll take off our battery, and put on theirs, as before.

B. I fancy I heard a trace of your voice.

W. Shall I put on their battery, to see if it increases the effect?

B. I'll tell you what we'll do. We'll take off our battery altogether, and put on theirs, as before.

[The company's batteries having been placed in circuit, faint and indistinct sounds were heard at the Boston end, and then came the intelligible sentence.]

W. Is our battery off?

B. Yes, our battery is off. What have you been doing? The sounds were quite soft at first, but now they are quite loud.

B. Shall I put in our battery again?

W. (Indistinctly heard.) That was very indistinct. Put on our battery.

W. Is our battery off?

B. (Very indistinct — unintelligible.)

W. That was very indistinct. Put on our battery.

[Original battery replaced.]

B. We may congratulate ourselves upon a great success.

W. Both batteries are on now. (Another sentence heard indistinctly.)

B. Repeat the last sentence.

W. Both batteries are on now.

B. I understood that before, but thought you said something else.

B. We may congratulate ourselves on our great success.

W. We deserve success. Both batteries are on now.

B. Repeat the last sentence.

W. Both batteries are on now.

B. I understood that before, but thought you said something else.

W. Remove their battery, please.

B. All right; our battery is the only one on now.

W. I have put battery cells on here.

B. How many cells have you there?

W. S-i-x — six.

B. Please whisper something to me.

W. (Sound of the whisper clearly audible, but the utterance unintelligible.)

B. I could hear you whispering, but could not understand what you said.

W. Perhaps we have got the batteries opposed to one another. Had you not better reverse your battery and see what the matter is, or rather what the effect is?

B. I will try the effect of reversing my battery.

W. Reverse your battery, please.

B. All right; our battery is the only one on now.

W. I have six Daniell cells on here.

B. How many cells have you on there?

W. S-i-x — six.

B. Please whisper something to me.

W. Now I am whispering.

B. I could hear you whispering, but could not understand what you said.

W. Perhaps we have got the batteries opposed to one another. Had you not better reverse yours and see what the effect is?

B. I will try the effect of reversing my battery.

[Battery reversed.]

B. Is this any better?

W. That sentence was accompanied by that curious crackling sound.

B. Yes; I hear it too.

B. What time is it by your watch?

B. Is this any better?

W. Much fainter, accompanied by that curious bubbling sound.

. . . . . .
. . . . . .
. . . . . .

[Battery again reversed.]

W. What are you doing? I have not heard anything except . . . for quite a while.

B. I asked you what time it was by your watch. Perhaps you hear me better now, because I have reversed the battery again.

W. My battery is now cut out.

B. Don't you think we better go home now?

W. Yes; but why does your talking come out so much fainter now?

W. What are you doing? I haven't heard anything except that bubbling sound for quite a while.

B. I asked you . . . . . .
. . . . . .
. . . . . .
. . . because I . . .
. . . . . .

W. My battery is now cut out.

B. Do you think we had better go home now?

W. Yes; but why does your talking come out so much fainter now?

[Mr. Bell here placed the magnet of the telephone nearer to the membrane.]

B. Because I had moved the magnet further away from the membrane.

W. That was very much more distinct.

B. Will you try to understand a long sentence if I speak right on?

W. I will.

B. A few minutes ago I heard a fire engine pass by the door. I don't know where the fire is, but the number of the box is 196.

W. The time by my watch is five minutes past ten. Had I not better go into Boston?

B. Yes; I think it is time to stop now.

W. Shall I go to Exeter Place?

B. Yes; but look in here on your way, in case I have not gone.

W. Let us talk conversationally, without noting.

B. Because I moved the magnet further away from the membrane.

W. That was very much more distinct.

B. Will you try to understand a longer sentence if I speak right on?

W. I will.

B. A few minutes ago I heard a fire engine go past the door. I don't know where the fire is, but the number of the box is 196.

W. The time by my watch is five minutes past ten. Had I not better go into Boston?

B. Yes; I think it is time to stop now.

W. Shall I go to Exeter Place?

B. Yes; but look in here on your way, in case I have not gone.

W. Let us talk conversationally, without noting.

Conversation was then carried on for about half an hour with the utmost freedom, and the experiment closed.

Int. 9. Before going any further, please to state whether the preceding account in the *Advertiser*, of your use of the telephone between Boston and Cambridge, is substantially correct, so far as it goes.

Ans. It is correct.

Int. 10. Please to continue your answer to Int. 8.

Ans. The Boston *Evening Transcript* of Oct. 19, 1876, says: —

"*Telephony.* . . . . The registry of sounds by telegraph has now been carried to such a point that the delicate variations involved in the articulation of human speech are transmitted with such unerring accuracy and distinctness that one may talk with another through the telegraph as though face to face.

"The leading scientific men of the world gathered at Philadelphia last summer saw the fact accomplished on a small experimental

scale. Sir W. Thomson was so impressed that in his opening address as president of the British Association, he described it at some length, and pronounced it the greatest by far of all the marvels of the electric telegraph. Ten days ago the test was repeated over an actual out-of-door telegraph between this city and Cambridge. The entire success of this experiment marks, for all that we can see, a revolution and advance in the world's progress worthy to rank with the practical completion of the first printing telegraph in New York City about forty years ago, and with the laying of the great ocean cables twenty years ago.

"The operation of this new and startling development of telegraphic mechanism is thus described by Prof. Thomson, in the address referred to: —

"'All this my own ear heard spoken to me with unmistakable distinctness by the thin, circular disk armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague judge, Prof. Watson, at the far end of the line, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform, in the neighborhood of an electro-magnet in circuit with the line, motions proportional to the sonorific motions of the air.' . . .

"We give in another column the interesting account of the practical exemplification of the invention between Boston and Cambridge. The inventor, Mr. Graham Bell, is a young Edinburgh scientist, formerly of Montreal, but later of this city, and a naturalized citizen of the United States."

During the fall of 1876 and the following winter and spring, Mr. Bell operated publicly his electric speaking telephone. I assisted at most or all of these exhibitions. They were noticed very generally in the newspapers as matters of practical value. I mention: —

Boston *Post*, Oct. 20, 1876.

Boston *Daily Evening Traveller*, Oct. 19, 1876.

Boston *Sunday Herald*, Oct. 22, 1876.

Titusville *Herald*, Oct. 22, 1876.

Boston *Evening Transcript*, Oct. 19, 1876.

These describe the transmission of speech from Boston to Cambridge.

The New York *Tribune* of Monday, Oct. 23, 1876, says: —

"The experiments which Prof. A. Graham Bell has been recently making, relative to the transmission of speech by wire, have been quite successful. Two operators were stationed two miles apart, one in Boston and the other in Cambridge. The battery ordinarily used was replaced by one of ten carbon elements. At first the sounds were indistinct, but soon they grew clear and intelligible. The operators carried on a long conversation, and on subsequently comparing their records ascertained that the tones had been transmitted with perfect accuracy."

An editorial in the New York *Tribune* of Nov. 9, 1876, contained the following: —

"The Centennial Exhibition has afforded the opportunity to bring into public view many inventions and improvements which otherwise would only have been known to the smaller circles that may find them of service. . . . The telephone is a new instrument of electrical science, more likely than some of the rest to find immediate use. It operates by transmitting the current through a tuning fork. The fork will only vibrate a given number of times in a second. A message can be sent through it by the usual Morse code, there being no apparent interference between the tuning-fork vibrations and the message. But at the other end of the line the message can be taken off through a tuning fork in unison with the first. Consequently, if a tuning fork of different pitch is interposed at each of several stations served by one wire, and the messages are sent through forks of corresponding pitch from the head office, the message to one station will not be repeated at the others during transmission.

"Sir William Thomson, at the Glasgow meeting of the British Association for the Advancement of Science, gave foreign notoriety to another of the Centennial exhibits that has attracted great attention from the judges of the group to which it belongs. It is a curious device, that might fairly find place in the magic of Arabian tales. A membrane is stretched over the end of a short speaking trumpet. The membrane carries a small piece of metal which is, so

to speak, the armature of a magnet. The magnet forms part of a telegraph circuit, through which a current is passing. To send a message it is only needful to talk loudly into the trumpet.

"The message is received by a similar trumpet with membrane and armature at the other end of the line; and that trumpet being placed to the ear repeats the sound like an echo. Dom Pedro was with the scientific people who tested this instrument on one occasion; so accurately did it reproduce sounds that each member of the party was in turn recognized by peculiarities in voice or accent. The final test was the reading of a paragraph from the news columns of the *Tribune*. Of what use is such an invention? Well, there may be occasions of state when it is necessary for officials who are far apart to talk with each other without the interference of an operator. Or some lover may wish to pop the question directly in to the ear of a lady and hear for himself her reply, though miles away; it is not for us to guess how courtships will be carried on in the twentieth century. It is said that the human voice has been conveyed by this contrivance over a circuit of sixty miles. Music can be readily transmitted. Think of serenading by telegraph!"

Nov. 26, 1876. We carried on a long conversation on the lines of the Eastern Railroad, using part of the time a circuit from Boston to Salem (fifteen miles), and part of the time a circuit from Boston to North Conway and back to Salem, and part of the circuit from Boston to Portland and back, about two hundred miles of actual telegraph wire.

This is noticed in —

Boston *Post*, Boston *Daily Globe*, Boston *Daily Advertiser* and Boston *Herald*, of Nov. 27, 1876.

The Boston *Post* of Nov. 27, 1876, says: "The experiments in electric telephony which Prof. A. Graham Bell has been conducting for several years past have resulted in the development of apparatus by means of which the human voice, as ordinarily used in speaking, can be transmitted with certainty and ease to an indefinite distance, — assuredly hundreds of miles. . . .

"The latest experiments with the telephones were made yesterday over the wires of the Eastern Railroad, that day being selected be-

cause the trials would not then be interrupted by the ordinary business of the line. Prof. Bell, President Rockwell of the Eastern road, and wife, Miss Stearns, Mr. Morrison, and Mr. Hubbard, beside two telegraph operators, were the occupants of the Boston office. The instruments were arranged for about a twenty-mile test; consequently Salem, about sixteen miles away, was the point at which the second telephone was fixed. Mr. Thomas A. Watson, assisted by the Salem operator, was in charge there. All those at the Boston end of the line held free and easy conversation with the Salem office, even a whisper or a loud breath being distinctly heard at one end when given at the other."

Int. 11. Please to answer the same interrogatory as to the first half of 1877.

Ans. Jan. 13, 1877, Prof. Bell gave a lecture on his electric speaking telephone, with an exhibition of it, before the Washington Philosophical Society, at Washington, D. C. This was reported in the Washington *Evening Star* of Jan. 20, 1877.

The said report in the *Evening Star* begins as follows: —

"*Bell's Telephone.* At a meeting of the Washington Philosophical Society on the evening of the 13th January, Mr. Bell, the inventor, gave to the members a description of the construction and operation of his most admirable and wonderful invention, *and exhibited it in operation.*"

The Boston *Daily Advertiser* of Jan. 22, 1877, contained the following: —

"The most important of the tests made recently by Prof. A. Graham Bell, in the practical development of telephony, is dispensing with the use of the battery entirely, so that now all that is required to communicate between the most distant places is simply a line of wire and the telephones.

"Yesterday morning successful experiments were made between Boston and Salem, on the Eastern Railroad wire. At the Boston end were Prof. Bell, Mr. Nutting, the operator, Mr. E. H. Foster, Mr. William Auld, and Mr. J. B. Parker; and at the Salem end, Mr. T. A. Watson, who is associated with Mr. Bell, and the lady operator.

"Recently two Japanese gentlemen conversed in their own lan-

guage through the telephones, and had no difficulty in understanding all that they said. An experiment has been made in overcoming an artificial resistance greater than the Atlantic cable, and there is no doubt but that it will be possible to talk across the Atlantic."

The Boston *Evening Transcript* of Feb. 1, 1877, contained a long description of an exhibition of a telephone, in which the following is found: —

"At noon, yesterday, a distinguished party of gentlemen were assembled at the office of the Boston Rubber Shoe Company, on Congress Street, in order to witness a series of experiments performed on the telephone between the inventor, Prof. A. Graham Bell, here, and his associate, Mr. Thomas A. Watson, at the residence of Mr. Converse, at Malden, about six miles distant.

"Prof. Bell had been invited by some of our most prominent citizens to give a practical demonstration of the most recent developments of an invention which, in accordance with its name, has already sounded far and wide the fame of the telephone. The experiments yesterday were as follows: —

"Telephones having been connected with the private telegraphic line of the Boston Rubber Shoe Company, and the operators at either end having taken up their station, conversation was at once commenced. Stationed at the Boston end of the wire, Prof. Bell requested Mr. Watson to speak in loud tones, with a view of enabling the entire company at once to distinguish the sounds.

"This was so successful that a smile of mingled pleasure and surprise played on the features of those present. That it, however, might not be supposed that loud speaking was essential to intelligibility, Mr. Bell explained that soft tones could be heard across the wires even more distinctly than loud utterances, even a whisper being audible. In confirmation of this statement, Mr. Watson commenced speaking in turn to each member of the company; and after the efficiency of this method had been proved to the satisfaction of all, he took up a newspaper and informed the assemblage that gold had closed the previous evening at New York at $105\frac{5}{8}$.

"As there were quite a number of business men present, the effect that this practical demonstration of the value of the telephone produced can scarcely be exaggerated. Other passages from the daily

journals were then given; and by this time the desire for conversation having become general, Mr. Watson was plied with questions, such as, Is it thawing or freezing at Malden? Who is to be the next President? etc., etc. It was remarkable that Mr. Watson was able to distinguish between the voices at the Boston end, he calling at least one gentleman by name as soon as the latter commenced speaking.

"This went on for some time until a lady at the Malden end sent the company an invitation to lunch per telephone, and an appropriate response was made by the same medium.

"At length the company were requested to remain quiet while a lady at the other end conveyed to them the sweet strains of music. The assemblage thereupon listened with rapt attention while a young lady commenced singing 'The Last Rose of Summer.' The effect was simply charming. Possessing, as the fair cantatrice does, a voice of exquisite sweetness, the sounds penetrated into the Boston end of the telephone with a distinctness equal to that attainable in the more distant parts of a large concert room, and a unanimous vote of thanks was sent by the handy little instrument which had procured for the assemblage so agreeable an hour.

"Among those present were electricians and gentlemen occupying prominent positions on our Western railroads, and one and all expressed the conviction that the telephone was destined to achieve the greatest possible results. Let us hope that the day is fast approaching when every man will be in a position to turn on the electricity in his house with the same facility with which he now turns on the water or the gas. C. H. H."

Early in 1877, Prof. Bell began to give public lectures and exhibitions of his electric speaking telephone.

He gave one in Salem, Mass., Feb. 12, 1877, and a report of it, published in the Boston *Globe* of Feb. 13, was transmitted from Salem to Boston by his speaking telephone.

The same *Globe* of Feb. 13, 1877, contained the following: —

"We have the pleasure of presenting to our readers this morning the first despatch ever sent to a newspaper by the newly invented telephone, Prof. A. Graham Bell's system of transmitting sound by

telegraph. The despatch was sent from Salem, where Prof. Bell lectured last evening, our active representative in that city having secured the exclusive privilege of the instrument for that purpose. The message was received in this city by another representative of the *Globe*, who could readily recognize the voice at the other end.

. . . . . .

"SENT BY TELEPHONE. — THE FIRST NEWSPAPER DESPATCH SENT BY A HUMAN VOICE OVER THE WIRES. — TO THE DAILY GLOBE, FROM SALEM. — PROF. GRAHAM BELL EXPLAINS HIS VALUABLE INVENTION. — AN ENTHUSIASTIC AUDIENCE. — HOW THE CAPACITY OF THE TELEPHONE WAS TESTED.

"*Special despatch by telephone to the Boston Globe.*

"SALEM, Feb. 12, 10.55 P. M.— Prof. A Graham Bell, the inventor of that wonderful instrument, the telephone, which has caused so much interest in the scientific world, and which is now becoming so popularly known, lectured on his invention at Lyceum Hall this evening. The lecture was one of a course of the Essex Institute, and about five hundred persons were present.

. . . . . .

"Mr. Watson was then asked to make a speech to the audience. He expressed himself as having more confidence eighteen miles away than if he were present. His speech was as follows: —

"'*Ladies and Gentlemen*, — It gives me great pleasure to be able to address you this evening, although I am in Boston and you in Salem.' This could be heard thirty five feet distant, — that is, all over the hall, — and brought down the house with applause. A system of questioning was then carried on, and Mr. Watson was asked if he heard the applause. The answer was, 'I was not listening; try again.' The applause was given, and its receipt at once acknowledged in Boston. Coughing and singing were then heard, and a variety of questions were then asked from the Salem end, and among them, 'What news from the Electoral Commission?' followed by the distinct answer of 'I don't know of any.' But the news came fleeting along that the engineers of the Boston and Maine Railroad had struck. Gen. Cogswell asked if trains were running; the

answer was clear and distinct that they were not at 5.30 o'clock. Prof. Bell introduced the Rev. E. C. Bolles, who said, 'I shake hands with you cordially in imagination twenty miles away.' The Rev. E. S. Atwood asked, 'Does it rain?' 'It does not in Boston,' was Mr. Watson's answer. Prof. Gage, the electrician, then spoke through the telephone, endeavoring to have his voice recognized. This could not be done, as Mr. Watson was not familiar with the voice. Mr. Shaje Zsawa was recognized, Mr. Watson being perfectly familiar with his tones. One of the assistants in Boston then said that 'Hold the Fort' would be sung in Boston, and the tune which followed was readily recognized. Prof. Bell closed his lecture by briefly stating the practical uses to which he was confident the telephone could be applied. Hearty applause was afforded the lecturer as he finished, and people flocked about the stage in large numbers to more closely examine the wonderful instrument that had placed them in audible communication with people nearly twenty miles away.

. . . . . .

"This special by telephone to the *Globe* has been transmitted in the presence of about twenty, who have thus been witnesses to a feat never before attempted, — that is, the sending of a newspaper despatch over the space of eighteen miles by the human voice; and all this wonder being accomplished in a time not much longer than would be consumed in an ordinary conversation between two people in the same room.

H. M. B.

"THE SCENE AT THE BOSTON END.

"The instrument which transmitted the wonderful voice message to the listening ears in this city was placed in a little room in Exeter Place, where were assembled Prof. Watson, Benjamin Bridden, the electrician, Prof. E. B. Warman, and Mr. A. B. Fletcher, representative of the *Globe*. The experiment was certainly a great success. The conversation with the friends eighteen miles away was carried on in ordinary tones of voice. The *Globe* representative in Boston very easily recognized the voice of the transmitter of the despatch in Salem, and very distinctly heard the applause which

was given in the Essex Institute Hall. It was a very noteworthy occasion, certainly; and the complete success attained led to the discussion of many plans for the further practical utilization of the telephone, which sends its first newspaper despatch to the *Globe* readers for their delectation and wonder, this morning."

The Boston *Daily Globe* of Feb. 15, 1877, contained the following: —

"THE TELEPHONE. — SOMETHING ABOUT THE CONSTRUCTION AND WORKING OF PROF. BELL'S WONDERFUL INVENTION.

"As the telephone, the new invention of Prof. A. Graham Bell, is but little understood, the following reprint of a description and explanation of the instrument may not be amiss: —

"'The telephone in its present form consists of a powerful compound permanent magnet, to the poles of which are attached ordinary telegraph coils of insulated wire. In front of the poles, surrounded by these coils of wire, is placed a diaphragm of iron. A mouthpiece to converge the sound upon this diaphragm substantially completes the arrangement. The motion of steel or iron in front of the poles of a magnet creates a current of electricity in coils surrounding the poles of the magnet, and the duration of this current of electricity coincides with the duration of the motion of the steel or iron moved or vibrated in the proximity of the magnet. When the human voice causes the diaphragm to vibrate, electrical undulations are induced in the coils environing the magnets precisely analogous to the undulations of the air produced by that voice. These coils are connected with the line wire, which may be of any length, provided the insulation be good. The undulations which are induced in these coils travel through the line wire, and, passing through the coils of an instrument of precisely similar construction at the distant station, are again resolved into air undulations by the diaphragm of this instrument.'

"It was by this wonderfully simple instrument that the three quarter of a column report of Prof. Bell's lecture was transmitted from Salem to the GLOBE by the voice on Monday evening. All who saw the working of the instrument were astounded at the results obtained."

The following report of the Salem lecture appeared in the Salem *Observer* of Feb. 17, 1877: —

"SATURDAY, Feb. 17, 1877.

"THE TELEPHONE. — The illustrated lecture upon telephony, by Prof. A. Graham Bell, was exceedingly interesting. The results exhibited were indeed amazing; nearly every experiment was successful. . . .

"On Monday evening, Mr. Watson, who was in the Boston office, 'wired' several tests to the audience of five hundred who were assembled in the Lyceum Hall. He conversed with Prof. Bell freely; the latter asking questions in an ordinary tone of voice, with distinct articulation, and the answers immediately returning and having a sort of muffled sound. Mr. Watson addressed some words to the audience in Salem, which were distinctly heard, and the applause which followed was heard by him in Boston. He sang 'Auld Lang Syne' and other pieces, and played upon a reed organ, all the sounds of which were duly delivered at the Salem end of the wire. The person in Boston was also heard to cough and to laugh. During the evening Rev. Dr. Bolles, Rev. Mr. Atwood, Prof. Gage, Gen. Cogswell, a gentleman from Japan, and a lady (Miss Loring) all spoke successfully through the telephone. A full report of the meeting was sent to the *Globe* by telephone from its correspondent, Mr. Batchelder.

"The apparatus by which this astonishing result is secured is wonderfully simple: only a telegraphic wire, a horseshoe magnet, two helices and a vibrating disk, at each end. The audience see only a mahogany box upon the table, of the appearance of an ordinary photographer's camera. The tube in the end is used in this case to speak into and to hear out of. Within the box is a horseshoe magnet. Opposite each arm of the magnet is a helix of the usual construction.

"One end of the wire among the helices is connected with the ground, and the other with Boston, or the place in operating connection. Set up against the helices, within a sixteenth of an inch, is a sheet of thin polished iron, upon which the voice of the operator impinges when speaking. The magnet induces an electrical current

in the telegraphic wire. The vibrating disk imparts pulsations to this electrical current corresponding to the sound, which are conveyed to Boston, and reproduce themselves upon the vibrating disk there with exactness of tone and articulation. The little four inches of iron utters the whole gamut of the human voice. This is indeed wonderful, — the greatest achievement of modern science. Another exhibition of the telephone is to be given."

The following is an extract from an article in the New York *Sun* of Feb. 20, 1877 : —

"PROF. BELL'S TELEPHONE. — THE HUMAN VOICE CARRIED A HUNDRED AND FORTY MILES. — MARVELLOUS STORIES ABOUT THE LATEST ACHIEVEMENT OF SCIENCE. — MUSIC IN SALEM AND APPLAUSE IN BOSTON. — THE CONSTRUCTION AND CAPABILITIES OF THE INSTRUMENT DESCRIBED.

. . . . . .

"The honor of having received the first newspaper despatch ever sent by means of the telephone belongs to the Boston *Globe*. A report of a lecture by Prof. Bell, in Salem, was transmitted verbally to it last Monday night. This lecture was about the telephone, and in the course of the evening a series of remarkable experiments was made in the presence of the audience. Songs and brief speeches were sent from Boston, and the applause which greeted their reception in Salem was distinctly heard in Boston. Imagine sitting in a hall and hearing a man eighteen miles away sing 'Hold the Fort'!

"'I haven't the slightest doubt,' Mr. Watson said to-day, 'that in a few months things will be so that a man can make a lecture here in Boston and be heard by an audience in any part of the country.'

"'Do you expect that the telephone will entirely supersede the present system of telegraphing?' I asked.

"'Yes, we expect it will, eventually. A company is now forming for the purpose of manufacturing and introducing the instrument. In time it can't fail to replace the old dot-and-line alphabet system entirely. We expect at first it will be used mostly on private lines and for city business. It will probably take the place of the present

district telegraph companies and the like, as it will be especially convenient for that class of business.'

. . . . . .

"The wonderful little instrument, of whose future value to civilization the inventor is so sanguine, consists of a powerful compound permanent magnet, to the poles of which are attached ordinary telegraph coils of insulated wire. In front of the poles, surrounded by these coils of wire, is a diaphragm of iron. A mouthpiece, whose function is to converge the sound upon this diaphragm, substantially completes the arrangement. The operation of the instrument is thus described by Prof. Bell: The motion of steel or iron in front of the poles of a magnet creates a current of electricity in coils surrounding the poles of the magnet, and the duration of this current of electricity coincides with the duration of the motion of the steel or iron moved or vibrated in the proximity of the magnet. When the human voice causes the diaphragm to vibrate, electrical undulations are induced in the coils around the magnets precisely similar to the undulations of the air produced by the voice. The coils are connected with the line wire, and the undulations induced in them travel through the wire, and passing through the coils of another instrument of similar construction at the other end of the line, are again resolved into air undulations by the diaphragm of this instrument. The voltaic battery is entirely dispensed with. The line wire may be of any given length, provided the insulation be good. Prof. Bell further says that soft tones can be heard across the wires even more distinctly than loud utterances, even a whisper being audible."

Feb. 23, 1877, a second lecture and public exhibition was given at Salem. A long report of this was transmitted by telephone, and published in the Boston *Daily Globe* of Feb. 24, 1877. That report contains the following: —

"*Special Despatch by Telephone to the* BOSTON GLOBE.

"SALEM, Friday, Feb. 23 10.20 P. M. — Lyceum Hall has been crowded this evening with an audience of five hundred, which had assembled to hear Prof. A. Graham Bell's interesting lecture on

his wonderful invention, the telephone, and the results obtained by the evening's exhibition were certainly most astonishing. This was the second public exhibition of the new invention and its practical uses, and Salem has been fortunate indeed in having both given before her citizens. This second lecture and exhibition was given in response to an invitation to Prof. Bell by a number of scientific gentlemen and prominent citizens, and the audience was one which only a rare and notable occasion can draw together in Salem. Among the more prominent people in the audience were the Hon. George B. Loring, Judge Endicott of the Supreme Court, Prof. D. B. Hagar of the State Normal School, Dr. J. R. Nichols of Haverhill, editor of the Boston *Journal of Chemistry*, Judge Osgood, Mayor Oliver, Aldermen Daton and Stone, Prof. John Robinson, Ex-Mayor Williams, Dr. Henry Wheatland, president of the Essex Institute, the Rev. Messrs. Arey, Dean and Atwood, John W. Perkins, master of the Salem High School, Gen. William Cogswell, J. S. Packard, Esq., and many other prominent citizens. The experiments were similar to those given at the former lecture, and were eminently successful, receiving hearty applause. Prof. Thomas A. Watson, Prof. Bell's assistant, transmitted several messages from the Boston end of the telephonic wire.

. . . . . .

"The company at the Boston end of the telephonic wire between Boston and Salem was quite as numerous as Prof. Bell's laboratory could well accommodate. It is a little room at the end of Exeter Place, up three flights of stairs, with the various instruments of the telephonic apparatus to be seen on every hand. On one of the tables were the models on which Prof. Bell worked out the telephone as it now exists; and they form an interesting study. Books, letters and papers, all pertaining in more or less degree to the science of electricity, are arranged about the room, which is plainly and tastefully furnished. Occupying the post of duty near the working instrument was Prof. Thomas A. Watson, Mr. B. F. Bridden having charge of the working of the electric apparatus, with two young lads as assistants. The company present included Mr. D. P. Richards, who has been one of Prof. Bell's co-workers, the Hon. Charles Levi Woodbury, John C. Hoadley of Lawrence,

Dr. Henry I. Bowditch, Dr. C. J. Blake, Mr. W. A. Hovey and Mr. C. E. Hurd of the *Transcript*, three gentlemen from one of Dr. Tourjée's Tabernacle choirs, a cornet player, and an artist who was illustrating the scene for the *Scientific American*, beside reporters from the various city papers.

. . . . . .

"The *Globe* despatch then came, followed by another press message, giving merely the news furnished by the *Globe* about the telephone a week ago. Then 'Yankee Doodle' and 'Auld Lang Syne' were sung by Prof. Bell, and distinctly heard in every tone by all in the room; and at 10.30 the conference came to an end."

The Providence *Press* of Feb. 24, 1877, had a long account of the Salem lecture, which contained the following: —

THE PROVIDENCE PRESS.

FEB. 24, 1877.

"We willingly surrender space to-day to the somewhat enthusiastic report by a member of our editorial staff who was invited to witness the experiments with the telephone last night at Salem. The importance of the invention promises to be such as to make all obtainable knowledge of it valuable, and we do not remember to have yet seen any so detailed and intelligible description of its workings as our representative furnishes.

. . . . . .

"HOW THE THING IS DONE

is, of course, the practical reader's demand. It is done by a magnificent effort of genius, making itself felt with common tools. It is simplicity embodied and almost made personal. There is not even a battery to send an electric current along the line, for the affair is sufficient unto itself within its six by twelve inch dimensions, asking nothing of existing telegraphy but the wires it has strung. The principle is the familiar one that a plate of iron presented to a coil of insulated wire on the end of a magnet causes an electric current to traverse the magnet, provided the circuit is complete. Prof. Bell, therefore, takes a horseshoe magnet, places on each of its ends a nearly flat spiral wire, and just in front of the

points of the spirals, an infinitesimal distance away, sets up his plate of iron. To complete this circuit he connects one arm of the magnet with the earth, by means of the gas pipes, and the other communicating wire runs out from the other arm to wherever the other operator may be stationed, with a similar earth connection on the magnet at his end." . . .

On the occasion of this Salem lecture I was at the Boston end of the telephone line, and the account given in the papers which I have quoted from is substantially correct, so far as came under my knowledge. I made the instruments used, and they are correctly described.

The lecture at Salem was followed by a series of lectures in Boston, Providence, Lowell, Manchester and New York, and these were extensively noticed in newspapers in different parts of the country; *e. g.*, the New York *Sun*, Feb. 11, 1877, had nearly a column about the lecture at Salem; the Boston *Journal of Chemistry*, March 1, 1877, had a long account; also the New York *Times; Daily Graphic*, of March 6, 1877, with illustrations; *Scientific American*, March 31, 1877, with illustrations; *Frank Leslie's*, March 31, 1877, with illustrations; *The Athenæum*, London, England, March 3, 1877. At all of them electric speaking telephones with metallic diaphragms were used; at all of them the electric speaking telephones were publicly exhibited, their construction and operation explained, and they were publicly used in the transmission of articulate speech. At these exhibitions an admission fee was charged and paid by the audience. The following accounts of them are substantially correct, so far as they came within my knowledge. The instruments used were made by me, or under my supervision.

The following is the opening paragraph of the article in the Boston *Journal of Chemistry*, of March 1, 1877, above referred to: —

BOSTON JOURNAL OF CHEMISTRY.

BOSTON, MARCH 1, 1877.

"THE TELEPHONE.

"The telephone is the invention of Prof. A. Graham Bell of this city, and has resulted from a course of inductive reasoning, growing

out of a careful study of the philosophy of sound, as related to wave motions in air, and in metals when induced by electrical excitation. The instrument is exceedingly simple and inexpensive, and easily understood. It consists in attaching to the terminals of the ordinary telegraph wires, between any two points, powerful compound magnets, with coils of wire connected. In front of the pole, surrounded by these coils of wire, is placed a diaphragm of iron. A mouthpiece to converge the sound upon the diaphragm, substantially completes the arrangement. When the human voice causes the diaphragm to vibrate, closing and breaking the circuit with each vibration, electrical undulations are induced in the coils, precisely analogous to the undulations of the air produced by that voice. These coils are connected with the line wire, which may be of any length, provided the insulation be good. The undulations induced in these coils travel through the line wire, and, passing through the coils of an instrument of precisely similar construction at the distant station, are again resolved into air undulations by the diaphragm of this instrument."

The Providence *Journal*, of March 15, 1877, had a long article on the telephone, from which the following is an extract: —

"THE LAST GREAT WONDER.

. . . . . .

"In the telephone no galvanic battery is used. A permanent steel magnet is surrounded with a coil of insulated wire, and confronted with a disk of sheet iron. When the iron disk vibrates, under the influence of sound, it disturbs the magnetism of the steel magnet before it; and by a familiar law, every change of magnetism in a magnet excites an electric current in a surrounding coil. The coil is connected with the telegraphic wire, and that with the coil around the magnet at the farther end of the line, the ground being used for the return circuit. The distant magnet thrills with the electric current so excited, and vibrates the disk in front of it, which, in turn, impresses sound waves on the air."

The Boston *Daily Globe*, of April 6, 1877, had a report of the Providence lecture, from which the following is taken: —

"PROF. BELL EXHIBITS ITS WONDERFUL WORKINGS TO A PROVIDENCE AUDIENCE. — A SUCCESS DESPITE UNFAVORABLE CONDITIONS. — A SPECIAL TO THE 'GLOBE' BY TELEPHONE.

"Prof. A. Graham Bell, the inventor of the telephone, lectured in Providence last evening; and in his little room at the top of No. 5 Exeter Place, Mr. Thomas A. Watson, the electrician, with several members of the press and a number of gentlemen interested in science, were assembled, for the purpose of holding communication with the professor, and demonstrating anew the practical workings of the instrument.

. . . . . .

"The *Globe* reporter remained with Mr. Watson until a late hour; and when the audience in Providence had been dismissed, and all the visitors had left the room in this city, he was repaid for his waiting by receiving the following message from a brother reporter of the *Globe*, who went to Providence especially to send a telephonic despatch: —

"'THE EXHIBITION IN PROVIDENCE.

"'*Special to the* GLOBE *by Telephone.*

"'PROVIDENCE, R. I., April 5.

"'The bad weather prevented the exhibition from being as effective as usual; still the audience which crowded Music Hall, and represented the best society of the city, had conclusive proof of the value of the invention. The transmission of musical sounds from the reed organ in Boston, giving "Music in Air," and other familiar tunes, was admirably perfect, and was heard distinctly all over the hall. The exhibition of singing was fairly successful; and Mr. Reeves's cornet solo, "Yankee Doodle," played at the request of one of the audience, was recognized very easily. The experiment of brass-band playing was not very successful. A conversation carried on between the Rev. Dr. Behrends here, and Mr. Watson at Boston, on the Rhode Island election, caused much merriment. Gov. Lippitt introduced Prof. Bell, who spoke till after ten o'clock, and remained in the hall an hour after, exhibiting the telephone to a curious crowd. An effort will be made to have the lecture repeated, when, it is

hoped, circumstances will be more favorable for the working of Prof. Bell's invention.'

"NOTE. — On account of damage to the wires it was impossible to send as full a despatch as was intended; but fortunately the accident did not happen until after the lecture had been delivered, and Providence people had been satisfied of the success of the invention."

The following is an extract from a report of the lecture which appeared in the Providence *Daily Journal*, of April 6, 1877: —

"PROF. BELL'S LECTURE ON THE TELEPHONE.

"Music Hall was filled last evening, notwithstanding the storm, by one of our best audiences, to witness the first public exhibition of the speaking telephone in this city.

. . . . . .

"Prof. Bell stated that in vocal utterance it is best to remove the battery, and use nothing between the telephonic instruments in Boston and Providence. The Boston office was then telegraphed to cut out the battery. While waiting for this to be done, Prof. Bell explained in a few words the structure of his instrument and its history.

. . . . . .

"Mr. Watson next sung 'Hold the Fort,' which was switched on to the different telephones. Mr. Watson then repeated a sentence which was switched on to the telephones and generally heard. Rev. Mr. Behrends then interviewed Mr. Watson, asking him if it was stormy in Boston, also 'What time is it?' and 'Have you heard the news from Rhode Island?' Mr. Watson had not. Mr. Behrends informed him that we had an election yesterday, and 'Did you hear who was elected?' Yes, Mr. Watson had read it. 'What is the news in Boston?' Answer, 'I have not heard any.' 'Good night, Mr. Watson,' closed the conference.

. . . . . .

"The mysterious little box at Prof. Bell's lecture contains an apparatus almost elementary in its simplicity, which answers the double purpose of transmitting and receiving sounds. It may be divided into two parts, the artificial ear and the magneto-electric

transmitter. The artificial ear may be likened to a grocer's sugar funnel, of tin or other metal (having a tube of about two inches diameter), the large flaring end of which has been sealed with a circular disk of thin sheet iron. This disk is the tympanum of the artificial ear. The two-inch tube is the part which projects from the box into which you talk, and at which you listen for a reply. Inside of the box there is a fixed U-shaped steel magnet, whose poles very nearly approach the sheet-iron disk, keeping it in a state of tension by virtue of magnetic attraction. Around the arms of the U magnet, near its poles, are bobbins of fine insulated copper wire, which communicate together, and one of the free ends of which connects with the telegraph wire outside, and the other with the ground, for the return current. For certain reasons it is thought better, in practice, to attach small, soft-iron cylinders, on which the bobbins are placed, to the poles of the fixed magnet; and the ends of these cylinders then take the place of the poles of the magnet, in close proximity to the iron disk or tympanum. This is virtually the whole apparatus. When a word is whispered into the two-inch auditory tube it causes the iron tympanum to vibrate. This disturbs the magnetism of the fixed magnet, and of its soft-iron cylindrical poles. This disturbance, in its turn, induces electrical currents in the coils of fine wire and in the telegraph wire outside. At the distant station these processes are then taken up in reverse order. The induced currents, passing from the telegraph wire through the coils of the receiving instrument, disturb the magnetism of the fixed magnet there, and that sets the disk in front of it in vibration, which communicates in turn the same sound undulations to the air which originated this curious series of transformations. In other words, the persons listening at the distant disk hear the same words, accents, tones, which were confided to the disk at the near station. It will be observed that the sound waves are converted first into mechanical vibrations of the disk, then into magnetic vibrations, then into electric currents, then back into magnetic vibrations, then into vibrations of the distant disk, and lastly into sound vibrations again, — and that these transmutations of the original sound waves between the two disks require four jumps through air spaces."

The *Sun*, *Tribune*, *Herald*, *World* and *Times*, of New York, of May 12, 1877, had long accounts of an exhibition of the speaking telephone by Prof. Bell, in the presence of Gen. Eckert, president of the Atlantic and Pacific Telegraph Company, President Gibbs, of the Dominion Telegraph Company, President Barnard and Profs. Newberry and Rood, of Columbia College, and many others, at the St. Denis Hotel. The following is the article from the New York *Tribune*: —

"An exhibition of the speaking telephone was given last night at the St. Denis Hotel, in this city. An invitation to exhibit the instrument here had been tendered to Prof. A. Graham Bell by Prof. F. A. P. Barnard, Dr. Howard Crosby, Prof. Henry Morton, and two or three dozen other gentlemen eminent in the learned professions or connected with telegraphy. Before beginning his proposed course of lectures, Prof. Bell invited a few of his scientific friends to be present at an informal exhibition, to show the power of the instruments. About fifty gentlemen were gathered in one of the parlors of St. Denis Hotel last evening. Among those present were President Barnard, Prof. O. N. Rood and Prof. J. S. Newberry, of Columbia College; the Rev. Dr. Armitage; Gen. Eckert, president of the Atlantic and Pacific, and the Hon. T. N. Gibbs, president of the Dominion Telegraph Company; Prof. Peet, of the Deaf and Dumb Asylum; Eastman Johnson, Gen. Gaylord, S. A. Bunce, R. H. McCurdy, F. O. Evans, and other well-known citizens. There was some delay about the proceedings, which was afterwards explained.

"Prof. Barnard introduced Prof. Bell to the audience, having become acquainted with the instrument and the inventor at Philadelphia. Prof. Barnard stated that of all the instruments of precision and research, etc., which the group of Centennial judges, of which he was chairman, was called upon to examine, there was none that occasioned greater interest or that they regarded as of higher novelty and importance than the speaking telephone of Prof. A. Graham Bell. In introducing Prof. Bell to the audience, Prof. Barnard said that he did so with the conviction that the name of the inventor of the telephone would be handed down to posterity, with a permanent claim on the gratitude and remem-

brance of mankind. Prof. Bell expressed himself as surprised at the size and importance of the gathering. He had at first expected only a small number of his friends, and had arranged to exhibit his telephone merely by placing one of the instruments in one room, and another in another room, in the hotel, connecting them by wires. But at a late hour he had determined upon a more complete exhibition of the character of the instrument, and had therefore sent his assistant, Mr. Gower, to Brooklyn, and hoped before long to hear that Mr. Gower had arrived somewhere in that city, and to hear it from Mr. Gower through the telephone. While Prof. Bell was speaking, a sound was heard from the instrument; he placed his ear against it, and after listening for a moment, said to the audience: 'It is all right. Mr. Gower has been in search of a cornet player, and thinks he will have one to play a tune for us.' Prof. Bell then carried on a brief conversation with Mr. Gower, finally desiring the latter to be in readiness after a short interval, in which Prof. Bell proposed to explain some features of the instrument to his audience.

"Prof. Bell mentioned many of the facts with which our readers are already familiar, as to the construction and character of the instrument. When a magnet approaches a bar of iron, it generates a current or a change of electrical condition in the iron; when it is drawn back it generates the converse electricity: *i. e.*, in the one case positive, in the other negative. What Prof. Bell had done was to substitute a sheet or plate of iron for the bar, to make that vibrate instead of the magnet, and to keep the magnet stationary. The vibration was communicated to the plate in front of the poles of the magnet by the waves of sound striking on the plate. These differences of positive and negative electricity, transmitted through the wire, caused a magnet at the other end of the wire to attract or repel a precisely similar iron plate; and the vibrations of that, communicated to the air, were sounds precisely corresponding to those presented at the first plate. He has tested it on two hundred and fifty-eight miles of wire between New York and Boston. He commenced by understanding it; now he does not understand it.

"The vibration was supposed to be like that of a membrane such as is that of the drum of the ear. But we all know that such vibration

can be readily dampened by fastening upon the membrane something to stiffen it.

"There was no such result with the telephone when a wooden ring was screwed to the plate; or when the plate itself was made of extraordinary thickness, the vibration is molecular. The curious sounds heard in the telephone were described; some of them had been ascertained to proceed from earth currents. The instrument was more sensitive than a galvanometer to certain imperfections in the wire, or imperfect connections.

"The cornet player at last arrived. He was borrowed for a brief period from the orchestra of a neighboring theatre. He played two tunes, the latter one being very distinctly heard. When the note happened to strike the fundamental note of the telephone box it sounded abnormally loud. Otherwise it was fairly rendered. The voice in Prof. Bell's instrument sounds very much as though it had come through a very long speaking tube. Some practice is necessary to catch the words uttered, the vibrations giving a sort of confusing rattle. Nevertheless, the success of the transmission is unquestionable.

"After Prof. Bell finished speaking, the different members of the audience listened at the instrument, and some of them conversed with Mr. Gower, who was at the telegraph office, No. 340 Fulton Street, Brooklyn. Much laughter was occasioned by Prof. Bell getting the word 'Fulton' wrong after asking Mr. Gower where he was; Prof. Bell understood him to say 'Beacon Street,' perhaps having Boston in his mind. The proprietors of the St. Denis Hotel invited the visitors to a repast after the exhibition."

The first New York lecture was given May 17, 1877, at Chickering Hall, and long reports of it were in the New York *Herald*, *Tribune*, *World* and *Times* of the next day. These reports stated that President Barnard and Prof. Rood, of Columbia College, President Morton and Prof. Mayer, of the Stevens Institute, Mr. Cyrus W. Field, Mr. William Orton and Gen. Eckert, and Messrs. Preece and Wheeler (of the English Postal Telegraph) were present, and that Mr. Field spoke through the telephone to the operator at Brunswick.

The lecture in New York, at Chickering Hall, was preceded by the following request, the original of which is before me, which was published in the daily papers, and will be produced if required: —

"NEW YORK, April 7, 1877.

"Prof. A. GRAHAM BELL, *Boston University:*

"*Dear Sir*, — The interest excited during the Centennial Exhibition by your experiments with your telephone, holding communications in audible speech with persons many miles away, and the published accounts of your improvements in the wonderful instrument, prompt us to request that you will deliver in our city, on some evening convenient to yourself, a lecture on sound and electricity, with an exhibition of your speaking telephone, showing what can be done by it, and making known its scientific and commercial value.

"Very truly, etc.,

"F. A. P. BARNARD [*President Columbia College*].
HOWARD CROSBY [*Chancellor of New York University*].
HENRY MORTON [*Stevens Scientific School*].
E. L. YOUMANS [*Ed. Popular Science Monthly*].
CYRUS W. FIELD [*Atlantic Cable*].
THOS. T. ECKERT [*Pres. Atlantic and Pacific Tel. Co.*].
A. M. MAYER [*Stevens Scientific School*].
WILLIAM ORTON [*Pres. Western Union Tel. Co.*].
J. S. NEWBERRY [*School of Mines, Columbia College*].
C. T. CHANDLER [*Prof. Chemistry, College Phys. and Surgeons*].
H. D. NOYES [*Prof. Aural Surgery, Bellevue College*].
JNO. W. DRAPER [*Prof. Chemistry, N. Y. University*]."

At Boston three lectures were given in the Music Hall in May, 1877, at the first of which Prof. Bell was introduced by Governor Gaston, and at each of them articulate speech was publicly transmitted. The exhibitions at Boston and Providence were reported in the principal newspapers; *e. g.*, Providence *Journal* of April 6, 1877, the Boston papers of April 6, and of May 5, 8, 9, of 1877.

The Boston lectures were preceded by the following, which was published in the daily papers, and will also be produced when required: —

"Boston, April 20, 1867.

"Prof. Alexander Graham Bell:

"*Sir*, — The undersigned, having followed with great interest the accounts of your discoveries and inventions in connection with the electric telephone, which have from time to time appeared in the newspapers, and confident that the general public of the city in which your researches have been made will be glad to witness a practical exhibition of your telephone under your direction, respectfully request you to gratify this desire of your fellow-citizens at such time and place as may be most convenient to you.

"Benjamin Pierce [*Prof. Mathematics, Harvard College*].
Joseph Lovering [*Prof. Physics, Harvard College*].
E. N. Horsford [*formerly Rumford Prof., Lawrence S. School*].
Henry W. Longfellow [*Cambridge*].
Geo. B. Emerson [*Boston*].
O. W. Holmes [*Boston*].
Charles W. Eliot [*President University at Cambridge*].
Alexander H. Rice [*Governor of Massachusetts*].
Nehemiah Gibson [*Boston*].
Frederick O. Prince [*now Mayor of Boston*].
William F. Warren [*Cambridge*].
John D. Runkle [*Mass. Inst. Technology and Naut. Al.*].
C. F. Adams [*Quincy*].
Wolcott Gibbs [*Prof. Lawrence Scientific School*].
Edward C. Pickering [*Prof. Physics Mass. Inst. Tech., now Director of the Observatory at Cambridge*]."

I will refer to the following publications, though I was not present on the occasions described: —

Dr. Henry Morton gave a lecture on the telephone, and an abstract of it is in the New York *Herald* of June 14, 1877.

The *Journal of the Telegraph*, March 1, April 1, April 16 and May 16, 1877, describe and refer to Mr. Bell's electric speaking telephone, and to Mr. Bell as the inventor thereof.

The *Popular Science Review*, an English publication, for 1877,

page 429, has an article of four pages on electric speaking telephones, in which it says: —

"THE TELEPHONE. — During the recent session of the British Association at Plymouth, the lion's share of attention was unquestionably given to the telephone. Wherever the instrument was to be exhibited, whether in the physical or in the mathematical sections, or at Mr. Preece's popular evening lecture, there were always crowded audiences, eager to learn something about so novel an apparatus. At the *soirées*, too, the telephone stood above everything else as the centre of attraction, and knots of people were crowded round the instrument, anxious to converse with friends in distant apartments. The interest in this subject culminated on the arrival of Prof. Graham Bell, the inventor of the talking telegraph."

The Mr. Preece referred to is, I presume, Mr. W. H. Preece of the English Postal Telegraph, vice-president of the Society of Telegraph Engineers. A paper by him on the telephone was published in the *Philosophical Magazine* for April, 1878. It begins as follows: —

"The introduction of the speaking telephone, by Alexander Graham Bell, has supplied physicists with an instrument of research, as well as with an instrument of practical utility."

I have before me a pamphlet by Prof. W. F. Barrett, F. R. S. E., read Nov. 19, 1877, before the Royal Dublin Society, and reprinted from their *Proceedings*. It says: —

"The various attempts to communicate audible speech by means of electricity have culminated in the recent discovery by Prof. Graham Bell of the articulating telephone. The discovery was not the result of chance, but of long and patient endeavor. . . .

"These experiments revealed to Prof. Bell the important point that the transmission of speech by electricity could only be accomplished by using what may be termed an undulatory current; that is to say, one that merely varied in strength, without the occurrence of any actual interruptions which would give rise to a discontinuous or intermittent current. It is this principle of an unbroken current which distinguishes Bell's telephone from all preceding efforts.

"The electric currents in this telephone are in simple proportion

to the motions of the air produced by the voice; and further, the electric waves sent to the distant extremity are (by a receiving arrangement precisely similar to the transmitting instrument) caused to reproduce motions of the air identically the same in character as those that gave birth to the currents. Thus, not only is articulation heard perfectly, but moreover, the different qualities of different voices are heard, so that at fifty or one hundred miles' distance the individuality of the speaker is transmitted as well as his ideas."

The *Scientific American* of Oct. 6, 1877, has a long article entitled "The New Bell Telephone." It is illustrated by large woodcuts of the hand telephone now in common use, and of the manner of using the same. Said article describes the structure of the apparatus, and its mode of operation. It concludes with the following paragraph: —

"The telephone has advanced considerably beyond the status of a 'beautiful scientific toy,' which many hastily pronounced it, and is now in constant use in numerous private lines in New York, Boston and Providence. Professor Bell recently exhibited it before the British Association at Plymouth, England, where it attracted great attention. It is at present manufactured by the Telephone Company of New York, Mr. Charles A. Cheever, manager, 32 Tribune Building, in this city."

I annex the opening paragraph of a long article, under the caption of "The Telephone," which appeared in the *Westminster Review* for January, 1878 (page 208): —

"Of all modern inventions connected with the transmission of telegraphic signals, the telephone, devised by Mr. Alexander Graham Bell, has excited the most widespread interest and wonder. Wherever Mr. Bell has appeared before the public to give an account of his invention and the researches which have led up to it, crowds have assembled to hear him. Nor is this astonishing; for the telephone professes not only to convey intelligible signals to great distances without the use of a battery, but to transmit in *facsimile* the tones of the human voice, so that a voice shall be as cer-

tainly recognized when heard over a distance of a few hundreds of miles as if its owner were speaking in a room by our side. And the telephone does not fall short of its profession. Scientific men have had their wonder and curiosity aroused even more than the unscientific public, since a scientific man appreciates the enormous difficulties to be overcome before such an instrument can be realized. Had any hardy speculator a few years ago proposed a telephone which should act on the principle and be constructed in the form of Mr. Bell's instrument, he would have probably have been considered a lunatic." . . .

Int. 12. In Mr. Bell's deposition he speaks of the transmission of articulate speech from Boston to Providence, on the occasion of the lecture and exhibition at Providence, which you have described in your last answer; please to state whether you took any part in that transmission; and if so, what.

Ans. I was at the Boston end of the line, and had entire charge of the experiments by which the lecture was illustrated; and I conversed with a large number of people in Providence, and succeeded in making my voice audible to a large part of the audience at once.

Int. 13. Please state what, if anything, you had to do with the transmission from Providence to Boston of a report of the Providence exhibition, which was published in the Boston *Globe*, a copy of which you have already given.

Ans. I received it by telephone.

Int. 14. The account in the *Advertiser*, Oct. 9, 1876, of the use of the telephone between Boston and Cambridge, speaks of it as the first occasion where conversation was carried on over a telegraph wire. Is that strictly correct, or in what way did that use of the instrument differ from the uses you and Mr. Bell had previously made of it?

Ans. No; it was not strictly correct. Mr. Bell had several months previously, in Canada, carried on conversation over a telegraph wire; and before Oct. 9 we had often carried on conversation over a local circuit. The article in the *Advertiser* of Oct. 9, 1876, gives the first recorded conversation over a telegraph line.

[*Testimony as to use in Canada objected to as incompetent by counsel for Gray, and also by counsel for Edison.*]

Int. 15. What do you mean by the phrase "telegraph line," or "telegraph wire," as distinguished from a "local circuit"?

Ans. By telegraph line I mean one running out of doors. By a local circuit I mean a circuit connecting different points within one building.

Int. 16. I now call your attention to the use by Mr. Bell and his licensees of electric speaking telephones provided with metallic diaphragms; and I wish you would state some early instances of uses in public, or uses to which publicity was given, of instruments constructed with metallic diaphragms, and refer to the publications which describe such uses. Please answer, first, as to instances before April 1, 1877.

Ans. Referring to my answer to Int. 11, all the instruments used at the public exhibitions therein described, from Jan. 1 to April 1, 1887, had metallic diaphragms. In addition to that I will state some other uses of telephones with metallic diaphragms: —

Mr. Bell's magnet receiver, used as part of his speaking-telephone apparatus, exhibited and used at the Centennial Exposition, had a diaphragm entirely of soft iron. One like it, with a soft-iron diaphragm, was given by him to Sir William Thomson, and described by that gentleman in his address before the British Association in August, 1876, a copy of which, taken from the Boston *Daily Advertiser* of Sept. 25, 1876, has already been given. A description of the same, with woodcuts, is in the *Scientific American* supplement of Feb. 10, 1877. These woodcuts are reproduced in Mr. Prescott's book on the "Telephone," page 101, in a reduced size, and are given on page 241, *supra*. This thin metallic iron disk, in combination with the electro-magnet, is also described as the receiver used at the Centennial in the official report on awards, prepared by Sir William Thomson, already quoted on page 236, *supra*. I have already described and given some newspaper accounts of the use of Mr. Bell's telephone between Boston and Cambridge in October, 1876. Metallic diaphragms were then used in those instruments.

The instruments exhibited in operation before the Washington Philosophical Society, Jan. 13, 1877, had metallic diaphragms. An

extract from a report of this in the Washington *Evening Star* of Jan. 20, 1877, has already been given.

All the telephones, the use of which has been mentioned in this deposition as occurring after that date, had metallic diaphragms. Among the uses of those telephones with metallic diaphragms, which took place in the presence of a large number of persons and received publicity through the newspapers, I mention the following, which are already referred to in this deposition: —

Report in Boston *Evening Transcript* of Feb. 1, 1877; report of lecture at Salem, Feb. 12, 1877, was transmitted by telephone, and which was transmitted and received in the presence of a large number of persons.

Another lecture at the same place, Feb. 23, 1877, was reported in the *Globe* of Feb. 24, 1877, the report transmitted by telephone in the presence of a large number of persons. At all the subsequent lectures mentioned in this deposition the public generally attended, paying admission fees; and large numbers of the audience were at liberty to, and actually did, transmit and receive articulate speech through telephones with metallic diaphragms. The character and construction of the diaphragm, and the fact that the *Globe* report was transmitted by it, is described and told in an extract from the *Globe* of Feb. 15, 1877, given in a former answer, page 256. Such telephones were publicly used in New York, May 11, 1877, and a description of the use and of the instrument, mentioning the iron plate, was given in the New York papers of the next day; an extract from the *Tribune* report has been given on page 267.

Other public uses of the speaking telephone with metallic diaphragms were made in New York, May 17, 18 and 19, 1877, and reports of their use are in the New York papers of the next day. These reports stated that the audience publicly transmitted and received speech by them.

Int. 17. Please state whether Mr. Bell and his associates made, with your knowledge, in the spring of 1877, any arrangements for the manufacture of electric speaking telephones, under his patents, and with metallic diaphragms for general commercial use; and if so, state whom they arranged with for their manufacture.

Ans. Mr. Bell and his associates made an arrangement with

Charles Williams, Jr., of Boston, for the manufacture of such telephones some time previous to April 1, 1877.

Int. 18. Was any arrangement made with Mr. Williams to act as agent for Mr. Bell and his associates in putting out telephones for private lines; if so, what was the nature of the arrangement?

Ans. An arrangement was made prior to April 1, 1877, by which Mr. Williams obtained the right to supply the public with telephones made under Bell's patents. He was to be allowed a commission on all he leased.

Int. 19. Please state the first line that was put up in the vicinity of Boston for the use of such telephones on it; giving any extracts from newspapers or other publications which you may have relating to it.

Ans. Before April, 1877, a line of wire was built from Boston to Somerville, for the express purpose of being used with telephones. It is correctly described in the following newspaper extracts: —

BOSTON DAILY ADVERTISER.

APRIL 5, 1877.

"The first telephone line that was ever established has just been constructed between the office of Mr. Charles Williams, electrician, in this city, and his house in Somerville, and a conversation can be carried on with perfect distinctness. Mr. Bell was in New York on Tuesday evening, and conversed readily over the regular wires with parties in this city. He lectures in Providence this evening on telephones."

BOSTON POST.

THURSDAY MORNING, APRIL 5, 1877.

"The telephone has been put into practical use; yesterday a line was opened from the office of Charles Williams, Esq., 109 Court Street, to his house in East Somerville. The great value of this invention is thus manifested, for by its uses Mr. Williams is now able to converse with his family when separated from them by fully three miles of distance."

THE BOSTON DAILY GLOBE.

APRIL 5, 1877.

"PERFECTING THE TELEPHONE.

"Prof. A. Graham Bell, the inventor of the telephone, had the pleasure of assisting at the opening of the first regular telephone line in the world, a private line between the place of business of a gentleman in this city and his residence in Somerville. The instrument worked admirably, and the enterprising gentleman is very much pleased with his private telephonic wire between town and home. The practical value of Prof. Bell's invention is being newly proved every day.

"While the professor was in New York recently, he communicated with his associate in Boston, Mr. Watson, and the telephone transmitted conversation over two hundred and eighty miles of space with wonderful clearness and distinctness of sound."

THE BOSTON HERALD.

APRIL 5, 1877.

"The first telephone line ever established has just been constructed between the office of Mr. Charles Williams, electrician, in this city, and his house in Somerville."

THE BOSTON TRAVELLER.

APRIL 5, 1877.

"The first telephone line ever established has just been constructed between the office of Mr. Charles Williams in this city and his house in Somerville."

The telephones used on this line had metallic diaphragms. The owners of Mr. Bell's patents were about to manufacture largely for general commercial use, and this line was constantly used for the public to talk over that they might be induced to buy or hire telephones. Such use by the public was made largely in April, 1877.

Int. 20. Please to describe some other lines that were used for Mr. Bell's telephones in April or the early part of May, 1877, and give any newspaper extracts you may have relating to them; and if you wrote and published any circular or advertisement relating to

telephones for commercial use, please give a copy of it, and state generally what exertions were made in the way of putting telephones on the market for sale or on lease during May, 1877.

Ans. Between April 20 and 30, 1877, a line was built connecting the laboratory of Prof. Bell, No. 5 Exeter Place, with the office of Charles Williams, Jr., No. 109 Court Street; and about the same time, telephone connection was made between said laboratory and the office of Stearns & George, 37 Pearl Street. These lines were specially erected for the business convenience of the parties interested, and were fitted up with telephones, all of which had metallic diaphragms.

JOURNAL OF THE TELEGRAPH.

APRIL 16, 1877.

"The first regular telephone line has been put in operation between the place of business of Mr. C. Williams, 109 Court Street, Boston, Mass., and his residence in Somerville, a distance of about three miles. Mr. Williams states that it works well, and that 'conversation can be carried on by it nearly as well as if in the same room.'"

About May 1, 1877, telephones with metallic diaphragms were put on a line connecting the office of Stone & Downer, 28 State Street, Boston, with the residence of one of the parties in Somerville, concerning which they addressed the following letter to Mr. Gardiner G. Hubbard, who at that time had charge of the business interests under the Bell patents: —

"OFFICE OF STONE & DOWNER, CUSTOM-HOUSE BROKERS AND FORWARDERS, DEALERS IN SPECIE, GOVERNMENT BONDS AND STOCKS, EXCHANGES ON THE PROVINCES AND SAN FRANCISCO, 28 STATE STREET, BOSTON, MAY 14, 1877.

"GARDINER G. HUBBARD, Esq., Cambridge, Mass.:

"*Dear Sir*, — In reply to your inquiry regarding the use of the telephone, I would state that we placed them on our line between Boston and North Somerville some two weeks ago; we have used them constantly since with good success; in fact, we have become so used to them that we use them in preference to the 'Morse

System,' being able by the use of the telephone to transmit our messages much faster, and with a great deal less labor. We have experimented several times with musical instruments, and in each case have been attended with remarkable success; the playing of a piano being heard very distinctly, and no difficulty experienced in distinguishing the piece being played. We can certainly indorse the telephone as a success, and believe it can be used practically with many advantages over the old system of telegraphy.

"Yours respectfully,

"R. C. & F. W. DOWNER."

The inquiry of Mr. Hubbard referred to in said letter was with the view of drawing out a reply from the Messrs. Downer for publication, in a circular then in course of preparation, and which was immediately thereafter printed for general circulation and widely distributed, which circular was in the following words: —

"THE TELEPHONE.

"The proprietors of the telephone, the invention of Alexander Graham Bell, for which patents have issued by the United States and Great Britain, are now prepared to furnish telephones for the transmission of articulate speech through instruments not more than twenty miles apart. Conversation can be easily carried on, after slight practice, and with the occasional repetition of a word or sentence. On first listening to the telephone, though the sound is perfectly audible, the articulation seems to be indistinct; but after a few trials, the ear becomes accustomed to the peculiar sound, and finds little difficulty in understanding the words.

"The telephone should be set in a quiet place, where there is no noise which would interrupt ordinary conversation.

"The advantages of the telephone over the telegraph for local business are: —

"*First.* That no skilled operator is required, but direct communication may be had by speech, without the intervention of a third person.

"*Second.* That the communication is more rapid, the average num-

ber of words transmitted a minute by Morse sounder being from fifteen to twenty; by telephone, from one to two hundred.

"*Third.* That no expense is required, either for its operation, maintenance or repair. It needs no battery, and has no complicated machinery. It is unsurpassed for economy and simplicity. The terms for leasing two telephones for social purposes, connecting a dwelling house with any other building, will be $20 a year, — for business purposes $40 a year, — payable semi-annually in advance, with the cost of expressage from Boston, New York, Cincinnati, Chicago, St. Louis or San Francisco. The instruments will be kept in good working order by the lessors, free of expense, except from injuries resulting from great carelessness.

"Several telephones can be placed on the same line at an additional rental of $10 for each instrument, but the use of more than two on the same line where privacy is required is not advised. Any person within ordinary hearing distance can hear the voice calling through the telephone. If a louder call is required, one can be furnished for $5.

"Telegraph lines will be constructed by the proprietors if desired. The price will vary from $100 to $150 per mile; any good mechanic can construct a line. No. 9 wire costs 8½ cts. a pound, 320 pounds to the mile, 34 insulators at 25 cts. each; the price of poles and setting varies in every locality; stringing wire $5 per mile, sundries $10 per mile.

"Parties leasing the telephones incur no expense beyond the annual rental and the repair of the line wire. On the following pages are extracts from the press and other sources relating to the telephone.

"GARDINER G. HUBBARD,

"MAY, 1877. "Cambridge, Mass.

"For further information and orders address Thos. A. Watson, 109 Court St., Boston."

In addition to the foregoing this circular contained a long extract from the reports on awards of the judges of the Centennial Exhibition, Sir William Thomson, chairman; a series of resolutions

adopted by the Essex Institute, Feb. 19, 1877, relative to the telephone; an extract from the Providence *Evening Press* of March 19, 1877, giving an account of successful experiments by Prof. Bell in talking through the telephone over a line forty-three miles long; an extract from the New York *Herald* of May 12, 1877, giving a description of an exhibition by Prof. Bell at the St. Denis Hotel; and the letter of Messrs. R. C. & F. W. Downer, above given in full. In the New York *Graphic* of Wednesday, May 23, 1877, appeared the following article relative to the practical use of the telephone, from which it is evident that this circular had at that date reached New York: —

THE DAILY GRAPHIC, NEW YORK.

WEDNESDAY, MAY 23, 1877.

"The telephone is quickly working out a practical application. A Boston company is prepared to furnish telephonic communication between places not over twenty miles apart. The advantages are thus set forth: No skilled operator employed; a little practice makes any one master of the telephone; communication more rapid, — the telephone transmits one or two hundred words per minute, the old telegraph apparatus averages not more than twenty; no expense required in its operation; no battery needed; two telephones connecting two houses may be leased for $20 per year. The company keep the instruments in working order. It must be understood that the rental mentioned above is for the use of the telephonic instrument. A telegraph line, when required, will cost from $100 to $150 per mile."

In the early part of May, 1877, an arrangement was made with the Cambridge Board of Water Works for putting up telephones on a line connecting their office in Cambridge with the works at Fresh Pond. This practical use of the telephone for public purposes was referred to as follows, in a Boston newspaper of May 19: —

THE BOSTON HERALD.

MAY 19, 1877.

"PRACTICAL USE OF THE TELEPHONE.

"A telephone is to be placed in the City Hall, Cambridge, in the office of the Water Board, to establish communication with the water

works at Fresh Pond. A line of wire has been constructed, it being originally intended for the use of the printing telegraph. At the suggestion of Hon. Gardiner G. Hubbard, a telephone is to be substituted, that gentleman guaranteeing that the city shall be subjected to no expense unless the machine proves satisfactory."

THE BOSTON DAILY ADVERTISER.

MAY 19, 1877.

"THE FIRST PRACTICAL APPLICATION OF THE TELEPHONE.

"The Water Board of Cambridge has decided to have telephone communication with the water works at Fresh Pond, in order to facilitate the sending of messages. The board has accepted the offers of Mr. Gardiner G. Hubbard to place the telephone in operation, the city to be at no expense unless the arrangement proves satisfactory. Mr. Hubbard was formerly president of the board, and feels interested in having Cambridge first to apply the wonderful invention to public service."

In the early part of May, 1877, telephones with metallic diaphragms were put up on lines connecting the office of E. T. Holmes, Washington Street, Boston, with the banking house of Brewster, Bassett & Co., Congress Street, and the office of Charles Williams, Jr., 109 Court Street. These lines were intended to demonstrate the value of the telephone in connection with the burglar and fire-alarm systems of Mr. Holmes, and a public exhibition of the same was given on the seventeenth day of May following, notice of which appeared in a Boston newspaper of the next day. The telephones used on that line had metallic diaphragms.

BOSTON EVENING TRANSCRIPT.

MAY 18, 1877.

"THE TELEPHONE.

"Another successful series of experiments with the telephone was made yesterday afternoon at the rooms of Prof. Holmes, electrician, on Washington Street. At this place Mr. T. M. Carter played several cornet solos, which were distinctly heard at the rooms of

Messrs. Brewster, Bassett & Co., on Congress Street, at a branch office on Court Street, and in Somerville.

"In response, Mrs. Williams sang several songs in Somerville, which were plainly heard at these points above mentioned in this city; and singing from the Court Street office was heard in all the other places. Conversation was also carried on between the several points connec'ed, with perfect ease."

On the eighteenth day of May, 1877, I personally put up a telephone in the office of H. L. Roosevelt, No. 40 West 18th Street, New York, connecting with another telephone supplied by Prof. Bell at said Roosevelt's residence, both of which had metallic diaphragms.

On Monday, the twenty-first day of May, 1877, in pursuance of an arrangement made some time prior thereto, I put up telephones, with metallic diaphragms, on a line in Altoona, Pa., going from New York specially for that purpose.

All the lines above referred to as erected in April and May, 1877, were put up for practical business purposes, and were so used from the date of their construction.

During the months of April and May, 1877, Mr. Hubbard was constantly negotiating for the disposal of exclusive privileges, territorial licenses, etc., under the Bell patents, and for supplying telephones with metallic diaphragms for commercial use. In April, or before, we made an agreement with Charles Williams, Jr., and the firm of Stearns & George, by which these parties acquired a right to the private line telephone business for Boston and vicinity within a radius of ten miles.

Before May 1, 1877, said Hubbard was negotiating with Charles A. Cheever and others to supply telephones to them for general commercial use in New York City; with Russell & Kinsman for their use in Boston; with E. T. Holmes for use of the telephone in Boston in his bank and express business; and with a great number of parties whose names I do not now recall, for territorial privileges in various parts of the country. The offers made to these persons by Mr. Hubbard in April and May were to furnish telephones to

them to be used on lines which they were to put up for any customer who might apply.

Int. 21. Please state when the circular referred to in your last answer, or its contents, were advertised or made public.

Ans. Some time prior to May 16, 1877.

Int. 22. How do you fix that date?

Ans. The circular was prepared by Mr. Gardiner G. Hubbard, Mr. Bell's business manager, and an abstract from the circular was published in the New York *Graphic* of May 23, 1877, a copy of which has been given in my previous answer. These circulars were sent out by Mr. Hubbard from Boston; and as Mr. Hubbard had left Boston on May 16, to attend the lectures of Mr. Bell in New York on the 17th, 18th, and 19th, and on the 20th went to Altoona, Pa., with me to put up telephones, and went directly from Altoona to Washington, I am certain they were mailed before he left Boston.

Int. 23. Did you put up any electric speaking telephones with metallic diaphragms at Altoona, Pa., in May, 1877; if so, when and for whom?

Ans. I put up a set of such telephones Monday, May 21, 1877, for Mr. Gardner, superintendent of the Pennsylvania Railroad.

Int. 24. State, if you know, how early the arrangement to put up those telephones was made between Mr. Bell and his associates and the Pennsylvania Railroad, and when you received your directions to go to Altoona and put them up.

Ans. The arrangement was made before Mr. Hubbard left Boston, May 16, 1877; I received my instructions May 18 or 19.

Int. 25. Some extracts from the Cambridge and Boston papers of May 19, 1877, given in your previous answers, refer to Bell telephones used or to be used by the Cambridge Water Board: will you state when that arrangement was made, and how you fix the date?

Ans. The arrangement was made between Mr. Hubbard and the Water Board early in May, 1877. It was made before Mr. Hubbard left for New York, May 16, 1877.

Int. 26. One of your previous answers refers to telephones put up for Mr. Roosevelt, in New York, May 18, 1977: state whether or

not you put them up or superintended putting them up, and how positively you can fix the date.

Ans. I put up one of them myself. Mr. Roosevelt put up the other. We immediately used the line and it worked very satisfactorily. I am able to fix the date, May 18, 1877, as the telephones were put up during the New York lectures, already mentioned; and the first and last days, the 17th and 19th, I was too busy to do anything but attend to preparations for the lectures.

Int. 27. State what kind of diaphragms were in the instruments you have described as having been made, furnished or put up between Jan. 1, 1877, and June 1, 1877.

Ans. The diaphragms in those instruments were composed entirely of soft iron.

Int. 28. The extracts from the *Advertiser* and the *Globe*, of April 5, 1877, given in your answer to Int. 19, refer to the transmission of articulate speech over the regular wires between New York and Boston a few days before. Please state whether or not such transmission took place, and whether you took part in it.

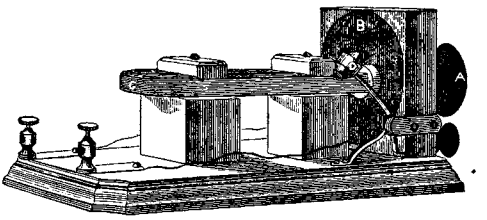
Ans. Such transmission took place as described. I was at the Boston end of the line, and talked with Mr. Bell in New York.

Int. 29. Please describe the telephone that was used on that occasion.

Ans. It was what was called a box telephone, consisting essentially of a large permanent magnet, with coils of wire on its ends and a diaphragm of soft iron, fastened on a wooden block behind a mouthpiece, and the whole covered with a thin wooden box. It is essentially like the drawing defendants' Exhibit Bell Telephone A, page 772, Vol. II. of the record in the Dowd case. That drawing, however, shows the instrument with its cover off in order to exhibit its interior. In practice a wooden cover like a box went over the whole interior part, which was screwed on to the base, and this is what gave it the name of box telephone. As we progressed, the telephones were gradually made neater and smaller. I have here before me on the table, box telephone No. 39, which was made in June, 1877. A sectional cut of this will be made part of my answer. In this the cores of the coils are prolongations of the magnet. They were afterwards placed on the side of the magnet, and the position of the

"BELL TELEPHONE A," page 772 of Dowd Case.

(RECORD, PAGE 286.)



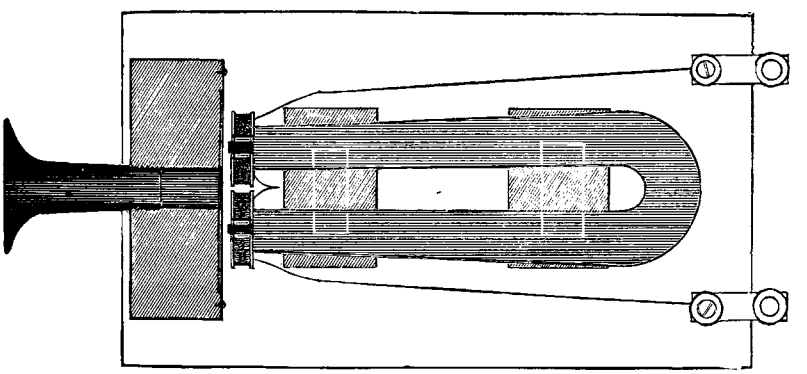
A. Speaking Tube.
B. Metallic Diaphragm.
C. Permanent Magnet.
D. Signal Call.

DIMENSIONS.

Length of permanent magnet	$7\frac{1}{4}$ inches.
Length of spool	$\frac{3}{8}$ "
Diameter of spool	$1\frac{1}{8}$ "
Diameter of diaphragm	$4\frac{1}{4}$ "
Length of speaking tube	$3\frac{1}{4}$ "

BOX TELEPHONE (No. 39) OF JUNE, 1877.

(RECORD, PAGE 286.)

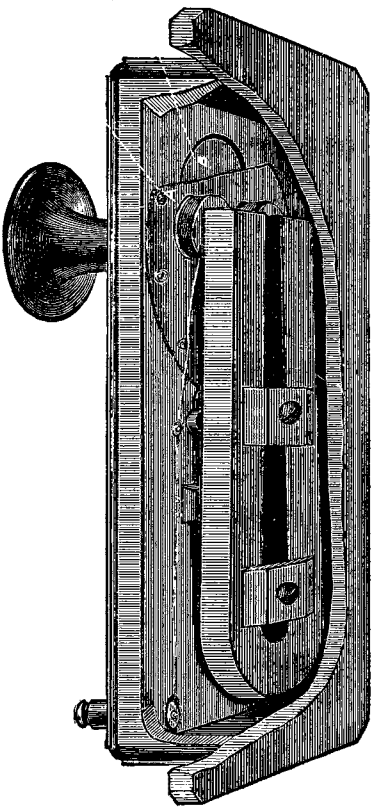


DIMENSIONS.

Length of permanent magnet (including core)	$7\frac{5}{8}$ inches.
" spool	$\frac{1}{4}$ "
" core	$\frac{5}{16}$ "
Diameter of spool	$1\frac{1}{8}$ "
" core	$\frac{1}{4}$ "
" diaphragm	$4\frac{3}{16}$ "
" sound chamber	$3\frac{3}{8}$ "
Depth of sound chamber	$\frac{1}{16}$ "

BOX TELEPHONE (No. 251) OF AUGUST, 1877.

(RECORD, PAGE 291.)



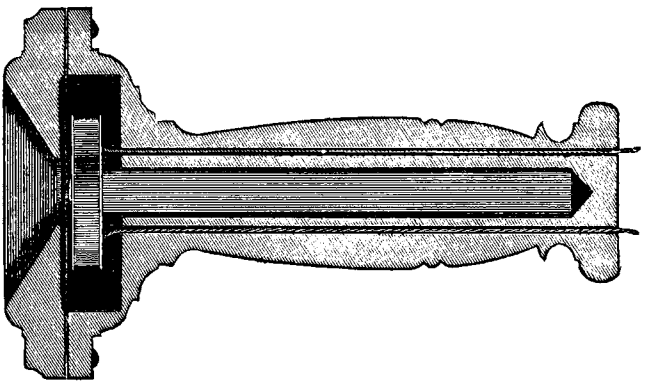
A. Diaphragm broken off to show sound chamber.
B. Sound chamber.

DIMENSIONS.

Length of permanent magnet	7	inches.
" spool	$\frac{3}{8}$	"
" core	$\frac{7}{16}$	"
Diameter of spool	1	"
" core	$\frac{1}{4}$	"
" diaphragm	$4\frac{1}{8}$	"
" sound chamber	$3\frac{3}{8}$	"
Depth of sound chamber	$\frac{1}{16}$	"

HAND TELEPHONE (No. 10) OF MAY, 1877.

(RECORD, PAGE 291.)

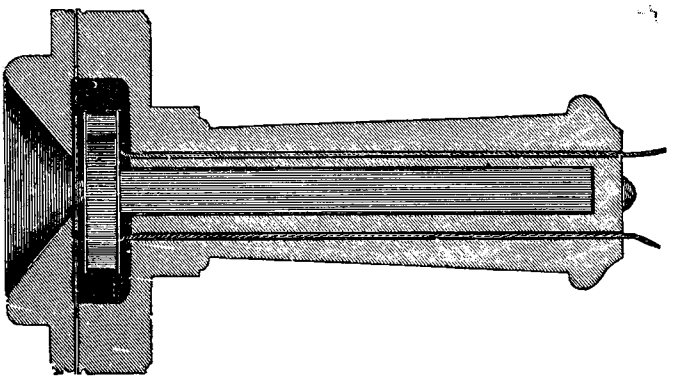


DIMENSIONS.

Length of permanent magnet	$4\frac{1}{4}$	inches.
" spool	$\frac{1}{4}$	"
Diameter of spool	$1\frac{1}{8}$	"
" diaphragm (in the clear)	$1\frac{3}{4}$	"

HAND TELEPHONE (No. 18) OF JUNE, 1877.

(RECORD, PAGE 291.)

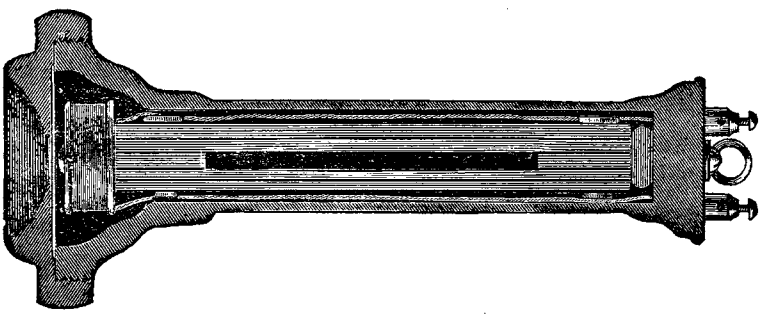


DIMENSIONS.

Length of permanent magnet	$4\frac{1}{16}$	inches
" spool	$\frac{1}{4}$	"
Diameter of spool	$1\frac{1}{8}$	"
" diaphragm (in the clear)	$1\frac{3}{4}$	"

RUBBER HAND TELEPHONE, IN USE SINCE DEC., 1877.

(RECORD, PAGE 291.)



DIMENSIONS.

Length of permanent magnet	$4\frac{3}{4}$	inches.
" soft-iron core	$\frac{9}{16}$	"
" spool	$\frac{1}{2}$	"
Diameter of spool	1	"
" core	$\frac{1}{4}$	"
" diaphragm (in the clear)	$1\frac{3}{4}$	"

diaphragm and mouthpiece changed, so as to occupy the same position in relation to the cores as in No. 39. This much reduced the size of the instrument and allowed it to be screwed directly to the wall. The change was made about Aug. 1, 1877. I produce one, No. 251.

Those used at the lectures in the spring of 1877 were substantially like the exhibit, but were much larger. The first modification was to reduce the size of the box and the magnet; then to change the position of the cores on the magnet, and about the middle of May, 1877, we began to make the form of telephone known as the hand telephone. I have one here, which I now produce for inspection. No. 10 of the manufacturer's series of hand telephones was made in the last of May or first of June. I insert sectional cuts as part of my answer. In this telephone the magnet is a solid single-pole steel magnet, about four inches long. The core is about a quarter of an inch in diameter and half an inch long, formed by reducing the diameter of the steel magnet; with a coil about three eighths of an inch long and one and a quarter in diameter, of insulated wire. Resistance, sixty-five ohms. The diaphragm of thin soft iron about two inches in diameter. The whole is mounted in a wooden handle, similar in shape to a butter stamp, so that it can be easily handled.

After this form, No. 10, we modified the shape of the hand telephone, making it a little larger and a plainer shape, with a rather deeper flare at the mouthpiece. This change was made early in June, 1877. I produce one of this form, No. 18 of the manufacturer's series, a cut of which I insert as part of my answer.

About the middle of December, 1877, we gave up wood as a material for the handles of hand telephones, and adopted hard rubber of substantially the form now in use.

I will also add that about the middle of August, 1877, we changed from single bar magnets to compound bar magnets made up of several layers of magnetized steel, which was stronger and easier to magnetize than the single bar magnet.

My recollection is very strong that no hand telephones were actually put out for commercial use before the first of June, 1877, or within a few days of that time.

Int. 30. Will you state about how many magneto telephones are now in use in this country as transmitters?

Ans. About twenty-five thousand are so used, without counting those used in connection with Blake transmitters as receivers, which are often used as transmitters in case of temporary derangement of the Blake transmitters. I have in mind one instance of the use of magneto telephones as transmitters. The Massachusetts Institute of Technology has recently been fitted with telephones on lines connecting their various departments, — about twenty stations. At all these stations magneto telephones are used as transmitters and give perfect satisfaction.

Int. 31. Please state how many electric speaking telephones made by Mr. Bell, or his associates, under his patents, were in public and commercial use at the dates which I will indicate.

Ans. By June 30, 1877, about 164 hand and 70 box telephones were in public use.

By July 31, 1877, about 658 hand and 120 box telephones were in public use.

By Aug. 31, 1877, about 1,000 hand and 300 box telephones were in public use, all of which had metallic diaphragms of soft iron.

By Oct. 31, 1877, about 3,000 telephones in all were in use.

By June 1, 1879, over 33,000 were in use.

Cross Examination by W. D. BALDWIN, Esq., *of Counsel for Gray.*

Cross-Int. 32. Please point out any portion of Bell's patent of March 7, 1876, which in term specfies an electric speaking telephone.

Ans. I cannot find that the patent mentioned uses that term.

[*Adjourned.*]

MARCH 11.

Direct Examination resumed by Mr. STORROW, *of counsel for Bell.*

Int. 33. Please state whether or not said patent states and shows an apparatus by which the same vocal sound that is uttered into the transmitter by the human voice is heard to proceed from the receiver without any limitation as to the character of the sound.

Ans. It certainly does.

Int. 34. Please state, as to the early telephones put out in April and May, 1877, whether written leases for them were executed at the time the instruments were furnished and put up, or whether the leases were executed subsequently; and state, if you recollect, the earliest date when any such leases were executed.

Ans. The leases were invariably executed from a week to a month later than the date of putting the instruments in use. The date of the first lease that was executed for telephones was June 8, 1877.

Cross Examination by L. W. SERRELL, Esq., *of Counsel for Edison.*

Cross-Int. 35. Please refer to the drawing marked "Exhibit No. 37 [25], Bell's Toronto drawing," and state at what time the instrument shown in the lower right-hand figure was first employed in the manner indicated in the writing under that figure.

Ans. Some time during June or July, 1875. Certainly not later than the middle of July, 1875.

Cross-Int. 36. Please refer to page 71 of Prescott's work on the Speaking Telephone, etc., 1879, and state whether or not the account given of the instrument, Fig. 49, corresponding with the sketch last referred to, is correct.

Ans. I do not consider that it is correct.

Cross-Int. 37. It appears to have been a statement made by Mr. Bell in his lecture before the Society of Telegraphic Engineers, Oct. 31, 1877: do you now think that your recollection of the operation of that instrument is more correct than the statements of Mr. Bell given over three years ago?

Ans. I do.

Cross-Int. 38. Wherein was Mr. Bell's statement then given incorrect, and when did you first find out that it was incorrect?

[*Question objected to, for the reason that it is a matter which the examining counsel should have examined Mr. Bell upon if he desired the information. Counsel for Mr. Edison replies that he had no reason to suppose his statements made at his lecture were incorrect, or else he should have asked Mr. Bell upon the subject.*

Counsel for Bell objects to remarks of counsel for Edison as im-

proper to go upon the record, and because, the subject having been fully gone into on Mr. Bell's examination, counsel refrained from cross-examining him.]

Ans. The results were entirely satisfactory to both of us, and Mr. Bell was greatly encouraged by the result of the experiment. I discovered that it was incorrect when I first read the lecture, about a month or two after it was delivered.

Cross-Int 39. Did you call Mr. Bell's attention, and if so, when, to the incorrectness of the statements he had made?

Ans. I think I did, immediately on his return from England, in the winter of 1878–9.

Cross-Int. 40. Please refer to Fig. 7 of Bell's first patent, No. 174,465, and state whether or not the instrument therein represented is the same one as that shown in Fig. 49 of Prescott's work before spoken of, and mentioned in Mr. Bell's lecture before the Society of Engineers.

[*Objected to on the ground that the figures speak for themselves.*]

Ans. Each of the figures referred to shows two telephones. The left-hand one of those in Fig. 7 of the patent is substantially the same as either of those shown in Fig. 49 of Prescott's book. The right-hand instrument of Fig. 7 of the patent differs substantially in the shape of the mouthpiece.

Cross-Int. 41. About how many instruments did Mr. Bell make with a membrane diaphragm, an electro-magnet and a hinged armature upon one pole of the magnet connected with the diaphragm similar to those shown in the figures referred to, regardless of the shape of the mouthpiece, before the end of 1877?

Ans. At least two.

Cross-Int. 42. Did Mr. Bell use, in connection with those instruments, mouthpieces in either of the forms shown in the drawings before referred to?

Ans. The mouthpieces, as I remember them, were similar to those shown in Fig. 7 of the patent. The instruments were constructed in such a manner that different shapes of mouthpieces could be attached.

Cross-Int. 43. Are you confident that such tubes or mouthpieces were used with these instruments?

Ans. I am.

Cross-Int. 44. Please refer to the drawing of the instrument Exhibit 40 [*Exhibit* 28, *p.* 233, *of pending case*], after page 75, Vol. II., of the Dowd case, and also to Figs. 51 and 59, pages 72 and 93 of Prescott's Speaking Telephone, and state whether or not those three figures are intended to represent the same instrument.

Ans. Figs. 51 and 59 of Prescott's work represent the same instrument, but the drawing Exhibit 40 [28 *of pending case*] represents a different instrument.

Cross-Int. 45. How many instruments like Exhibit 28 were made prior to the end of 1877?

Ans. I only remember one exactly like this figure.

Cross-Int. 46. What kind of a metal plate was used on the top of that instrument, and how was it fastened?

Ans. The metal plate was made of soft iron, about the same diameter as the top of the tube, and about two one hundredths of an inch thick, and the instrument was generally used with the plate laid on the top of the tube, and held there by the attraction of the magnet. We sometimes used a wooden mouthpiece, which fitted on the top of the tube and pressed upon the edge of the diaphragm. The wooden mouthpiece was used during October or November, 1876.

Cross-Int. 47. When was any instrument made with the plate fastened at one edge to the tube, and standing up at the opposite edge from the tube, as represented at Figs. 51 and 59 of Prescott's work, before referred to?

Ans. The first instrument of this kind that had the screw through the edge of the diaphragm was the one given to Sir Wm. Thomson, in the summer of 1876. The office of the screw was merely to prevent the diaphragm from being lost.

Cross-Int. 48. When the screw was tightened, did not the opposite edge of the disk or diaphragm rise above the top of the tube?

Ans. I am very certain that it did not.

Cross-Int. 49. Do you know who furnished the drawings of these instruments that have been put in Mr. Prescott's said work as being part of Mr. Bell's London lecture?

Ans. I do not.

Cross-Int. 50. How many instruments substantially like Fig. 51, in Prescott's work, were made before the end of 1877?

Ans. I perfectly remember three.

Cross-Int. 51. On about how many occasions during 1876 was an instrument made use of corresponding to Fig. 7 of the Bell patent No. 174,465?

Ans. Such an instrument was used constantly during the experiments made by Mr. Bell in the summer of 1875. It would be impossible to say on how many occasions it was used, as I have no doubt it was used a dozen times a day on some days. In 1876 the instrument had been improved, and I do not remember this exact form being used at any time during 1876.

Cross-Int. 52. What was the next or improved form of the instrument spoken of in your last answer?

Ans. That shown in Fig. 58, page 93, of Prescott's work.

Cross-Int. 53. When was this first used?

Ans. In the early summer of 1876. This is one of the forms that was used at the Centennial.

Cross-Int. 54. Please refer to Fig. 3, on pages 1 and 2 of Vol. II. of the Dowd telephone suits, and state whether or not the hole in the top of the case there represented is the same hole in the case that was held to be detrimental, as was spoken of in answer to Int. 50, on page 546, Vol. I., of the Dowd telephone suits [page 211, *supra*].

Ans. The hole in the figure is in a similar position in relation to the diaphragm, and would have the same detrimental effect as those holes spoken of in answer to the interrogatory inquired upon.

Cross-Int. 55. On page 551, Vol. I., of the Dowd telephone suits, do I understand correctly that your experiments led you to understand that there is no difference between a speaking telephone when a tube is used of some considerable length for the sound to travel through between the diaphragm and the operator, and one having only a flaring opening, as shown in the drawing complainants' Exhibit 25 [46 *of pending case*], following page 49 of Vol. II. of the telephone suits?

Ans. If the tube is not more than a foot long, and about five

eighths of an inch internal diameter, there would be no practical difference. This I know from experiment.

Cross-Int. 56. Suppose the tube was smaller than five eighths of an inch in diameter, what would be the operation?

Ans. I have never used a tube smaller than about three eighths of an inch internal diameter, and such a tube worked perfectly satisfactorily.

Cross-Int. 57. Suppose that the tube was more than five eighths of an inch in diameter, what then do you find?

Ans. If it were considerably more in diameter, it would be apt to give a booming quality to the articulation.

Cross-Int. 58. Was any such booming sound noticeable upon the instrument corresponding with Fig. 7 of the Bell patent No. 174,465, or the receiver· No. 2, following page 49, Vol. II. of the telephone suits, or Exhibit No. 22, or Exhibit No. 38, following page 75, or Exhibit No. 39? [*Exhibits* 43, 26, 27 *of pending case.*]

Ans. The articulation of these instruments was always characterized by what I term a "booming" quality.

Cross-Int. 59. Do you consider that booming quality detrimental to such an extent as to interfere with the practical use of the telephone?

Ans. Had we no better telephones at the present day, we could use practically any of those mentioned in Cross-Int. 58.

Cross-Int. 60. On page 550, Int. 71, of your testimony of Vol. I. of the telephone suits [page 215, *supra*], you speak of the battery being discarded in December, 1876: why was it discarded?

Ans. Because, about the time mentioned in that answer, we made such improvements in the permanent magnet telephone that the results obtained from such telephones were superior to those obtained from telephones in which the magnetism was produced by an electric current from a battery in the circuit.

Cross-Int. 61. About when, after December, 1876, did the Bell Company introduce batteries in their telephone circuits?

Ans. About November, 1878, telephones were introduced by the owners of Mr. Bell's patent that required the use of a battery in connection with them.

Cross-Int. 62. Tell us what telephones those were.

Ans. What is known as the Blake transmitter.

Cross-Int. 63. Is it a fact, then, that previous to the introduction of the Blake transmitter, the Bell Company had only used magneto transmitters and receivers without a battery?

Ans. It is a fact.

Cross-Int. 64. How long before the introduction of the Blake transmitter had other parties — such, for instance, as the Gold and Stock Telegraph Company — used transmitters with a battery, as far as you know?

Ans. As nearly as I can remember, one or two months.

Cross-Int. 65. About how many telephones has the Bell Company now in operation in the different cities and places under its license; and what proportion of those instruments are in circuits provided with batteries, and what proportion without batteries?

Ans. The Bell Company has about 150,000 telephones in use under its license in the United States, of which about 60,000 have batteries used in connection with them; the rest are magneto telephones which are not provided with batteries.

Cross-Int. 66. About how many magneto telephones are in use upon circuits in which batteries are provided for use when desired?

Ans. About 90,000.

Cross-Int. 67. About how many magneto telephones are in use upon circuits in which batteries are not provided at all, directly or indirectly?

Ans. Somewhat more than 25,000.

Cross-Int. 68. Is it not a fact that in cities where there are numerous lines adjacent to telephone lines, that the magneto telephone without any battery in the circuit is very liable to indicate false sounds?

Ans. No more so than with the battery.

Cross-Int. 69. Is it not a fact that in instances where a carbon transmitter and a battery are made use of under the circumstances required in the last question, the sounds are much more clear and distinct than they are when a magneto transmitter is made use of?

Ans. The carbon or battery transmitter of any kind will undoubtedly transmit sound more loudly than a magneto transmitter; but

either could be and is used under the circumstances described in Cross-Int. 68.

Cross-Int. 70. Is it not a fact that telephone instruments in which batteries and carbon, or similar transmitters, are employed, are less liable to detrimental influences by inductive currents than the magneto instruments?

Ans. The only effect of inductive currents on a telephone circuit that would be detrimental to its working is the noise produced by such currents in the receiving telephones connected with such circuit. This noise would be no greater if a magneto telephone was used as a transmitter than if a battery transmitter was used.

Cross-Int. 71. When a battery transmitter is used under the circumstances spoken about in your last answer, do the noises interfere with the reception of the message as much as they do when a magneto transmitter is used?

Ans. They do not.

Cross-Int. 72. And is that the reason why the battery transmitters have been as extensively used as indicated in your previous evidence?

Ans. That is one reason.

Cross-Int. 73. Have you made any careful experiments by which to ascertain the comparative merits of the Edison carbon transmitter and the Blake carbon transmitter, taking into account the reliability of the adjustment, the tendency to change under different atmospheric conditions, the quality of the articulation at the receiving instrument and the relative cost of construction?

Ans. I have made many such experiments, and am familiar with the relative cost.

Cross-Int. 74. Is it not a fact that in the Blake transmitter the electrodes are liable to separate where a loud talking or shouting takes place at the instrument?

Ans. This is a defect common to all battery transmitters, and the Blake transmitter is no more affected that way than any other.

Cross-Int. 75. Do you know whether in the Edison carbon transmitter the electrodes will separate under the circumstances inquired of in the last question?

Ans. It will, under certain adjustments.

Cross-Int. 76. Please answer my previous question under the supposition that the Edison instrument is adjusted in the most approved manner by a competent person.

Ans. The most approved method of adjusting an Edison transmitter is undoubtedly to make the pressure of one electrode against another so great that it would not separate under the influence of shouting. This necessitates placing the lips close to the mouthpiece when talking to it. In practice this is inconvenient, and the transmitter is often adjusted with the electrodes pressing less tightly, so that the lips need not be placed so closely to the mouthpiece. Under the latter adjustment the electrodes would separate if spoken to loudly with the lips touching.

Cross-Int. 77. Have you ever known of any instance where the electrodes in the Blake transmitter have been injured by an electric spark passing when the electrodes were separated?

Ans. I have never known an instance of the Blake transmitter being injured that I have traced to this cause.

Cross-Int. 78. Have the Bell Company ever manufactured the Edison carbon transmitter themselves; and if so, to what extent?

Ans. The Bell Company do no manufacturing whatever. The Bell Company have ordered about five hundred from the Western Electric Manufacturing Company since November, 1879. These were ordered shortly after the Bell Company obtained control of the Edison patents.

Cross-Int. 79. Is it not a fact that the Bell Company now has the entire control of the telephone business so far as the Edison, Blake, Bell and Gray inventions are concerned, and can supply whichever instrument they see fit to their customers?

Ans. It is a fact that the Bell Company has such control; but it has to supply such telephones as are called for by its agents.

Cross-Int. 80. About how many Edison carbon transmitters were turned over to the Bell Company at the time of the consolidation in November, 1879?

Ans. Between 15,000 and 20,000.

Cross-Int. 81 And about how many of them are now in use?

Ans. I should judge about one half that number.

Cross-Int. 82. Is the article in the *Scientific American*, Sept. 9,

1876, a correct statement of the extent of success obtained by Mr. Bell at that time?

Ans. It is, I think, substantially correct. The first part of it refers to experiments made several months previous.

Cross-Int. 83. In the trial of the telephone for articulate speech on a telegraph line, which was stated was on the 9th of October, 1876, referred to in your answer to Int. 14, what kind of instruments were made use of?

Ans. Both instruments used in the experiment described in the article from the *Boston Advertiser* of Oct. 9, 1876, were substantially the same as complainants' Exhibit No. 38, Bell's Single Pole Centennial Membrane Telephone [*Exhibit* 26 *in pending case*], following page 75 of the Dowd suit, Vol. II. But the mouthpieces were, omitted.

Cross-Int. 84. Were the instruments made use of in the trial between New York and Boston, April, 1877, at both ends alike? And state whether or not any battery was used on the line.

Ans. They were substantially alike, and no battery was used.

Cross-Int. 85. State whether or not the magnet was adjustable.

Ans. It was.

Cross-Int. 86. And in what respect was it similar to the magnet shown in Bell's patent of Jan. 30, 1877, No. 186,787?

Ans. It had precisely the same adjustment as that shown in Figs. 2 and 3, but had a horseshoe magnet instead of a bar magnet.

Cross-Int. 87. When first did Mr. Bell make use of an iron diaphragm?

Ans. One of the telephones exhibited at the Centennial, in July, 1876, was the first instrument I know of that had an iron diaphragm.

Cross-Int. 88. When first did Mr. Bell make use of an iron diaphragm with a case or mouthpiece intervening between the diaphragm and the mouth of the speaker or the ear of the listener?

Ans. In August, 1876.

Cross-Int. 89. Please refer to the instrument shown in Figs. 2 and 3 of Bell's patent, No. 186,787, and state when first such an instrument was made.

Ans. It was made about the middle of October, 1876.

Cross-Int. 90. To what extent have instruments like those shown in the said figures of the patent been made or used?

Ans. I consider that all the magneto telephones that the Bell Company has in use are substantially like the telephones shown in Figs. 2 and 3 of that patent, the difference being chiefly in the case and shape of the mouthpiece. Not over a dozen telephones exactly like those shown have ever been manufactured.

Cross-Int. 91. So far as the rights of the Bell Company relate to the invention of Mr. Bell, as now made use of by the company, is there any other patent or application of Mr. Bell, other than the two patents now in interference, which shows any device or invention of Mr. Bell?

Ans. There are at least two other patents that I have in mind of Mr. Bell's, that relate to speaking telephones that are the property of the Bell Company, one of them No. 228,507, June 8, 1880. The subject matter of that patent is not now made use of by the company practically.

Another, No. 220,791, Oct. 21, 1879, is made use of to a limited extent.

Another, No. 213,090, March 11, 1879, which is not used practically by the company.

Another, No. 201,488, March 19, 1878, which is not used practically by the company.

Cross Examination by GEO. W. DYER, Esq., *of Counsel for Voelker.*

Cross-Int. 92. In July, 1879, I suppose that you had gone to a pretty large extent into the manufacture of telephones, and had abundant machinery and skilled workmen in your employ; and at that time had acquired a good deal of skill in the construction and the manipulation of telephones?

Ans. Nearly all the telephones that the Bell Company have in use have been made by contract with Charles Williams, Jr., Boston. The workmen who make them are consequently in his employ. I consider that I was well posted at that time in all the mechanical and electrical branches of the telephone business.

Cross-Int. 93. What connection had you with the works of Williams?

Ans. I have no direct connection with Mr. Williams's works, but my duties as general inspector and engineer of the telephone company necessitate my spending considerable time at his works. I am and have been entirely in the employ of the owners of the Bell patents since August or September, 1876.

Cross-Int. 94. Since that time, have the telephone instruments been made under your direction and inspection, or either direction or inspection?

Ans. They have been made almost entirely under my direction and inspection. I have and have had assistant inspectors, whose duties are to examine details.

Cross-Int. 95. Have you determined forms, sizes and arrangement of parts in the telephones made under your direction at Williams's works?

Ans. I have, to a great extent.

Cross-Int. 96. What other person has to any less extent?

Ans. Mr. Francis Blake, the inventor of the Blake transmitter, and Mr. Emile Berliner, have suggested sizes, and forms of details to a certain extent; and I have accepted their suggestions. This applies merely to the manufacture of telephones, and not to ther invention.

Cross-Int. 97. Have you determined materials, as well as forms, etc.?

Ans. Almost entirely, where there has been any choice of materials.

Cross-Int. 98. In the summer of 1879 had you the skill and experience which would enable you to manufacture a telephone capable of use in transmitting and receiving articulate speech, if such capacity had existed in the invention of that telephone?

Ans. In the summer of 1879 I had sufficient skill and experience to make any form of speaking telephone, as well as any other man I know of.

Cross-Int. 99. In the experiments related by you in your testimony in the summer of 1879, with instruments wholly reproduced, or reproduced in large measure, did you bring to bear your best skill in the manipulation of such instruments?

Ans. I do not think I did. I did not make the instruments at all; merely examined them after they were made, and used them

without any special adjustment as they came from the workmen's hand.

Cross-Int. 100. What was the purpose of the lectures and exhibitions stated by you in answer to Int. 10; covering the time from Jan. 13, 1877, up to May, 1877?

Ans. The only purposes that I know that Mr. Bell had in giving those lectures and exhibitions were to raise money by admission fees, and to prove the practicability of the instrument.

Cross-Int. 101. Referring to that part of your answer to Int. 20 relating to putting telephones on a line for Stone & Downer, do you know upon what terms or conditions telephones were put up on that line?

Ans. They were to be paid for at our regular rates, if satisfactory; and they were, I think, afterwards paid for.

Cross-Int. 102. Do you know how long after?

Ans. I think it was several months; but as I have had nothing to do with the financial branches of the telephone company's business, it will be impossible for me to say without reference to their books.

Cross-Int. 103. Were the telephones on that line changed during their use by Stone & Downer?

Ans. They were. It was the custom of the company to exchange telephones, when improvements of any importance were made. That custom has continued to the present day.

Cross-Int. 104. Was that change made before Stone & Downer paid?

Ans. I cannot positively say, but I think not.

Cross-Int. 105. Were the terms of compensation by Stone & Downer, in accordance with the circular of Mr. Gardiner G. Hubbard, set out in full in your deposition?

Ans. I think they were, substantially.

Cross-Int. 106. When were the telephones put on the line between the offices of the Board of Water Works at Cambridge?

Ans. In May, 1877, shortly after the publication of the articles in the Boston *Herald* and Boston *Advertiser* of May 19, 1877, which are given in my testimony.

Cross-Int. 107. Do you know upon what terms or conditions these telephones were furnished?

Ans. They were to be paid for, if satisfactory, at our regular rates, substantially as stated in the circular already mentioned.

Cross-Int. 108. Do you know who furnished this article to the Boston *Daily Advertiser* of May 19, 1877, or the material for it?

Ans. I do not.

Cross-Int. 109. Were the telephones put up on the line to Prof. Holmes's, connecting with Brewster, Bassett & Co.'s bank, put up on the same conditions as those just mentioned of Stone & Downer and the Cambridge Water Works?

Ans. No. Under the arrangement we had made or were about to make with Mr. Holmes, he was to have the right to place telephones on the lines connecting his central office with the various banks throughout the city of Boston; Mr. Holmes was to pay us a rental of $10 for each telephone per annum, he collecting a larger sum than that from the banks for the use of the telephone and line, and services rendered in connecting one bank with the other as they might desire. The title of Professor is erroneously applied to Mr. Holmes. He was the general manager of the Holmes Burglar Alarm Telegraph Company, and he was to use the telephones on his line wires.

Cross-Int. 110. Was he to pay for those telephones whether they were satisfactory or not?

Ans. He satisfied himself of the practicability of the telephone before beginning negotiations with the owners of the Bell patents, as the introduction of the telephones on his burglar alarm wires necessitated quite an expense for alterations, which expense he met; and I think the first telephones he had, he expected to pay for: but had they not been satisfactory, we should certainly not have asked for pay any more than from the preceding gentlemen.

Cross-Int. 111. What was the first instance when telephones were furnished for commercial use without conditions?

Ans. It was our practice, during nearly the whole of 1877, to allow agents to put out telephones and let their customers try them for a few weeks, before requiring payment, giving them the right to return if unsatisfactory. The chief reason why we did this was

the great doubt that existed in everybody's mind, when first approached to leave a telephone, as to whether it was possible to do such a wonderful thing as to transmit articulate speech over a telegraph wire. As this doubt wore off, we began to require payment as soon as the telephones were put in working condition. At the present time we would not require any customer to keep a telephone that he was not satisfied with. The first lease that was executed and payment made for telephones was, as I have already testified, dated June 8, 1877. These instruments were put into use about one week previous to that time.

THOMAS A. WATSON.

MARCH 11, 1881.

Subscribed and sworn to before me,

CHARLES H. SWAN, *U. S. Commissioner.*

BOSTON, Aug. 28, 1882.

Present: JAMES J. STORROW, Esq., *of Counsel for Complainants;*
L. HILL, Esq., *of Counsel for Defendants.*

Before me,

CHARLES H. SWAN, *Examiner.*

Further Examination of Mr. WATSON *by* J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 112. In the twenty-fourth answer in your first deposition here stipulated in from the Dowd case and given July 15, 1879, and found on p. 205 of complainants' printed record, instead of describing the circuits you used on the 5th of July, 1879, you referred for a description of them to a deposition in the Dowd case instead of repeating that description at length. As that deposition is not here in evidence, I wish you would describe the arrangement of those circuits and the position of the instruments, referring, if you please, for the purpose of refreshing your memory, to the same paper you referred to in giving that deposition.

Ans. The transmitter was placed in Room 42, Union Building, State Street, Boston, and the receiver in the office of Mr. J. J. Storrow, in the same building, a story lower. The two rooms were separated by an open court about one hundred feet long, across which the wires run. A metallic circuit was used. There was also a second circuit running between the two stations, on which two ordinary hand telephones were connected to verify the results obtained from the other telephones.

[NOTE. — Mr. Watson's sixty-sixth answer, p. 214, adopts, as his statement of certain experiments, a passage from another deposition in another case; that deposition is not in evidence in this cause, but the specific answers so adopted by Mr. Watson are reprinted as a part of his sixty-sixth answer.]

Int. 113. Your eightieth answer adopted, as a part of it, a portion of the contents of a deposition in another case which is not here in evidence. For that reason I shall desire to have you give now a statement concerning those experiments. To begin with, please state, first: What was the general arrangement of the two stations and of the circuits on which, on the 2d of June, 1879, at No. 40 State Street, Boston, you tried the instruments complainants' Exhibits 36 and 37; Exhibits 38 and 39, Baby Membrane Telephones; Exhibits 40 and 41, Lovers' Electric Telephones?

Ans. The circuits and arrangement of instruments were the same as described in my one hundred and fiftieth answer.

Int. 114. Did you speak into the instruments, or did you listen, or did you do both?

Ans. I did both.

Int. 115. State whether or not those instruments at that trial transmitted articulate speech well enough to be of any practical utility.

Ans. I think they did. I have already testified that if there were no better instruments these could and would be used practically, in my opinion.

Int. 116. In your one hundred and fiftieth answer you testified that you used a second circuit with two ordinary hand telephones to verify the results obtained from the other telephones: did you so verify the results in the experiments now inquired of?

Ans. The results were verified through the hand telephones.

[*Memorandum.* — The Mr. Wilson referred to in Mr. Watson's one hundred and eighth answer, p. 222, is a witness who testified in the Dowd case, but who has not yet testified in this case, and whose deposition has not been stipulated into this case.]

Int. 117. In your fifty-first answer, p. 211, and elsewhere, you referred to Mr. Edward Wilson: does Mr. Wilson live in this country now?

Ans. He does.

Int. 118. How long since he returned from living abroad?

Ans. He returned about three months ago.

[NOTE. — Mr. Edward S. Renwick, referred to in Mr. Watson's fifty-second answer, p. 211, was a witness called by the defendants in the Dowd case. He has not been called as a witness in this case, nor has his deposition been put in evidence.

Counsel for defendants states that the stipulation, agreeing to admit the depositions of Mr. Bell and Mr. Watson taken in other suits and legal proceedings to be used as evidence in this case, was only intended to admit as evidence the statements of the two witnesses, Mr. Bell and Mr. Watson, and was not intended to admit as evidence here the depositions of any other persons that may have been referred to by them in the course of their depositions; and defendants' counsel objects to the use of any portion of Mr. Cross's deposition and Dr. Blake's deposition, referred to in the deposition of Mr. Watson taken or stipulated into this case, for the reason that the statements of Mr. Cross and Dr. Blake are merely hearsay.*]

Int. 119. In your answer to Int. 36, p. 208, you referred to Mr. Bell's Centennial instruments, which, you said, were made by you personally, and drawings of which are found on pp. 232–234 of your second deposition, and on pp. 32–34 of complainants' volume of exhibits. I wish you would tell me how the membrane diaphragm and brass frame carrying it in the magneto-membrane telephones there shown, Exhibits 26 and 27, compare with the membrane diaphragm and brass rings carrying the same in the liquid transmitter, Exhibit 29.

Ans. They were precisely similar, castings from the same patterns being used for both sets of rings.

* The depositions of some of said witnesses were afterwards taken in this cause.

Int. 120. If you have any memorandum of articulate speech transmitted by you and Mr. Bell with a liquid transmitter in March, 1876, will you please read it?

Ans. I have such memorandum, from a note book I was using at that time. It reads as follows: —

"MARCH 10, 1876.

"'Mr. Watson, come here: I want you. How do you do? God save the Queen,' and several other articulate sounds."

Int. 121. When you heard that at the receiver, who was speaking into the transmitter?

Ans. Mr. Bell.

Int. 122. Where was the experiment?

Ans. Between two rooms at Mr. Bell's laboratory, No. 5 Exeter Place.

Int. 123. What liquid, if you remember, was used?

Ans. Water, with a little sulphuric acid in it.

Int. 124. Of what material, if you remember, was the wire which was attached to the membrane and dipped into the liquid?

Ans. Platinum.

Cross Examination by L. HILL, Esq., *of Counsel for Defendants.*

Cross-Int. 125. Please describe all the conditions of the circuits and the instruments in the experiments referred to in your last answer.

Ans. The two rooms were situated at each end of an entry about twenty-five feet long, with an ordinary annunciator wire connecting the two. In one room an instrument similar to Exhibit 29, Centennial Liquid Transmitter, was connected to this wire, and at the other end was what is known as a harmonic receiver. The circuit was completed by the gas pipe. Mr. Bell spoke at the transmitter and I listened with my ear pressed to the spring of the harmonic receiver. What is known as the electro-poion battery was used and I do not remember exactly how many cells. Mr. Bell had twelve or fifteen cells in his laboratory, and my impression is that only three or four were used.

Cross-Int. 126. Please describe the instrument known as the harmonic receiver which you refer to.

Ans. It consisted of an L-shaped piece of iron, the legs of which were about two inches long, having on one end the coil and core of an electro-magnet, and clamped to the other a piece of steel clock spring, which projected over and near to the end of the coil. The whole was mounted on a base of black walnut with two binding posts, to which the terminals of the coil were connected.

Cross-Int. 127. How did that instrument compare with the instruments shown at the ends of the circuit in Fig. 5 of Bell's patent of March 7, 1876?

Ans. It was precisely similar, with the exception that the figure referred to is not mounted on a base.

Cross-Int. 128. Give the dimensions of the clock spring used on the instrument, as accurately as you can.

Ans. I do not remember the exact dimensions, as Mr. Bell had a large number of these receivers with different springs. The clock spring that he used mostly was from three fourths to one inch in width, and about one fiftieth of an inch in thickness. The length I do not remember; it could not have projected over the core more than three or four inches, and certainly must have covered the core.

Cross-Int. 129. I do not understand how the spring could have projected over the core three or four inches, when the legs of the L-shaped arm were only two inches in length. Will you please explain?

Ans. The only physical thing that would limit the length of the spring would be the size of the room that the instrument was contained in.

Cross-Int. 130. In said Fig. 5 in Bell's patent, the spring is represented as projecting over the core just far enough to cover it, and as corresponding substantially in length to the length of the lower leg of the L-shaped arm. Fig. 5 you say is a correct representation of the instrument which you used. What I want to know is, how the spring, if the instrument was constructed as shown in said Fig. 5, could extend over the core three or four inches.

Ans. In my answer to Cross-Int. 127, I should have excepted the length of the spring, as I have no recollection of the precise length of the spring on the instrument referred to used in the experiment. I only know that Mr. Bell had harmonic receivers with springs of various lengths, and that one of these was used.

Cross-Int. 131. I noticed that the words which you say were transmitted through that apparatus at that time, and recorded by you in a memorandum book, were not read by you from a book but from a sheet of paper apparently new: why do you not produce the memorandum book itself?

Ans. I have the memorandum book at home. Not having been at home for several days, I did not have it with me to-day for reference, so I copied the memorandum from a letter I had written upon the subject. I am willing to produce the book to have the note verified, but cannot part with it.

[*Defendants' counsel objects to the evidence as to the words alleged to have been transmitted during that experiment as resting merely upon secondary evidence, unless the memorandum book itself is produced.*]

Cross-Int. 132. How many times and in what cases have you been examined as a witness as to the invention of the electric speaking telephone by Mr. Bell?

Ans. Twice. In the suit of Bell Telephone Company *v.* Dowd, and in Telephone Interferences A — L.

Cross-Int. 133. In either of those depositions did you testify to the exact words transmitted in the experiment of March 10, 1876, as you have now this morning done?

Ans. I have no recollection of so doing.

Cross-Int. 134. In that experiment of March 10, 1876, did you make the memorandum in your memorandum book at the time of your experiment?

Ans. I did; either the same evening, or the next morning.

Cross-Int. 135. Did you make memorandum of all the words that were spoken into the transmitter or only of such as were heard at the receiver?

Ans. Only such as I heard.

Cross-Int. 136. I suppose a good deal was spoken into the transmitter which you could not hear at the receiver, was there not?

Ans. I have no positive recollection as to how much I heard, or as to how much was said. I know, however, that the result of the experiment created great enthusiasm in my mind.

Cross-Int. 137. How long did the experiment last, and what time of day was it made?

Ans. I have a strong impression that it was made in the latter part of the afternoon, and that it lasted an hour or two.

Cross-Int. 138. Have you any knowledge or recollection as to how far the experiment was successful, and as to how much that was said into the transmitter was heard at the receiving instrument?

Ans. I have a positive recollection that the experiment was entirely successful. I do not remember what proportion of the words spoken at the transmitter were understood at the receiver.

Cross-Int. 139. When you say that the experiment was entirely successful, you evidently had in your mind some standard or ideal of entire success in such an experiment in the then state of the art. I want to know what that standard or ideal is. Did you consider it an entirely successful experiment because you were enabled to hear some words or sentences successfully?

Ans. I do not remember that I had any standard or ideal. I considered it successful inasmuch as the results were better than any I had previously heard.

Cross-Int. 140. It is a fact, is it not, that you did not hear at the receiver all that was spoken into the transmitter during that experiment?

Ans. I cannot say that it is a fact.

Cross-Int. 141. Have you any doubt that such is the fact?

Ans. I consider it highly probable that many words were spoken at the transmitter that were not understood at the receiver during that experiment?

Cross-Int. 142. In your answer to Cross-Int. 136 you say that the result of that experiment created great enthusiasm in your mind: why was your mind so greatly excited over that?

Ans. Because the results were so much of an improvement on what I had previously heard in the telephonic line.

Cross-Int. 143. Was that the first time that you had heard speech successfully transmitted over a telephonic line?

Ans. I had heard the previous summer the sound of Mr. Bell's voice through the telephone, but not nearly so well as on the March 10, 1876, experiment.

Cross-Int. 144. Prior to March 10, 1876, had you ever heard and understood any spoken words through a telephone, — I mean through any electric telephone?

Ans. I have no recollection of having heard more than the sound of Mr. Bell's voice prior to that experiment, but I cannot positively assert that such was the case.

Cross-Int. 145. In brief, you have no recollection of ever having heard a word through any electric telephone prior to March 10, 1876: is not that the fact?

Ans. The only recollection of experiments on speaking telephones prior to March 10, 1876, that I have, is that conveyed in my answers to Ints. 13 and 15, p. 203, in this case.

Cross-Int. 146. By referring to said thirteenth and fifteenth answers, I find that they do not definitely answer the question which I have just asked. I therefore repeat the question, and call for a definite answer to it.

Ans. I have no recollection of having understood anything that was said through the telephone prior to March 10, 1876.

Cross-Int. 147. In the liquid transmitter used March 10, 1876, in what sort of a vessel was the dilute sulphuric acid contained? Describe the vessel, the quantity of the liquid, the size of the platinum wire, and the depth to which it was immersed, and give the strength of the dilute sulphuric acid.

Ans. The liquid was contained, I think, in an ordinary glass tumbler. I have no positive recollection about the quantity of the liquid. I should think that possibly there was from one quarter to one half a pint. The platinum wire was considerably less than one eighth inch in diameter, how much less I cannot say. The instrument operated best when the platinum just touched the water. The strength of the acid was what Mr. Bell used for his electro-poion batteries, which was about one part of sulphuric acid to ten of water.

Cross-Int. 148. Was the top of the tumbler closed or open?

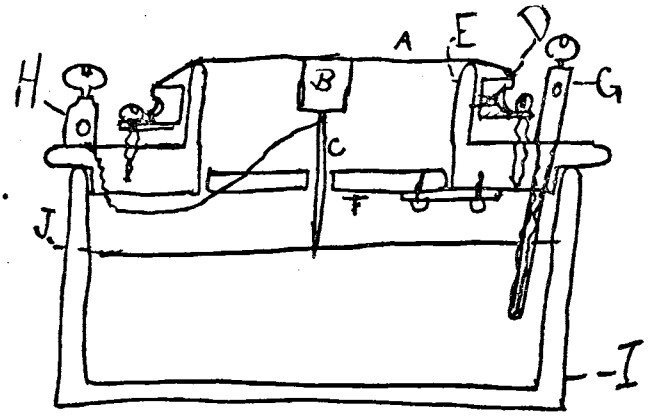
Ans. It was closed, I think, by a wooden cover, by which the membrane was supported, and connection was made with the water by a rod of metal, — platinum, I think, — passing through the cover into the water near one side of the vessel.

Cross-Int. 149. Can you make a drawing giving a vertical section of that apparatus sufficient to enable us to understand the construction of it?

Ans. I think I can. I am willing to try.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No.* 1," *and is as follows*: —]

EXHIBIT WATSON SKETCH NO. 1, C. H. S., EXAMINER.



Cross-Int. 150. Please describe the different parts represented in the sketch, making use of the reference letters which you have marked on it.

Ans. A is the membrane fastened to the ring D, by which it is stretched over the ring E. The membrane carries a piece of cork B, in which is inserted a piece of platinum C; the platinum point is connected with the binding post H, and another binding post G runs through the wooden cover or ring E and dips into the water contained in the glass vessel I. I remember also that there was a plug passing through the cover E and into the water, and arranged so that more or less of it could be immersed in the water in order to regulate the depth of the platinum needle. F is a shield of wood fastened to the inside of the cover E to prevent the dilute sulphuric acid from spattering on the membrane. J represents the line of the top of the water.

Cross-Int. 151. Who made this instrument represented in Exhibit Watson Sketch No. 1?

Ans. I did.

Cross-Int. 152. Had you made one like it before you made this?

Ans. Never.

Cross-Int. 153. Had any one else ever made one like it, to your knowledge, before you made this?

Ans. Not to my knowledge.

Cross-Int. 154. When did you make this instrument?

Ans. I think I finished it a few days before the experiment of March 10, 1876.

Cross-Int. 155. Was it first tested on the tenth day of March, 1876; that is, was that the first test made with it?

Ans. My recollection is, that the first tests were made three or four days before March 10, but on that occasion it did not work so well, and some alterations were made.

Cross-Int. 156. You didn't succeed in getting any words through it so as to be understood before March 10, did you?

Ans. As I now remember the experiment, the instrument talked the first time we tried it, but the decomposition of the liquid caused it to be spattered against the membrane, rotting and spoiling it very quickly. The addition of the shield to prevent this splashing was, I think, the chief alteration that was made, and the only one that I remember.

Cross-Int. 157. In your answers to Cross-Int. 143 and Cross-Int. 146, you testified that you had no recollection of having heard and understood a word through an electric telephone prior to March 10, 1876: how do you reconcile that with your answer to Cross-Int. 155 and Cross-Int. 156?

Ans. In making the drawing the previous trials of that instrument were brought to my mind more distinctly than when I answered the questions referred to.

Cross-Int 158. Then am I to understand you now that two or three days prior to March 10, 1876, you heard and understood words transmitted through that same instrument before the shield was put on it?

Ans. That is my recollection, and that should have been excepted in my answers to Cross-Int. 143 to Cross-Int. 146.

Cross-Int. 159. Inasmuch as the shield took no part in the transmission of the current, I suppose you heard and understood the words just as clearly before the shield was put on as afterwards, did you not?

Ans. No; my recollection is that I heard very much more plainly March 10 then on the previous days.

Cross-Int. 160. How do you account for that?

Ans. Some other alteration must have been made beside the addition of the shield, but what that other alteration was I have forgotten.

Cross-Int. 161. Did you make a memorandum of any words spoken through that instrument prior to March 10, 1876, and if not, why not?

Ans. I have found no memorandum, and have no recollection of making any. If I didn't make any, it must have been because I didn't think the results were much of an improvement on what I had previously heard.

Cross-Int. 162. And it is still your recollection that the results of March 10 were so striking an improvement that they excited great enthusiasm in your mind, is it?

Ans. That is still my recollection.

Cross-Int. 163. Was Prof. Bell present while you were making that instrument or while you were making the alterations in it?

Ans. The instrument and the alterations were made by Mr.

Bell's directions, but I do not think he was actually in the shop while I made them.

Cross-Int. 164. If I understand your testimony correctly, the instrument was made, completed and tested a few days before March 10, 1876, with results which were not entirely satisfactory; then the shield was added and certain changes were made which you cannot now remember in detail, after which the instrument was tested on March 10, 1876, with satisfactory results: is my understanding correct, and if not, wherein is it not?

Ans. That is my recollection of the matter.

Cross-Int. 165. Prof. Bell's first patent was dated March 7, 1876: did you have the specification of that patent in your hands to guide you in making that instrument?

Ans. I think not.

Cross-Int. 166. Did you get any assistance from that patent in making the modifications in that instrument which enabled it to produce satisfactory results after its first unsatisfactory trials?

Ans. I have no recollection whatever of so doing.

Cross-Int. 167. Do you regard the instrument as you had it March 10, 1876, as capable of successful practical use as a telephonic transmitter without any further change in it?

Ans. If there was no other telephone transmitter, that could in my opinion be used practically.

Cross-Int. 168. Please answer the same question as to the same instrument before the shield was applied to it and the changes made which you say were made at the time the shield was applied.

Ans. It would be impossible for me to say, as I do not remember the changes that were made other than the addition of the shield.

Cross-Int. 169. When the instrument was first tested, a few days prior to March 10, 1876, and found to give unsatisfactory results, what did Prof. Bell say about it?

Ans. I do not remember.

Cross-Int. 170. He directed you to go to work and make alterations in it, did he not?

Ans. He did.

Cross-Int. 171. How many tests did you make with it before you made the alterations?

Ans. I do not remember.

Cross-Int. 172. Did he discuss with you the character of the alterations he proposed to make and their possible advantage, before he directed you to apply them?

Ans. I have no recollection of his so doing.

Cross-Int. 173. Did the changes which were made considerably modify the construction of the instrument or not?

Ans. My recollection is the changes were slight, and did not change the form of the instrument at all.

Cross-Int. 174. Before those changes were tested on March 10, 1876, had you or Mr. Bell any knowledge of the striking results

which they would produce, or was your knowledge of their effect gained only from the test on March 10?

Ans. I hadn't the slightest knowledge myself what the effect would be of the changes, and I don't think Mr. Bell had.

Cross-Int. 175. In the state of the art at that time I suppose the effect of those changes could not have been known except by actual experiment and test, could it?

Ans. That is my opinion.

Cross-Int. 176. Will you please refer to Prof. Bell's first patent, dated March 7, 1876, and state whether you find therein any directions or description whereby a skilled electrician could have constructed a practically operative liquid transmitter without any experiment on his own part, but simply by following the directions of the patent?

Ans. If a copy of this patent had been placed in my hands in 1876 or in the hands of any well-posted maker of electrical instruments, I think I or he could have made a liquid transmitter without any experiment by reading the whole specification and by special reference to the passage beginning "Undulations are caused in a continuous voltaic current," etc.

Cross-Int. 177. Had you never seen that specification prior to March 10, 1876?

Ans. I do not remember reading the specification till after March 10, 1876, and am quite sure I did'nt until a month or two later than that.

Cross-Int. 178. As early as the fall of 1875 you knew that Prof. Bell was preparing his specification, did you not?

Ans. I did.

Cross-Int. 179. And you had been assisting him in his various experiments for over a year prior to March 10, 1876, had you not?

Ans. No. I have no recollection of doing anything for him between July or August, 1875, and just before March, 1876.

Cross-Int. 180. Prior to March, 1876, you and Mr. Bell had very fully discussed his theories concerning electric undulations and the transmission of sound thereby, had you not?

Ans. I have no recollection of discussing theories with Mr. Bell prior to that time. I understood what he was working for, and made his apparatus to the best of my ability, exactly as he directed.

Cross-Int. 181. Do you mean to say that prior to March, 1876, you were ignorant of the theories and facts stated in Mr. Bell's first patent in the paragraph beginning with the words "undulations are caused," and ending with the words "diminishing the power of the battery?"

Ans. No, I don't think I was. I think I understand the theory of the telephone prett ywell for six or eight months prior to that date.

Cross-Int. 182. How did you come to understand it? Did you discover it yourself, or did Mr. Bell communicate it to you?

Ans. All I knew about it was what Mr. Bell told me.

Cross-Int. 183. You say you understood Mr. Bell's theories

and particularly the theories and facts contained in said paragraph of his first patent for a long time prior to March, 1876, and it is certain that Mr. Bell himself must have known them for some time, inasmuch as his application for said patent was sworn to in January, 1876, and prepared some time before that: in view of these facts how do you account for it that the united intelligence of Mr. Bell and yourself didn't succeed in making that liquid transmitter work satisfactorily until March 10, 1876, and until after you had experimented with it, and changed it from the condition in which it was first produced and tested by Mr. Bell's directions?

Ans. My recollection of those changes is so indistinct that I can form no theory to account for the fact.

Cross-Int. 184. In this liquid transmitter exhibted in your sketch it is necessary to the successful working of it that it should stand on a horizontal foundation and be absolutely free from any movement or jar, is it not?

Ans. Not at all. The foundation should be nearly enough horizontal to prevent the liquid from running out of the glass, and I know no reason why it should be kept free from slight jar.

Cross-Int. 185. Would not the jarring of the liquid produce independent undulations of the current and interfere with the action of the transmitter?

Ans. I think strong and constant jarring would.

Cross-Int. 186. I understand you that you found the instrument worked best when the point of the platinum wire just touched the liquid. In that case the jarring of the liquid would be liable to make and break the current, would it not?

Ans. A strong jar probably would; I don't think a slight jar would.

[*Adjourned.*]

AUGUST 29, 1882.

[*The witness states*]: —

I produce the note book referred to in my answer to Int. 158.

Cross-Int. 187. Do you know what has become of that liquid transmitter that you experimented with on March 10, 1876?

Ans. No; I have not seen it since the experiment.

Cross-Ans. 188. What was the next transmitter that Mr. Bell produced after the experiment of March 10, 1876?

Ans. The next I remember were similar to the transmitters exhibited at the Centennial.

Cross-Int. 189. A liquid transmitter was exhibited at the Centennial, was it not?

Ans. Yes.

Cross-Int. 190. Was that liquid transmitter that was exhibited at the Centennial constructed exactly like the liquid transmitter that was tried March 10, 1876, or were further changes made in it before it was exhibited at the Centennial?

Ans. The construction is different, but the operation is the same.

Cross-Int. 191. That liquid transmitter exhibited at the Centennial is illustrated in the cut No. 29, p. 234 of Vol. I., complainants' case, and p. 34 of Vol. II., complainants' case, is it not?

Ans. It is.

Cross-Int. 192. Who made that transmitter?

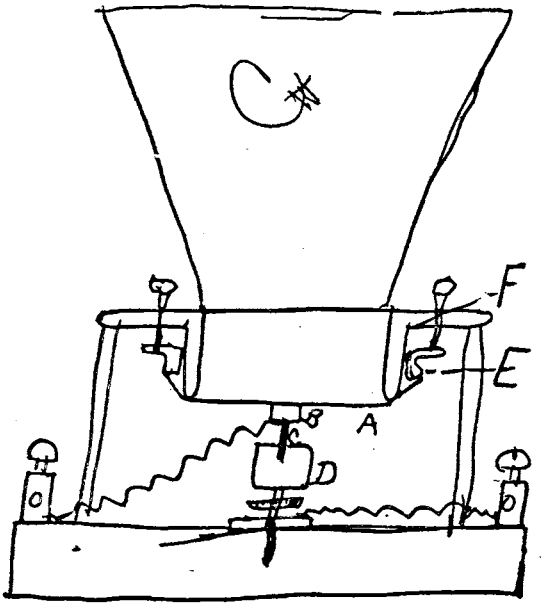
Ans. I did.

Cross-Int. 193. The cut printed in complainants' case does not exhibit the internal construction of the machine: will you please make a rough sketch showing in section its internal construction?

Ans. I have made such a sketch, and I here produce it.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No. 2."*]

EXHIBIT WATSON SKETCH NO. 2, C. H. S., EXAMINER.



A is the membrane tied to the ring E and stretched over the ring F. The membrane had attached to its centre a cork B carrying a piece of platinum wire C, which dipped into the liquid contained in the cup D. The depth of immersion of the platinum wire was regulated by raising or lowering the cup D by means of an adjusting screw. G was a tin mouthpiece, and the platinum point was connected with one binding post and the cup D to another.

Cross-Int. 194. Was the cup D covered or open at the top?

Ans. My recollection is that there was a cover, through which the platinum played.

Cross-Int. 195. Did this Centennial liquid transmitter produce

any better or different results, as compared with that which was tested March 10, 1876?

Ans. I do not remember that it did.

Cross-Int. 196. You were present when Sir William Thomson tested the Bell telephone at the Centennial Exhibition, were you not?

Ans. No.

Cross Int. 197. What receiver was used at the Centennial Exhibition?

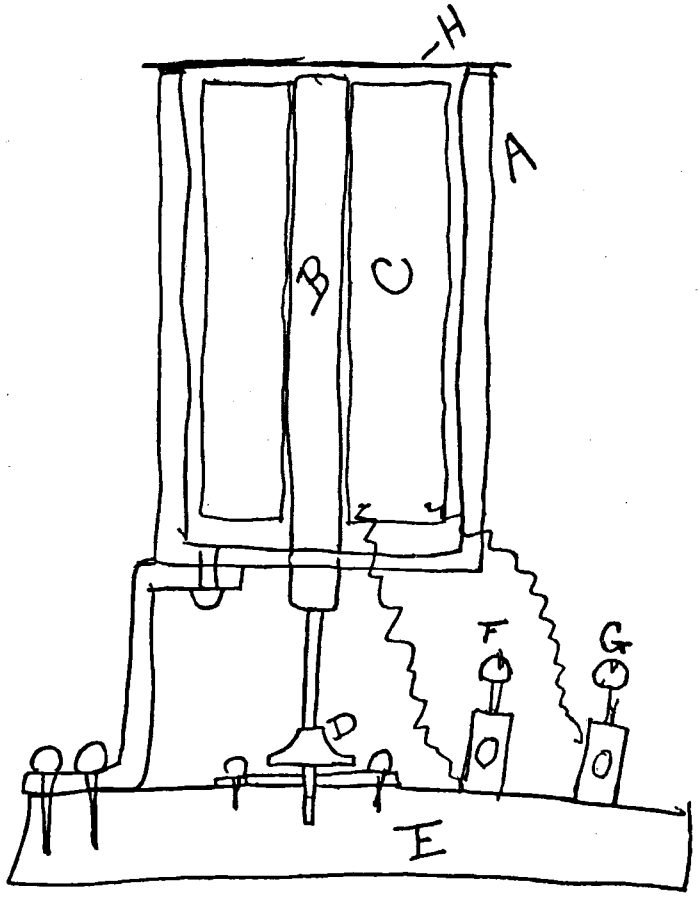
Ans. I have always heard that the iron box magnet receiver was most used, but I don't know whether the magnetos Nos. 26 and 27 were used or not.

Cross-Int. 198. Will you make a sectional drawing of the iron box magnet receiver, Exhibit No. 28, to show the construction of it?

Ans. I will, and I here produce it.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No. 3."*]

EXHIBIT WATSON SKETCH NO. 3, C. H. S., EXAMINER.



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A is an iron tube closed at the bottom end by an iron plate. B is an iron rod or core, which slides through a hole in the bottom plate and is surrounded by a coil of insulated wire C. The core is adjusted by means of the screw D, and the whole is mounted on a wooden base E. The terminals of the coil are connected with binding posts F and G. On the open or upper end of the tube was laid a disk of thin iron H.

Cross-Int. 199. Was that disk of thin iron H fastened to the top of the tube in any way, or did it simply rest on the tube, touching at all the points around the tube?

Ans. The plate was laid on the top of the tube without fastening, I think.

Cross-Int. 200. That plate was the receiving diaphragm of the instrument, was it not?

Ans. Yes.

Cross-Int. 201. In your sketch No. 3 you have represented that plate as touching the tube at one side, but not the other: is that by design?

Ans. It is an accident, and I now correct it.

Cross-Int. 202. The instruments represented in Exhibits 26 and 27 were used both as transmitters and receivers, I suppose, were they not?

Ans. Yes.

Cross-Int. 203. As receivers how did their operation compare with Exhibit 28; which was the most satisfactory?

Ans. I think one who was not an expert at listening could have heard better with 28 than with 26 or 27; but I do not remember that I could hear one better than the other.

Cross-Int. 204. How did the operation of the instrument represented in Exhibit 28 compare with that which you used as a receiver in your experiment of March 10, 1876, and which was the most satisfactory?

Ans. The results were about the same, as I remember them.

Cross-Int. 205. You made all of Bell's Centennial instruments, did you not?

Ans. Yes.

Cross-Int. 206. It is in evidence here that a pair of instruments was presented by Mr. Bell to Sir William Thomson, cuts of which are shown at top of p. 241, Vol. I. of complainants' case: did you make those instruments which were presented to Sir William Thomson?

Ans. I did not make the iron box receiver there shown, but I think I did the other.

Cross-Int. 207. The iron box receiver is represented in the right-hand figure on p. 241, is it not?

Ans. Yes.

Cross-Int. 208. Did you see that iron box receiver after it was made, and before Sir William took it away to Europe?

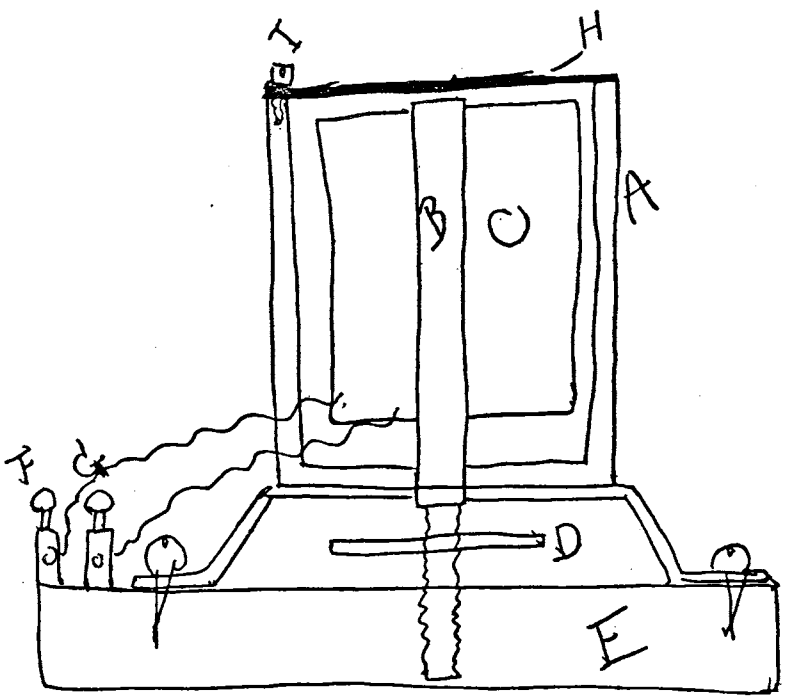
Ans. I did.

Cross-Int. 209. Will you make a sketch showing in section the construction of the iron box receiver?

Ans. I will, and here produce it.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No. 4."*]

EXHIBIT WATSON SKETCH NO. 4, C. H. S., EXAMINER.



I have lettered the sketch to correspond with sketch No. 3. It has in addition a screw I, by which the diaphragm is secured to the iron tube.

Cross-Int. 210. What was the function of that screw I, and why was it used?

Ans. To prevent the diaphragm from falling off and being lost when the instrument was not in use.

Cross-Int. 211. In the cut at the top of p. 241, complainants' case, the diaphragm is represented as in contact with the top of the tube only at the side where the screw is: how was that?

Ans. The instrument was not intended to be so.

Cross-Int. 212. Was that instrument intended as a substantial reproduction of the iron box receiver Exhibit 28?

Ans. It was.

Cross-Int. 213. Did you test it yourself to see whether it worked as well as the instrument shown in Exhibit 28?

Ans. I tested it, but do not remember whether it was better or worse than 28.

Cross-Int. 214. How do you account for it that the diaphragm in the cut is represented as in contact with the tube only at one side, when the instrument itself was constructed to have the diaphragm in contact with the tube all around?

Ans. It must have been bent in transportation or by some accident.

Cross-Int. 215. Were these Centennial instruments the first instruments made by or for Prof. Bell containing a metallic diaphragm?

Ans. There was another instrument with a metallic diaphragm made just before the Centennial Exhibition, but, aside from this, the Centennial instruments were the first that I know of that had metallic diaphragms.

Cross-Int. 216. Was that other instrument with a metallic diaphragm which was made just before the Centennial Exhibition a transmitter or a receiver?

Ans. My recollection is that it was used both ways.

Cross-Int. 217. It was then the first transmitter that contained a metallic diaphragm, was it not?

Ans. The first that I remember.

Cross-Int. 218. Is it illustrated in any of the cuts put in in complainants' case?

Ans. It is referred to in Ints. and Ans. 47 and 48, p. 210, complainants' case, Vol. I., and in Mr. Bell's Ints. and Ans. 167–169, pp. 169 and 170 of the same volume, and is illustrated in Exhibit 33, p. 64 of Vol. II.

Cross-Int. 219. In the cut p. 64, Vol. II., I see nothing more than a flat disk supported on three pins: does that represent the entire instrument?

Ans. No.

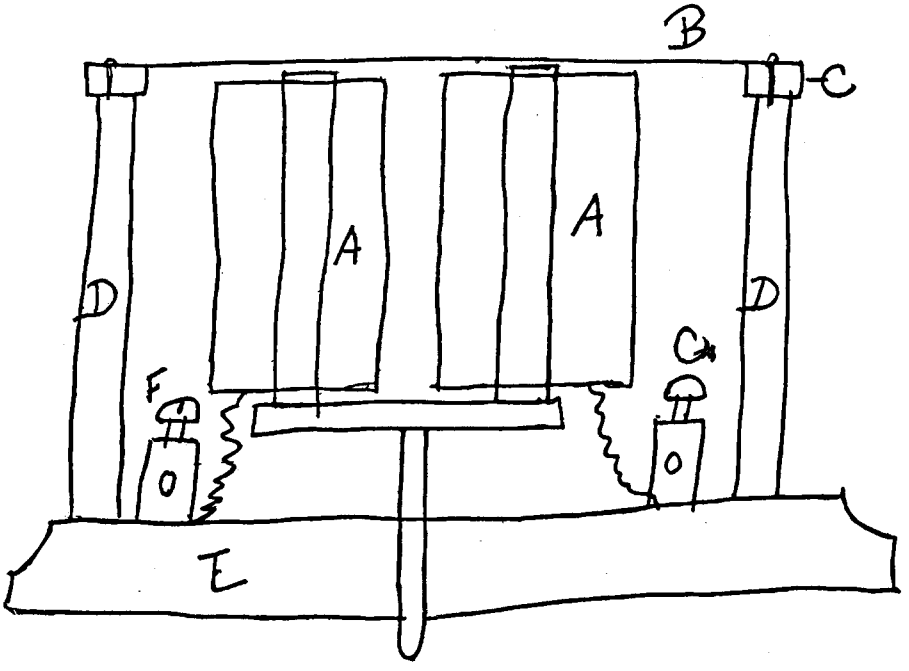
Cross-Int. 220. Please make a sketch representing the entire instrument in section, so as to show its construction.

Ans. I have made a sketch of the instrument as I remember it, and here produce it.

A A represents a double pole electro-magnet, B a diaphragm of thin sheet iron riveted to the brass ring *C*, and mounted on legs D D. The terminals of the magnet were connected, I think, to binding posts. There was some means of adjustment to regulate the distance between the end of the electro-magnet and the diaphragm. What that adjustment was I have forgotten.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No. 5."*]

EXHIBIT WATSON SKETCH NO. 5, C. H. S., EXAMINER.



Cross-Int. 221. Referring to the memorandum book which you have produced here this morning: has that been in your possession ever since March 10, 1876?

Ans. It has.

Cross-Int. 222. The entry in it is made in pencil, is it not, — I mean the entry of March 10, 1876?

Ans. It is. Almost all the entries in the book are.

Cross-Int. 223. Have you always retained a distinct recollection from that time to this of making that memorandum?

Ans. It is impossible for me to say. I have such a recollection now, and probably always would have had if my attention had been called to it particularly.

Cross-Int. 224. When was the first time that you ever heard and understood words transmitted over a telephonic line by means of a magneto transmitter?

Ans. My recollection now is that I heard and understood words from a magneto transmitter shortly after March 10, 1876.

Cross-Int. 225. Is that magneto transmitter illustrated here in any of the cuts in evidence in this case?

Ans. I do not remember precisely what it was, but it was similar to Exhibits 26 or 27.

Cross-Int. 226. To the best of your recollection, how long after March 10, 1876, was it that you first heard spoken words successfully transmitted over that magneto instrument?

Ans. To the best of my recollection during March or April, 1876.

Cross-Int. 227. That instrument had a membrane diaphragm, I suppose, had it not?

Ans. I think it had.

Cross-Int. 228. Describe the armature, its size, shape, material and manner of attachment to the diaphragm in that instrument.

Ans. All that I can remember about it is that it consisted of a piece of clock spring shellacked to the membrane. I do not remember the dimensions at all.

Cross-Int. 229. Was that the first magneto instrument which had a metal armature attached to and supported only by the diaphragm?

Ans. It was the first I remember.

Cross-Int. 230. Who made that instrument and when?

Ans. I think I did, just before it was tested.

Cross-Int. 231. It was made after March 10, 1876, was it not?

Ans. According to my recollection.

Cross-Int. 232. Did you ever see the instruments which Mr. Bell made or had made in 1875, which are represented in Fig. 7 of his first patent?

Ans. I consider Fig. 7 a diagram of the instruments I made for him in June and July, 1875.

[*Defendants' counsel puts in evidence in this case the extracts from Prof. Bell's London lecture of Oct.* 31, 1877, *before the Society of Telegraphic Engineers, printed on pp.* 692, 693 *and* 694 *of Vol.* II. *of the Dowd case, the same to be marked in this case as "Exhibit Extracts from Bell's London Lecture"; and it is admitted by complainants' counsel that said extracts are correct copies from Prof. Alexander Graham Bell's said lecture.*]

Cross-Int. 233. In that part of Prof. Bell's London lecture which I have just put in evidence he refers to an apparatus which he tried, and which he illustrates by Figs. 22 and 23, and concerning which he then proceeds to make the following statement, to wit: —

"The results, however, were unsatisfactory and discouraging. My friend, Mr. Thomas A. Watson, who assisted me, in his first experiment declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion. After many experiments, attended by the same only par-

tially successful results, I determined to reduce the size and weight of the spring as much as possible. For this purpose I glued a piece of clock spring, about the size and shape of my thumb nail, firmly to the centre of the diaphragm, and had a similar instrument at the other end; we were then enabled to obtain distinctly audible effects."

I suppose that the instrument here referred to by Mr. Bell, after he had glued the piece of clock spring about the size and shape of his thumb nail firmly to the centre of the diaphragm, and with which he was then able to obtain distinctly audible effects, was the same instrument to which you referred this morning as having been made in March or April, 1876, and after March 10, and through which you for the first time heard and understood words transmitted through a magneto transmitter, was it not?

Ans. I don't actually know, but am inclined to think so.

Cross-Int. 234. In the experiments connected with Mr. Bell's invention, when and in what machine was provision first made for adjusting the distance between the pole of the electro-magnet and the surface of the armature which was to vibrate in front of the pole of the electro-magnet?

Ans. In the first machine I made for him, in June, 1875.

Cross-Int. 235. The machines which you made for him in June, 1875, are represented at Figs. 19 and 22, pp. 3 and 4 of Vol. II. of complainants' case, are they not?

Ans. Yes, with the exception noted in my answer to Int. 20. p. 205, Vol. I., of complainants' case.

Cross-Int. 236. Which of those two machines was first made? I mean the originals.

Ans. That represented by Exhibit 19.

Cross-Int. 237. Both of the original machines, duplicates of which are shown in Exhibits 19 and 22, had the same adjustment, had they not?

Ans. That is my recollection. In both the originals the adjustment was made by sliding the cross bar that supported the magnet up and down in the slots in the sides, as in Exhibit 19, and binding it in place, when it was properly adjusted, by the screws and clamps.

Cross-Int. 238. In these Exhibits 19 and 22 the armatures are composed of pieces of very thin metal: was that so in the instruments constructed in the summer of 1875, or were the armatures thicker and heavier in those instruments?

Ans. I do not now remember; I think they were thicker.

Cross-Int. 239. The apparatus represented in Fig. 7 of Bell's first patent was not made till some time after the original instruments of which Exhibits 19 and 22 purport to be duplicates, was it?

Ans. Fig. 7 I consider merely as a diagram of the original instruments made in June and July, 1875.

Cross-Int. 240. Do you mean that prior to March 7, 1876, there was no apparatus made of which Fig. 7 would be an exact representation?

Ans. I know of none.

Cross-Int. 241. If such an apparatus was made, then I suppose you do not know why all means of adjusting the armatures relatively to the poles of the magnet were omitted from it, do you?

Ans. I know of no reason why it should have been.

Cross-Int. 2 2. Do you know whether the original instruments made in June, 1875, are now in existence?

Ans. Parts of them are, as stated in my answer to Int. 18, p. 204, Vol. I.

Cross-Int. 243. When were the duplicates Exhibits 19 and 22 made?

Ans. In the summer of 1879, I think.

Cross-Int. 244. Are any of the original instruments represented in the cuts on pp. 232–234, complainants' case, Vol. I., still in existence; if so, which ones?

Ans. I believe they all are.

[*Defendants' counsel requests complainants' counsel to put in evidence all the existing instruments and parts of instruments made by and for Mr. Bell prior to the close of the Centennial Exhibition in November*, 1876.]

Cross-Int. 245. From your experience as a manufacturer of speaking telephones, state whether or not a very delicate adjustment of the distance between the armature and the pole of the electro-magnet is required for the effective transmission of speech.

Ans. What I understand as a delicate adjustment is not required.

Cross-Int. 246. What do you understand as a delicate adjustment?

Ans. It depends entirely upon the nature of the instrument. I should consider that a telephone requiring an adjustment as close as one or two one-hundredths of an inch would be one that required a delicate adjustment.

Cross-Int. 247. Did Mr. Bell get his harmonic telegraph to work satisfactorily?

Ans. I do not know; I think not.

Cross-Int. 248. In your experiments relating to harmonic telegraphy in 1875, did you succeed in getting the different pitch of tones clearly indicated through Mr. Bell's instruments?

Ans. It is my recollection that I did.

Cross-Int. 249. Is it your recollection that you got the pitch of vocal tones clearly indicated, or only the pitch of instrumental tones?

Ans. My recollection is that I heard the pitch of Mr. Bell's voice in the June 2, 1875, experiment.

Cross-Int. 250. In testing those instruments made in the summer of 1875 and experimenting with them in that year, — I mean the

original instruments, of which Exhibits 19 and 22 purport to be duplicates, — did you make pretty frequent use of the adjusting devices for adjusting the armature to the poles?

Ans. I do not remember how frequently they had to be adjusted.

Cross-Int. 251. In your thirty-fifth answer, p. 208, complainants' evidence, Vol. I., you state that the filing of the application for an American patent by Mr. Bell was delayed during the fall and winter of 1875, in order that he might apply for a patent in England before he did in the United States: do you know when Mr. Bell did apply for his English patent; if so, when was it?

Ans. I knew, but I have now forgotten.

[*Defendants' counsel calls attention to the fact that complainants have put in evidence and printed in Vol.* II., *pp.* 46–63, *the provisional specification of Mr. Bell's English patent, dated Dec.* 9, 1876. *Defendants' counsel objects to the introduction of the provisional specification without the rest of the English patent, on the ground that it is partial and incomplete, and requests that the entire patent be put in evidence.*]

Cross-Int. 252. In the instruments represented by Exhibits Nos. 19 and 22, the cuts on pp. 3 and 4, complainants' evidence, Vol. II., are intended to show the actual position of the instruments when in use, are they not?

Ans. No.

Cross-Int. 253. Will you please explain then the actual position of the instruments when in use, and how they were used in your experiments?

Ans. No particular position is necessary. My recollection is that they were held in the hand when first used in the most convenient position for directing the voice against the membrane on the side opposite to the magnet.

Cross-Int. 254. The mouth orifice then extends through the base-board of the instrument as represented in those two cuts?

Ans. Yes.

Cross-Int. 255. And in testing the instruments in your experiments, you spoke or made noises through the orifice in the base-board, did you not?

Ans. Yes.

Cross-Int. 256. Did you preserve any actual measurements of any of the instruments made prior to the close of the Centennial Exhibition, or actual measurements of any of the parts of said instruments, or the relative positions of the different parts? If so, designate all the instruments of which measurements were preserved, and state what measurements were preserved.

Ans. I have preserved no measurements, but the originals of Exhibits 26, 27, 28 and 29, on pp. 232–234, and the parts noted in my eighteenth answer have been preserved.

Cross-Int. 257. Were any such measurements made and preserved by anybody, to your knowledge?

Ans. I do not now remember that there were, understanding the question to refer to written measurements, and not to instruments and parts of instruments that were preserved.

Cross-Int. 258. Then of all the instruments that were made prior to the Centennial instruments, there now are extant only the parts specified in your eighteenth answer, and, so far as you know, there are not extant any records of measurements of such parts as have disappeared, nor of the relative arrangement of the parts with relation to each other and their distances from each other: is that a fact?

Ans. The only parts I know of still extant are the parts mentioned in my eighteenth answer, and the tripod and diaphragm shown as Exhibit 33, p. 64, complainants' evidence, Vol. II. I do not now know of any records of such measurements.

Cross-Int. 259. Then in getting up the reproduced instruments, which were tested in 1879, and subsequently, and which instruments and tests have been put in evidence here, you had to supply the missing parts simply from memory and judgment, had you not?

Ans. I believe so.

Cross-Int. 260. You cannot swear then that the reproduced instruments referred to were, in fact, exact copies of the originals in all respects, but only that they were the best that you could do from memory, aided by the presence of the few parts which remained extant. Is that the fact?

Ans. That is the fact.

Cross-Int. 261. Were the reproduced instruments which are here in evidence made under your direction and in your presence?

Ans. They were made under my general directions, but not in my presence

Cross-Int. 262. In the summer of 1879, when these reproduced instruments were made under your direction, you had already had a great deal of experience in the manufacture and operation of electric speaking telephones, had you not?

Ans. Yes.

[*Adjourned.*]

AUGUST 30.

[*The witness states*: —]

Since I answered Cross-Int. 261 I have found that I had already testified on this point. When I made the answer I was under that impression, and so stated in conversation, but was unable to find it. I had already testified in my sixty-fourth answer, p. 213, Vol. I.; as I then testified within a few weeks of the making of the instruments, the answer is undoubtedly correct.

[*Defendants' counsel now ascertains from complainants' counsel that the several articles referred to in the extract from Prof. Cross's depo-*

sition in the Dowd suit, which has been put into this case and printed on pp. 223–228, have not been offered in evidence and are not here present. Said articles are referred to in said extract as Exhibits Nos. 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 and 47. The witness, Mr. Watson, in adopting as his own answers the third, fourth, fifth, sixth, seventh, eighth, ninth and tenth answers of Prof. Cross, above referred to, has testified concerning all those exhibits from No. 36 to No. 47 inclusive; and as the exhibits are not in evidence, and not here present, it is impossible for defendants' counsel to cross examine with reference to them and the experiments and tests alleged to have been made with them. Defendants' counsel therefore objects to the reading of the extracts from Prof. Cross's deposition, and objects to all testimony of Mr. Watson relating to said exhibits, Nos. 36 to 47, or any of them, by reason of the facts here stated, and because defendants' counsel has never had any opportunity to see any of said exhibits, and cannot, in their absence, properly conduct a cross examination with reference to them.

Complainants' counsel states that the instruments referred to are on file and in the custody of another tribunal, and that he hopes to be able to procure them for exhibition and use in this case.

Defendants' counsel states that that will not obviate the objection just made by defendants' counsel to the testimony of Mr. Watson and the reading of said extract, unless defendants' counsel shall have an opportunity after the said instruments or articles are put in evidence to cross examine the witness upon them.

Complainants' counsel says that he does not agree with defendants' counsel in this respect, but the Court will judge of the weight of the objection.]

Direct Examination resumed.

Int. 263. In your first answer, given July 14, 1879, you stated that you were then general inspector of the National Bell Telephone Company: how long did you continue thereafter to hold that position or any similar one for that company or its successors?

Ans. Until the spring of 1881.

Int. 264. Where did you go then?

Ans. To Europe.

Int. 265. How long did you stay abroad?

Ans. One year.

Int. 266. Are you about to leave this part of the country now; and, if so, how soon and for how long?

Ans. I am; the last of this week; for probably a year.

Int. 267. I call your attention to the ordinary rubber hand telephone of the ordinary butter-stamp form, referred to in your deposition, p. 290, Vol. I.

I understand from your deposition that that form, first with wooden

and afterwards with hard rubber handles, was introduced into commercial use in 1877, and is the form of magneto telephone in ordinary use in this country: is that the fact?

Ans. It is.

Int. 268. While you superintended or inspected the construction of those instruments, what was the rule and practice with regard to the distance between the core and diaphragm?

Ans. To make it rather less than one thirty-second of an inch.

Int. 269. Was that distance fixed in the original construction of such instrument at the shop, or were the instruments provided with an adjusting screw by which the operator could vary it?

Ans. It was fixed in the shop, and could be varied only by taking the instrument entirely to pieces. No adjusting screw whatever was or has been supplied.

Int. 270. In the first form of the hand telephone with the wooden handle, shown at the top of p. 289 of your deposition, I observe that the diaphragm is held in a definite position in the wooden handle by being placed on the end of the body of the handle, and the cap piece is screwed down on to it so that the distance between the diaphragm and the core is determined by the position of the magnet in the handle: please state how in that particular instrument the core and magnet were held in position in the handle.

Ans. The hole was made rather smaller than the diameter of the magnet, and the magnet driven tightly into it.

Int. 271. If you found any practical difficulty in the use of that form of instrument with reference to the maintenance of the proper distance between the core and diaphragm, please state what it was.

Ans. I found such difficulty. The magnet would often become loose in the handle, and the slight jars to which it was subjected in ordinary use caused the end of the core to come in contact with the diaphragm.

Int. 272. What steps did you take, or what change in construction did you adopt, if any, to remedy that difficulty?

Ans. I made the hole in the handle exactly the right depth, tapped a hole in the end of the magnet farthest from the diaphragm, and fastened it by putting a screw through the bottom of the handle into it.

Int. 273. In the rubber hand telephones of the butter-stamp form in ordinary use, how is the magnet and core attached to the handle?

Ans. In the same manner as in the previous answer.

Int. 274. Will you point out that screw in a hand telephone, and state whether it is shown in the drawing of p. 290?

Ans. It is shown in the drawing; and it is the screw between the two binding posts, with a washer under its head.

Int. 275. In placing the magnet in position in each instrument as manufactured, is its position determined in each instrument by

experiment, or is its position determined by measuring or gauging, or how?

Ans. Its position is the same in every telephone, and is determined by a gauge, consisting of a piece of steel filed to rest on the top of the body of the handle, against which the diaphragm rests, and to project inside the handle the proper distance, which I have stated to be rather less than one thirty second of an inch. The pole is then pushed up against it, and the magnet is fastened in that position. Then the gauge is removed and the diaphragm inserted.

Int. 276. Your object being to so fasten the magnet that the end of the core should come to a definite position with reference to the front or flaring end of the handle, how do you make up for accidental variations in the length of the magnet itself, or in the bore of the handle?

Ans. By inserting thin metal or paper washers between the end of the magnet and the bottom of the bore of the handle.

Int. 277. Has it been the practice at any time in manufacturing these articles for commercial use, after the magnet was placed in position in the handle to fill up the interstices between the magnet and the handle with wax or paraffine poured in, melted and allowed to harden?

Ans. Such was the practice up to about a year ago; and I think is still, unless some other substance is used.

Cross Examination resumed.

Cross-Int. 278. Are you now engaged in any business, if so, what?

Ans. I am in no business just now.

Cross-Int. 279. Was your recent visit to Europe on telephone business?

Ans. It was partly for pleasure and rest, and partly to sell my foreign patents.

Cross-Int. 280. Were your foreign patents for telephones?

Ans. No.

Cross-Int. 281. What were they for?

Ans. For switch boards and call bells for telephone systems.

Cross-Int. 282. Have you American patents on those inventions?

Ans. On some of them.

Cross-Int 283. Have you any American patents on telephones?

Ans. Yes.

Cross-Int. 284. How many American patents have you taken out or applied for, including all subjects of invention?

Ans. I haven't exactly in mind. I think rather more than sixty.

Cross-Int 285. Do the complainants own any of those inventions on which you have taken patents or applied for patents?

Ans. They own all of them.

Cross-Int. 286. Do you get any royalty or other emolument for the use of your inventions by the complainants?

Ans. No.

Cross-Int. 287. Are you a stockholder in the complainant corporations or either of them?

Ans. I am a stockholder in the American Bell Telephone Company.

Cross-Int. 288. You have stated that in the hand telephones the distance between the diaphragm and the pole of the electro-magnet is fixed and not adjustable, and is set at something less than one thirty-second of an inch: why is it set at that distance?

Ans. That distance was determined somewhat arbitrarily by myself, that being the distance which, in my judgment, would be sufficient to allow for the variations consequent on the accidents attending its ordinary use and the different degrees of expansion and contraction in the rubber handle and steel magnet.

Cross-Int. 289. Could the diaphragm and the pole of the electro-magnet be placed any nearer together in practice without the diaphragm being liable to touch the pole when vibrating in the ordinary use of the instrument?

Ans. The fact that there has been little or no trouble arising from the contact of the core and diaphragm in the many thousands of instruments made under my charge leads me to suppose that the distance could be less than it is now, but I should not recommend that it be done.

Cross-Int. 290. When did you determine upon that distance?

Ans. When the manufacture of telephones for practical business use was first begun in the spring of 1877.

Cross-Int. 291. I suppose you made some experiments to assist you in determining upon what was the best distance, did you not?

Ans. I have no recollection of making such experiments.

Cross-Int. 292. The complainants have made and sold no telephones having a membrane diaphragm, have they?

Ans. None that I know of.

Cross-Int. 293. If they used a membrane diaphragm in a hand telephone instead of a metal diaphragm, in machines which they put out for the public to use, would it be necessary to have some means provided for adjusting the distance between the armature and the poles of the electro-magnet?

Ans. I do not think it would be entirely necessary; still it might be better to do so.

Cross-Int. 294. Do you think the instruments would be successful and satisfactory to the public without some means of adjustment in such case.

Ans. If there were no better telephones I think they would.

Cross-Int. 295. In your answer to Int. 35, p. 208, you say that in the fall of 1875, or that winter, you knew that Mr. Bell was making arrangements with some one to take out the English patent for him: what kind of an arrangement do you refer to; arrangements with an attorney to do the work or arrangements with capitalists to furnish the means?

Ans. The latter.

Cross-Int. 296. You have stated that you have taken out or applied for some sixty American patents: what proportion of that number of your inventions related to telephones?

Ans. They all do, either to telephones or to auxiliary telephonic apparatus. About ten of them relate to telephones.

THOMAS A. WATSON.

Attest: CHAS. H. SWAN, *Examiner.*

BOSTON, Nov. 13, 1882.

Present: JAMES J. STORROW, Esq., *of Counsel for Complainants;*
L. HILL, Esq., *of Counsel for Defendants.*

DEPOSITION OF CLARENCE J. BLAKE.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. Please state your name, age, residence, and occupation.

Ans. Clarence John Blake; thirty-nine years; Boston; physician.

Int. 2. Did you give a deposition in 1879 in the case of the American Bell Telephone Company *v.* Peter A. Dowd?

Ans. I did.

Int. 3. Will you look at that deposition, of which I show you a printed copy, and state whether the facts there stated are correctly stated; and if so, read it to the magistrate, that he may take it down as a part of your answer?

Ans. They are correctly stated. It is as follows: —

DEPOSITION OF C. J. BLAKE.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

BOSTON, July 25, 1879.

Int. 1. Please state your name, age, residence, and occupation.

Ans. Clarence J. Blake; age, thirty-six; Boston, Mass.; physician; lecturer on otology in Harvard University, aural surgeon in Massachusetts Eye and Ear Infirmary.

Int. 2. Please look at the drawing Exhibit 30* [*Exhibit No.* 18 *in People's Telephone Co. case*],† Dr. C. J. Blake Drawings. State when, where and by whom they were made, and in whose custody they remained after they were made.

Ans. October, 1874; at my office, in Hotel Berkeley, Boston; by Alexander Graham Bell, and remained in my possession.

Int. 3. Did Mr. Bell, at that time, describe to you any apparatus for the transmission of sound by electricity? If so, please repeat the description he gave you of the apparatus and the mode in which it was to operate, and the character of the sounds which he intended to transmit by it.

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* A photo-lithographic *fac-simile* of this exhibit is on p. 336, *infra*.

† In the deposition here incorporated into Dr. Blake's answer to Int. 3, the exhibits are numbered as in the Dowd case. The numbers in brackets are the numbers applied in the present suit of the American Bell Telephone Company *v.* The People's Telephone Company.

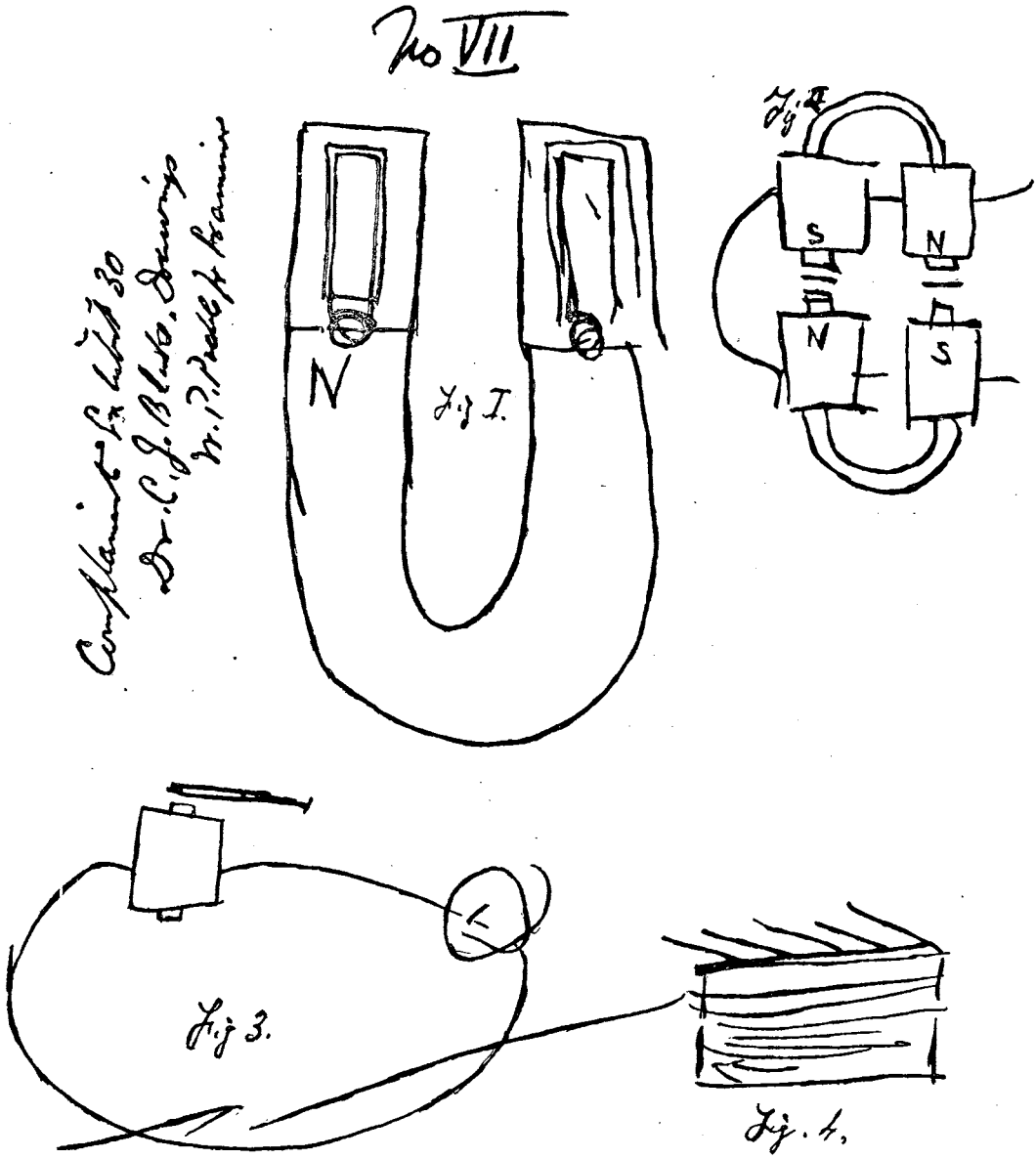
COMPLAINANTS' EXHIBIT NO. 30.

[No. 18 in People's Telephone Co. Case.]

DR. C. J. BLAKE'S DRAWINGS.

[Complainants' Record, pp. 123, 335, etc.]

C. H. S., *Examiner.*



Ans. He did describe an apparatus consisting of a metal reed set in vibration in front of a magnet as part of an organ pipe. Also an apparatus consisting of a metal reed set in vibration in front of a magnet and coil, and also an apparatus consisting of a metal reed set in vibration between two magnets and coils, and also an apparatus consisting of a series of metal reeds which might be set in vibration in response to a musical instrument or the human voice. The idea of this latter apparatus was that the metal reeds of different lengths would respond to the different tones of a musical instrument or of the human voice.

Int. 4. Did he describe to you any electrical apparatus in which a membrane was to be used? If so, please tell me what that apparatus was.

Ans. Yes; an apparatus in which one metal reed was substituted for the several metal reeds of the harp last mentioned, this one reed being actuated by a membrane to which it was to be attached, which membrane was to be set in vibration by the tone of the musical instrument or by the human voice.

Int. 5. Did you have any discussion with him as to the character of the membrane, or mode of arrangement of the membrane and armature? And if so, state what was said on that subject at that interview by both of you.

Ans. Yes; the idea of Prof. Bell as communicated to me was this: That if the simple pendulous vibration of a metal reed could be communicated to a second reed electrically connected with the first, more complicated vibrations communicated to the metal reed from a musical instrument or the human voice, through the medium of the air, could also be electrically transmitted. To accomplish this purpose, it was, according to his idea, advisable to attach the metal reed to a membrane, which would reproduce the aerial vibrations produced by a musical instrument or the human voice, substituting a metal reed in fact for the stylus of the improved Morey phonautograph, and of the *membrana tympani* phonautograph with which he had been experimenting. I then suggested, as an experiment, since his principal object was the electrical transmission of articulate speech, that the metal reed should be brought in contact with the human *membrana tympani*, suitably prepared and mounted for the purpose.

Int. 6. What did you conceive to be the advantage of using a membrane consisting of the human *membrana tympani* instead of parchment or sheepskin, or other kind of membrane, in such an apparatus as he described for the electrical transmission of articulate speech?

Ans. The fact that the human *membrana tympani* responds to a wider range of musical tones than any artifically prepared membrane, and that it has been specially adapted by nature to respond in vibration to the human voice.

Int. 7. Did you make a transmitting and receiving instrument of a speaking telephone, using the membrane of a human ear?

Ans. At that time the experiment was not tried. We were unwilling to dismount the *membrana tympani*, which we were then using as a phonautograph. But I have since constructed a human *membrana tympani* telephone, with which articulate speech was electrically communicated in March, 1878.

Int. 8. Please look at the instruments now shown you, marked "Complainants' Exhibits 15 and 16, Membrane Telephone No. 2" [*Exhibits Nos.* 36 *and* 37 *in People's Telephone Co. case*], "Exhibits 17 and 18, Baby Membrane Telephones [*Exhibits Nos.* 38 *and* 39 *in People's Telephone Co. case*], 19 and 20, Lovers' Electric Telephones" [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case*]. State whether you have witnessed the transmission of articulate speech by them or any of them; if so, state when and where, and with what results.

Ans. Yes. Afternoon of June 2, 1879. Office of Mr. Storrow, 40 State Street, Boston. I heard distinctly a sentence spoken by Mr. Watson, using Exhibit 15 [*Exhibit* 36 *in People's Telephone Co. case*], with Exhibit 16 [*Exhibit* 37 *in People's Telephone Co. case*], as a receiver; also Exhibit 17 [*Exhibit* 38 *in People's Telephone Co. case*], using Exhibit 18 [*Exhibit* 39 *in People's Telephone Co. case*] as a receiver; also Exhibit 19 [*Exhibit* 40 *in People's Telephone Co. case*], using Exhibit 20 [*Exhibit* 41 *in People's Telephone Co. case*] as a receiver.

Int. 9. To save time I will ask you whether the general arrangement of the two stations and the circuit was the same as that described in Prof. Cross's third answer, p. 383? [p. 223 *supra.*]

Ans. It was.

Int. 10. Did you use any of these instruments to transmit from the station where you were to the other station; if so, which?

Ans. Yes. Exhibits 19 and 20 [*Exhibits* 40 *and* 41 *in People's Telephone Co. case*] transmitted both ways.

Int. 11. Why did you not attempt to transmit both ways by the others?

Ans. Because the cone of the receiving instrument was not adapted to transmission.

Int. 12. State whether or not the instruments at that trial transmitted articulate speech well enough to be of any practical utility.

Ans. They did.

Int. 13. State whether or not at that trial you found that the instruments were affected by continuous use for any length of time, and if so, whether they were affected favorably or unfavorably, and what particular change took place in them in consequence of continued use of the transmitter.

Ans. They were unfavorably affected in consequence of the relaxation of the membrane, due to the absorption of moisture from the breath in speaking into the instrument.

Int. 14. Please look at the complainants' Exhibits 31 and 34, Bell Telephone of 1875 [*Exhibits Nos.* 19 *and* 22 *in People's Telephone Co. case*], and state whether you took part in a trial of them on the 7th of July, 1879, when they were mounted with the sheepskin membranes, Exhibits 32 and 35 [*Exhibits Nos.* 20 *and* 23 *in People's Telephone Co. case*], and the heavy armatures 33 and 47 [*Exhibits Nos.* 21 *and* 35 *in People's Telephone Co. case*]; if so, describe those trials, and state where they took place.

Ans. I did. First, in the workshop of Charles Williams, Jr., at 109 Court Street, Boston, the receiving instrument being in the workshop, and the experiments being conducted while the usual work of the shop was going on. I am not certain of having heard any sound through the instrument. Second, with the same instruments, immediately after the first trial, the experiment was repeated in the office of Mr. Storrow, and articulate speech was distinctly heard with the receiving instrument.

[*Cross examination waived.*] .

CLARENCE J. BLAKE.

Attest: W. P. PREBLE, Jr., *Examiner.*

[*The exhibits therein referred to are produced.*

The drawing marked "Dr. C. J. Blake Drawing," not being on file in any case, will be produced at the hearing if required, and a photolithograph made from a tracing of the drawing is produced; the drawing, being in pencil, cannot be photolithographed.]

Cross Examination by L. HILL, Esq., *of Counsel for Defendants.*

Cross-Int. 4. Were the three figures that are shown on the drawing all made at the same time and during the same interview?

Ans. Yes.

Cross-Int. 5. Is this the original paper on which they were made; and are these the original sketches?

Ans. It is; they are.

Cross-Int. 6. How happened this paper to be preserved?

Ans. I preserved it as a matter of purely personal interest.

Cross-Int. 7. Of what personal interest was it to you?

Ans. A matter of scientific interest in the investigation of Mr. Bell.

Cross-Int. 8. Were any other sketches made at the same time?

Ans. There were.

Cross-Int. 9. Where are they?

Ans. I do not know.

Cross-Int. 10. Were they preserved, and if not, why not?

Ans. As I remember, there were several sketches made by Mr. Bell in pencil and one made by myself in ink on prescription blanks, which I fastened together afterwards with a metal clamp and

left in a drawer in my office desk, where I found them subsequently, and gave them to Mr. Bell, as I remember, at his request.

Cross-Int. 11. When did you give them to Mr. Bell, and where?

Ans. At some time prior to July 25, 1879, at the Massachusetts General Hospital.

Cross-Int. 12. Do you remember how many sheets of prescription paper there were at that time containing sketches which you gave to Mr. Bell?

Ans. I do not.

Cross-Int. 13. Give the best of your recollection about it.

Ans. Three or four.

Cross-Int. 14. These sketches here, Exhibit 30, Dr. C. J. Blake Drawing, all are on one sheet, are they not?

Ans. Yes.

Cross-Int. 15. Have you any recollection what the sketches were on the other sheets?

Ans. I have not, except of my own only.

Cross-Int. 16. If I understand you correctly, there were one or two sheets containing sketches made at that interview by Mr. Bell in addition to the sheet here produced and in addition to the sheet upon which you sketched.

Ans. Yes.

Cross-Int. 17. Did all those sketches upon all those sheets relate to the subject of transmitting sound by electricity?

Ans. No; my own drawing was made to illustrate the structure of the organ of Corti in the human ear, with a view to explaining the manner in which its different parts vibrate sympathetically in response to different musical tones.

Cross-Int. 18. Referring to this sketch which is here in evidence, which was marked "No. 30" in the Dowd case and is now marked "Exhibit 18" in this case, please describe what the lines in Fig. 1 represent, as explained by Mr. Bell to you at the time.

Ans. I shall have to answer to the best of my recollection that Fig. 1 represents a horseshoe magnet with a framework carrying a metal reed at the end of the poles.

Cross-Int. 19. You mean a framework at the end of each pole?

Ans. I do.

Cross-Int. 20. What does Fig. 2 of the same drawing represent?

Ans. Two horseshoe magnets placed opposite to each other in circuit, and having metal reeds between the poles.

Cross-Int. 21. The little black lines between the poles represent the reeds in cross section, I suppose, do they?

Ans. Yes.

Cross-Int. 22. The reeds such as were referred to there were the ordinary metallic reeds of a musical instrument, such as an accordion, were they not?

Ans. Yes; or, as I understood Mr. Bell, simple strips of metal.

Cross-Int. 23. What does Fig. 3 of that sheet represent?

Ans. A series of metal reeds vibrating in response to the tone of a tuning fork which, in vibration, acts as a metal reed.

Cross-Int. 24. I see in Fig. 3 only one metal reed: where is the series?

Ans. Excuse my mistake; I confounded Fig. 3 and Fig. 4.

Cross-Int. 25. Your answer then would be correct if I had asked the same question as to Fig. 4, would it?

Ans. Not precisely; Fig. 3 represents a tuning fork vibrating opposite the pole of a magnet and coil, Fig. 4 a series of metal reeds arranged with a coil.

Cross-Int. 26. In Fig. 4 the five inclined lines represent the reeds, do they not?

Ans. Yes.

Cross-Int. 27. And what does the quadrilateral beneath them represent?

Ans. As I remember, a coil of wire.

Cross-Int. 28. Were the reeds to be attached to the end of the coil or not?

Ans. No.

Cross-Int. 29. The sketch looks as though the reeds were either attached to the ends of the coil or to a large black horizontal line close to the upper end of the coil: do you recollect what was really meant by that at the time?

Ans. A series of metal reeds vibrating as armatures to a magnet or series of magnets.

Cross-Int. 30. What does the heavy black horizontal line at the upper end of the coil represent?

Ans. I do not know, unless it be the base to which the metal reeds would be attached.

Cross-Int. 31. Did you at the time clearly understand Mr. Bell's explanations of the ideas which he professed to have conceived in regard to the transmission of sound by electricity, and the means which he proposed to use to carry them into effect?

Ans. I did.

Cross-Int. 32. Do you now recollect clearly and fully what those ideas were and what the means were, as he then described them to you?

Ans. Yes, as regards the main points. It was in part a desultory conversation in which other points relating to acoustics were discussed.

Cross-Int. 33. What was the date of that conversation?

Ans. October, 1874.

Cross-Int. 34. How do you fix that date?

Ans. By a letter.

Cross-Int. 35. What letter?

Ans. A letter of mine to Mr. Bell, dated Oct. 21, 1874.

Cross-Int. 36. Will you please put a copy of that letter in evidence as Exhibit Blake Letter?

Ans. I produce a copy, which is as follows: —

HOTEL BERKELEY, Oct. 21, 1874.

My dear Sir, — There is a meeting of the Boston Society of Medical Sciences on the 27th inst., and I should like very much, if you please, to show some of your tracings. If you have no photographs, I can have some made for the purpose. It will be well for us to publish at an early date, in order to lay our claim to the experiments.

I have received a letter from the Royal Institute from Elisha Gray concerning his experiments in telegraphing vocal sounds, which you will be glad to see.

Sincerely yours,

CLARENCE J. BLAKE.

PROF. A. GRAHAM BELL.

Cross-Int. 37. In that letter you refer to a letter received from Elisha Gray concerning his experiments in telepraphing vowel sounds: will you please put in evidence a copy of the letter from Prof. Gray to you?

Ans. I produce a copy; it is as follows: —

ROYAL INSTITUTION, LONDON, Oct. 2, 1874.

CLARENCE J. BLAKE, M. D.

Dear Sir, — I received your line a few days since which was forwarded to me from Chicago. I am engaged at present with Prof. Tyndall and Latimer Clark in conducting some experiments partly as a matter of scientific interest and partly with a view of certain practical applications. I shall be in New York by the time you receive this, as I sail on the 8th inst. on the White Star steamer "Adriatic." Shall be in New York a week or ten days, and may possibly come to Boston, although I think it not likely.

I shall be glad to receive the results of your experiments, and shall in turn be most happy to furnish you any information I can. I shall have my apparatus in New York, and, should you be there, or should I go to Boston, I should take pleasure in repeating some of the experiments before you. My New York address will be Everett House, Union Square. Yours very truly,

ELISHA GRAY.

Cross-Int. 38. Did you, in the summer and fall of 1874, write Prof. Gray; and if so, how many letters?

Ans. I did; two letters.

Cross-Int. 39. Will you please put in evidence copies of those two letters?

Ans. I produce copies; they are as follows: —

BOSTON, HOTEL BERKELEY, Aug. 15, 1874.

ELISHA GRAY, Esq.

Dear Sir, — I have just learned of your experiments on telegraphic transmission of musical tones, and shall be much interested to learn more thereof, as I have been lately experimenting, in connection with Prof. A. Graham Bell, on the phonautographic value of consonant and vowel sounds as received and transmitted by the drum membrane of the human ear. In your own further experiments, it may be of value to you to know of the late work by Prof. Wolf, entitled "Speech and the Ear"; and, if our experiments this autumn prove successful, shall be happy to place their results at your disposal, and should, in return, be obliged for any further information which you may be pleased to give me concerning your own investigations. Very truly yours,

(Signed) CLARENCE J. BLAKE, M. D.,
Lecturer on Otology, Harvard Medical School.

HOTEL BERKELEY, BOSTON, Oct. 22, 1874.

My dear Sir, — Accept my thanks for your favor, dated London, Oct. 2, which came duly to hand. If possible, it will give me great pleasure to call upon you in New York, but, if unable to do so, I shall endeavor to send you photographs of some of the tracings made from vibrations of the incus. The object of the experiments has been to ascertain the character of the figures traced by a style attached to the incus, malleus and stapes, and to various points on the *membrana tympani* in response to vocal sounds. The reproduction of overtones on the plates has been very clearly shown under the microscope in a few instances, and the plates would, I think, be of some interest to you.

Respectfully your obedient servant,
(Signed) CLARENCE J. BLAKE.

Cross-Int. 40. Was the interview at which the sketches Exhibit 18 were made before or after the date of your letter of Oct. 21, 1874, to Prof. Bell?

Ans. As I remember, after.

Cross-Int. 41. At the time of that interview, did the conversation relate in any way to what Prof. Gray or others had been doing with reference to the transmission of sound by electricity?

Ans. Only in this much, that Mr. Bell reasserted his preference to pursue his investigations independently of others following the same line of research.

Cross-Int. 42. Mr. Bell, at that time, was laboring on the subject of the harmonic telegraph, was he not?

Ans. He was.

Cross-Int 43. That conversation, and the sketches which were made by him in the course of the interview, related to the harmonic telegraph, did they not?

Ans. Less to that than to his absorbing idea of the transmission of human speech, for, as I remember that interview, the transmission of single musical tones was considered only incidentally.

Cross-Int. 44. So far as you have any knowledge, Mr. Bell had not at that time discovered how to transmit articulate speech, had he?

Ans. Yes.

Cross-Int. 45. What knowledge have you that leads you to that conclusion, and when and how was that knowledge derived?

Ans. Mr. Bell's description of a means which he proposed for that purpose. I refer to his description at that time.

Cross-Int. 46. Now, as you say, you remember clearly and fully what Mr. Bell described at that time: will you please give us the description which Mr. Bell then gave you of his discovery of the transmission of speech by electricity?

Ans. The plan proposed by Mr. Bell was the attachment of a metal reed to a membrane vibrating in response to the human voice, the metal reed acting as armature to a magnet connected with another magnet at the end of a line wire, armed with a corresponding reed and membrane, the idea being that if the simple pendulous vibrations of a metal reed at one end of a line wire could be reproduced in a metal reed at the other end of the line wire, the more complicated vibrations evoked by the human voice could also be so reproduced.

Cross-Int. 47. If I understand you, Mr. Bell had not tried the experiment at that time, but only proposed it as a possible solution of the question: am I correct?

Ans. So I understood him.

Cross-Int. 48. Have you stated all that you remember that he said at that time about that proposed apparatus described in your answer to Cross-Int. 46?

Ans. He spoke also of speaking directly to the metal reed, and also of the undulatory current of electricity.

Cross-Int. 49. Did he anticipate any difficulty in accomplishing the object by that proposed means, or express any fear that it might not practically answer the purpose?

Ans. None, except so far as purely mechanical difficulties were concerned in the use of animal membranes.

Cross-Int. 50. Did he express the opinion that the strength of the electric currents generated in that way would be sufficient to reproduce in the receiving reed the same vibrations as were imparted to the transmitting reed?

Ans. Yes; I am not aware that the doubt occurred to either of us.

Cross-Int. 51. You yourself had no doubt that the strength of the electric currents or impulses so generated in such an instrument would produce in the receiving reed the same vibrations as were occasioned in the transmitting reed: is that the fact?

Ans. Yes.

Cross-Int. 52. You were at the time pretty familiar with electric science, were you?

Ans. Practically, not at all.

Cross-Int. 53. Your prior experiments with Prof. Bell had not then related to the electric transmission or reproduction of sound, had they?

Ans. They had not.

Cross-Int. 54. Was that interview the first time in which Prof. Bell had spoken of or explained to you his proposed inventions for the electric transmission of sound?

Ans. It was not.

Cross-Int. 55. Was that the first time he had explained to you this apparatus which you have described in your answer to Cross-Int. 46?

Ans. Yes.

Cross-Int. 56. Did you have any conversation with Prof. Bell afterwards about that proposed instrument; if so, when next?

Ans. At this same interview I proposed using a curved instead of a plane membrane to actuate the metal reed at both ends. As for instance, the drum membrane of the human ear or of the ear of some animal. This proposition was not carried out because we did not wish to dismount the human drum membrane which we were using as phonautograph, because of the difficulty of obtaining other preparations. Mr. Bell, therefore, proposed using a plane membrane.

I did not have any conversation with Prof. Bell about that proposed instrument after that interview.

[*Adjourned to Nov.* 14, *at* 9.30 A. M.]

NOVEMBER 14, 1882.

Cross-Int. 57. How long have you been acquainted with Prof. Bell?

Ans. Eleven years or thereabouts.

Cross-Int. 58. Did you see him frequently during the summer and early fall of 1874?

Ans. No.

Cross-Int. 59. Did you see him frequently between the time of that interview of October, 1874, at which the sketches were made, and the beginning of 1877?

Ans. No.

Cross-Int. 60. Did you have any talk with him about telephones between the time of that interview and the beginning of 1877?

Ans. I did.

Cross-Int. 61. When and how often?

Ans. I cannot recall dates, — at long intervals, I think, because, after the date of this interview in October, my interest in the experiments of Mr. Bell became less, as he had apparently attained the solution of the problem concerning which he consulted me; namely, the transmission of articulate speech electrically.

Cross-Int. 62. When did your interest begin to decrease in consequence of your belief that he had attained the result he was aiming at?

Ans. At or soon after the date of this interview in October.

Cross-Int. 63. How much latitude do you give the expression "soon after" in your last answer, — a week or a month?

Ans. A month is nearer the time.

Cross-Int. 64. Did you have any interview with Mr. Bell during that month?

Ans. I do not remember.

Cross-Int. 65. Your belief that he had attained the result sought for, and your consequent loss of interest in his investigations, were then based entirely upon what you learned during that interview, were they?

Ans. Yes, principally.

Cross-Int. 66. If they were in part based upon anything else, state what.

Ans. The demands made upon my time by my professional work, and the feeling that the further solution of the problem being a more purely mechanical one, I could be of less assistance to Mr. Bell than others better acquainted with mechanics.

Cross-Int. 67. Then, if I understand you correctly, your idea was that he had struck upon the correct principle to be applied, and that the further development would consist in discovery or invention of the proper means for carrying that principle into practice: am I correct?

Ans. Not precisely; rather that, having determined one mechanical means of effecting the purpose of transmitting speech electrically, further experiment in the direction of an improvement of this mechanical means would be required to perfect an apparatus for this purpose.

Cross-Int. 68. Do I understand you that you believed that the mechanical means which he described and illustrated in those sketches at that interview would in the form there shown be capable of transmitting articulate speech electrically?

Ans. Yes, as concerns the attachment of a metal reed to a membrane.

Cross-Int. 69. He did not in his sketches illustrate the attachment of a metal reed to a membrane, did he?

Ans. I think not, but described its attachment in the place of the stylus of the phonautograph.

Cross-Int. 70. Had you been assisting him upon or with experiments with the phonautograph prior to this interview?

Ans. Yes, I allude to the *membrana tympani* phonautograph.

Cross-Int. 71. Does Fig. 3 in your sheet of sketches Exhibit No. 18 represent a telephone instrument which he proposed to use; and if not, what does it represent, and why was it made?

Ans. It does not, as I remember, but represents a magnet and coil with a tuning fork as armature, and a galvanometer in circuit, and was, I think, made in illustration of an experiment made by Mr. Bell, in which deflection of the galvanometer was caused by vibration of the tuning fork as an armature, or by movement of its mass of metal to and from the magnet.

Cross-Int. 72. Did he describe the reeds in Fig. 4 as being of the same length, or of different lengths?

Ans. Different lengths.

Cross-Int. 73. What did he state to be the object in making them of different lengths?

Ans. To provide an apparatus which would vibrate sympathetically to a number of musical tones, or to the human voice.

Cross-Int. 74. He proposed to make them of different lengths because a reed of a given length would emit a sound only in one particular key or pitch, and would respond sympathetically only to a sound emitted in that key or its octave, did he not?

Ans. Yes, that was his idea, but not so fully expressed.

Cross-Int. 75. Which of the instrumentalities shown in these four figures of your sketch No. 18 did he in that interview lay the most stress upon or regard as the most important form which he had conceived?

Ans. That represented in Fig. 4.

Cross-Int. 76. Did he describe that as having been made, or only as conceived and to be made?

Ans. I do not remember

Cross-Int. 77. Then you probably do not remember that he spoke of any results having been already attained by it?

Ans. I do not remember.

Cross-Int. 78. Was that interview in October, 1874, the first interview between you and Prof. Bell in which the employment of a membrane with a metal reed was suggested or talked about?

Ans. Yes.

Cross-Int. 79. At that interview, who first suggested the employment of a membrane, you or Prof. Bell?

Ans. Prof. Bell told me that, as the results of his experiments with a membrane phonautograph, he had conceived the idea of a way in which speech could be electrically transmitted. I replied, "I think that I know how you would accomplish it, by making a

membrane actuate a metal stylus." Mr. Bell replied, "That is precisely my idea. If a membrane like the human *membrana tympani* moves a weight such as that of the ossicles, a membrane having a metal reed attached to it should move that reed in response to the human voice." His further idea, as communicated to me, was, that by means of this arrangement, undulations should be produced in an electric current corresponding to the undulations of the air produced by the human voice.

Cross-Int. 80. Then you actually described the instrument to him before he described it to you, did you?

Ans. I did not.

Cross-Int. 81. I understood you to say that before he told you how he proposed to accomplish the result, you anticipated him by suggesting the employment of the membrane and attached stylus, and that he then, in response to that suggestion, gave you to understand that that was the idea which he had had in his mind, but which, as I understand you, he had not until then described to you. If I am incorrect in this understanding, will you please correct me?

Ans. My remark to Mr. Bell concerning the attachment of the membrane and metal stylus was in the form of a question rather than a suggestion.

Cross-Int. 82. What I want to know is this: Whether you asked that question before Mr. Bell described to you the plan of attaching the metal stylus to a membrane for the purpose of transmitting speech electrically, or whether you did not ask the question till after he had described such plan; did your question come before or after his description of that plan?

Ans. Before.

Cross-Int. 83. Now, when that plan was talked over after you had suggested it in your question, did or did not Mr. Bell express any doubt in his mind as to whether the sound waves caused by the human voice would have sufficient strength to impart the necessary vibrations to the stylus or metal to cause electrical impulses through the circuit sufficient for the transmission of speech?

Ans. I think that his idea was to use a battery to provide a current.

Cross-Int. 84. What I want to know is this: Did he express any doubt whether the movements of the metal stylus so arranged would be sufficient for the purpose of transmitting speech, or did he ask your opinion upon that point?

Ans. He expressed no doubt as to the production of undulations in an electric current corresponding to the movement of a stylus, and did not ask my opinion. His idea, as I remember it, was, that in order to transmit speech it would be necessary to provide a current by means of a battery.

Cross-Int. 85. That answer does not fully meet the question which

I asked, and which, perhaps, I can simplify by putting it in this form: Did he ask your opinion as to whether the human voice could or could not vibrate a membrane with a stylus or armature attached?

Ans. Yes.

Cross-Int. 86. What answer did you give to his question?

Ans. That it could, if proportioned properly to the membrane, but that I doubted if a plane membrane would reproduce with sufficient accuracy the sound waves resulting from the human voice.

Cross-Int. 87. And then you went on to suggest bringing the metal reed in contact with the human *membrana tympani*, suitably prepared and mounted for the purpose, did you not?

Ans. Yes.

Cross-Int. 88. When did you first have knowledge that Mr. Bell had made or experimented with a telephone instrument having a membrane with armature attached?

Ans. I do not remember; I think not until 1876.

Cross-Int. 89. At that interview in October, 1874, when you suggested the use of the human *membrana tympani* and expressed a doubt as to a plane membrane being sufficient for the purpose, did you and Mr. Bell discuss pretty thoroughly your reasons for preferring the *membrana tympani?*

Ans. Yes.

Cross-Int. 90. What were those reasons as you then stated them to him?

Ans. That a curved membrane, that is to say, a membrane the centre of which is depressed below the level of its periphery, and the surface of which therefore presents a curve from the centre to the periphery, responds in sympathetic vibration to a much wider range of musical tones than a plane membrane, and that the human *membrana tympani*, being especially adapted for such vibrations, would best answer the purposes of the experiment.

Cross-Int. 91. Did you discuss with Prof. Bell the reasons why the curved membrane approximating the form of the ear would produce the expected improved result?

Ans. Yes; but very briefly.

Cross-Int. 92. What reasons were suggested for it in that discussion?

Ans. That, responding more readily in sympathetic vibrations to a wider range of tones, it would respond more readily to the human voice and reproduce more accurately the complicated sound waves therefrom resulting.

Cross-Int. 93. Yes. I understand that from your answer to Cross-Int. 90, and what I meant to ask was this: Did you discuss the reason why it would respond more readily in sympathetic vibrations to a wider range of musical sounds, or was the talk simply of the fact without investigating the reasons?

Ans. We did not discuss the reason why, the talk was simply of the fact.

Cross-Int. 94. How long had you and Prof. Bell been experimenting together with phonautographs prior to that time?

Ans. During the preceding summer we had experimented independently, but with the knowledge that each had such investigations in progress.

Cross-Int. 95. Then you had not experimented together?

Ans. No.

Cross-Int. 96. But Prof. Bell knew of your experiments, and of the apparatus you used, did he?

Ans. Of the experiments, yes; of the apparatus no. He was in Canada during the summer, where he had with him, if I remember rightly, a preparation of the *membrana tympani* to be used as a phonautograph.

Cross-Int. 97. Did you see the phonautographs with which he experimented prior to that interview of October, 1874?

Ans. I had seen the phonautograph at the Institute of Technology, but to the best of my recollection I did not see the *membrana tympani* phonautograph with which he experimented until after that interview.

Cross-Int. 98. Had he experimented with the phonautograph at the Institute of Technology?

Ans. So I understood.

Cross-Int. 99. What was the construction of that instrument?

Ans. That of the ordinary membrane phonautograph, with the stylus hinged at the periphery of the membrane and moved by a piece of wood connecting it with the centre of the membrane.

Cross-Int. 100. What was the diameter of the membrane?

Ans. I cannot remember exactly; I should think about six inches.

Cross-Int. 101. About how long was the stylus?

Ans. I cannot remember exactly; I should think between twelve and eighteen inches, including the pen at its extremity.

Cross-Int. 102. At the experiments referred to in your answer to Int. 8 in the Dowd case (incorporated into your answer to Int. 3 in this case), how many persons were present taking part in the receiving and transmitting of speech, and who were they?

Ans. I do not remember exactly; I think five or six, including Mr. Watson, Mr. Henck, Prof. Cross and Mr. Storrow.

Cross-Int. 103. Were you at the transmitting or the receiving instrument?

Ans. Receiving, principally. One pair of instruments, I think, transmitted both ways.

Cross-Int. 104. When these instruments, now numbered "36" and "37," were tested at that time, did you listen at the receiver or speak at the transmitter?

Ans. I listened at the receiver.

Cross-Int. 105. Did you test these two instruments on more than one day?

Ans. If I remember rightly, on a second occasion.

Cross-Int. 106. About the same time or long afterwards?

Ans. About the same time.

Cross-Int. 107. How came you to test them on the second occasion? What caused that test to be made?

Ans. I do not know.

Cross-Int. 108. Did they work differently on the two occasions; and if so, did they work better at the first test or at the second?

Ans. As I remember, they worked uniformly well.

Cross-Int. 109. You had no difficulty in getting articulate speech through them clearly, did you?

Ans. As I remember, I heard words distinctly, using Exhibit 37 as a receiver.

Cross-Int. 110. What transmitter was used when Exhibit 37 was used as a receiver, or did you see the transmitter that was then in use?

Ans. I did not see the transmitter then in use.

Cross-Int. 111. Did you get sentences through the receiver No. 37, or only an occasional word?

Ans. Certainly, words; either through this or another receiver used in experiments at the same time, a connected sentence.

Cross-Int. 112. Who adjusted the instruments in those tests?

Ans. Mr. Watson.

Cross-Int. 113. How often were they adjusted during the tests?

Ans. I have evidently misunderstood your previous question, presuming adjustment to refer to the setting of the instruments for the experiment. I do not remember that they were adjusted during the experiments.

Cross-Int. 114. You don't remember about any of the instruments being adjusted during those tests in June, 1879, at Mr. Storrow's office.

Ans. I do not.

Cross-Int. 115. Do you remember any word that you received through those instruments at those tests?

Ans. Yes.

Cross-Int. 116. What words, and through what instruments?

Ans. "Holloa," "hoy," "cold," and a sentence which was, I think, "it is cold," or, "is it cold to-day"; through receiver Exhibit 37, or another receiver used in the experiments.

Cross-Int. 117. Referring now to Exhibit 37, do you positively remember any word that you received through that instrument at those tests, if so, what word or words? Give us all you can remember, but confining your answer to that particular instrument.

Ans. I cannot now remember whether the words mentioned in my previous answer were heard with this or another instrument.

Cross-Int. 118. Are you sure that any words were heard by you through this receiver No. 37?

Ans. Yes.

Cross-Int. 119. How perfectly did the instrument work? I mean No. 37.

Ans. Having no standard with which to compare it, I can only say not very perfectly, as compared with the sound of the human voice as ordinarily heard in conversation.

Cross-Int. 120. How did its working compare with that of the telephone instruments in general use in the city?

Ans. Very unfavorably.

Cross-Int. 121. Did it work well enough to be of any practical value for business purposes?

Ans. No, for a very simple reason, that after using for a time, the membrane of the transmitters, being moistened by the breath of the speakers, became relaxed.

Cross-Int. 122. How long could they be used before they would become relaxed so as to unfit them for use?

Ans. About half an hour to an hour of pretty constant use was, I think, sufficient to moisten the membranes and relax them.

Cross-Int. 123. Before the membranes became moist, how perfectly did they work as compared with the ordinary telephones now in use?

Ans. I find it very difficult to compare the two justly. With the present Bell hand telephone, used both as transmitter and receiver, the quality of the voice is plainly distinguishable, although about ninety per cent of the sound, so to speak, is not heard from the receiver. In the receivers used in these experiments the words, while distinguishable, were dull, and I do not remember that I could have distinguished the speaker by the voice.

[*Adjourned to Nov.* 15, *at* 9.30 A. M.]

NOVEMBER 15, 1882.

Cross-Int. 124. Referring to those tests made at Mr. Storrow's office with Exhibits 36 and 37, in 1879, how much time did you spend at the receiver during those tests?

Ans. I think about two minutes.

Cross-Int. 125. How much time did you spend at the other receiving instruments that were used during those tests?

Ans. I think about the same length of time.

Cross-Int. 126. How many sentences did you hear and understand through the receivers during all those tests, — anything except the sentence "it is cold," or something like that, which you referred to last evening?

Ans. Yes, I did hear other words and parts of sentences, but I do not remember what.

Cross-Int. 127. There was a good deal transmitted, I suppose, which you tried to hear at the receiver, but which you could not hear or understand, was there not?

Ans. Yes.

Cross-Int. 128. You stated in your answer to Int. 12 in the Dowd (case incorporated in your answer to Int. 3 of this deposition), that at that trial the instruments transmitted articulate speech well enough to be of some practical utility. Explain just what you meant by that.

Ans. The words which I distinguished were sufficiently clear and distinct to make the means employed for the transmission of speech in these experiments of practical value if the instruments could be made to work uniformly as well.

Cross-Int. 129. That would be true of any instrument that would transmit a word sufficiently plainly and clearly to be heard and understood at the receiver, would it not?

Ans. Yes, I should think so; in equal degree.

Cross-Int. 130. From your tests of those instruments, did you consider that they successfully solved the problem of transmitting spoken speech by electricity, assuming them to be the first instruments that ever produced the results which you witnessed?

Ans. Yes

Cross-Int. 131. During those tests at Mr. Storrow's office, who was at the receiver the greater length of time?

Ans. I do not remember; the receivers were passed from hand to hand during the transmission of speech.

Cross-Int. 132. From which of the receivers there used were the best results obtained?

Ans. I do not remember.

Cross-Int. 133. Do you recollect whether you heard any entire sentences through the lovers' telephones, Exhibits 40 and 41?

Ans. I do not.

Cross-Int. 134. Do you recollect whether you heard any entire sentences through the baby telephone, Exhibits 38 and 39?

Ans. I do not, because I do not remember through which receiver I heard the sentence given in my answer to Cross-Int. 116.

Cross-Int. 135. In your answer to Int. 14 in the Dowd case you referred to having taken part in a trial of Exhibits Nos. 19 and 22 at the workshop of Charles Williams, Jr., Court Street, Boston, and afterwards at Mr. Storrow's office: how long did the trial of these instruments at Mr. Storrow's office last, and who were present?

Ans. The duration of the trial in question I do not remember. To the best of my recollection, there were present, among others, Mr. Storrow, Mr. Watson, Prof. Cross and Mr. Berliner.

Cross-Int. 136. Did you listen at the receiver during that trial?

Ans. I did.

Cross-Int. 137. Did you hear and understand any spoken words through the receiver; if so, how many, and state any of them that you remember?

Ans. I did. I do not remember how many, and can recall only "holloa," "hoy," and "now."

Cross-Int. 138. Did you get any of those words pretty plainly, or not?

Ans. Not plainly.

Cross-Int. 139. Where was the transmitter during that experiment, in another room or in the same room? If so, how far off, and what intervened?

Ans. In another room, across the courtyard, in the rear of Mr. Storrow's office. The courtyard is about one hundred feet wide, and closed windows intervened.

CLARENCE J. BLAKE.

Attest: CHAS. H. SWAN, *Examiner.*

DEPOSITION OF EDWARD L. WILSON.

Direct Examination by JAMES J. STORROW, Esq., *of Counsel for Complainants.*

BOSTON, Nov. 13, 1882.

Int. 1. State your name, age, residence, and occupation.

Ans. Edward L. Wilson; I am twenty-three years old; I live in Malden, Mass.; and am a mechanic.

Int. 2. Did you give a deposition in the case of the American Bell Telephone Company *v.* Peter A. Dowd, in the summer of 1879?

Ans. Yes.

Int. 3. Please look at the printed copy of that deposition, and say if the statements therein are correct; and if so, please read it as a part of your answer.

Ans. Yes, sir; they are correct. The deposition is as follows: —

DEPOSITION OF E. L. WILSON.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

BOSTON, July 24, 1879.

Int. 1. Please state your name, age, residence, and occupation.

Ans. Edward L. Wilson; twenty; Boston, Mass.; mechanic.

Int. 2. Look at complainants' Exhibit 45, Bell's Speaking Telephone Metallic Diaphragm. [*Exhibit No.* 33 *in People's Telephone Co. case.*]* State, if you know, when it was made.

Ans. In the summer of 1876.

Int. 3. Did you during that summer assist Mr. Bell in any telephonic experiments in which that Exhibit 45 [*Exhibit No.* 33 *in People's Telephone Co. case*] was used?

Ans. Yes; I assisted him in trying it after it was made at Exeter Place, Boston, as a receiver and as a transmitter.

Int. 4. How did you use it as a transmitter?

Ans. By speaking to this iron diaphragm and covering it as much as possible with the hands, so as to form a mouthpiece with them.

Int. 5. Please look at complainants' Exhibit 43, Bell's Permanent Magnet of 1876. [*Exhibit No.* 31 *in Peopte's Telephone Co. case.*] State when it was made.

Ans. It was made in July, 1876.

Int. 6. State when you first knew of its use in a speaking telephone.

Ans. About that time. As soon as it was made we tried it.

* In the deposition here incorporated into Mr. Wilson's answer to Int. 3, the exhibits are numbered as in the Dowd case. The numbers in brackets are the numbers applied in the present suit of the American Bell Telephone Co. *v.* The People's Telephone Co.

Int. 7. Please look at complainants' Exhibits 15 and 16, Membrane Telephone No. 2 [*Exhibits Nos.* 36 *and* 37 *in People's Telephone Co. case*], and state whether you made them, and if so, what parts were made by you or under your directions.

Ans. Every part was made by me except the iron cones and the winding of the coils, which were done under my direction.

Int. 8. Who gave you the directions according to which you worked?

Ans. Mr. Watson.

Int. 9. What directions did he give you as to size and arrangement of parts?

Ans. He gave me a drawing containing the length of the cones, thickness and length of the core, the size of the iron used in making the right-angled back piece, the armature, the cones that connect the armature with the diaphragm, and the resistance of the coils, and told me what parchment to get for the diaphragms.

Int. 10. Was he present while you were making them?

Ans. No.

Int. 11. Did you stretch the diaphragms?

Ans. Yes.

Int. 12. What instructions did he give you as to any particular manner of stretching them?

Ans. None.

Int. 13. Please look at complainants' Exhibits 17 and 18, Baby Membrane Telephones. [*Exhibits Nos.* 38 *and* 39 *in People's Telephone Co. case.*] State whether you made them or had them made under your direction, and from whom you received your instructions about making them.

Ans. I made them. A tracing was given me — a drawing — by Mr. Watson, and he told me to make them as near the size of the drawing as possible.

Int. 14. What directions did he give you about the size of the core and the resistance of the coil?

Ans. He gave me no directions about the size of the core, only to make it the size of the core in the drawing. He told me to have the spool filled with a certain size wire. I don't remember what size.

Int. 15. What directions did he give you as to size and shape of the armature?

Ans. He told me to make the armature as wide as the iron back piece to which it is hinged.

Int. 16. What directions did he give you about the width of the iron back piece?

Ans. He gave me the width, and the thickness I got by the drawing.

Int. 17. Did you stretch the membranes on them?

Ans. Yes.

Int. 18. What directions did he give you about the membranes or about the manner of stretching them?

Ans. He told me what to use for a membrane, and I tied it on with a piece of string.

Int. 19. Please look at the complainants' Exhibits 19 and 20, Lovers' Electric Telephones. [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case.*] State what parts of them you made, and from whom you received your directions.

Ans. I made every part except the mouthpiece, the spool and the stretching the diaphragms. The diaphragms were on when they were brought to me by Mr. Watson, who gave me my directions.

Int. 20. What directions did he give you as to size of core and resistance of coil?

Ans. He gave me the size of the core, the diameter and length of the coil, the resistance of the coil, and told me to make the rest similar in shape to those made before, and to use my own judgment about the thickness of the back piece and armature. He did tell me something about the armature. I had some iron one sixteenth of an inch thick, and half an inch wide. I asked him if that would do. He said it would.

Int. 21. Please look at the complainants' Exhibits 23 and 24, Hand Telephone Membranes. [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case.*] State whether you made any part of them; if so, what part?

Ans. I made the hinged armature and the brass cone that connects it with the diaphragm.

Int. 22. Where did you get the wooden ring?

Ans. It was brought to me by Mr. Watson.

Int. 23. What directions did you receive as to the size and shape of the armature, and from whom did you receive such directions?

Ans. Mr. Watson gave me a drawing, with the shape he wished to be made, the thickness and width of the iron.

Int. 24. How do the thickness and width of the armatures of 23 and 24 [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case*] compare with the thickness and width of the armatures of 19 and 20? [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case.*]

Ans. I think the armatures of 23 and 24 [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case*] were made before those of 19 and 20. [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case.*] They are both made of the same iron.

Int. 25. Who stretched the diaphragms on 23 and 24? [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case.*]

Ans. I did.

Int. 26. What directions did you have about stretching the diaphragm?

Ans He told me to stretch them the way I always had done, and shellac them, to prevent their becoming loose from being spoken to.

[*Adjourned to July* 25, 1879.]

Cross Examination by CAUSIEN BROWNE, Esq., *of Counsel for Defendants.*

BOSTON, July 25, 1879.

Cross-Int. 27. Have you been employed by any one at any time in or about the making of telephones, besides the work you did in making the particular telephones mentioned in your direct examination?

Ans. No, I have not.

Cross-Int. 28. What has been your employment during the last three or four years?

Ans. I have been employed in assisting Mr. Bell and in the factory of Charles Williams, Jr.

Cross-Int. 29. Mr. Charles Williams, Jr., manufactures the Bell telephones, doesn't he?

Ans. Yes.

Cross-Int. 30. What is the nature of your employment in his place?

Ans. Working upon different kinds of electrical work.

Cross-Int. 31. How long have you been in Mr. Williams's employment?

Ans. About two and a half years.

Cross-Int. 32. Do you mean to be understood by your first answer this morning that you have never done any work on telephones at Mr. Williams's place until you made the exhibit telephones by Mr. Watson's directions, as mentioned in your direct examination?

Ans. I have done a very little work on our regular instruments, the Bell telephones.

Cross-Int. 33. Did you make Exhibit 45 [*Exhibit* 33 *in People's Telephone Co. case*], or any part of it?

Ans. No, I did not.

Cross-Int. 34. I suppose that, prior to making and completing the exhibit telephones in pursuance of Mr. Watson's directions, you had seen no models of any telephones, had you?

Ans. Yes, I had.

Cross-Int. 35. Any except those that you had had to do with while working under Prof. Bell?

Ans. No.

Cross-Int. 36. How long did you work under him?

Ans. About two months.

Cross-Int. 37. When was it?

Ans. In the summer of 1876.

Cross-Int. 38. What telephones or parts of telephones having stretched membranes had you seen before you made the exhibits by direction of Mr. Watson, as testified yesterday? I mean, of course, electric telephones.

Ans. None except those used by Mr. Bell in the summer of 1876, and I have seen them since lying around.

Cross-Int. 39. Do you mean the same ones you saw in 1876, or other stretched membrane telephones?

Ans. I suppose they were the ones used by Mr. Bell. There were very few of them.

Cross-Int. 40. How many do you remember altogether, first and last?

Ans. There may have been fifteen or twenty.

Cross-Int. 41. Did you have anything to do with the making of any of them, or with any alteration or repairing of any of them?

Ans. I had nothing to do with the making of them, but have put on several new membranes.

Cross-Int. 42. Have you not assisted Prof. Bell in some of his experiments since the summer of 1876?

Ans. Not that I remember.

Cross-Int. 43. Is the whole of your employment at this time with Mr. Charles Williams in this city?

Ans. No; I am in the employ of the Bell Telephone Company.

Cross-Int. 44. In what capacity?

Ans. Starting telephonic exchanges, — starting the apparatus and teaching the operators.

Cross-Int. 45. Is Mr. Charles Williams, Jr., the sole manufacturer of the Bell telephones?

Ans. I think he is, at present.

Cross-Int. 46. Your work in starting telephonic exchanges is done at different distant towns, is it not?

Ans. Yes; wherever I am sent by the company.

Cross-Int. 47. How long have you been on this duty of starting telephonic exchanges?

Ans. About one month.

Direct Examination resumed.

Int. 48. Are these instruments, the Philadelphia Centennial Telephones 38, 39 and 41 [*Exhibits Nos.* 26, 27 *and* 29 *in People's Telephone Co. case*], among those which you say you have seen?

Ans. Yes.

E. L. WILSON.

Attest: W. P. PREBLE, Jr., *Examiner.*

[*Complainants' counsel produces for inspection the exhibits therein referred to.*

Mr. Hill waives cross examination, but asks that the exhibits here produced shall be marked as of this case and produced at the hearing; otherwise he will object to the deposition of this witness.]

EDWARD L. WILSON.

Attest: CHAS. H. SWAN, *Examiner.*

CIRCUIT COURT OF THE UNITED STATES.

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

THE AMERICAN BELL TELEPHONE COMPANY, AND THE METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY, COMPLAINANTS,

vs.

THE PEOPLE'S TELEPHONE COMPANY, JOSEPH LOTH, JULIUS BIEN, MARCUS MARX, AUGUST H. GIRARD, JOHN N. GOODWIN, FRANK A. KLEMM, ERNEST MARX, EDGAR W. CHELLIS, RICHARD C. MCCORMICK, HENRY D. COOKE, JR., MAX L. GUTMAN, MORITZ LOTH, AND SIMON WOLF, RESPONDENTS.

EVIDENCE FOR COMPLAINANTS IN REPLY,

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me,
FRED. M. OTT, *Examiner.*

ROOM NO. 5, BOLTON'S HOTEL,
HARRISBURG, PENNA., July 13, 1882, 3.30, P. M.

Examination commenced.

Present: Mr. Storrow for complainants; and Mr. Hill and Mr. Jacobs for respondents.

HARVY W. WHITEHEAD being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

Q. 1. State your age, residence, and occupation?

Ans. I will be twenty-eight the seventh day of next month; residence, Duboistown, Lycoming county, Penna.; occupation at present, engaged as clerk for the Lycoming county commissioners.

Q. 2. Do you have charge of the records of the county commissioners of that county?

Ans. I have.

Q. 3. If among those records you have the inquest held in the year 1867, on the body of George Miller, will you please produce it?

Ans. I will. (Witness produces paper.)

Q. 4. Will you please send it to the examiner, that he may take down a copy of it as a part of your answer, and in reading it, read everything that is written on the paper? State first whether the paper you now produce, and are about to read, is the original inquest on file in the commissioner's office?

Ans. It is (witness reads paper as follows):

Commonwealth of Pennsylvania, Lycoming county, ss:

An inquisition indented and taken at the city of Williamsport, in the county of Lycoming, the fifteenth day of October, in the year of our Lord one thousand eight hundred and sixty-seven, before me, John Hepburn, J. P. in and for said county, upon the view of the body of a man named George Miller, by a pass-book found upon his person, then and there lying dead upon the railroad track, in front of the depot, in the city of Williamsport, upon the solemn affirmations of R. C. Swan, C. P. Colver, and J. F. Vanderslice, W. W. Hicks, J. C. Peterman, and William Bancard, good and lawful men of the county aforesaid, to inquire on the part of the Commonwealth when, where, and how, and after what manner the said George Miller came to his death, do say upon oaths of William Frizzel and David Ferguson, that the said George Miller came to his death accidentally, by the cars passing over him, and crushing his head and, moreover, the jurors, upon their oaths, do say that the said George Miller, at the time of his death, had upon his person one pocket knife, three hundred and ninety-four dollars and forty cents; also, one carpet sack, containing one shirt and one handkerchief, which is now in the hands of R. C. Swan, foreman of the jury.

In witness whereof, as well the aforesaid justice of the peace, as the

jurors aforesaid have to this inquisition, put their hands and seals on the day and year above mentioned.

JOHN HEPBURN, *J. P.* [SEAL.]
R. C. SWAN, *Foreman*, [SEAL.]
C. P. COLVER, [SEAL.]
J. A. VANDERSLICE, [SEAL.]
W. W. HICKS, [SEAL.]
J. C. PETERMAN, [SEAL.]
W. H. BANKART, [SEAL.]

John Hepburn, J. P., viewing a dead body, . .	$2 75
Summoning and qualifying in inquest, . . .	1 37
Summoning and qualifying each witness, 25, . .	50
R. C. Swan, foreman, ...	50
Charles P. Colver, ...	50
J. A. Vanderslice, ...	50
W. W. Hicks, ...	50
J. C. Peterman, ...	50
W. Bankart, ...	50
(Witness) David Ferguson, ...	31
W. Frizzel, ...	31
	$8 24

Received payment.

WMS.'PORT, Nov. 21, 1867.

JOHN HEPBURN, *J. P.*

[Endorsement.]

Nov. 25, 1867. Approved: Inquest necessary.

Per cur.

I. SMITH, *A. J.*

Q. 4. The paper which you have just produced and read, seems to be a receipt for the expenses of the inquest, as well as the inquest itself. Who paid those expenses, if the records of the county show?

Ans. It does. Lycoming county paid the expenses, from the records.

Q. 5. If you have the stub of the order-book, or drafts on the treasurer, please point out the record of this payment on the stub and read it?

Ans. This is the order-book from which the orders on the treasurer for the payment of money were drawn for the year 1867. The stub is as follows: "No. 134, Dec. 31st, 1867, W. T. I. Painter and others, for holding inquisitions, 1867, $127 29.

Q. 6. Have you examined all the inquisitions in the county for that year, and the receipts on each, and ascertained whether the costs of all of them put together amount to the sum named in the stub you have just read?

Ans. I have, and find that they amount to $126 29.

Q. 7. I infer from your last answer that the clerk who footed them up in 1867 made a mistake of just one dollar in adding them up. Does that appear to be the fact about it?

Ans. I believe that it was a clerical error.

Q. 8. Have you here all the other Lycoming county inquests for 1867; and if so, will you please produce them for the inspection of counsel?

Ans. All that the records of the county show to have been held during that year.

Q. 9. Is it by law the duty of the county to pay the expenses of inquests on dead bodies found in the county?

[*Objected to by Mr. Hill as incompetent and hearsay, and because the witness is not proved to be an expert as to what was the law at that time.*]

Ans. It is.

Cross-examination waived by counsel for respondents.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 13th day of July, 1882.

FRED. M. OTT, *Examiner.*

HARVY W. WHITEHEAD.

ABRAHAM PAGE being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is sixty-nine; residence, Williamsport, Lycoming county, Penna.; occupation, cabinet-maker and undertaker.

Q. 1. You have just heard read an inquest on the body of George Miller, killed on the railroad track at Williamsport, in October, 1867. Did you provide the coffin and grave clothes for him, and attend to the undertaker's work in Williamsport on his body?

Ans. Yes, sir; I did.

Q. 2. If you have your books of account, in which you made the original charges for that work, will you please to produce them and read them?

Ans. Yes, sir. This is what we call the work-book,—a book to enter

those works in just as they are done each day. (Witness reads:) "1867, October 16, one walnut coffin and case, six and a half feet, P. & E. r. r., George Miller, $23 00." I also have a ledger account relating to the same transaction, which is as follows:

"*Philadelphia and Erie R. R. Co.:*

1867.		*Cr.*	*Dr.*
October 16.	To one walnut coffin and case, bg. George Miller, ...		$23 00
" "	one shroud and clothing, . . .		14 00
			$37 00
Mar. 24.	By cash paid by N. C. R. Rway, . . .	$37 00"	

Q. 3. Are all these entries in your handwriting?

Ans. Yes, sir.

Q. 4. Were they made by you at the time of the dates and of the transaction?

Ans. Yes, sir.

Q. 5. Do they contain true accounts of the transactions?

Ans. Yes, sir.

Q. 6. Please look at the railroad voucher which has been produced by Mr. Broderick, and put into his deposition, and state whether the receipt at the foot of it is signed by you?

Ans. That is correct. It was signed by me.

Q. 7. Is that the voucher and receipt on which you obtained from the Northern Central railroad payment for the charges you have read relating to the body of George Miller?

Ans. Yes, sir.

Q. 8. Who directed you to furnish this coffin and clothing, and take charge of the body?

Ans. He was superintendent of the road there, but what his name was I don't know. I think it was Mr. Black was there at that time.

Q. 9. Do the Philadelphia and Erie road and the Northern Central road use the same depot at Williamsport, and did they at that time?

Ans. Yes, sir.

Q. 10. Which is the road that runs from Harrisburg to Williamsport?

Ans. The Northern Central runs from Harrisburg to Sunbury, and the P. & E. from Sunbury to Williamsport.

Q. 11. I see that you have no charge for burying. I suppose from

that, that the body was delivered to some one else for burial. Was that the fact?

Ans. To the best of my knowledge it is. I have got no charges for burying. I always charge for the grave when I do that, but there is none in this case.

Cross-examination waived by counsel for respondents.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 13th day of July, 1882.

FRED. M. OTT, *Examiner.*

A. PAGE.

W. J. BRODERICK, being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is forty-one; residence, Baltimore, Md.; occupation, clerk in the auditor's office of the Northern Central railway.

Q. 1. Will you produce the voucher for the payment by your company of thirty-seven dollars to A. Page, Son & Co., March 24, 1868?

Ans. Yes, sir. Here it is. (Witness produces the paper, which is as follows:)

"No. 23. LOSS FROM INJURIES TO INDIVIDUALS, &C. ACCOUNT.

Northern Central Railway Company, lessee.

TO A. PAGE, SON & CO., WMS.PORT, *Dr.*

14.

1867. For the following, as per bill rendered, with affidavit annexed, and filed in auditor's office, at Baltimore, viz: E. S. B.

	Dollars.	Cents.
Oct. 16. 1 coffin, case, &c., ...	23	00
Under clothing, ...	14	00
	37	00

For man killed on P. & E. road at Wms.port.

Passenger station, Oct. 16, 1867.

Payable in current funds at Lumberman's National Bank, Wms.Port, Pa.

J. E. C.

I certify that the above claim is just; that it has been duly authenticated, and that the items therein specified are correct.

J. N. DUBARRY. *General Supt.*

The above account is duly authorized; it has been examined by me, found correct, and hereby approved.

S. LITTLE, *Auditor.*

Received, March 24, 1868, of J. S. Leib, treasurer of the Northern Central R. W. Co., lessee, thirty-seven $\frac{x}{100}$ dollars, in full of the above account, and for all claim against the said company for service, loss, damage, personal injury, or otherwise, to date.

U. S. inter. revenue stamp. 2 cts.

$37 00.

A. PAGE, SON & Co.

Read this. ☞The above receipt must be dated and signed by the party in whose favor this voucher is made out; or when signed by another party, the authority for so doing must in all cases accompany it; and this receipt must not be cut off from the body of the voucher.

[Endorsement.]

Northern Central Rail Way Company, lessee.

Elmira and Williamsport R. R.

No. 28.

Conducting transportation, loss from injuries to individuals, &c.

A. Page, Son & Co.

For January, 1868. $37 00.

Office Calvert station, Baltimore.

Theo. F. Scheffer, Printer, Harrisburg."

Cross-examination waived by Mr. Hill:

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 13th day of July, 1882.

FRED. M. OTT, *Examiner.*

W. J. BRODERICK.

Adjourned until July 14, 1882, at ten, A. M.

JULY 14, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

WILLIAM DARR being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is about fifty-eight years; residence, corner of Market and Eleventh streets, Harrisburg, Penn'a; my occupation is keeping a small candy shop, cigars, and tobacco.

Q. 1. Did you ever live at Eberly's Mills, or Milltown; and if so, when, and when did you leave it?

Ans. I lived there twenty years; I left in 1870.

Q. 2. Did you know George Miller, who was killed on the railroad at Williamsport, in October, 1867?

Ans. Yes, sir; I knew him. He was a brother-in-law of mine.

Q. 3. Did you go up to Williamsport for his body?

Ans. Yes, sir; I did.

Q. 4. Were you an undertaker at that time?

Ans. Yes, sir; I was.

Q. 5. Did you get his body at Williamsport and bring it down here?

Ans. Yes, sir; I fetched it to Bridgeport at four o'clock in the morning.

Q. 6. Who hauled it from Bridgeport to Milltown?

Ans. Harry Gardner.

Q. 7. Was there a funeral at Milltown, and did you go to it?

Ans. Yes, sir; there was a funeral there, and I was with it.

Q. 8. It has been stated, that at the time he was killed he had with him about four hundred dollars belonging to Mr. Daniel Drawbaugh; did Mr. Drawbaugh ask you to get that money and bring it to him, and did he give you an order for it?

Ans. Yes, sir; he did.

Q. 9. The inquest states that a sum of money, a little less than four hundred dollars, was found in the pocket of the dead man, and was, at the time of the inquest, in the possession of Mr. Swan, foreman of the coroner's jury; did Mr. Swan give that money to you at Williamsport?

Ans. Yes, sir; he did.

Q. 10. What did you do with it?

Ans. I stuck it in my pocket-book. I had a coat on similar to this,

and I put it in my side pocket. It was rolled together, and I put a little newspaper around it.

Q. 11. Whom did you give the money to?

Ans. I gave it to Daniel Drawbaugh.

Q. 12. Did you give him the whole of it, just as you received it?

Ans. Yes, sir; I did.

Q. 13. Did anybody come down from Williamsport with you and the body; and if so, who?

Ans. Yes, sir; Mr. Swan; I think his name was Swan.

Q. 14. Was it the same Mr. Swan from whom you received the money?

Ans. Yes, sir.

Q. 15. Did the railroad company furnish passes to come down with from Williamsport to Bridgeport?

Ans. No, sir; they didn't.

Q. 16. Who paid your expenses on that trip?

Ans. I paid the half of them myself, and Drawbaugh paid the other half.

Q. 17. Do you remember how much they amounted to?

Ans. As near as I can, about seven dollars and a half.

Q. 18. While you lived at Eberly's Mills, did you frequently go to Mr. Drawbaugh's shop?

Ans. I was over there often; yes, sir.

Q. 19. I now show you five instruments marked "F," "B," "C," "C re-produced," and "I," and ask you whether you ever saw any of them at Mr. Drawbaugh's shop?

Ans. No, sir; I never saw any of them.

Q. 20. Did you ever see any talking-machine at Mr. Drawbaugh's shop?

Ans. No, sir; I didn't.

Q. 21. Did you ever hear of any talking-machine there?

Ans. No, sir; I didn't.

Q. 22. Did Mr. Drawbaugh come to you about a year ago and ask you about telephones or talking-machines?

Ans. Yes, sir; he did.

Q. 23. Did Mr. Drawbaugh come to you this morning and talk with you about George Miller?

Ans. Yes, sir; he did.

Q. 24. Did he speak about talking-machines to you this morning?

Ans. No, sir; he didn't.

Cross-examined by Mr. Hill:

Cross-Q. 25. When Mr. Swan came down with the body and with you, did he go to Bridgeport?

Ans. Yes, sir.

Cross-Q. 26. Did he go any further than Bridgeport?

Ans. He told me he was going to Harrisburg.

Cross-Q. 27. How long did he remain at Bridgeport?

Ans. About half an hour.

Cross-Q. 28. Where did he go then?

Ans. He told me he was going to Harrisburg, and I saw him start for the toll-bridge. He said he was going to walk over. This was down at the railroad bridge, where we stopped with the corpse.

Cross-Q. 29. Was that the last you ever saw of him?

Ans. Yes, sir; that was the last time I saw him.

Cross-Q. 30. Where did Mr. Swan hand you the money?

Ans. He handed it to me in some restaurant.

Cross-Q. 31. In what town?

Ans. Williamsport.

Cross-Q. 32. Was any person else present when he handed you the money?

Ans. There was two other men present, but they were strangers to me.

Cross-Q. 33. Did you give Swan a written receipt for the money when you got it from him?

Ans. No, sir; I didn't.

Cross-Q. 34. Was the money rolled up and covered with a piece of newspaper when he gave it to you?

Ans. No, sir.

Cross-Q. 35. The money was in bills, I suppose, was it not?

Ans. I guess so; I didn't see it apart.

Cross-Q. 36. You didn't open it then to examine it?

Ans. No, sir; I didn't.

Cross-Q. 37. I suppose you and Mr. Swan took a drink together in the restaurant?

Ans. Yes, sir; he treated me to some oysters, and we took some whisky with it.

Cross-Q. 38. While you and Swan were together on that trip, did you have your suspicions excited in any way about Swan?

Ans. I had; he invited me three or four times into a sleeping-car, and I had an idea he was going to take the money from me.

Cross-Q. 39. When you arrived with the body at Bridgeport, was anybody there waiting to meet you, or did you have to go home to get a conveyance to take it home?

Ans. I waited an hour, and then Harry Gardner came with a conveyance.

Cross-Q. 40. Swan had left before Harry Gardner arrived, had he?

Ans. Yes, sir; about a half an hour.

Cross-Q. 41. Did Harry Gardner have a carriage to take the body away?

Ans. He had my spring-wagon and his horse.

Cross-Q. 42. Did you see Daniel Drawbaugh that day, after you got the body to Milltown?

Ans. I saw him right away when I got home with the corpse.

Cross Q. 43. That was the first time you had seen him since you had gone to Williamsport to get the body, was it?

Ans. Yes, sir; the first time.

Cross-Q. 44. Did you give him the money all rolled up in a paper, just as you had it in your pocket?

Ans. Yes, sir; I did.

Cross-Q. 45. And you never knew whether the money was in bank bills or in any other form, did you?

Ans. No, sir; I knew it when Drawbaugh unwrapped the newspaper off; but I had never looked at them.

Cross-Q. 46. Who put that newspaper around the money at Williamsport?

Ans. I don't know who put that around.

Cross-Q. 47. You didn't put it around, did you?

Ans. I put part of it around; I did that to make it stronger, because I had no pocket-book, and was just carrying it in my pocket; there was a newspaper around, and I put a second newspaper around.

Cross-Q. 48. When Drawbaugh unrolled the newspaper and saw that it was really money, did he roll it up again and put it in his pocket and take it away?

Ans. I don't mind of that, what he done.

Cross-Q. 49. Your only recollection about it is, then, that you handed him the roll, and that he unrolled the newspaper and looked at it?

Ans. Yes, sir.

Cross-Q. 50. As you hadn't had the money open, but had it rolled up all the time, you didn't consider it necessary to have it counted, I suppose?

Ans. No, sir.

Cross-Q. 51. When did Drawbaugh pay his half of the expenses?

Ans. Right away when I went to Williamsport.

Cross-Q. 52. He furnished the money in advance then?

Ans. Yes, sir.

Cross-Q. 53. How much money did he advance for the purposes of that trip?

Ans. About three dollars and a half.

Cross-Q. 54. Was that just to pay your fare?

Ans. Yes, sir.

Cross-Q. 55. How long were you at Williamsport?

Ans. I was there four hours.

Cross-Q. 56. What time of day did you leave Williamsport to return?

Ans. At twelve o'clock, midnight.

Cross-Q. 57. Why did Swan come down on the train with you?

Ans. He told me he was going to arrest a man in Harrisburg.

Cross-Q. 58. Was he, Swan, a constable, or policeman, or detective, or what?

Ans. I think he was a policeman at that time.

Cross-Q. 59. Can you swear positively that the name of the man who gave you the money in Williamsport was Swan?

Ans. I never heard anything else but that; they were all strangers to me; it was the first time I was there, and the last time, too.

Cross-Q. 60. Do you know his first name?

Ans. No, sir; I don't.

Cross-Q. 61. You were not present at the inquest on the body of George Miller, at Williamsport, were you?

Ans. No, sir; I wasn't.

Cross-Q. 62. Then you don't know, of your own personal knowledge, whether the man who gave you the money at Williamsport had anything to do with that inquest or not, do you?

Ans. No, sir.

Cross-Q. 63. When you lived at Eberly's Mills, did you live in the village or outside of it?

Ans. I lived in it.

Cross-Q. 64. In what house?

Ans. A stone house close to the mill.

Cross-Q. 65. Who owned the house?

Ans. Mr. Christian Eberly.

Cross-Q. 66. When did you first live in that house, and how long did you live there?

Ans. I lived there twenty years. I moved away thirteen years ago.

Cross-Q. 67. In what month did you move away?

Ans. The last day of March I moved away.

Cross-Q. 68. You are sure it was thirteen years ago, the last day of last March, are you?

Ans. Yes, sir; that we moved over here, and left that place.

Cross-Q. 69. At that time you moved to Harrisburg?

Ans. I moved to Highspire, Dauphin county, Penna.

Cross-Q. 70. How long did you live at Highspire?

Ans. I lived there ten years.

Cross-Q. 71. And then you moved to Harrisburg?

Ans. I moved from Highspire to Steelton. I lived at Steelton three years.

Cross-Q. 72. When did you move to Harrisburg?

Ans. This last April, the first or second day; I don't just mind, but I think it was the first, though.

Cross-Q. 73. What was your business when you lived at Steelton?

Ans. The two first years I kept a boarding-house; the third, the same I am at now, a little tobacco shop and segar shop.

Cross-Q. 74. You boarded workmen in the steel works, I suppose; did you?

Ans. Yes, sir.

Cross-Q. 75. What was your business at Highspire when you lived there?

Ans. Part of the time I was in the undertaking business, and part of the time I was peddling. I was five years in the undertaking business at Highspire.

Cross-Q. 76. From the last day of March, 1870, to the time when you moved to Harrisburg, was only twelve years, so that you must have moved away from Milltown on the last day of March, 1869, must you not?

Ans. I always thought it was 1870. I might, may be, have been mistaken.

Cross-Q. 77. When you lived at Eberly's Mills, did anybody live in the same house with you. If so, who?

Ans. Three or four families. I really forget their names. I occupied the stone part, and the other families were in the frame part. There were several tenements in one long building, partly frame and partly wood. Each tenement had its own front door.

Cross-Q. 78. Who lived there in that building the last year that you lived there?

Ans. Henry Yetter lived in it the last year. He had it to himself the last year. He kept a hotel, and needed the whole house.

Cross-Q. 79. Where did Daniel Drawbaugh live the last year that you were there?

Ans. He lived in the house next to the blacksmith-shop there. I think he owned it at one time. Had bought it from his pap, or he bought it from Mr. Hauck, who had bought it from old Mr. Drawbaugh. That was the way, I think.

Cross-Q. 80. Where did he have his workshop?

Ans. He had one back at the mill there. He had two. He had one down at the creek, where they were making these faucets.

Cross-Q. 81. Were you in his shop down at the creek, where they were making faucets?

Ans. I got in there sometimes. Not as much as I did up at the mill.

Cross-Q. 82. What did you go in there for down at the creek. To see them make faucets?

Ans. Yes, sir.

Cross-Q. 83. Then I suppose you didn't pay much attention to anything else there except the making of the faucets?

Ans. Yes, sir; that was about all.

Cross-Q. 84. When you would be down there, you would find Drawbaugh at work about the faucet business, would you?

Ans. Yes, sir.

Cross-Q. 85. I have heard that you once got off a very good joke on Drawbaugh while you lived there. He was telling you that he had a machine with which he could talk across the Atlantic ocean, and you replied, that he had better limit his operations to Yellow Breeches creek before he tried the Atlantic ocean.

Ans. That is so; that is what I told him.

Cross-Q. 86. Your words, as I have heard them repeated, were about as follows: "Dan, you had better try the Yellow Breeches first before

you try the Atlantic ocean;" is that substantially the reply you made to him?

Ans. Yes, sir; that is about it. He said the time was coming when they could talk across the sea. I said, "Oh! take the Yellow Breeches first."

Cross-Q. 87. How long was that before you moved away from Eberly's Mills?

Ans. I don't know whether I can study that up or not; I know it was a couple of years before I moved over here.

Cross-Q. 88. Do you mean to say that it was just two years before or might it have been more than two years?

Ans. About two years before I moved over here.

Cross-Q. 89. Where was that conversation, in what building or place?

Ans. In the shop next to Eberly's Mill. One was called the upper shop, and the other the lower shop. It was in the upper shop.

Cross-Q. 90. How happened the conversation to start on the subject of talking across the sea?

Ans. I hardly mind that—exactly how it happened. I don't think much was said. He was tired, and leaning against the bench and said: "Bill, do you believe the time is coming when we can talk across the sea?" I said, "Oh! you had better try the Yellow Breeches first." I said too, "What is the matter with you Dan, are you going crazy?" I don't think there was much more than that said, before or after.

Cross-Q. 91. Didn't he say, also, that he was going to do it, or had a machine that would do it?

Ans. No, sir; he said nothing of the kind.

Cross-Q. 92. He dropped the conversation after your reply to him, did he?

Ans. Yes, sir.

Re-direct by Mr. Storrow:

Q. Q. 93. You have been asked about the purposes for which you went to Mr. Drawbaugh's shop. Did you ever do any work there for yourself or for him?

Ans. I done some for him.

Q. Q. 94. What did you do for him?

Ans. I made some stave-jointers and stave-cutters. I worked at them.

Q. Q. 95. Did you ever work on any models for him?

Ans. No, sir; I didn't.

Q. Q. 96. After you had given him the money which you brought from Williamsport, did he ever complain to you that there was near a hundred dollars of it missing?

Ans. No, sir; he didn't.

Re-cross by Mr. Hill:

Re-cross-Q. 97. The work which you did on the stave-jointers and stave-cutters was done before the rebellion, was it not?

Ans. Yes; I think it was.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 14th day of July, 1882.

WILLIAM DARR.

FRED. W. OTT, *Examiner.*

Recess for dinner, until 2.30, P. M.

JULY 14, 1882, 3, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

HENRY R. MOSSER being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is fifty-four years; residence, New Cumberland, Cumberland county, Penna.; occupation, lumber merchant.

Q. 1. How long have you been engaged in the lumber business, and had saw-mills or planing-mills there?

Ans. Ever since my majority. I first had a planing-mill about thirty years ago.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, and how long have you known him?

Ans. I know him, and have known him for probably thirty-five years.

Q. 3. Please look at the newspaper, *Baltimore American*, for Saturday, February 2, 1878, and tell me whether you wrote the article therein, entitled "A letter from New Cumberland?"

Ans. I did write that letter.

Q. 4. That letter is dated January 31, 1878. Was that the time when you wrote it?

Ans. My recollection is that it was.

Q. 5. Will you please read the article to the Examiner, that he may make it a part of your answer?

Ans. Yes, sir.

LETTER FROM CUMBERLAND.

A new route to Baltimore.—Proposed bridge over the Susquehanna.—A wonderful clock.—Crops in Southern Pennsylvania.

[Special correspondence of the AMERICAN.]

NEW CUMBERLAND, PA., *January* 31, 1878.

I have been a reader of the *American* for over thirty years, but do not remember having seen a letter from New Cumberland. The *American* is found in most of our business offices daily, and is a favorite with our merchants. We have been bound to Baltimore, commercially, by iron bands since 1851, and are now threatened with a double bond in the erection of an iron bridge at this place, which is to connect ultimately Boston, *via* Poughkeepsie and Harrisburg and Hanover with Baltimore and the South. The bridge company has a charter, and it is asserted that it will be speedily built.

Our business men have long had an extensive and favorable acquaintance with Baltimore merchants and, like all Pennsylvanians residing south of the Susquehanna, have preferred to deal there, but railway facilities have led them largely away from Baltimore, and it is not strange to find much satisfaction expressed at the prospect of this second line to their favorite city. The rich mineral and agricultural country through which it will pass, will give reasonable assurance of success, and its connection with the new line now in operation from Milton, Muncy, and Williamsport, and now to Jersey Shore, and soon to Lock Haven, will give the line quite an extended run among the coal and lumber points in Pennsylvania, and give Baltimore two competing lines through the heart of Pennsylvania.

We have a really scientific study in motive power, which has been made after years of patient study, by Mr. Daniel Drawbaugh. He has perfected a clock without spring or weight, and is never wound up, but will run for centuries, so far as motive power is concerned, or so long as electricity and the magnet remain the subtle agencies of mechanical power. It is a real scientific production, and a wonder well worth a visit even from Baltimore. It will doubtless come into general use, but Mr. Drawbaugh, like many other ingenious inventors, is not financially able to place this valuable clock quickly before the public.

*

The crop prospect for wheat in York, Cumberland, and Franklin counties is very good, notwithstanding the absence of snow. X.

Q. 6. Were you at Mr. Drawbaugh's shop at Eberly's Mills, and did you see some electric or magnetic clocks there shortly before you wrote that article?

Ans. I was there, and saw some electric clocks.

Q. 7. Did he give you any explanation about the clocks?

Ans. He did.

Q. 8. Had you read in the papers at that time that electric speaking telephones were getting into use in the community?

Ans. I had.

Q. 9. Did you have any conversation with Mr. Drawbaugh at that visit about electric speaking telephones?

Ans. I had.

Q. 10. Will you state the substance of that conversation?

Ans. My recollection is, that he showed me some parts or work that he said he had been working upon for some time previous.

Q. 11. Did he state how long he had worked at them?

Ans. Not to me.

Q. 12. Did he state whether he had given up working at them, or abandoned them, or anything in relation to that; if so, what was it.

Ans. I don't think he did.

Q. 13. What was your object and purpose in writing that newspaper article?

[*Objected to by Mr. Hill as immaterial and incompetent.*]

Ans. I was very much interested in the clock, and desired to draw attention to the discovery, that Mr. Drawbaugh might be benefited thereby.

Q. 14. If he had made any statements to you which led you to believe that he was really the first inventor of the speaking telephone, would you have mentioned that in your article also?

[*Objected to as hypothetical and incompetent, and calling for a mere matter of present opinion.*]

Ans. I think I would.

Q. 15. Did you go there purposely to see his clock, or for some other purpose, on that occasion?

Ans. I went there to see Mr. Drawbaugh on business. I also desired to see his clock, of which I had heard a good deal.

Q. 16. Had you ever heard, up to that time, that he had made any electric speaking telephones?

Ans. I may have heard of it; I do not now remember.

Q. 17. Please to look at the instruments now shown you, and see if any of them look anything like the telephones or parts of telephones he showed you on that occasion?

Ans. I think I recognize that ("B") as one, or something like one he showed me.

Q. 18. Do you recognize these two large ones, ("H" and "J.")

Ans. I have no recollection of seeing them.

Q. 19. I now show you all the other original instruments which have been put in evidence by the defendants, and I ask you which, if any of them, you saw at that time?

Ans. Mr. Drawbaugh showed me several parts of his telephone, only one of which I definitely seem to remember; that is this one, (indicating "B.")

Q. 20. In your conversation with Mr. Drawbaugh on that occasion, did he appear to be much interested in telephones, or what was he chiefly interested in?

Ans. My recollection is, that in his conversation with me he seemed to be chiefly interested in perfecting his clock.

Q. 21. Do you know a man by the name of Hieronymus Geistwite, and did he ever work for you?

Ans. I did know him, and he worked for me.

Q. 22. He was called as a witness for the defendant's in this case, and testified, on page 478, that he worked as mill-wright for Mr. Mosser, at the mill just across the creek in York county, opposite New Cumberland; was that one of your mills at that time?

Ans. Yes, sir; I had it leased.

Q. 23. Did he ever work for you, and was he a mill-wright?

Ans. He worked for me, but I never knew him as a mill-wright.

Q. 24. He testifies that he began to work for you in July, 1870, repairing or re-building the mill. Did you put in new saws or repair the mill in 1870?

Ans. No, sir; I have no recollection of any repairs that year.

Q. 25. Is there any circumstance which satisfies you that you didn't overhaul the mill that year?

Ans. Yes, sir.

Q. 26. If you have your time book here for the years 1869, 1870,

1871, and part of 1872, will you please point out where his name first appears as having done work for you?

Ans. On the 26th day of June, 1871.

Q. 27. I notice, also, that that page contains the names of fifteen or twenty workmen, and that his is the last on the list; does that indicate that he was a new hand?

Ans. I think it does.

Q. 28. I see his name is there written "R. Geistwite;" what was he commonly called?

Ans. Ronny Geistwite.

Q. 29. Will you look at that time-book and at your ledgers, at the accounts headed with his name, and tell me how long your books show that he continued to work for you, or at your mill?

Ans. From June, 1871, to July 31, 1874, and he may have worked longer than that on the mill, after this period, for Hull & Dugan, who were running the mill by the thousand; it is quite likely that he worked for them.

Q. 30. I observe that the last page of your account, page 134 of the ledger, shows that the last work he did for you was some work in April, 1874, and a few half days in July, 1874, and that Hull & Dugan's name then appears in his account; was that about the time his work was charged to them?

Ans. Yes, sir.

Q. 31. I observe, that according to the ledger, page 63 for example, he appears to have worked for you, either by day work or job work, pretty full time through 1872; was that the fact?

Ans. Yes, sir; and to the close of February, 1873.

Cross-examined by Mr. Hill:

Cross-Q. 32. You speak of the mill as one which you leased; when did you first lease that mill?

Ans. My father leased it in 1848, and I had been associated ever since. I renewed my lease in 1871. The mill was re-built in 1857, on the old site. The renewed lease was from the 1st of April, 1871.

Cross-Q. 33. Did you repair the mill in 1871?

Ans. I did.

Cross-Q. 34. And according to your books, Geistwite commenced to work for you in the latter part of June, 1871, and worked pretty steadily right along for about a year and a half or a little more; is that a fact?

Ans. That is so.

Cross-Q. 35. And he did some work for you, from time to time, afterwards, for a year or so?

Ans. Yes, sir.

Cross-Q. 36. Did he assist in repairing the mill?

Ans. I think he did.

Cross-Q. 37. He is dead now, I understand. Do you know that fact?

Ans. He was in our employ, and died in our house.

Cross-Q. 38. When you went up to see Mr. Drawbaugh on business, and had the conversation about the clocks, how did that conversation come about. Did you tell him that you wanted to write up the subject in the newspapers, or that you felt an interest in the clock invention, and did the conversation commence in some such way as that?

Ans. I don't think I mentioned the writing of the letter to the newspapers. My recollection is, that that was an afterthought after I went home. I saw the clocks there, and heard of them, and was very much interested in his explanation of them, showing their properties. My desire was to attract public attention to the invention, that Mr. Drawbaugh might be benefited.

Cross Q. 39. Mr. Drawbaugh was indebted to you at that time, was he not?

Ans. Not to me personally.

Cross-Q. 40. Was not your business, that took you to his shop, the collection of a bill from him?

Ans. It was. I had been appointed attorney-in-fact for Lee & Bayler. The account was theirs.

Cross-Q. 41. Did you make the collection at that time?

Ans. I did not.

Cross-Q. 42. How long were you there at the shop at that visit?

Ans. Possibly an hour. I could not tell positively. I was not as busy then as I am now.

Cross-Q. 43. Was anybody present with you and Drawbaugh during any part of the conversation?

Ans. My little son and daughter were with me. I don't think anybody else was present.

Cross-Q. 44. When you went into the shop, did you find Drawbaugh at work at anything. If so, what?

Ans. My recollection is that he was busy. I could not say at what.

Cross-Q. 45. Did he say anything about having in prospect an ar-

rangement with Shettel and the Grissinger's for the manufacture of the clocks?

Ans. I don't remember the names. He did say that he had in prospect an arrangement with parties who would manufacture the clocks. I think the party he named was Shapley, of Mechanicsburg.

Cross-Q. 46. Did he talk to you about any other of his inventions except the clock and the telephone?

Ans. I think I asked him about a barometer that I had heard he had invented.

Cross-Q. 47. Anything else that you remember as to inventions?

Ans. I do not.

Cross-Q. 48. Do you remember whether he began the conversation about clocks, or whether you did?

Ans. I think it is very likely I did, seeing them there.

Cross-Q. 49. But he began the conversation on telephones, did he?

Ans. That I cannot say. I think that is likely.

Cross-Q. 50. Which part of the conversation came first. That on telephones or that on clocks?

Ans. I cannot say. I think on clocks.

Cros-Q. 51. Was the barometer conversaton after the talk on telephones?

Ans. I think it was.

Cross-Q. 52. Did he show you the barometer?

Ans. I don't think he did. I think it was out of order, or he did not have one there. I had been told that he had invented a barometer, and asked him about it.

Cross-Q. 53. The conversation on telephones, I suppose, was very brief, was it not?

Ans. It was.

Cross Q. 54. But you had a full conversation on clocks, and he explained them to you fully, did he?

Ans. Yes, sir; pretty fully, I think.

Cross-Q. 55. Did he have a large, handsomely made, and attractive looking clock in the shop there?

Ans. Not completed, I think, at that time.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this fourteenth day of July, 1882.

FRED. M. OTT, *Examiner.*

HENRY R. MOSSER.

SADE R. WEAVER being produced, affirmed and examined, saith:

Examined by Mr. Storrow:

My residence is Harrisburg, Pa. Occupation, clerking.

Q. 1. You were requested to search the following papers: *Harrisburg Independent*, *Harrisburg Patriot*, and the *Harrisburg Telegraph*, daily editions, for the years 1877, 1878, and 1879, and to find and copy therefrom everything which named or referred to Daniel Drawbaugh. Did you search those papers carefully for that purpose?

Ans. Yes, sir.

Q. 2. Will you tell me the dates of the papers in which you found anything relating to him, and produce copies of all the articles in all those papers during that period which mentioned him?

Ans. Feb. 1, 1878, Harrisburg Telegraph.
" 13, 1878, " "
April 18, 1878, " "
May 7, 1878, " Patriot.
" 9, 1878, " Independent.
" 14, 1878, " Patriot.
" 15, 1878, " Independent.
" 17, 1878, " "
Dec. 28, 1878, " Patriot.

(Witness produces copies of the foregoing articles, to be marked "Complainant's Exhibit, Drawbaugh Harrisburg Newspaper Articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial and not rebutting.*]

Q. 3. Did you also find in, and copy from said papers certain articles relating to the introduction and use of electric speaking telephones in Harrisburg and elsewhere. And if you have copied some of them, which I designated to you, will you please produce the copies, and state the papers from which you copied them?

Ans. I produce them. They are from the following papers:

Harrisburg Patriot, Feb. 26, 1877.
" Independent, Sept. 20, 1877.
" Telegraph, " 28, 1877.
" " Oct. 10, 1877.
" Independent, Nov. 12, 1877.
" Telegraph, Dec. 19, 1877.
" Independent, Mch. 14, 1878.
" Telegraph, " 16, 1878.

Harrisburg	Patriot,	Mch. 18, 1778.
"	Telegraph,	" 29, 1878.
"	Patriot,	May 4, 1878.
"	Telegraph,	" 11, 1878.
"	"	" 21, 1878.
"	Independent,	June 11, 1878.
"	Patriot,	" 14, 1878.
"	Independent,	Oct. 1, 1878.
"	Telegraph,	" 1, 1878.
"	Independent,	Dec. 3, 1878.
"	Telegraph,	Apr. 29, 1879.
"	Patriot,	Oct. 22, 1879.
"	Telegraph,	Dec. 19, 1879.

(Said copies are put in evidence, to be marked "Complainant's Exhibit, Harrisburg Newspaper Telephone articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial and not rebutting.*

Q. 4. You also found in those newspapers certain articles relating to Edison's phonograph, which I asked you to copy. Will you please produce such copies, and state the newspapers from which they are taken?

Ans.

Harrisburg	Patriot,	June 17, 1878.
"	"	" 18, 1878.
"	"	" 21, 1878.
"	"	" 26, 1878.
"	"	Jan. 16, 1879.
"	"	" 20, 1879.
"	Telegraph,	June 19, 1878.
"	"	" 24, 1878.

(Said copies are put in evidence, to be marked "Harrisburg Newspaper Phonograph articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial, irrelevant, and not rebutting.*]

Cross-examination waived by Mr. Hill.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 14th day of July, 1882.

FRED. M. OTT, *Examiner.*

SADE R. WEAVER.

ELIZABETH R. WEAVER being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

Q. 1. Where do you live, and are you a sister of the last witness?

Ans. I live at 222 Boas st., Harrisburg, and am a sister of the last witness.

Q. 2. I asked you to search carefully the following daily newspapers: *Harrisburg Patriot* for the years 1874, 1875, and 1876; the *Harrisburg Telegraph* for the years 1874, 1875, and 1876, and the *Harrisburg Independent* from the time it began, which was in 1876, to the end of 1876, and to note if you could find therein any reference to Mr. Daniel Drawbaugh, or any reference to any magnetic clock. Did you make that search?

Ans. Yes, sir.

Q. 3. Did you find in either of those papers, during any of those years, any reference to Mr. Daniel Drawbaugh, or to a magnetic clock?

Ans. I found no reference.

Q. 4. I also requested you to search carefully a newspaper called the *Baltimore American*, published at Baltimore, Md., for the years 1875, 1876, 1877, and 1878, and to note and copy all the articles found therein, which related to Daniel Drawbaugh. Did you make such search, and will you produce copies of all such articles, and state date of the papers in which you found them?

Ans. February 2, 1878.
May 18, 1878.
November 28, 1878.

I produce the copies.

(Said copies are put in evidence, and are marked "Drawbaugh's Baltimore American Articles.")

[*Said copies are severally objected to by Mr. Hill, as immaterial and not rebutting.*]

Q. 5. I also asked you to copy from the *Baltimore American* certain articles which I designated, relating to telephones; will you please produce those copies and mention the newspapers from which you copied them?

Ans. Baltimore American, July 22, 1876.
" " August 18, 1876.
" " November 30, 1876.
" " December 3, 1877.

I produce the copies.

(Copies put in evidence, and marked "Baltimore American Telephone Articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial and not rebutting.*]

Cross-examination waived by Mr. Hill:

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 14th day of July, 1882.

FRED. M. OTT, *Examiner.*

ELIZABETH R. WEAVER.

Adjourned until July 15, 1882, at 10, A. M.

JULY 15, 1882, 10 A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

THEOPHILUS WEAVER being produced, sworn, and examined, saith:

Examined by Mr Storrow:

My age is nearly forty-nine; residence, Harrisburg, Penn'a; occupation, solicitor of patents, pattern-maker, builder of experimental machinery, manufacturer, &c.

Q. 1. When did you begin to live in Harrisburg, and what was your occupation when you first lived here?

Ans. I began to live in Harrisburg in 1864. I then became principal of the boys' high school, in the south end of Harrisburg, about the 15th of February.

Q. 2. Had you been a school teacher before that?

Ans. Yes, sir.

Q. 3. How long did you teach the boys' high school?

Ans. Between two and three years.

Q. 4. While you taught that school, here in Harrisburg, did you become interested in inventions and patents; and if so, how at first?

Ans. I did I became inventor and patentee of school desks in 1864; I took out two patents then, about November.

Q. 5. Have you since then made any inventions yourself on which you have taken out patents; and if so, how many?

Ans. I have; I have taken out twelve or more patents of my own, running through a series of years.

Q. 6. Did you in those cases draw your own specifications and claims, and did you prosecute your cases yourself or employ a solicitor?

Ans. In my first two patents on school furniture, I drew up my own specifications, and prosecuted those cases without an attorney; one Robert Hudson having made the drawings for me. Soon after, in other applications of my own invention, I made the drawings and drew the specifications myself, and prosecuted the applications without any assistance. In several applications I did have assistance, after the applications were made, once employing D. P. Holloway, Mason & Co.

Q. 7. When did you begin to act as solicitor of patents for other people?

Ans. As early as 1868, having then made an application for William A. Middleton and John A. Haller, on a horse-hitch.

Q. 8. Did you at any time become interested in an eraser invention by Mr. William P. Patton, of Harrisburg; and if so, when was it?

Ans. I did; in 1866 Mr. Isaac Lloyd, of Harrisburg, and myself, bought the entire patent of William P. Patton, on an eraser-holder for use on lead-pencils.

Q. 9. When did you become personally acquainted with Mr. Daniel Drawbaugh, of Eberly's Mills, and who mentioned him to you, and in what connection?

Ans. At the time of purchasing the eraser-holder, Mr. William P. Patton directed our attention to Daniel Drawbaugh, of Eberly's Mills, as a person who was likely to make us a good machine, or tool for making the eraser-holders, stating that Mr. Drawbaugh had made a stamping machine to make a certain discous-headed carpet tack of Mr. Patton's invention a few years before, which machine, he said, was a curious and wonderful novelty of its kind. And he thought Mr. Drawbaugh could get us up a very superior machine for our purpose.

Q. 10. Were your eraser-holders made out of stamped metal?

Ans. Yes, sir; they were to be of stamped metal.

Q. 11. Now you may go on and state whether you saw Mr. Drawbaugh in that connection, and if so, what year it was in?

Ans. This prompted me to go and see Mr. Drawbaugh sometime in the next spring—the spring of 1867.

Q. 12. Where did you see him?

Ans. I saw him at Eberly's Mills.

Q. 13. Did you see him in his shop, or where?

Ans. I saw him in his shop, and also at the fore-bay of Eberly's grist-mill.

Q. 14. How near was his shop to the grist-mill?

Ans. It was only about a stone's throw off.

Q. 15. Did you talk to him about the construction of a stamping machine for your eraser-holder?

[*This question, and all other questions relating to the construction of this machine objected to, as immaterial, irrelevant, and not rebutting.*]

Ans. I did.

Q. 16. Did you then contract with him to build it, or what was it understood he was to do about it?

[*Same objection.*]

Ans. He was to make an estimate of the cost of building a machine or tool for said purpose, and also show a plan of the machine, which he agreed to do. He spoke of his ability to get up such a machine, talked wisely on the subject, and spoke of manufacturing the article advantageously on a large scale. And that it would be best to get up a machine that would turn the work out rapidly, and agreed to report soon.

Q. 17. You say he spoke of his ability to get up a machine. Did he, or did he not, tell you that he could construct it in addition to designing it?

[*Same objection.*]

Ans. He did say so affirmatively.

Q. 18. Did you see him at Eberly's Mills again during that year—1867?

Ans. I did, later in the year—sometime after August.

Q. 19. Had he then moved to the lower shop, where they made faucets, or not?

Ans. He still worked at the same place. I think it was in the basement of his dwelling-house.

Q. 20. Did he finally construct the stamping machine for you, and if not, why not?

[*Same objection.*]

Ans. He did not. We waited some months to get his plans and estimate, and to come to an understanding. And we got tired waiting on him, and I commenced work about that time myself, and got up a design for the machine, and went to work to build it at Boyer's works, a

new enterprise just started up on Fourth street, Harrisburg. The machine, when made, did not answer the purpose perfectly, and Mr. Drawbaugh happened to come into the shop about the time we had given the machine a trial. He said he could make the machine work, but he would have to get up a set of new dies, and also spoke of changes in the feed, to make the working slower. And, in consequence, I visited his shop the second time, as already stated.

Q. 21. At these visits to Mr. Drawbaugh's shop, in 1867, did he show you any devices or contrivances which he was experimenting on or working at. And if so, will you please mention some of them?

Ans. He did. I think I met him at the first visit at the fore-bay of Eberly's grist-mill, where he was experimenting at that time with his rotary measuring faucet applied, or used, as a force pump, having hose attached to it, by which he drew water out of the fore-bay, and forced it out through a hose on which I stood, to test the force of the pump. In the shop, in the basement of his house, at the northeast end, he showed me a miniature steam engine, which he said he had built when a boy. It had been used, he said, in running a grind-stone. On the long southeast side of the shop was a wood-turning lathe, and, if I mistake not, a machine for turning iron, partly of his design, and a work-bench, on which were some wooden patterns of his rotary faucet. At the southwest end of the shop, which was better lighted than some other parts of the shop, there were displayed some tools of his own make, he said. Among others, some remarkable long, heavy, round, and square files, which he said he had cut himself. On the said long side of the shop wall, I think, were displayed some drawings of landscape scenery, which he said he had executed.

Q. 22. Did he explain to you, as well as show you, the various contrivances you have mentioned?

[*Objected to by Mr. Hill as immaterial.*]

Ans. He did; he seemed to take pleasure in showing those devices, and I was much interested, and was impressed that he was a man who was fertile in expedients or invention.

Q. 23. Did you get the impression at the time from what he said and did, that he showed you everything he had worth showing?

[*Objected to by Mr. Hill as incompetent and mere opinion.*]

Ans. I did.

Q. 24. From the time you first knew him, in 1867, have you been in the habit of meeting him frequently?

Ans. I have met him frequently. I believe once, or oftener every year, from then on to the present time. Sometimes quite frequently.

Q. 25. Has he been to your office between 1867 and 1877, and if so, has it been only once or twice, or frequently?

Ans. He has often called at my office between the years 1867 and 1877. He would most always, if he was in the lower end of the city, call in, and we would have a friendly talk, and sometimes confer on inventions, and sometimes refer to the inventions of others.

Q. 26. On page 991 of the defendant's record, Mr. Drawbaugh, referring to you, testified: "I often asked him to make search for me on different inventions, but I don't now remember what." Is that the fact, according to your recollection?

Ans. It is.

Q. 27. Did you have at your office a set of the Patent Office publications?

Ans. I did have the patent office reports running from 1853 up to the year 1877, including the Official Gazette.

Q. 28. If you remember any particular occasions of meeting him during those years, please name some of them?

Ans. I fix the occasions mostly by my own employments and work on my own inventions, and in some cases by the inventions of others. In 1868 I was engaged in experimenting on hand corn-shellers, and had occasion to pass frequently up to W. O. Hickok's foundry. In going there and returning I sometimes went up Short street, or came down that way, and passed William Jenning's and David Stevenson's machine works, where Drawbaugh's rotary pump was at that time being made, in the early part of 1868. I recollect meeting Daniel Drawbaugh at that work, then. I had been in the works and had seen work being done by the machinists on the rotary pumps; the work was irregular in form, and could not all be made by the lathe, part of the turning had to be done by hand devices, and the case of the pump being oval, required repeated turning to clean the inside. After seeing the work, I spoke to Mr. Drawbaugh, on that occasion, on the nature of the work and the difficulty, and the necessity of simplifying it; he said he was getting up some tools by which it could be readily performed. He appeared to be very confident of overcoming all difficulties, and I didn't venture to make any suggestions to him further than to allude to the necessity, as stated; he had a reputation as a machinist, that very few men would venture to offer advice to him.

Q. 29. Do you remember any other particular occasion of meeting him in 1868; and if so, state where it was, and in what part of the year, and what he was doing?

Ans. I do remember meeting him at the State fair, held about the last of September and beginning of October, 1868. He was at that fair exhibiting his nail machine and rotary pumps, and I was also there exhibiting by a substitute. Mr. Drawbaugh, during that fair-week, in a conversation, wanted to illustrate something by making a sketch; I don't remember what it was, but I remember that in trying to get the pencil out of his pocket—inside pocket of his coat—he had to get out first a roll of money—bank-bills—the roll being about two or three inches in diameter. I was amazed to see a man carry that amount of money in such a way, at such a place; that is mainly what impressed that interview.

[Recess for dinner, until 2, P. M.]

JULY 15, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Q. 30. If you met him the next year, 1869, at the State fair, state what you were doing there, and what he was doing there?

Ans. I met him at the State fair of 1869, at about the same time of year, about the latter part of September and beginning of October; he was exhibiting his rotary faucet and rotary pump, or was by them, and I was exhibiting at that fair my off-hand sheller and my geared corn-sheller. We had interviews at that fair, but I can't remember the substance of any of them, only remembering that he had illustrated circulars, and was apparently prosperous with his inventions.

Q. 31. Have you recently refreshed your memory as to the fact of his exhibitions at these fairs, and as to their date; and if so, how?

Ans. I have; I consulted the files of the Harrisburg Patriot for the year 1868, and found that the State fair was held for that year from September 28 to October 2, and that the issue of the paper for October 4, contained the official report, in which appeared the mention of Daniel Drawbaugh's nail machine and rotary pump. I also consulted the files of the Harrisburg Daily Telegragh for the year 1869, and found that the State fair was held, likewise, the last week in September and first

few days of October; also, that Daniel Drawbaugh was mentioned in connection with his rotary faucet and pumps exhibited at that fair, and that my inventions were also mentioned and commented on.

Q. 32. Were your two corn-shellers patented by you, and if so, when?

Ans. They were. My first corn-sheller patent is dated July 6, 1869. The other is dated August, some day—I don't remember the day exactly—1869.

Q. 33. Do you remember any particular and distinct occasion when he came to your office, in 1870?

Ans. Yes, sir; I do. It was sometime in the spring of 1870, when I was manufacturing a lot of my hand corn-shellers, which I generally put together and finished in one part of the room in which my office is. I remember him remarking favorably on the finish of my corn-shellers, and he asked me where I got the castings. I told him they were made at Reading, Penna., at the hardware works, but that I had made the patterns. Also, that they were japanned in Reading. I thought he seemed reticent on that occasion. I thought my work had somewhat surpassed the finish of some of the castings that he had got at different places. In getting my first castings on the corn-shellers, I had got them at Mount Joy, for the shellers which I had exhibited at the State fair the year previous. While at Mount Joy, I saw some of his patterns there on faucets. This reminds me that I had a conversation, sometime before that, with him, regarding those patterns, because they required to be drawn squarely out of the sand, and I had spoken to him something about the draft of those patterns. I also had a conversation with J. W. Moffitt about that time, in which he represented that Daniel Drawbaugh was the original inventor of what is known as the Giffard injector for steam engines. I am impressed that in that interview in 1869, I asked Mr. Drawbaugh personally whether he had any hand in the invention spoken of. He left me under the impression that he had invented the same thing, in substance, before Giffard did. This opened my mind to study Mr. Drawbaugh carefully, either as an inventor of greater claim than I supposed he was, or that he was in the habit of talking in a visionary manner—that is, imagining that he was an inventor, when, perhaps, he was not really that character.

[*Mr. Hill objects to the facts stated in the above answer, as utterly immaterial and irrelevant, and not rebutting, and objects to the inferences, suppositions, and opinions expressed as immaterial and incompetent.*]

Q. 34. Did you have any knowledge that he had done anything about injectors except the verbal assertions he had made?

[*This whole line of examination objected to by Mr. Hill, as frivolous and immaterial, and mere waste of time.*]

Ans. I did not, except what Mr. Moffitt had stated.

Q. 35. State whether in 1871 there was any interview or matter passing between you and Mr. Drawbaugh, that you specifically remember?

Ans. I remember having interviews with Mr. Daniel Drawbaugh some time after August of that year, in which I consulted him or asked his opinion on the merits of my spherical gears, on which I had obtained a patent that year. Those gears were peculiar, and I was in the habit of consulting different machinists. I remember Mr. Drawbaugh took some interest in the gears, but said they would wear pretty rapidly. I remember this, because I afterwards studied to overcome the friction, and was governed somewhat by his opinion.

Q. 36. Were the Reading hardware works celebrated for the fine quality of their small castings?

[*Objected to by Mr. Hill, as the witness is not shown to be in a position to know the general reputation of their work, and further, as immaterial and irrelevant.*]

Ans. I know personally that they were. I was through their works several times several years before. I was personally acquainted with William Harbster, of the firm of Harbster Bros., who showed me the wares they were making; also, their styles of japanning; also, various articles they were manufacturing, and I had learned by inquiry that hardware men considered their wares of first-class finish.

Q. 37. How did you come in contact with Dr. Moffitt, in 1868 and 1869, and was it Dr. J. W. Moffitt, the dentist, of Harrisburg?

[*Objected to by Mr. Hill as immaterial.*]

Ans. The individual referred to was Dr. J. W. Moffitt, the dentist, of Harrisburg. I first did some work for said Moffitt, in the fall of 1867, on a reservoir soldering iron, but I am impressed that Mr. Drawbaugh made a wooden pattern for casting the body of the iron. I am not positive. Then, in 1868, I took out a patent for Dr. Moffitt on sash locks, and was engaged by him in working the lock up as an article for the trade. Certain defects appearing, owing to difficulty in casting it, he induced me to re-model it or make a new lock, on which he was willing

*

to take out a patent, and did so the same year, in my name. Then, and for some time thereafter, I made different locks and hardware patterns for him on said lock, which was varied in sizes and styles: window-lock, a cupboard-lock, and common door-lock. I assigned said patent to Dr. Moffitt.

Q. 38. Was that 1868 patent taken out on an invention made by Dr. Moffitt, or on one that he bought?

[*Same objection.*]

Ans. The 1868 patent was taken out on the invention he bought from me for a few dollars. I sold it low, because I was in his employ.

Q. 39. Do you mean that you only took out one patent for him, and that that was on your own invention, or that you took out two for him?

[*Same objection.*]

Ans. I mean that I took out only one patent for Moffitt in person that year, but I did take out other patents in other years for him.

Q. 40. Did he already have a lock patent before you took out that one on your own invention?

[*Same objection.*]

Ans. Yes, sir.

Q. 41. Was that taken out on his own invention, or had he bought it?

[*Same objection.*]

Ans. It was taken out on his own invention in sash locks.

Q. 42. Did you before the end of 1877 take out any other patents for him?

[*Same objection.*]

Ans. Yes, sir.

Q. 43. What others?

[*Same objection.*]

Ans. I took out two patents for him on bra shoes for cars.

Q. 44. Were those on his own inventions, or on inventions which he purchased, and when were they taken out?

[*Same objection.*]

Ans. Those patents were both taken out on his own inventions; they were probably taken out in 1872 and 1873. I cannot answer that ques-

tion definitely, without referring to the Patent Office reports. I am impressed that it was in 1873.

Q. 45. Do you remember any particular occasion in 1872, when any special matters passed between you and Mr. Drawbaugh?

Ans. Yes, sir; I remember consulting him in 1872, in regard to a rotary steam engine, the invention of John Blankinhorn. I was at that time—about the month of June, 1872—employed by Mr. Blankinhorn to take out a patent on his oscillatory engine, if I should find it patentable. I was searching the Patent Office reports, when Mr. Drawbaugh came into my place of business. I was very glad he did so, and I stated the matter to him—that I had an examination to make—and stated the nature of it. I was unreserved in stating this matter, and departed from my general rule of secrecy in making applications for patents, because Mr. Blankinhorn had already constructed a life size engine, and had it in operation at the machine shop of the Canal Company, at the Pennsylvania canal, near State street, Harrisburg. Mr. Drawbaugh stated that he had experimented on an oscillatory steam engine several years before that, and he would take pleasure in seeing the engine. We next went up town together and visited the shop, and saw the engine, but it was not in operation that day. However, Mr. Blankinhorn took us into a wood-shop, where he had the patterns of the engine, which he showed us, and explained the principles of the construction of the engine. Mr. Drawbaugh remarked that he did not think it was new in its main features. Some parts, he said, were different from anything he had seen, but he thought, if he would look over the *Scientific American*, he could find an engine illustrated, which was very much like Mr. Blankinhorn's engine. That is all I can remember of that interview.

[*Answer objected to by Mr. Hill, as totally irrelevant and immaterial.*]

I ought to have stated that he promised to send me the cut, if he could find it.

Q. 46. Did he afterwards send you the cut; and if so, how did he send it?

[*Same objection.*]

Ans. Yes, sir; he sent me the cut, inclosed in a letter, soon after. It illustrated Runkle's oscillating engine, and had appeared in the *Scientific American* a few years before. I have the letter yet, but it appears that I returned him the cut sometime in 1873. I infer this from a note which I made on the envelope containing the letter.

Q. 47. Please produce that envelope and letter, and state whether they are in the handwriting of Drawbaugh, and read them, that they may be made a part of your answer.

[*Same objection.*]

Ans. This is Daniel Drawbaugh's handwriting. The letter reads as follows:

"EBERLY'S MILLS, PENNSYLVANIA, July 25, 1872.

MR. THO. WEEVER:

Dear Sir:

Enclosed find engraving of Runkel's oscillating piston Engine, which I promest to send you, and had intended sending along with this a drawing of a cylinder oscillating engine which I was working some years ago, but could not find. it is laying among some old papers, so that it would take some to look it up, but will look for it hereafter.

Yours, respectfully,

DANL. DRAWBAUGH."

The envelope is addressed as follows:

"Mr. Theophilus Weaver,
Harrisburg,
Pa."

Post-mark:

"Eberly's Mills,
July 25, Pa.,
72."

In pencil:

"Returned copy,
Jan. 1, 1873."

Q. 48. In whose handwriting is the penciled memorandum on it, and what does it mean?

[*Same objection.*]

Ans. The memorandum is in my handwriting. The word "copy," I think, means the cut referred to, illustrating Runkle's engine.

Q. 49. Did you see Mr. Drawbaugh at his shop, at Eberly's Mills, at any time in 1873?

Ans. Yes, sir; during that spring I was still working on hardware pattern-making for H. C. Demming, of Harrisburg. I had done a good deal of work for him the previous year or two, in working up the Reis-

inger sash-lock. Mr. Isaac Lloyd, of Harrisburg, had electro-plated a good many gross of said sash-locks. Mr. Lloyd and I had frequent interviews, and he sometimes talked about a magnetic clock that he had seen at Daniel Drawbaugh's shop. I had my curiosity excited, in this way, to visit Mr. Drawbaugh's shop some time that year, and I went over and saw him and his clock.

Q. 50. Tell me what you saw at that shop, at that time?

Ans. I saw the magnetic clock, mounted on a board, which was placed against a partition, in a little room in the northeast corner of the shop now occupied by Chellis and Drawbaugh. The clock had no face on. The works were naked, and all exposed to view. It was, or claimed to be, worked by magnets—one a permanent magnet, and the other an electro-magnet. Two wires led from the clock, and were said to communicate with plates in the ground. Down stairs, I believe, I saw his nail machine, having specimens of nails on it or near it, which Mr. Drawbaugh said had been cut on the machine. There were other machines in that room down stairs. I don't recollect that my attention was particularly directed to them, as they were idle and out of use at that time. That is all that I can recollect, I believe.

Q. 51. Did Mr. Drawbaugh take you down stairs to see the nail machine, or how did you happen to go to see it?

Ans. He did; he took me down; he showed me all that I have mentioned.

Q. 52. If you remember any specific and particular occasion when he came to your office in 1874, please state what it was?

Ans. In 1874 I was experimenting on car-couplers, and I believe it was that year—I am almost positive, in August, 1874—that Mr. Drawbaugh and Wilson Bear called at my office, and, among other things, we talked car-coupler. I showed him and Bear my devices, and in the conversation, Mr. Drawbaugh remarked, that he had experimented on couplers, too, at one time. He said he had invented a coupler in which he employed a ball on which to support the coupling-pin, and the entering link would displace the ball, and leave the pin drop through the link. I remarked, that that was not a new device; it was very old, but a very good one, and I got down the Patent Office report of 1855 and showed him an illustration of England's coupler, which showed precisely that kind of a coupler. Mr. Drawbaugh examined it, but didn't manifest very much surprise over it—didn't appear to be concerned in that way.

[*Answer objected to by Mr. Hill, as immaterial and irrelevant.*]

Q. 53. If you had any business in 1875 which brought you in contact with Mr. Drawbaugh, will you please state what it was?

Ans. In 1875 I was employed as counsel in an interference case on Jacob Kline's patent, more particularly on Kline's patents on harvester crank-pin, which I had re issued, as attorney of record, that spring. After the re-issue of said patent, the Domestic Sewing Machine Company sought to re-issue, with broad claim, a sewing-machine journal of one Wild, of Baltimore, Md. I frequently met Mr. Drawbaugh, pending that suit of interference, and while taking out other patents for Jacob Kline. The Kline Axle Company was then doing business at Eberly's Mills, at Drawbaugh's shop. I was there at that shop when Drawbaugh was at work getting up special tools for manufacturing the axles and sewing-machine journals under the Kline patents. I saw Mr. Drawbaugh sometimes at M. M. Grove's office on Walnut street, Harrisburg, who was the manager of the company at that time. I think it was at Grove's office that I saw him when he first made a reaming tool for reaming out the eye of the balance-wheels of sewing machines.

During the taking of the testimony in the interference suit, Kline *vs.* Domestic Sewing Machine Company, sewing-machine journal, Mr. Drawbaugh was one of the witnesses. He had prepared for Mr. Kline certain sealed drawings on sewing-machine journals and pitman attachments, to represent certain models.

[*Answer objected to by Mr. Hill, as immaterial and irrelevant.*]

Adjourned until 10, A. M., July 17, 1882.

MONDAY, July 17, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Theophilus Weaver, by Mr. Storrow, continued.

Q. 54. Can you give me the dates of the Kline patents?

Ans. Yes, sir; I find, by reference to the official reports, they are as follows: Harvester-crank and pin, March 22d, 1870, No. 101,134; harvester, May 10th, 1870, No. 102,835; harvester-crank and pin, No. 101,134, re-issued June 15th, 1875, as No. ————; carriage axle,

April 6th, 1875, No. 161,518; sewing-machine journal, June 6th, 1876, No. 178,303.

Q. 55. Did you take out all those patents, and were they the patents under which the axle company worked?

Ans. I took out all those patents. The company worked on all those patents, except the one named "Harvester," May 10, 1870, and the last-named patent.

Q. 56. Have you looked up the dates of the patents you took out for Dr. Moffitt. If so, please state them?

Ans. Yes, sir; I also examined the official reports, and find the record as follows:

Sash-lock, Feb. 16, 1869, No. 86,936.

Brake-shoe, May 6, 1873, No. 138,514.

Construction of car-brakes, Feb. 24, 1874, No. 147,856.

Q. 57. You spoke of some work you did in connection with car-couplers. If you have any memorandum by which you fix that date, please state what it is.

Ans. In looking over old bills filed away, I find one dated July 18, 1874, of work done for me by W. O. Hickok. The item in the bill is "hinged irons." I know that work was done for me, on the car-coupler referred to.

Q. 58. If you have any official letter from the Patent Office, which names the date of your application on car-couplings, please produce it, and state what that date is.

Ans. I have an official letter, which states that my application on car-coupling referred to was filed August 25, 1874.

Q. 59. Please state whether, in 1876, you had any particular occasion to go to Mr. Drawbaugh's shop, and if so, when was it, and for what purpose?

Ans. Yes, sir; I went to Mr. Drawbaugh's shop about the beginning of March, 1876, with members of the Kline Axle Co., to take an inventory of their machinery and stock on hand, with a view to run the work myself, under a lease from them, and to manufacture their axles and sewing-machine journals on a royalty.

Q. 60. Did you go there more than once with reference to taking that inventory, about that time?

Ans. Yes, sir; I went there first to make a rough estimate, and then spent about two days afterwards in making a true inventory, writing down everything in an itemized statement.

Q. 61. If you have that inventory you will please produce it, and state what date it bears.

Ans. I have it here. It is dated March 2d, 1876. This, I think, was a copy of the inventory taken on the first and second days of March, 1876, in pencil-writing, and I copied it in the evening of the second of March, 1876, and the following day.

Q. 62. Is this all in your handwriting?

Ans. It is.

Q. 63. I notice that there is annexed to it a paper, in pencil, dated "Harrisburg, Feb. 29, 1876," and headed "Inventory of goods at M. M. Grove's." What was that?

Ans. That part of the inventory was taken on the day stated, before we went over to the Axle Company's works. The company had some goods and a few tools at M. M. Grove's office, who was the acting manager of the company.

Q. 64. Did you carry out the expected arrangement with the company for which that inventory was taken, or did the negotiations fall through?

Ans. The negotiations fell through, and the work was not carried on by me.

Q. 65. On either of those visits about the inventory, did you go out from Harrisburg alone to Mr. Drawbaugh's shop, and arrive there before the members of the company?

Ans. On the first morning; that is, of the day on which we took the rough estimate, I am impressed I went over on the train to White Hill station, and went from there alone to the company's workshop. When I arrived there, I found only Wilson Bear of the company on hand, the other members not having arrived yet.

Q. 66. Did you wait long for the other members, and what did you do while waiting?

Ans. It was quite awhile before Captain Moore and Mr. Grove arrived. Meanwhile, we found Mr. Daniel Drawbaugh in a room upstairs, and went into his place where he was working, or about beginning work, on brass work lying on his bench, which he stated he had got cast at Hickok's, at Harrisburg, for some party whose name I do not now recollect, remembering only that Mr. Drawbaugh explained to us a certain difficulty which had before existed in casting a large bulb on that work, in which a core had to be suspended in a peculiar manner. Mr. Drawbaugh left his work, and waited on us, showing us various articles of

interest which he had constructed and invented. I remember his showing us an electric fire-alarm. Having placed certain parts near the stove, and shown us that when certain wooden parts became heated by the stove, which was then hot, a bell would be caused to ring automatically by the apparatus. He also showed us what he termed a "dial telegraph," an instrument which he had in an upper part of a cupboard or closet, in the north-east corner of the room. He explained its operations. This did not appear to me the first time that I had seen it, yet in giving my testimony the other day, stating that I had been in his place in 1875, I cannot clearly re-call that I really was in his place in 1875. I also remember that when I was in the work in 1875, if I was there, Mr. Herman K. Drawbaugh was at work on axles. My impression is I must have seen the dial telegraph in 1875. Mr. Drawbaugh also took us into the adjoining small room, and showed us his magnetic clock. This, too, had not that novelty which it had when I saw it on a former occasion, but was still in operation, and apparently in good condition. I remember quite well that Mr. Drawbaugh spoke favorably of it as a time keeper; that it had run for a long time without gaining or losing much, but had varied somewhat. I think he also spoke of making certain improvements on it, by which he could regulate the variations. I remember nothing further of his novelties, except a needle for sewing carpet rags, by which the ends of rags could be joined without needle and thread. I recollect, however, he was building a new lathe for himself at that time, and had it almost completed. He stated he was about going to do business in Mechanicsburg, and was fitting up tools to do model work there and work of that class. I think I remember also seeing a small tool or machine for stamping tin plates for some purpose or other, which he had constructed. That is all I can remember of his things.

Q. 67. It has been testified, I believe, that a considerable part of the machinery of the axle company was upstairs in the second story, on the floor where the little room and clock were. During the days while you were there about the inventory, did you confine yourself to that floor, or did you go all over the shop?

Ans. We went through the two little rooms already mentioned, and through the main room; that is, all over the upper story, and went over the large room next below that. I do not remember any other place, except the smith-shop, and what objects were outside of the building. It is possible we looked into a kind of basement or cellar where the

wheel is; I think we examined the source of power—the machinery that creates the power in the work—the water wheel.

Q. 68. During those visits about the inventory, did he show or explain to you or talk to you about his devices at any other time than the morning you have just mentioned?

Ans. No, sir; not during the inventory.

Q. 69. During this interview which you have described, did you or did you not understand that he showed and explained to you all the principal contrivances he had devised, which he was in the habit of showing to people?

[*Objected to by Mr. Hill, as leading, calling for a mere opinion, and incompetent.*]

Ans. The impression made then on my mind was, that he had shown us all his improvements of interest at the shop.

Q. 70. In your fiftieth answer you testified, that at your visit in 1873, there were other machines in the room down stairs, which were idle and out of use at that time, and to which your attention was not then particularly directed; did you, during the inventory visits, recognize those machines and ascertain what they were?

Ans. Yes, sir; this reminds me that Mr. Drawbaugh also explained to us, on that first day of the inventory, a certain drilling-machine by which about six holes were made by one operation, which had been used in the manufacture of his rotary faucets; he stated that he had built it for the faucet company, and that it was of his design. He also, in a few words, explained the use of a few other machines that were standing idle on that floor, which had been used by that company and the pump company.

Q. 71. Do you remember any particular interview with Mr. Drawbaugh in 1877?

Ans. I cannot fix the date exactly; it was either in the latter part of 1876, or in the middle of 1877, that Mr. Drawbaugh was at my place when he was experimenting on hygrometers; he was then about to manufacture certain hygrometers, in which, he explained, he was going to use the glass of wood as the actuating part of the instrument, by which the indicator-hand would be operated. After he used the word "glass of wood," I asked him to explain what he meant by it; he showed me at some wood which we had on hand, that a part of the annual growth, or rings in the wood, were more compact or harder than other parts; that

he wanted to use the more compact parts. Once, also, in 1877, I went with him to see Mr. Jacob Reichard, who lives on Race street, Harrisburg, Pa.; he and Mr. Reichard had a conversation in my presence on the taper-bit or auger, a cutting tool for making the taper holes in spigots. Mr. Drawbaugh wanted fifteen dollars to make the tool, and Mr. Reichard declined to pay that much for it; Mr. Drawbaugh said he could not make a good tool for less than that. I am not positive that this was in 1877, as I have no fixed data, but it was not far from that time.

Q. 72. You have described certain particular interviews between you and Mr. Drawbaugh in every year from 1867 to 1876 or 1877 inclusive. I now wish to ask you whether those are or are not all the interviews that took place between you during those ten years?

Ans. They are not all the interviews between me and Drawbaugh during that time.

Q. 73. At the various meetings between you and him during those ten years, as you would meet from time to time on the occasions you have specifically named, and on other occasions, was your talk merely a social conversation, or were there any particular class or character of subjects that you and he were in the habit of talking on; and if the latter, state what?

Ans. At our interviews we usually exchanged greeting as friends, and talked of each other's interests in a general way, but our conversation mainly related to our inventions, and sometimes we referred to the inventions of others.

Q. 74. During all those years, and down to the end of 1877, had you ever seen any electric speaking telephone made, or purporting to be made, by Daniel Drawbaugh?

Ans. I had not.

Q. 75. During all those years, had Daniel Drawbaugh ever told you that he had made an electric speaking telephone?

Ans. He had not.

Q. 76. Do you remember whether during the Centennial year, 1876, you had read in the newspapers of the existence of Mr. Bell's electric speaking telephone?

[*Objected to by Mr. Hill as irrelevant and immaterial.*]

Ans. I think it was by reading the newspapers I had become aware of that fact.

Q. 77. There have been put in evidence a number of articles from

the Harrisburg newspapers relating to the electric speaking telephone of Mr. Bell, the first of which, I believe, is in the *Harrisburg Independent* of February 26, 1877, containing a long account of a lecture and exhibition by Mr. Bell, at Cambridge, Mass., and of the transmission by telephone, of a newspaper dispatch from Salem to Boston. Do you remember reading that article, or articles of that character, in the Harrisburg newspapers at that time, or about that time?

Ans. Yes, sir; but I cannot remember distinctly of reading the article in the *Independent* first mentioned, but I do remember discussing the contents of that article about that time. I can almost definitely state that I first discussed it at George Winters' place, on Second street, at that time.

Q. 78. If at any time before you had heard of the existence of Mr. Bell's electric speaking telephone, Mr. Drawbaugh had brought you, or shown you, at his shop, a practically operative electric speaking telephone apparatus, and told you that he wanted to patent it, but hadn't then the means to pay the Government fees and solicitor's fees, and had asked you to take out the patent on his credit, or on the credit of the invention, would you or would you not have done so?

[*Objected to by Mr. Hill as leading, hypothetical, calling for mere opinion, and incompetent.*]

Ans. From my habit in taking an interest in inventions, I certainly would have made an application for a patent, or caused it to be made, for Mr. Drawbaugh at that time, under the circumstances.

[Recess for dinner, until 2, P. M.]

JULY 17, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Theophilus Weaver, by Mr. Storrow, continued:

Q. 79. You and the axle company had it in contemplation that you would take up and carry on the business of manufacturing axles at Mr. Drawbaugh's shop, the negotiations for which, however, fell through in March, 1876. If at that time Mr. Drawbaugh had produced to you a practically operative and successful electric speaking telephone, and asked

you to take out a patent on it, and to aid him in manufacturing them, would you or would you not have done so?

[*Same objections.*]

Ans. I believe I would have done so.

Q. 80. You know what your relations with him were during the years you have testified about, and how freely he and you conferred with each other. I wish to know whether your relations were or were not such that he could have had practically operative and successful electric speaking telephones during a considerable portion of those years, made by him before they were heard of elsewhere, and which he was disposed to show to his friends generally, without showing them or mentioning them to you?

[*Same objection.*]

Ans. Under the circumstances, to believe that such was the case, is such a strain, in the situation of men and things, that it is incredible, if not impossible, to believe that he had such an invention reduced to practice, and shown it to so many others, and not have shown it or mentioned it to me.

Q. 81. It appears from the file-wrappers put in evidence, and printed in the defendant's volume of exhibits, pages , that Mr. Drawbaugh's nail-feeder, faucet, and pump patents, were taken out in 1865 and 1866, and that the next patents that he applied for, or that were applied for on his behalf, were those relating to the clock, and earth-batteries for the same. Did he come to you to take out those clock patents?

Ans. Yes, sir; I made application for him on his magnetic clock, which application, according to the rulings of the examiner in charge, was divided, and a separate application was made for earth-batteries relating to magnetic clocks, etc.

Q. 82. I see by the certified copies that the two Grissingers and Shettel were joint owners with him in the clock and battery. Had you personally known those three gentlemen before Mr. Drawbaugh brought them to you?

Ans. No, sir.

Q. 83. Among the Patent Office certified copies, is a letter printed in defendant's book of exhibits, page , signed by you, filing the application in the battery, and stating that "this application is supplemental to application by some party on magnetic clock, filed May 27, 1878." I suppose you saw him a number of times at your office while preparing

the application on the clock, which appears from this paper to have been filed May 27, 1878, did you?

Ans. Yes, sir.

Q. 84. It appears from these certified copies of file-wrappers, that applications were filed for him on improvements in rotary-measuring faucets January 14, 1879, and an improvement in water-motors or water-wheels, July 2, 1879. Did you prepare and file those applications?

Ans. Yes, sir. I was attorney for Mr. Drawbaugh in those cases, in making those applications, but had some assistance in reproducing the drawings.

Q. 85. Who first came to you with reference to those applications. Mr. Drawbaugh or the other parties interested?

Ans. I understood Mr. Drawbaugh recommended me to those parties, and brought them to my place.

[*Answer objected to by Mr. Hill, so far as it undertakes to assume that Mr. Drawbaugh recommended the witness to said parties, as mere hearsay.*]

(Witness continues.) Mr. Drawbaugh first came to me, and spoke to me, that he desired that I should take out his application after this on patents, using the expression: "You can word the specifications better than I can."

Q. 86. Going back now to the time when you went to work on the clock application, about May, 1878, had you noticed any recent mention in the Harrisburg papers of the growth of the use of speaking telephones, and of their introduction into use in Harrisburg? I refer more particularly to those articles put in evidence by Miss Weaver's deposition, and to be printed among complainant's exhibits.

Ans. I had noticed at different times during that period, such articles appearing in the local papers.

Q. 87. When did you first read in any paper, or hear that Mr. Drawbaugh had constructed any electric speaking telephone?

Ans. I don't know that I had heard or read of his having constructed such prior to his making application on the magnetic clock; but that he was getting up a telephone. I supposing when I saw that notice in the paper that he was getting up some variation on the Bell telephone. I can't give the exact date, but think it was some time in 1878.

[*Statement referred to objected to by Mr. Hill as hearsay, and the supposition of the witness objected to as incompetent.*]

Q. 88. You may look at a paragraph from the *Harrisburg Telegraph*

of April 18, 1878, put in evidence by Miss Weaver's deposition, and which is as follows:

[From Harrisburg Telegraph, April 18, 1878.]

"Daniel Drawbaugh, of Eberly's Mills, the mention of whose wonderful clock was first made in the columns of the *Telegraph* some time ago, is now engaged in the construction of a new telephone. If it is as great a success as the clock, Mr. Drawbaugh can be congratulated."

And state whether that is the newspaper mention you have just referred to?

Ans. Yes, sir.

Q. 89. If there was any conversation between you and Mr. Drawbaugh on the subject of electric speaking telephones and phonographs during the two months before May 27, 1878, will you please state what it was?

Ans. I don't recollect of having had any conversation in that period with him.

Q. 90. If at any time while he was at your office, say in the first half of 1878, with relation to the clock application, you had any conversation with him regarding electric speaking telephones or phonographs, will you state what it was?

Ans. I would like to first correct my first answer by stating, that when I spoke about a certain period, I meant the period that intervened between the time that Mr. Drawbaugh came to me to make the clock application and the time referred to in the newspaper extract quoted, and in answer to the question ninety, I state that I had not.

[*Mr. Storrow requested that the questions eighty-nine and ninety be read to the witness, suggesting that it was impossible that both answers should be correct; the questions and answers were thereupon read to the witness by the examiner, and witness says:*]

My answer to question ninety is: I had; during several weeks which elapsed while I was preparing the application for patent on Drawbaugh's magnetic clock, Drawbaugh sometimes came in to see me, and have conversations on the composition of the specification, and the setting forth of all the principles of his invention, the specification being necessarily a lengthy one, occupying about twenty pages of legal-cap paper, and the application being somewhat complicated, owing to several inventions being embraced in one application. Right at the beginning, in preparing the application, I stated that I believed we would have to divide the case and make several applications; some one's of the parties preferred that I should make one application; then I stated that I would draw up the

application in such a manner that I could divide the application afterward, if required, and did so. Mr. Drawbaugh was, at that time, exhibiting his electric clock on Market street, Harrisburg, and he would sometimes come in while I was at work on his case. In one of those private interviews, then, he alone being present with me, he stated he, too, had experimented on the electric telephone years ago, and before Bell came out with his invention, and that he had some results, but that they were not of such a satisfactory nature as to go ahead at the time with his experiments; that he had given up his experiments for the time being, and now it was too late for him to hope to have any standing as the inventor of the electric telephone; but that he had some results, and that he had experimented considerably; and had also experimented on the phonograph before Edison came out; and since Edison came out, he had experimented further, using not only thin membranes as part of the means or as the diaphragm of the apparatus, but that he had also used pretty thick plates, and found that they answered as well, if not better, than thin diaphragms.

Q. 91. Did he say anything about connecting the clock with a phonograph or telephone, or acoustic instrument?

Ans. Yes, sir; he did. I believe that was mainly his object in opening the conversation. He stated he had not yet constructed the apparatus, but he was about to construct it. The device, he said, was intended to increase the compass, or loudness of the sound, and it was to be used in connection with either the phonograph or the telephone, and to be an attachment not only for his magnetic clock, but for clocks of other kinds than magnetic. The purpose of the device was to be, to cause the clock to announce the hours vocally, instead of striking the hours as in the usual manner. He, at that time, used a piece of the paper which I had lying on my table, on which I had sketched a part of the specification on one side. And he made a sketch in pencil, which he said would give me an idea of the device referred to. He said it was to operate on the principle of a vibratory long-arm lever, which, by having a vibratory touch given it some distance in from the end of the long-arm, would enhance the vibration of the end of the long-arm. He spoke to me on this wise, that he thought it was still patentable, and meant to make application on it for a patent. But that he did not feel inclined to let the Grissinger's, or party who were partners in the clock, have a footing in that invention, unless they would come out fair and

square on the clock first. He stated he had experimented somewhat on the device in question, and believed he had good results.

Q. 92. Will you please produce the sketch referred to in your answer, as made by Mr. Drawbaugh on that occasion?

Ans. This is the sketch. (Witness produces sketch, which is put in evidence, and marked "Complainant's Exhibit, Drawbaugh-Weaver Sketch of 1878.")

Q. 93. Did the statements and assertions he then made to you make a distinct impression on your mind at that time as to whether Mr. Drawbaugh had, or had not, made a practically operative speaking telephone apparatus before Mr. Bell's invention was published? And if so, what was the impression it made on you in that respect?

[*Objected to by Mr. Hill as immaterial and incompetent.*]

Ans. I can't say that it made any decided impression, except so far as it prompted me to make further inquiries how far he had gone in his experiments at that earlier time.

Q. 94. Did you make further inquiries of him on that topic at that same interview?

Ans. Yes, sir; I did.

Q. 95. And what was the result on your mind, at the time of such inquiries, from the statements he made in response to them?

[*Objected to by Mr. Hill as immaterial and incompetent.*]

Ans. I regarded his case as almost hopeless, if not altogether, even as a successful experimenter, as he gave me to understand he had nothing to show how far he had gone in his earlier experiments. What he had used before was detached, and could not be gathered together; besides he did not appear to have reduced it to practical form. I then dismissed the subject from my mind, and I don't think we ever afterwards approached the subject when we came together; at least not in an earnest way, or with a view to taking out a patent, or doing anything at all in the matter.

Q. 96. If his statements had been such as to convey to your mind or leave upon your mind, the impression that he had gone far enough, according to his own statements even, to be entitled to claim to be the first inventor of the speaking telephone, would you, or would you not, have followed up the matter with a view to taking out a patent, o doing something about it?

*

[*Objected to by Mr. Hill as leading, hypothetical, calling for opinion, and incompetent.*]

Ans. I believe I would have followed up the matter without delay, and would have taken proper steps at least to make an application for a patent on the invention. I came to this conclusion because I have taken an interest in other's patents before this, even at the risk of having an interference suit through it, when the case seemed to be a clear one.

Q. 97. It has appeared in this case that when Mr. Drawbaugh devised his improvement in nail-feeders, Mr. Eberly and Mr. Lee paid the expenses of experimenting, taking out the patent and getting up the first machine, and that when he first devised a rotary faucet, Croll, or Croll & Gardner, paid the expenses of experimenting, taking out the patent, and constructing the first faucets, taking, of course, an interest in the patent for doing so. Did you have a general knowledge of that part of his history?

Ans. Yes, sir; it came to me partly as a disclosure, in taking testimony before this.

Q. 98. Miss S. R. Weaver and her sister, who testified in this case, are they any relatives of yours?

Ans. Not to my knowledge.

Q. 99. Mr. Jacob S. Shopp has testified, on page 408 of the defendant's printed record, that you went to his house at a time when he was asked to give his affidavit. Did he or did he not understand that that affidavit was not to be used in Mr. Drawbaugh's favor, and might be used against him?

Ans. He was so informed at that time, that it might be used against Mr. Drawbaugh, and he remarked that it was a matter of indifference, because the facts were the same any way.

Adjourned until July 18, 1882, at 10, A. M.

JULY 18, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Theophilus Weaver, by Mr. Storrow, continued:

Q. 100. In your thirty-seventh answer you referred to an invention which you made for Dr. Moffitt while working up his lock, and which you afterwards assigned to him. If you have since examined the official records, and ascertained the date of that patent, please state what it is?

Ans. I have examined the office report, and have made the following no e regarding it: "Combined latch and lock, Oct. 26, 1869, No. 96,175, assigned to J. W. Moffitt."

Q. 101. How much have you been at Mr. Drawbaugh's shop since the spring of 1878?

Ans. I don't recollect that I was there at all since that time.

Q. 102. I suppose you needed to see the clock, or its works at least, while you were preparing that specification. Where did you see the works to make the drawings from?

Ans. The model in that application was a life-size clock, minus the case, and, I believe, showed all the co-acting parts. Moreover, I had seen his full-sized clocks in operation at the exhibition then being held on Market street, Harrisburg, near Adams' express office.

Q. 103 What had been your usual charge for taking out a patent up to that time?

Ans. The usual charge in taking out a patent, in ordinary cases, was twenty dollars, attorney fee, and the Government fees amount to thirty-five dollars.

Q. 104. Is that a usual rate of charge among patent solicitors. Are there many who take out patents at that rate?

[*Objected to by Mr. Hill, unless the foundation of the witness' knowledge on the subject is first shown.*]

Ans. It is the usual fee charged by some firms of patent attorneys, as that of Evans & Co., and of A. C. Snow & Co., both of Washington, D. C., as per advertisements in the local papers, but I find through practice in doing business for my clients, that such firms charge extra for drawing; sometimes at the rate of five dollars a sheet.

Cross-examined by Mr. Hill:

Cross-Q. 105. You are an attorney-at-law, are you not?

Ans. No, sir.

Cross-Q. 106. In your fifty-third answer, you stated that in 1875 you were employed as "counsel" in an interference case on Jacob Kline's patents. Did you use that word "counsel" in a Pickwickian sense?"

Ans. The word "Pickwickian" is so vague, that I know not how to answer it.

Cross-Q. 107. Were you in the habit of assuming to act as counsel in contested legal proceedings, for other parties than yourself?

[*Question objected to by Mr. Storrow, as ambiguous, because it does not appear whether it relates to contests in the Patent Office, or contests in the courts.*]

Ans. I have been employed several times in contested cases in the United States Patent Office, for other parties. In 1874, as attorney of record in several cases, or patents, of Alexander Morrison, superintendent of the Chesapeake Nail Works at this place. I acted as counsel both in the taking of his testimony at this place, and in cross-questioning at the taking of John Coyne's testimony, at Pittsburgh, Penna. And I was also admitted to argue that case in the Patent Office. I have since been acting in like capacity in several other interference cases.

Cross-Q. 108. Designate all the contested cases in which you have ever acted as counsel, and state the times?

Ans. I believe the first occasion in which I acted partly as counsel, was in an interference on switches for railroads, under the patent of William P. Patton, of this place, whose application was filed in 1866. Of which invention I became one-third owner, by purchase, at the beginning of the interference, and afterwards I became two-thirds owner, by purchase. In that case I first acted in the taking of testimony *per se.* Afterwards we employed Mr. Mason, of the firm of Holloway, Mason & Co., Washington, D. C. In 1875, as attorney of record in the Kline patents, I acted as counsel in an interference between Kline's patents on harvester-crank and pin, which had been re-issued shortly before, and one Wild's patent, of Baltimore, whose patent had been purchased by the Domestic Sewing Machine Company, and was then sought to be re-issued. I was only of counsel in that case. In 1879, I was likewise only associate counsel in an interference case between the applications for patent of Daniel Drawbaugh, the defendant in this legal proceeding, and that of David A. Hauck, of Mechanicsburg, Penna.,

whose inventions on rotary measuring faucets were put in interference by the rulings of the Patent Office. Those are all the cases.

Cross-Q. 109. In the contest between Morrison and Coyne, was there one interference or more than one?

Ans. Only one of his patents had been involved in interference, and there was afterwards a second interference between the same parties on another of Morrison's patents on nail separators. But on Coyne's side, if I mistake not, two patents were involved. I am not sure, just now, of the latter. In giving my answer above as to the number of interferences I had been engaged in, I considered it as but one contest between said parties, as Morrison did not act on the defensive in the second interference.

Cross-Q. 110. What is the name of the party who contested Patton's right to the invention in 1866?

Ans. Luther M. Simon, of Harrisburg, Penna.

Cross-Q. 111. Then the four interferences, Patton *vs.* Simon, Morrison *vs.* Coyne, Kline *vs.* Wild, and Drawbaugh *vs.* Hauck, are all in which you ever officiated as counsel, were they?

Ans. To the best of my knowledge.

Cross-Q. 112. How many of those cases, and which, did the client whom you represented win?

Ans. The first and last named won, and the other two lost.

Cross-Q. 113. In the last named, Hauck *vs.* Drawbaugh, did you take the testimony?

[*Objected to by Mr. Storrow, because the record thereof is already in evidence, introduced by the complainants, and is the best evidence of the fact.*]

Ans. I prepared the preliminary statement, and was alone, at the start, in the case; but when the testimony was taken, M. W. Jacobs, Esq., of Harrisburg, Penna., was called in, and I cheerfully assented that he should put the questions; but I was by at the taking of testimony, and was consulted in most instances.

Cross-Q. 114. Did you argue that interference at the Patent Office?

Ans. I did not; I had the pleasure of introducing the parties whom I first represented in the case to my present questioner, Lysander Hill, Esq., who, I believe, conducted the case to a successful issue, along with M. W. Jacobs, Esq., who is still retained.

Cross-Q. 115. Did you withdraw from the case before it came to argument?

Ans. I did; by my own request.

Cross-Q. 116. Did you have any hard feeling against your clients, Mr. Drawbaugh and the then owners of his invention of a rotary measuring-faucet, at the time of your withdrawal from their case?

Ans. I cannot say that I ever had hard feelings against Mr. Drawbaugh personally, nor against J. W. Moffitt, one of the owners, nor particularly against E. W. Chellis, the other owner; only in general against the latter, and then only as regards the manner of conducting that case, and the dilatory, and as I considered, improper conduct in prosecuting the magnetic clock case.

Cross-Q. 117. After you withdrew from the case, and before it came to final argument, did you have any conferences with Mr. Hauck, Drawbaugh's opponent, or his attorney, Joseph Ritner, Esq., with reference to said case?

Ans. As regards the last named, I don't recollect any conferences, only as I chanced to meet him on the street once or twice, in which I cannot recollect that any important questions were raised on the subject. In regard to David A. Hauck; he did call at my place two or three times, and there was some talk between him and me about minor details of the testimony, or rather, on the surroundings of the case.

Cross-Q. 118. As the result of these conferences between Mr. Hauck and yourself, did Mr. Hauck propose to get the taking of the testimony in the case re-opened, and to call you as a witness in his behalf?

Ans. Such was the result. I cannot say that it was of the conferences with me, but he felt so disposed, I know; and I finally firmly refused to do anything in the matter, for particular reasons, telling him honestly what I thought of his situation.

Cross-Q. 119. Are not these facts, to wit: that at first you agreed with Mr. Hauck to testify in his behalf if he could get the case re-opened; that the testimony you were to give related to confidential communications between Mr. Drawbaugh and yourself in the course of your employment in the case; that after receiving your assurances, Mr. Hauck went to Washington to get the case re-opened; that while Mr. Hauck was so in Washington you met Mr. E. W. Chellis and Mr. M. W. Jacobs at Mr. Chellis' store, in this city, and then and there Mr. Jacobs, having learned of the facts which I have stated, threatened you that if you carried out the plan he would institute proceedings to have your name stricken from the roll of persons authorized to practice in the Patent Office, and would have an action for damages brought against you, and

that you thereupon went from the store to the telegraph office and telegraphed Mr. Hauck, at Washington, a dispatch, which you showed to Mr. Jacobs at the time, and the substance of which was that you had reconsidered the matter and would not testify in his behalf? And if those are not the facts, state which one is not, and give your own version of the matter.

Ans. Part of this tissue of questions is fact and part is falsehood. The threat is a fact; the telegram is not as sent. It simply read: "I will not appear for you." The communication referred to was not on matters confidentially stated to me after I became attorney in that case. The matter related to what I learned from Mr. Drawbaugh prior to his filing his application in that case. It is not a fact that I changed my mind after said interview with E. W. Chellis and M. W. Jacobs, Esq., but I had firmly decided not to appear for Hauck before I went to see them in the interview referred to; and, in consequence of that determination, I believe I went to see them, and had that conference, or something of that nature. It is a fact that I did not fully understand the responsible and almost sacred nature of the relation that an attorney stands in to his client until I was then sharply reproved by my friend Mr. Jacobs, and for which I gave him thanks at the time; for in the whole proceeding my sole object was to do right in the matter. It is not a fact, I believe, that Mr. Hauck went to Washington solely on account of said interview with me, or on account of what I may have disclosed, because I remember he was solicitous to consult his attorney, James L. Norris, Esq., of Washington, D. C., on other matters, as his case was then in limbo. I recollect he said he was going to Washington at any rate, for consulting Mr. Norris, and said that he would leave home in the next morning train.

Cross-Q. 120. You say you did not receive the communication from Mr. Drawbaugh after you were employed in the case, but prior to filing his application; did you receive that communication from Mr. Drawbaugh at your office in Harrisburg?

Ans. I am impressed it was at my office, some time before he had made his model, and of which I do not know that he ever did make a model.

Cross-Q. 121. At that interview at your office, was he consulting you with reference to the preparing and filing of his application?

Ans. I do not know that he ever made an application on that.

Cross-Q. 122. Was he consulting you with reference to the preparing and filing of an application, whether it was ever made or not?

Ans. Not at that interview.

Cross Q. 123. When was that interview?

Ans. I do not know that he ever consulted me to make an application, because the invention I considered unmade, in a certain sense; but the interview was in the fall of 1878, and this is partly the reason why I felt that I might be taking wrong steps, as I before intimated, in answer to a long question, because I was then acting as attorney for Mr. Drawbaugh in the clock case, at that time, although I had ceased to be attorney on the faucet when the interview between Houck and me occurred.

Cross-Q. 124. Was said interview between you and Mr. Drawbaugh in November or December, 1878?

Ans. About that time.

Cross-Q. 125. Did you withdraw your appearance as attorney for Drawbaugh in the clock case and in the faucet case at the same time, or about the same time?

Ans. I believe I withdrew from the faucet case first, and from the clock case some months afterwards; I can't tell exactly how long afterwards.

[Recess for dinner, until 2, P. M.]

JULY 18, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 126. The faucet about which Mr. Drawbaugh made the communication, which you proposed to testify to in favor of Mr. Hauck if the interference testimony should be re-opened, was the same faucet about which the interference was instituted between Drawbaugh and Hauck; was it not?

Ans. The first part of the question states that I proposed, or volunteered, to offer testimony to Hauck, which is not the fact. Mr. Hauck had obtained a clue that I had certain information, and came to me and entreated me to give him the benefit of that information. At the first interview I did not give it. If it is now insisted that I shall answer that question fully, I cannot do so without casting reflections on Mr. Drawbaugh in a manner which I forbear to do, until I hear further.

Cross-Q. 127. Have you conferred with complainants counsel about the matter during the recess for lunch? I mean this faucet matter that I have been cross-examining about?

Ans. I have not; said counsel informed me that he would mention nothing whatever on matters relating to the cross-examination.

Cross-Q. 128. Now, what I want to know, is this: Did that communication from Drawbaugh to you refer to the faucet invention, which was subsequently in interference between Drawbaugh and Hauck? This question you can answer by yes or no, without reflecting on any body.

Ans. Yes, sir; it had a decided bearing on the validity of Drawbaugh's claim to that invention.

Cross-Q. 129. How came Hauck to know that you had the information?

Ans. I cannot say, certainly. But I can see how it may have occurred.

Cross-Q. 130. Had you disclosed the fact to Joseph Ritner, Hauck's counsel?

Ans. I did not disclose any particular fact, but I did taunt Mr. Ritner, at a time when I met him on the street, after he had lost the case, at one or two hearings.

Cross-Q. 131. At what stage of the faucet proceedings did you withdraw your appearance in the Patent Office?

Ans. I cannot give the exact date, but it was not long after my questioner was employed in the case, and certainly before I met the parties referred to, to the best of my recollection.

Cross-Q. 132. Then it was soon after the closing of the testimony, and prior to the hearing before the examiner of interferences, was it not?

Ans. This reminds me that it was after the hearing before the examiner of interferences, for particular reasons which I prefer not to state.

Cross-Q. 133. It was before the hearing on appeal before the examiner in chief, was it not?

Ans I am not positive. It may have been after the hearing before the examiner in chief.

Cross-Q. 134. How long was your interview with Hauck after you withdrew from the case?

Ans. I do not know which interview is referred to.

Cross-Q. 135. I mean the interview at which you promised Hauck to testify for him, if the case should be re-opened.

Ans. I cannot say that I definitely promised Mr. Hauck to testify for him at any interview, but told him I would hold it under consideration. When that interview was, I cannot definitely state. Mr. Hauck was pressing me to give the information, but I hesitated. Some talk may have led him to come to a conclusion of that kind, but I do not think that my talk could have been positively so construed. Still, he seems so to have inferred it. His case was desperate then, and he was catching at straws.

Cross-Q. 136. Reflect carefully, and state whether you did or did not promise Hauck to testify in his behalf if called upon, or to that effect.

Ans. This reminds me that I did say in that interview, that I would not appear for him unless he would compel me, by a writ from the circuit court served on me.

Cross-Q. 137. Did you tell him all that?

Ans. I did, to the best of my recollection, as now reminded.

Cross-Q. 138. Was that the only kind of a promise you gave him to testify?

Ans. I could not answer more definitely than I have already answered, in answer to the question before the last.

Cross-Q. 139. Then, in substance, you told him that if he would have you duly subpœnaed, you would testify to Mr. Drawbaugh's communication, did you not?

Ans. I believe I stated that if he would compel me in that manner, I would have to appear and testify, I not knowing that I could avoid it in such a case.

Cross-Q. 140. Did you undertake to appear as counsel in contested cases for other parties, without knowing what was the duty of counsel, and without knowing on what principles or rules evidence was to be admitted or excluded?

Ans. I did not fully understand the nature of my duties under those circumstances, nor did I understand all the principles which should be observed in the conduct of such cases.

Cross-Q. 141. At the interview with E. W. Chellis and M. W. Jacobs, at Chellis' store, to which I have heretofore referred, did you not tell those gentlemen plainly, that you had promised Mr. Hauck to testify in his behalf upon the matter?

Ans. I am impressed I did not, except with the proviso already stated.

Cross-Q. 142. Are you willing to swear that you did not tell those gentlemen at that interview, without any qualification, that you had promised Mr. Hauck to testify in his behalf?

Ans. I cannot swear positively in the affirmative or the negative that I did so unqualifiedly. Further, I may not have used the same words with them that I did with Mr. Hauck at the interview referred to.

Cross-Q. 143. Your recollection then of what you had said to Mr. Hauck was pretty fresh, was it not?

Ans. It was not, until it was refreshed by a question a few moments ago.

Cross-Q. 144. I mean that at the time of your interview with Chellis and Jacobs, at Chellis' store, your recollection *then* of what you had said to Mr. Hauck during your interview with him was pretty fresh and clear, was it not?

Ans. I believe it was, but my recollection of, or ability to recall words, is not so good as it is recalling things or occurrences.

Cross-Q. 145. Do you think it is so poor that you might have failed at the interview with Chellis and Jacobs, at Chellis' store, to correctly recall the conversation which you had with Mr. Hauck at the interview with him?

Ans. There is this at the bottom of this question: I have heard so many false versions given to what occurred there, that if my words were even correctly reported, which I doubt will be the case, I would hesitate and study very much, if it were reported to me from that source, to believe my own words, and my memory is very good in that direction.

[*Answer objected to by Mr. Hill as irresponsive.*]

Cross-Q. 146. Do you mean to say that your memory of conversation is very good, so that you can give the exact words after a considerable lapse of time?

Ans. It is good enough for all practical purposes.

Cross-Q. 147. Then what makes you think that at that interview at Chellis' store, you may not have given those gentlemen the real statement that you had made to Mr. Hauck, but some other statement?

[*Objected to by Mr. Storrow, as assuming the witness to have said what he has not said.*]

Ans. Nothing.

Cross-Q. 148. Then I will ask you once more; did you, or did you not, at that interview at Chellis' store tell Mr. Chellis and Mr. Jacobs, without qualification, that you had promised Mr. Hauck to testify in his behalf in the interference, if re-opened, or to that effect?

Ans. I did not, without that proviso, to the best of my recollection.

Cross-Q. 149. State what proviso you refer to?

Ans. The proviso which I mean, to refer to the issuing of a certain writ, and enforcing its mandate on me to do so, or words to that effect.

Cross-Q. 150. Do you testify that you mentioned the writ at all to those gentlemen at that interview?

Ans. My impression is that I did, and that this was one reason why Mr. Jacobs took me in hand to lecture me, stating, if I mistake not, that such a writ could not be enforced upon me unless I was willing, or words to that effect.

Cross-Q. 151. How long a time intervened between the interview with Hauck, last referred to, and the interview with Chellis and Jacobs, at Chellis' store?

Ans. I do not know which interview is meant at Chellis' store, for I had other interviews there afterwards.

Cross-Q 152. When I have been referring again and again to a certain interview at Chellis' store, at which certain things took place, and no other interview at Chellis' store has been referred to in the deposition, and I again refer to it in the one hundred and fifty-first cross-question as "the interview with Chellis and Jacobs at Chellis' store," do you mean to say on oath, that you don't know what interview I refer to?

Ans. As I myself had referred to occurrences or occasions there, I deemed it best to be certain, and I can now answer, since "the interview" means that interview referred to.

Cross-Q. 153. Please answer the one hundred and fifty-first question now?

Ans. The length of time that elapsed was probably only about a day, if not less.

Cross-Q. 154. You state in your one hundred and fifty-first answer, that you did not know what interview I meant, because you had other interviews there afterwards, meaning at Chellis' store; and in your one hundred and fifty-second answer you say you had referred to occurrences or occasions there, and deemed it best to be certain, etc.; will you please refer to the record of your deposition, and point out any place or places therein where you may have made reference to any other interview with

Jacobs and Chellis, at Chellis' store, than the one interview at the end of which you sent the telegram to Mr. Hauck, at Washington, as testified to?

Ans. I find I did make such reference in a general way in my answer to question one hundred and forty-five; that is what I referred to.

Cross-Q. 155. I understood that answer one hundred and forty-five to refer to the same interview; but you now state that it refers to some other time and interview; do you?

Ans. I regard this question, also, as not clear, because I meant in my said answer, or the answer about which the misunderstanding occurred, to refer, not only to that particular interview now most referred to, but also to occurrences or versions of things that occurred there on other interviews afterwards.

Cross-Q. 156. Did you ever have any other interview with Mr. Jacobs and Mr. Chellis there afterwards? If so, how many, and when?

Ans. I did. I don't know how many, nor when, except in a general way. I seldom met them both together. Mr. Jacobs would sometimes call in in the evening while my account as attorney on the Drawbaugh case was not fully paid off.

Cross-Q. 157. What was the subject of any one of those interviews which you had with Mr. Jacobs and Mr. Chellis, at Chellis' store, subsequent to the main interview, of which mention has been made?

Ans. It is hard for me to tell whether both were positively present, but I remember well having interviews there, in the back room, with Mr. E. W. Chellis and some of his friends. Probably M. W. Jacobs, Esq., was present. And the subject of conversation was sometimes on working up the new Drawbaugh rotary faucet, and of getting a good indicator to register the measuring of the faucet.

Cross-Q. 158. Did you have any trouble about getting your pay for services in the interference? Was there any dispute about it?

Ans. I cannot say that there was, or that there was any trouble in any way, except considerable delay.

Cross-Q. 159. As the result of all that had taken place in the interference, and between you and the owners of the Drawbaugh measuring faucet that was involved in it, did you feel friendly to them, and wish them success in their business of introducing the invention and making profit out of it, or not?

Ans. I may say safely that I wished them good success in every honorable way. So far as Mr. Drawbaugh is concerned, I stated in the be-

ginning of my cross answers that I was friendly to Mr. Drawbaugh especially.

Cross-Q. 160. After the said interference was over, did you ever do anything to hinder or embarrass their business operations in connection with the manufacture and introduction of their faucets?

Ans. I did not, except as I acted against the course of certain dishonorable proceedings, as I had reason to believe it was such a proceeding, in the act of his outrunning me in the manner in which he did with the Reading Hardware Works some time afterwards; on what subject I await further question.

Cross-Q. 161. State just what you mean and all you mean?

Ans. I cannot tell consistently, or prefer not to, all I mean, but I do refer to the introduction of the new Drawbaugh measuring-faucet to the trade, then largely, if not entirely, owned by E. W. Chellis.

Cross-Q. 162. What interest had you in that matter, that caused you to interfere with Mr. Chellis' operation? State all about it.

Ans. The interest I had arose from the fact, as I believe, and as I think I have letters to show and to prove, that I was first to apply to said hardware company, seeking to interest them in the manufacture of an entirely different rotary faucet, which I had shown both Mr. Drawbaugh, the defendant in this case, and E. W. Chellis, in my office, at the time when I first practically tested it, they both having approved of it; Mr. Chellis, in an interview thereafter, having stated to me in as many words: "Go ahead with it;" that he was not going to put the new Drawbaugh rotary faucet out on royalty, but was going to have it put upon the market by a New York jobber, whose name, I believe, he did not give, and that he was going to manufacture his faucet himself, at his works at Eberly's Mills, he then having such confidence in the Drawbaugh faucet that he did not appear to care how many competed with him. After I had experimented further on modified forms of my faucet, and while I was corresponding with the Reading Hardware Company, I was informed by him one day, in the back room at his store, that he was going to have his faucet run by said company, and that they meant, and informed him that they would put a cut illustrating the Drawbaugh faucet into their illustrated price-list. I then wrote to the firm, and informed them that they had better well inquire regarding the validity of said patent before they would assume the responsibility of selling it; that I did not believe it was a valid patent, or correspondence in substance to that effect. Mr. M. W. Jacobs thereupon,

for Mr. E. W. Chellis, sent me a threatening letter. As I am asked to tell all about it, I defer answering further this question till I can furnish day and date for many of these conferences. Concluding this answer by stating that all along, after the Drawbaugh application had been made awhile, that I believed that invention then in interference would be a mechanical failure, owing to its want of correct principles of construction, having stated some of these misgivings at different times to some of the parties concerned. I may as well state here, as this question will lead to another calling for such a statement, that this was one of the reasons why I withdrew from the Drawbaugh case, carefully avoided to be stated before. I mean the last part of my answer, by the words "this was one of the reasons."

[*Mr. Hill objects to all that part of the answer expressing the witness' opinion, contained between the words "concluding" and "concerned," inclusive, as not responsive and incompetent.*]

Adjourned until July 19, 1882, at 10, A. M.

JULY 19, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 163. In your last answer you testified that Mr. M. W. Jacobs thereupon, for Mr. E. W. Chellis, sent you a threatening letter. If you have that letter in your possession please produce it, in order that the examiner may make a copy of it upon the record.

Ans. This is the letter.

[The letter is offered in evidence by Mr. Hill, and a copy substituted by consent, as follows, and marked "Exhibit, Jacobs'-Weaver Letter:"]

"No. 5 N. 3RD ST., HARRISBURG, PA., July 22nd, 1880.

THEOPHILUS WEAVER,

Harrisburg, Pa.

Sir:

Mr. Chellis is this afternoon in receipt of your postal card to the Reading Hardware Company.. He has instructed me to begin an action against

you at once. I prefer, however, first to give you this warning, *once and for all*, that you will be held responsible to the fullest extent of the law for any further interference in his affairs. You are pursuing a perilous course, as well as a very foolish one, and certainly will be made to understand, if you persist, both its folly and its peril.

Yrs, &c.,

M. W. JACOBS,
Attorney for E. W. Chellis."

Cross-Q. 164. Did you send more than one communication to the Reading Hardware Company by mail on that subject?

Ans. Not, that I recollect, more than one.

Cross-Q. 165. Was that a letter or a postal card?

Ans. I am impressed it was a postal card.

Cross-Q. 166. Please look at the postal card which I now show you, and state whether it is in your hand-writing, and whether it is the one that elicited the threatening letter from Mr. Jacobs?

Ans. That seems to be the communication. Its contents are a little different from what I thought they were.

(Mr. Hill puts said postal card in evidence, to be marked "Exhibit, Weaver, Reading Postal Card." The following copy is substituted by consent:

"HARRISBURG, PA.,
July 19, 1880.

If you have not concluded to handle the Drawbaugh new faucet, you had better wait a few weeks, as there may be some fun yet for other parties. I learn that you may be held liable.

Yours, &c.,

T. WEAVER."

(Address.)
"Reading Hardware Co.,
Reading,
Pa."

(Post-mark.)
"HARRISBURG, PA., *July* 19, 5, P. M.")

Cross-Q. 167. What did you mean by stating to the Reading Hardware Company, in your said postal card, "there may be some fun yet for other parties?"

Ans. I meant that William J. Lane, of Millbrook, N. Y., patentee

of a measuring faucet, patented May 14th, 1878, and numbered 203,627, whose patent had not been put in interference with the Drawbaugh case, was about to cause trouble to the owners of said Drawbaugh patent. This I had learned about that time.

Cross-Q. 168. When you wrote further to them in the same card, as follows, to wit: "I learn that you may be held liable," did you have reference to a liability under said Lane patent?

Ans. Yes, sir; or subordinate to said patent.

Cross-Q. 169. You meant that they might be held liable under the Lane patent?

Ans. Yes, sir.

Cross-Q. 170. How did you first learn of said Lane patent?

Ans. I cannot tell exactly. I believe it was in examining the office reports.

Cross-Q. 171. Was it officially cited by the Patent Office, in their examination of the application of Drawbaugh for a patent on his measuring faucet?

[*Objected to by Mr. Storrow, as the public records of the Patent Office are the only proper evidence on that topic.*]

Ans. Not while I was in the case, to my knowledge.

Cross-Q. 172. Did you have any correspondence with Mr. Lane in regard to his patent?

Ans. I did make inquiries of him, in a letter.

Cross-Q. 173. You began the correspondence with him on the subject, did you?

Ans. I believe I did.

Cross-Q. 174. Don't you know perfectly well that you did?

Ans. I don't deny it.

Cross-Q. 175. How many letters did you write to Mr. Lane about it?

Ans I cannot tell. There were several.

Cross-Q. 176. How long before the date of this postal card, July 19, 1880, did you commence this correspondence with Mr. Lane?

Ans. I cannot tell. It was some weeks, at least.

Cross-Q. 177. Have you all the letters, or copies of all the letters, you wrote to Mr. Lane on that subject?

Ans. I don't recollect that I have any copies at present. I may have them.

*

Cross-Q. 178. Will you search your archives at the noon recess to-day, and if you have any, produce them here this afternoon?

Ans. I will.

Cross-Q. 179. In the meantime, will you state whether you informed Mr. Lane, in that correspondence, of the Drawbaugh measuring faucet, and that it was about to be manufactured or sold by the Reading Hardware Company?

[*Objected to by Mr. Storrow, on the ground that the letters themselves are the only proper evidence.*]

Ans. I believe I did, to that effect.

Cross-Q. 180. If I understood your one hundred and sixty-second answer correctly, after you withdrew from the Drawbaugh interference case on measuring faucets, you went to work and invented a measuring faucet of your own; am I correct?

Ans. I may have invented it before; I cannot tell exactly. I am searching a pass-book to find the date when I invented it. I cannot tell from this book, as this refers to times only when I had my faucet completed, and showed it to parties; but it was prior to June 6, 1879.

Cross-Q. 181. Your faucet was a rotary measuring faucet, was it not?

Ans. It was.

Cross-Q. 182. Did you file an application for letters patent upon it in this country?

Ans. That is a matter that the office deems proper to withhold from the public. I will not answer it unless it is insisted on.

Cross-Q. 183. I am not examining the "office," but you, and I do not ask for the contents of your application, but only for the fact whether you filed one, or not; please answer the question?

[*Objected to by Mr. Storrow, that the witness has a perfect right to decline to state whether he has or has not filed an application, if he deems it for his personal interest, which alone is to be consulted in the matter.*]

Ans. Since the question does not require the date of application, I answer, I did.

Cross Q. 184. Has any patent issued on that application?

Ans. It was only granted, but not issued.

Cross-Q. 185. In your thirty-seventh answer, as modified by your fifty-sixth answer, it appears that in 1869 you took out a patent for Dr Moffitt on sash locks, and that soon afterwards you invented an improvement in sash locks, which you patented and sold to him. When people employed you to take out patents on their inventions, were you in the

habit of going to work to get up improvements of your own in the same lines of invention, and apply for patents on them, as you appear to have done in the Drawbaugh faucet case, and the Moffitt sash-lock case?

[*Objected to by Mr. Storrow, as an incorrect statement of the witness' testimony; in this, that it does appear that the witness was employed by Dr. Moffit not merely to patent an invention brought to him, but to work the lock up as an article for the trade, and that the improvement was invented in the course of that work; and in this, that it does not appear that the witness' invention in measuring faucets bore any relation to the Drawbaugh invention applied for in* 1879, *further than that both instruments belonged to an old and well-known class.*]

Ans. The question assumes that my invention in that case was a sash lock; it was not so stated in the title of the invention. I am not in the habit, properly restricted, of doing work as if to circumvent an application intrusted to me, but it often happens in working up an invention, that patentable changes have to be made, and in this way I sometimes became patentee in the same class, and assigned the patents to those for whom I worked.

Cross-Q. 186. Is that the true explanation of how you happened to invent the improvement in rotary measuring faucets in 1879?

[*Question objected to by Mr. Storrow, because it assumes that the witness was employed to work up Mr. Drawbaugh's faucet, or was expected to work up Mr. Drawbaugh's faucet, whereas nothing of the sort appears on the evidence.*]

[*Mr. Hill replies that the question assumes nothing at all.*]

Ans. No, sir; I claim to be able, sometimes, to make an original invention of my own; and in that case I simply followed out and embodied ideas on rotary faucets which I had tolerably clearly developed before I went into the Drawbaugh case.

Cross-Q. 187. And are you sure that that was an original invention of your own?

Ans. I so swore to it in my application for a patent, and I reaffirm it now.

Cross-Q. 188. I wish you to refresh your memory and state whether or not, as a matter of fact, that alleged invention, in substance, was not communicated to you by Mr. E. W. Chellis, at Mr. Chellis' store, in Harrisburg, at an interview at which you, Mr. Chellis, Dr. J. W. Moffitt, and Mr. M. W. Jacobs, were present, and whether Mr. Chellis did not then

and there, in the presence of those gentlemen, make and exhibit to you a drawing of said invention, which you subsequently incorporated, in substance, in your application for a patent, and in accordance with which you proceeded to make some models, or patterns, and, possibly, faucets?

Ans. This is another tissue of questions that has very little truth to support it. I think all the parties were present, except Dr. J. W. Moffitt. He was present at other interviews, but I have no distinct impression that he was present at that particular time. Mr. Chellis did make a sketch of a conjectural faucet, but his plan was subsequently ruled by Mr. Drawbaugh, the defendant in this case, as too complicated and as impractical. I did not incorporate any of those principles in my faucet, and I will venture to say no inventor ever will in a rotary measuring faucet. As regards the rest of the question, it may be that it was some time after that that I got out my first patterns, which I showed to Mr. Chellis, and he never put in a claim for any particular part thereof, except a ruse, which he came on me about the indicator bell, and which I did not incorporate in my application for a patent.

[Mr. Hill requests the witness to produce, this afternoon, his correspondence with Mr. Lane, including his letters to Lane, as well as Lane's letters to him.]

[Recess for dinner, until 2, P. M.]

JULY 19, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 189. Please answer the last part of my question, as to whether you did not proceed to get up patterns, a model, and a faucet or faucets, embodying substantially the invention shown in the drawing which Mr. Chellis exhibited to you as aforesaid?

Ans. No, sir.

Cross-Q. 190. Did you get up one of your faucets, and send it to the Reading Hardware Company?

Ans. Yes, sir.

Cross-Q. 191. Did you apply to that company to make or sell the faucets for you?

Ans. Yes, sir.

Cross-Q. 192. Did they decline to do it?

Ans. They did, at first. But in subsequent letters they wished to have proper samples sent to them. They seem to have had in view some plan or arrangement by which they could make them, or have them made, if they approved them.

Cross-Q 193. After you sent them the sample, did they decline to make or sell them?

Ans. They deferred giving me a promise that they would undertake the work for me, as they were then very full of work of their own, and were about establishing a branch foundry further up on the Schuylkill, and they wanted time.

Cross-Q. 194. Have they ever made or sold any of those faucets?

Ans. None of mine.

Cross-Q. 195. Has your faucet ever been put onto the market for sale?

Ans. No, sir; only a sample or two have been sold and tested.

Cross-Q. 196. Why did you not have your patent issued after it was granted?

Ans. Because the letter of allowance or grant was re-called, and one of the claims rejected, by a ruling upon the discovery by the office that the claim was too broad, showing that a radial, full-sweep piston is not new, or patentable as such.

Cross-Q. 197. Did the office cite the Lane patent against you in your application?

Ans. No, sir.

Cross Q. 198. Have you searched for the Lane correspondence, to which I referred this morning?

Ans. I have.

Cross-Q. 199. Did you find it?

Ans. I did not.

Cross-Q. 200. Have you ever known, or heard that Mr. Lane has taken any steps, up to the present time, in the way of asserting his claim against Mr. Chellis' Drawbaugh faucet, as intimated in your postal card of July 19, 1880?

Ans. I have not.

Cross-Q. 201. You referred this forenoon to Mr. Chellis' playing a ruse upon you at one time. What do you mean by that?

Ans. It was in reference to the indicator bell I was speaking, and I find now, by reference to a pass book, that that occurred on the 15th of August, 1879. He then told me he wanted to tell me a secret, but I

should never say a word to any one about it. That he intended to use a bell on their faucet, that would strike when the required amount of of molasses was drawn. I told him that was my invention, and that I had shown it to him in the drawing, which I had shown him on the 12th inst. He said he did not remember of my showing him a bell. I told him my index-wheel was of bell-metal, and was a bell in shape. I had made it so on purpose, as a bell. By "ruse," I mean a fraudulent play-off on me.

Cross-Q. 202. Was he playing that off on you as a practical joke?

Ans. It was no joke to me.

Cross-Q. 203. You made a memorandum of that conversation with Chellis, and just read it from your pass-book, did you not?

Ans. Yes, sir.

Cross-Q. 204. Did the drawing, which you showed Chellis on the 12th of August, as you say, have any striking apparatus for striking the bell?

Ans. It had not.

Cross-Q. 205. Referring to the patent which you took out for Dr. Moffitt on sash-locks in 1869, as referred to in your thirty-seventh answer, you state that you were engaged by him in working the thing up as an article for the trade; what were you to do for him in that direction?

Ans. I made certain cards of metal patterns for snap-work, such as are used in hardware foundries, and also got a small lot of locks cast for him, in a bill of my own on corn-shellers in the spring of 1870.

Cross-Q. 206. How came you to make the improvement on that lock which you patented?

Ans. The trouble in Moffitt's lock was, the tumbler would not hold the bolt locked, if the lock was turned upside down; and he wanted it to be a right-and-left hand lock, to put on either side of window sash, hence it was necessary to make certain alterations in the tumbler and its hold in the lock, to be applied in that manner.

Cross-Q. 207. And your patent was for those alterations which you made for that purpose, was it?

Ans. Yes, sir; mainly.

Cross-Q. 208. Did Dr. Moffitt request you to improve his lock so as to adapt it to the purpose you have referred to?

Ans. I believe he did, after I showed him a little sketch indicating how I believed it could be made; we had tried the other lock consider-

ably before we came that far. He afterwards still believed his lock might be made practical, and tried it further.

Cross-Q. 209. Do you mean after you showed him the sketch and before you took the patent out?

Ans. No, sir; after the patent came out.

Cross-Q. 210. How did Dr. Moffitt get his first knowledge of your proposed improvement, did you communicate it to him, or did he first learn it from some other source?

Ans. I cannot tell surely; I believe it first came from me.

Cross-Q. 211. Please refresh your memory and see if you can state whether he didn't first learn it from some other source, and then question you about it, and demand that, if it was patented, you should assign the patent to him?

Ans. I have no such recollection at all, only this general recollection that no such demand was made of me.

Cross-Q. 212. You have referred, in the course of your deposition, to the fact that you sometimes have made inventions in the nature of improvements upon the inventions of your clients, and, also, that you have sometimes made inventions that were original with yourself; will you please give me a list of all the inventions of the latter class, that you ever made?

Ans. I take the sense of the question to be this: a list of patents in which I appeared as inventor, distinct from other parties, or employers; and I give the following list:

Desk and seat,	Nov. 20, 1864, No.	45,286.
Table and seat,	" 29, 1864, "	45,287.
Writing tablet,	Ap. 4, 1865, "	47,175.
Whip socket,	Aug. 28, 1866, "	57,603.
" "	July 30, 1867, "	67,237.
Clothes-hook and line holder combined,	Aug. 18, 1868, "	81,312.
Safety horse-hitch,	Nov. 24, 1868, "	84,450.
Corn sheller,	July 6, 1869, "	92,410.
"	Aug. 24, 1869, "	94,050.
Hand corn-sheller,	Ap. 12, 1870, "	101,949.
Spherical gears,	Aug. 1, 1871, "	117,706.
Corn-sheller,	Nov. 26, 1872, "	133,346.
Clothes washer,	Aug. 6, 1872, "	130,168.
Cream freezers,	Mch. 26, 1872.	
Spherical gear,	Dec. 2, 1873, "	145,075.

Carriage wheel, July 21, 1874, No. 153,207.
Dumping wagon, Sept. 14, 1875, " 167,715.
Nut lock, Oct. 10, 1876, " 183,089.

Cross-Q. 213. Now will you please give a similar list showing inventions patented by you, made in the nature of improvements upon inventions with which you had something to do for your clients?

Ans.

Combined latch and lock, Oct. 26, 1869, No. 96,175.
(Assigned to J. W. Moffitt.)
Sash-holder, Aug. 19, 1873, No, 141,904.
(Assignor to H. C. Demming, Harrisburg.)
Carriage seats, Oct. 25, 1881, No. 248,818.

I sold the last to the Anderson Manufacturing Company, of Lancaster, Pa., for whom I have been attorney.

Cross-Q. 214. In your forty-second, forty-third, and forty-fourth answers, as modified by your fifty-sixth answer, you state that in 1873 and 1874 you took out two patents for Dr. J. W. Moffitt on brake-shoes of his invention for cars; did you, about that time, make any invention of your own for brake-shoes?

Ans. Not at that time.

Cross-Q. 215. Did you at any time after Dr. Moffitt put his inventions in brake-shoes, or either of them, into your hands for the purpose of procuring patents thereon?

Ans. I did; several years after that.

Cross-Q. 216. About when was it that you did it?

Ans. I cannot tell definitely. I never made application for patent on them, and attached no importance to them afterwards.

Cross-Q. 217. Were they in the nature of improvements upon, or modifications of Dr. Moffitt's inventions?

Ans. No, sir; no more than on others.

Cross-Q. 218. Did you communicate knowledge of those brake-shoe inventions of yours to Dr. Moffitt?

Ans. Yes, sir; he saw them, I believe.

Cross-Q. 219. How did he happen to see them?

Ans. He frequently called at my place, and we were free to talk about our inventions and that of others. I had used my efforts to get him a proper footing by an assignment of his shoes to a western railroad company before that.

Cross-Q. 220. What was the name of that company?

Ans. I cannot give it now, and have no means to give it.

Cross-Q. 221. Did you correspond with the company for Dr. Moffitt?

Ans. No, sir; not to my recollection.

Cross-Q. 222. What had you done then to get him a proper footing in connection with that company?

Ans. I gave him advice, wrote certain assignments, and interviewed certain parties at the time the assignment was made.

Cross-Q. 223. Did the company take hold of his brake-shoes and introduce them?

Ans. I do not know.

Cross-Q. 224. When Dr. Moffitt first saw your invention of brake-shoe, did you show it to him, or did he accidentally discover it in your place of business?

Ans. I made no concealment of it. The pattern lay on an open shelf in my office for years. He might have seen it there accidentally.

Cross-Q. 225. Had you had some castings made of it?

Ans. Yes, sir; one sample, full size.

Cross-Q. 226. Did he not first know of your invention by accidentally discovering that casting under your work bench?

Ans. No, sir; it was lying on the floor quite a long time, on the side of the room, so that any one could see it.

Cross-Q. 227. When he learned of your brake-shoe invention, did he not manifest a good deal of indignation, and did he not then and there threaten you with legal proceedings unless you immediately dropped the matter; and did you not immediately drop the matter?

Ans. No, sir; Dr. Moffitt and I never had unkind words, and he never threatened me; and I did work for him afterwards. The same cordial relation existing between us to this day, to the best of my knowledge.

Cross-Q. 228. Did not Dr. Moffitt, upon learning of your said invention, tell you then and there that he would make trouble for you if you did not drop it, or to that effect?

Ans. No, sir; I recollect of words quite otherwise.

Cross-Q. 229. If you recollect then, state all that he said about it.

Ans. He said: "Brother Weaver, let me give you a bit of good advice. Don't put money in brake-shoes. I have tried it hard, and put a good deal of money into it. There is no money in it."

Cross-Q. 230. Is that all that he said about it, or the substance of all that he said?

Ans. That is all; and it is his kind way that helped me remember it.

Cross-Q. 231. How long was that after the issue of his 1874 patent on car-brakes?

Ans. I cannot tell now. It was quite a while, though. A year or two.

Cross-Q. 232. Did you ever take out any patents as joint inventor with others? If so, please give me a list of such patents?

Ans. Coffee mill, of Shetter and Shetter and Weaver, of 1881.
Creamer, Rudy and Weaver, to date August 1, 1882.

Cross-Q. 233. Did you ever have anything to do with the making of a sulkey-plow invention? If so, what and when?

Ans. I did, in 1874, as I find by official report. I invented it entire and distinct as sole inventor, and built a working sample, or several, and practically tried them at my own expense.

Cross-Q. 234. By what official reports do you fix the date?

Ans. By a memorandum taken from the Patent Office report.

Cross Q. 235. Do you mean that you obained a patent on that invention? If so, what was its date and number?

Ans. Yes, sir; this was inadvertently omitted in the list given before. This patent is noted as follows:

"Sulky Attachment for Plows, Aug. 18, 1874, No. 154,306."

Adjourned until July 20, 1882, at 10, A. M.

JULY 20, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Chauncey Smith for Complainants, and Mr. Hill and Mr. Jacobs for Respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 236. In your two hundred and twenty-second answer, referring to what you did to help Dr. Moffitt to get a proper footing by an assignment of his brake-shoe to a western railroad company, you say that you gave him (Dr. Moffitt) advice, wrote certain assignments, and interviewed certain parties at the time the assignment was made. What certain assignments did you write?

Ans. It occurred to me, in thinking over my two hundred and

twenty-second answer, that the papers I had drawn up were not accepted, and that the negotiating party from the west, some self-styled judge, I know not who, acted somewhat dictatorial—had the papers drawn pretty much his own way—and my advice was to some extent disregarded.

Cross-Q. 237. Was the self-styled judge acting for the railroad company or for Dr. Moffitt?

Ans. For the railroad company, and of course, after contract, became a partner, to some extent, in the invention.

Cross-Q. 238. Am I to understand you that you prepared assignment papers for Dr. Moffitt, and gave them to him, but they were not subsequently executed by him?

Ans. I cannot say that I gave them to him, but he came to my place, and after conversation, and noting down certain data, he left me, stating that he would expect me to meet him at a certain place, and wanted me to be there and counsel him, and overlook the transfer. I drew up such papers, expecting that they would be acceptable to both parties. But before negotiations were started really, I further had words with said Dr. Moffitt, and heard that he had waived certain conditions which I before had cautioned him about, and the papers were useless. I did not produce them, and his invention became a tied-up, dead thing in consequence.

[*The last clause of the answer objected to by Mr. Hill, as irresponsive and mere opinion.*]

Cross-Q. 239. Then you never showed him the assignment papers which you had drawn up, did you?

Ans. I may have. My impression is I did not.

Cross-Q. 240. Had he requested you to draw up assignment papers for him?

Ans. I cannot tell now. That is my impression.

Cross-Q. 241. In what part of the west was the railroad located, with the owners of which he was negotiating in that affair?

Ans. In the far west.

Cross-Q. 242. The outcome was, that he assigned his patent to that railroad company, was it?

Ans. I don't know the meaning of the word outcome.

Cross-Q. 243. Did he assign his patent to that railroad company?

Ans. That is a question that was debated by us at the time. I believe he did.

Cross-Q. 244. Is your meaning this: That he made a contract with the railroad company, which you construed to be an assignment?

Ans. Yes, sir.

Cross-Q. 245. What parties did you interview for him at the time the assignment was made?

Ans. Mr. Whitney, then superintendent at the Pennsylvania canal, is all that I can now mention or recollect. I believe he is the only party.

Cross-Q. 246. How many times did you interview Mr. Whitney on that matter?

Ans. Only once to my knowledge. I had met him on the street.

Cross-Q. 247. Do you mean that the interview was a meeting with him on the street?

Ans. Yes, sir; and conversation with him.

Cross-Q. 248. Who was present at that interview?

Ans. There was no one to take part in it but us two.

Cross-Q. 249. Why did you interview Whitney on that matter. What had he to do with it?

Ans. If I remember correctly, he had first interested his friend, said judge, in said invention, and was to have had a footing in the benefits by said assignment.

Cross-Q. 250. What was Whitney's full name, and what is his present address, if he is living?

Ans. I cannot give it, but it is in the city directory. He may own property here yet, but is away. I can ascertain. I don't know his initials.

Cross-Q. 251. You have referred, in your one hundred and second answer, and the answers immediately following, to an interference of William P. Patton against Luther M. Simon on railroad switch; what attorney conducted the taking of the testimony submitted on behalf of Mr. Patton's claim to priority in that case?

Ans. Mr. Patton had no attorney by formal appointment, but I was present as an interested party, on that occasion, and was permitted to say a few words by the master, before whom it was taken.

Cross-Q. 252. Did not John C. Kunkle, Esq., then a well-known lawyer in this place, conduct the taking of the testimony in behalf of Mr. Patton's right?

Ans. Not at the first taking, but at the re-taking of the said testimony. He was employed only for about two hours.

Cross-Q. 253. Why did the testimony have to be re-taken?

Ans. Mainly on account of incompetency of the master to check the over-bearing manner, if I remember rightly, of the opposite counsel.

Cross-Q. 254. Who was the opposite counsel, and who was the master, to whom you referred in your last answer?

Ans. I believe the counsel was A. J. Herr, Esq., and the master was Alderman Maglaughlin. I don't remember his first name; he was an old man.

Cross-Q. 255. Was the testimony taken on behalf of Mr. Patton before Mr. Kunkle was brought into the case thrown out by the Patent Office?

Ans. I believe, upon our complaint of certain irregularities at the taking, we were permitted to re-take the testimony, and what became of that first taken, I cannot tell.

Cross-Q. 256. When taken the second time, before what magistrate was it taken?

Ans. My impression is, it was taken before M. L. Bower, alderman in the upper part of the city.

Cross-Q. 257. When the testimony in behalf of Mr. Simon's claim of priority was taken, who cross-examined the witness?

Ans. Rodney Mason, Esq., of the firm of Holloway, Mason & Co., Washington, D. C.

Cross-Q. 258. Who argued that case at the Patent Office in behalf of Mr. Patton?

Ans. Said Mason, Esq., but after having lost a decision, I wrote an argument to assist him in the next hearing.

Cross-Q. 259. Do you know whether that argument was used at the hearing?

Ans. Mr. Mason stated so in a letter, and said that he had used it to advantage.

Cross-Q. 260. In your one hundred and eighth answer you stated that you became one third owner of Mr. Patton's said invention, by purchase, at the beginning of the interference, and afterwards became two thirds owner by purchase. Who owned that invention at the time when the testimony was taking in the interference?

Ans. Said William P. Patton had at first one third interest in it, and likewise Isaac Lloyd and myself had each one third interest in the invention—all of Harrisburg—but at some period during the interference I purchased Mr. Patton's interest, as stated. At one period of the tak-

ing of the testimony we all three were owners, but before the close of the taking of the testimony Mr. Lloyd and I owned the whole invention.

Cross-Q. 261. Did you obtain your interests by an assignment or assignments, in writing?

Ans. I presume I did.

Cross-Q. 262. Don't you remember whether you did or not?

Ans. Yes, sir; I have some recollection of it; not very clear, only remembering that it was a necessity for me to buy him out.

Cross Q. 263. Why a necessity?

Ans. He had not money to meet his share of the expense in prosecuting the interference.

Cross-Q. 264. How many assignments did you receive from him of interests in that invention?

Ans. Two.

Cross-Q. 265. Were they recorded in the Patent Office?

Ans. My impression is only one.

Cross-Q. 266. Have you those two original assignments among your papers?

Ans. I cannot positively state so. My impression is I handed over the second assignment to one Jacob G. May, to whom I afterwards sold that same interest that I had purchased by the second assignment.

Cross-Q. 267. Will you search among your papers for those assignments, and if you find them, or either of them, produce what you find this afternoon?

Ans. Yes, sir.

Cross-Q. 268. Referring to the interference between Hauck and Drawbaugh, mentioned in your same one hundred and eighth answer, were not your duties in the taking of the testimony in that interference, as "associate counsel," limited to acting as a clerk, for the purpose of making a copy of the written depositions?

Ans. No, sir; not entirely.

Cross-Q. 269. State all else that you did in that contest?

Ans. I never ceased to have a proper status as attorney of record in that case, and by me, notice was given to the opposite party of such takings of testimony as are customary in such cases. After I had written the preliminary statement, which was the frame of the case—although the questions were put, at the taking of the testimony, by Mr. Jacobs, Esq.—I was often consulted; although, I did act in capacity of clerk. Owing to this latter fact, and other circumstances, when the

time came for printing the testimony, I first objected to appear as counsel by mention, along with the published testimony. But was pressed by Mr. Jacobs, my associate, to let it stand with his.

Cross-Q. 270. Were you consulted in that case as to what witnesses should be called and examined, before they were put upon the stand?

Ans. I cannot understand the drift of the question. Whether it means I had nothing to say at all with reference to who should be brought in as witnesses, or not. In most cases I was little consulted, and the machinery of the case was run secretly.

Cross-Q. 271. Did the owners of the Drawbaugh invention, and their counsel, Mr. Jacobs, or any of them, even let you know the names of the witnesses, except as you learned them by actually seeing the witnesses called upon the stand to testify?

Ans. Some of them. Others I did not know.

Cross-Q. 272. How many of them, and who did you know were to be called, before you actually saw them called upon the stand to testify?

Ans. I cannot tell how many, unless I had the testimony before me. I remember these: E. W. Chellis, himself; Phillips, the alderman's clerk; John W. Moffitt; Ira D. Kahney, the miller at Eberly's Mills; and Herman K. Drawbaugh, was counted, but was captured by the opposite party.

Cross-Q. 273. Do you mean to say that you knew that all these gentlemen would be called as witnesses on Mr. Drawbaugh's side of the case?

Ans. Yes, sir; and others which I cannot now name. Some of them had been named to me by Mr. Daniel Drawbaugh himself, and it was in that way I was able to frame the preliminary statement, by having consulted him.

Cross-Q. 274. Did you ever know why the machinery of the case was run secretly from you?

Ans. Not, certainly.

Cross-Q. 275. Did you ever know why Mr. Jacobs was brought into the case to manage it as counsel?

Ans. Certain reasons were given me by Mr. Chellis, but I don't know whether his words spoke facts.

[Recess for dinner, until 2, P. M.]

JULY 20, 1882.

Examination resumed pursuant to adjournment.

Present: Mr. Chauncey Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 276. Did you make search for the Patton assignments, as I requested you this forenoon?

Ans. Yes, sir.

Cross-Q. 277. Did you find any of them; if so, how many?

Ans. Only one, which pertains to the sale of Patton's last third interest in the patent mentioned, and in one related thereto. Here it is.

[Witness produces assignment acknowledged by Wm. P. Patton, April 14, 1866, and recorded at the Patent Office, May 21, 1866, in Liber G, 8, page 466, of transfers of patents.]

Cross-Q. 278. In the interference of Morrison against Coyne, in the taking of the testimony, did you have charge of the examination of Morrison's witnesses, and the cross-examination of Coyne's witnesses, and did you put the questions to them?

Ans. Yes, sir.

Cross-Q. 279. In the interference of Kline against Wild, did you have charge of the examination of Kline's witnesses, and the cross-examination of Wild's witnesses, and did you put the questions to them?

Ans. Yes, sir.

Cross-Q. 280. Who argued that case in the Patent Office in behalf of Kline?

Ans. Both the senior member of the firm of Evans & Co., and myself.

Cross-Q. 281. Did you argue it orally, or in writing?

Ans. In two printed briefs, and orally in part.

Cross-Q. 282. Can you tell me what was the first patent you ever took out as attorney for any inventor, and when it was?

Ans. I took out my own first two patents in November, 1864, both on the same day.

Cross-Q. 283. You didn't act as attorney for yourself. What I wanted to know was, what was the first you ever took out as attorney for anybody?

Ans. If I remember correctly, it was on a horse-hitch of William A. Middleton and J. Haller, 1868, some time in the spring.

Cross-Q. 284. Did you take out a patent on anything else for Middleton and Haller, or either of them, that year?

Ans. Never anything else for Haller, nor for said Middleton that year, to my knowledge.

Cross-Q 285. Did you ever take out any other patent for either of those gentlemen at any time?

Ans. Yes, sir.

Cross-Q. 286. What, when, and for whom?

Ans. The patent of William A. Middleton, Harrisburg, metallic fence-post, February 16, 1869, No. 86,935.

Cross-Q. 287. Did you have anything to do with any clothes-hook or line-holder invention in 1868, for anybody, prior to your own patent of August 18, that year?

Ans. I made patterns, possibly in the spring of 1868, or latter part of that year—I believe it was in the spring—for one Zinn, on line-holder or clamp.

Cross-Q. 288. Had Zinn patented his line-holder at the time?

Ans. He had patented one some time before that, quite different in construction.

Cross-Q. 289. Prior to applying for any of your patents on corn-sheller, did you have anything to do for anybody else on the subject of corn-sheller inventions?

Ans. Not to my recollection.

Cross-Q. 290. Were you not consulted by anybody on that subject prior to that time?

Ans. Not to my recollection.

Cross-Q. 291. Possibly I can aid your recollection a little. Prior to that time, were you not consulted by one Brady, of Mount Joy, Lancaster county, Penna., with reference to a corn-sheller that he had invented, and did you not discourage him from proceeding to patent the same; and did you not, soon after, yourself apply for letters patent on a corn-sheller?

Ans. Not to my recollection. He had a corn-sheller of his own. I don't recollect ever discouraging him about that or any other. I dealt at his works or foundry, and got castings from him, after my patent had issued. My invention was entirely different in patentable features.

*

Cross-Q. 292. Had he consulted you with reference to his corn-sheller?

Ans. Not to my recollection, as a consultation. We had conversations when together. He did not ask my advice, that I can recollect.

Cross-Q. 293. How came you to first know about his corn-sheller?

Ans. By seeing it at Henry Gilbert's hardware store, Harrisburg.

Cross-Q. 294. Did Mr. Brady never explain to you any proposed improvement on, or modification of, his corn-sheller?

Ans. I think he did talk at one time with reference to the holder—one or two changes inside or the working or actuating of the jaws.

Cross-Q. 295. Is that all the change or modification that he ever proposed or suggested to you that he was going to make, or was thinking of making, on his corn-sheller?

Ans. I cannot tell what he was thinking of. That is all that I recollect. I believe that it is fully all that he stated to me.

Cross-Q. 296. Where did he tell you that?

Ans. I cannot tell. I met him at a fair. I also met him at his works. He was never my client.

Cross-Q. 297. With reference to your dumping wagon, patented September 14, 1875, had you been doing any work on dumping wagon inventions for anybody else not long before you applied for that patent?

Ans. I had been, some time before that.

Cross-Q. 298. For whom?

Ans. For Hamilton Baily, of Harrisburg.

Cross-Q. 299. What had you been doing for him on dumping-wagon inventions?

Ans. I took out a number of patents, and built a number of models for his patent wagons. I cannot give the date and number now, but will, if desired, furnish data.

Cross-Q. 300. Referring to your patent for sulky attachment for plow, dated August 18, 1874, did you get into trouble with anybody about that application for patent?

Ans. Yes, sir.

Cross-Q. 301. With whom did you have that trouble?

Ans. With one Rev. H. D. Kutz, now of New Haven, Conn.

Cross-Q. 302. Did Kutz commence legal proceedings against you in connection with it?

Ans. He attempted at one time do so.

Cross-Q. 303. Were his proceedings in the nature of a criminal charge for perjury?

Ans. I did not know it to be such charge.

Cross-Q. 304. Did he employ counsel, if so, who?

Ans. I think I was notified by one George H. Irwin, Esq., on Third street, Harrisburg, who notified me to appear before him before proceeding against me for him, the said Kutz.

Cross-Q. 305. Mr. Irwin is a well-known lawyer of this city, is he not?

Ans. He is known, and has some practice.

Cross-Q. 306. Did you appear before him in response to that notification?

Ans. Yes, sir.

Cross-Q. 307. Did you assign a part interest in that patent on sulky attachment for plows to Mr. Kutz, if so, what interest?

Ans. I did not give him a formal assignment.

Cross-Q. 308. What did you give him?

Ans. My impression is it was a receipt for some twenty one dollars, with a promise or agreement to make an assignment of the half interest on the performance on his part, I think, of certain other conditions. I cannot state precisely the tenor of the paper.

Cross-Q. 309. Is that paper, or a copy of it, in your possession?

Ans. It is not. I can produce a copy. I learned it was recorded at Washington.

Cross-Q. 310. Will you please procure a certified copy from the Patent Office at Washington, at my expense, and produce it here?

Ans. Yes, sir.

Cross-Q. 311. Why did you, in that transaction, execute a receipt to Mr. Kutz for twenty-one dollars. What did that grow out of, and how?

Ans. It came about as follows: Sometime in the end of 1872, said Kutz came to me to see whether I could secure a patent for him and his partner, S. A. Stockstill, of Medway, Ohio, on an application already filed in the Patent Office, in charge of Munn & Co., their attorneys, which had been rejected. He stated that if I could get a patent for him I should be well repaid. I became attorney, in due form, for said parties. Proceeded to Washington. Attended to that case, in connection with other business. And shortly after my return, in 1873, sometime, I procured a patent for them, which is dated April 15, 1873, No.

137,870, and was paid for my services. On trial of said plow—said patent having been on a plow, also an attachment in its nature to common plows—it was found to be inoperative on hilly ground. Mr. Kutz, after considerable time, came back to me, and asked me if I could change the attachment, so as to make it work satisfactorily on hilly ground. I told him I did not know, but would study over it, and he was to return at a certain time. I then studied over the matter, and the invention came to me, as nearly all inventions do, by intuition. I drew the thing on paper, and showed it to him when he next came to me. He was pleased with it, and after some talk we agreed to go together and take out a patent, he stating that if I would draw up the papers and make a model, we would take it out, and he would pay said twenty-one dollars. The work, after filing the case, to be carried on as stipulated by the conditions of the receipt referred to, of which you requested a copy. When we came to swear to the invention, he wanted to swear to the invention as joint inventor with me, and I objected to his doing so, stating that I believed it would invalidate our patent afterwards, when it became known that I had invented it, as it had no points common with his former patent. He insisted on swearing to his papers, so we went to the alderman's, and we took the oath to the specifications. After leaving me, he then having gone away for several weeks to an eastern town, I was so mortified at the circumstance that I withheld sending it, still meaning to do right by him as a partner. And I drew up a second specification paper, and swore to it, and sent it to the Patent Office as sole applicant, informing him on his return of my action, and stating my reasons. After some words we agreed again, and proceeded to work up the invention, he stating that he would be willing to pay one half the money necessary to build a full-sized attachment, for actual trial of the thing before the issue of the patent. I being then willing to give him the whole concern, if he would pay for what it had cost me, and my trouble. By an understanding that he was to pay more when he returned the next time, I proceeded to build, and had built, the device, according to our verbal agreement. When it was made, and ready for trial, I asked him: "Are you willing to take the risk—to pay one half the cost on it, whether it works or not?" He said he would pay one half the cost if it worked well, but he wouldn't pay anything if it didn't work, and I was stuck again. And I said: "You are not the man for me to be a partner with. I will pay you back your money, assume the risk, and take out the patent." That he wouldn't do either. The time

came when the patent had to be lifted, and I paid its final fee for it. That is how it came about.

Cross-Q. 312. When you and Mr. Kutz went to the magistrate's office, and he swore to the papers as joint inventor, did you also swear to them as joint inventor?

Ans. That I cannot tell, as the form in the office rules then differed from what it is now, and I think I had an older form to guide me in writing it.

Cross-Q. 313. Isn't your recollection good enough to enable you to state from memory whether or not you swore to them as joint inventor with him?

Ans. I am not positive.

Cross-Q. 314. What is your best recollection about it?

Ans. My impression is, we simply both swore as the original and first inventors.

Cross-Q. 315. Your recollection, then, is that you took the oath with him; is it?

Ans. Yes, sir.

Cross-Q. 316. But that you took it with a mental reservation arising from the form used; is that it?

Ans. Not on my part, for I half believed he would not do it.

Cross-Q. 317. Did you think it any worse for him to take the oath of joint invention, who apparently believed it right to do it, than for you to take the same oath, who profess that you knew it to be wrong to do it?

Ans. That is not for me to say, for I felt convinced afterwards that it was wrong, on both our parts, to do it in that way.

Cross-Q. 318. Did you not feel convinced of that till afterwards?

Ans. Not so fully.

Cross-Q. 319. What new facts came to your knowledge after taking that oath that modified your views of the moral character of the transaction?

Ans. He had at the time argued that he had given me some general idea to make a plow attachment adapted to be adjusted manually for hilly ground, without stating the plan or detail of the invention. He thought by virtue of that he could take the oath, but I, upon more mature reflection, and in hunting up some other cases, found that that general idea or adjustable feature of a plow attachment was not new, and he had really not made any part of the invention.

Cross-Q. 320. Was that all he claimed at the time to have suggested to you that was incorporated in that application?

Ans. Yes, sir; I am positive of that.

Adjourned until July 21, 1882, at 10, A. M.

JULY 21, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present: Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

(Witness desires to state as follows:) I wish to state that I should have used the expression "so-styled judge," instead of the expression "self-styled judge" yesterday afternoon in my testimony, when referring to Dr. Moffitt's case, and I thus correct it now, as in thinking over it I believe he was introduced as judge to us.

Cross-Q. 321. In your three hundred and eighth answer you say you gave Mr. Kutz a receipt for some twenty-one dollars, with a paper agreeing to make an assignment of a half interest on certain other conditions; was that done at Mr. Irwin's office?

Ans. Not exactly in that many words.

Cross-Q. 322. Where was it done?

Ans. I may not understand the question.

Cross-Q. 323. Where was that receipt and paper executed?

Ans. I think the receipt was first given at my office for probably sixteen dollars, and probably there was added to it five dollars a short time afterwards at my office. I never saw it since. I cannot positively state this morning whether it was ever recorded, as intimated yesterday, only that Mr. Kutz said that he would do so; namely, have it recorded.

Cross-Q. 324. Were the receipt and the agreement to assign separate papers, or were they both one paper?

Ans. Only a few lines on one paper.

Cross-Q. 325. Was that paper executed after your interview with Mr. Irwin, in response to his notification?

Ans. There was a legal tender made to Mr. Irwin of the amount of money received, with interest, which was not accepted, and then an offer

made to divide territory, or anything that would be right and proper under the circumstances.

Cross-Q. 326. That does not answer my question. Will you please notice more particularly what I asked you?

Ans. That is all that ever was done at Mr. Irwin's, or elsewhere, except that we met several times afterwards and tried to adjust the matter between us, but failed. I mean by "we," Mr. Kutz and I.

Cross-Q. 327. I repeat the question. Was that paper executed after you appeared at Mr. Irwin's office in response to his notification? I mean was it *made* or *signed* after that?

Ans. It was made long *before* that in *my* office.

Cross-Q. 328. How came it to be made before that?

Ans. I have already partly stated, in former answers, how it came to be made. I made the drawing, prepared the case for an application for a patent, and also made the model, which, by our estimate, was worth about twice as much, or nearly, as the twenty-one dollars, or the amount of the receipt, I not having counted the invention much, and expecting that he would run the invention, or sell it, he alleging that I should be well repaid if he made anything out of it.

Cross-Q. 329. I understand you that there was a paper made containing a receipt and an agreement to assign the half interest to Mr. Kutz on certain conditions. I want to know whether that paper was made and delivered to Mr. Kutz before or after you received the notification from Mr. Irwin?

Ans. I am not certain that such were the conditions of the paper, but a receipt of a small sum of money, whatever it was, and some explanations attached to it—the only paper that ever passed between us—was made long before Mr. Irwin was approached by Mr. Kutz on the subject.

Cross-Q. 330. And was it delivered to Mr. Kutz before Mr. Irwin sent you the notification?

Ans. Yes, sir.

Cross-Q. 331. Was that receipt a receipt by you of money from Kutz, or a receipt by Kutz of money from you?

Ans. As stated, it was a receipt from me of money, by way of starting the application. Of course the money, I suppose, came from Kutz or his intended father-in-law. It was not handled by Mr. Irwin, to my knowledge.

Cross-Q. 332. When you appeared before Mr. Irwin in response to his notification, what did he want with you?

Ans. He did not specify particularly, only that he was employed by Mr. Kutz to attend to his interests in some way connected with that plow attachment already referred to, and asked to appear before him. I don't remember any particular other purport of the notice.

Cross-Q. 333. Did the notice contain any intimation that he would proceed against you in behalf of Mr. Kutz?

Ans. Yes, sir; I gathered that from the notice.

Cross-Q. 334. Now, when you did appear before Mr. Irwin in response to the notice, what did Mr. Irwin state that he wanted of you?

Ans. All that I particularly remember, is that I made him a legal tender of the amount referred to, and, after refusing, he was about to state the course he was going to pursue. I don't remember that I waited or had many words, or heard many, either, from Mr. Irwin, for my main object was to make the legal tender, and then let action be brought, and the worst be done that could be to prove that I had not done my part. I do not think Mr. Irwin stated his course distinctly to me.

Cross-Q. 335. Did Mr. Irwin cause any legal proceeding, of any character, to be commenced against you?

Ans. No, sir; not to my knowledge.

Cross-Q. 336. Do you wish to be understood that, after Mr. Kutz found his invention to be inoperative on hilly ground, he requested you to change the attachment, so as to make it work satisfactorily on such ground?

Ans. He did not use words implying that it was to be a mere change of the sulky attachment patented by him and Mr. Stockstill the year before, but spoke to me of the necessity of making a sulky attachment for plows that would answer that purpose better than his. I do not believe now that he wanted to have his former partner have any show in the improvement. He wanted it to be distinct from that patent, as they were at outs. This I remember clearly.

[*That part of the answer expressing the witness' belief, objected to by Mr. Hill, as irresponsive and mere opinion.*]

Cross-Q. 337. Did he, or did he not ask you if you could change his attachment so as to make it work satisfactorily on hilly ground, and if not, what did he say?

Ans. He may have said so at first, but I am positive his words were not to that effect after we talked on the subject a little while. I cannot

now give the exact words, but he wanted it to be a monopoly in that kind of plow attachment, and free from all claimants. I am impressed at first he did talk differently than he did soon after.

Cross-Q. 338. You say he may have said so at first. Have you any actual recollection whether he did say in fact or not?

Ans. I cannot new recall his words, but I have that impression now that he had some unmechanical idea on that subject.

Cross Q. 339. Did he ask you with reference to that idea, whatever it was, to get a patent on it for him, or to bring your inventive skill to bear upon it to assist in working it out?

Ans. I think he simply said it would be a good thing if it could be made, or words to that effect. I do not remember that we talked about patent then at all, because the invention was not made yet. He simply said he had money in sulky plow, and would like to get it out, and if I could help him it would be a good thing for us both.

Cross-Q. 340. And that was what started you to work as an inventor, to devise an improvement, was it?

Ans. I believe it was. I had no special liking for it, and did it as a matter of duty.

Cross-Q. 341. But you do not remember that he, in fact, asked you to get up a change in the invention which would make it work, do you?

Ans. No, sir; in no particular way at all; only in a general way.

Cross-Q. 342. Did he ask you to go to work on it as an inventor, and make some change in it to make it work, or did he not?

Ans. Not at that time.

Cross-Q. 343. Did he at any time, if so, when?

Ans. He did, soon after the issue of their patent, ask my advice on some changes in the attaching clips of that patented device to avoid clogging, and I freely suggested a change which, I believe, he adopted. I never saw it, but he said it was an improvement the next time I saw him; that he had tried it. That related only to their attachment.

Cross-Q. 344. Is that all that he ever asked you to do on the thing as an inventor?

Ans. No, sir.

Cross-Q. 345. Well, what else did he ever ask you to do on the thing as an inventor?

Ans. As I stated before, he first came to me with an unmechanical idea that the attachment might be adapted for hilly ground, and asked me if I couldn't get it up. After a little conversation, I having declared

that it was impossible, I believed, to adapt the thing as a change merely of their sulky attachment, he concluded, it would be better to have it all new if it could be done in a simple way.

Cross-Q. 346. And did he request you to get up one all new, as an inventor?

Ans. I don't remember; only I remember stating I would study on the matter, and see if it could be done. I had no clear idea at that time, yet.

Cross-Q. 347. Then you don't remember whether he asked you as an inventor to make an improvement that would remedy the difficulty on hilly ground, or whether you volunteered to do it, do you?

Ans. As much one way as the other. I partly volunteered after he talked about the necessity of the case.

Cross-Q. 348. Is it not an unusual occurrence for an inventor to fall back upon his patent solicitor to make his inventions work practically?

Ans. It has often occurred in my practice, and almost unavoidably.

Cross-Q. 349. When Mr. Kutz returned, after you had filed your sole application in the Patent Office, did you volunteer information to him of your action and reasons?

Ans. Yes, sir.

Cross-Q. 350. Without waiting for him to make any inquiries?

Ans. That is what I mean.

Cross-Q. 351. Are you a mechanical draftsman, and able to make drawings, such as are received by the Patent Office in connection with applications for patents?

Ans. Yes, sir; I have made such.

Cross-Q. 352. You are also able to make models for the Patent Office, are you not?

Ans. I have made some.

Cross-Q. 353. Do you generally get up your own models and drawings in your applications for patents on your own inventions?

Ans. Yes, sir; in most cases. Recently I have sometimes employed draftsmen in Washington to renew my drawings after an informal drawing made by me had been admitted provisionally by the office until the case was passed by the examiner to issue.

Cross-Q. 354. When you prepared Drawbaugh's application on magnetic clock, did you make the drawings?

Ans. I did; an informal drawing.

[Recess for dinner, until 2, P. M.]

July 21, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 355. How many of your inventions, and which ones, ever paid you a profit over and above their incidental expenses, including the expenses of the patent?

[*Question objected to by Mr. Storrow, as immaterial and frivolous.*]

Ans. The clothes-hook and line-holder, 1868; safety horse-hitch, 1868; corn-sheller, July 6, 1869; corn-sheller, August 24, 1869; latch and lock, October 26, 1869; hand corn-sheller, April 12, 1870; sash-holder, August 19, 1873; carriage seats, October 25, 1881. Those are all I can remember—some more, some less remunerative.

Cross-Q. 356. Referring to your answers to the seventy-eighth and ninety-sixth interrogatories, were you a man of considerable financial means, or have you always been a poor man?

Ans. I have always been able to meet life's emergencies, and I cannot say that I have been a poor man. I do not know that I owe a man a dollar to-day, and nearly always have had income from some source or other; and my credit has been as good as means or ability, at times.

Cross-Q. 357. Do you own the house you live in, and the shop you work in?

Ans. It belongs to my family, not to me.

Cross-Q. 358. In 1878, when you say Drawbaugh had a talk with you about his telephone, upon what amount of property were you assessed for taxes, taking its assessed value as the standard?

Ans. None.

Cross-Q. 359. Answer the same question for each year from 1866 down to 1878?

Ans. The same, with the exception that I paid income taxes, at times, on my business, and government licenses, both as dealer and as solicitor.

Cross-Q. 360. Have you never, when applying for a patent on your own invention, and when the patent was allowed and was ready to issue on the payment of the final government fee of twenty dollars, found yourself financially unable to pay the twenty dollars within the six months allowed by the Patent Office therefor, and for that reason allowed the application lapse?

Ans. No, sir.

Cross-Q. 361. Have you never stated to anybody that you had allowed any of your applications to lapse, because you had been unable to pay the second government fee within the time allowed therefor?

Ans. I regard this answer as superfluous, in view of my last answer. But for the sake of ascertaining who would have the cheek to swear to the contrary, I answer, I have not.

Cross-Q. 362. Have you ever, in the case of applications for patents on your own inventions, found yourself obliged to get the time for paying the final fee extended, or to renew the application, by reason of your inability to pay the fee within the time allowed?

Ans. No, sir; and I have never renewed an application of my own.

Cross-Q. 363. Didn't you say, right here in this room, since this deposition has been commenced, substantially these words: "I once lost a patent by not paying the final fee in season." And then added: "I was hard-up at that time?"

Ans. If my recollection serves me right, I showed a letter of grant here on a car-coupler, and also a letter from Hon. Ellis Spear, Commissioner of Patents, in which it was stated that the final fee came too late to be applied for the issue of that patent. I remarked, in that connection, that the rules of the office then were different from what they are now. That the final fee was received within the six months, according to law. But the rules were such, that I was deprived of my patent. I was not hard-up at that time, as I can remember now, and for that reason the latter part of the question is a gratuitous, left-handed compliment. There was a stringency in the rules only, and not in my pocket. And my words must have been misconstrued in a dishonorable manner by the persons in this presence who so allege.

Cross-Q. 364. What did you say in that connection, about being hard-up?

Ans. I don't know that I used the phrase at all.

Cross-Q. 365. After exhibiting the letter, did you not turn partially around, and say these exact words: "I was rather hard up at that time?"

Ans. No, sir; this illustrates how language may be perverted. I did say something else. I said there was a hardship in that case; and so there was, that I should be deprived in that manner, and be compelled to renew my application. The last part I have now added.

Cross-Q. 366. You did not renew said application, did you?

Ans. No, sir.

Cross-Q. 367. When you exhibited the letter here, and made the remark about losing your patent, some person present informed you that you might have saved it, even under those circumstances, by renewing it, did he not?

Ans. I believe you stated that; a fact which I did not know, at least at that time, and, perhaps, not until you stated it; but I had thought since the rule was changed, that if the final fee was received within the six months—I had before intended to write to the commissioners, and ascertain about that matter.

Cross-Q. 368. Did you not know that it was always the practice at the Patent Office to permit a mere formal renewal without any extra charge or fee, in cases where the final Government fee was received at the Patent Office within six months from the date of the allowance of the patent, but not in season for the actual making and signing of the patent within the six months?

Ans. I did not.

Cross-Q. 369. Have you been employed by the complainants in connection with this suit?

Ans. No, sir; only by way of a few days' work, which I did some time ago as a citizen.

Cross-Q. 370. Were you paid for that work?

Ans. Yes, sir.

Cross-Q. 371. How much?

Ans. I believe it amounted to about fifty or sixty dollars, minus my expenses.

Cross-Q. 372. When were you first employed for that work, and when did you do the first work under that employment?

Ans. At first I was not employed at all, and did some part by way of accommodation. Then the party took up some of my time in looking up some matters, and he said he would pay me for my time and trouble, or labor. I think that was all some time before the injunction in this case.

Cross-Q. 373. Who was that party whom you refer to?

Ans. I do not know him, personally. He named himself Fred. Weeks at the time, and thereafter.

Cross-Q. 374. Did you ever learn, or hear that that was a fictitious name, and not his true name?

Ans. I did. Sometime afterwards.

Cross-Q. 375. Did he profess to be acting for the complainants in this case?

Ans. Not at first.

Cross-Q. 376. Did he at any time. If so, how long after you first had communication with him on the subject of the case?

Ans. I cannot tell. It was sometime afterwards. It may have been a month or two.

Cross-Q. 377. Did you ever do any work, of any kind, for the complainants, since the granting of the preliminary injunction in this case?

Ans. Not to my recollection. I cannot fix the time of the injunction now. I am informed, now, that it was in November, 1880. I cannot recollect of doing anything since that time, except trying to look up matters that I might possibly be called on to answer, if summoned as a witness.

Cross-Q. 378. Did you go to work looking up matters at the request of complainants. If so, how long ago did they make that request of you?

Ans. I cannot say that they made that request. They simply inquired of me to know what I could testify to. The other part was voluntary, on my part.

Cross-Q. 379. How long ago did they first inquire of you what you could testify to?

Ans. I cannot tell. It was a long while ago. Perhaps a year and a half, or more. It may be less than that, not much.

Cross-Q. 380. Was it before or after the preliminary injunction in November, 1880?

Ans. All that I can remember before that, was what occurred between me and the so-called Mr. Weeks. I know this, because I didn't expect that my name would appear in the injunction papers.

Cross-Q. 381. Did it appear there?

Ans. Yes, sir; I was since shown the printed volume of papers on the motion for an injunction, in which my name appears in connection with file-wrappers, as attorney, when some of the Drawbaugh patents were taken out.

Cross-Q. 382. Why didn't you expect that your name would appear in the injunction papers?

Ans. I didn't know that patents on mere mechanical devices, or such as I was attorney for, had any connection with, or relation to, patents on telephones. I have learned differently since.

Cross-Q. 383. Have you ever heard what was Weeks' true name?

Ans. Yes, sir; I believe it is Harris. I can't give his initials now.

Cross-Q. 384. Where does he live?

Ans. At Laconia, New Hampshire.

Cross-Q. 385. Where did he tell you he lived?

Ans. There, as stated.

Cross-Q. 386. Did he give his name as Weeks, of Laconia, New Hampshire?

Ans. No, sir; only Fred. Weeks.

Cross-Q. 387. Did he ever give you any other residence that Laconia?

Ans. No, sir; but I inferred he lived somewhere not far from here.

Cross-Q. 388. When the papers for the preliminary injunction were preparing did you request that your connection with this case should not appear in them?

Ans. No, sir.

Cross-Q. 389. How long did you render assistance in behalf of the complainants before you became employed by them?

Ans. I was never regularly employed by them; only I assisted now and then when the said Weeks (*alias* Harris) wanted me to do work for him.

Cross-Q. 390. What kind of work did you do for him?

Ans. I ascertained, by conferring with certain parties, what data certain parties could and were willing to swear to in some of the affidavits. In some cases Mr. Weeks had gathered the data, and I arranged them in a form and submitted them to him for his approval before they were submitted to the parties who afterwards swore to them. I went to see several parties and had them appear—only by request—before a notary, and there take their depositions, Mr. Weeks all the while having the control or supervision over everything which I did. At one time I went to Carlisle, Cumberland county, and examined the records to ascertain how Daniel Drawbaugh stood as it regards property owned by him. At one time, later I believe, I accompanied Mr. Weeks, or Harris, to Mechanicsburg, and from thence out to Jacob S. Shopp's and back. I also, at one time, went with Mr. William R. Gorgas to Mechanicsburg to examine the account books of the Drawbaugh Manufacturing Company, then in charge of Dr. Mosser there. I also, at one time, went to Camp Hill, Cumberland county, and interviewed some parties there. This is about all I can recollect.

Cross-Q. 391. What parties at Camp Hill did you interview with regard to this case?

Ans. Jacob Kline and J. Addison Moore.

Cross-Q. 392. You didn't take their affidavits, did you?

Ans. No, sir.

Cross-Q. 393. The fact is, that you assisted in preparing the complainants papers for their motion for preliminary injunction; is it not?

Ans. They were to be used for legal purposes, but I didn't know at that time that they were to be used for an injunction, nor for any other particular purpose, only for legal purposes.

Cross-Q. 394. Did you inform Weeks what you knew about the Drawbaugh telephone?

Ans. Yes, sir; perhaps not all I knew.

Cross-Q 395. Did you inform him of the conversation which you say, in your ninetieth and ninety-first answers, took place between yourself and Mr. Drawbaugh in your private office, he alone being present with you?

Ans. Yes, sir; we talked somewhat on that subject.

Cross-Q. 396. Did you give him the substance of the information which you have given us in your ninetieth answer, commencing with the words: "In one of those private interviews, then, he alone being present with me," and ending with the end of said ninetieth answer?

Ans. Yes, sir; perhaps not fully all that part relating to phonographs, that I have there stated, but pretty near the same matter otherwise.

Cross-Q. 397. Did you make an affidavit yourself for Mr. Weeks in that connection, or at any time before the motion for preliminary injunction was granted?

Ans. No, sir.

Cross-Q. 398. Did you prepare or write any of the affidavits that are contained in that printed book of papers relating to the complainants motion for preliminary injunction, which you say you have seen?

Ans. Yes, sir; but they were somewhat revised by Mr. Weeks aforesaid.

Cross-Q. 399. Designate each of those which, in substance, you prepared or wrote?

Ans. Affidavit of W. R. Gorgas, pages 167 and 168; affidavit of Frederick U. Worley, pages 172 and 173; affidavit of Isaac Lloyd, pages 173 and 174; that is all.

Cross-Q. 400. Did you take any other affidavits which do not appear in the printed book, or assist in taking or preparing any?

Ans. The only other one I can recollect is that of Jacob Shopp, which I assisted in taking only so far as interviewing him was concerned, at his home.

Cross Q. 401. Was Mr. William R. Gorgas present when you wrote his affidavit?

Ans. The form was first written and submitted to him at his home, and he there indicted certain changes in it, and stated, that in regard to the figures for financial statements therein contained, he would have to go to Mechanicsburg first and refer to the account books, and that he would then give me a correct statement that he would be willing to be qualified to. We went over there to Mechanicsburg, and repaired to Dr. Mosser's together, and he gave me a written statement, and on my return. I re-wrote the affidavit, putting it in form and containing the matter he intended it should. It was then submitted the second time to him, and he was satisfied with it, and qualified to it, as it now appears in that book.

Cross-Q. 402. Did you examine the account books at Dr. Mosser's with him?

Ans. I did. Perhaps not as fully as he did.

Cross-Q. 403. Was Mr. Worley's affidavit prepared in his, Mr. Worley's, presence?

Ans. Yes, sir; it was first submitted to him at his home, in a certain form, and, I believe, re-written afterwards, embodying what he desired should be changed, and worded as he afterwards swore to it, and as it now appears in that book.

Cross-Q. 404. Was Mr. Lloyd's affidavit written and prepared in his, Mr. Lloyd's presence?

Ans. Yes, sir; in that sense. It was composed in his presence, and put in that form in which he desired it should be, and in which form it was afterwards sworn to, and now appears in that book.

Cross-Q. 405. When you went to Mr. Gorgas to procure his affidavit, or the materials from which to make out his affidavit, did you represent to Mr. Gorgas that you came as a friend of Mr. Daniel Drawbaugh?

Ans. No, sir.

Cross-Q. 406. Did you represent to Mr. Gorgas that you came in the interest of parties whose interests were adverse to Mr. Drawbaugh in the matter of the telephone?

*

Ans. Not exactly in that way, only stating that what he swore to might be used against Mr. Drawbaugh in some legal proceeding.

Cross-Q. 407. You stated that to Mr. Gorgas, did you?

Ans. Yes, sir; I emphasized the word *might*. I did not know, for sure, whether they *would* be used, at that time.

Cross-Q. 408. Didn't you give him to understand that the affidavit was intended to be used on behalf of Mr. Drawbaugh?

Ans. No, sir.

Cross-Q. 409. When you interviewed Mr. Jacob Kline and Mr. J. A. Moore, at Camp Hill, as you have testified, did you represent to those gentlemen, or either of them, that you called upon them as a friend of Daniel Drawbaugh?

Ans. I don't know that that question was asked me by Captain Moore, or whether I said anything to him about it. Mr. Kline pressed me, by questions, to find out on which side I was, and as he didn't appear to know anything of importance about the matter in controversy, I think I didn't fairly tell him on which side I was, but meant to fairly tell him in case he had knowledge, or to the effect that his knowledge might be used against Drawbaugh.

Cross-Q. 410. Then you didn't go to Captain Moore or Mr. Kline with the statement that you were a friend of Mr. Drawbaugh, and didn't make that statement to either of them, did you?

Ans. I don't recollect. Such might have been inferred, I think, only by inference, and not by my words to them.

Cross-Q. 411. When you visited Mr. Shopp, did you tell him that you were a friend of Daniel Drawbaugh?

Ans. I might have said that as a man I was a friend to him, but as a party, or as it regards the knowledge which he had or would give, might be used against him.

Cross-Q. 412. When you visited Mr. William R. Gorgas, did you tell him that you were a friend of Daniel Drawbaugh?

Ans. I did not say that I was not a friend to him, as a man.

Cross-Q. 413. Did you tell Mr. Gorgas that you were a friend of Mr. Drawbaugh, or did you not?

Ans. I have no recollection that the question was raised by him, or that any statement to that effect was made to him.

Cross-Q. 414. Did you tell Mr. Shopp that you were a friend of Mr. Drawbaugh, or did you not?

Ans. Mr. Shopp was sufficiently clearly informed by our talk and manner that his information was to be used against Mr. Drawbaugh.

Cross-Q. 415. (Question four hundred and fourteen repeated.)

Ans. It appears to me that there was talk that in regard to Drawbaugh, as a man, I was friendly, but that the information was to be used against him.

Adjourned until July 22, 1882, at ten, A. M.

JULY 22, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 416. What did Mr. Harris, *alias* Weeks, give you as his address afterwards, after he admitted his true name?

Ans. L. B. Harris, Manchester, New Hampshire.

Cross-Q. 417. Please state as nearly as you can the time of year, the month, and part of the month, in which you first were approached by anybody in the interest of the complainants with reference to this suit?

Ans. I cannot tell now exactly, but it must have been in the first part of September, 1880, when I had interviews with Mr. Harris, then known as Mr. Weeks, concerning matters pertaining to affidavits; but I had interviews with him a little while before that, when, as I said before, I gave him some information in conversations at my place.

Cross-Q. 418. How long before that were those first interviews with Mr. Harris, *alias* Weeks?

Ans. I cannot tell. It may have been the last week in August.

Cross-Q. 419. Did Weeks, or Harris, tell you how long he had been around here on that business before he interviewed you?

Ans. I either learned from him, or from some other source, probably from him, that it was about four weeks. I did not find that out during the time of the first interviews I had with him.

Cross-Q. 420. When Weeks, or Harris, gave you his true address, as you have just testified, why did he give it to you; was he going away, and was it to enable you to correspond with him?

Ans. Yes, sir.

Cross-Q. 421. Did you have any correspondence with him?

Ans. Yes, sir.

Cross-Q. 422. Will you please produce all the correspondence that you had with him, or all that is in your possession, or within your control, relating in any way to this controversy, or to any proceeding or matter having any connection therewith, and if you have any copies of it, or of any parts of it where you have not the original, please produce the copies?

Ans. I have no copies of my letters to him, and only a few from him to me, to my knowledge, but will do as requested in the question.

Cross-Q. 423. Did you interview Theodore Grissinger or Jacob H. Grissinger, with reference to this controversy, in the summer or fall of 1880?

Ans. No, sir.

Cross-Q. 424. Did you give Mr. Weeks or Harris information about the Grissingers, which resulted in his procuring their affidavits?

Ans. I am not sure but that he knew of them and their relations to Mr. Drawbaugh before he came to me, but I believe we did talk about them.

Cross-Q. 425. Did you inform him of any hostility or hard feeling between the Grissingers, or either of them, on the one hand, and Mr. Drawbaugh on the other hand?

[*Objected to by Mr. Storrow as an assumption of something not proved or testified to by anybody.*]

Ans. I believe not.

Cross-Q. 426. Was the question of their hostility or unfriendliness to Mr. Drawbaugh discussed or talked about between you and Mr. Weeks?

[*Same objection.*]

Ans. I cannot recollect that it was.

Cross-Q. 427. You have mentioned in your testimony the names of several persons from whom you and Mr. Weeks or Harris procured affidavits, and of several other persons whom you interviewed with relation to this case. Did you give him the names of any other persons who you thought would testify against Mr. Drawbaugh's claims. If so, who are they

[*Objected to by Mr. Storrow as not proper cross-examination, and having a different and obvious purpose.*]

Ans. I did give him the name of one other person, but not specially

for that purpose, but simply as a party to whom he could refer for information. That was in one of our first interviews. That party is James P. Matthews, of Baltimore, Md., formerly connected with the *Baltimore American* who, I was aware, had written and printed some statements which appeared in that paper.

Cross-Q. 428. When and how did you become aware of that fact?

Ans. I cannot tell; but I think it was communicated to me first by J. W. Moffitt; but I had brought it up one time or other, and talked it over with Mr. Drawbaugh himself, not knowing, however, then that Mr. Matthews had referred to anything in that article but the magnetic clock.

Cross-Q. 429. When did you bring it up and talk it over with Mr. Drawbaugh himself, and where?

Ans. I cannot tell precisely; it may have been during the exhibition of his clock here in Harrisburg, in 1878.

Cross-Q. 430. Was it at the private interview, he alone being present with you, about which you testified in your ninetieth answer?

Ans. I have no recollection of it in that connection. It appears to me it was before that. We had at one time a conversation about the Gary motor, and about Mr. Drawbaugh being the prior inventor of that, or claiming to be; and it appears to me Matthews was then mentioned in connection with another party, who had been at his shop to take notes on his invention in magnetic clocks, whose name I never heard mentioned. I cannot say that that was the first time I heard Matthews' name mentioned.

Cross-Q. 431. In the conversation between you and Mr. Drawbaugh about the Matthews article, did you have the article present?

Ans. No, sir.

Cross-Q. 432. Did you understand that it had then been published?

Ans. Yes, sir; a good while before that.

Cross-Q. 433. How long?

Ans. I can't tell. My recollection is, no time was mentioned.

Cross-Q. 434. Where did that conversation take place, and who was present?

Ans. I have no distinct recollection of it. It may have been at my place. The only thing I think was talked of in connection with it was the magnetic clock, and it may be, another party was present, but I can't re-call who. Dr. John W. Moffitt often called at my place; it may have been he.

Cross-Q. 435. When you and Mr. William R. Gorgas inspected the

account books at Dr. Mosser's, as you have testified, was a statement in writing drawn up from said books, exhibiting the credits and debits of Mr. Drawbaugh ?

Ans. It appears to me Mr. Gorgas referred mainly to the credits in Drawbaugh's account, and prepared a statement himself on a piece of paper, which he handed me, and by which I was guided in making the statement in his affidavit, composing it accordingly.

Cross-Q. 436. Do you mean credits in favor of the company against Drawbaugh, or credits in favor of Drawbaugh against the company ?

Ans. I mean the latter.

Cross-Q. 437. Did you examine the items that Mr. Gorgas gave you and compare them with the entries in the books?

Ans. Not particularly. I left that to Mr. Gorgas himself, to satisfy his own mind.

Cross-Q. 438. Why did you go with Mr. Gorgas to examine the books. Couldn't you trust him to do it himself without your presence?

Ans. I believe the main object was to gain a little time and to be sure that he would attend to it; he being a member of the bank in Mechanicsburg, and having many engagements to attend to, I went with him to have that affair attended to certainly. I meant by "credits," in my answer to cross-question four hundred and thirty-six, the amount which Drawbaugh received from the company.

Cross-Q. 439. Did you incorporate the written statement that Mr. Gorgas gave you bodily into his affidavit, or did you select such parts as you desired and incorporate them, in substance, into it ?

Ans. All the data were bodily incorporated, without excluding any parts thereof, he remarking that he could bring counter statements, if desired, afterwards; which I said, of course he could, if he saw proper ?

Cross-Q. 440. That who could bring counter statements; Gorgas or Drawbaugh ?

Ans. Mr. Gorgas, in favor of Drawbaugh.

Cross-Q. 441. Then, for the purposes of that affidavit, you desired only a one-sided statement, which should present the account as strongly as possible against Drawbaugh without showing the matter in his favor or the counter statements; did you ?

[*Question objected to by Mr. Storrow, as improper and as assuming.*]

Ans. No, sir; if such is the inference, as now intimated by this question, I was misled in my answers before by the obscurity of the question that preceded, for the important item extracted from the account by

Mr. Gorgas was the balance in that account in favor of Mr. Daniel Drawbaugh, over and above charges against him, amounting to, as I recollect, about eight hundred dollars; but Mr. Gorgas stating that he might bring counter statements from other sources than in the accounts which we examined.

Cross-Q. 442. As you prepared Mr. Gorgas' affidavit, you made it contain the following statement, which I quote from it: "We," (meaning the Drawbaugh Manufacturing Co.,) "were to pay Daniel Drawbaugh at the rate of three dollars per day for his services. But when the business proved unsuccessful in 1870, we settled with him by compromise in that year, at two dollars and fifty cents per day. His wages then amounted to eight hundred and seventy dollars, a few hand-tools, and a second-hand lathe being included in said amount, which were bought of him. The business was discontinued, and the machinery, stock, and right offered for sale, which was effected in 1873, when we sold out the whole concern to Hauck Bros. & Co., of Mechanicsburg, Pennsylvania, at seven thousand dollars." Did you not know that that eight hundred and seventy dollars was not a balance at all, but merely an amount allowed Drawbaugh for wages, tools, and lathe, and off-set on the same books by the charges against him for installments due from him to the said company?

Ans. I have no recollection that the books were made to have such showing against Drawbaugh at that stage of the accounts?

Cross-Q. 443. Did you not know that the books so showed?

Ans. No, sir.

Cross-Q. 444. If you thought at the time that the eight hundred and seventy dollars referred to was a clean balance shown by the books to have been due or paid to Drawbaugh, why did you not make the affidavit say so, instead of using the peculiar and misleading phraseology which you actually did employ?

[*Mr. Storrow objects to the assumption that there is anything peculiar or misleading in the phraseology, and further objects that the question is misleading in quoting part of the affidavit and not the whole.*]

[Mr. Hill offers in evidence, in connection with the question, and by reason of Mr. Storrow's objection, a full copy of said affidavit taken from pages 167 and 168, of complainant's moving papers on motion for preliminary injunction, but only for the purpose of showing what the entire affidavit was, without admitting any of its statements to be true, and said

copy of the affidavit will be attached to the record of this case, and marked "Exhibit, copy of Gorgas affidavit."]

[*Mr. Storrow objects, that the question as now modified imputes that an affidavit filed as a part of the moving papers in this case, was expressed in such language as to present a misleading view of transactions between Drawbaugh and the manufacturing company, and the efore calls attention to the fact that an account of the transaction, given by Mr. Drawbaugh himself, under oath, was filed by the complainants as a part of the moving papers in the case, and printed on pages* 177 *and* 178.]

Ans. The reason why, appears by inference, when I state that my only motive in that affair was to present a fair and substantiated exhibit of Drawbaugh's resources or income, without colored phraseology. And Mr. Gorgas, likewise, desired to be accurate, as he stated, in his statement to which he swore, and of which he approved at the time.

[Recess for dinner, until 2, P. M.]

JULY 22, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 445. From Mr. Gorgas' affidavit, it would naturally and reasonably be understood that Mr. Drawbaugh, in 1870, received the sum of eight hundred and seventy dollars in cash from the Drawbaugh Manufacturing Company, whereas, from the said books of the company, it appears that he did not, but that his labor was balanced against his debts due from him to the company. Do you think the affidavit presented a fair statement of his resources in that particular?

[*Objected to by Mr. Storrow, that the question does not correctly represent the affidavit, which states a settlement, but does not state whether part had been paid before, or part then, or how. And does not correctly state the books set forth in the deposition of William L. Gorgas. And finally, that the total amount paid to him, as stated in the affidavit—if there be therein a statement that eight hundred and seventy dollars were paid to him—is not materially different from the amount shown by the exhibition of the books, as stated in William L. Gorgas' deposition, particularly in answer thirty-three.*]

(Mr. Hill refers to answers twenty-two and twenty-three of the depo-

sition of William L. Gorgas, pages 679 and 680 of defendant's printed record.)

Ans. That would not affect his resources in the least, no more than his debts anywhere else.

Cross-Q. 446. What object had you in putting a statement of his pecuniary resources in that affidavit?

Ans. I cannot say that I had any definite object, except to show that he was earning money, and deriving means from various sources, thus making a showing that he was not a destitute man, in that period of time, but had considerable income, or at least apparently so, so far as it could be gathered.

Cross-Q. 447. And you did not take the trouble to ascertain whether that apparent income was not actually canceled, as fast as it accrued, by his dues to the company, did you?

Ans. No, sir; not particularly.

Cross-Q. 448. Are you the only patent solicitor who has had a business office in Harrisburg or its vicinity, from 1875 down to 1879, or during any part of that time?

Ans. During some parts of the time at least, I was the only one, to my knowledge. There were others, at times, who advertised to do business of that kind, but I do not know how much they accomplished. They mostly soon abandoned the effort, and I was left alone in that business without advertising.

Cross-Q. 449. How many others do you remember of attempting to do such business here within that time, and what were their names?

Ans. I cannot give their names. One represented himself as having been an examiner in the Patent Office, and I think it was in that time, also, that Robert Snodgrass, Esq., gave notice that he would attend to business of that kind, or have it attended to. There was, also, in the summer of 1879, an individual stopping here, and may be here yet, a Mr. Stouffer, if I recollect correctly, who had been in the solicitor busi- in Washington, D. C. There is a Captain Smith who professes to prepare applications for patents, and has for some years placarded his name at hotels for that same business. I know not whether he has done any business alone, or not.

Cross-Q. 450. How long has Captain Smith placarded his business, as you say?

Ans. I think I saw it placarded about the summer of 1879.

Cross-Q. 451. Do you not know that Mr. Snodgrass only received and forwarded applications to attorneys in Washington?

Ans. I know he did that much, but did not know really to the contrary but what he might have made some applications alone, or by having some draftsman in the city assist him. I never inquired of him.

Cross-Q. 452. After you took out your dumping wagon patent of September 14, 1875, did you do any further patent business for Hamilton Baily, of Harrisburg, or did he thereafter employ other attorneys about his patent business?

Ans. Yes, sir; I did some other business for him—took out some patents, worked on models for him—I believe, as late as last year; but he has also employed others.

Cross Q. 453. In your twenty-ninth and thirtieth answers, you say you saw Mr. Drawbaugh at the State fair in the year 1868, and again in the year 1869; where were those State fairs held?

Ans. They were held about two miles north of the city limits of Harrisburg.

Cross-Q. 454. Do you know whether he was exhibiting there on his own account, or for the companies that owned the inventions which he exhibited?

Ans. I inferred he was doing both in the 1868 fair.

Cross-Q. 455. Did you know anything about it, except by mere inference?

Ans. That and the fact that mention in the paper, at that time, so reported him.

Cross-Q. 456. What paper?

Ans. I believe it was the Harrisburg Patriot.

Cross-Q. 457. In answer twenty-nine you say, that at the State fair of 1868, you saw him take a roll of money, bank-bills, about two or three inches in diameter, from his pocket; do you know whose money that was?

Ans. I only know that he had possession of it.

Cross-Q. 458. You say, in answer eighteen, that you visited Drawbaugh's shop at Eberly's Mills in the year 1867, some time after August. In answer forty-nine, you say you visited his shop in 1873. Were you at his shop at any time between those two visits?

Ans. I cannot re-call any visits. I may possibly have visited his shop then.

Cross-Q. 459. In answer fifty-three, you say you were at his shop in

1875. Did you visit his shop at any time between said visit of 1873 and said visit of 1875?

Ans. I cannot re-call any visit in that time, nor now very clearly any visit in 1875. I must have visited his shop sometime between 1873 and 1876.

Cross-Q. 460. You say you were at his shop about March 1, 1876, when you took the inventory. When were you next again at his shop after that?

Ans. If I recollect correctly, it was next day. It took us several days to take the inventory.

Cross-Q. 461. In answer sixty-four, you say that the negotiations with which that inventory was connected, fell through. How soon after the inventory was taken did the negotiations fall through?

Ans. The papers were not withdrawn from the custody of the attorney who drew them up, for about a week after that, but we disagreed on some of the conditions of the lease soon after the inventory was taken—I should say, of the lease and stipulations on the stock.

Cross-Q. 462. Give the name of the attorney to whom you refer.

Ans. Robert Snodgrass, Esq.

Cross-Q. 463. After those negotiations fell through, when were you next at Mr. Drawbaugh's shop, at Eberly's Mills?

Ans. I cannot surely remember whether I was over any more at all, only I sometimes think I was over the year, or about the time that Jacob Kline's new sewing machine journal was about being made. I had a conference then, I think, with both Mr. Drawbaugh and Mr. Kline, but I am not sure that it was in his shop. It may have been in my office. But that is the last time that I have any recollection of a visit to his shop, if I was there then. I am inclined to think the visit was in my office.

Cross-Q. 464. Then the only visits that you can positively remember of making at his shop, were the visit of 1867, the visit of 1873, and the visits during your negotiations with the axle company, about the beginning of March, 1876. Am I correct?

Ans. You are correct, if you include two visits while making the eraser-holder, in 1867.

Cross-Q. 465. How many times were you at his shop, pending the negotiations with the axle company, about March 1, 1876, and through what length of time did those particular visits extend?

Ans. Only during the first and second days of March, both days

being largely occupied with taking the inventory at the company's shop. The day before—I believe it was Feb. 29th—we had taken the inventory at Mr. Grove's office.

Cross-Q. 466. Why did those negotiations with the axle company fall through?

Ans. It was on account of the disposal of the old stock on hand. A misunderstanding arose in this way. I had understood I was to be given said stock in charge, with security to run it out on royalty when manufactured, and was to have the use of the machinery under a lease; but when we came to close the stipulations on the stock, some members of the company then shaped that part of the contract in such a way that it amounted to an actual sale to me on a short time, so that I would have been stuck for the unuseful old stock, which I could not manufacture or dispose of to advantage. I objected to come under that arrangement, and the provisional assignment of the one fifth interest in the Kline patents to me, which had been drawn up and left in the custody of said Snodgrass, Esq., I did not lift, the consideration in it having been a hundred or more dollars, which the company still owed me for services.

Cross-Q. 467. In your answer ninety, you have given a statement of an alleged conversation with Mr. Drawbaugh in a private interview, he alone being present with you. Where was that interview?

Ans. In my office, 119 Paxton street, Harrisburg, Penna.

Cross-Q. 468. How long did it continue?

Ans. It may have been about an hour.

Cross-Q. 469. Have you testified to all that Drawbaugh said to you about the telephone at that interview?

Ans. It is quite likely there was more talk on that subject than I have embodied in my answers to questions.

Cross-Q. 470. State anything else that you remember that he said to you about telephones at that interview, which you have not already testified to?

Ans. It occurs to me that he stated that about the time that he gave up experimenting, the country people had laughed at him a great deal and made light of him; that he was getting beside himself, or something to that effect, to experiment on things of that kind, and that he had given it up, and hadn't done anything at it for a long while.

Cross-Q. 471. Have you now testified to all that you can remember that he said about telephones at that interview?

Ans. I have given about the substance of it, only I remember we

had some talk of what he had really done and accomplished, or rather, failed to accomplish. One thing I recollect; that the unappreciation of the country people was very great against him, he said. The impression left upon my mind was, that what he had accomplished had come as a result after experimenting on the magnetic clock; I never heard him say that he had experimented on telephones before he had experimented on his magnetic clock. He left me under the impression that the experiments on the magnetic clock brought on the other experiment on telephones. At least I never had knowledge that the opposite was the course of his experiments, until I heard it afterwards from others.

Adjourned until Monday, July 24, 1882, at 10, A. M.

MONDAY, JULY 24, 1882.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith, for complainants, and Mr. Hill and Mr. Jacobs, for respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

[*Mr. Hill objects to all testimony as to what the witness didn't have knowledge of, as immaterial, it being only what he did have knowledge of that is evidence.*]

Cross-Q. 472. Referring to that alleged private interview with Mr. Drawbaugh, no one being present, please fix the time of that interview as exactly as you can?

Ans. As near as I can recollect and fix it by a circumstance, it was about a week before the date of the application on the magnetic clock, some time in the month of May, 1878. It was a little after the exhibition of the magnetic clock, here in Harrisburg, closed. I am now informed that the magnetic clock application was filed May 27, 1878. It was about a week before that date, which would make it near May 20, 1878.

(Mr. Hill here puts in evidence a copy, from page 112 of complainants printed moving papers for a preliminary injunction, of a letter purporting to be from Theophilus Weaver, attorney for Daniel Drawbaugh, to the Commissioner of Patents, dated Harrisburg, Pa., Sept. 19, 1878, and being as follows:

"*Hon. Commissioner of Patents.*

DEAR SIR:

Enclosed find P. M. order for fifteen dols., ($15,) the first fee on application for Patent by Daniel Drawbaugh, on Earth Batteries. The model, drawing & specification is forwarded by express. Please admit informal drawing for examination of case immediately, and in due time I will have drawing renewed. This application is supplemental to application by same party on Magnetic Clock, filed May 27, 1878.

Yours truly,

THEOPHILUS WEAVER,

Atty. for Daniel Drawbaugh.

HARRISBURG, PA.,

Sept. 19, 1878.

Exd. J. A. W.

M. McK.")

Cross-Q. 473. The interview to which you refer was about a week before the filing of the original application on magnetic clock, on May 27, 1878, referred to in the last paragraph of the above letter, was it?

Ans. I infer it was that time, or near that time, by a circumstance in the matter, which mainly guides me in fixing the time.

Cross-Q. 474. What was that circumstance? State all the reasons which you have for fixing the date of the interview at that time.

Ans. The drawing was made first in that application, which took me some days to make it. Then I wrote the specification. The latter occupied about twenty pages of legal cap paper. I had to re-write portions, consulting Mr. Drawbaugh, at times, to get his ideas rightly embodied in it. Some of those papers, written in pencil, were lying on my table, and I find on comparison of the writing on the obverse side of the sketch offered in evidence in my testimony, that that language substantially resembles a statement in the specification at about the fifteenth manuscript page of it. I therefore infer that it must have been near the end of the time that I was engaged in preparing that application.

Cross-Q. 475. How long did it take you to prepare the said drawings and specification complete?

Ans. Two weeks, at least.

Cross-Q. 476. Was the application filed immediately after the completion of the specification?

Ans. I think some days elapsed meanwhile before it was sent on.

Cross-Q. 477. How many?

Ans. I cannot say precisely.

Cross-Q. 478. As many as seven a week?

Ans. I am impressed it was not more than three or four days, but the Grissinger's had to come over, and had a consultation; also, Mr. Shettel, I believe, came over before the papers were sent on.

Cross-Q. 479. Was the application filed as soon as it could conveniently be done after you had completed the specification?

Ans. There was some tardiness about it, I recollect.

Cross-Q. 480. How long was it after the application was sworn to by Mr. Drawbaugh before it was filed in the Patent Office?

Ans. It was probably a couple of days, for I know the Grissinger's somewhat hesitated to pay the thirty dollars which I demanded as my reasonable first fee in preparing such a difficult application.

Cross-Q. 481. How long did it take you to make and complete that specification?

Ans. At least two weeks, as I have already stated.

Cross Q. 482. You stated that it took two weeks at least to prepare the specification and drawing. What I want to know is, how long it took to prepare and complete the specification alone after the drawing was completed?

Ans. It may have taken ten days, and I recollect that the claim wasn't completed until in one of the last interviews with Drawbaugh and his partners, shortly before sending it to Washington. I had written the claim before, and waited some days without seeing the parties, and then when they came together some claims were put in better form, as we thought at the time. The whole time on the specification may have been two weeks, including some days of waiting for the parties to appear.

Cross-Q. 483. Referring now to that private interview, no one else being present, is your recollection of what took place at that interview very full, clear, and distinct, or not?

Ans. I cannot say that it is very full. The main parts were very impressive to me at the time, and I believe they are clear in my mind yet. I remember Mr. Drawbaugh's attitude very clearly as we talked about it. We were standing at a little work-table at the south end of my room or office, both standing, when he said it to me; and most of the conversation occurred right there, until a little while after, we went over to the other end of my room, where my writing table is, and my library, and there he made the sketch which I have offered.

Cross-Q. 484. Were you both standing when he made the sketch?

Ans. My impression is, I sat down, and I believe he made the sketch in a stooping position, leaning on the table. This part is not so clear in my mind. When Mr. Drawbaugh came to my place, still, he was generally on his feet and in motion, trying to explain his ideas in some way better than he could with words, and it was so then, to some extent.

Cross-Q. 485. Do you distinctly remember the fact of his making a sketch at all at that interview.

Ans. Yes, sir; it was such a curiosity and was so related to the conversation growing out of the first part of the conversation, that I always call it up as a part of that conversation. I am not so clear but that that same subject covered by the sketch was again referred to by him at some after time, for a particular reason.

Cross-Q. 486. Did he make more than one sketch at that interview, or only one?

Ans. I do not recollect any more. He did, during the making of the application on magnetic clocks, make other sketches on making natural or permanent magnets, and various other experiments which he had been making to increase the life of a permanent magnet; that is, its period of power.

Cross-Q. 487. Can you swear that that is the identical sketch which he made at that interview?

Ans. Yes, sir; that is his sketch made at that time.

Cross-Q. 488. Was the writing on the back of that paper when he made the sketch upon it, just as now appears?

Ans. Yes, sir; I did not particularly notice what was on the back of the drawing until a few days ago, but I knew it was a part of the blotter or first sketch of that specification long ago, and it is my writing in pencil.

Cross-Q. 489. Did you know at the time of the interview that that paper on which the sketch was made was written over in pencil on the back or obverse side?

Ans. Yes, sir.

Cross-Q. 490. You recollect that fact, do you?

Ans. Yes, sir; I gave him the paper, presenting it upside down for him to write the sketch upon.

Cross-Q. 491. And you swear that that is the identical paper, and the identical writing that was then on it, do you?

Ans. Yes, sir.

[Mr. Hill requests the Examiner to certify here on the record all the writing that appears on the back of that paper.

The Examiner certifies that it is as follows: "force, as then escapement d^1 becomes a circuit conductor by bearing against part b'', and magnet Q is electrified, and its poles being opposite in kind to those of magnet M, the descent of pendulum from N^2 to C^1, will be accelerated by gravity plus the electric force."

All the above appears in pencil, the erased words having been omitted by the Examiner. On turning the paper upside down, the following words appear written in ink: "beds to have, (one more word too indistinct to be read,) Earth.]

Cross-Q. 492. Was the paper at the time of that interview the same in size as now?

Ans. No, sir; I clipped off parts with a pair of scissors, to be more convenient to put away.

Cross Q. 493. When did you do that?

Ans. I believe it was right after Mr. Drawbaugh left.

Cross-Q. 494. Why did you then deem it of such importance as to carefully file it away, first having clipped off all unnecessary paper?

Ans. Firstly, because it is my habit to do that with important sketches which others leave on my table; secondly, because Mr. Drawbaugh then spoke about taking out a patent on the device in question, or something related thereto, and I deemed it important to preserve the sketch, as I then understood he had not then built his model of it, but had merely made certain successful experiments on it.

Cross-Q. 495. Now, will you please, from your unaided memory, set forth in the order in which it occurred, all the conversation between you and Mr. Drawbaugh at that interview, on the subject of telephones, to the fullest extent of your present recollection, and giving the exact words used, so far as you remember them?

Ans. I cannot give his exact words or mine either at that time, only remembering here and there certain expressions Mr. Drawbaugh did say, edging up to me as we stood at the table at the south end of my room: "I, too, experimented on telephones." "Did you?" said I; "When was that?" "It was long ago. It was before Bell's telephone came out. I was at it a good deal, and I had some results, too. The country people made so much fun of it and me, I gave it up." I made some inquiries then, what he might have done at that early period. The impression left on my mind by his words then, was that he had begun experiment

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ing to make a clock tell the hours audily and loud without striking them in the usual way. I could not understand, then, and never could since, how he could connect a telephone with a clock; but I understood from that conversation that his experiments were with temporary apparatus—something gotten up in a temporary way—that he had nothing to show on hand then like a speaking telephone, by which he could prove that he had ever reduced it to practical form in those early experiments. He stated that his experiments, for whatever purpose in view he had, were not altogether satisfactory, but he had some results. I put it sharply to him, to see if he might have a chance to establish a claim as the first inventor of the telephone. He admitted it was too late; he had given up, and now it was too late, and he would not pretend now to put in a claim for it, but that he still thought that he could get valuable improvements patented. Then came up the main subject, why he came to me at that time; to consult me to take out a patent some time on something related to that sketch on file in my testimony. The impression left on my mind was, that he had obtained no good results from those early experiments from the fact that the country people ridiculed him so much about it, as I thought then, that if he had obtained satisfactorily results, the country people would have applauded him, but I did not state that to him. He seemed to have gotten his mind off that subject of early experiments, and had attached no importance to it himself. Before making the sketch he stated that he had also experimented on something like the phonograph before Edison came out with his invention on it; that he had made various experiments to get good vibrations with plates or diaphragms. That is about all I can remember.

[Recess for dinner, until 2, P. M.]

JULY 24, 1882.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 496. Have you now stated, in your last answer, all that Mr. Drawbaugh told you about the telephone at that interview?

Ans. He stated the object of that last device, to which the sketch referred, was to improve the delivery of the sound in some way, to make it louder, and that it might be used in connection with a telephone, as

well as with a phonograph, if I remember rightly. At any rate, it was to improve the loudness of the clock's announcement of the hours, and before leaving, I believe he requested me to give him a cut or book to show the construction of the human ear, stating that he would like to study the drum of the ear; that is, the tympanum and the little bones near it inside. I searched my libra y in the dwelling-house, and I found "Hooker's Elementary Physiology," which I gave him. It had a cut which pretty well illustrated the human ear, and he took it along. He never told me he had a telephone as such; not before that time, nor at that time.

Cross-Q. 497. Did you understand from his conversation at that interview, that the only thing he had been working on in the nature of a telephone, up to that time, was the device which he had purposed to use in connection with the clocks?

Ans. No, sir; not quite in that way, because he commenced talking about telephones first without reference to clocks, because he mentioned clocks in the after part of the conversation. I may only wrongly have inferred that, and got telephones and phonographs a little mixed in the after part of the conversation, for I know that he mentioned Bell's name in the first part.

Cross-Q. 498. Then you did, at the time, infer that the telephone which he had been working upon was to be used in connection with a clock, did you?

Ans. In the after part of the conversation. It did not appear impossible, so far as I understood it then, and he talked of both in connection with his proposed improvement. That was a part I didn't fully understand.

Cross-Q. 499. What did not appear impossible, so far as you understood it then?

Ans. That his improvement might be used with a telephone, and both with a clock, but how I could not understand.

Cross-Q. 500. Did he make any sketch or sketches to show how his telephone was constructed, except the sketch which you have put in evidence?

Ans. No, sir; not that I recollect.

Cross-Q. 501. Did he tell you that he had been able to actually talk through his telephone, or been able to get words through it, so as to be distinctly heard and understood through the medium of electrical transmission?

Ans. No, sir; it was only on reproducing some kinds of sound. Speech was not mentioned, except in connection with the new improvement.

Cross-Q. 502. What kind of sounds were those mentioned as reproduced, or intended to be reproduced, by it in its original form?

Ans. The kind was not stated. Only to repeat sounds.

Cross-Q. 503. State just exactly what he said about that, as fully and clearly as you remember it.

Ans. I think I have stated the exact words—"to repeat sounds." I am not positive. It is too long for me to remember the exact words.

Cross-Q. 504. Did he say they were to be transmitted or repeated by electricity?

Ans. He didn't mention that. I took it for granted that he was experimenting by the aid of electricity.

Cross-Q. 505. Didn't you ask him whether he had ever transmitted speech by his apparatus?

Ans. I did, when I asked him whether he had a practical working telephone. He said he had nothing to show now or then. That what he had used was only a temporary contrivance. I didn't put the question in the words of your question.

Cross-Q. 506. Did you understand that the improvement that he was then talking of getting up, was one which he had already constructed, or one which he proposed to make? I mean the new improvement referred to in your five hundred and first answer.

Ans. It was one which he had demonstrated successfully. He wanted to get it up in proper form, and have it patented.

Cross-Q. 507. Was that sketch which you have put in evidence made to illustrate that new improvement?

Ans. Yes, sir; that is my recollection of it.

Cross-Q. 508. Was that new improvement to be applied only to clocks, as you understood it?

Ans. No, sir; he said there was a great field yet for improvement in both telephones and phonographs. And this re-calls—I can almost state his words, I think: "They haven't got it yet."

Cross-Q. 509. Did he tell you when he made that improvement, and when and how he demonstrated its success?

Ans. He did not, to my knowledge. I can't remember.

Cross-Q. 510. Did he tell you how long he had been working on that new improvement, or give you to understand how long?

Ans. I can't re-call anything about that matter. It appears to me, or is my impression, that it was a good while. But there is nothing clear about the time.

Cross-Q. 511. Did he tell you how long it was, from the time when he gave up his telephone experiments till he went to work on this new improvement, or give you to understand how long it was? If so, what idea did you get as to that?

Ans. He didn't mention any time, that I can recollect, only that his improvement was in the direction to perfect the telephone, as well as the phonograph. I know I had not considered the phonograph as worth very much, but I then thought he might make some use of it after awhile.

Cross-Q. 512. Did you ask him to bring over his new improvement, and let you see it?

Ans. No, sir; I didn't know that he had it yet, and supposed that he would bring it when he was ready?

Cross-Q. 513. Did you ask him the direct question, whether he had any of his experimental machines that were made before this new improvement, or whether they were in existence?

Ans. I think I did, only in reference to his earlier experiments. He had partly stated that matter already, himself.

Cross-Q. 514. What had he said about it already, himself? Give us as nearly as possible his words, if you can remember them?

Ans. I have already stated, as near as I can recollect, that what he had used was a temporary apparatus, taken apart and put away, and he didn't know whether he could get it together again. It was only to try an experiment, he said. That is all I can recollect of it.

Cross-Q. 515. Did he say that he had given up his telephone experiments before Bell had entered the field, or afterwards?

Ans. I understood it was before Mr. Bell came out with his telephone.

Cross-Q. 516. Was any mention made as to the time when Mr. Bell came out with his telephone?

Ans. I have no recollection of any particular date being mentioned.

Cross-Q. 517. Did he tell you how many different forms of telephones he had gotten up before he gave up his telephone experiments?

Ans. No, sir; he only said he experimented a good deal.

Cross-Q. 518. Did he tell you whether he experimented on the magneto-telephone or carbon-telephone in those experiments of his?

Ans. He didn't specify.

Cross-Q. 519. Didn't you ask him which it was?

Ans. No, sir.

Cross-Q. 520. Did you know the difference between the magneto-telephone and carbon-telephone, at that time?

Ans. I did not; and there is a circumstance which raises a question right here. Late in the fall of that year, probably in November, Mr. Drawbaugh got me to look up some patents, particularly all of Brush's patents, referring to carbon burners and electric lights, and also the pa-t ents relating to the vibratory or trembling sign then displayed in Daniel Hamaker's drug-store window, which latter I found covered by the patents of Blowney, in 1876, and patent of Blackmer, in 1878. This leads me to think that was the first time Mr. Drawbaugh ever referred to carbons in connection with his early experiments, except coke, in connection with his earth-battery plates.

Cross-Q. 521. When you asked him about his telephone experiments, I understand you to say that you asked him only about his earlier experiments; is that so?

Ans. Yes, sir; and up to the time of Bell's patent.

Cross-Q. 522. State exactly what question you did ask him on that point?

Ans. I mainly let him talk. He opened the talk, and now and then I put in a word to get him to tell what he had done before. He told it pretty much all of his own accord. I wanted to know what he had done, and what shape he was in, to see if he could substantiate his claim as the prior inventor of the telephone.

Cross-Q. 523. Did he tell you when he first went to work at telephone experiments?

Ans. No, sir; but it was long ago, he said.

Cross-Q. 524. Did you get the idea that it was about the time of Bell's patent, or several years before that time?

Ans. I don't know how long before Bell's patent, but he said that his crude experiments were before Bell came out—a good while before Bell came out.

Cross-Q. 525. Was the date of Bell's patent mentioned in that interview, or anything said about it?

Ans. No, sir.

Cross-Q. 526. Did you at the time of that interview know the date of Bell's patent, or either of them?

Ans. Only the one patent, the Centennial year patent.

Cross-Q. 527. Did he state that he had given up his telephone experiments before the date of Bell's Centennial year patent, or after it?

Ans. Not in so many words, but so it was conveyed to my mind, that he gave up his experimenting before the Centennial year, but what was in Mr. Drawbaugh's mind I cannot tell. I supposed it was commonly understood that Bell came out publicly about the Centennial year.

[*Last clause of the answer objected to by Mr. Hill, as irresponsive, mere opinion, and incompetent.*]

Cross-Q. 528. When he said that he had had some results in his earlier experiments, didn't you ask him what those results were?

Ans. No, sir; he went on and stated them of his own accord.

Cross-Q. 529. Well, what were they, according to his statement?

Ans. He said he had some results in reproducing sounds, only in a general way. He didn't particularly lay stress on what is now known as articulate sounds. He didn't mention speech or words. I didn't know but what they were musical sounds, as he didn't specify.

Cross-Q. 530. And you didn't ask him whether they were musical sounds or not?

Ans. No, sir; I thought that was understood that the telephone was to deal with speech, but speech was not mentioned.

Cross-Q. 531. Did he use the expression—the words—that he had given it up, or some other form of expression, and if so, what?

Ans. That is what he said.

Cross-Q. 532. Did he state why he had given it up. If so, why?

Ans. Both because it wasn't fairly practical or successful, and because he was ridiculed by the country people.

Cross-Q. 533. Give his language, as closely as you can, on that point.

Ans. It is only a general impression I have clear, but it appears to me he said: "I was much opposed, and laughed at by the people. It wasn't altogether successful. I had some results when I gave it up, and now it is too late for me to hope to have any standing or any show. I didn't go far enough. But I still think I could get up some improvements on it. They haven't got it yet."

Cross-Q. 534. When did he say that. When he was standing with you at the south end of the room?

Ans. Yes, sir; before he made the sketch.

Cross-Q. 535. Why didn't you state all that before, when I asked you for all of his conversation. Didn't you recollect it?

Ans. I sometimes recollect things better after I am spurred by questions, but my recollection is not very clear on it yet. That was the tenor of the talk.

Cross-Q. 536. Did you get any impression from his conversation as to how he was led to first make experiments on the telephone?

Ans. Not particularly, only that some way I got the impression that it was after he experimented on clocks. Why I got that, I cannot tell now.

Cross-Q. 537. Did you get the impression that the clock experiments led to the telephone experiments?

Ans. Yes, sir; some way that part of the apparatus was used in the temporary experiments. I may have inferred this.

Cross-Q. 538. Do you mean that part of the clock apparatus was used in the temporary telephone experiments?

Ans. Yes, sir; as he had no instrument, I somehow inferred that he had made an experiment some way with what he had used on the clock, but I have no words that way that I can recollect. He never told me that he had a telephone, at that early time.

Cross-Q. 539. Did you get an impression of what was the purpose or object of that temporary experiment. If so, what was it?

Ans. It was to reproduce sounds.

Cross-Q. 540. Is that the best and fullest answer you can give to that question?

Ans. That is a fair answer, in connection with the statement that Bell's telephone was mentioned. And that he stated he, too, had experimented in that direction, before Bell came out.

Cross-Q. 541. Did you get the impression that that first telephone experiment was in the nature of an attachment to the clock?

Ans. No, sir; only that I knew he was very much absorbed on the clock, in experiments, as I stated elsewhere in the beginning of the testimony.

Cross-Q. 542 and 543. In answers five hundred and thirty-seven and five hundred and thirty-eight, you say you got the impression that a part of the clock apparatus was used in the temporary telephone experiments, did you get the impression that part of the clock apparatus was taken out and used separately from the clock in the telephone experiments?

Ans. He didn't say anything to me about that, but I inferred that was the way that he had made a temporary experiment, at first, or in

the early part, but it was only because he didn't appear to have any special instrument left to show what his early experiments were.

Cross-Q. 544. Having inferred that he took out a part of his clock apparatus and used it separately from the clock in his temporary telephone experiments, did you get the impression that that was done for the purpose of improving the clock in any way?

Ans. No, sir; that part came out more distinctly in the after part of the conversation, in connection with the improvement he was about to make.

Cross Q. 545. How do you reconcile this last answer with your four hundred and ninety-sixth answer, in which you say: "I made some inquiries then what he might have done at that early period; the impression left on my mind then by his words was, that he had begun experimenting to make a clock tell the hours audibly and loud without striking them in the usual way?"

Ans. I stated before that I could not understand that part, how the telephone could be used in that connection. Yet notwithstanding that, I did get the impression that either the telephone or phonograph was sought by him to be made use of on his clocks somehow for that purpose; and I had qualified my answer before, that I could not understand how he meant to do so. He tried to explain that to me at the time he made the drawing.

Cross-Q. 546. Is that the best explanation you can give of the apparent discrepancy in your statements?

Ans. I will have to ask those two answers to be read another time, if you please. (The examiner reads them again.) My answers do not preclude the possibility that he still earlier experimented on the phonograph, or something of that nature, in connection with the clock. I don't really know when he claimed first to have experimented on the phonograph, only that he claimed to have done it before Edison.

Cross-Q. 547. The first experiment that he mentioned to you was the experiment he made in connection with the clock; was it?

[*Mr. Smith objects to the assumption of the question, that Mr. Drawbaugh had described to the witness experiments with the telephone in connection with the clock, witness having repeatedly stated that he merely inferred that some parts of the clock were used in the earlier experiments.*]

[*Question withdrawn by Mr Hill.*]

Cross-Q. 548. The first experiment that he mentioned to you was the

experiment which you understood at the time to have been made in connection with the clock; was it?

[*Mr. Smith objects, that the question assumes that Mr. Drawbaugh had described some specific experiment, which the witness has never stated, having only stated that he had experimented early, or to that effect; and that the expression "in connection with the clock" is not an expression which the witness has used, and does not properly convey the idea which the witness expressed, that he inferred that some parts of the clock were used in the early experiments on the telephone.*]

Ans. If the word experiment is meant to signify experiments, as seems to be intended, then I reply that I meant to say only, that the impression was made on my mind that Mr. Drawbaugh's early experiments in telephones were made subsequent to his experiments on his magneto-electric clock, for the reason already stated, that he did not appear to have a distinct and special apparatus extant to show what he had experimented with at that early time.

Cross-Q. 549. Didn't you get the impression that his first experiments in connection with telephones were begun for the purpose of making a clock tell the hours audibly and loud, without striking them in the usual way?

Ans. I had some obscure notion of that kind; but if I said so positively, it is a surmise on my part, because I did not really know such to be a fact, I only knowing in that regard that the magnetic clock was an all-engrossing subject with him long ago—before I ever heard that he had any idea of making a telephone, and that when he, in the afterpart of the conversation, referred to the improvement having a relation to clocks by aid of the phonograph or telephone, my mind naturally reverted, that he might have begun his experiments for that purpose in beginning on the telephone.

Adjourned until July 25, 1882, at 10, A. M.

JULY 25, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 550. Referring to that sketch which you say Mr. Drawbaugh made at that interview, did he explain to you what the different parts of the sketch represented?

Ans. Not particularly the lower part, which I inferred was a telephone, but he did explain the top part to some extent.

Cross-Q. 551. Then he did not tell you that the lower part was a telephone, but that was only one of your surmises, was it?

Ans. The main talk was on telephones, then came his explanation how he meant to improve it, stating that his improvements might apply to the phonograph as well.

Cross-Q. 552. Please make a copy of said sketch, and letter the different parts, and explain what those parts severally were, as Mr. Drawbaugh explained them to you at that interview?

Ans. I will have to be guided by the sketch offered in evidence.

[Examiner hands the witness the sketch.]

[Witness draws sketch and continues.]

There is a rough sketch of the sketch, with lettering on it.

Cross-Q. 553. Please describe all the parts that you have designated by different letters, giving, as nearly as you can, the description which Mr. Drawbaugh at that time gave you?

Ans. *A* is the base or lower part, which I understood to be a telephone. *B*, the open end of it, but not explained by Mr. Drawbaugh. *G*, a vibratory arm or frame. *H*, the long arm or end of it. *K*, the point of attachment of said vibratory frame; *a*, transverse pieces on said frame. *D* an armature; said frame with armature I termed the top part. These and their communication with the lower part Mr. Drawbaugh tried to explain to me, stating that the vibration at the point *C* would be enhanced or increased, so that not only an equal amount of vibration with that of the lower part would be realized, but much more. The point *E* is simply the return of the frame, as I understood it. The parts *a* were not clearly explained to me, but he did speak of them.

Cross-Q. 554. How was the vibration at the point *C* to be enhanced or increased, so that not only an equal amount of vibration with that of the lower part would be realized, but much more?

Ans. I inferred it was by the reaction of the vibration upon the free end or long arm of the vibratory frame above.

Cross-Q. 555. Was the free end or long arm of the vibratory frame above to be fastened to anything, or bear against anything; if so, what? Or was it simply to project into the air?

Ans. It was fastened at its heel, or part *K*, and its other end was in contact with, or close proximity to the part beneath; and I understood it was to be so close as to have magnetic communication in some way.

Cross-Q 556. Magnetic communication in some way with what?

Ans. With or by the armature *D*. I had not explained to me what was beneath it.

Cross-Q. 557. What was the frame which you call the vibratory frame to be made of?

Ans. I cannot recollect now.

Cross-Q. 558. Do you remember whether it was metal or not?

Ans. I cannot.

Cross-Q. 559. Was the end *E* to be fastened to anything, or simply to project in the air free?

Ans. I understood it was to be free, and above the rest of the apparatus.

Cross-Q. 560. Did you understand that that frame from the armature *D* out to its extreme end at *E* was to be free, or, in other words, not in contact with anything?

Ans. I understood it to be free, but nearly in contact.

Cross-Q. 561. Nearly in contact with what?

Ans. The part below.

Cross-Q. 562. Did you understand that the pin *C* was to be fastened to the armature *D*?

Ans. I believe that was his explanation of it. It was to be carried by it.

Cross-Q. 563. What was the frame *G* fastened to at *K*?

Ans. I can't recollect that part of the explanation.

Cross-Q. 564. From the point *K* to the armature *D*, was the frame *G* in contact with the top of the instrument; that is, the top of the part indicated by *A*?

Ans. No, sir; only at *K*.

Cross-Q. 565. Was there a diaphragm in the instrument anywhere; if so, how many and where?

Ans. Yes, sir; it was mentioned as being in the part below.

Cross-Q. 566. Where, in the part below, near the letter *A* or near the letter *B*?

Ans. The letter *A*.

Cross-Q. 567. Was the instrument to be actuated by sound-waves or sound?

Ans. I understood it so.

Cross-Q. 568. Was the armature *D* to be attached to the diaphragm?

Ans. That part I didn't clearly understand, whether it was attached to the end of the vibratory lever or to the diaphragm; but on reflecting on it afterwards, I thought that it must have been attached to the vibratory arm.

Cross-Q. 569. By the vibratory arm, do you mean the part you have marked *G*, extending from *K* to *E*?

Ans. No, sir; only part *H*.

Cross-Q. 570. The part *H* extends from *D* to *E*, does it not?

Ans. Yes, sir.

Cross-Q. 571. Is not that part *H* merely a continuation of the part *G*?

Ans. Yes, sir; I so understood it.

Cross-Q. 572. Was the part *G*, *H* an arm or a frame?

Ans. In speaking of it, I termed it a frame. But I also termed the part *H* an arm.

Cross-Q. 573. Did you understand the armature *D* to be attached to part *G*, *H*, about at the middle of said last-named part *G*, *H*?

Ans. No, sir; if I understand the question right.

Cross-Q. 574. How do you understand the question?

Ans. That it considers the part *G*, *H* one continuous frame.

Cross-Q. 575. Well, was it not one continuous frame?

Ans. Yes, sir.

Cross-Q. 576. Well then, considering it as one continuous frame, was the armature *D* attached about at the middle of said frame, or not?

Ans. It was not. But it was vertically situated about at its middle.

Cross-Q. 577. Was it not attached to said frame *G*, *H*?

Ans. I am not positive about that, as I stated before. My impression is it was.

Cross-Q. 578. Did you understand the diaphragm to be situated right along the top of the part marked *A*, close to the upper edge of it, and extending from the end or edge *L*, to the end or edge *N*?

Ans. Yes, sir; about there.

Cross-Q. 579. Was there a mouth-piece to the instrument. If so, where was it?

Ans. There was nothing said about it.

Cross-Q. 580. Where were the sound waves to enter the instrument, in order to produce their mechanical effect upon it, or through it?

Ans. There was nothing said about that, either.

Cross-Q. 581. Did the instrument have one diaphragm, or more than one?

Ans. Only one, that I heard of.

Cross-Q. 582. Did you understand that the sound waves were to act on that diaphragm, to throw it into vibration, and thus operate the instrument?

Ans. Yes, sir.

Cross-Q. 583. Did Drawbaugh explain to you how he proposed to apply that instrument to a clock?

Ans. No, sir; not particularly.

Cross-Q. 584. Did he say he proposed to apply it in connection with a clock?

Ans. Yes, sir; he spoke of applying the top part of it in some way.

Cross-Q. 585. Did he say anything about using an electro-magnet or a permanent magnet, in connection with this instrument shown in the sketch?

Ans. I cannot re-call his words exactly. I am impressed something was said about a permanent magnet.

Cross-Q. 586. Do you remember of anything being said about an electro-magnet, in connection with that sketch, or the instrument therein shown?

Ans. I cannot recollect distinctly. I only know that a magnet was mentioned, and I am not positive which.

Cross-Q. 587. Was anything said, in that conversation, about different kinds or constructions of magnets?

Ans. Not in that conversation, but near that time.

Cross-Q. 588. What did you understand to be Drawbaugh's object in commencing that conversation?

Ans. He seemed to have come on purpose, to talk about the intention he had of taking out a patent on that improvement.

Cross-Q. 589. Did he ever mention that improvement to you from that time to this, or did you ever mention it to him?

Ans. No, sir; I was waiting for him to turn up with a model some day.

Cross-Q. 590. Did you ever mention it to Mr. Jacobs or Mr. Chellis, or any of Mr. Drawbaugh's friends. And if not, why not?

Ans. I don't recollect that I did, except, perhaps, I may have given a hint to Mr. Jacobs during the taking of Drawbaugh's testimony on the faucet, when a certain pass-book was produced containing a sketch—something relating to telephones and phonographs—but I never explained it, to my knowledge. I think this was because Mr. Drawbaugh wanted to keep it concealed for the time being.

Cross-Q. 591. Do you swear that you did give a hint of it to Mr. Jacobs?

Ans. No, sir.

Cross-Q. 592. Did you regard it as a confidential communication from Mr. Drawbaugh to you?

Ans. I did, until I heard indirectly that nearly everything that Drawbaugh had done in his experiments was brought forward in the taking of his testimony in this case.

Cross-Q. 593. To whom did you first communicate knowledge of it, and when?

Ans. I never explained it to any one, until about two or three weeks ago I showed it to Mr. Storrow—made a few remarks about it. I did show it to Mr. Harris after Drawbaugh's witnesses had been secured by taking their affidavits; but I didn't explain it to Mr. Harris as I have done here.

Cross-Q. 594. When did you show it to Mr. Harris?

Ans. It was late in 1880 some time.

Cross-Q. 595. Was it while you and Mr. Harris were running around together, trying to pick up testimony against Drawbaugh, prior to the preliminary injunction in this case?

Ans. We didn't run around together. We only went together once—to see Mr. Shopp—and I think it was in one of the last interviews that I had with Mr. Harris that I showed it—probably after the injunction.

Cross-Q. 596. Did you ask Mr. Drawbaugh's permission to show it to Mr. Harris?

Ans. No, sir. I didn't consider it his property, nor that I was his servant?

Cross-Q. 597. You felt free to inform his opponents of his confidential communications to you, did you?

Ans. Yes, sir; and more than that.

Cross-Q. 598. When Drawbaugh, as you say, in that interview told you that he had given up his telephone experiments, did he tell you that he had given them up only for the time being, or that he had given them up completely without the intention of resuming them?

Ans. He didn't qualify his words, but his manner qualified them.

Cross-Q. 599. Then he didn't say that he had given them up for the time being, did he?

Ans. He unqualifiedly stated that he had given them up—had stopped experimenting in that early period.

Cross-Q. 600. Didn't he say that he had given up his experiments for the time being, or words to that effect? Didn't he use that expression at all?

Ans. No, sir; I have no recollection of any such expression being used by him.

Cross-Q. 601. Then, when in your ninetieth answer you swore that he stated to you in that interview, "that he had given up his experiments for the time being." You swore to what was not true, did you?

Ans. No, sir; it is a false way of putting my language. I did not quote Mr. Drawbaugh's language. Mr. Drawbaugh's meaning is put in my language. The question is a perversion, so far as it relates to the authorship of language. I stated in general terms the substance of Mr. Drawbaugh's communication to me, and such I have repeatedly stated.

Cross-Q. 602. Did you ever tell Mr. M. W. Jacobs, of Harrisburg, that Daniel Drawbaugh had shown you his telephones years ago?

Ans. I never stated anything of that import to any dead or living man.

Cross-Q. 603. I wish to refresh your recollection a little. Before Mr. Jacobs moved his office to the room where it now is, and in the summer of 1880, before you had known or met Harris, *alias* Weeks, did you not stand with Mr. M. W. Jacobs, on the steps in front of his office, at No. 5, North Third street, Harrisburg, Penna., and did you not then and there have a conversation with Mr. Jacobs concerning Daniel Drawbaugh and his electric telephones, a portion of which was substantially as follows: Mr. Jacobs asked you how long you had known about Dan's (meaning Daniel Drawbaugh's) telephones, to which you replied, "Why, Dan must have been at that a long time. I saw his instruments years ago?"

Ans. No, sir; Mr. Jacobs must have mistaken the individual, for I

am positive I never saw any of Mr. Drawbaugh's telephone instruments before I saw them in this room, about ten days ago, and I had quite a different conception of the form of his instruments from what they are now seen to be, only so far as I had gathered from that sketch, which was my sole means of knowledge in that direction. I will not deny that I may have had a coversation in which I may have made some remarks on Mr. Drawbaugh's experiments, but if I used language implying that he had instruments years ago, it was but an echo of what Mr. Jacobs had stated himself, or some one else, for I had no such knowledge.

[Recess for dinner, until 2, P. M.]

JULY 25, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 604. You do not mean to say that the examiner did not take down your ninetieth answer correctly, as you gave it, do you?

Ans. No, sir.

Cross-Q. 605. Have you examined your papers for the letters that passed between you and Harris, *alias* Weeks, as I requested?

Ans. Yes, sir.

Cross-Q. 606. Did you find any? If so, please produce them in order that copies may be made by the examiner and put in evidence.

Ans. They are here—only the letters from Mr. Harris to me. I have no copies of mine to him.

[Mr. Hill puts the letters now offered in evidence, there being five of them, dated respectively October 18, 1880; October 22, 1880; October 22, 1880; October 30, 1880; and November 3, 1880.]

The letters are as follows:

(Printed heading.)

"Manchester (N. H.) Telephone Exchange,

"L. B. Harris,\Manager."

(Letter.)

"OCT. 18th, 1880.

THEO. WEAVER, Esq.,

DEAR SIR:

I got a telegram that took me away from Harrisburgh before I could see you.

*

I want to get you to quietly keep your eye peeled, and if you learn anything of our friend's movements let me know. I want to get you to go over to Camp Hill and have a talk with that man over there—I can't re-call his name—who is one of their principal witnesses, and make memoranda of what he says. I want you to see him before Wednesday, if you can, if you find out of any other witness of theirs that is important I wish you would see them and get what you can from them. There is a possibility that they will want to change their evidence after seeing ours. I will write you again in a day or two.

Yours truly,

L. B. HARRIS."

(Printed heading.)

"Manchester (N. H.) Telephone Exchange,
L. B. Harris, Manager."

(Letter.)

"OCT. 22, 1880.

THEOPHILUS WEAVER, Esq.:

DEAR SIR:

I would be free to show the witnesses on the other side Matthews, and Rockafellows, and other affidavits—it will tend to make them cautious; any little attention you can show Lloyd and Worley will be timely, and if you think best, I would let them look the evidence over.

The best way to do any kind of business is open and above board, when we can, and I can't see any objections to your showing people who are interested as much as you think best; it will be a good point to make, that Dan seems to be out of the case, and that Jews are the persons now interested.

Yours truly,

L. B. HARRIS."

(Printed heading.)

"Manchester (N. H.) Telephone Exchange,
L. B. Harris, Manager."

(Letter.)

"OCT. 22, 1880.

THEOPHILUS WEAVER, Esq.:

DEAR SIR:

Yours of the 20th came to hand this day. Can you get me a copy of the testimony in the "Kline interference case?" Keep at them

as you can; on Nov. 1st send me your bill, and I will see that you get your pay; it will be better to make it at the end of each month, I think —won't that be the best way? I will have some copies of the printed evidence to send you in a day or two.

Yours truly,

L. B. HARRIS.

Make bill to 'The American Bell Telephone Company.'"

(Printed heading.)

"Manchester (N. H.) Telephone Company,
L. B. Harris, Manager."

(Letter.)

"OCT. 30, 1880.

T. WEAVER, Esq.:

DEAR SIR:

Yours, with enclosed bill, is received, and I have approved it and forwarded it to the company for payment, which they will do as soon as possible.

I am sorry that you could not have seen those other parties before Chellis and Jacobs had a chance to see them, after we filed our evidence, so as to give them a chance to change their statements. It seemed to me that there was time enough.

Yours truly,

L. B. HARRIS.

I will write again in a few days."

(Printed heading.)

"Manchester (N. H.) Telephone Company,
L. B. Harris, Manager."

(Letter.)

"NOV. 3, 1880.

THEOPHILUS WEAVER, Esq.:

DEAR SIR:

We are in receipt of information from "our friends" which will relieve us from further movements at present. I will let you know if it is desired that you take up the line of march again.

I shall be glad to hear from you at any time.

Yours truly,

L. B. HARRIS."

Cross-Q. 607. Are these five letters all the correspondence between Mr. Harris and yourself that you could find?

Ans. Yes, sir.

Cross-Q. 608. In that of Oct. 18, 1880, I find a request for you to go over to Camp Hill and have a talk with some man there. What man did you understand that to mean?

Ans. That probably was Mr. John Oyster.

Cross-Q. 609. Did you go over to Camp Hill to see him, as Mr. Harris requested?

Ans. I went over to Jacob Kline's, and there I learned that he was out west, and of course that ended the matter.

Cross-Q. 610. Had you seen him before the date of Mr. Harris' letter of Oct. 18th, with reference to the Drawbaugh telephone?

Ans. No, sir; I never saw him to know him.

Cross-Q. 611. In Harris' letter of Oct. 30, he says: "I am very sorry that you could not have seen those other parties, before Chellis and Jacobs had a chance to see them," etc. What other parties were those?

Ans. I cannot tell for certain, only that I had seen a Mr. Coble, a school-teacher, but not until he came home from a teachers' institute, somewhere at a distance. As the plural was used, I don't know who the other party was. But I did accidentally meet Mr. George Free at the station, and he gave me a statement of what he had sworn to, without me asking him. Stating certain changes that he and Oyster probably would make in their affidavits, which were taken some six months before that. That is all I can remember now. Probably that is what he referred to.

Cross-Q. 612. What is Mr. Coble's full name, and where does he live?

Ans. I can't give it now. I have a note of it somewhere. He taught school about a half mile south of White Hill station.

Cross-Q. 613. When did you see Mr. Coble about the Drawbaugh telephone, and how many times?

Ans. Only once—probably a few days before the date of that letter.

Cross-Q. 614. Did you tell Mr. Coble what you wanted. If so, what did you tell him?

Ans. I can't recollect what I told him, except that I wanted him to tell what he knew of Drawbaugh's experiments on telephones. And as

he didn't appear to know anything of importance, I didn't tell him what I wanted.

Cross-Q. 615. Did you tell him that you were a friend of Daniel Drawbaugh?

Ans. No, sir; I didn't tell anything about that—that I can recollect.

Cross-Q. 616. How many times were you over to see Mr. George Free about Mr. Drawbaugh's telephones?

Ans. I never went to see him expressly, and only met him once, at the time I have stated.

Cross-Q. 617. When was that one meeting with him, and where?

Ans. When I accidentally met him at White Hill station on my return at that time, two or three days before the date of that letter of October 30, 1880. I think I seen Mr. Kline on the same trip, or a little while before; a day or two before probably.

Cross-Q. 618. Was your meeting with Mr. George Free at the station purely accidental, or were you seeking him?

Ans. I probably would have gone to seek him if I hadn't accidentally met him there.

Cross-Q. 619. Don't you know that you were seeking him at the time when you say you accidentally met him?

Ans. I didn't go there for that purpose, but he happened to be there.

Cross-Q. 620. I have been informed that you were at White Hill station three different times, inquiring for Mr. George Free, at that period; that on the third time, shortly after you had inquired for him, some person present came and said: "Here he is," and brought you and Mr. Free together, and then you proceeded to inquire of Mr. Free about Drawbaugh's telephones. Is my information substantially correct or not, and if not, wherein is it incorrect?

Ans. The facts are about these: I went over there only twice to my knowledge; but on going out from the station to see Mr. Coble, I made some inquiries as to where Mr. Free lived, and I think some one informed me that he wasn't about just then, and then when I came back to the station I believe some one did point him out to me, and we came together in the station, and probably I started him to talk by some remark. At any rate, we stepped back a few paces from the platform, where we had a conversation. I had somehow learned that he was going to change his affidavit, which he corroborated in conversation; but I learned it was to be all the more in favor of Mr. Drawbaugh, and I didn't deem it proper to approach him further.

Cross-Q. 621. Mr. Free lived close by White Hill station, did he not?

Ans. Yes, sir; pretty near.

Cross-Q. 622. Now, when you go right into a man's neighborhood inquiring for him, and in consequence of your inquiries he is pointed out to you, and you accost him and transact your business with him, that is what you call accidentally meeting him, is it?

Ans. I suppose it is understood how I did meet him, which I suppose was somewhat accidental, on my return, for I did not expect to see him on my return.

Cross-Q. 623. But when you swore that you accidentally met him, it was not understood how you met him, and it took considerable cross-examination to bring out the facts. Why did you not state the facts just as they were the first time?

Ans. I am not responsible for your misunderstanding, when all the facts were not called for at first; and further, I count it accidental yet that I did meet him at the station under the circumstances.

Cross-Q. 624. In your six hundred and twentieth answer, you say that after you and Mr. Free came together in the station, "probably I started him to talk by some remark." Don't you know that you began to inquire at once about Drawbaugh's telephones and his affidavit?

Ans. Yes, sir; that was my object, at least, to find out how he stood with relation to his affidavit, and what he knew.

Cross-Q. 625. In that conversation with Mr. Free, did you pretend to be a friend of Daniel Drawbaugh, or say that you were his friend?

Ans. I don't think I said anything of the kind, in so many words, nor did I profess to be.

Cross-Q. 626. Just as you closed the conversation with Mr. Free, while referring to Daniel Drawbaugh and this suit, did you remark to Mr. Free, "Oh, Dan will make it?"

Ans. I don't recollect those words.

Cross-Q. 627. Did you say anything like them, or to the same effect?

Ans. It appears to me I said, "I hope the right one will gain it."

Cross-Q. 628. You have referred in your cross-examination, in answer four hundred and fifty-three, to business which you did for Hamilton Baily last year. What business was that?

Ans. It was work on a modification of his patent dumping-wagon, a form which he has still further modified since. He has spoken to me recently about taking out a patent on it, but my work last year was on the model of it.

Cross-Q. 629. Didn't you get up your dumping-wagon at the time when you were working on Mr. Baily's applications for patents on dumping-wagons?

Ans. No, sir; I invented it before, when I was at work on jump-seats for carriages, for C. K. Mellinger, if I remember rightly, but I patented it after I took out the patent for Mr. Baily.

Cross-Q. 630. Did you tell Mr. Baily anything about it prior to the issue of his patent?

Ans. I believe I did. I generally do business in that way.

Cross-Q. 631. Have you any recollection about it any way; that is, about telling him?

Ans. Not particularly, only that he ridiculed it.

Cross-Q. 632. Was that prior to filing Baily's application, or while the application was pending or after his patent issued?

Ans. I cannot tell that exactly, only that he knew all about it long before my patent came out. I had another model made of my dumping wagon, and it was standing there where he could see it.

Cross-Q. 633. You have referred to your patent on clothes-hook and line-holder, 18th August, 1868; did one George Nebinger have anything to do with that application?

Ans. Yes, sir.

Cross-Q. 634. Was he to pay all of the expenses and have an assignment of half of the patent in consideration thereof?

Ans. Yes, sir; that was the understanding.

Cross-Q. 635. Did you get into any trouble with him about the business?

Ans. No, sir; not particularly. We settled, and I have his final receipt on it. There was a queer circumstance connected with it.

Cross-Q. 636. I have heard there was, and that it consisted in this: that after you and he had made the agreement, and he had performed his part of it, you, in his absence, sold the entire patent and pocketed the proceeds, but he afterwards succeeded in getting his one half from you. How far is that information correct?

Ans. About ninety-five per cent. gossip, and five per cent. fact, with due variation. Squeezing the whole thing together and boiling it down, there are some signs of honesty in your informant left. The only hook I find to put an answer on to such a question, is to stretch the line, as follows: Nebinger paid the first fee to make the application, and then, through his own choice, he employed D. P. Holloway, of Washington,

to procure the patent, at his own expense. Nebinger went away, and I didn't hear about the affair for a good while; but he held a provisional assignment from me. One day the patent came to me. I wrote to Nebinger to know if he had paid the final fee, and the attorney, and he wrote me that he did neither. I wrote on to Holloway, and he couldn't account for the issue of the patent, stating that some other one's final fee must have been mis-applied; and to this day I never could find out who had paid it. Nebinger was unable to pay Halloway, and I was ashamed to let him go unpaid, and I paid him, or satisfied him with a part pay of his fee. I repeatedly wrote to Nebinger to come up to time, and he had no money; but he got me to work up some patterns on the line-holder and another invention which he had. I sent them on to Philadelphia, as he directed me. He afterwards stated that he never got them. They cost me more than the money that he had paid me. He gave me to understand by letter that I should go ahead and dispose of the line-holder as I saw proper. After putting some more money into it, I sold it for a small sum; but he thought I had received much, and came on and raised a fuss the subject of the gossiping question. I settled with him, taking his receipt in full for five dollars.

Cross-Q. 637. Do you know A. D. Repman, of New Cumberland, Cumberland county, Pennsylvania?

Ans. I can't re-call anything about him. I have heard the name. It occurs to me now, there was something connected with a sewing machine related to Repman.

Cross-Q. 638. Didn't you file an application for a patent for him some ten years ago?

Ans. I intended to. I doubt whether I did.

Cross-Q. 639. Didn't you notify him that you had, and that it had been allowed, and call for the second Government fee from him, and receive it, but never deliver the patent nor return the second Government fee to him?

Ans. I have no recollection of anything but a consultation, now.

Cross-Q. 640. What fees did you charge for your services in preparing the application for the Drawbaugh magnetic clock, and what fee did you charge for the second application after the division of applications was made?

Ans. I have already stated I received thirty dollars for making the application on the clock, and I believe I received ten dollars on the new application on earth batteries. The latter case was not merely a division,

but a new model was filed, showing a peculiar clock in connection with earth battery devices, requiring drawings and specification to be carefully drawn to avoid another division of application.

Cross-Q. 641. You referred in your two hundred and ninety-first answer to the corn-sheller of one Brady, of Mount Joy. What was Brady's first name?

Ans. C. H., I believe.

Cross-Q. 642. What was the firm name?

Ans. I believe it was Brady, Mishey & Co.

Cross-Q. 643. Do you know where Brady is now, and where he is doing business?

Ans. I cannot tell. Only I heard a report that he was out west somewhere, probably at Chicago, or some other point.

Cross-Q. 644. Was not the name William Brady, or T. G. Brady?

Ans. William Brady had an interest in the Brady sheller.

Cross-Q. 645. Did you not go to them, to get an agency for the sale of that sheller?

Ans. No, sir.

Cross-Q. 646. Did you not apply to them for that purpose?

Ans. No, sir; I only applied to C. H. Brady, in 1869, to see if he would run my bird-sheller for me.

Cross-Q. 647. Did he decline to do it?

Ans. Yes, sir; he said he would like to, but they ought to be run on a large scale, and he couldn't do it.

(Mr. Hill puts in evidence the copy made by the witness to-day, of "Complainants Exhibit—Drawbaugh-Weaver Sketch of 1878," the same to be marked "Exhibit, Copy Drawbaugh-Weaver Sketch of 1878.")

(By consent, copies of the Harris letters above put in evidence, are to be used instead of the originals, the originals to be retained by complainant's counsel, and to be produced when called for.)

Adjourned until July 26, 1882, at 10, A. M.

JULY 26, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Re-direct examination of Theophilus Weaver, by Mr. Smith.

Q. Q. 648. In the three hundred and third cross-interrogatory, you were asked by Mr. Hill this question, referring to your difficulties with Mr. Kutz: "Were his proceedings in the nature of a criminal charge for perjury?" And you answer: "I did not know it to be such charge." You were then asked: "Did he employ counsel in the matter. If so, who?" And you answered: "I think I was notified by one George H. Irwin, Esq., Third street, Harrisburg, who notified me to appear before him before proceeding against me for him, the said Kutz." In order that we may judge with what justice this suggestion was made, that you were threatened with proceedings in the nature of a criminal charge for perjury, will you produce, if you have it, the letter which you received from Mr. Irwin in relation to the matter, to be copied by the examiner, and made an exhibit in the case?

Ans. Yes, sir; I will. This is it.

[The letter is as follows, a copy being substituted by consent, the original to be produced by complainant's counsel when called for:

GEO. H. IRWIN,
Attorney-at-Law,
Office: No. 3½ N. Third St.

HARRISBURG, PENNA., Jany. 1st, 1874.

DEAR SIR:

I would like to see you about the patent sulky attachment to plows, in which Mr. H. D. Kutz possesses an interest or right, under an article of agreement between you and him. We can possibly arrange the matter satisfactorily to Mr. Kutz and you, if you call at my office not later than the early part of next week, as he intends soon to go to Washington on this business. The agreement is duly recorded in the Patent Office, and we are now prepared to move in this matter legally, if you do not give to Mr. Kutz what it is his right to have.

Yours, etc.,

GEO. H. IRWIN,
Atty. for H. D. Kutz.

To Mr. THEOPHILUS WEAVER,
Paxton St., Hbg.

(Address.) Mr. Theophilus Weaver, Paxton St., Harrisburg, Pa.

(Post-mark.) Harrisburg, Jan. 2, Pa."]

Q. Q. 649. I observe that Mr. Irwin's letter refers to an interest which Mr. Kutz possessed under an article of agreement between you and him, and which he says had been duly recorded in the Patent Office. I suppose that to refer to the same assignment which you mentioned in your answer to the three hundred and seventh interrogatory, and which Mr. Hill, in the three hundred and tenth interrogatory, asked you to procure a certified copy of. As he did not afterwards ask you to produce such a copy, I will now ask you to produce it, if you have it, to show the true relations between you and Mr. Kutz, and the dates of the transactions to which it refers?

Ans. Yes, sir; here it is. It is a certified copy which Mr. Storrow procured for me, and of which I have had copies made.

[Complainant's counsel offers the certified copy in evidence, to be marked "Exhibit Weaver Assignment." By consent the following copy is substituted for the original, the original to be produced by complainant's counsel when called for.

"Liber N. 18, p. 374.

HARRISBURG, PA., July 9th, 1873.

Whereas the Patent Office has required a division of a certain application for patent on Attachment for Plows and Wheels, and whereas H. D. Kutz has in part paid, and agrees to pay the final fee on Patent of Sulky Attachment, in consideration for which I agree to authorize the Commissioner of Patents to issue said patent on Sulky Attachment to us as equal assignees.

And whereas said H. D. Kutz has paid me in hand $5 as part of first ——— on a new application for patent on the Wheel excluded from said patent by the ruling of the office, the receipt of which is hereby acknowledged. I do hereby agree further to make a formal assignment to said H. D. Kutz, for the free and equal use of said Wheel on said Sulky Attachment, to be sold, used, and enjoyed by us conjointly and equally in said patent to be issued on Sulky Attachment for Plows.

Witness my hand this 9th day of July, 1873.

THEOPHILUS WEAVER.

2. Received June 4th, 1873, of H. D. Kutz, the sum of sixteen dollars as first fees on application for patent on Sulky Attachment for Plows, as worked up by me, for which, and the final fee, I agree to assign one undivided half interest of the patent.

THEOPHILUS WEAVER.

Recd. Dec. 21, 1874.
Ex'd J. A. W.
M. McK."]

Q. Q. 650. I notice that Mr. Irwin's letter is dated January 1, 1874, and that it speaks of the assignment as being duly recorded in the Patent Office; but on reference to the certified copy, I find it was received for record December 21, 1874, and I infer that Mr. Irwin must, on the 1st day of January, have made a mistake and written 1874 instead of 1875, which was subsequent to December 21, 1874. Have you any recollection about the time, or any circumstance which would lead you to infer that Mr. Irwin did make that mistake?

Ans. Yes, sir; I have. The circumstance is this: When I had the difficulty with Mr. Kutz referred to, I recollected he had a partner by the name of Stockstill in the patent of 1873, on plow, and I was prompted to satisfy my own mind, that I had done right with Mr. Kutz to write to Mr. Stockstill to know how Mr. Kutz deported himself in relation to him, Mr. Stockstill; and in hunting up my old letters, I find Mr. Stockstill's answer dated January 20, 1875, it having been written soon after the notification letter of Mr. Irwin referred to.

Q. Q. 651. Will you produce the letter from Mr. Stockstill to be copied by the examiner as an exhibit?

Ans. Yes, sir; here it is. I have had a copy made of it, also.

[Mr. Smith puts the letter in evidence, to be marked "Exhibit Stockstill Letter." By consent, the following copy of said letter is substituted, the original to be produced by complainant's counsel when called for:

"JAN. 20, 1875.

THEO. WEAVER:

DR. SIR: Yours of the 11th inst. is received, and you ask how Kutz and I stand. I suppose you mean financially; if so, will say he owes me some money honestly. If you mean as friends, will say he owes me apologies, honestly, neither of which do I expect he will render. Secondly, you ask, are we partners. I am paying no attention to him as being anything to me; consider him a failure. Thirdly, "Is he," (Kutz,) "inventor with you?" (me.)—Not in the least; became so only by virtue of his *oath*.

Fourthly. "Did he act honorably by you?" (me.)

The above will answer.

Yours, etc.,

S. L. STOCKSTILL.

(Addressed.) Mr. Theophilus Weaver, Attorney, Harrisburg, Pa.
(Post-marks.) Osborn, O., Jan. 20.
1-22."]

[*The statements of the above letter, excepting the date, objected to by Mr. Hill as mere hearsay, and incompetent.*]

Q. Q. 652. I observe that the receipt which you gave Mr. Kutz for sixteen dollars, "as first fees on application for patent on sulky attachment for plows, as worked up by me, for which and the final fee I agree to assign one undivided half interest of the patent," is dated June 4, 1873. Do you remember whether that date was prior to the drawing up of the specification to which both you and Mr. Kutz made oath. And if you know on what date you made the oath, will you give it?

Ans. Yes, sir. My recollection is pretty clear that that was a number of days before the day on which we took the oath together. I have that old specification yet, by which I can fix the date exactly, if required. It is in the adjoining room, I believe. Here it is now. I find, by reference, it was sworn to on June 14, 1873.

Q. Q. 653. In your cross-examination you spoke of your recollection of the form of the oath. Will you please hand the paper you have just produced to the examiner, to make a copy of the oath and the signatures?

Ans. Yes, sir; here it is. I find the language is precisely as I quoted it from recollection on the point referred to.

[The oath is as follows:

COUNTY OF DAUPHIN, } *ss:*
State of Pennsylvania, }

Theophilus Weaver and Henry D. Kutz, the above-named petitioners, being duly sworn, depose and say that they verily believe themselves to be the original and first inventors of the improvement in sulky attachment for plows described and claimed in the foregoing specification; that they do not know and do believe that the same was ever before known or used; and that they are citizens of the United States.

THEOPHILUS WEAVER.
HENRY D. KUTZ.

Sworn to and subscribed before me, this 14th day of June, 1873.

PETER STUCKER,
Alderman."]

Q. Q. 654. I do not wish to encumber the record with a long descrip-

tion of the mechanism in that specification, unless it is required by the counsel for the respondents, but I wish you to point out to the examiner, to be copied by him, such passages as mention your name and that of Mr. Kutz, or refer to you by a plural pronoun?

Ans. I find such on the first page, as follows:

"*To the Commissioner of Patents:*

Your petitioners, residents of Harrisburg, Pa., pray that letters patent may be granted to them for the invention set forth in the annexed specification.

THEOPHILUS WEAVER,
HENRY D. KUTZ.

To all whom it may concern:

Be it known that we, Theophilus Weaver and Henry D. Kutz, both of Harrisburg, county of Dauphin, and State of Pennsylvania, have invented an improved SULKY ATTACHMENT for plows, of which the following is a specification:

The nature and objects of our invention are embraced——"

At the end of the statement of the specification and description following the passages above quoted, and preceding the claims, is the following passage:

"Having thus fully described our invention, what we claim as new, and desire to secure by letters patent, is——"

Q. Q. 655. I observe that the second paper given by you to Mr. Kutz bears date July 9, 1873, and that it refers to the division of a certain application for a patent on an attachment for plows and wheels. Was this a division of the application for a patent in your name individually, which you have stated that you drew up and filed after the specification was drawn up to which you and Mr. Kutz both made oath?

Ans. Yes, sir; it referred to that invention; the only invention I ever made on sulky plows. The date of my individual application, before the division, was June 28, 1873.

Q. Q. 656. Reference has been made to some business which you had with one Nebinger, and you referred to a receipt which he gave you. If you have that receipt, will you please produce it, to be copied by the examiner as part of your answer?

Ans. Yes, sir; here it is.

(The receipt is as follows:

"Received, Sept. 25, 1874, of Theophilus Weaver, five dollars as

balance in full on all accounts to date, including line-holder and all patent arrangements.

$5 00 G. R. NEBINGER.")

Q. Q. 657. In your answer to the six hundred and thirty-sixth interrogatory, you said among other things: "He gave me to understand by letter, that I should go ahead and dispose of the line-holder as I saw proper." Have you, since the last adjournment, made search for that letter, and if so, have you been able to find it?

Ans. Yes, sir; I searched for it, but could not find that letter, but found another.

Q. Q. 658. You say also in that answer: "after putting some more money into it," (referring to the patent in question,) "I sold it for a small sum; but he thought I had received much, and came on and raised a fuss," &c. Will you state how much you received for it, and whether it was more or less than any expenses you may have incurred on account of it. And will you also state how much Mr. Nebinger thought you had received, when he came on?

Ans. My recollection of it is, that I received about one hundred and twenty-five dollars for it, but had so much expense on it, in various ways, that I didn't make much on it. I had a great deal of trouble with it. I believe Mr. Nebinger had been informed that I had received about five hundred dollars for it. After he saw a statement which I made of all the items of expense on it, he was satisfied to take five dollars as balance in full, and settle the account, as shown in that receipt.

Q. Q. 659. State whether or not your relations with Mr. Nebinger, after that settlement, continued friendly; and if the letter to which you have just referred, indicates in any way what your subsequent relations were, will you hand it to the examiner to be copied as part of your answer?

Ans. We were the best of friends after that, and he frequently called at my place. He took a deep interest in a translation of the New Testament which I was engaged on, and had been then, already. And he spoke favorably of my compensation journal. I have here a letter which explains itself, showing a part of what passed between us on the subject of the journal. I now hand the letter to the examiner.

(The letter is as follows:

PHILA., PENN.,
Sept. 4th, 1877.

THEOP. WEAVER.

DR. SIR:

I have shown your drawing of "compensating bolt" to a party, & they asked if I had a model, and said if it was what it appeared to be, and the price asked for it was not too high, they would make an offer.

Can you send me a model? If so, send by Express to Phila., (do not direct to my house,) and write me the lowest figure in cash you will take for it. I will then do the best I can for you.

Yours truly,

GEO. R. NEBINGER,
1534 Christian St.")

Q. Q. 660. Is Mr. Nebinger now living. If not, how long has he been dead?

Ans. He died about two years ago.

[Recess for dinner, until 2, P. M.]

JULY 26, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Re-direct examination of Theophilus Weaver, by Mr. Smith, continued.

Q. Q. 661. Have you made an examination, to find if you filed an application for a patent for Mr. A. D. Repman, as referred to in interrogatory six hundred and thirty-seventh. If so, with what result?

Ans. I made a careful search of my old files and letters, and can find no trace, in any form, to show that I ever made such application.

Q. Q. 662. Will you give the particulars of the work which you have done for Hamilton Baily since taking out your patent of September 14, 1875, on dumping-wagon?

Ans. Yes, sir; I took out the following patents for him:

Re-issued on December 7, 1875, his patent, No. 147,468, on dumping-wagon, re-issue No. 6,783.

Patent on dumping wagon, November 27, 1877, No. 197,447.

Patent on dumping-wagon, November 12, 1878, No. 209,745.

Worked on remodeling dumping wagon for him in the spring of 1881.

Q. Q. 663. Will you give the particulars of the work you have done for Dr. J. W. Moffitt, since you made the brake-shoe that has been referred to?

Ans. Yes, sir; I made an alteration of the model of F. F. Wagner, on paper-ruling machine, patented August 31, 1880, No. 231,694; application filed May 31, 1880. The work I did on that model was done by J. W. Moffitt's order, to embody his ideas. Said Moffitt and Rev. W. H. H. Snyder, both of Harrisburg, paid for taking out the patent; in which case I was attorney. Dr. Moffitt went to Baltimore after I had started making the application, and there saw Mr. Wagner, and made an agreement with him. Then, also, about January, 1881, I did work for Dr. Moffitt on a celluloid vulcanizer. I made some changes, by a suggestion, on his plan of building his vulcanizer. Made a working drawing or plan of it. Engaged a wood-turner. Did some work on pattern making. Bought some fifteen pounds of brass castings—these for him. Paid for them out of my own pocket. Handed the work over to Dr. Moffitt, receipt and all, and was paid for my time and expense by him. He finished up the apparatus then, and I was present in his office in February, 1881, when it was tested.

Q. Q. 664. What work have you done for John W. Anderson since taking out your patent of October 25, 1881, on carriage seats?

Ans. I took out the following patents for him:

Slicing machine, patented November 1, 1881, No. 248,978.

Slicing machine, patented January 24, 1882, No. 252,595.

Device for converting motion, patented January 24, 1882, No. 252,821.

Slicing machine, granted April 1, 1882.

I sold my entire interest to the Anderson Manufacturing Company, of which John W. Anderson is treasurer, after I had taken out two patents for said John W. Anderson, himself, on carriage seats, both dated 1881.

Q. Q. 665. What did you obtain for that patent, and how came you to make the invention which it embraced?

Ans. After I had taken out Anderson's last patent on carriage seats, I told them I knew I had taken out more patents on carriage seats than any other attorney or set of attorneys in the United States, and that I believed I could still make an improvement, that was distinct from all the patents I had ever taken out on that subject. "Well," said he, "if you can do that, we would like to have the first chance to buy it." He

*

asked me to make a model, and send it to them. I did so, and he came up, and we entered into an agreement. The company paid for patenting it, and I never put a dollar into it. They were first to run it on royalty, but they finally preferred to pay for it cash, allowing me about three hundred dollars for the entire interest. I have since made it over to them for Canada also, mainly out of good will, receiving only ten dollars for Canada.

Q. Q. 666. Do you know of any statute which prohibits a man from making an improvement, and patenting it, on another man's invention, the patent for which he has assisted in procuring, or any moral law, or rule of professional conduct, which he violates in doing so?

Ans. No, sir; I do not, provided the improvement which he makes on another man's patent is acknowledged by him to be auxiliary and tributary to the foundation patent. But if his improvements are not of a tributary nature, but are original inventions, I think he simply fulfills the intent of the patent system, which has for its object to foster an encourage invention. In the latter case he has the right, civil and moral, without a proviso. I know of no law to the contrary.

Q. Q. 667. Can you state, approximately, how many patents you have taken out for other people, say within the last ten years?

Ans. I believe nearly one hundred and fifty.

Q. Q. 668. Referring to Mr. Gorgas' affidavit, which you assisted in preparing, did you understand that the sum of eight hundred and seventy dollars mentioned therein, with the exception of some part for tools sold, was a sum which he had actually earned in the service of the company, and which had been credited to him?

Ans. Yes, sir.

Q. Q. 669. In your answer to the five hundred and twentieth cross-interrogatory, you speak of Mr. Drawbaugh's asking you to look up the patents relating to vibratory or trembling sign, then displayed in Daniel Hamaker's drug-store window. Do you remember for what purpose he wished the inquiry to be made?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. Yes, sir; he stated he had under consideration applying his earth battery with some kind of motor mechanism to actuate the sign, or one like it, and wanted to know what claims there were on it. Such is my recollection. He did not specify particularly how he meant to do it.

Q. Q. 670. Your investigations were also to extend to Brush's pat-

ents relating to carbon burners and electric lights. Do you remember whether your investigations were to relate particularly to carbon burners, or were to extend to all of Brush's patents relating to electric lights?

Ans. More especially to the patents on the carbon burners, or, as he termed them, the candles. He wanted to know what claims there were on them.

Q. Q. 671. Did he state why he wished to know what claims there were on them?

Ans. Not particularly, only that he was experimenting on something which was related to them somehow.

Q. Q. 672. At the end of that answer, after stating the results of your investigation, you say: "This leads me to think that was the first time Mr. Drawbaugh ever referred to carbons in connection with his early experiments, except coke in connection with his earth battery plates." Do you remember what early experiments he referred to in connection with carbons, at that interview, in the latter part of 1878?

Ans. The word early, there, is misleading, and should have been omitted. I meant the experiments about May, or the time of making the clock application, and after that in that year. I don't know, really, what use he wanted to make of the carbons, but they were called for in connection with his electrical experiments.

Q. Q. 673. In your answer to the six hundred and third cross-interrogatory, relating to an alleged conversation with Mr. Jacobs, you say: "I will not deny that I may have had a conversation in which I may have made some remarks on Mr. Drawbaugh's experiments." Have you any recollection of having any such conversation with Mr. Jacobs?

Ans. No, sir.

Q. Q. 674. In your answer to the four hundred and forty-ninth cross-interrogatory, you speak of an individual stopping here in the summer of 1879, "a Mr. Stouffer, if I recollect correctly, who had been in the solicitor business in Washington, D. C." Can you now say whether you did recollect correctly the name of the individual referred to?

Ans. No, sir; I think I was in error in that matter. The name should have been J. Franklin Reigart. His name is mentioned in the motion papers. His name appears as attorney in some of Mr. Drawbaugh's applications for patents.

Q. Q. 675. In your answer to the ninetieth interrogatory, you said, referring to Mr. Drawbaugh, among other things, in giving an account of his conversation with you at your office, "that he had given up his

experiments for the time being, and now it was too late for him to hope to have any standing as the inventor of the electric telephone." Did you use the expression "for the time being" with reference to anything which Mr. Drawbaugh said indicating an intention to resume his experiments, or with reference to the time which had intervened between the earlier experiments of which he spoke, and the later ones which he had been engaged upon recently?

[*Objected to by Mr. Hill as leading and incompetent.*]

Ans. No, sir; I did not mean to convey the impression that Mr. Drawbaugh had stated that he meant to resume those early experiments, but the expression, "for the time being," I used in the sense of the time intervening between those early experiments—before Bell came out with his telephone—and the after experiments, about May, or tolerably near that time, in 1878. I did not know precisely how long the intervening time was; but I inferred it was a long time. He conveyed that impression on me.

Re-cross-examination by Mr. Hill.

Re-cross-Q. 676. Referring to your six hundred and sixty-ninth answer, in which you say Mr. Drawbaugh had under consideration applying his earth battery with some kind of motor mechanism, to actuate the sign, or one like it, did you know that Mr. Hamaker himself had directed Mr. Drawbaugh's attention to that sign, and suggested the application of his earth battery to it as a motor?

Ans. No, sir; I never heard that till now, to my recollection. I do recollect that he stated he saw it as he came into town at Mr. Hamaker's window; but Mr. Hamaker, I do not think, was mentioned as conversing about it.

Re-cross-Q. 677. Referring to your six hundred and seventieth answer, and the answer immediately following relating to your investigation of the Brush patents and your conversations with Mr. Drawbaugh on that subject, state all that Mr. Drawbaugh told you in those conversations about experimenting on electric lights or carbon candles?

Ans. I don't know that he said that he was experimenting on electric lights. He said he would like to know of what composition the candles were, and what claims there were on them. He said he didn't care so much about the machines for generating the electricity as he did for the burners—the carbon points—which, I think, he called candles also. He said he was experimenting on something, or was trying some-

thing. It appears to me he said he was trying something, but I don't think he told me what it was, and I didn't feel like intruding to ask him.

Re-cross-Q. 678. You don't remember all that was said during that conversation; do you?

Ans. It is likely that I do not; but it was in that same conversation that the signs were talked about, and I remember he mentioned the trembling parts of the sign also—wanted me to see whether that part was covered by the claims. That was the main thing on the signs.

Re-cross-Q. 679. Did he tell you that some person had written to him asking him certain questions about the Brush electric lights, and that he was seeking the information in order to properly reply to that communication?

Ans. No, sir; I have no recollection of that; but I do recollect that he offered to pay me for that search, which seemed to be unusual for him to engage me to do work of that kind and offer to pay for it, as I had accommodated him sometimes to make a simple search without charging him anything. My impression is, it was for his own use in experimenting.

Re-cross-Q. 680. When was that conversation?

Ans. It was a couple of weeks before the large clock at Dr. Moffitt's (then on Market street,) had got the tantrum and wouldn't go right, and the earth plates had to be taken up and placed, I believe, deeper in the ground, or something changed at them, and some of the partners of the clock company were at Moffitts', and that, I believe, was in December. Reckoning several weeks ahead of that would bring it in the latter part of November, 1878. I remember this, because I had waited two or three weeks to see Mr. Drawbaugh, and there is where I met him. We had not much talk on the subject, as the clock was the main talk then.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 26th day of July, A. D. 1882.

FRED. M. OTT, *Examiner.*

THEOPHILUS WEAVER.

Adjourned until July 27, 1882, at 10, A. M.

JULY 27, 1882.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill and Mr. Jacobs, for respondents.

[By consent, the copy of the faucet interference record, put in evidence on page 1070 of defendants printed record, is now withdrawn, and a certified copy of the same is substituted for it.]

WILLIAM NATCHER being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is sixty-eight; residence, Carlisle, Cumberland county, Penna.; occupation, formerly a miller; I am retired.

Q. 1. Did you, at one time, run the grist-mill at Eberly's Mills?

Ans. Yes, sir.

Q. 2. Did you, when you first went there, run it on your own account, or as miller for somebody else?

Ans. I run it on my own account; I had it leased.

Q. 3. If you have here the lease under which you first occupied that mill, please produce it?

Ans. Here it is; this is a true copy of the original.

(Witness produces copy of lease.)

[*Objected to as secondary*]

Q. 4. Where was the original lease left when it was signed?

Ans. In Carlisle, with A. L. Sponsler, a crippled man, on Main street.

Q. 5. In whose handwriting is this copy, and when was it made and handed to you?

[*Same objection by Mr. Hill, and it is further objected to as immaterial.*]

Ans. Mr. Sponsler drew the original, and at the same time drew this copy, and handed it to me.

Q. 6. Has this paper been in your possession ever since?

[*Same objection.*]

Ans. Ever since.

(Mr. Storrow requests the examiner to note that the paper produced is a copy of a lease from Christian Eberly and John Beetem to William Natcher, dated March 1, 1870, of the grist-mill property at Eberly's Mills, including several houses and ten acres of land, at a rent of eleven

hundred dollars a year. The lease to commence April 1st, 1870, and continue one year. Signed by the three parties, and witnessed by A. L. Sponsler.)

[Paper put in evidence, marked "Exhibit, Natcher Lease."]

[*Same objection.*]

Q. 7. Was Mr. Sponsler a lawyer at that time?

Ans. He was a justice of the peace.

Q. 8. If you have the day-book and ledger which you kept while running that mill under that lease, please produce it, and state in whose handwriting it is.

Ans. I produce the book, which contains both day-book and ledger, parts of the same book being devoted to each. It is in my handwriting.

Q. 9. Please read to the examiner, to be taken down as part of your answer, the heading of the first page of the day-book, and the date of the first entry therein.

Ans. "Eberly's Mills.

Day-book, W. Natcher.

(First entry.) April 5, 1870."

Q. 10. Will you state up to what time you ran that mill, under that lease, and whether you gave up the lease before it expired. If you have any memorandum in your said book which helps you to fix the date, you may refer to it.

Ans. I have, on page forty-eight of the day book.

Q. 11. What time did you stop running the mill under that lease?

Ans. The 5th of September, 1870. One of the entries on page 48, following the date of August, 1870, is: "Expenses of flitting William Natcher & Son;" and another memorandum is: "On the eighth August I gave Beetem and Eberly notice that would leave the mill; written by J. B. Drawbaugh; served by the constable at Frogtown, Lower Allen township." Another is: "1870, August 19, John Beetem was at my house on the nineteenth, was at my house, and told me he had a man to take the mill."

Q. 12. Did you afterwards go back to the mill the following year, and if so, in what capacity, and who then owned the mill?

Ans. I went back. George Leonard owned the mill. I done all the work and got the one third of all the tolls and flour making, &c., and one half of the off-falls, and house rent free and the gardens.

Q. 13. If you kept in this same book an account for the mill while you were there under that arrangement with George Leonard, please re-

fer to it, and read the heading of the first page and the first date, that relate thereto?

Ans. I kept the same book. The heading of the first page is as follows: "G. Leonard's Mills, Formerly Eberly's." The first date is October 17, 1871.

Q. 14. Up to what date did you run that mill for George Leonard, and if you have any entry in the same book which helps you to fix the date, please give the date of the last entry which refers to running it for George Leonard?

Ans. I have. The ninth of August, 1872, is the last entry. It is as follows:

"George Leonard, to 2 bushels of toll wheat.

William Natcher, to 1 bushel of wheat toll."

Q. 15. While you lived at Eberly's Mills, first as tenant and afterwards on shares, did you know Daniel Drawbaugh, of that place?

Ans. Yes, sir.

Q. 16. Did he deal with you at the mill?

Ans. Yes, sir.

Q. 17. Did he buy of you for cash or on credit?

Ans. Sometimes for cash, and other times he told us to charge it.

Q. 18. Have you, in the ledger part of the account-book, his ledger account during both the times you were at the mill?

Ans. Yes, sir.

Q. 19. Please read them, in order that the examiner may take them down as part of your answer.

Ans. They are as follows:

"11

1870.

May. Daniel Drawbaugh.

10	Dr.		Contra. c.	
P. 8.	To 5 qts. meal, - -	30	July, 1870.	
" 20.	To ¼ bus. skreanings,	22	P. 41. By bill, - - - - -	1 38
" 12.	do. -	22	By do. - - - -	60
" 32.	do. -	23	By recd. from Geo. Dra, -	3 24
" 40.	do. -	37		5 22
		1 34		
" 41.	flour, -	1 88		
" 46.	flour, -	2 00		
		5 22		

1871.	Dan. Drawbaugh.		Contra.	
Pag. 56.	flour, - - - - -	1 00	Cr.	
63.	do. and feed, - -	1 87	By making Branding Iron,	1 00
66.	do. - - - - -	1 00	" repairing Door, - - -	80
80.	Mill-feed, - - -	1 35		1 80
80.	halling done, - -	1 00	" " Bureau, - -	1 00
82.	do. do. - -	1 50	for daughter Kate.	2 80
		8 82	March 28. By cash, - - -	2 00
82.	flour, Leonards, for Carls, - - -	1 00		4 80
		7 82	April 15. By cash in full, - -	3 27
	½ of holling brass,	25		
		$8 07		$8 07

Q. 20. I observe by this account, and the day-book pages to which it refers, that the date of the first sale to him, viz: "Five quarts of meal, thirty cents," was May 10, 1870. Have you any charge against him in your books before that?

Ans. No, sir.

Q. 21. Had you had any dealings with him before you went to Eberly's Mills, about the 1st of April, 1870?

Ans. No, sir; I never knew the gentleman until I went there.

Q. 22. Mr. Drawbaugh told us, in substance, (defendant's printed record, page 1117,) that he paid you some money before 1870. Did he ever pay you any money before 1870?

Ans. No, sir.

Q. 23. Did your son Michael live with you, and work for you, the first time you lived at Eberly's Mills, or the second time?

Ans. He worked for me both times.

Q. 24. Did he work for you in the mill either time, and if so, which?

Ans. I have a memorandum of the first time he worked for me in the mill. The first time he farmed for me.

Q. 25. Please read the memorandum.

Ans. (Witness reads from the book already referred to.) "December 15th, 1871. Michael H. Natcher commenced working with me in the *mill* for twelve dollars per month."

Q. 26. In whose handwriting is that entry, and when was it made?

Ans. My own. It was made on the day that he commenced—on the day that it is written there.

Q. 27. While you lived there, on these two occasions, did Drawbaugh do any work for your mill or yourself?

Ans. He done some little. What the account, already copied in, shows.

Q. 28. Did he used to come to the mill and see you, and talk?

Ans. Yes, sir; he came frequently. He mostly came himself for what he wanted for family purposes.

Q. 29. Did you used to go to his shop while you lived there?

Ans. Yes, sir; not so very often, but I was frequently there.

Q. 30. Did he ever show you any talking-machines while you lived there?

Ans. No, sir.

Q. 31. While you lived there, did you ever hear that he had a talking-machine?

Ans. No, sir; he never told me he had it.

Q. 32. Please look at the machines now shown you, marked "F," "B," "C,' and "I," and tell me whether you ever saw either of them while you lived at Eberly's Mills?

Ans. I can just say in a word, that I never saw any of them.

Q. 33. Please look at the machine marked "C, Reproduced," and tell me whether you ever saw a machine like that, while you lived at Eberly's Mills.

Ans. No, sir; I never did.

Cross-examination by Mr. Hill.

Cross-Q. 34. Can you take your oath that you now remember everything that Daniel Drawbaugh ever showed you while you lived at Eberly's Mills?

Ans. I can take an oath that I never saw those things.

[*Answer objected to by Mr. Hill, as irresponsive. Question repeated.*]

Ans. Yes, sir; I can.

Cross-Q. 35. Will you please tell us everything that Daniel Drawbaugh ever showed you while you lived at Eberly's Mills?

Ans. He showed me those faucets, that he told me he had invented to draw molasses and oil, &c. Then he had rams—he called them hydraulics—to raise the water out of low places. He had some little machinery that he had invented, to make nails. I don't know whether it

had come to perfection then, or not. I didn't take much account of it. He ground apples, and pressed out cider somewhere below in his shop. That is about all that I remember.

Cross-Q. 36. Do you swear that those four things, faucets, hydraulic rams, the nail machinery, and the cider machinery, are all that Drawbaugh ever showed you while you lived at Eberly's Mills?

Ans. Yes, sir.

Cross-Q. 37. Can you take your oath that you now remember all the inventions or machines that Drawbaugh ever told you about, or talked to you about while you lived at Eberly's Mills?

Ans. Yes, sir; his mind seemed to be centered on the hydraulics and the faucets, about that time. He had my horse several times to go and see about the hydraulics, up the creek and around there.

[*All the last part of the answer, including all after the words "yes, sir," objected to by Mr. Hill, as irresponsive.*]

Cross-Q. 38. Will you please name all the inventions and machines that Mr. Drawbaugh ever talked to you about while you lived at Eberly's Mills?

Ans. The faucet; he said he invented the faucet, and he was endeavoring to make out of them all he could. And as regards these hydraulics, he asked me several times if I knew any good place where they could be put in, as I was well acquainted up along the Canadaguinet creek. He said he had some in operation in York county, and he asked me if I would lend him my horse to go and see about them; I lent him the horse. He was gone over night; he started one day, and came back the next. As regards the machinery to make nails, he spoke to me several times about that. He said he endeavored to get up machinery to make nails; that he thought he could make nails there as he had the power there. As regards the grinding the apples and pressing the cider, he didn't say anything to me about that until it was in operation. He asked me to go and see it; I saw it. That is all that I know about his machinery.

Cross-Q. 39. You swear that those four things, the faucet, the hydraulic rams, the nail machinery, and the cider machine are all the inventions or machines that Drawbaugh ever talked to you about while you lived at Eberly's Mills; do you?

Ans. Yes, sir.

Cross-Q. 40. Can you swear that Drawbaugh showed you all the in-

ventions and machines which he had in his shop while you lived at Eberly's Mills?

Ans. No; I can't swear that he did.

Cross-Q. 41. What business are you now engaged in?

Ans. I have been living retired for the last five or six years. Occasionally I help the farmers, and haul the water for the steam saw-mill.

Cross-Q. 42. Why did you retire from business; were you getting too old and feeble to continue in active life?

Ans. No, sir; I thought I had worked long enough, and that I might take the world a little easy, and so I did. I am assessed as a gentleman.

Cross-Q. 43. You have partially lost your sight and hearing, have you not?

Ans. No, sir; when a person speaks straight to me, without a cigar in his mouth, or hair around his mouth, I can hear every word he says. My sight, at a little distance off, is as good as when I was a boy; and for any fine reading, I use spectacles; but I can write my name without them.

Cross-Q. 44. How long have you used spectacles?

Ans. I don't know exactly how long. It is about seven or eight years that I have used them occasionally.

Cross-Q. 45. You have been using them here this morning during the taking of your deposition, have you not?

Ans. Yes, sir.

Cross-Q. 46. When you were about commencing your testimony this morning you particularly requested the counsel and the examiner to put the questions loudly and distinctly, so that you could hear them. Why did you do that?

Ans. I didn't say loudly.

Cross-Q. 47. What did you say?

Ans. I said firm, or something like that, and in such a way that I would ———, and for the very reason that some persons either will have a cigar in their mouth, or a moustache or hair around their mouth, and they don't speak firm. I can understand when they speak fairly and firmly. I want to understand what is said.

Cross-Q. 48. Did the examiner have a cigar in his mouth?

Ans. This gentleman; I understand every word he says—the writer.

(Question repeated.)

No, sir; he didn't have a cigar in his mouth.

Cross-Q. 49. Did Mr. Storrow have either a cigar or a moustache?

Ans. I didn't take notice whether he had or not. I understood every word that you spoke to me.

Cross-Q. 50. Didn't you sit within four feet of Mr. Storrow and the examiner?

Ans. I knew that he (Mr. Ott) was the gentleman examining me, and I wanted to hear correctly.

Cross-Q. 51. How far did you sit from Mr. Storrow and Mr. Ott while giving your testimony, and at the time you made the request to have the questions given "firm?"

Ans. About three feet from Mr. Storrow and about four from Mr. Ott, or about the same distance from both.

(At the request of Mr. Storrow, the examiner certifies that at the time the said request was made by the witness, the examiner was sitting on the opposite side of a table and about eight feet from the witness, and that the examiner moved his chair about two feet nearer to the witness. Mr. Storrow also calls attention to the fact that the examiner remarked at the time that there was considerable noise in the hall and stairway leading to the room, and the examiner further certifies that during the deposition both he and the witness leaned forward upon the table, bringing their heads nearer together, the distance then being reduced to about four feet and a half.)

[Recess for dinner, until 2.15, P. M.]

JULY 27, 1882, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of William Natcher, by Mr. Hill, continued:

Cross-Q. 52. In what year were you born?

Ans. In 1816; I think that is the time I was born; I have it recorded, and I think that is what it is. I am not just so right certain about that. I think I am sixty-eight years old the 10th of October, next.

Cross-Q. 53. Have you ever been examined before as a witness in a law-suit; if so, how many and what law-suits?

Ans. I never was examined much. I don't know of any in particular just now. I was on one in Perry county—Stouffer against Stouffer was the case.

Cross-Q. 54. When was that?

Ans. About ten years ago.

Cross-Q. 55. Is that the only case you ever were examined in in court?

Ans. I think it was in the common pleas. That is all that I can remember of just now. There were several Commonwealth cases that I have been on.

Cross-Q. 56. Mention all the Commonwealth cases in which you have ever been examined as a witness, and state when and where they were tried?

Ans. One was E. J. Krause. He was the prosecutor.

Cross-Q. 57. Give the defendant's name. Who was the criminal?

Ans. I think a man by the name of Jeremiah. I disremember.

Cross-Q. 58. Is that all the Commonwealth case in which you ever were examined as a witness?

Ans. No, sir; there was another, but I can't think what the man's name is, who was the prosecutor. He prosecuted three black men for stealing apples.

Cross-Q. 59. When was that?

Ans. That was about three years ago.

Cross-Q. 60. What was Jeremiah charged with?

Ans. Charged with something about beer, either stealing beer or selling it some way—selling beer or beer kegs. It involved the kegs and the beer some way.

Cross-Q. 61. Were those two criminal cases in Cumberland county, at Carlisle?

Ans. Yes, sir.

Cross-Q. 62. Have you now mentioned all the Commonwealth cases in which you ever testified as a witness?

Ans. I am not certain whether I mentioned all, but all that I can think of just now.

Cross-Q. 63. When were you first spoken to about giving evidence in this case, and by whom?

Ans. This here is the gentleman—Mr. Storrow—about the first week in June of this year, 1882.

Cross-Q. 64. Where?

Ans. In Carlisle.

Cross-Q. 65. Give us your address in Carlisle?

Ans. My address is "William Natcher, Carlisle, Cumberland county, Pa."

Cross-Q. 66. What street do you live on?

Ans. I live in a short alley between the market-house and Pomfert street. I formerly lived on West North street.

Cross-Q. 67. Since Mr. Storrow was there to see you the first time, how many times have you been consulted about this case?

Ans. I was only consulted once.

Re-direct by Mr. Storrow:

Q. Q. 68. Have you been working in the harvest field this summer?

Ans. Yes, sir.

Q. Q. 69. What particular part of the work did you do in harvesting?

Ans. I helped to dry the hay first, and after it was dry and turned I loaded all the hay on a large farm. I done all the loading in the field. I was on the wagon and done the building of the load. We ran two wagons. P. H. Albright, the man I was assisting, then started the reaper. The first day he put me to shocking. The reaper cut six feet, and some of the hands couldn't bind their sections; so he told me to try my hand, and I did, and bound my section after the reaper right through harvest every day. Then, when we were done with that, he said: "Natcher, you must do the building again. I did, and built all the wheat for the two wagons we ran. We were done with the sheaves then, and he had a small field that he asked me to help mow. I mowed along with a man named Samuel Gill at grass till noon, and we then hauled in the rakings, and I built then again. After that we started the separator, and I handed the loose rakings to be fed. That time amounted in all to seventeen days in succession.

Re-cross-examination by Mr. Hill.

Re-cross-Q. 70. For whom were you doing that work, and for what wages?

Ans. Peter H. Albright. The wages was considered—first, he was to pay two dollars and a half for harvest and less for other work; but he afterwards concluded to pay one dollar and a half all through, with boarding, wet days and Sundays included.

Re-cross-Q. 71. Are you still working for him?

Ans. I was yesterday, and would be to-day if I was at home. I will work for him again when I go home, unless I go with his brother, who

wants me to go and haul water for the saw-mill, the same as I did before.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 27th day of July, 1882.
FRED. M. OTT, *Examiner.*

WM. NATCHER.

MICHAEL H. NATCHER being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is forty-three. Residence, New Kingston, Cumberland county, Pa. Occupation, formerly a miller, now I am working on a farm.

Q. 1. Are you a son of William Natcher, who has just testified?

Ans. Yes, sir.

Q. 2. Did you work for your father at Eberly's Mills, while he ran the mill as tenant to Beetem and Eberly, in 1870?

Ans. Yes, sir; I done the farming.

Q. 3. Did you work for your father in the mill, while he run the mill for Mr. Leonard, in 1871–2?

Ans. Yes, sir; I was there from the winter on until the next spring—till the time to sow oats.

Q. 4. The memorandum in your father's book, states that you began to work for him in the mill December 15, 1871. Does that agree with your recollection?

Ans. Yes, sir.

Q. 5. While you were there at Eberly's Mills with your father, did you use to see Mr. Daniel Drawbaugh. If so, where?

Ans. Yes, sir; I saw him often in the mill, and in his mill, and I can't tell where all. I saw him every day that he was about home.

Q. 6. Look at the four instruments now on the table—"B," "F," "C," and "I"—and tell me whether or not you ever saw either of them while you were at Eberly's Mills?

Ans. No, sir; I never saw anything of that kind.

Q. 7. Did, or did not, Daniel Drawbaugh ever show you any talking-machines while you were at Eberly's Mills?

Ans. No, sir; he never did.

Q. 8. Did he, or did he not, while you were at Eberly's Mills,

ever speak to you about talking-machines, or mention the subject to you?

Ans. No, sir; he never did.

Q. 9. Did you ever, at Eberly's Mills, see a machine like this one I now show you, marked "C, Reproduced"?

Ans. No, sir; I never saw anything like that, to my knowledge.

Q. 10. Did he ever show you, at his shop, machines or things which he said he had invented and made?

Ans. Yes, sir; he showed me some few things there. He showed me his faucet, and clock, and a few other things.

Cross-examination waived by Mr. Hill.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 27th day of July, 1882.

FRED. M. OTT, *Examiner.*

MICHAEL H. NATCHER.

Adjourned until July 28, 1882, at 10, A. M.

THEODORE GRISSINGER, being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is thirty-seven; residence, Mechanicsburg, Cumberland county, Pa.; I have been in the patent-right business for the last two or three years; that is about all the business that I have now; before that I was a dealer in agricultural implements in Mechanicsburg.

Q. 1. Have you taken out patents on your own inventions?

Ans. Yes, sir.

Q. 2. How long have you lived in Mechanicsburg, or near there?

Ans. I have lived in Mechanicsburg since the spring of 1878. I have lived near there since 1872; within a mile.

Q. 3. When did you first employ Daniel Drawbaugh, of Eberly's Mills, to do any work for you, and what was the work?

Ans. In June or July, 1869, I employed him to make me a machine for cutting and rounding straps, or leshes, for leather fly-nets, at one operation.

Q. 4. Were you interested in the fly-net business at that time; if so, where was it carried on?

*

Ans. I was not.

Q. 5. Did he get up a fly-net machine for you, and did you pay him for it; if so, how much?

Ans. He did get up the machine for me. I paid him forty dollars.

Q. 6. It has been testified that you were one of the members of the magnetic clock company, got up to patent and build magnetic clocks in accordance with Daniel Drawbaugh's plans, and that such company formed and began its operations about the 1st of April, 1878. Is that according to your recollection?

Ans. Yes, sir.

Q. 7. Who were the other members of that company?

Ans. Jacob H. Grissinger, who is my brother, and J. E. Shettel, who is my brother-in-law, and Mr. Drawbaugh, were the firm, with me.

Q. 8. Do you remember having a conversation with Mr. Drawbaugh at the shop at Eberly's Mills about telephones after the clock company started, and during the spring or summer of 1878?

Ans. I do.

Q. 9. Will you tell me whereabouts in the shop, and on which story you and Mr. Drawbaugh were when you had that conversation, and in doing so you may refer to the diagram No. 3 of Mr. Drawbaugh's deposition, on page 923 of defendant's printed record.

Ans. There was a basement to the building, and counting that, it would be the third story. It was about the center, or near the center of the west room—near the letter F on the diagram. This partition was not here, or only part of that short partition was there.

Q. 10. Were you and Mr. Drawbaugh engaged in working at a bench at the time, or what were you doing?

Ans. He was sitting on a trestle.

Q. 11. Was there anybody else on that story at the time. If so, who, and where were they?

Ans. My brother and Mr. Shettle were in the room part of the time.

Q. 12. Where were they the rest of the time?

Ans. They were in the southeast room part of the time.

Q. 13. At the time of that conversation, had you, or had you not, read about telephones in the newspapers, and what newspapers were you in the habit of reading?

Ans. I had heard of them. I was a subscriber to the Scientific American.

Q. 14. Did you make any inquiries of Mr. Drawbaugh, or remarks

to him, with relation to telephones at that interview. And if so, state the nature of the first inquiry or remark you addressed to him on that subject?

Ans. I did. I asked him why he had not invented the telephone, saying, in a jesting way, that it would have paid better than electric clocks.

Q. 15. Did he make any reply to that inquiry, and if so, what?

Ans. He did. He said he had done something in that way.

Q. 16. Did that lead to any further inquiry by you? If so, please state it.

Ans. It did. I asked him what he had done.

Q. 17. What led you to make further inquiry about it. What did you want to ascertain?

[*Objected to by Mr. Hill, as immaterial and incompetent.*]

Ans. I thought it was a pretty good thing, if he had invented the telephone. If he had done enough, far enough back, I would have went in with him.

[*Last clause of the answer further objected to by Mr. Hill, as mere opinion and not fact, and as based upon the witness' opinion in a matter of which he was not qualified to judge.*]

Q. 18. If, in reply to your inquiry, he made any statement as to what he had done far enough back, or as to whether he had anything to show that he had done something in that way, please state what he said?

Ans. He said—he told different things he had done, but could show nothing, nor give any dates for what he had done.

[*All after the word "but" objected to by Mr. Hill, as mere opinion.*]

Q. 19. If he had shown you anything tangible, or given you any dates, would you have taken any action thereupon, or would your action have been influenced thereby?

[*Objected to by Mr. Hill, as hypothetical, calling for mere opinion, and incompetent.*]

Ans. It certainly would.

Q. 20. In what respects would your action have been influenced?

[*Same objections.*]

Ans. I would have examined the matter more closely. I would have investigated the matter, to ascertain whether he had done anything far enough back to sustain a claim of priority of invention.

Q. 21. Please state whether or not the statements he then made to you left a distinct impression on your mind as to whether he had or had not done enough far enough back to entitle him to claim the invention?

[*Same objections.*]

Ans. It did.

Q. 22. State what impression it made on your mind at the time in that respect?

[*Same objections.*]

Ans. I was entirely satisfied from what he told me that he had no claim.

Q. 23. Did he or did he not at that interview claim that he was entitled to be considered as the first inventor of the telephone?

Ans. He didn't claim to be.

Q. 24. At the time of this conversation, had you or had you not read about phonographs in the newspapers?

Ans. I had.

Q. 25. Did he speak to you also about phonographs at this conversation, as well as telephones?

Ans. Yes, sir; he did.

Q. 26. If at this interview he said anything about having experimented himself with phonographs, you may state what he said upon that subject.

Ans. He said he had experimented and had made a phonographic instrument.

Q. 27. While you were connected with the clock company were you in the habit of seeing him and of going to his shop at Eberly's Mills?

Ans. I was; yes, sir.

Q. 28. Did he ever have a telephone with him at your store in Mechanicsburg, while you were connected with the clock company?

Ans. Yes, sir.

Q. 29. Had you, before that time, seen the same, or a similar instrument, at the shop at Eberly's Mills?

Ans. I had; yes, sir.

Q. 30. When you first saw it at Eberly's Mills was it connected up with wires ready to talk, or was it lying on the bench unconnected, or what condition was it in?

Ans. It was a single instrument. It was not connected with any wires. I think he got it out of his case.

Q. 31. Did you ever talk through a speaking telephone, or hear anybody talk through one, at Eberly's Mills?

Ans. No, sir; I did not.

Q. 32. Did you ever know of there being a pair of telephones connected up at the shop at Eberly's Mills while the operations of the clock company were going on there, and if so, during what part of the time?

Ans. During the latter part of the time there was a pair connected so he said. I didn't speak through them, neither did I examine it.

Q. 33. Did you understand whether he was, or was not, attempting to get up improvements in telephones, while the operations of your company were going on?

Ans. Yes, sir; he was talking of improving them, or making improvements.

[Recess for dinner, until 2, P. M.]

JULY 28, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Theodore Grissinger, by Mr. Storrow, continued.

Q. 34. Did Mr. Drawbaugh, at the interview you have particularly described, at his shop, or at any other time, tell you whether he had ever tried a telephone on any line of wire leading outside of his shop, and if so, what did he tell you about it?

Ans. He told me that he had a line running from his shop to his dwelling-house.

Q. 35. Did he tell you whether he had ever tried to transmit speech over it, and with what result?

Ans. He did try to transmit speech, and could, by speaking very loud, hear a noise, but could not understand anything.

Q. 36. Did he tell you this at the interview at his shop already described, or at some other time?

Ans. At this interview.

Q. 37. I will now show you the various instruments which have been put in evidence by Mr. Drawbaugh, and ask you if you recognize any of them as being the same instruments, or like the instruments, which you saw during your connection with the clock company?

Ans. Here is one marked "D" that I think I saw at his shop. This

one marked "E" I think he showed me at my office in Mechanicsburg, or one like it. Those are the only two that I ever seen.

Q. 38. Did you ever see, while you were connected with the clock company, either of these three larger ones, "H," "J," or "P?"

Ans. I did not.

Q. 39. Did your brother or Mr. Shettel take part in the conversation you have described at Drawbaugh's shop, either as speaking in it or listening to it?

Ans. They listened to it partly; I do not remember that they took any part in it.

Cross-examined by Mr. Hill:

Cross-Q. 40. How long did that conversation last?

Ans. It lasted probably a half hour, perhaps an hour.

Cross-Q. 41. Can you swear that it lasted over ten minutes?

[*Objected, by Mr. Storrow, that it does not appear from the question whether it refers to the conversation on telephones, or to all the conversation of the day.*]

(Question withdrawn.)

Cross-Q. 42. Can you swear that the conversation on telephones, which you say took place at the shop, lasted over ten minutes?

Ans. I think it did.

Cross-Q. 43. Is your recollection clear enough to swear positively that it did?

Ans. Yes, sir.

Cross-Q. 44. Can you repeat the conversation in the words in which it took place?

Ans. I cannot.

Cross-Q. 45. What was the date of that conversation?

Ans. I do not know the exact date.

Cross-Q. 46. Appromimate it as nearly as you can.

Ans. I think it was during the summer of 1878.

Cross-Q. 47. The first or last part of the summer?

Ans. It might have been the latter part. I think it was the latter part.

Cross-Q. 48. What work was going on in the shop at the time?

Ans. There was no work going on at the time of this conversation.

Cross-Q. 49. What time of day was this conversation?

Ans. I don't know.

Cross-Q. 50. Were your brother and Mr. Shettel present, and in hearing, when you began the conversation?

Ans. I am not positive.

Cross-Q. 51. Was anything besides telephones and phonographs talked about during that conversation?

Ans. Not to my recollection.

Cross-Q. 52. When did Mr. Drawbaugh say he invented the phonographic device?

Ans. He didn't know.

Cross-Q. 53. Did he say it was a long time before?

Ans. He said it was some time before. He couldn't give me any dates, or any time.

Cross-Q. 54. Did he say it was some years before?

Ans. Yes; he intimated that it was some years.

Cross-Q. 55. Did he say anything about having done anything on that phonograph principle recently?

Ans. I think not.

Cross-Q. 56. Did he say whether he had invented the telephone, or the phonograph first?

[*Objected to by Mr. Storrow, for the reason that the witness has not testified that Mr Drawbaugh said that he had invented the telephone; but only that he had done something towards it.*]

Ans. He didn't say.

Cross-Q. 57. Did he say whether the telephones on which he had worked were able to convey spoken speech, or whether he or anybody else had ever talked through them, or not?

Ans. He said he had talked through them, but could not be understood.

Cross-Q. 58. When did he tell you that?

Ans. At this conversation referred to.

Cross-Q. 59. Did he tell you that he had ever talked through them and had been understood, or that he had ever heard anybody talk through them, and had understood what was said?

Ans. No, sir.

Cross-Q. 60. Can you give his words on that subject of having tried to talk through them, and not being able to understand?

Ans. Not his entire words in the conversation I couldn't.

Cross-Q. 61. Can you testify to anything more than your present recollection of what your impressions were at the time?

Ans. My impression that I received from him at that conversation. That is all—impressions received at that time, from what he told me.

Cross-Q. 62. Were you acquainted with the construction and mode of operation of the electric telephone at that time?

Ans. I was slightly acquainted with it—yes, sir; although I never made a close examination of them at that time.

Cross-Q. 63. What did you know about their construction and mode of operation at that time?

Ans. I knew nothing more than what I had read—the descriptions of them—in papers.

Cross-Q. 64. Of what telephones had you read the descriptions at that time, and in what papers?

Ans. I can't say at this time.

Cross-Q. 65. State just what you did know about the construction of telephones at that time?

Ans. That would be very hard to do.

Cross-Q. 66. Did you know whether they operated on a closed or open circuit?

Ans. I really do not know. I suppose I did.

Cross-Q. 67. Do you know now? If so, please state.

Ans. They are operated with a closed circuit.

Cross-Q. 68. Did you know, at that time, whether they contained an electro-magnet, and for what purpose?

Ans. I knew that they had a magnet, but did not know for what purpose. I may have known, but paid little attention to the construction of them.

Cross-Q. 69. I suppose you didn't, in that conversation, ask Mr. Drawbaugh how his telephones had been constructed, did you?

Ans. Not to my recollection.

Cross-Q. 70. Did you, at the time of that conversation, know the date of Alexander Graham Bell's telephone patents, or the time at which he claimed to have made his invention?

Ans. I don't think I knew, at that time, of the exact date.

Cross-Q. 71. Was anything said, in that conversation, about the date of Bell's invention?

Ans. I don't think there was.

Cross-Q. 72. Did you ask Mr. Drawbaugh, in that conversation, if he had any telephone instruments at that time, that he had made?

Ans. Yes; I did.

Cross-Q. 73. Can you give his reply to that question?

Ans. He said he didn't have any.

Cross-Q. 74. Did you ask him whether he had been doing anything recently on the subject of telephones?

Ans. My previous answer referred to telephones that he had constructed before that. He did have the telephones on the line to his house. My answer was in reference to those old machines that he had made in his early experiments. I wanted to see what he had to show. I knew that he had improvements of his invention, or what he claimed to be such.

Cross-Q. 75. Did he tell you that that line from the shop to his house was one of his early experiments?

Ans. Yes, sir; it was one that he claimed was one of his first experiments.

Cross-Q. 76. Did he mention any other early experiment, except that line to his house?

Ans. I think he spoke of communicating from one room to another in the shop; but that was the most important one—from the shop to the house.

Cross-Q. 77. Did he say that he had been able to talk from one room to another, in the shop, by means of his telephones, in those early experiments, so as to be understood?

Ans. Not in his early experiments.

Cross-Q. 78. The object of your inquiries, I suppose, was to get at the time of his first experiments, and find out what he did in those first experiments in order to get at the date of his original invention; was it not?

Ans. My object was to know or find out whether he had done enough, far enough back, to sustain a claim of priority of invention.

Cross-Q. 79. Did you tell him, at the time, that such was your object?

Ans. I don't know that I did.

Cross-Q. 80. Was the conversation directed to anything except his earliest experiments?

Ans. I don't know. The conversation was all he had done in his experiments—of course, his early experiments. I cared nothing about his improvements that he was making at that time.

Cross-Q. 81. Can you give the exact language of the questions which you asked him?

Ans. I asked him what he had done; and, to prove what he had

done, whether he had any instruments, witnesses, or dates to prove what he had done.

Cross-Q. 82. You mean, what he had done in his early experiments; do you?

Ans. Any of his earlier experiments; anything that he had done up until the time of these improvements.

Cross-Q. 83. I don't think you understood my question, which was, whether you can now give the exact words in which you made the inquiry?

Ans. The exact words to the letter would be impossible at this time. Those questions I asked him, but whether it was in those exact words, I do not know; it may have been a few words more.

Cross-Q. 84. Was anything said in that conversation about his recent improvements on the telephone?

Ans. I do not know that there was; I suppose there was.

Cross-Q. 85. Did he tell you how long he had been at work on his improvements?

Ans. No, sir.

Cross-Q. 86. Did he tell you how many improvements he had made since his earlier experiments, or what results he had accomplished?

Ans. He didn't say what number of improvements. His claim was that he made a more simple and cheaper instrument.

Cross-Q. 87. Did he tell you whether he had been working a great deal on improvements, or not?

Ans. He didn't claim to be working much on improvements.

Cross-Q. 88. I didn't ask what he didn't tell you, but what he did tell you. What did he say about the amount of work he had done on improvements?

Ans. He didn't say.

Cross-Q. 89. For aught you know, then, his so-called improvements that he referred to may have been going on four or five years, at that time, may they not?

Ans. My impression was that they were quite recent.

Cross-Q. 90. I did not inquire for your impression, but your knowledge. For aught you know, and for aught he told you in that conversation, his so called improvements may have been then going on four or five years, may they not?

Ans. The instruments he showed me, with what he claimed were improvements, were made within a year.

Cross-Q. 91. I did not ask about any particular instrument, but about all that he referred to as improvements, and I now repeat the question.

[*Question objected to by Mr. Storrow as having already been fully answered in several forms.*]

Ans. Do you mean improvements on other telephones?

Cross-Q. 92. It seems impossible that my question can be misunderstood, and if you got no clearer idea of Mr. Drawbaugh's statements than you do of my questions, I do not wonder at your testimony. But I will endeavor to make myself plain. For aught you know, and for aught he told you in that conversation, his so-called improvements on telephones may have then been going on for four or five years, may they not?

[*Preamble to the question objected to by Mr. Storrow, as improper and uncalled for.*]

Ans. The improvements referred to he claimed were improvements on the Bell telephone, and made since the patent was granted to Bell, and consequently could not have been going on five or six years. I can't make myself any plainer.

Cross-Q. 93. Did he say, in that conversation, that the improvements were improvements on the Bell telephone, and made since the Bell patents were granted?

Ans. I think he did.

Cross-Q. 94. Do you swear that he did so state?

Ans. I couldn't swear positively that he stated that.

Cross-Q. 95. If you remember what he did state, please give it, and if you don't remember, please refrain from giving an imaginary statement.

Ans. Are those questions now of that conversation that we had entire, or of all the conversations that we have had with regard to telephones?

Cross-Q. 96. My question refers to that conversation. I have mentioned no other, and I now repeat the question.

Ans. I have given about what transpired at that conversation.

Cross-Q. 97. You have stated, in your ninety-second answer, that "the improvements referred to he claimed were improvements on the Bell telephone, and made since the patent was granted to Bell." And in your ninety-fourth answer, you state that you can't swear positively that he said that. I am unable, in view of those answers, to determine

what transpired in that conversation. And now I ask you to state just what Mr. Drawbaugh said on that subject, and all he said, which you can swear to positively.

Ans. That did not occur at that conversation we had in the shop with regard to telephones.

Cross-Q. 98. For aught that occurred in that conversation in the shop, may not Mr. Drawbaugh have been then working on his so-called improvements four or five years?

[*Objected to by Mr. Storrow, as asking for mere opinion, inference, or guess, and as not asking the witness either for his recollection of what was or was not said, or for his recollection of the impression then made upon him.*]

Ans. Not from what he told me.

Cross-Q. 99. What did he tell you to the contrary in that conversation?

Ans. We were speaking of his original inventions, and not of any improvements on other telephones.

Cross-Q. 100. (Question ninety-nine repeated.)

Ans. That was not the subject.

Cross-Q. 101. In my ninety-eighth question I asked you: "For aught that occurred in that conversation in the shop, may not Mr. Drawbaugh have been then working on his so-called improvements four or five years?" To which you replied: "Not from what he told me." If you know a single word that he told you, to the contrary, in that conversation, tell it.

Ans. When I asked him what he had done, whether he had any instruments, any dates, or any witnesses to prove what he had done, he said he had not. And if the improvements would have been going on for a period of five or six years, he certainly would have mentioned it.

[*Answer objected to by Mr. Hill, as not responsive, but mere argument.*]

Cross-Q. 102. (Cross-question one hundred and one repeated.)

[*Question objected to by Mr. Storrow, because it has been frequently and fully answered.*]

Ans. I can't answer that question more fully than I have.

Cross-Q. 103. Did he tell you that he had not been working on those improvements at least four or five years, at that time?

Ans. No, sir.

Cross-Q. 104. Did he tell you, at that time, how long he had been working upon them?

Ans. No, sir.

Cross-Q. 105. Then your supposition at that time, that he had been working on them only recently, was a mere inference of your own, was it?

Ans. It was not entirely so.

Cross-Q. 106. If he didn't tell you how long he had been working upon them, which you say is the fact, how did you know, except by inference?

Ans. I gathered the facts from the general conversation that was had on the subject.

Cross-Q. 107. I want to separate the facts from the inferences. You say that it is a fact that he didn't tell you how long he had been working on these improvements. How, then, did you know, except by inference?

Ans. I only know, when I asked him for the proofs of his work, he didn't have them. And my mind was so completely and entirely made up at the time of this conversation, that he had no claim, that I paid very little attention to it thereafter.

Cross-Q. 108. The proofs that you asked him for, were proofs of his earlier experiments, were they not?

Ans. Any proofs that would go to sustain a claim of priority of invention.

Cross-Q. 109. But you have testified in answer seventy-nine, that you don't know that you told him that you wanted to know whether he had done enough, far enough back, to sustain a claim of priority of invention. And in answer eighty, you have testified: "The conversation was all he had done in his experiments—of course, his earlier experiments. I cared nothing about his improvements that he was working at that time." Did you ask him for any proofs, except the proofs of his earlier experiments?

Ans. I asked him for proof of his experiments. I specified no particular experiments.

Cross-Q. 110. Was the conversation at that time on the subject of priority of invention?

Ans. Yes, sir.

Cross-Q. 111. Did you tell him that that was what you wished to ascertain?

Ans. I asked him the question.

Cross-Q. 112. What question?

Ans. What he had done.

Cross-Q. 113. Done when?

Ans. Any time prior to that, was my question that I wanted to know.

Cross-Q. 114. And in reply to that he said that he had no machine to show, did he?

Ans. He then related his experiments.

Cross-Q. 115. Did he, at that conversation, show you a telephone?

Ans. I am not positive whether it was at that conversation, or whether it was since that that he showed me one similar to this instrument "D" here.

Adjourned until July 29, 1882, at 10, A. M.

JULY 29, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present: Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Theodore Grissinger, by Mr. Hill, continued.

Cross-Q. 116. Then you do not remember seeing any telephones at the time of that conversation, do you?

Ans. It is possible that he showed me the one I referred to; that is, the one I have already identified.

Cross-Q. 117. I wish to clearly distinguish fact from mere guess-work. Can you swear that he showed you a telephone at the time of that conversation?

Ans. I could not swear positively. It was then or soon after.

Cross-Q. 118. Had he ever shown you a telephone before that conversation, or had you ever seen one about the shop before that conversation?

Ans. I think not.

Cross-Q. 119. How long after that conversation did he show you a telephone, and where was it?

Ans. I can't say how long afterwards. It was either in the western room referred to, or in the south-eastern room.

Cross-Q. 120. How do you fix the time of that conversation as being in the latter part of the summer of 1878?

Ans. I only know it was soon after we started in the business.

Cross-Q. 121. At what time did you start in the business?

Ans. It was in the spring of 1878?

Cross Q. 122. Did you start in the business about the beginning of April, 1878?

Ans. There may have been something done in the early part of April, but very little.

Cross-Q. 123. Do you remember the fact of an application being prepared by Mr. Weaver for a patent on the Drawbaugh magnetic clock?

Ans. Yes, sir. If I am allowed, in that other question where I said "the early part of April," I prefer to say "in April," for there was very little done in April.

Cross Q. 124. Did you interview Mr. Weaver several times in company with your brother, Mr. Shettel, Mr. Drawbaugh, or any of them?

Ans. I spoke to him at different times in regard to the clock.

Cross-Q. 125. Did you visit his office in company with any of the gentlemen referred to in my last question?

Ans. Yes, sir.

Cross-Q. 126. How many times?

Ans. I don't know.

Cross-Q. 127. Was that conversation at the shop before or after the preparation of the application, by Mr. Weaver, for the patent on the magnetic clock?

Ans. I am not positive, but think it was before.

Cross-Q. 128. Referring, now, to the first time when you have any *positive* recollection of seeing a telephone at Mr. Drawbaugh's shop, was that the telephone marked "D," which is here in evidence?

Ans. It is my impression that it is, or one like it.

Cross-Q. 129. How do you identify it. Do you recognize the curled magnet on the back?

Ans. I recognize it from its shape, and by the curled magnet.

Cross-Q. 130. How happened you to see it at that time?

Ans. He showed it to me.

Cross-Q. 131. What was he doing with it at that time?

Ans. He was showing it to me.

Cross-Q. 132. Where did he get it, when he showed it to you?

Ans. I do not remember where he got it.

Cross-Q. 133. What did he do with it, after he had shown it to you?

Ans. I don't know.

Cross-Q. 134. Did you take it in your hands and examine it?

Ans. It is possible that I did.

Cross-Q. 135. I want to caution you again against giving mere guess-work in your answers. What I want to know is, whether you have any recollection of taking it in your hand and examining it at that time, when he first showed it to you?

Ans. I have no distinct recollection of having it in my hand at that time.

Cross-Q. 136. What did he say about it, at that time?

Ans. He explained its construction.

Cross-Q. 137. Did he tell you it was one of his early experiments, or one of his so-called improvements?

Ans. It was one of his improvements.

Cross-Q. 138. Did you ever see it again after that; if so, when and where?

Ans. I saw it, or one like it, frequently afterwards in the shop. That word "frequently" you might leave out. I saw it afterwards in the shop.

(Defendant's counsel asks that it be taken down just as the witness said it.)

Well, say "frequently," then.

Cross-Q. 139. How far did you live from the shop during all the time of your connection with the clock business?

Ans. About six miles.

Cross-Q. 140. During all that time, how often were you at the shop?

Ans. I don't know.

Cross-Q. 141. Were you there every day?

Ans. No, sir.

Cross-Q. 142. Did your visits to the shop average as many as one in every two weeks?

Ans. From the time we articled until the time when we sold out?

Cross-Q. 143. I mean, during the time that the clock business was actually going on there at the shop?

Ans. They averaged more.

Cross-Q. 144. Did they average as many as one every week?

Ans. They averaged more.

Cross-Q. 145. Did they average as many as two every week?

Ans. I think they did.

Cross-Q. 146. You say that Mr. Drawbaugh showed you the instrument "D" at the shop, and tried to explain its construction to you. Did he ever afterwards show you that instrument, or say anything about it to you?

Ans. In the shop?

Cross-Q. 147. In the shop; yes.

Ans. He showed me the instrument, but said nothing about it to me in particular.

Cross-Q. 148. How happened he to show you the instrument afterwards again?

Ans. He showed it to me in a casual way, as he would show me any other instrument or machine.

Cross-Q. 149. When he showed it to you in that casual way, what did he say about it?

Ans. I could not say at this day. My mind was so entirely made up, that I paid very little attention to it afterwards—made up from what he told me at our first consultation.

Cross-Q. 150. How many times did he show it to you casually, at the shop?

Ans. I don't know.

Cross-Q. 151. At the time you speak of, when he showed it to you casually, did he show you any other telephone besides "D"?

Ans. No, sir; I think not.

Cross-Q. 152. Did you ever see any other telephone except "D," in the shop?

Ans. I think I saw this one, marked "E."

Cross-Q. 153. When did you first see that one, marked "E," at the shop?

Ans. I couldn't say.

Cross-Q. 154. How long was it after you had first seen "D"?

Ans. I am not positive that I saw it in the shop at all.

Cross-Q. 155. Did you never see the glass tumbler, or tin can instruments marked "F" and "B," in the shop?

Ans. I did not.

Cross-Q. 156. May they not have been there all the time, while the clock business was going on?

Ans. Openly, or locked up?

Cross-Q. 157. May they not have been there in the shop?

Ans. They might have been there, concealed.

*

Cross-Q. 158. May you not have seen them there, and forgotten it?

Ans. No, sir.

Cross-Q. 159. You swear to that positively, as a fact, do you?

Ans. To the best of my knowledge and belief, I did not see them there.

Cross-Q. 160. What I mean is this; do you swear to it as a positive fact, that if you had seen them there, you would not have forgotten the circumstance?

Ans. I don't think I would have forgotten it.

Cross-Q. 161. But you don't state that to be the positive fact, but only your present opinion and belief. Is that what you mean to testify?

Ans. I think it is a fact.

Cross-Q. 162. Do you swear to it as a fact?

[*Objected to by Mr. Storrow, that the question has been fully answered; and now comes to be a mere metaphysical discussion.*]

[Mr. Hill replies, that it has not been answered; that he wishes to separate fact from opinion; and to find out how far this witness is willing to swear to matters as fact, and how far he is willing to admit that they are only matters of opinion and belief.]

Ans. Yes, sir.

Cross-Q. 163. Now, then, I want to know how you are able to swear to it as a fact, that you could not have seen those instruments there, and forgotten the circumstance. Do you never forget anything?

Ans. I was very much interested in the matter, when he said that he had been experimenting in telephones, and if I would have seen them there, I certainly would not have forgotten it.

Cross-Q. 164. That is merely your present opinion and belief about the matter; is it not?

Ans. It is from my knowledge of myself.

Cross-Q. 165. Have you not testified repeatedly, in substance, that after that first conversation you paid very little attention to Drawbaugh's telephones?

Ans. After that first conversation? Yes, sir.

Cross-Q. 166. May you not have seen those two instrument, "F" and "B," there at the shop, after that first conversation, and have forgotten the circumstance?

Ans. No, sir; I think not.

Cross-Q. 167. Did you never see the instruments "C" and "I" there at the shop, after that first conversation?

Ans. No, sir.

Cross-Q. 168. Can you swear that they were not both at the shop during all the time that the clock operations were going on?

Ans. They might have been concealed.

Cross-Q. 169. Did you never see an instrument similar to "C Reproduced," there at the shop, after that first conversation?

Ans. I did not.

Cross-Q. 170. Did you ever see the instrument "H" there at the shop after the first conversation?

Ans. No, sir.

Cross-Q. 171. Can you swear that it was not there all the time during the operations of the clock company?

Ans. Not openly.

Cross Q. 172. Did you ever see a telephone instrument of Mr. Drawbaugh's having two cords attached to it, one cord being of a bright red, and the other of a bright green color? This question does not relate to the shop, but anywhere. Did you ever see such an instrument?

Ans. Do you mean a cord of wire?

Cross-Q. 173. It had wire inside of it, but it was covered with thread. One side was bright red, and the other was bright green?

Ans. I do not remember.

Cross-Q. 174. I refer to the instrument marked "N;" did you ever see that instrument?

(Witness examines instrument "N.")

Ans. Not to my recollection.

Cross-Q. 175. Is not that the instrument which Mr. Drawbaugh showed you at Mechanicsburg, as you have testified?

Ans. I think not.

Cross-Q. 176. Are you able to swear positively that it is not?

Ans. I couldn't swear positively, but I think it is not.

Cross-Q. 177. Please look at the instruments "A," "G," "K," "J," "L," "M," "N," "O," and "P," and state whether you ever saw them or any of them at the shop after that first conversation?

Ans. This instrument, (indicating "A,") I have seen somewhere, but I can't place it. I may have seen it there. The others I didn't see any of.

Cross-Q. 178. Referring to the instruments "G," "J," "K," "L," "M," "N," "O," and "P," are you able to swear that they may not have been at the shop all the time during the clock company's operations there?

Ans. Not openly.

Cross-Q. 179. When you visited the shop once or twice a week during the operations of the clock company, what did you visit it for. Did you take any part in the work there?

Ans. I was interested in the clocks, and wanted to see what was done.

Cross-Q 180. Did you do any manual work there, yourself?

Ans. No, sir.

Cross-Q. 181. Were you running your store, at Mechanicsburg, all the while?

Ans. Yes, sir.

Cross-Q. 182. How long were you in the habit of staying at the shop, on your visits there?

Ans. From one to three, four, or five hours.

Cross-Q. 183. Did you stay in the shop all the time, or were you around the village?

Ans. I was in the shop.

Cross-Q. 184. Did Drawbaugh ever show you a telephone instrument at Mechanicsburg, more than once?

Ans. Not to my recollection.

Cross-Q. 185. Where did he have the instrument then? Was he carrying it in his pocket?

Ans. I think he took it out of his coat pocket.

Cross-Q. 186. What did he say about it at the time?

Ans. I think he told me he was going to take it and show it to Mr. Thomas.

Cross-Q. 187. What Mr. Thomas?

Ans. R. H. Thomas, who lives in Mechanicsburg, and edits "The Farmers' Friend," "Saturday Evening Journal," and "Cumberland Valley Independent," and another paper that I do not know the name of. At least, I think he edits another. No, I guess I am mistaken, and there are only three.

Cross-Q. 188. When were the operations of the clock company discontinued?

Ans. I think I sold out some time in the early part of 1880.

Cross-Q. 189. To whom did you sell?

Ans. E. W. Chellis.

Cross-Q. 190. When were the manufacturing operations of the clock company discontinued?

Ans. I can't give the exact date.

Cross-Q. 191. Was it not early in 1879?

Ans. It was some time in 1879, but I can't give the time.

Cross-Q. 192. Were you at the shop as often as once or twice a week, clear up to the time when the manufacturing operations were discontinued, or only a part of that time?

Ans. The greater part of that time?

Cross-Q. 193. When were you last at the shop?

Ans. I do not know. I couldn't give the date.

Cross Q. 194. Have you been there since the company's manufacturing operations were discontinued?

Ans. No, sir.

Cross Q. 195. Which member of the clock company was at the shop most frequently during the operations of the clock company?

Ans. I do not know.

Cross-Q. 196. Which member of the company had, to the geatest extent the confidence of Mr. Drawbaugh?

Ans. I do not know that any particular one had his confidence.

Cross Q. 197. Did you ever have any reason to believe that you did not have his confidence?

Ans. No, sir.

[Recess for dinner, until 2, P. M.]

JULY 29, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Theodore Grissinger, by Mr. Hill, continued:

Cross Q. 198. How many times during the continuance of the clock company's operations, did you have any conversations with Mr. Drawbaugh, about his telephones, which you can now distinctly remember?

Ans. I remember distinctly of two.

Cross-Q. 199. Is that all that you have a distinct recollection of?

Ans. We had more. But those are the only ones that I can distinctly remember.

Cross-Q. 200. Was one of those two conversations the conversation that took place at Mechanicsburg, when he showed you the instrument there?

Ans. Yes, sir.

Cross-Q. 201. Tell us all you remember of that conversation at Mechanicsburg?

Ans. He showed me the instrument; showed me what improvements he claimed on it, and said he was going to show it to Mr. Thomas.

Cross-Q. 202. Do you recollect what the improvements were that he claimed on it?

Ans. I do not.

Cross-Q. 203. Have you given all of that conversation now, that you can remember?

Ans. All I can remember.

Cross-Q. 204. Was that conversation in your store?

Ans. Yes, sir.

Cross-Q. 205. In what part of the store?

Ans. In the front part.

Cross-Q. 206. Who was present, besides yourself and Drawbaugh?

Ans. No one.

Cross-Q. 207. Did you ever have a conversation in your store, at Mechanicsburg, with Mr. Drawbaugh on the subject of telephones, at which anybody was present, except yourself and him?

Ans. I think not.

Cross-Q. 208. The first conversation, which you described, with Mr. Drawbaugh, to wit: the conversation at which you asked him about the dates of his earlier experiments, &c., was the other conversation, which you say you distinctly remember; was it not. That is to say, the two conversations, which you say you distinctly remember, were the one at the shop, in which you asked him about the date of his early experiments, and the other at your store, at Mechanicsburg, in which he mentioned that he was going to show the machine to Mr. Thomas; am I correct?

Ans. Those were the two conversations; yes, sir.

Cross-Q. 209. You say that at one time, after the first conversation at the shop, he showed you the machine "D," and tried to explain its construction. I suppose you do not distinctly remember what that conversation was; do you?

Ans. I said that I was not positive that he showed me an instrument at that time, or whether it was some time afterwards.

Cross-Q. 210. Assuming that it was some time afterwards, then what I want to know is, whether you distinctly remember the conversation that took place at that time when he did show it to you?

Ans. I do not.

Cross-Q. 211. Do you remember anything about it, except that he showed you the machine and tried to explain its construction to you?

Ans. I only know that he showed it to me and explained the improvements that he claimed to have made.

Cross-Q. 212. Do you remember what those improvements were?

Ans. No, sir; his main claim was its simplicity of construction and cheapness of manufacture.

Cross-Q. 213. You understood that I was not inquiring about the conversation at Mechanicsburg, but about the conversation at the shop in which he showed you the machine; did you?

Ans. It was at one of the conversations at the shop.

Cross-Q. 214. But you don't remember whether it was at the first conversation at the shop, about which you have testified, or whether it was at a subsequent conversation at the shop, if I understand you?

Ans. I think it was at a subsequent conversation.

Cross-Q. 215. Do you recollect any other particular conversation with Drawbaugh about telephones, except the three that you have specified, to wit: the first conversation in which you asked the date of his earlier experiments, the conversation at Mechanicsburg, and the possible other conversation in which he showed you the machine "D?"

Ans. I could not specify any other particular conversations.

Cross-Q. 216. Did you ever see any of Drawbaugh's telephone machines away from his shop, except on the occasion at Mechanicsburg, of which you have testified, until you saw these machines here at this house during the taking of this deposition?

Ans. Yes, sir.

Cross-Q. 217. Where and when?

Ans. In Mechanicsburg, about ten days or two weeks ago.

Cross-Q. 218. Who showed them to you there?

Ans. This gentleman; Mr. Storrow, I believe is his name. My former answer should be "similar machines." I do not know that they were Drawbaugh's. They were similar to the machines that were shown me here.

Cross-Q. 219. Is that the only time that you ever saw any of Mr. Drawbaugh's machines away from his shop, except on the one occasion at Mechanicsburg when Mr. Drawbaugh showed you a machine, and here during the taking of this deposition?

Ans. I think so.

Cross-Q. 220. When Mr. Storrow showed you the machines at Mechanicsburg recently, did you examine them carefully?

Ans. I did.

Cross-Q. 221. Will you please look at the machines from "A" to "P," inclusive, both original and re-produced, that are here in evidence, and point out which of those machines Mr. Storrow showed you at Mechanicsburg, if they are the same machines which he showed you; and if he only showed you copies or re-productions, point out which are the machines of which he showed you copies or re-productions.

Ans. I could not point out all the machines which he showed me. There were some which I understood him to say were copies. I could not say what ones they were.

Cross-Q. 222. How many machines did he have there, and show you?

Ans. I don't know; I didn't count them.

Cross-Q. 223. Did he have this machine, "H," there, or one like it?

Ans. Yes, sir.

Cross-Q. 224. Did he have this machine, "J," there, or one like it?

Ans. Yes, sir.

Cross-Q. 225. Did he have this machine, "A," there, or one like it?

Ans. Yes, sir.

Cross-Q. 226. Did you tell him that you had seen that machine, "A," before, or one like it?

Ans. No, sir.

Cross-Q. 227. At that first conversation with Drawbaugh at the shop, was he sitting or standing?

Ans. Sitting.

Cross-Q. 228. Do you recollect whether Mr. Shettel, or your brother took any part in the conversation at all?

Ans. I think they were present part of the time.

Cross-Q. 229. What I mean is, did they take any part in the conversation?

Ans. They took no particular part. They may have spoken a word or two.

Cross-Q. 230. Did Drawbaugh get up from his seat during the conversation, or did he remain sitting all the while?

Ans. He may have got up. We were sitting the greater part of the time.

Cross-Q. 231. Have you any recollection of his getting up from his seat during the conversation?

Ans. I am not certain that he got up.

Cross-Q. 232. What were your brother and Mr. Shettel doing, during that conversation?

Ans. I cannot say.

Cross-Q. 233. What was the first work that the clock company did, when they began to occupy the shop? Was it to make changes in the partitions, to accommodate their expected business?

Ans. Yes, sir; They made changes in the partitions.

Cross-Q. 234. Does the diagram on page 923 of defendant's printed record, correctly represent that floor, after the changes were made?

Ans. With the exception of this partition marked F. That partition was not there, entire.

Cross-Q. 235. What part of it was there?

Ans. A portion of the western part, from the wall of the house in, probably three feet.

Cross-Q. 236. Was the partition, *H*, there at the time of that first conversation?

Ans. I think so.

Cross-Q. 237. How long did the company occupy the shop, before that partition, *H*, was put up?

Ans. I cannot say.

Cross-Q. 238. What makes you think that this instrument, "E," is the one that Mr. Drawbaugh showed you at Mechanicsburg, at your store?

Ans. From this covering on the bottom, here, and the adjuster, (I suppose you would call it,) on the bottom of it.

Cross-Q. 239. Before he showed you the instrument, "E," at your store at Mechanicsburg, you had seen this instrument, "D," at the shop, had you not?

Ans. That is my impression; yes, sir.

Cross-Q. 240. When he showed you the instrument at your store at Mechanicsburg, did you recognize it as being different from the instrument which you had before seen at the shop, or did you think it was the same instrument that you had before seen at the shop?

Ans. It was the same instrument, with the exception of this bottom covering—seemed to be the same.

Cross-Q. 241. In your examination-in-chief, you say that, during the latter part of the time that the operations of the clock company were

going on at Drawbaugh's shop, there was a pair of telephones connected there, or at least he said so. Did you see those instruments?

Ans. I saw the one.

Cross-Q. 242. Where was it?

Ans. In the lower story, or ground floor.

Cross-Q. 243. Do you mean down in the basement or cellar, where the water-wheel was?

Ans. Yes, sir.

Cross-Q. 244. Where was the other instrument?

Ans. I don't know.

Cross-Q. 245. Did he tell you where it was, at the time?

Ans. I think he did; but I do not recollect where it was.

Cross-Q. 246. Didn't you see it?

Ans. No, sir.

Cross-Q. 247. How many times did you see the instrument down in the basement or cellar?

Ans. Once.

Cross-Q. 248. Was it connected to the wire when you saw it?

Ans. I don't know; I didn't examine it.

Cross-Q. 249. Do you know how long it remained there in the basement?

Ans. No, sir.

Cross-Q. 250. How happened you to go down into the basement and see it?

Ans. I think my brother spoke to me of it.

Cross-Q. 251. Did you have any of your clock machinery or materials in the basement?

Ans. No, sir.

Cross-Q. 252. You didn't go down into the basement, I suppose, very often; did you?

Ans. Not often.

Cross-Q. 253. If your brother hadn't spoken to you about that pair of instruments being connected to the line, you wouldn't have known anything about it, would you?

Ans. If I wouldn't have been told of it, I would not have known it.

Cross-Q. 254. Do you recognize among these instruments here in the room, the particular instrument which you saw down in the basement or cellar at that time?

Ans. No, sir.

Cross-Q. 255. Was it a large or small instrument?

Ans. I cannot say. I merely glanced at it and saw that there was one there.

Cross-Q. 256. At that first conversation that you had with Mr. Drawbaugh there in the shop about telephones, you say he spoke to you also about phonographs, and said he had experimented and made a phonographic instrument. Did he describe that instrument that he had made?

Ans. Yes, sir.

Cross-Q. 257. Do you remember his description of it?

Ans. No, sir; I do not—not distinctly. He made no diagram or sketch of it.

Cross-Q. 258. State all that you remember that he said about it?

Ans. I can only remember of him saying that it had a wooden cylinder that revolved, and a horizontal lever with a pin attached to the end, extending over this cylinder, and by speaking in the machine, it would cause this lever to vibrate and the pin would make indentations on the wooden cylinder corresponding to the speech. That is as near as I can remember, as I understood it.

Cross Q. 259. Did he tell you how he happened to get up that instrument, or what he intended it to be used for?

Ans. No, sir.

Cross-Q. 260. Did he not tell you that it was devised and intended to be employed as an attachment to clocks?

Ans. No, sir.

Cross-Q. 261. Did he not tell you that the phonograph instrument which he had made was designed to re-produce only musical sounds?

Ans. No, sir.

Cross-Q. 262. Did he not tell you that it had been intended to make a clock sing a tune, instead of striking certain hours?

Ans. No, sir.

Cross-Q. 263. Did he say when he had experimented with phonographs? How long ago?

Ans. No, sir.

Cross-Q. 264. Did he give you to understand that it was at the time of his early experiments with telephones, or afterwards?

Ans. He didn't say.

Cross Q. 265. You say in your fifth answer, that you paid him forty dollars for a fly-net machine, which he made for you in 1869. When did you pay him that forty dollars?

Ans. I can't give the time. It was a very short time after he made the machine.

Cross-Q. 266. Did you pay it to him all at once, or in installments?

Ans. It is my impression now, that I paid it to him at once.

Cross-Q. 267. Did you take any receipt from him for it?

Ans. I do not know. I think not.

Cross-Q. 268. Did you meet Mr. Drawbaugh, once in 1879, at a Grangers' meeting in Cumberland county.

Ans. Yes, sir.

Cross-Q. 269. Was that after the clock company suspended active operations, or not?

Ans. I think it was.

Cross-Q. 270. Did you have a quarrel with him at that meeting?

Ans. No, sir.

Cross-Q. 271. Was it a very amicable and friendly meeting between you two?

Ans. It was; so far as I was concerned.

Cross-Q. 272. Who was present besides yourself and Mr. Drawbaugh at your meeting with him on that occasion?

Ans. I couldn't say.

Cross-Q. 273. Where was that meeting?

Ans. I think it was where I had my implements on exhibition.

Cross-Q. 274. Where was that?

Ans. At the Grangers' pic-nic referred to.

Cross-Q. 275. Where was the Grangers' pic-nic.

Ans. On Yellow Breeches creek, on the line of the Mechanicsburg and Dillsburg railroad, about four miles south-west of Mechanicsburg.

Cross-Q. 276. It was at a place called Williams' Grove; was it not?

Ans. Yes, sir.

Cross-Q. 277. Did not hot and angry words pass between you and Mr. Drawbaugh on that occasion?

Ans. No, sir.

Cross-Q. 278. Nor on any other occasion?

Ans. No, sir; not to my recollection.

Cross-Q. 279. Mr. E. W. Chellis once called upon you, to see what you knew about Drawbaugh's telephones; did he not?

Ans. I don't recollect that he did. He may have spoken to me about them, but I don't remember of having any particular conversateon with him with regard to them.

Cross Q. 280. Don't you recollect a conversation with Mr. E. W. Chellis, in the early part of the fall of 1880, and of telling him, in that conversation, that you knew nothing at all about Drawbaugh's telephone?

Ans. I don't recollect it..

Cross Q. 281. You made an affidavit for the complainants in this suit, in the fall of 1880, did you not?

Ans. I think it was in the fall of 1880.

Cross-Q. 282. Who went to you on behalf of the complainants, to procure that affidavit, or to ascertain what you knew about the case?

Ans. I think it was Mr. Storrow who procured the affidavit.

Cross-Q. 283. Were you visited by Mr. Weeks, or Mr. Theophilus Weaver, on that business?

Ans. There was a gentleman called on me. I think his name was Weeks.

Re-direct examination by Mr. Storrow:

Q. Q. 284. You said that your brother and Mr. Shettle were near you during some parts of this conversation in the shop, which you have described. Was that during the telephone part of the conversation, or the other part of the conversation?

Ans. They were present while he was talking of the phonograph.

Re-cross-examination by Mr. Hill.

Re-cross-Q. 285. Which was talked about first; the telephone or phonograph?

Ans. The telephone.

Re-cross-Q. 286. Were they not present during any part of the conversation on telephones?

Ans. I think not.

Re-cross-Q. 287. You are not certain about it, are you?

Ans. They took no part in the conversation.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 29th day of July, 1882.

FRED. M. OTT, *Examiner.*

THEO. GRISSINGER.

Adjourned to meet at Baltimore, Md., on Tuesday, August 1, 1882, at 10, A. M.

EUTAW HOUSE, BALTIMORE, MD., August 1, 1882.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow, for complainants, and Mr. Hill for respondents.

JAMES P. MATTHEWS, being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is forty-four years; residence, 303 Hollins street, Baltimore, Md.; I am employed on the Baltimore *Sun*.

Q. 1. Were you one of the editors of one of the Baltimore papers in 1878; if so, which one?

Ans. I was the managing editor of the Baltimore *American*.

Q. 2. Please look at the article I now show you, in the Baltimore *American*, of February 2, 1878, entitled: "A Letter from New Cumberland," and printed in complainants' record, page —; and tell me whether you read it at the time it appeared?

Ans. I saw the manuscript of that article before it appeared. I made it up as copy. I read it before it was printed. I remember of reading it, very distinctly, in the manuscript. Whether I read it next morning in the paper, or not, I can't say. Very likely I did.

Q. 3. Did you afterwards visit the shop of Mr. Daniel Drawbaugh, at Eberly's Mills?

Ans. I did.

Q. 4. Please look at a copy which I now hand you, of an article in the Baltimore *American* of November 28, 1878, printed on pages 99–102, complainants' moving papers, and state whether you wrote it?

Ans. I did.

Q. 5. Please read it to the examiner, that he may take it down as part of your answer.

Ans. It is as follows:

(From the Baltimore American of November 28, 1878.)

A MAGNETIC MOTOR.

The Boston correspondent of the New York "Times" gives an account of a new motor now being constructed by Mr. W. W. Gary, of that city, which seems to be almost identical in its action with the perpetual clock, invented by Mr. Daniel Drawbaugh, of Cumberland county, Pa.; two magnets, one upright and one horizontal, are so adjusted that the alternate attraction and repulsion, which occur as a piece of soft iron

vibrates between them, keep a wheel in revolution. We quote from Mr. Gary's explanation of the movements of the machine, as given by the correspondent:

"Now you see that when the poles of the upright revolving magnet are opposite the corresponding poles of the horizontal one, they are repelled—like repelling like—so the upright magnet is turned around until positive and negative meet. Here it would stay, and all motion would cease where it not for the delicate balancing of that piece of soft iron, which is alternately attracted and repelled according to the conjunction of the magnets, changing its polarity in such a way and at just such a moment as to swing the poles of the upright, revolving magnet beyond the dead center; thus the motion is made continuous. It is quite like giving just enough additional impetus at each stroke of a pendulum to keep it continually in motion."

If Mr. Gary has been correctly reported, he describes the very principle on which Mr. Drawbaugh's clock is constructed. The pendulum receives an impulse at each stroke which keeps up a continuous motion, and this impulse is derived from the alternate attraction and repulsion of two magnets, and the existence of "a neutral line," at which the one pole loses its power and the other begins to act. One of the editors of the "American" visited Mr. Drawbaugh last April, and looked at his clock, but not being an "expert" in electro-magnetism, he did not care to attempt to demonstrate the principle on which it moves and keeps time accurately from year to year. Mr. Drawbaugh is not a scientific man himself, and it may be doubted whether he could explain the action of his clock in a way that would be entirely intelligible even to a trained electrician. He is a plain mechanic, who has had a hard struggle to support his family, by making common agricultural implements, while he was meditating on the nice adjustment of forces and the delicate mechanism which keep his clock in motion. If the principle is the same as that on which the Boston motor is constructed, Mr. Drawbaugh can claim at least four years' priority in the discovery.

Unlike other clocks, the pendulum is the motor in this perpetual time-keeper. It is suspended on a sharp-edged pivot of hardened steel, so as to reduce friction to a minimum. The ball probably weighs twenty pounds. The middle rod terminates midway between the ball and the point of suspension in an ordinary permanent magnet; fastened against the back part of the case, or against the wall, at right angles to the permanent magnet, is an electro-magnet. The wires attached to the poles

of this magnet are not in sight, but they run down into the ground, each terminating in a copper plate, about two feet below the surface. Thus the earth becomes the battery that feeds the electro-magnet. When the pendulum is swung away from the perpendicular line, the opposite poles of the two magnets first attract and then repel, and in this way the oscillation is kept up; we shall leave it to the scientists to elucidate the theory and explain the electrical action by which this is effected. We are only speaking of the result, namely, the continuous vibration of the pendulum. At the top of the pendulum is a little ratchet, which moves the wheel to which the second hand is attached, and from this the motion is communicated to the minute hand, and from the minute hand to the hour hand. There being no necessity for the multiplication of motion at the expense of power, the complicated series of cog wheels, by which this is effected in clocks moved by weights or spring coils is done away with. The three cog wheels, with the index hands attached to their axles, constitute the entire "works" of the clock. There is nothing to get out of order; and, there being only four bearings that are subjected to the least friction, the clock would probably run two hundred years or more before any part would have to be renewed. This comes nearer to perpetual motion than anything that has been discovered.

It is a singular fact that this ingenious piece of mechanism, which embodies in its action the latest discoveries of science, is the work of a plain, hard-working man, who has always lived in the country, and who has never had an opportunity of seeing any practical experiments in electro-magnetism.

No doubt when he began to make a clock that would require neither weight, nor spring, nor galvanic battery to move it, he was pursuing the *ignis fatuus* of self-taught inventors,—perpetual motion. He has patented several useful agricultural and mechanical machines, but has never had means to make them a commercial success. No one that visits his shop would suppose it possible that a beautiful clock could be made in such a place. Nevertheless, where there is mechanical genius fine work can be done with the simplest tools. Mr. Drawbaugh lives about two miles from New Cumberland, on the Northern Central Railway. If any Baltimorean doubts the truth of what we have written about the perpetual clock, a visit to his shop, and look at this scientific and mechanical wonder that has been ticking away for four or five years without a second's intermission, will cure him of his scepticism.

It may be mentioned that Mr. Drawbaugh constructed a rude telephone

long before Edison loomed up as the "boss" inventor. He never expected to send articulate sounds over a magnetized wire, but he believed that an alphabet could be arranged after the manner of the musical scale, and that messages could be transmitted and understood by the variations of tone and pitch. This unlettered country mechanic came very near anticipating Edison and Bell in the invention of the telephone. Nothing but his poverty prevented him from conducting his experiments to a successful issue.

Q. 6. This article states: "One of the editors of the *American* visited Mr. Drawbaugh last April," which would be April, 1878. Are you the editor there referred to?

Ans. I am.

Q. 7. Was your visit in the first part, or last part of April, 1878?

Ans. It was in the last part, or it may have been the first of May.

Q. 8. Your article of November 28, 1878, begins by referring to, and quoting from the New York *Times*, a passage from a then recent publication about the Gary motor. It then purports to give an account of what you learned from Mr. Drawbaugh, at the visit to his shop on the day referred to. Does or does not the part which refers to Mr. Drawbaugh and his work, correctly state the recollection you had, at the time of the writing of the substance of what Mr. Drawbaugh told you at that interview?

Ans. It does.

Q. 9. The last paragraph of your article refers to something that Mr. Drawbaugh did, or attempted to do, about the telephone. Does that paragraph correctly state the recollection you had, at the time of writing, of the substance of what Mr. Drawbaugh told you at that interview?

Ans. It does.

Q. 10. I again call your attention to those parts of the article which relate to Mr. Drawbaugh, and ask you whether they agree with your present recollection of the substance of what Mr. Drawbaugh told you at that interview?

Ans. They do.

Q. 11. At the time you went to Mr. Drawbaugh's shop, and at the time you wrote that article, did you intend and desire to depreciate Mr. Drawbaugh and his work, or did you intend and desire to speak as favorably of him and it as what you learned there might warrant, in your judgment?

*

Ans. I went there to see his clock, and I intended to write it up as favorably as the facts would warrant.

Q. 12. While you were at his shop, at that visit, was any talking carried on through a telephone?

Ans. No.

Q. 13. Did you, at his shop, see any telephones completed and in working order?

Ans. I did not.

Q. 14. While you were there, did you see any telephone completed and put together, or did you see any detached parts, which he told you belonged to a telephone?

Ans. I saw no telephone, or nothing looking like a telephone, as I understood it. Mr. Drawbaugh showed me two small hemispheres, to each of which there was a wire attached, and told me that he had been experimenting with the telephone. He showed me no other apparatus, except these pieces.

Q. 15. Please look at the large tall instrument "H," now shown you, and tell me whether you saw it at that interview?

Ans. I saw no instrument like that.

Q. 16. Have you ever been at Mr. Drawbaugh's shop, except at that visit?

Ans. I have not.

[Recess for dinner, until 3, P. M.]

AUGUST 1, 1882, 3, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of James P. Matthews, by Mr. Hill.

Cross-Q. 17. How long was your visit at Mr. Drawbaugh's shop?

Ans. It was an hour, or possibly two hours, to the best of my recollection.

Cross-Q. 18. I suppose you had no motive in going there, except to see the electric clock; had you?

Ans. My object was to get material for a striking newspaper article, and I only had the clock in my mind.

Cross-Q. 19. Did you take any notes while you were there?

Ans. I must have taken notes, although I cannot remember, now, the form in which they were taken.

Cross-Q. 20. Do you recollect the fact of taking notes, or do you infer that you took notes, from your usual habit, or from the character of the article which you published?

Ans. I recollect that I did take notes, but I am often in the habit of taking down rough sketches, which re-call to my mind the subject-matter that I wish to reproduce.

Cross-Q. 21. Then, if I understand you, you are not able to say whether you merely took down the heads with which to excite your mind to recollection afterwards, or whether you took down full notes, from which you had merely to prepare the article?

Ans. I am sure that I did not take down full notes.

Cross-Q. 22. The article seems to have been published November 28, 1878, and the visit, which it described, I understand to have occurred about the latter part of April or early part of May, 1878, was the article written about the time of its publication or immediately after your return from the visit?

Ans. The article was written, as far as I remember, on the evening before it was published.

Cross-Q. 23. Have you ever studied mechanics or practiced any mechanical occupation?

Ans. No, sir; not particularly.

Cross-Q. 24. Have you ever been engaged in any other business except that of newspaper editing and reporting?

Ans. I have been a school teacher and I practiced law four years.

Cross-Q. 25. With your limited mechanical knowledge, do you feel confident that you got a correct understanding or gave a correct description of Mr. Drawbaugh's clock?

Ans. I was not at all satisfied with the description I obtained of Mr. Drawbaugh's clock, nor with his explanation of the principle on which it was constructed, and for that reason I did not write the article on my return home.

Cross-Q. 26. I suppose you were really stimulated to write the article, in November, 1878, by reading the article in the New York Times, relating to the Gary motor, to which you refer in your article, were you not?

Ans. I was; it was that article that re-called my visit to Mr. Drawbaugh's shop. I supposed that the principle of the Gary motor was the

same that Mr. Drawbaugh had tried to explain to me, and I meant to set up a claim of priority of invention for him.

Cross-Q. 27. I observe in your article this statement: "Mr. Drawbaugh is not a scientific man himself, and it may be doubted whether he could explain the action of his clock in a way that would be entirely intelligible even to a trained electrician." I judge from that paragraph that in your interview with Mr. Drawbaugh you found him to possess very little facility in communicating his mechanical ideas. Am I right?

Ans. I had much difficulty in understanding him.

Cross-Q. 28. Was your interview at his shop mostly taken up with the examination and discussion of the clock?

Ans. Yes, sir; we devoted more time to the clock than anything else.

Cross-Q. 29. Was anybody present with you and Mr. Drawbaugh during that interview?

Ans. The shop, as I remember, had two or three apartments; and there was a man working at a clock case in one of the apartments—in a large room. The boy who drove me over from New Cumberland may have been there part of the time.

Cross-Q. 30. I suppose you made no very particular examination of any other machinery except the clock; did you?

Ans. We examined the clock more particularly than anything else.

Cross-Q. 31. I suppose you couldn't undertake, after this lapse of time, to re-call or enumerate all the instruments or machines that were standing around in the shop where you were; could you?

Ans. I could not; there may have been things there that escaped my notice.

Cross Q. 32. Referring, for example, to this machine before you, marked "H," I suppose the most you can say of that machine is, that you do not recollect having seen it there, and that you could not swear, as a matter of fact, that you did not see it there; could you?

Ans. I cannot say that it was not there. I did not see it, although I asked Mr. Drawbaugh to show me his telephone.

Cross-Q. 33. Did he, in response to that request, show you any telephones; if so, how many?

Ans. When that request was made, my recollection is that we were not in the main shop; we were in another room. Mr. Drawbaugh picked up two hollow wooden hemispheres—my recollection is—and said that he had been experimenting with them. I have no distinct recollection of their mechanical construction, except that there were pieces of loose

wires attached. When I say loose wire, I mean that the other end was not attached to anything. It was hanging free. He showed me no other apparatus than that—of telephones.

Cross-Q. 34. Did you understand from him that he had been recently experimenting with those, or that they were the subjects of former experiments, or did he give any idea as to when the experiments were made?

Ans. I cannot recollect that he told me when he had been experimenting; but these pieces were not in use at that time.

Cross-Q. 35. Did they look as if they were recently made, or did they have an antique appearance?

Ans. Very ancient and rude.

Cross-Q. 36. How large were they, and were they both alike in dimensions and shape?

Ans. My recollection is that they were alike, and that they were about three inches and a half in diameter—possibly four.

Cross-Q. 37. Are you pretty clear in your recollection that they were hemispherical in shape?

Ans. That is my recollection at present, although I made no drawing of them, and paid very little attention to them. And Mr. Drawbaugh himself gave me the impression that he had thrown them entirely aside.

Cross Q. 38. Do you mean that he had thrown those two hemispherical instruments entirely aside?

Ans. Yes, sir.

Cross-Q. 39. In the last part of your article I see the following statements, referring to Drawbaugh and his telephone: "He never expected to send articulate sound over a magnetized wire, but he believed that an alphabet could be arranged after the manner of the musical scale, and that messages could be transmitted and understood by the variations of tone and pitch." Are you confident that you have correctly referred that statement to the telephone, and that you have not mixed up statements which he made concerning an old dial or alphabetical telegraph of his with statements which he made concerning his telephone, and possibly with statements concerning the possibility of transmitting musical tones?

Ans. I saw no dial telegraph in his shop, and I do not think the subject was mentioned. The statement which I have made in that article is a reproduction of the impression that his conversation made upon me at that time. We had a good deal of talk about the telephone, and he explained to me the different theories upon which he had worked. The

passage quoted is the summing up of what he said, or at least of what I understood him to say.

Cross-Q. 40. You found that he talked very rapidly, and in broken and disjointed sentences, running from one subject to another; did you not?

Ans. I cannot remember that I noticed that peculiarity so much as a want of facility of expression. He had difficulty in selecting language to convey his ideas, which I attributed to his imperfect education.

Cross Q. 41. Suppose you were informed that, out of over a hundred witnesses examined in this case, a very large number had testified in substance that prior to your interview with Mr. Drawbaugh, and even prior to the year 1876, they had actually witnessed the sending of articulate sounds over a magnetized wire at Mr. Drawbaugh's shop—had sent such sounds and had heard them when sent by others—and that among all the witnesses who had ever been at the shop not one had testified of an alphabet being arranged after the manner of the musical scale, or of messages being transmitted and understood by variations of tone and pitch; in view of such information, would you feel confident that you had correctly understood or remembered Mr. Drawbaugh in the matter referred to in the quotation which I last made from your article?

[*Question objected to by Mr. Storrow, because it asks the opinion of the witness on matters alleged, but not within his knowledge, and because it does not state the many facts and circumstances which throw discredit upon the testimony referred to.*]

[*Mr. Hill objects to the last clause of the objection going upon the record, because unwarranted by any facts in the case.*]

Ans. Mr. Drawbaugh never told me that he had an instrument that would transmit messages in the way mentioned, but that was the theory upon which he had worked. I have no information whatever on the subject, except that derived from my conversation with Mr. Drawbaugh. He did not tell me that he ever had sent articulate sounds over a magnetized wire, or that he had an instrument by which that could be accomplished. As to weighing my recollection against the testimony, that is a judicial question which I cannot answer. When I wrote the article I was trying to state the case as strongly in favor of Mr. Drawbaugh as my recollection of his conversation would permit.

Cross-Q. 42. Then I will ask you this question: Are you entirely confident, that in the matter referred to in that quotation, you really understood Mr. Drawbaugh as he meant to be understood?

Ans. There were two things that we talked about that day, the clock and the telephone. The clock received by far the most attention. I cannot remember that any other instrument was mentioned in connection with the telephone. We talked about the claim of priority of invention, and mentioned both Bell and Edison. Mr. Drawbaugh told me that the idea of the telephone was not first suggested by either of them. He did not set up any claim as being the discoverer himself; he said he had first read about it in a translation of some foreign publication.

Cross-Q. 43. That does not quite answer my question, which was: Are you confident that you understood Mr. Drawbaugh correctly in the matter referred to in the paragraph quoted, or may you not have mistaken his meaning?

Ans. I gathered from the previous question, that Mr. Hill suggested, whether we may not have talked of other instruments in connection with the telephone, and that I may have applied portions of the conversation to the telephone, which, in fact, related to another instrument. In response to that part of the question, I said that I did not remember that we talked of any other instrument in connection with the telephone. I cannot pass any opinion as to the accuracy of my recollection.

Cross-Q. 44. You did talk, in that conversation, about a foreign publication; and you did, in that conversation, get an idea of the use of the musical scale, and of transmitting messages by variations of the tone and pitch. Did you not?

Ans. Mr. Drawbaugh didn't say anything about a musical scale. That is my illustration of the theory which he was trying to explain to me. There was some remark made about a foreign publication. It was merely incidental. I knew nothing about it, myself.

Cross-Q. 45. Was there any talk about Gray's harmonic telegraph?

Ans. There was not.

Cross-Q. 46. Was there talk about messages being transmitted by varying the tone or pitch?

Ans. There was.

Cross-Q. 47. Was there talk about the transmission of music?

Ans. There was not.

Cross-Q. 48. Was there talk about an alphabet being arranged like a musical scale, so that variations of pitch would indicate different letters?

Ans. Mr. Drawbaugh did not go into any details. We merely talked about the theory. I cannot remember that anything was said about an alphabet.

Cross-Q. 49. Did he say anything about having experimented in the direction of the telephone prior to Edison and Bell?

Ans. He did. He talked of having entertained this theory for a long time, and of having experimented years before.

Cross-Q. 50. Did he say that he never intended to send articulate sounds over a magnetized wire?

Ans. He did not use that language at all. The sending of articulate sound was not in his theory, as I understood it. That is, in the theory he was explaining to me. He may have had other theories.

Cross-Q. 51. This theory that he was explaining to you was the one which he said was first enunciated in the foreign publication, was it not?

Ans. No; what he said about the foreign publication was, that it was the idea of the telephone.

Cross-Q. 52. Would you remember the name of the foreign scientist, if you heard it?

Ans. No, sir; he didn't mention any name. I think he said it was a translation from the French. I am sure he said so.

Cross-Q. 53. When Drawbaugh showed you the two pieces, which you think were of hemispherical shape, where did he get them; were they lying on a bench near him?

Ans. They were lying either on a bench or a shelf. He reached some place and took them down, apparently merely because I asked him. He didn't volunteer to show them.

Cross-Q. 54. Did he reach them from where he was standing when you asked the question?

Ans. I have no accurate recollection about that. When we went up stairs we went into a room at the right hand, and I think it was in there that I asked him to show me his telephone, and he showed me these pieces. It was not in that large work-shop, although I think that most of our conversation took place in that large work-shop. My recollection is, that on going up stairs, on turning to the left, we went into the large shop, and on turning to the right, we went into the little room. I do not know which room we entered first. We were in the small room a very short time, and these pieces of apparatus were not under our notice for more than half a minute, perhaps.

Cross-Q. 55. If he didn't reach those pieces from where he was standing, he, at any rate, didn't have to move more than a step or two to reach them, I suppose?

Ans. I cannot be positive; but they were close at hand. It required no time or effort to get them.

Cross-Q. 56. That was your first aquaintance with Mr. Drawbaugh, was it not?

Ans. I never saw him before nor since.

Cross-Q. 57. Did you take any letter of introduction, or any friend to introduce you, or did you introduce yourself?

Ans. I introduced myself. When I went to New Cumberland, I went to Mr. Mosser's house, to get him to go with me, but he was not at home.

Re-direct by Mr. Storrow:

Q. Q. 58. Did you ever meet Mr. Drawbaugh, or have any communication with him, after that?

Ans. I did not.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 1st day of August, A. D. 1882.

FRED. M. OTT, *Examiner.*

JAMES P. MATTHEWS.

Adjourned until August 2, 1882, at 10, A. M.

AUGUST 2, 1882.

Postponed until August 3, at 10, A. M.

AUGUST 3, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present: Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

GEORGE W. KISSINGER being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is fifty-seven, I think; residence, Talbot county, at a place called Chapel, near Easton, Md.; my occupation is farming.

Q. 1. Did you ever live at Eberly's Mill, Cumberland county, Pa.; and if so, when did you live there?

Ans. I moved there in 1871.

Q. 2. Mr. Thomas Draper, a witness for the defendants, testified, page 1165 of defendants' printed record, that about the 1st of April, 1874, you hired of him a farm at Marysville, a few miles north of Milltown, and moved on to it. Does that agree with your recollection?

Ans. Yes, sir.

Q. 3. Did you live at Milltown up to the time when you moved on to Draper's farm, about the 1st of April, 1874?

Ans. Yes, sir.

Q. 4. The lease of Draper's farm to you, which was put in evidence by the defendants, states that it is "for one year from the date of this agreement, and to continue so long as said parties can agree." How long did you occupy that farm before you moved to where you are now?

Ans. Six years.

Q. 5. Mr. Draper testifies that while you lived at his farm, at Marysville, one of Mr. Drawbaugh's rams was put in to throw water up to the house. Is that according to your recollection?

Ans. Yes, sir.

Q. 6. Mr. Draper testifies that you and he went to Mr. Drawbaugh's shop to arrange for the purchase of the ram, but that it was put in the next season after that, because it took some time for you to bore the logs for it. Is that according to your recollection?

Ans. Yes, sir.

Q. 7. Do you remember going to Mr. Drawbaugh's shop with Mr. Draper to arrange for the purchase of that ram?

Ans. Yes, sir.

Q. 8. Did you ever go there more than once with Mr. Draper?

Ans. No, sir.

Q. 9. How did you go over with Mr. Draper and where did you go from?

Ans. We went in a spring wagon. I took him over. We went from his farm, where I was living.

Q. 10. Was it in hot weather or in cool weather?

Ans. Cool weather.

Q. 11. What part of the year was it according to your recollection?

Ans. In the fall.

Q. 12. What was the arrangement between you and Mr. Draper as

to who should pay for the ram and what iron piping had to be bought for it?

[*Objected to by Mr. Hill, as immaterial and irrelevant.*]

Ans. The arrangement was I was to get the material and take it out of the rent.

Q. 13. Did you do that?

[*Same objection.*]

Ans. Yes, sir.

Q. 14. Mr. Draper says that some of the piping was to be of logs which you were to get out and bore. Did you get out some logs and bore them for part of the piping?

Ans. Yes, sir.

Q. 15. Did your son, John, help you about boring some of the logs?

Ans. I can't tell you whether it was my son John, or son Cyrus, or Frank; but the boys, I suppose, all helped me.

Q. 16. Did you buy the logs or did you cut them and get them out yourself?

Ans. We got them off the farm.

Q. 17. How soon after you went to Drawbaugh's shop with Draper did you go to work cutting and getting out the logs?

Ans. Early in the spring.

Q. 18. What part of the piping did you make of logs?

Ans. The next to the spring.

Q. 19. Was the ram put right at the spring or some distance off from the spring?

Ans. A good distance from the spring.

Q. 20. Did you use wooden piping or iron piping for the small pipe between the ram and the house?

Ans. Small iron pipe.

Q. 21. How did that small iron pipe get to Marysville?

Ans. It got there through Drawbaugh sending it there.

Q. 22. I ask you to look at the Pennsylvania Railroad Freight Receipt Book, at Marysville Station, receipt four hundred and eighty-five, for two bundles of pipe, one hundred and sixty-five pounds, and at the order from Mr. Daniel Drawbaugh, annexed thereto, and your order annexed thereto, all dated in 1878, and tell me whether that is the pipe which Mr. Drawbaugh sent you, to run from the ram up towards the house?

Ans. Yes, sir.

Q. 23. I see the pipe seems to have been finally receipted for by J. C. Zimmerman. Who was he, and where did he live?

Ans. He lived with me. He was a son-in-law of mine.

Q. 24. Did anybody at Marysville, except you, have one of Mr. Drawbaugh's rams, while you lived there?

Ans. No, sir.

[Mr. Storrow puts in evidence a bill of pipe, from Morris, Tasker & Co., dated July 1, 1878, for two bundles half-inch pipe, one hundred and sixty-five pounds; marked "Marysville," produced by Mr. Drawbaugh, on page 1068, defendants' printed record, as pipe purchased to go with one of his rams; the railroad receipt, headed "Marysville, July 2, 1878, two bundles of pipe, one hundred and sixty-five pounds," consigned to "D. Drawbaugh;" an order annexed thereto, signed by D. Drawbaugh, to deliver it to G. Kissinger, dated September 6, 1878; and, on the back thereof, an order signed by George Kissinger, to deliver the same to Zimmerman; all of which papers are copied into the record, as follows:

"PHILADELPHIA, 7, 1, 1878.

Mr. DANIEL DRAWBAUGH, Eberly's Mills, Cumb. Co., Pa.

Bought of Morris, Tasker & Co., Limited.

Mkd Marysville, Pa.

2 bdles ½" pipe,	200	.07	14.00	
165 lbs. 55 per cent. and 2 per cent,			7.82	6.18

P. R. R.

. . . . . .

No. 485.

MARYSVILLE STATION, July 2, 1878.

Mr. D. DRAWBAUGH,

To Pennsylvania R. R. Co., Dr.

For freight from Philad'a, per manifest No. 22,694.

	Marks.	Weights.	Rate.	Amount.
On 2 bdls pipe,		165	21	35

Received the above articles from Pa. R. R. Co.,

J. C. ZIMMERMAN.

. . . . . .

EBERLY'S MILLS, PA., September 26, 1878.

Mr. GUIDE, Agent, P. R. R. Co., Marysville:

Please let George Kissinger have the pipe at your warehouse, as the pipe is for his use.

DANIEL DRAWBAUGH.

Mr. Gibe, let Zimmerman have them pipe.

GEO. KISSINGER."

Q. 25. Did you, after getting that pipe, procure the ram from Mr. Drawbaugh's shop?

[*Objected to by Mr. Hill as leading.*]

(Question withdrawn.)

Q. 26. Did you get the ram from Mr. Drawbaugh's shop before or after that pipe came by railroad to Ma ysville?

Ans. After the pipe came.

Q. 27. How did you get the ram over from Mr. Drawbaugh's shop to your place?

Ans. I brought it over in a spring wagon.

Q. 28. Did you get any other iron pipe for the ram, before it was put in, except this half-inch pipe that came by the railroad, as already stated?

Ans. Yes, sir; I got several pieces more.

Q. 29. Where did you get that extra pipe?

Ans. Some in Harrisburg; and brought some along when I brought the ram from Mr. Drawbaugh's.

Q. 30. Did, or did not, Mr. Drawbaugh come over and help you put in the ram?

Ans. Yes, sir; he put the ram in.

Q. 31. How did he get over?

Ans. I brought him, part of the way.

Q. 32. Mr. Drawbaugh testifies (defendants' printed record, page 1055) that he put in a ram for you. Did he ever put in any ram for you, except the one you have been testifying about?

Ans. No, sir.

Q. 33. When you took Mr. Draper over to Mr. Drawbaugh's shop to arrange about the ram, as you have testified, did you stay with Mr Draper and Mr. Drawbaugh all time you were there, or were they left by themselves any part of the time?

Ans. They were talking by themselves, and I was walking about the shop viewing other things.

Q. 34. On your way home with Mr. Draper, that day, did he say anything to you about Mr. Drawbaugh having asked him to put any money into anything, or to buy anything from him?

[*Objected to by Mr. Hill, as irrelevant, immaterial, calling for hearsay, and incompetent.*]

Ans. I believe he said something, on the way home, about buying something, and about buying a clock.

Q. 35. Did he, or did he not, say that Mr. Drawbaugh had said anything to him about furnishing any money in connection with the telephone?

[*Same objection.*]

Ans. He said something about furnishing money, but I can't be positive whether it was about telephone, or not, any more. I rather think it was something about the telephone.

Q. 36. Did you, or did you not, see a large clock at Mr. Drawbaugh's, on that visit?

Ans. Yes, sir.

Q. 37. Do you remember whether it was a clock to go by weights, or whether it was a clock that was to go by electricity?

Ans. To go by electricity. I saw no weights.

Q. 38. While you lived at Eberly's Mills, from April, 1871, to April, 1874, what was your occupation?

Ans. I kept a little store there, and worked out occasionally.

Q. 39. Was there any other store in the place?

Ans. No, sir.

Q. 40. What has become of the building where you kept the store?

Ans. I believe it blowed up.

Q. 41. Did you work out any in Harrisburg, while you lived at Eberly's Mills; and if so, how much, and at what?

Ans. Yes, sir; I worked about eighteen months there, in the car shops, at Harrisburg.

Q. 42. Are you a mechanic by trade?

Ans. I am a carpenter by trade.

Q. 43. While you worked at the Harrisburg car shops, did you live at Harrisburg, or live at home, at Eberly's Mills?

Ans. I lived at home, at Eberly's Mills.

Q. 44. Did you go back and forward every day?

Ans. Yes, sir; except part of the time that I boarded.

Q. 45. During how much of the time did you board at Harrisburg?

Ans. I boarded there the first winter, three months.

Q. 46. Was your store much of a place of resort in the evenings?

Ans. It was; some evenings it was full.

Q. 47. Did you ever have any particular attractions there, Saturday evenings?

Ans. Not particularly, only ice cream, and so on, to spend Saturday night with.

Q. 48. Was there any tavern in the village, while you were there?

Ans. No, sir.

Q. 49. After you left there, and moved to Marysville, were you in the habit, for a number of years, of going over to Milltown frequently; and if so, for what purpose?

Ans. Yes, sir; I went to Milltown pretty often, on account of collecting a little money.

Q. 50. On these occasions, when you would go over to collect money, did you often go to Mr. Drawbaugh's shop; and if so, for what purpose?

Ans. I often went there to see him; and we had a little dealings still; and sometimes I would get something there; and sometimes I had a little other business there.

Q. 51. On any of these visits, did Mr. Drawbaugh ever show you a telephone, or ask you to put your ear at one, and listen?

Ans. Yes, sir; I held my ear to something; but I couldn't tell whether it was the same telephone that he showed me, or not; but I listened at something.

Q. 52. Did you understand what was said through the telephone, at that time?

Ans. No, I think not, sir; I don't recollect of understanding anything about it.

Q. 53. Mr. Drawbaugh, in his testimony (defendants' printed record, page 887) produced a note signed by himself and you, dated April 26, 1873, for sixty dollars, payable thirty days after date, in favor of George Leonard. Do you remember about that note?

Ans. Yes, sir.

Q. 54. Mr. Drawbaugh testified that it may have been for a bill he owed you at the store. Was it for the bill, or part of the bill, he then owed you?

Ans. Yes, sir; it was got out of the store?

Q. 55. Did Mr. George Leonard cash that note for you?

Ans. I think, if my memory serves me right, I got nearly all cash for it.

Q. 56. What did you get for the rest of it that you didn't get actual cash for?

Ans. It went on part rent and bills of things that I got from Mr. Leonard.

Q. 57. I see that that note is signed both by you and Mr. Drawbaugh. Was it understood between you which of you two was to pay it?

Ans. Yes, sir; Drawbaugh was to pay it?

Q. 58. Have you ever been asked to pay it?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. No, sir.

Q. 59. Did Mr. Leonard own your store building all the time you were at Eberly's Mills?

[*Objected to by Mr. Hill, as incompetent and calling for secondary evidence.*]

Ans. Yes, sir.

Q. 60. Did you hire it of him all the time you were there?

Ans. Yes, sir.

Q. 61. While you lived at Eberly's Mills, and before you moved away, were you, or were you not, in the habit of going to Mr. Drawbaugh's shop?

Ans. We were in the habit of going there pretty often.

Q. 62. While you lived at Eberly's Mills did he ever show you any talking machines or telephones?

Ans. No, sir; not while we lived there.

Q. 63. While you lived at Eberly's Mills did you ever hear that he had a talking machine or telephone?

Ans. No, sir.

Q. 64. Did Mr. Drawbaugh and one of his counsel come down to your place near Easton, about eighteen months ago, and speak with you about telephones?

Ans. Yes, sir.

Q. 65. What part of the year was it, and what kind of weather was it?

Ans. I think it was in February. It was very cold weather, I know—

cold enough to freeze most anybody. I can't tell what month exactly, but it was in February or the latter part of January. I saw it in the book, but I can't tell you now.

Q. 66. Did they have with them, and show to you, any instruments, and ask you if you could recognize them?

Ans. Yes, sir.

Q. 67. Did you identify the instruments they showed you?

Ans. No; I couldn't exactly identify them.

Q. 68. Did Mr. Drawbaugh and one of his counsel come to your place again, this present year?

Ans. Yes, sir.

Q. 69. When was it?

Ans. I believe it was March, as near as I can tell you.

Q. 70. What time of the day did they come to your house?

Ans. They came in the night, betwixt eight and ten, as near as I can get at it. I was in bed. I didn't look what time it was when they left.

Q. 71. What did they ask you about, at this visit?

Ans. Something about the time the ram was put in, or the time Draper was down.

Q. 72. What did you tell him about the date?

Ans. I told him I would look up something, and, if I could find something to interest him, I would leave him know in the morning.

Q. 73. Did you, at that evening, tell him what your recollection was, at that time, about the date?

Ans. I did, as near as I could.

Q. 74. What date did you give him?

Ans. I gave him the date of 1878; that the ram was put in in 1878.

Q. 75. Did you hunt your papers that night, to see if you could find anything to fix the date, as he requested?

Ans. Yes, sir; I hunted till near twelve o'clock that night.

Q. 76. Did you find any paper to fix the date, that night?

Ans. No, sir.

Q. 77. Where did you meet them next morning?

Ans. I met Mr. Drawbaugh out at Woodland station, between my house and Easton; that was where I had agreed to meet them.

Q. 78. Did either of them get out of the cars, and come and speak to you; and if so, which one?

Ans. None but Drawbaugh I talked to that morning.

*

Q. 79. Did you tell him that you hadn't found any paper that fixed the date?

Ans. Yes, sir.

Q. 80. Did you tell him of any place where he could find a writing that would fix the date?

Ans. Not more than that I told him the only place to find it would be at Marysville.

Q. 81 What place in Marysville?

Ans. The Pennsylvania depot.

Q. 82. What did you tell him he could find there that would fix the date?

Ans. Principally the receipts and the bill; by which he could see when the pipe came.

Q. 83. That morning when you met Mr. Drawbaugh at Woodland Station, did you give him any note or memorandum about finding the date at Marysville?

Ans. I gave him a little note drawn up by pencil, because I thought I would not have much time to talk to him; but he got out of the cars, and the paper wasn't of much use, as I told him.

[Recess for dinner, until 2.15, P. M.]

AUGUST 3, 1882, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of George Kissinger, by Mr. Storrow, continued:

Q. 84. Please look at the instruments now shown you, marked "F" and "B" and state whether those are the instruments that Mr. Drawbaugh showed you, when he first came to see you at your place, about eighteen months ago?

Ans. I don't know whether its the same ones; but they look like it; they are pretty near the thing.

Q. 85. Look at the instrument "I", and tell me whether you ever saw it or one like it, to your recollection?

Ans. No, sir.

Q. 86. Look at the instruments "C" and "C reproduced," and tell me whether you ever saw them, or instruments like them, to your recollection?

Ans. No, sir; I saw nothing but things the shape of this (indicating permanent magnet of "C reproduced"); some were small and some were large.

Q. 87. According to your recollection, was it while you lived at Eberly's Mills, or at some of your visits after you moved away to Marysville, that you saw those horse shoe magnets at the shop?

Ans. I saw those before I moved away. I will tell you how I came to know. I had some in my hands, and would pick up pins and such things with them; they would draw it up.

Q. 88. Did Mr. Drawbaugh ever show you any telegraph instruments at his shop?

Ans. Yes, sir.

Q. 89. What did he say about them, or what kind of things were they?

Ans. They were things that you put your fingers on. There were some wires run up on the wall. A very simple thing, too, it seemed, but I didn't understand it. He was showing it to me there.

Q. 90. Did one of those telegraph instruments have a dial with letters around it, and a pointer to point to the letters?

Ans. I can't tell; but it has something to make a mark. What it was I can't say.

[*Mr. Hill objects to the introduction and use of the book purporting to be the Pennsylvania railroad book, and to the extracts taken therefrom, on the ground that the said book has not been properly verified.*]

Cross-examined by Mr. Hill.

Cross-Q. 91. How long ago did Mr. Drawbaugh show you that telegraph instrument?

Ans. It was directly after I moved, or just before I moved, to Marysville. I can't say whether it was before or after.

Cross-Q. 92. I suppose you wouldn't be able to recognize that instrument now, if you saw it again, would you?

Ans. I don't think I would. I might, possibly.

Cross-Q. 93. Did you see the horse-shoe magnets hanging up on the wall before or after Mr. Drawbaugh showed you that telegraph instrument?

Ans. I suppose it was hanging there about the time.

Cross-Q. 94. Did you ever see an electric clock at Drawbaugh's shop before you moved to Marysville?

Ans. No, sir.

Cross-Q. 95. Did you ever see a machine for making nails, there at Drawbaugh's shop?

Ans. Yes, sir.

Cross-Q. 96. Did you see it there before you moved to Marysville?

Ans. Yes, sir.

Cross-Q. 97. How long before did you first see it?

Ans. The first time I moved to Eberly's Mills.

Cross-Q. 98. Did you ever see a fire-alarm apparatus at Drawbaugh's shop?

Ans. No, sir.

Cross-Q. 99. Did you ever see a machine for making tacks at Drawbaugh's shop?

Ans. Not more than the flour-barrel tacks—about three-penny—made on the nail machine.

Cross-Q. 100. You never saw any machine for making tacks except what Drawbaugh called the nail machine, did you?

Ans. That is all.

Cross-Q. 101. Did you ever see a machine for stemming grapes, there at Drawbaugh's shop?

Ans. No, sir.

Cross-Q. 102. Did you ever see a machine or instrument for sewing carpet rags there at Drawbaugh's shop?

Ans. Yes, sir.

Cross-Q. 103. When did you first see that, there?

Ans. The time I was living there.

Cross-Q. 104. The first part or last part of the time you were living there?

Ans. The latter part, I think.

Cross-Q. 105. Did you ever see a galvanometer there at Drawbaugh's shop?

Ans. Yes, sir.

Cross-Q. 106. When was that?

Ans. About the latter part of the time I was there.

Cross-Q. 107. What sort of a looking thing was that? Describe it as well as you can.

Ans. It was pretty much like a thermometer, but we looked at it to tell the weather. It would raise up in heavy weather and then it would fall. It was a weather-teller.

Cross-Q. 108. When did you first see that, there at the shop?

Ans. That was about the last of my time there, about the last year.

Cross-Q. 109. Did you ever see what Drawbaugh called a galvanic or electric battery, there at the shop?

Ans. Yes, sir.

Cross-Q. 110. When did you first see that, there?

Ans. I saw that the first or second year I lived there.

Cross-Q. 111. Did you ever see it more than once?

Ans. I don't recollect.

Cross-Q. 112. You don't recollect of seeing it but once, do you?

Ans. Yes, sir.

Cross-Q. 113. What do you mean by that, that you did see it more than once or that you did not?

Ans. I only saw it once that I can recollect of.

Cross-Q. 114. What sort of looking thing was it?

Ans. I can hardly tell you. It was a thing that you held on to as long as you could, and they had to get the steam off to get you loose.

Cross-Q. 115. Would you recognize it if you saw it again now?

Ans. I wouldn't like to undertake to recognize it now. It has been a good while.

Cross-Q. 116. Did Drawbaugh tell you what he used it for?

Ans. He has told me what it was used for already; but I couldn't tell you now.

Cross-Q. 117. I suppose you didn't take much interest in Drawbaugh's contrivances there at the shop, while you lived there; did you?

Ans. No, sir.

Cross-Q. 118. Even if you heard people talking about them, I suppose you didn't pay much attention to what was said, did you? Didn't charge your memory with it?

Ans. No, sir.

Cross-Q. 119. Do you recollect of ever hearing anybody talk about his galvanometer, or his electric clock, or his telegraph, or his fire-alarm, or his battery, before you moved to Marysville?

Ans. No, sir; I think not. I don't recollect of hearing anyone.

Cross-Q. 120. I suppose you wouldn't swear you didn't hear people talk about his talking-machine before you moved to Marysville, but only that you don't recollect hearing anybody talk about it. Am I right?

[*Question objected to by Mr. Storrow, as purely illucid and metaphysical.*]

Ans. Yes; I couldn't swear.

Cross-Q. 121. When you lived in Marysville, did you always live in one house?

Ans. Yes, sir; I lived six years in one house.

Cross-Q. 122. Who lived in that house before you moved into it?

Ans. Mr. Shaffer.

Cross Q. 123. Do you know how long Mr. Shaffer lived in it before you took it?

Ans. Two years; may be three years.

Cross-Q. 124. When was that house built?

Ans. Fifteen or sixteen years ago, (1866 or 1867.)

Cross-Q. 125. Was that a stone or wooden house?

Ans. A stone house.

Cross Q. 126. Mr. Draper, in his testimony, refers to a new stone house that he had built on the hill. Is that the house you lived in?

Ans. Yes, sir.

Cross-Q. 127. Do you know why Mr. Draper called it a *new* stone house?

[*Question objected to by Mr. Storrow, as asking the witness to account for the thoughts which another witness expressed in his deposition.*]

Ans. I suppose it was the only house on the farm.

Cross-Q. 128. How far was that from the spring where your family got water for household purposes?

Ans. A little over a hundred yards.

Cross-Q. 129. Until the ram was put in, your family had to carry the water from the spring to the house, did they not?

Ans. Yes, sir.

Cross-Q. 130. Did your wife begin to make complaint about it, pretty soon after you moved there, and want the water brought nearer?

Ans. Yes, sir; we were not long there until they wanted the water up.

Cross-Q. 131. Did you speak to Mr. Draper about it, or write him about it?

Ans. I spoke to him several years before he put it in.

Cross-Q. 132. I suppose you spoke to him about it pretty soon after you found it was wearing upon your wife, did you not?

Ans. It was near onto two years before he came up, after I moved there—near onto two years before he came to see me.

Cross-Q. 133. Are you positive about that?

Ans. Yes, sir.

Cross-Q. 134. Are you as positive about that as you are about anything else you have testified to?

Ans. Yes, sir.

Cross-Q. 135. Didn't you write Mr. Draper about it before you spoke to him about it?

Ans. I don't recollect writing to him about the ram.

Cross-Q. 136. Did Mr. Draper go with you to Mr. Drawbaugh's shop about the ram, the first time that he, Draper, came up to the farm after you moved on to it?

Ans. No, sir.

Cross-Q. 137. Did he go the second time that he came up to the farm?

Ans. No, sir.

Cross-Q. 138. The third time?

Ans. That I can't say, whether it was the third or fourth time; but it was in 1877, that we were over.

Cross-Q. 139. Were you ever down to visit Mr. Draper, at or near Dover, Delaware; if so, how many times?

Ans. I was down once.

Cross-Q. 140. When was that?

Ans. In October of the year of the Centennial. From the Centennial I went down. It was 1876.

Cross-Q. 141. Wasn't your visit with Mr. Draper to Mr. Drawbaugh's shop before you went to see him at Dover, in the fall of 1876?

Ans. No, sir.

Cross-Q. 142. How long was Mr. Draper at the farm on the occasion of that visit, in the course of which you and he went down to Drawbaugh's shop to see about the ram?

Ans. I can't tell you how long he was there. I suppose he was there about six or eight days.

Cross-Q. 143. Where did he stay during that visit to the farm?

Ans. He always stayed with me, on the farm.

Cross-Q. 144. Do you recollect anything else that he did during that visit, except go down to Drawbaugh's shop with you?

Ans. The day before, we went up to what is called Little Cove, to look at a coal mine there. That is all I can recollect.

Cross-Q. 145. What did you want to look at the coal mine for?

Ans. We just wanted to look at it to see what kind of coal it was.

We found the mine was about a mile from the road, up near the top of a mountain; so we didn't go up to it. We stopped at the fertilizer-mill there, and the fertilizer man told us we couldn't see much if we did go up.

Cross-Q. 146. Who was the fertilizer man that you saw there at the fertilizer mill?

Ans. That I can't tell you—his name—now. It has got out of my memory.

Cross-Q. 147. Tell us just where that fertilizer-mill stood?

Ans. It stood about a mile and a half above Marysville, right along the Susquehanna river. I suppose not twenty yards off the river.

Cross-Q. 148. Was it the only fertilizer-mill anywhere around in the neighborhood of Marysville?

Ans. Around Marysville. There was one up at Duncannon, about three miles and a half above that mill.

Cross-Q. 149. That mill where you stopped that day is the only fertilizer-mill within three miles of Marysville; is it?

Ans. Yes, sir; there is no other around there but the little one up in Duncannon.

Cross-Q. 150. Whose plan was it to go up to see that coal mine, yours or Mr. Draper's?

Ans. We were talking about it and we made up our minds to go and see it. I had never seen it myself. So one afternoon we drove up. It was only a kind of a little spurt.

Cross-Q. 151. Is that coal mine worked now?

Ans. No, sir; it hadn't been when we left there.

Cross-Q. 152. You mean when you moved away from Marysville, do you?

Ans. Yes, sir; when I moved away from Marysville.

Cross-Q. 153. Do you mean that it never had been worked down to the time when you moved away from Marysville?

Ans. Not more than that they sunk a shaft to find out whether there was any coal there?

Cross-Q. 154. Do you know who sunk that shaft?

Ans. I do not.

Cross-Q. 155. Do you know when it was sunk?

Ans. No; I believe I can't tell the year when it was sunk.

Cross-Q. 156. Was it sunk before you and Mr. Draper went up to see it and stopped at the fertilizer mill?

Ans. Yes, sir; it was open then.

Cross Q. 157. Was your visit, when you went to see it and stopped at the fertilizer-mill, soon after the shaft was sunk?

Ans. I don't know how long the shaft was sunk before that.

Cross-Q. 158. Had you heard, before that, of the shaft having been sunk?

Ans. Yes; I heard frequently before that.

Cross-Q. 159. How long, before that, had you heard of it?

[*Mr. Storrow objects to the further continuance of this line of cross-examination as simply consuming time.*]

Ans. I can't tell you how long, some time before that.

Cross-Q. 160. Give us your best recollection?

[*Same objection.*]

Ans. My best recollection is, I suppose, about a year, may be eighteen months, before we went up.

Cross-Q. 161. Is that the only coal mine in that vicinity?

[*Same objection.*]

Ans. All I can mind of. I don't know of any other.

Cross-Q. 162. What name did it go by in the community when it was talked about?

[*Same objection.*]

Ans. It had no name, I believe, but Cove mountain.

Cross-Q. 163. How far was your farm-house, at Marysville, from Drawbaugh's shop, at Eberly's Mills?

Ans. It was called eleven miles.

Cross-Q. 164. Are those visits of yourself and Mr. Draper to the fertilizer-mill, and, the next day, to Drawbaugh's shop, at Eberly's Mills, the only things that you can remember that Mr. Draper did, during that visit to his farm?

Ans. Yes, sir.

Cross-Q. 165. What was his business to the farm, that brought him up there on that occasion?

Ans. His business was, I suppose, to come up and look at the farm, and see how it was conducted. That is about all I know. And I suppose he thought he would get a little rent.

Cross-Q. 166. Do you remember about his going around and looking at the farm, on that visit?

Ans. Yes, sir; he walked over the farm, I suppose, every time he came up.

Cross-Q. 167. What particular kind of work was going on on the farm when he was there, on that occasion?

Ans. It is hard for me to tell what we were doing.

Cross-Q. 168. Have you no recollection about it?

Ans. Not more than that when he came, I walked down into the city of Marysville with him, and we went around and spent part of the day among old acquaintances. That is all I know that he was doing.

Cross-Q. 169. What acquaintances did you see that day, at Marysville, and spend part of the day with?

Ans. I can't tell you the parties every day. We were down at Mr. Seidel's, and around. I can't tell you every day where we were.

Cross-Q. 170. You went down, then, on different days, while Mr. Draper was there with you, did you?

Ans. Yes, sir.

Cross-Q. 171. Can't you name anybody, except Mr. Seidel, that you and Mr. Draper visited at Marysville, on that occasion?

Ans. I could name the half of Marysville.

Cross-Q. 172. I mean that you visited on that occasion with Mr. Draper?

Ans. We were at old Mr. Fenn's. We went around in the machine-shop and round-house, talking to the men; and down to Mr. Eppel's, his agent's. We were down there several nights.

Cross-Q. 173. Give us the first names of Mr. Seidel, Mr. Fenn, and Mr. Eppel?

Ans. Al. Seidel, Theophilus Fenn, and Hiram Eppel.

Cross Q. 174. Did you pay Mr. Draper any rent during that visit of his to the farm?

Ans. No, sir; I think not.

Adjourned until August 4, 1882, at 10, A. M.

AUGUST 4, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of George Kissinger by Mr. Hill, continued:

Cross-Q. 175. You say that the visit of Mr. Draper and yourself to Mr. Drawbaugh's shop did not take place on the occasion of Mr. Draper's first visit to the farm after you moved upon the farm. Do you distinctly remember all about Mr. Draper's first visit to the farm after you moved there?

Ans. No, sir; I do not, any more.

Cross-Q. 176. Do you remember what time of the year Mr. Draper's first visit to the farm, after you moved there, was?

Ans. I do not. It was in the spring or early in the fall, that is after the first year. The first year he wasn't up.

Cross-Q. 177. You moved on to the farm about the 1st of April, 1874, the time the lease was made, did you not?

Ans. Yes, sir.

Cross-Q. 178. Was his first visit to the farm in the spring or fall of 1875?

Ans. No, sir.

Cross-Q. 179. What year was it?

Ans. The year after.

Cross-Q. 180. Do you mean the spring or fall of 1876?

Ans. It was in the spring or fall—I won't be positive which—of 1876.

Cross-Q. 181. Was it before or after you went to the Centennial Exhibition, at Philadelphia?

Ans. I can't tell you.

Cross-Q. 182. Don't you remember whether or not Mr. Draper had been to the farm, after you moved on to it, before you visited him at Dover, Delaware?

Ans. No; I can't recollect that.

Cross-Q 183. Where did Mr. Draper stay during his first visit to the farm after you moved there?

Ans. He stayed with me on the farm.

Cross-Q. 184. How long did he stay with you on that visit?

Ans. I can't tell you, sir.

Cross-Q. 185. What were you doing on the farm while he was there on that visit?

Ans. That I can't tell you.

Cross-Q. 186. Did he do any business that you know of in that neighborhood while he was there on that visit; if so, what, and with whom?

Ans. No, sir.

Cross-Q. 187. Did you have any business transaction with anybody, that you can now think of, while he was there on that visit; if so, what, and with whom?

Ans. I don't think I had any transaction at all with anyone.

Cross-Q. 188. Did you have anybody working for you on the farm at that time, if so, who?

Ans. My two sons here. I think three of my sons were home then, to the best of my recollection. I didn't have any hired man.

Cross-Q. 189. What are the names of your three sons?

Ans. The oldest one is George Franklin Kissinger, the next oldest is Cyrus Henry Kissinger, and the next is John Morris Kissinger.

Cross-Q. 190. Did all three work for you the first four years that you were on the farm?

Ans. Sometimes they were at home and sometimes they were not. They worked off and on. Some went west and came back, and went west again.

Cross-Q. 191. How long after Mr. Draper's first visit to the farm was his second visit there?

Ans. If my mind carries it right, it was the fall of 1877.

Cross-Q. 192. Did he make more than one visit there in the year 1877?

Ans. He only made one visit, I think, if my memory carries me right.

Cross-Q. 193. Was he there at any time during the year 1878?

Ans. In the fall of 1878.

Cross-Q. 194. What time in the fall?

Ans. In November, if I am not mistaken.

Cross-Q. 195. Was that the only time he was there, in the year 1878?

Ans. Yes, sir.

Cross-Q. 196. When Mr. Draper was there on his second visit after you moved there, did he stay with you on the farm?

Ans. Yes, sir.

Cross-Q. 197. What were you doing on the farm at that time?

Ans. I don't think I was doing anything. I was visiting with him around.

Cross-Q. 198. Where did you go with him during that second visit of his to the farm?

Ans. Around through the village.

Cross-Q. 199. Did you go anywhere else with him during that second visit of his to the farm?

[*Objected to by Mr. Storrow, for the reason that the whole history of that visit was fully gone into yesterday.*

Mr. Hill objects to the objection as an improper interference with the cross-examination.

Mr. Storrow replies to that objection, that it has no weight unless the interrogatory was such as to confuse and mislead the witness and court as to the visit inquired of.

Mr. Hill repeats his protest against the interference with the cross-examination; and if it is repeated, will make it the ground of a motion to suppress the deposition.]

Ans. It was the same visit that we went to see about the ram; it was in 1877.

Cross-Q. 200. In your one hundred and thirty-sixth, one hundred and thirty-seventh, and one hundred and thirty-eighth answers, you testified positively that you did not go to Drawbaugh's shop with Mr. Draper about the ram the first time that Draper came up to visit the farm after you moved on to it, nor the second time that he came up there to the farm, and that you can't say whether it was the third or fourth time; and now you testify that it was on his second visit to the farm, that you went with him to see about the ram. Do you really know on what visit it was that you went to Mr. Drawbaugh's shop?

Ans. It was in 1877. It is so long that I can hardly recollect it. I think that it was the second visit, but I am not positive. The first visit was in the spring or early fall the year after I moved there. That was the first visit. Now, the next visit I thought was late in the winter, but since I reflect I think the second visit was about eighteen months from the time I moved on the farm, if my mind now carries me right.

Cross-Q. 201. And you think that it was on the second visit that you and Draper went to Drawbaugh's shop, do you?

Ans. I think, since I reflect, that that is as near as I can get at it. I think it was.

Cross-Q. 202. You think it was the second visit that you and Draper went to Drawbaugh's shop?

Ans. Yes, sir; as near as my memory will carry me. I have been studying over it ever since I have been down here.

Cross-Q. 203. When you first put in the ram, between the spring and your house, how much wooden pipe did you put in?

Ans. That is more than I can tell you now.

Cross-Q. 204. Was the wooden pipe put in next to the house or next to the ram?

Ans. Next to the spring. There were two joints of iron next to the ram to keep it from bursting.

Cross-Q. 205. Was the most of the pipe between the ram and the house made of iron or of wood?

Ans. All iron pipe.

Cross-Q. 206. The pipe from the spring to the ram was how long?

Ans. I can't tell you to the right foot, but it was about two hundred and six feet. It was over two hundred feet.

Cross-Q. 207. Who bored the wooden pipe that was used in connection with that ram?

Ans. I bored it myself. I had a little help.

Cross-Q. 208. Who helped you to bore it?

Ans. My boys helped me principally.

Cross Q. 209. Did anybody else besides your boys?

Ans. I think not.

Cross-Q. 210. The wood that you bored to make the pipe, did you get it on the farm?

Ans. Yes, sir.

Cross-Q. 211. Where did you get the auger that you used in boring the pipe?

Ans. From Mr. Keller. I can't tell you his first name now.

Cross-Q. 212. Where did he live then and where does he live now?

Ans. He lived then a little over seven miles from Marysville, up the valley. I suppose he lives there yet.

Cross-Q. 213. How do you go to get to his place from Marysville?

Ans. Right up the valley from Marysville. There is a public road up there. You turn to the left from the Susquehanna river and go up the valley between the two mountains. He lives right along the road, it is called the "Valley road."

Cross-Q. 214. What is his business?

Ans. Farming.

Cross-Q. 215. Did you borrow the auger, or hire it and pay him for it?

Ans. When I got the auger, I asked him what he would charge me. He said he didn't know, but thought it ought to be worth a dollar. I never paid it. I took the auger back, but he wasn't there. He never said nothing to me since.

Cross-Q. 216. Who came to see you about giving your testimony here, on behalf of the Bell Telephone Company?

Ans. There was a man to see me a little over a year ago. I don't know who he was.

Cross-Q. 217. Did he give his name at the time?

Ans. No, sir.

Cross-Q. 218. Did he say he was a lawyer?

Ans. No, sir.

Cross-Q 219. Has anybody been to see you recently for the Bell Telephone Company; if so, who?

Ans. This man (indicating Mr. Storrow) and Mr. John Comfort.

Cross-Q. 220. Mr. Comfort that lives just above Eberly's Mills?

Ans. Yes, sir.

Cross-Q. 221. Referring to the man who first came to see you for the Bell Telephone Company, as you state, was his visit in summer or winter?

Ans. It was the forepart of the winter, if I ain't mistaken.

Cross-Q. 222. Was it this last winter?

Ans. Yes, sir.

Cross-Q. 223. Was it not about the last part of January last.

Ans. I thought it was about the first part of the winter—about eight or ten days before Mr. Drawbaugh and Mr. Jacobs came.

Cross-Q. 224. Mr. Drawbaugh and Mr. Jacobs are the parties you referred to, in your direct examination, as "Mr. Drawbaugh and his counsel," are they not?

Ans. Yes, sir.

Cross-Q. 225. Was it about eight or ten days before their first visit to you, or before their second visit to you?

Ans. The second visit.

Cross-Q. 226. When that man came, on behalf of the Bell company, to see you, at that time, did he say anything about going to see Mr. Draper on the same matter?

Ans. He came from Draper's to my house. Mr. Draper sent him to me.

Re-direct by Mr. Storrow:

Q. Q. 227. You have testified, several times, both yesterday and to-day, that the visit to Drawbaugh's shop with Mr. Draper was during the year before the ram was put in. I want to know, now, whether you have or have not any doubt on that point?

Ans. I have no doubt it was the year before, as near as I can recollect. If my mind carries me right, it was the year before. I don't want to say a thing that aint so. I want to be correct.

Q.-Q. 228. You seem to have been somewhat uncertain about the dates of Mr. Draper's visits to the farm, and how many there were. I want to know whether or not, in spite of that, you are still satisfied that the visit to Drawbaugh's shop with Mr. Draper, was the year before the ram was put in, as you have just stated, and not three or four years before?

[*Objected to by Mr. Hill, as leading, and because the witness' memory has already been exhausted on that subject.*]

Ans. The year before. My mind won't lead one any other way than that.

Re-cross-examination by Mr. Hill:

Re-cross-Q. 229. After the ram was put in, how often did Mr. Draper visit the farm, while you lived there?

Ans. My best recollection is that the first fall after the ram was put in him and his wife was up. He wrote me that I should hurry and get the ram in, as he was going to bring his wife up. The next fall after that him and his daughter was up; and then in the spring I had sale, and he came the night before the sale. That was the first sale; and that, I think, was the last visit he made on the farm while I was there.

Re-cross-Q. 230. How long was your first sale before you moved off the farm?

Ans. I think the first sale was on the twentieth of March. I think I moved on the twenty-eighth, and got to the Eastern Shore on the first day of April.

Re-cross-Q. 231. Were any members of his family ever with him on any of his visits to the farm, while you lived there, before the ram was put in?

Ans. I think not. His son John was with him, I think, after the ram was put in. I think his son John came up for two horses or colts

he had bought up there, and took them home; but what time that was, I couldn't tell.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 4th day of August, 1882.
FRED. M. OTT, *Examiner.*

GEO. W. KISSINGER.

JOHN MORRIS KISSINGER, being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is twenty-three; residence, Chicago, for the last five years; I have been in the livery business for three years.

Q. 1. Are you the son of Mr. George Kissinger, who has just testified?

Ans. Yes, sir.

Q. 2. Did you live at Eberly's Mills from April, 1871, to April, 1874, when your father lived there?

Ans. Yes, sir.

Q. 3. Did you move to Marysville with him in April, 1874?

Ans. Yes, sir.

Q. 4. Whilst he lived at Marysville did you live with him all the time, or were you away part of the time; and if the latter, state when you lived away?

Ans. The summer of 1874, the summer of 1875, and part of the summer of 1876 I lived at home; I left home on the twelfth day of August, 1876, for Chicago. I stayed there until the fall of 1877—I suppose, along about the twentieth of December, 1877—when I came back. Then I stayed home until the twenty-seventh day of May, in 1878. On the twenty-seventh of May I started to Chicago. After that I never was back to the Marysville house.

Q. 5. While you were at home at Marysville, from Chicago, from the latter part of December, 1877, to the latter part of May, 1878, was there any work going on at your father's place, about getting in a hydraulic ram to throw water up to the house?

Ans. Yes, sir.

Q. 6. Was the ram in and working, at that time?

Ans. No, sir.

Q. 7. What preparations were they making for it?

Ans. They had the logs down, and were boring at them, when I got

home, and I helped to finish the logs. The logs were all bored when I left.

Q. 8. Did you ever see the ram in and working there?

Ans. No, sir.

Q. 9. Was there any ram there, at the time of that visit?

Ans. No, sir.

Q. 10. While you lived at your father's house, at Marysville, what was your occupation?

Ans. The best part of the time I was helping to grade for the new coal-shutes on the railroad, there.

Q. 11. What was your occupation the first year you lived at Marysville?

Ans. Helping my father on the farm.

Q. 12. Did you work on a farm any during the three years that you lived at Eberly's Mills?

Ans. Not the first summer, I didn't.

Q. 13. Whose farm did you work on the second and third summers?

Ans. The second summer I worked for Levi Miller, between Eberly's Mills and New Cumberland; the third summer I worked for Ez. Gilbert, who lives in the big stone house right adjoining Eberly's Mills.

Q. 14. Did you live at home during the winters?

Ans. Yes, sir.

Q. 15. How much were you in the habit of going to Drawbaugh's shop while you lived at Milltown?

Ans. We used to get there every Sunday, most; maybe two or three times.

Q. 16. Did you get down there week-days and see him at work, ever?

Ans. Not after the first summer.

Q. 17. Did you ever see anything there that he told you were talking machines, or telephones?

Ans. No, sir.

Q. 18. While you lived at Eberly's Mills, did you ever hear of his having a talking machine, or telephone?

Ans. No, sir.

Q. 19. When you would go to his shop, while you lived there, were you in the habit of seeing his various inventions and contrivances?

Ans. Yes, sir. I would get to see some of them. I wouldn't get to see them all.

Q. 20. Do you think, from your familiarity there, that he could

have been in the habit of showing a speaking telephone, and using it to speak from one part of the shop to another, without your seeing it or hearing of it?

[*Objected to by Mr. Hill, as leading, argumentative, calling for mere opinion, and otherwise incompetent.*]

Ans. No, sir.

Q. 21. Were there any particular fellows that you were in the habit of being with, while you lived at Eberly's Mills? If so, who were they?

Ans. There was Bill Fettrow, Bill Frownfelter, George and Lewis Row, Norman Kahney, and John Heck.

Q. 22. Who were their fathers, and where did they live?

Ans. Will Fettrow's father's name was Daniel Fettrow, blacksmith; he lived right there in town. Amos Frownfelter, (Bill's father,) lived in town. I don't know what Mr. Row's first name was. He was a cooper, about a quarter of a mile out towards White Hill station. Mr. Kahney was also a cooper by trade, and generally worked for Row. He lived in town. John Heck's father had a little place there in town, and he generally worked out among the farmers. His name was Billy Heck.

(Recess for dinner, until 2.30, P. M.)

AUG. 4, 1882.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of John M. Kissinger, by Mr. Storrow, continued:

Q. 23. When did Amos Frownfelter move there, and when did he move away, if you recollect?

Ans. They moved there the same spring we did, and moved away when we did.

Q. 24. When will you be twenty-four years old?

Ans. The twenty-fifth of September, 1882.

Cross-examined by Mr. Hill.

Cross-Q. 25. When you moved to Eberly's Mills you were about twelve and a half years old, and when you moved away from there you were fifteen and a half years old. Were you not?

Ans. Yes, sir.

Cross-Q. 26. Name all the persons you ever saw in Drawbaugh's shop, while you lived at Eberly's Mills.

Ans. There was Dan Drawbaugh, Harman Drawbaugh, George Drawbaugh; that is all my recollection.

Cross-Q. 27. Name all the inventions of Mr. Drawbaugh that you ever saw at his shop while you lived there.

Ans. There he had that battery-machine for one; and he had that rag-sewer; and a patent fly-chaser attached to the ceiling. That is about all that I can recollect.

Cross-Q. 28. Have you ever been in the shop since you moved away from there, in 1874?

Ans. No, sir.

Cross-Q. 29. Did you ever take any shocks from the battery-machine while you lived there?

Ans. Yes, sir.

Cross-Q. 30. Did you see an electric clock in the shop while you lived there?

Ans. No, sir; not to my recollection.

Cross-Q. 31. Did you ever see a nail machine in Mr. Drawbaugh's shop while you lived there?

Ans. Yes, sir.

Cross-Q. 32. Where was it?

Ans. In the basement.

Cross-Q. 33. Where did Amos Frownfelter move to when he moved away from Eberly's Mills in the spring of 1874?

Ans. He moved on old man Heck's place, over back of West Fairview.

Cross-Q. 34. How far was old man Heck's place from Drawbaugh's shop?

Ans. That is something I couldn't tell you.

Cross-Q. 35. Were you ever there?

Ans. Yes, sir; I was there once, with Amos Frownfelter, while we lived in Milltown.

Cross-Q. 36. It isn't over three or four miles from Drawbaugh's shop, is it?

Ans. That is something I couldn't say. They count it five miles from Milltown to West Fairview, I believe.

Cross-Q. 37. Was old man Heck's place between West Fairview and Milltown?

Ans. No, sir; it was on another road entirely.

Cross-Q. 38. When you went over with Amos Frownfelter, did you ride or walk?

Ans. We rode. He drove a four-horse team over, and I was in the wagon.

Cross-Q. 39. How long did it take you to go from Milltown to old man Heck's place?

Ans. I have no idea.

Cross-Q. 40. Do you remember the old saw-mill that used to stand on the run a short distance from the creek at Milltown?

Ans. Yes, sir.

Cross-Q. 41. That was old man Heck's saw-mill, was it not?

Ans. Yes, sir; It wasn't worth much though, while we lived there.

Re-direct by Mr. Storrow.

Q. Q. 42. Did Will Frownfelter and some of the other fellows you have mentioned, use to go to Drawbaugh's shop with you?

[*Objected to by Mr. Hill, as the witness has already testified that nobody was at the shop but Daniel Drawbaugh, Harman Drawbaugh, and George Drawbaugh.*]

Ans. Yes, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me this 4th day of August, 1882.

FRED. M. OTT, *Examiner.*

JOHN M. KISSINGER.

SAMUEL G. GEIB, being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is twenty-four; residence, Marysville, Perry county, Pa.; I am railroad agent for Pennsylvania and Northern Central railroads, at that place.

Q. 1. Please look at the Pennsylvania railroad book of "freight received" at Marysville station, referred to in the twenty-second question to George W. Kissinger, and particularly at the freight receipt, No. 485, put in evidence after his twenty-fourth answer, and tell me what that book is, and whether it is in your official custody as station agent.

Ans. This is the receipt-book of the Pennsylvania railroad for freight received, and is one of the books of my office.

Q. 2. In whose handwriting is the receipt, except the signature of Mr. Zimmerman?

Ans. The handwriting is mine.

Q. 3. Did you receive and fasten into the book, at the time, the order of Drawbaugh and Kissinger, now attached to that receipt?

Ans. The order was received by my father, who was then freight agent, and was fastened in by me, to the best of my recollection.

Q. 4. What was your occupation in your father's office at that time?

Ans. I was his clerk.

Q. 5. Was that pipe delivered under those orders and that receipt—485?

Ans. It was.

Q. 6. That receipt, 485, is dated at the top, "July 2nd, 1878;" what does that date mean?

Ans. The day that the pipe was received.

Q. 7. The order from Mr. Drawbaugh was a little more than two months after that. Do you remember the circumstance of that pipe remaining in the ware-house a considerable time before it was taken away?

Ans. The pipe being consigned to Mr. Drawbaugh, Mr. Zimmerman could not lift it until he had an order from Drawbaugh. It took some time, I suppose, to get that; and there may have been other delays that I don't recollect. That was one of them.

[*Suppositions of the witness objected to by Mr. Hill, as incompetent.*]

Q. 8. That receipt states that the pipe came from Philadelphia, under manifest No. 22,694; will you please produce that manifest, that a copy of it may be made a part of your deposition?

Ans. I did not bring it, but I have sent for it, and expect it this evening. I remember that it was dated at Philadelphia, July 1, 1878.

[The manifest is as follows:

Manifest.

No. 22694

FORM NO. 9—B.—SPECIAL.

PENNSYLVANIA RAILROAD.

July 1, 1878.

ROAD MANIFEST OF MERCHANDISE *forwarded from* PHILADA. *to* MARYSVILLE.

Printed in Copy Ink.

CAR.		Consignor.	Consignee.	Description of Articles.	Weight.	Rate.	Freight.	Expenses.	Prepaid.	To be Collected.
Initial.	Number.									
P. R. R.	462		D. Drawbaugh, Marysville.	Bdle. Pipe, 2–165.	165	21	35			35

Bill 485.

R. 2.]

Q. 9. Do you remember when I came up to you in the spring and got you to show me this entry?

Ans. Yes, sir.

Q. 10. Had you shown it to anybody before that this spring?

Ans. I had not. To the best of my recollection, that is the only time it was shown to anybody since the freight was received.

Cross-examined by Mr. Hill.

Cross-Q. 11. Have you shown it to anybody since that; if so, who?

Ans. I have not.

Examination taken, reduced to writing and by the witness affirmed and subscribed before me this 4th day of August, 1882.

FRED. M. OTT,
Examiner.

SAM'L G. GE B.

GEORGE F. KISSINGER being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is thirty-five. Residence, Talbot county, Md., near Easton. I am a son of George Kissinger, who has testified. I am a laborer. I live with my father, and work on the farm with him.

Q. 1. Did you live with your father at Marysville, from April, 1874, to April, 1880?

Ans. Yes, sir; excepting about two months that I was away.

Q. 2. While you lived with your father, at Marysville, what was your occupation?

Ans. Working on the farm with him.

Q. 3. Do you remember that a hydraulic ram was put on to the place to throw water up to the house, while you lived there?

Ans. Yes, sir.

Q. 4. It appears from the papers, that the iron pipe for that ram was brought to the place sometime after the eighth of September, 1878. Did the ram come there before or after that pipe?

Ans. To the best of my recollection, it came after the pipe was delivered.

Q. 5. How late in the season did it get to be, and how cold did the weather grow, before the ram got to working?

Ans. It was about the last of the month.

Q. 6. Do you remember anything about the weather affecting the ram, before the work of setting it was completed?

Ans. Yes, sir; if I am right, the water froze in the pipe over night, and bursted two pieces.

Q. 7. Was that before the pipe was buried in the trench, or afterwards?

Ans. Before it was put into the trench.

Q. 8. Do you remember the fact of your father and Mr. Draper going over to Drawbaugh's shop, to see about purchasing the ram?

Ans. Yes, sir.

Q. 9. How many seasons, before the ram was put in, was it, that they went over there about it?

Ans. It was the fall before, if I am right.

Q. 10. Did you live with your father at Milltown, from April, 1871, to April, 1874?

Ans. I had my home there.

Q. 11. Where did you work during those three years?

Ans. The first year, 1871, I stayed in Marysville till late in the fall. And the second year, 1872, if I am right, I was down at Lochiel.

Q. 12. In 1873, where?

Ans. I was working for the Pennsylvania Railroad Company.

Q. 13. What were you doing for them?

Ans. I was working on the telegraph line.

Q. 14. Did you work for these parties during the winters, or stay at your father's during the winters?

Ans. I stayed at home during the winter.

Q. 15. Did you use to go to Mr. Drawbaugh's shop while you lived at Eberly's Mills?

Ans. Yes, sir.

Q. 16. Did he show you any telephones, or tell you that he had any telephones, while you lived at Eberly's Mills?

Ans. Not to my knowledge.

Q. 17. Do you recollect of ever having heard, while he lived at Eberly's Mills, that he had a telephone?

Ans. No, sir.

Q. 18. Do you remember the fact of Mr. Drawbaugh and his counsel coming to your father's about eighteen months ago?

Ans. Yes, sir.

Q. 19. Did they show you a pair of instruments at the same time that they showed them to your father?

Ans. Yes, sir; they had them there in the room.

Q. 20. Could you then indentify them as anything you had seen before?

Ans. That is more than I can say.

Q. 21. Please look at the two instruments now shown you, marked "F" and "B," and tell we whether they are, or are not, the two that Mr. Drawbaugh had at your father's house, at that visit, eighteen months ago?

[*Mr. Hill objects to the question as essentially leading and suggesting, and submits that the fairest and proper way to interrogate the witness is to submit to him all of the instruments here, without designating any in particular, and then ask him whether he can identify the particular instruments which Mr. Jacobs and Mr. Drawbaugh had at his father's house at that time.*

Mr. Storrow says that he makes the inquiry in the same way that the defendants made their inquiry eighteen months ago.

Mr. Hill replies that it has not yet been shown how many, nor which instruments Mr. Drawbaugh and Mr. Jacobs showed to the witness at his father's house, and, further, that as a matter of fact, these two instruments, "F" and "B," are not the only instruments that Mr. Drawbaugh and Mr. Jacobs showed there at that time as he (Mr. Hill) is now informed by Mr. Jacobs.]

Ans. They were something on that order.

Q. 22. Do you remember ever having seen those instruments, or instruments like them, while you lived at Eberly's Mills?

Ans. Not to my knowledge.

Cross-examined by Mr. Hill.

Cross-Q. 23. When you were working for the Pennsylvania Railroad Company, on telegraph lines, what was the work that you did?

Ans. In repairing the old lines.

Cross-Q. 24. What did you do?

Ans. I dug holes sometimes.

Cross-Q. 25. When you lived at Eberly's Mills, from 1871 to 1874, were you in Drawbaugh's shop very often?

Ans. Yes, sir; excepting some weeks.

Cross-Q. 26. Name all the machinery that you saw there in the shop during that time?

Ans. The nail-machine, I saw that, those faucets, and a knitter, or whatever you call it.

Cross-Q. 27. Is that all that you remember of seeing there in those three years?

Ans. That is all that I remember just now.

Cross-Q. 28. Did you see an electric clock there?

Ans. I did not.

Cross-Q. 29. While you lived there at Eberly's Mills, did you ever hear anybody say anything about Drawbaugh's having an electric clock?

Ans. Not to my knowledge.

Cross-Q. 30. Name all the persons that you can remember of having seen at Drawbaugh's shop in the three years that you lived at Eberly's Mills?

Ans. Daniel Drawbaugh, Squire Drawbaugh, George Drawbaugh, Harman Drawbaugh; that is about all that I can remember just now.

Cross-Q. 31. Were you ever over to old man Heck's farm, where Amos Frownfelter moved?

Ans. I was not.

Cross-Q. 32. Can you swear that you ever saw these two instruments, "F" and "B," before you saw them here to day on the table?

Ans. I saw those, to the best of my recollection, at the house there, when they had them up. If I am right, there was another one besides those two.

Cross-Q. 33. I suppose you talked over, with your father, the matter of the ram and the date of the visit of your father and Mr. Draper to Mr. Drawbaugh's shop after Mr. Jacobs and Mr. Drawbaugh left your father's place, did you not?

Ans. Not to my knowledge.

Cross-Q. 34. Did you talk it over while Mr. Jacobs and Mr. Drawbaugh were there?

Ans. No, sir.

Cross-Q. 35. Your father testified that Mr. Draper directed a man to your father's place, a few months ago, who, in the interest of the Bell Telephone Company, wanted to know about the date of that ram, and the visit of your father and Draper to Drawbaugh's shop. Did you see that man when he was at your father's place?

Ans. Yes, sir.

Cross-Q. 36. Did you talk over the matter with him?

Ans. Yes, sir.

Cross-Q. 37. Did you talk over the matter with your father about the same time?

Ans. Yes, sir; to the best of my knowledge.

Cross-Q. 38. Do you remember the second visit of Mr. Jacobs and Mr. Drawbaugh to your father's place, which was some time last winter, a week or ten days after that man was there?

Ans. Yes, sir.

Cross-Q. 39. Did you talk over the ram matter with your father again about that time?

Ans. I am not positive.

Cross-Q. 40. You can't remember all the times that you have talked over the matter with your father, can you?

Ans. I only talked it over once, to my recollection.

Cross-Q. 41. Your father testified that Mr. Storrow and Mr. John Comfort were at his place recently. Did you see them when they were there?

Ans. Yes, sir.

Cross-Q. 42. Did you talk over the matter with them while they were there?

Ans. We told them the date that we had fixed upon.

Cross-Q. 43. When Mr. Jacobs and Mr. Drawbaugh came to your father's house last winter, late in the evening after the family had gone to bed, did you see them?

Ans. No, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this fourth day of August, 1882.

FRED. M. OTT, *Examiner.*

GEO. F. KISSINGER.

[The register of "Haddaway's European House," Easton, Md., under date of Tuesday, February 7, 1882, has the names of "M. W. Jacobs" and "Daniel Drawbaugh," and it is admitted that that is the date of the second visit of those gentlemen to Mr. Kissinger's, referred to in the testimony.]

Adjourned to meet on notice.

FRED. M. OTT,
Examiner.

AUGUST 4, 1882.

PHILADELPHIA, PENNA., TUESDAY, *November* 21, 1882.

Examination resumed, pursuant to agreement of counsel, at the Hotel Lafayette, Broad street, below Chestnut, at seven o'clock, P. M.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

RUFUS E. SHAPLEY *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

I reside in Mechanicsburg, Cumberland county, Pennsylvania; I keep a jewelry store and do watch repairing.

Q. 1. How long have you resided in that place?

Ans. Since the fall of 1865.

Q. 2. Have you heretofore been acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, will you state when you first became acquainted with him, as near as you can?

Ans. I think I formed his acquaintance in 1876.

Q. 3. Where was he residing at that time, and where was his place of business?

Ans. He resided at Mechanicsburg, and his place of business was at Eberly's Mills; I may have met him before that, once.

Q. 4. Do you remember how long he resided at Mechanicsburg, and whether you saw him frequently during the time that he did reside there?

Ans. I do not remember how long he resided there; I met him frequently at my place of business.

Q. 5. Did you visit his place of business at Eberly's Mills during the time he resided at Mechanicsburg; and, if so, how came you to go there?

Ans. I visited his place while he resided at Mechanicsburg; my object was to see an electric clock that he was making.

Q. 6. How came you to know anything about this clock?

Ans. By a description that he had given me of it.

Q. 7. State whether or not he had any talk with you about taking an interest in this clock, and whether or not he invited you to go to his place of business to see it.

Ans. Prior to my visit to his place, I think he spoke nothing to me about taking an interest in it; but he invited me to come down and see the clock.

Q. 8. Before that time, had you any knowledge of electric clocks?

Ans. I knew that Himmer, of New York, had an electric clock.

Q. 9. I intended to inquire as to your knowledge of their construction and the way in which they were operated; what knowledge had you in relation to such clocks?

Ans. I had never seen the Himmer clock at that time.

Q. 10. Will you state whether or not Mr. Drawbaugh represented his clock to be a new invention of his own, and whether or not you visited his place with the belief that the clock was an invention which he had made?

Ans. He claimed it as an invention of his, and I went to see it with that understanding.

Q. 11. Can you state what time it was when you made your first visit to his shop, and who, if any person, accompanied you?

Ans. It was in October of 1876, and I. D. Landis, of Coatesville, Pennsylvania, accompanied me.

Q. 12. What relation is Mr. Landis to you, and how came he to accompany you on that visit to Mr. Drawbaugh's shop?

Ans. He is a brother-in-law of mine, and I requested him to go along to see the clock.

Q. 13. Did he come to your place for the purpose of making that visit, or did he happen to be there casually?

Ans. He did not come there for that purpose, but happened to be there.

Q. 14. State whether or not you saw Mr. Drawbaugh at his shop, and whether or not he showed you his clock? and if so, state what was the condition of the clock? what were its features?

Ans. We met Mr. Drawbaugh there, and we saw the clock and he explained it to us; it was driven by an earth battery.

Q. 15. Will you state where the clock was situated, and give some description of its size and appearance?

Ans. I suppose you would call it an office; it was hanging on the partition on the left, as you went in the room.

Q. 16. On which floor?

Ans. On the second floor; I suppose the clock was four or five feet long, and had a paper dial and wooden hands; the case was not completed.

Q. 17. State whether or not he had any other clocks which were operated in any way by electricity; and if so, state what clocks they were and how they were operated.

Ans. He had a small six or eight square clock driven by an old English clock.

Q. 18. Was there an electrical connection between these two clocks, and if so, what kind of battery was used?

Ans. There was electrical connection; I don't know whose battery, but it was an acid battery.

Q. 19. State whether or not you examined the works and workmanship of the clock first spoken of—the one run by an earth battery.

[*This whole line of examination about the clocks objected to by Mr. Hill, as irrelevant and immaterial.*]

Ans. I did.

Q. 20. Did Mr. Drawbaugh at that visit show you and Mr. Landis any other things about his shop which he had invented or experimented with, or which he had in use and had made, himself?

Ans. Yes, sir.

Q. 21. State whether or not he took you about to various parts of the shop to show you things; and if so, what parts of the shop you visited.

Ans. I believe we were only on that floor; our time was limited.

Q. 22. Can you name any other machines which he showed you at that time?

Ans. We saw several bells which were rung by electricity, and an alphabetical telegraph, and an instrument he called a telephone.

Q. 23. Where was this instrument he called a telephone, and how came he to show it to you?

Ans. The instrument was lying on a table near the clock—in the same room.

Q. 24. Can you give any description of this instrument, as you saw it on that occasion?

Ans. I suppose the board might have been twelve or fourteen inches long, by about five inches wide and an inch thick, with a tin can on, about three inches in length and perhaps two inches and a half in diameter, fastened to the board with a band. The can was lined with plaster of paris, and had a membrane over it, and an electro-magnet to it.

Q. 25. Was it connected with any other instrument, or with the table or building in any way?

Ans. Not at the time I saw it.

Q. 26. What, if anything, did Mr. Drawbaugh say about this instrument when he showed it to you?

Ans. I understood Mr. Drawbaugh to say that he had it up around the shop.

Q. 27. Were there any wires connected to it at the time you saw it at that visit?

Ans. There was not.

Q. 28. Did he say anything about any use that he had made of it, or about what use might thereafter be made?

Ans. I think I understood Mr. Drawbaugh to say that they had spoken with it, but I do not remember that he made any remark about any use that should be thereafter made of it.

Q. 29. Will you look at the instruments now on the table before you marked "F," "B," "D," "E," and "A," and state whether you recognize either of them as being the instrument which he showed you at that time, or like it?

Ans. This is it, (taking up instrument "B;") I recognize it as being like the one I saw; I do not remember of seeing "A," nor "D," and "E;" I really don't remember of seeing "F."

Q. 30. State whether or not Mr. Drawbaugh said anything to you about having any other instrument which he called a telephone, except the instrument you have already described, or whether you saw any other instrument there which he called a telephone.

Ans. I do not remember that he said he had any other, nor do I remember of seeing any other.

Q. 31. Will you look at the instruments I now show you marked "C, re-produced," and "I," and state whether you saw them on that visit to the shop, or instruments like them?

Ans. No, sir; I did not see anything like "C, re-produced;" he had an instrument with the knob on the end of the magnet which he rocked; that was not in the same room in which the telephone was. I do not remember of seeing an instrument like "I" nor like "C."

Q. 32. Did he say anything about what the instrument, which had a magnet to be rocked, was to be used for?

Ans. I do not remember; our time was very short there—just between trains—an hour and something like forty minutes I think it was; I am not positive, but think that the train was between one and two o'clock down and five back.

Q. 33. You say that the instrument which had the rocking magnet was in another room from the one in which the telephone was? What other rooms were you in, and why did you go into them?

Ans. There is three rooms on that floor that we went in, as Mr. Drawbaugh was kind in showing us around.

Q. 34. Do you remember seeing a machine for covering wire with thread?

Ans. Yes, sir.

Q. 35. Where was that?

Ans. It was in the room where this rocking magnet that I speak of was.

Q. 36. Do you remember any other machinery that you saw there at that time which was in use in the shop?

Ans. Yes, sir.

Q. 37. Can you state generally what it was?

Ans. In the main part of the shop was his lathes for turning iron and his machinery for grinding those axles, and drilling machines.

Q. 38. What axles do you refer to?

Ans. There was a patent axle there with a cone on the end for taking up the wear, I believe.

Q. 39. If you had at that time seen any of the instruments besides "B" to which your attention has been called, do you think you should have remembered them as well as you have remembered "B"?

[*Objected to by Mr. Hill, as calling for mere opinion, and incompetent.*]

Ans. I think if Mr. Drawbaugh had called my attention to it, I would.

Q. 40. Did Mr. Drawbaugh at that time, or at any subsequent visit which you may have made, take you into the attic of the building; and if so, for what purpose?

Ans. At that time I believe not, though afterwards he did; he showed me a great many patterns that he had made of different things.

Q. 41. Did you at any subsequent visit see the instrument marked "B," or either of the other instruments to which your attention has been called?

Ans. I think I saw this instrument "B;" it was lying, I think, at the same place; I did not see any of the others that I recollect.

Adjourned until November 22, 1882, at nine o'clock, A. M.

NOVEMBER 22, 1882, 9 o'clock, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Rufus E. Shapley by Mr. Smith continued:

Q. 42. Referring to your answer to the 32d interrogatory, where you speak of the time which you spent at Drawbaugh's shop, and of the times when the trains run, I understood you to say that you were at Drawbaugh's shop about an hour and forty minutes, but it is perhaps not clear that that was your meaning; state whether or not you did mean to be so understood.

Ans. I did.

Q. 43. After that visit did you make any arrangement with Mr. Drawbaugh to have an interest in the clock? If so, how soon after your visit was the arrangement made?

Ans. I did, about five weeks after that—about five or six weeks.

Q. 44. Was that arrangement in writing?

Ans. Yes, sir.

Q. 45. If you have that writing will you now produce it, to be taken down as part of your deposition?

Ans. Yes, sir.

(Witness produces paper of which the following is a copy.

"MECHANICSBURG, *Nov.* 8th, 76.

For valuable consideration I do hereby sell R. E. Shapley one half intrest in ———— Clock I am getting up, the sade R. E. Shapley to pay for the Patenting of same.

DAN'L DRAWBAUGH."

Said writing and its contents, so far as they may be intended to be used for any purpose except for fixing the date, are objected to by Mr. Hill as immaterial and irrelevant.

By consent the above copy is introduced in evidence instead of the original, the original to be produced when called for.)

Q. 46. I notice that this agreement bears date at Mechanicsburg; at what place at Mechanicsburg was it made?

Ans. In my store.

Q. 47. At the time this agreement was made did you loan Mr. Drawbaugh any money; and if so, did you take any memorandum of it? And if you did take a memorandum, will you produce it, to be copied as a part of your deposition?

Ans. I did.

(Witness produces the following paper, a copy of which is by consent substituted for the original; the original to be presented when called for.

"MECHANICSBURG, *Nov.* 8th, 76.

Thirty days after date I Promis to pay R. E. Shapley twenty dollars without defalcation for value received.

$20.00.

DAN'L DRAWBAUGH.")

Q. 48. Has this note ever been paid by Mr. Drawbaugh, in whole or in part?

Ans. He has done me some little work.

Q. 49. Has there ever been any settlement between you showing the balance, if any, between the amount of the note and the amount of the work which he had done?

Ans. There has not.

Q. 50. Had there been at or before the time when these papers were made any arrangement to have Mr. Drawbaugh bring to your shop and set up the clock which you saw at his shop, and which was run by an earth battery?

Ans. There had; the clock was at my store at the time the papers were made.

Q. 51. Had it then been set to running or was it set to running about that time? and if you have any memorandum showing any expenses which you incurred in relation to the clock, will you produce it and allow the examiner to take a copy of it?

[*Objected to by Mr. Hill, as immaterial and irrelevant.*]

Ans. The clock was started to running about that time—within a day or two.

(Witness produces the following memorandum, a copy of which is introduced in evidence; the original to be produced when called for:

"PHILADELPHIA, *Nov.* 6th, 1876.

Mr. R. E. SHAPLEY,

To Booze & Thomas, Dr.,

No. 108 South Eighth Street, 2d floor.

Terms: Jno. A. Haddock, Pr. 104 & 106 S. Eighth St.

Piece Copper, $4 00.")

Q. 52. What was that piece of copper for?

Ans. An earth battery.

Q. 53. Who set up the clock and set it running, yourself or Mr. Drawbaugh?

Ans. Mr. Drawbaugh.

[*This whole line of questions about the clock, objected to by Mr. Hill, as immaterial and irrelevant.*]

Q. 54. How long did the clock run in your shop, and did you find it to be a good time-keeper or not?

[*Same objection.*]

Ans. I don't know the length of time, but it was quite a while; it was no time-piece.

Q. 55. Do you remember how much it would vary from day to day?

[*Same objection.*]

Ans. As much as fifteen minutes.

Q. 56. Did Mr. Drawbaugh ultimately take this clock away from your shop; and, if so, can you state when it was?

[*Same objection.*]

Ans. He did, but the time I do not know.

Q. 57. Did you, about the time or soon after you made this arrangement with Mr. Drawbaugh to be interested in the clock, construct one for yourself; and, if so, did he and you confer together about its construction, and did he do any part of the work, or was any part of it done at his shop?

[*Same objection.*]

Ans. Some time after that, one was constructed for myself. To the best of my knowledge he and I did not confer together about its construction. The gearing was cut at his shop, as he had my cutting engine there; but I am not positive whether the cutting was done at his shop or at mine; if they were cut at his place he done the cutting.

Q. 58. Did you make new plans for this clock, or did you follow the plans of the clock which he had brought to your shop, or some other clock of which he had constructed the plans?

[*Same objection.*]

Ans. The clock was not made after the one brought to my place. The clock was made just as clocks afterwards made by him are made, except that I put in an intermediate wheel to carry the second hand the right way; I mean that the principle was the same, but the ornamentation was different.

Q. 59. Do you mean that the working parts of your clock were like clocks which he afterwards constructed, with the exception above-mentioned?

[*Same objection.*]

Ans. Yes, sir.

Q. 60. Had you seen these subsequent clocks of his, or plans of the same, before you constructed your clock?

[*Same objection.*]

Ans. I do not remember of seeing any.

Q. 61. After you had completed your clock, was it set to running, and what was its character as a time-keeper?

[*Same objection.*]

Ans. It was set to running, but it was not satisfactory.

Q. 62. Was it run with the same earth battery that Drawbaugh's clock was?

[*Same objection.*]

Ans. It was.

Q. 63. Did you arrange that battery in the earth, or did Mr. Drawbaugh?

[*Same objection.*]

Ans. Mr. Drawbaugh.

Q. 64. I observe that the contract which you have produced provides that you shall pay the expenses of patenting the clock; did you, at any time after the contract was made, have anything to say to Mr. Drawbaugh about patenting it? If so, state what it was.

[*Same objection.*]

Ans. I can't just state the conversation that took place, but I told him a number of times that I was ready to have the thing patented.

Q. 65. Why was it not patented by you, or at your expense?

[*Same objection.*]

Ans. The principal cause assigned, was not having time to make the model.

Q. 66. Do you mean assigned by Mr. Drawbaugh?

[*Same objection.*]

Ans. Yes, sir.

Q. 67. Did you see other clocks at Mr. Drawbaugh's shop besides

those you have spoken of as being there at your first visit, and if so, how many, and did you see work being done upon them, or did you see them running after they were completed?

[*Same objection.*]

Ans. I did see several other clocks; I saw them in different stages of construction; I saw them running, but am not positive that the cases were entirely finished.

Q. 68. Who worked on these clocks, Mr. Drawbaugh himself, or some other person?

[*Same objection.*]

Ans. I understood Mr. Drawbaugh that his nephew assisted him in making the cases.

Q. 69. Can you describe, generally, the appearance of these clocks, and the size of the cases?

[*Same objection.*]

Ans. One was a hanging clock. It might have been four feet in length. The other two were clocks that set on the floor; one may have been five, the other eight feet or more in height.

Q. 70. State whether or not there was any considerable amount of carved work on the cases of either of these clocks.

[*Same objection.*]

Ans. The larger clock was gotten up in good style—considerable work on the case.

Q. 71. Can you state generally how the working parts of the clocks you then saw at Drawbaugh's shop differed from the working parts of the clock you first saw at Drawbaugh's shop, if they did differ from it?

[*Same objection.*]

Ans. The escapement was the same; the hands were carried in the later clocks by a train of wheels; the pendulum, instead of being wood, was a compensating rod, or pendulum.

Q. 72. Before making his compensating pendulums did Mr. Drawbaugh make any inquiry of you about compensating pendulums; and if so, what was his inquiry, and what information did you give him about such pendulums, if any?

[*Same objection.*]

Ans. Mr. Drawbaugh and I had a talk on the matter, and I referred him to Horton's patent as being the easiest and cheapest made.

Q. 73. Did you show him any description or diagram of Horton's pendulum; and if so, in what work did you show it, and on what page?

[*Same objection.*]

Ans. I did; in the "*Watchmaker and Jeweler*," published in New York, of September, 1870, page 28.

(Complainant's counsel offers the description and diagram of Horton's pendulum referred to, to be copied by the examiner upon the record, and to be marked "Exhibit Horton's Pendulum." For convenience in printing, said exhibit is shown in "Complainants' Book of Exhibits."

Objected to by Mr. Hill, as immaterial and irrelevant.)

Q. 74. Was there anything said between you about modifying this pendulum, so as to be different in any way from that shown in the diagram? And, if so, what was said?

[*Same objection.*]

Ans. I suggested to Mr. Drawbaugh that we use two compensating rods instead of one, for appearance—not for better results; and to use a set screw in moving the rod for adjusting.

Q. 75. Did you consider these changes as patentable improvements, or as mere mechanical modifications?

[*Same objection.*]

Ans. I did not consider it patentable, as it did not change the principle.

Q. 76. Do you know whether the compensating pendulums which Drawbaugh afterwards constructed, embrace these modifications?

[*Same objection.*]

Ans. Mr. Drawbaugh instead of using one steel rod used two, to part it, to allow space for the electro-magnet and permanent magnet. The permanent magnet was fastened to the pendulum, and the electro-magnet was fastened to the back of the clock. The two rods were to allow space for the beating of the pendulum. He had two brass rods and adjusting screws.

Q. 77. The use of two steel rods was not spoken of between you and Mr. Drawbaugh at the time you showed him the Horton diagram, I understand you?

[*Same objection.*]

Ans. It was not.

Q. 78. Do you remember at what time it was that you showed him the Horton diagram, or whether it was while he resided at Mechanicsburg?

[*Same objection.*]

Ans. I do not remember the time, but think it was while he resided at Mechanicsburg.

Q. 79. Do you remember showing Mr. Drawbaugh a copy of the *Scientific American* containing a description of the "Reis Telephone," so-called?

Ans. I remember of showing Mr. Drawbaugh a *Scientific American* containing a description of a telephone, but do not remember whether it was Reis'.

Q. 80. How came you to show it to him?

Ans. I was in the habit of showing him my *Scientific Americans.* My reason for calling his attention to that one was because I had seen a telephone at his place.

Q. 81. Were you in the habit of loaning him the *Scientific Americans* while he lived at Mechanicsburg, or did he come to your shop to read them?

Ans. He used to come to my shop to look at them, and if there was anything he wished he took them with him.

Q. 82. You have said that after you made the contract with him you spoke to him several times about patenting his clock. Did you, at that time, think the invention was a valuable one?

[*Objected to by Mr. Hill as immaterial and irrelevant.*]

Ans. I did.

Q. 83. Did you afterwards come to a different conclusion, and if so, what led you to it?

[*Same objection.*]

Ans. Bad results from my clock led me to it.

Q. 84. Did you, at any time after you made your contract with Mr. Drawbaugh, find any description of electric clocks? If so, in what publication?

[*Same objection.*]

Ans. I did. The Mechanicsburg Library Association contains a

book containing a description of an electric clock. I am not certain about the name of the book, but think it was "Dictionary of Mechanics."

Q. 85. When did you find this description, and did you ever say anything to Mr. Drawbaugh about it?

[*Same objection.*]

Ans. I do not know how long afterwards I found it, nor do I remember what conversation I had with Mr. Drawbaugh, but I think I mentioned it to him.

Q. 86. Did you know of Mr. Drawbaugh, some time after your contract with him, having negotiations with the Messrs. Grissinger, and of their afterwards taking hold of the clock with him?

[*Same objection.*]

Ans. Only from report, I believe, having no conversation with Mr. Drawbaugh on the subject, to my recollection.

Q. 87. Why did you not have conversation with him about it, or object to his making a trade with other parties after his contract with you?

[*Same objection.*]

Ans. Finding that my clock was unsatisfactory I did not care.

Q. 88. Do you remember when you last visited Mr. Drawbaugh's shop how you came to go there, and how long you were there?

Ans. The last visit I made to Mr. Drawbaugh's shop was, I think, on the fourth of July, 1878. My brother and family, and myself and family, went fishing. I was not very much in the shop. I was in several times, but the length of time I don't remember. My brother was making a hammer, and wished to get it turned, and got Mr. Drawbaugh to turn it. That was more particularly why I selected that place for fishing.

Q. 89. Referring again to the clock which you saw on your first visit to Mr. Drawbaugh's shop, and which was run by an earth battery, what, in your judgment, would it have cost to construct that clock, including such case as there was when it was brought to your shop, and allowing a fair estimate for the labor?

[*Objected to by Mr. Hill as immaterial and irrevelant.*]

Ans. I can hardly tell; the case was not finished. It was made as such things are generally made; there was not a great deal of finish put

on the case; I suppose it would have cost twenty or twenty-five dollars, or perhaps more; I refer to the case and works.

Q. 90. What, in your judgment, would it have cost to construct the clock, including case and works that you subsequently saw there, and referred to as a hanging clock about four or five feet long?

[*Same objection.*]

Ans. I could not say; I never seen the clock completed, that is, the case.

Q. 91. Can you give any estimate of the cost of it in the condition in which you saw it?

[*Same objection.*]

Ans. Not less than twenty dollars.

Q. 92. What, in your judgment, would have been the cost of the large clock which you spoke of, eight or nine feet high?

[*Same objection.*]

Ans. I do not think it could have been put up for a hundred dollars.

Q. 93. Can you give an estimate of the other clock you referred to, a smaller one, made to stand on the floor?

[*Same objection.*]

Ans. I do not think it could have been put up for seventy-five dollars.

Q. 94. You have said that your last visit to Mr. Drawbaugh's shop was made July 4, 1878; can you tell how long before that it was since you had been at his shop?

Ans. I cannot.

Cross-examined by Mr. Hill.

Cross-Q. 95. You say your business is jeweler and repairing of watches; do you keep clocks for sale and repair them also?

Ans. Yes, sir.

Cross-Q. 96. Was your business in 1876 the same as it is now?

Ans. Yes, sir; it was.

Cross-Q. 97. How do you fix the time of your first visit to Mr. Drawbaugh's shop as October?

Ans. It was some four or five weeks prior to his agreement with me.

Cross-Q. 98. You mean the agreement of November 8, do you?

Ans. Yes, sir.

Cross-Q. 99. Can you swear positively that it was as much as two weeks prior to that agreement?

Ans. Yes, sir.

Cross-Q. 100. Can you swear postively that it was not as much as two months prior to that agreement?

Ans. I think I can.

Cross-Q. 101. Can you swear positively that that visit to his shop was not made before the first day of October, 1876?

Ans. My reason for it is, that my brother-in-law was with me on the first visit, he visiting me on Monday, October the second. Tuesday, October the third, I think it was, when we went to Mr. Drawbaugh's shop for the first time.

Cross-Q. 102. How soon were you at Mr. Drawbaugh's shop again after October third, 1876?

Ans. I could not say, having nothing to fix dates.

Cross-Q. 103. Was your second visit prior to the eighth of November, 1876, the date of the contract;

Ans. I am not positive; I think I was there between those dates.

Cross-Q. 104. How many times were you at Mr. Drawbaugh's shop between the third day of October, 1876, and the fourth day of July, 1878?

Ans. I could not say.

Cross-Q. 105. Approximate it as nearly as you can.

Ans. It may have been five, six, or more times; I don't know whether it was that many or not; I was there a number of times.

Cross-Q. 106. Fix the time as nearly as you can when you made up your mind that it was not worth while to go on with the clock matter, and ceased to take further personal interest in it.

Ans. I could not say; it may have been six or eight months, or more; it was after making my clock.

Cross-Q. 107. Was it while Drawbaugh still lived at Mechanicsburg?

Ans. I could not say.

Cross-Q. 108. After you made up your mind to go no further in the clock matter, did you visit his shop again at any time before July 4, 1878?

Ans. I am not positive, but think I did.

Cross-Q. 109. Have you any idea how many times, or for what purpose?

Ans. I do not remember the times. I had nothing in particular in view.

Cross-Q. 110. How came you to lend Drawbaugh the twenty dollars on the 8th of November, 1876?

Ans. He asked me for more, and I told him that was all I could spare him at that time, as I was just going to visit the Centennial that morning.

Cross-Q. 111. What reason did he give for wanting money at that time?

Ans. He wanted to pay a bill of some kind.

Cross-Q. 112. How long were you at the Centennial?

Ans. I think I was gone from home but three days.

Cross-Q. 113. Did you see any telephones there?

Ans. I do not remember of seeing any.

Cross-Q. 114. Referring to the note for twenty dollars which Mr. Drawbaugh gave you November 8, 1876, have you, within the last two years and a half, called his attention to it, or requested payment or a settlement of the account?

Ans. I do not remember of ever asking him.

Cross-Q. 115. You have in direct examination given estimates of the cost of various electric clocks which you saw, finished or unfinished, at Mr. Drawbaugh's shop; was that estimate based upon the cost of the raw materials alone, or upon both materials and labor?

Ans. Both material and labor.

Cross-Q. 116. Do you know whether the raw materials in those clocks were purchased by Mr. Drawbaugh himself with his own money, or whether they were purchased with money furnished by other parties, who were, or expected to become, interested in the electric clock invention?

Ans. I do not know where the money came from.

Cross-Q. 117. How long did it take you to make the electric clock which you say you made at Mechanicsburg?

Ans. I do not know; I made it between times in my work.

Cross-Q. 118. When you showed Mr. Drawbaugh the article in the *Scientific American* containing a description of a telephone, do you remember whether he read it, and what he said about it?

Ans. I do not think that he read it aloud; he said he would take the paper with him.

Cross-Q. 119. Did he ever refer to it afterwards? If so, what did he say?

Ans. I do not remember that he ever referred to it, having never returned the paper, to the best of my knowledge.

Cross-Q. 120. Do you remember who was the author of that article?

Ans. I do not.

Cross-Q. 121. Did it refer to Dr. Vanderweyde's lecture in New York on the subject?

Ans. I do not know, having never read the article since.

Cross-Q. 122. Had you ever read or heard anything about the telephone before reading that article, excepting what Mr. Drawbaugh had told you on the 3d of October, 1876?

[*Complainant's counsel objects to the question because it implies that the witness had not read the article before he had any communication with Mr. Drawbaugh on the telephone, nothing having yet appeared in evidence to justify the implication.*]

Ans. I do not remember.

Cross-Q. 123. Have you any recollection of ever having heard or read of a telephone before the 3d of October, 1876?

Ans. I don't know of any other than this article that I have reference to, and do not know that I had read that fully.

Cross-Q. 124. Did you show that article to Drawbaugh before or after the 3d of October, 1876, and if after, how long after, to the best of your recollection?

Ans. I do not know how long after, but it was after.

Cross-Q. 125. When you showed Drawbaugh the article about the telephone in the *Scientific American*, was the paper a new number or an old number? I mean was it a number that you had recently received or an old number?

Ans. I think it was a number that I had received some time before that.

Cross-Q. 126. Had you received it before the 3d day of October, 1876, or not until after that date?

Ans. Before.

Cross-Q. 127. How do you remember that fact?

Ans. I kept my *Scientific Americans* at the end of my counter and frequently referred to them. I think it was in a March number of 1876.

(Recess for dinner, until 2.30, P. M.)

NOVEMBER 22, 1882, 2.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Rufus E. Shapley, by Mr. Hill, continued.

Cross-Q. 128. Please look at the instruments now shown you marked "G," "H," "J," "K," "L," "M," "N," "O," "P," "Q," and state whether you have any recollection of ever having seen any of them at Mr. Drawbaugh's shop at any time; if so, which one?

Ans. I have no recollection whatever of seeing any one of them.

Cross-Q. 129. When you began to lose interest in the electric clock business, did Mr. Drawbaugh find some fault with you for not going on with the business; or did any feeling grow out of the matter between you and him?

Ans. We never conversed on the subject to my knowledge; and as far as I am concerned there is no bad feeling between us, and none that I know of on his part.

Cross-Q. 130. When and by whom were you first spoken to on behalf of the Bell Telephone Company in regard to the matters about which you have testified in this case?

Ans. I could not say. There was a gentleman—I would know him if I would see him—who was in my place and asked me a number of questions. I did not know and do not know now that he was in the interest of the Bell Telephone Company. I do not know his name; I believe he did not give me his name. I could not give any date.

Cross-Q. 131. Was it one or two years ago?

Ans. It may have been; I am not positive; it was quite a while.

Cross-Q. 132. Referring to the electric clock which you had at Mechanicsburg in your store, did you, while it was there, tell Mr. Drawbaugh that by altering the adjustment, or adjusting it, it was now keeping time correct within about a variation of a minute or less per day? I mean either clock that you had in your store.

Ans. I do not remember of telling Mr. Drawbaugh that its variation was within a minute or less. Its variation was greater some days than others.

Cross-Q. 133. In your answer 31 you refer to an instrument with a knob on the end of a magnet which he rocked. Was that knob on the end of a rocking magnet, or was it on the end of a rocking key, something like a telegraph key?

Ans. I think it was on the end of a magnet.

Cross-Q. 134. You wouldn't swear to that positively, would you?

Ans. I think I can.

Cross-Q. 135. On that first visit of yours to Drawbaugh's shop, October third, 1876, you went from Mechanicsburg to White Hill Station by rail, and returned from White Hill station to Mechanicsburg in the same way, did you not?

Ans. Yes, sir.

Cross-Q. 136. By a passenger train?

Ans. Yes, sir.

Cross-Q. 137. At what hour did you leave Mechanicsburg for White Hill station and at what hour did you leave White Hill station for Mechanicsburg on the return trip?

Ans. I think that we left Mechanicsburg at one-thirty and returned at five. I am not positive that it was just that, but about that.

Cross-Q. 138. Was it the regular passenger train, or a special train either way?

Ans. The regular.

Cross-Q. 139. Did you walk or ride from White Hill station to Drawbaugh's shop and back?

Ans. We went afoot, but it was a very fast walk—as fast as we could go, for we wanted to make time.

Cross-Q. 140. In your answers 72 to 78 inclusive you refer to Drawbaugh's compensating pendulum; you say that before he made his compensating pendulum you and he had a talk, and you referred him to Horton's patent, it being the easiest and cheapest made, etc., do you remember all that talk pretty clearly?

Ans. I do not remember all that talk; Mr. Drawbaugh and I talked on the subject; I referred him to the "*Watchmaker and Jeweler*," to the cut represented in September, 1870.

Cross-Q. 141. He introduced the subject of compensating pendulums, did he not?

Ans. I think he did.

Cross-Q. 142. Did he not, before you referred him to the "*Watchmaker and Jeweler*," state that he had contrived a compensating pendulum, and endeavor to give you an idea of what his contrivance was?

Ans. I do not remember that he did.

Cross-Q. 143. Will you swear that he did not?

Ans. I will not.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 22d day of November, 1882.

FRED. M. OTT,
Examiner.

R. E. SHAPLEY.

ISAAC D. LANDIS, *being produced, sworn and examined, saith:*

Examined by Mr. Smith:

Q. 1. Where do you reside, and what is your occupation?

Ans. My residence is Coatesville, Pennsylvania, and my occupation watch-maker and jeweler. My age is forty-one.

Q. 2. Where did you reside in 1876, and what was your occupation at that time?

Ans. Both the same.

Q. 3. Are you a relative of R. E. Shapley, of Mechanicsburg? If so, what is the relationship?

Ans. I am a brother-in-law.

Q. 4. Do you remember making him a visit in the fall of that year, and if so, can you fix the time when you reached his house and when you returned home?

Ans. I remember making him a visit in the fall of that year. I reached his house on or about the second day of October, 1876, and returned home on or about the sixteenth of the same month.

Q. 5. On what day did you leave home, and did you go to any other place before you went to Mr. Shapley's?

Ans. I left home on Saturday, September 30, and went to Duncannon, Pennsylvania.

Q. 6. On what day did you go from Duncannon to Mechanicsburg?

Ans. To the best of my belief, on Monday following, the second day of October.

Q. 7. Have you been able, by referring to your books kept at your store, to fix the date when you left and the time of your return? If so, state in what way you fix those dates.

Ans. By the entries being made in my cash-book by my brother, who was assisting me at that time temporarily.

Q. 8. Was he in charge of the store while you were away?

Ans. He was assisted by my father part of the time.

Q. 9. If you have the book with you to which you refer to fix these dates, will you produce it to be examined by the counsel for the respondent, if he desire?

Ans. I have, and will produce it.

[*Witness produces book.*]

Q. 10. Will you state what the last entry is, made by yourself before the entries made by your brother, and what was the first entry made by yourself after the entries made by your brother, and after your return?

Ans. The last entry in my hand-writing was on Saturday night, September 30, footing up the amount of the day. I wrote the heading for Monday, October 2. The first entry on my return, in my hand-writing, is on Monday, the 16th of October.

Q. 11. Do you remember that you went to Duncannon and spent Sunday?

Ans. I do.

Q. 12. After you reached Mechanicsburg did you go with Mr. Shapley to visit the shop of Daniel Drawbaugh, at Eberly's Mills?

Ans. I did.

Q. 13. How soon after you reached Mechanicsburg did you make that trip?

Ans. To the best of my belief it was the day after arriving there—Tuesday, October 3.

Q. 14. How came you to go with Mr. Shapley to Mr. Drawbaugh's shop?

Ans. Through the solicitation of Mr. Shapley.

Q. 15. Did he state what his object was in making the visit? If so, what was it?

Ans. To see a magnetic or electric clock made by Mr. Drawbaugh.

Q. 16. Do you remember what time of day you left Mechanicsburg to go there, and what time you returned?

Ans. We left Mechanicsburg shortly after dinner, and returned in time for supper.

Q. 17. Had you ever been to Mr. Drawbaugh's shop or seen him before that time, or have you ever been there since?

Ans. I had never been to his shop before; have no recollection of ever meeting him before, and have not been there since.

Q. 18. How long, according to your recollection, did you stay at the shop?

Ans. Something over an hour; I can't give the exact time; perhaps an hour and a half.

Q. 19. Did you see the clock which Mr. Shapley went to see, and did Mr. Drawbaugh show it to you?

Ans. I did, and Mr. Drawbaugh explained the working of it.

Q. 20. Do you remember whether or not he explained its being run by an earth battery?

Ans. Yes, sir; he did.

Q. 21. Will you describe briefly the appearance of the clock—what kind of hands and face it had, and the case?

Ans. The case was after the style of the ordinary English clocks, as they are called. It had two doors, one in the lower part, or waist of the clock, the other opening to the dial, with some ornamentation; dial round and made of paper, I believe; I cannot describe the hands.

Q. 22. Did you see two other clocks there which were connected electrically, so that one governed or propelled the other?

Ans. Yes, sir.

Q. 23. State whether or not Mr. Drawbaugh showed you any other machines or devices which he had there, and how he came to show them to you.

Ans. He took us through his work-shops, or shop, and showed us his apparatus for electric bells, also an insulator, and an electric fire alarm, and an electric alphabetical apparatus, his lathes, and a machine for grinding tighteners for his patent axles that he had, and an instrument for speaking through, called a telephone.

Q. 24. How did he come to show you these things? Did you ask him to show you what he had in the shop, or did he invite you, unasked?

Ans. Through courtesy, of his own accord, he took us through the place.

Q. 25. You mentioned an insulator as one of the things he showed you? Was that a machine for insulating wire by covering it with thread?

Ans. Yes, sir.

Q. 26. You mentioned, also, an alphabetical apparatus. Did you understand that to be some kind of telegraphic instrument?

Ans. Yes, sir.

Q. 27. On what floor were these various things which you have spoken of?

Ans. On the second floor, I presume you would call it.

Q. 28. Will you describe, as well as you are able, the telephone which

he showed you? State where it was, and what Mr. Drawbaugh said with relation to it.

Ans. It was in a room to the left on entering his place by the stairway, nearly opposite the door going into the room. My recollection of it is, as being made of tin—apparently a tin can—with a piece of bladder across the end of it, with a magnet attached to it in front of the bladder; and, also, that he said, in calling our attention to it, that this was to revolutionize the world, or words to that effect; that it was for the purpose of speaking through—carrying the sound of the voice.

Q. 29. Was that instrument connected in any way with any other instrument so far as you could see, or with the building?

Ans. No, sir; it was not in working order at the time.

Q. 30. Did he show you any other instrument which he called a telephone or which was to be used as a speaking instrument?

Ans. No, sir.

Q. 31. Will you look at the various instruments now on the table marked respectively "A," "B," "C," "C Reproduced," "D," "E," "F," and "I," and state whether you find among them the instrument which Mr. Drawbaugh showed you, and whether you saw on that occasion any of the other instruments?

Ans. I identify this instrument, (marked "B,") which is the only instrument I saw on that visit to the best of my knowledge.

Cross-examined by Mr. Hill.

Cross-Q. 32. Do you recollect all the conversation with Mr. Drawbaugh with regard to his telephone at that time?

Ans. This is all I remember specially.

Cross-Q. 33. Your examination of those machines, except the clock, was somewhat rapid and hurried, I suppose?

Ans. Not necessarily; we had ample time to look around.

Cross-Q. 34. Mr. Shapley testified that Mr. Drawbaugh said that they had talked through the telephone machine which he showed you; do you remember that?

Ans. He didn't while I was there—not in my presence.

Cross-Q. 35. How are you able to make oath to that, if you don't remember all the conversation? Can you swear to anything more than that you do not recollect of Mr. Drawbaugh's saying that?

Ans. I would very distinctly remember if I had heard any person speak through it.

(*Mr. Hill suggests that the witness must have misunderstood the question. Witness continues:*)

I understood you to say that Mr. Shapley testified that there was talking done through the instrument in our presence.

Cross-Q. 36. No, you misunderstood me; I will make my question plainer. Mr. Shapley in his 28th answer used these words, to wit: "I think I understood Mr. Drawbaugh to say that they had spoken with it;" I meant to ask you if you remembered Mr. Drawbaugh's saying that?

Ans. I do not remember; he may have said it to Mr. Shapley who paid closer attention to the details of the several instruments shown

Cross-Q. 37. Do you remember whether Mr. Drawbaugh said how far they could talk through this instrument?

Ans. No, sir.

Cross-Q. 38. Do you remember whether he expressed the opinion that it would take the place of the telegraph wholly or partially?

Ans. Yes, sir; that was the impression conveyed to my mind.

Cross-Q. 39. Did you understand the instrument to operate by electricity?

Ans. I cannot say as to that.

Cross-Q. 40. Did it have a magnet on it wound with insulated wire?

Ans. That is my recollection of it.

Cross-Q. 41. Did he explain why it was out of working order at that time?

Ans. Not to my knowledge.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 22d day of November, 1882.

FRED. M. OTT.

I. D. LANDIS.

Adjourned until November 23d, 1882, at ten, A. M.

NOVEMBER 23, 1882, 10, A. M.

Adjourned until November 24th, at ten, A. M.

NOVEMBER 24, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

JOHN S. FOOSE, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

Q. 1. What is your age, residence, and occupation?

Ans. My age is sixty-five. Residence, Duncannon, Perry county, Penna., on the Susquehanna river, about fifteen miles above Harrisburg. My occupation is constable at present.

Q. 2. How far is Duncannon above that part of Marysville which is called Haley's?

Ans. They call it seven miles to Marysville, and I suppose it means the same thing.

Q. 3. Did you ever open a coal mine on Cove mountain, between Duncannon and Marysville?

Ans. I explored for coal—put in shafts.

Q. 4. Will you produce the mining lease under which you made those explorations?

Ans. Yes, sir; here it is.

[The paper referred to is an indenture, dated October 29, 1875, whereby James Bell and L. C. Zimmerman, of Rye township, Perry county, leased to John S. Foose and Henry M. Sweger the mines of coal, iron, and other minerals on certain described tracts of land in the townships of Rye and Penn on a royalty. The lease is a mining lease for ninety-nine years, with a proviso that the lessees be allowed three years to explore the lands to discover coal, iron, or other minerals; and if within that time they do not discover them, and afterwards work them to their fullest capacity, the lease to be void.]

Q. 5. Did you have any other partner in the business under that lease besides Mr. Sweger; and, if so, whom?

Ans. Yes, sir; William Fields, of Harrisburg.

Q. 6. Have you here an account-book which contains the time and pay of the men who worked for you and your partners under that lease; and, if so, will you please produce it?

Ans. Yes, sir; this is the book.

Q. 7. In whose handwriting is it?

Ans. It is in my handwriting.

Q. 8. It seems to contain various entries of work and of payments under certain dates; were, or were not, those entries made by you at the time of those dates, and while the work was going on?

Ans. Yes, sir.

[The book is entitled on the first blank leaf as follows: "Duncannon, November 20, 1875. Accounts of the coal mines of J. S. Foose, Sweger, and Fields at the Cove mountain." The account of each man is kept separate, with a credit to him on one side of the number of days worked, and charges on the other side, under a regular series of dates, of cash paid, and articles furnished.]

Q. 9. I observe that the first man whose name appears in the book is "Larance Baker"; did he work for you in opening for coal on that land?

Ans. Yes, sir.

Q. 10. The first entry under his name is under date of November 20, 1875, "by three and a half days, $5 25;" was that the time when you and your partners began explorations on that land under that lease?

Ans. Yes, sir.

Q. 11. His account seems to run along with entries every week, or almost every week, until December 22d, 1876, when it is added up, and the credit to him for labor amounts to $422 25; did you and your partners prosecute the work pretty steadily on that land during that period between those dates, that is, between the middle of November, 1875, and the last of December, 1876?

Ans. Yes, sir; we did.

Q. 12. What were Baker's wages per day?

Ans. A dollar and a half.

Q. 13. I find in the same book that you were credited for time nearly every week from November, 1875, to September, 1876; were you attending to the work pretty steadily during that period?

Ans. Yes, sir; I did, as the charges are entered on the book.

Q. 14. I find that "Sam Foose" is credited for work nearly every week, at the rate of a dollar and a quarter a day, from November 20th, 1875, to December 22d, 1876, the total credit being $352 81; was, or was not, that for work on that land under that lease?

Ans. Yes, sir.

Q. 15. What relation of yours is Sam Foose?

Ans. A son of mine.

Q. 16. I find that John Metz is credited in that book at the rate of a

dollar and a quarter a day nearly every week from July 15th to December 22d, 1876, the whole amounting to $124 37; is that for work done on that land under that lease?

Ans. Yes, sir.

Q. 17. Have you here present an account-book of the expenses of yourself and partners, other than for labor, on that coal mine under that lease. If so, will you please produce it, and state whether or not it is in your handwriting?

Ans. Yes, sir; this is the book, and it is in my handwriting.

Q. 18. Were the entries therein made by you at or about the dates that are given for each, and while the work was going on?

Ans. Yes, sir.

[The book is headed "1875. Foose, Sweger & Fields. Expenses at coal mines." It begins with an account of expenses for powder, tools, &c. The first date of that account is November 29, 1875, and the last is December 30, 1876. This account amounts to $294 24.]

Q. 19. The first book that you produced containing the accounts of the men shows that the only work done by Baker after December 22, 1876, was two days' work in December, 1877, and about a month's work in the spring of 1878; and that the only work done by Sam Foose, after December 22, 1876, was two days' work in the spring of 1878; did you and your partners stop work on that land at the end of 1876, with the exception of this little work done in 1878, just referred to?

Ans. Yes, sir.

Q. 20. Has any work been done on that land in the way of digging for coal since 1876, except this little work in 1878 referred to?

Ans. No, sir; not in that firm.

Q. 21. If you or anybody else have done any working for coal on that land since then, will you state when it has been done, and how recently?

Ans. There has none been done, except that we put men to work last Monday again, but that is under a new lease.

Q. 22. What was the work that you and your partners had done on that Bell & Zimmerman land under that lease between the middle of November, 1875, and the last of December, 1876?

Ans. We run a tunnel into the mountain in that time.

Q. 23. Did you drive that tunnel from the surface or from the bottom of a shaft?

Ans. We drove it from the surface.

Q. 24. How long was that tunnel, about?

Ans. About two hundred and sixty feet.

Q. 25. Was it timbered?

Ans. It was timbered from the mouth till we struck the solid rock, and then it wasn't timbered. About thirty feet, I suppose, was timbered.

Q. 26. Did you sink any shafts on that land during that lease?

Ans. Yes, sir.

Q. 27. What was the principal part of the work done on that land, sinking the shafts or driving the tunnel?

Ans. Driving the tunnel.

Q. 28. Has any coal ever been shipped to market from that land?

Ans. No, sir.

Q. 29. Do you know a piece of land belonging to one Kirby on Cove mountain, a mile or two down the river from the Bell & Zimmerman land which you have testified about?

Ans. Yes, sir; I know the land, but from the line of Bell & Zimmerman's land it is not over a mile.

Q. 30. Did you ever make any openings to explore for coal on that Kirby land?

Ans. Yes, sir; I sunk a shaft.

Q. 31. Have you here a book containing any account of any work that you did, or time that you spent, yourself, in making this opening on the Kirby land. If so, will you please produce it, and point out the entries, and state in whose handwriting they are?

Ans. Here is the book, and it is in my own handwriting, done at the time. These are entries of some work I did myself.

[The entries referred to are headed "1877. William Kirby, Dr. to J. S. Foose," and are for fourteen days' work, the first date being June 6, 1877, and the last being July 14, 1877.]

Q. 32. Did you have any men working at those openings at that time; and, if so, whom?

Ans. Lawrence Baker, Jacob Myers, Samuel Foose.

Q. 33. Who paid those men, you or Mr. Kirby?

Ans. Kirby paid the men.

Q. 34. About how long did the men work on that Kirby land?

Ans. They worked about three weeks to the best of my recollection.

Q. What was the work they did?

Ans. Sinking a shaft down. First, they dug a couple of small holes

just to find a place to locate the shaft, and then they sunk one principal shaft down.

Q. 36. About how deep was that shaft?

Ans. About thirty feet.

Q. 37. Did you find coal there?

Ans. Yes, sir; we found some coal there.

Q. 38. Has any coal ever been shipped to market from that Kirby land?

Ans. No, sir; none that I know of.

Q. 39. Had there been any shafts sunk on the Kirby land before you sunk this shaft in 1877?

Ans. Not that I know of.

Q. 40. Have there been any coal mines opened on Cove mountain, except what you have opened?

Ans. Not that I know of.

Q. 41. Did the work that you did at these openings attract much attention in the neighborhood?

Ans. It did some, but not very much.

Q. 42. Did any geologists ever come to see it?

Ans. Yes, sir; I know of one.

Q. 43. Was he employed by you, or was he attracted to come and see it?

Ans. The Duncannon Iron Company brought him; Harvey Fisher brought him there.

Q. 44. Do you know an old fertilizer-mill where they ground bone, which stood on the river road between Marysville and Duncannon and not a great ways above Marysville?

Ans. Yes, sir.

Q. 45. About how far is that mill from Haley's?

Ans. About two miles.

Q. 46. Were they running that mill in 1877 while you were working on the Kirby land?

Ans. Yes, sir; part of the time only.

Q. 47. How far from that fertilizer-mill was the Kirby land, and in what direction?

Ans. About a short half mile in a south or south-east direction.

Q. 48. How do you go to get up to that opening on the Kirby land from the river road?

Ans. If you want to go with a horse and buggy, or anything, there

is a road on to the Kirby land, a little above the fertilizer-mill, but you can't get up on to the mountain to where we was digging unless you walk up.

Q. 49. If you want to walk up from the river road, where do you turn off to go to the place where you were digging?

Ans. Right there at the fertilizer-mill or bone-mill, as we call it; that is the nearest way to get up afoot.

Q. 50. How do you get from the river road up to the Bell and Zimmerman land where you drove the tunnel?

Ans. There is a road that crosses the main road after you leave Cove station a short mile. There is a by-road that runs between Zimmerman and Collier into the public road that crosses the mountain into Fishing Creek Valley, and that runs close by where we were digging on the mountain, within a hundred or a hundred and fifty yards.

Q. 51. How far is it from the bone-mill to the place where this cross-road turns off from the river road to go to Bell and Zimmerman's?

Ans. About a mile and a half.

Q. 52. Which is the nearest to Marysville, the bone-mill or the place where the cross-road turns off?

Ans. The bone-mill is the nearest.

Q. 53. It appears from the indenture that you took an exploring lease of the Bell and Zimmerman land October 29, 1875; had you before that made any tests on the mountain which made you think it worth while to take an exploring lease?

Ans. Yes, sir.

Q. 54. When you first made that test on the mountain, what kind of mineral were you searching for?

Ans. I was searching for iron ore in the first place there.

Cross-examined by Mr. Hill:

Cross-Q. 55. When you took the mining lease October 29, 1875, was your main object the mining of coal?

Ans. Yes, sir.

Cross-Q. 56. How long before the date of that lease did you first commence to do any work on that mountain in the way of mining or exploring for any mineral substance?

Ans. I can't recollect exactly, but it was over a year before that.

Cross-Q. 57. Was it in the spring, summer or fall when you began?

Ans. I think it was in the spring.

Cross-Q. 58. Whose land did you make your explorations on before you took the lease?

Ans. On the land of Bell and Zimmerman.

Cross-Q. 59. Who did the work in those explorations before the lease?

Ans. Baker and Myers' boys, and Metz; I can't exactly tell you right, but that was the party that worked for me. I did not keep a correct account of it while I was working by myself; I paid the men and kept no account of it.

Cross-Q. 60. Who was Baker, and where did he live?

Ans. He lived in Rye township, Fishing Creek valley, close to the mountain where we worked; his name is Lawrence Baker.

Cross-Q. 61. Who were Myers' boys, and where did they live?

Ans. They lived close neighbors to Baker; I can't give their names, I just paid them, still, and don't think I took their names; there were two of them, sons of Jacob Myers; the old man worked for me in the tunnel, and they lived all together.

Cross-Q. 62. While giving your last answer you mentioned, conversationally, a third Myers boy; did he do any work for you?

Ans. I had no third; there was two only; one started to go to Harrisburg one day and got under the cars and got his leg cut off, and he didn't work for me after that; there was only two worked for me.

Cross-Q. 63. Who was Metz, and where did he live?

Ans. He lived in Fishing Creek valley not far from Baker. I don't mind that Metz worked for me before I had the lease; I am not certain.

Cross-Q. 64. Have you mentioned all the persons who worked for you on that mountain before you had the lease?

Ans. To the best of my knowledge I did; I don't remember any other.

Cross-Q. 65. Did you work yourself?

Ans. Yes, sir; part of the time I did.

Cross Q. 66. Where do those four persons, Baker, the two Myers' boys, and Metz now live?

Ans. They all live there at the mountain—on the south side of the mountain.

Cross-Q. 67. Before you had the lease, was the work done at different places on the mountain or only at one place?

Ans. At different places.

Cross-Q. 68. How many and where?

Ans. We sunk some small shafts on the south side of the mountain

and some on the north side, and then the principal shaft that we sunk down was right on top of the mountain.

Cross-Q. 69. How far were those shafts apart?

Ans. I couldn't tell exactly, about a hundred yards or two hundred yards apart.

Cross-Q. 70. How far were they from the shaft or tunnel which you opened after you had the lease?

Ans. From the tunnel, I suppose in the neighborhood of a couple of hundred yards. I couldn't tell; may be a little more.

Cross-Q. 71. How deep was the principal shaft on top of the mountain?

Ans. I can't recollect exactly; it was about thirty feet I suppose.

Cross-Q. 72. Did you find any iron?

Ans. We found some specimens of iron.

Cross-Q. 73. Did you find any coal?

Ans. We found some coal, too, in small veins.

Cross-Q. 74. Did you find the iron or coal first?

Ans. We found the symptoms of coal first.

Cross-Q. 75. How near to that place were the nearest coal mines that were worked by anybody that you knew of?

Ans. The nearest I know were at Lykens Valley; that is about forty miles I suppose—about thirty or forty; I can't tell just the places.

Cross-Q. 76. Before you struck the coal or indications of coal on Cove mountain had it been understood or suspected that there was coal in that mountain so far as you know?

Ans. So far as I know I suspected coal there.

Cross-Q. 77. I mean, had there been any talk in the community about there being coal there?

Ans. The principal part of the talk in the community was, some said there was no coal there and some said there might be coal there.

Cross-Q. 78. When you struck the signs of coal there I suppose it made considerable talk in the community, did it not?

Ans. It made some, but some wouldn't believe in it at all; some had a little faith in it.

Cross-Q. 79. What was the nearest village to the place where you were exploring on the top of the mountain, and how far away was it?

Ans. I suppose Duncannon was the nearest, about three miles and a half away from it.

Cross-Q. 80. How far was Marysville away from it?

Ans. Something like four miles or a little over. You can hardly tell which would be the nearest, Marysville or Duncannon.

Cross-Q. 81. Marysville was east of it, and Duncannon west?

Ans. Yes, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 24th day of November, 1882.

FRED. M. OTT,
Examiner.

JOHN S. FOOSE.

SAMUEL A. FOOSE, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

Q. 1. What is your age, residence, and occupation?

Ans. I am twenty-seven. Residence, Duncannon. Occupation, keeping a hotel at Duncannon.

Q. 2. Are you a son of Mr. John S. Foose, who has just testified?

Ans. Yes, sir.

Q. 3. It appears from the account-book which your father produced that you worked for him on the coal lands which he and his partners had leased from Bell & Zimmerman on Cove mountain; do you remember working there?

Ans. Yes, sir.

Q. 4. It appears from the same books that you worked pretty steadily from the middle of November, 1875, to the end of December, 1876, and did not work there afterwards, except a couple of days in 1878; is that according to your recollection?

Ans. Yes, sir.

Q. 5. It appears from the same book that Lawrence Baker worked there with you about all that time, and Metz worked there with you about the latter half of that time; is that according to your recollection?

Ans. Yes, sir.

Q. 6. Please state generally what was the work that you and Baker and Metz did for your father and his partners on that land under that lease.

Ans. We tunneled for coal.

Q. 7. How much of a tunnel did you make?

Ans. About in the neighborhood of two hundred and fifty feet in length.

Q. 8. Did you sink any shafts for your father and his partners under that lease?

Ans. Not to my recollection.

Q. 9. Was any coal shipped to market from that Bell & Zimmerman land?

Ans. No.

Q. 10. Did you, after you had stopped working on the Bell & Zimmerman land, do any work for your father and Kirby on Kirby's land in the way of opening for coal?

Ans. Yes, sir.

Q. 11. What was the work you did on Kirby's land?

Ans. Shafting. We sunk a shaft up there.

Q. 12. How much of a shaft was it—how deep?

Ans. Twenty or twenty-five feet, as near as I can recollect.

Q. 13. Did you find any coal there, and get out any?

Ans. Yes, sir.

Q. 14. Was any coal ever shipped from there?

Ans. No, sir.

Q. 15. How was this Kirby land situated with reference to the old bone-mill or fertilizer-mill, and how do you get to it from the bone-mill?

Ans. It is about straight up the mountain from the mill. You can go up by old sled-roads—to sled out wood from the mountain.

Q. 16. Your father's account states that the work on the Kirby land was done in the summer of 1877; is that according to your recollection?

Ans. Yes, sir.

Q. 17. How do you go from the river road to the Bell & Zimmerman land?

Ans. By the public road across the mountain.

Q. 18. About how far is it from the bone-mill to where the public road turns off from the river road to go up to the Bell & Zimmerman land?

Ans. About two miles or a little more than that.

Q. 19. Did you do any work on the Bell & Zimmerman land, testing for your father, before he and his partners took their lease; and, if so, what was it?

Ans. It appears to me I did work a couple of days.

Q. 20. Did any of the work done on the Bell & Zimmerman land attract attention around that part of the country; and, if so, what part of the work attracted attention?

Ans. The tunnel part attracted the big attention of the people—more so than any other.

Recess for dinner, until half past two o'clock, P. M.

NOVEMBER 24th, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Q. 21. Who worked with you in the summer of 1877 on the Kirby lot?

Ans. Lawrence Baker and Jacob Weaver. I know they did, but whether Metz did I can't remember right.

Cross-examined by Mr. Hill.

Cross-Q. 22. If I understand you, you worked two days on the mountain before your father and his associates took the lease from Bell & Zimmerman; am I correct?

Ans. I believe that question was asked me this morning, and I misunderstood the question then. I said two days, but I worked two days at the tunnel before he got the lease, but I had done considerable work before that in the two shafts that were run.

Cross-Q. 23. Do you refer to the tunnel which you have testified was about two hundred and fifty feet long?

Ans. Yes, sir.

Cross-Q. 24. How far was that tunnel from the foot of the mountain?

Ans. A good quarter of a mile.

Cross-Q. 25. How far was it from the top of the mountain?

Ans. Not very much further.

Cross-Q. 26. You worked on Kirby's land also, did you?

Ans. Yes, sir.

Cross-Q. 27. What did you do there?

Ans. I shafted for coal.

Cross-Q. 28. How far was that shaft from the top of the mountain?

Ans. I would say between two and three hundred feet.

Cross-Q. 29. Was the distance from that shaft to the top of the mountain greater or less than the distance from the Bell & Zimmerman tunnel to the top of the mountain?

Ans. About the same.

Cross-Q. 30. That mountain is forty or fifty miles long, is it not?

Ans. It is a long range of mountains. I can't tell the distance. I never went the whole length.

Cross-Q. 31. How high is the mountain in that locality, to the best of your judgment?

Ans. That I can't answer. The mountains along there are all about the same height, but I never heard the height mentioned.

Cross-Q. 32. It is one of the Blue Ridge range, is it not?

Ans. Yes, sir.

Re-direct by Mr. Smith:

Q. Q. 33. How much work was done on the tunnel that you have referred to before the lease was made?

Ans. A couple of days' work on the tunnel.

Re-cross by Mr. Hill:

Re-cross-Q. 34. How long before the lease was made was that couple of days' work done?

Ans. Inside of a week, as near as I can tell.

Re-cross-Q. 35. Were you present when the lease was made?

Ans. No, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 24th day of November, 1882.

FRED. M. OTT,
Examiner.

SAMUEL A. FOOSE.

J. C. ZIMMERMAN *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

Q. 1. State your age, residence, and occupation.

Ans. I am thirty-one years of age, reside at Marysville, Perry county, Pennsylvania; I am a miller by trade, but have been working at railroading for the last six or eight years.

Q. 2. Where did you commence learning your trade?

Ans. I commenced learning my trade with L. C. Steinberger, at Bridgeport, about a mile from Landisburg, Perry county.

Q. 3. Did your father live there or near there?

Ans. Yes, sir; my father lived about a mile and a quarter from Landisburg.

Q. 4. How long did you work with Mr. Steinberger at that place, and where did you go next?

Ans. About a year, as near as I can recollect; and from there he moved to Cumberland county, to Eberly's Mills.

Q. 5. Did you go with him to Eberly's Mills, and work with him there?

Ans. Yes, sir.

Q. 6. How long did you stay there before going to another place?

Ans. About six or eight months, more or less; I can't just remember it exactly.

Q. 7. While you were there at that time did you become acquainted with George W. Kissinger and his family?

Ans. Yes, sir.

Q. 8. Where did you go to live from that place, and what did you do?

Ans. I went to New Cumberland, and I worked for Zacharias & Co., in a grist-mill or merchant mill.

Q. 9. Do you remember how long you remained there, or what time you left?

Ans. I was there about six months as near as I can remember.

Q. 10. Where did you go from there, and what did you do?

Ans. I went back to Perry county then, home; I worked on my grandfather's farm.

Q. 11. How long did you remain there, and where did you go next?

Ans. I can hardly answer that question; I don't remember how long I was at home that time; I can tell you where I went next, though; I went back to Cumberland county then, to Hurst's mill, on the Yellow Breeches creek, about a mile above Eberly's Mills.

Q. 12. What did you do there, and with whom did you work?

Ans. I worked in the grist-mill for Jonathan Nicholas.

Q. 13. How long did you work for him?

Ans. About a year.

Q. 14. Had you, during the time after you left Eberly's mills until

you lived at Hurst's mill, kept up your acquaintance with Mr. Kissinger's family, and visited there from time to time?

Ans. Yes, sir.

Q. 15. Did you afterwards marry one of Mr. Kissinger's daughters?

Ans. Yes, sir.

Q. 16. When was that?

Ans. July the fourteenth, 1873.

Q. 17. Where were you living at that time?

Ans. I was living with my uncle then, within about two miles of Landisburg, Perry county.

Q. 18. Did you go to live with him directly from Hurst's?

Ans. No, sir.

Q. 19. Where did you go, and what did you do when you went away from Hurst's mill?

Ans. I went home to my grandfather's and worked on the farm part of the time; I had that for my home, and when I was there I worked when they had work.

Q. 20. Had you lived at any other place except your grandfather's and your uncle's after you left Hurst's mill, before you were married?

Ans. Yes, sir.

Q. 21. At what place or places, and what did you do?

Ans. I worked one month at Duncannon in a grist-mill.

Q. 22. When you were married where did you go with your wife?

Ans. To my uncle's.

Q. 23. How long did you and she remain there, and where next did you or either of you, go?

Ans. We were there together about a month and then she went home to her parents.

Q. 24. Did you after that go to her father's and stay with her at Eberly's Mills, and if so, when was it and for how long a time? or did you visit her, while she remained there, frequently?

Ans. Yes, sir; I visited her, but didn't go there to live.

Q. 25. How long did she remain there and when did you go to keeping house, and where?

Ans. She remained there until the spring of 1874; we then went to keeping house in Perry county about two miles from Landisburg.

Q. 26. Did you know of Mr. Kissinger's leaving that place, Eberly's Mills, if so, when was it and where did he go?

Ans. He left in the spring of 1874 and went to Marysville, Perry county.

Q. 27. What was his business at Eberly's Mills while you knew him there?

Ans. He kept store.

Q. 28. Have you ever lived at Eberly's Mills or been there since Mr. Kissinger moved away in the spring of 1874?

Ans. I was there once.

Q. 29. When was that?

Ans. I hardly remember whether it was in 1875 or 1876.

Q. 30. At the time when you first lived at Eberly's Mills did you know Mr. Daniel Drawbaugh?

Ans. I got acquainted with him shortly after I went there.

Q. 31. Did your acquaintance with him continue during the time that Mr. Kissinger lived there, more or less?

Ans. Yes, sir.

Q. 32. Where and how frequently and in what places were you accustomed to see him?

Ans. I saw him there at Eberly's Mills going backwards and forwards from the shop most every day.

Q. 33. Were you ever at his shop, and if so, how often?

Ans. I was at his shop, but can't remember how frequently.

Q. 34. Were you there frequently or only a few times?

Ans. Only a few times.

Q. 35. Do you remember what business was being carried on while you were there, or what Mr. Drawbaugh was at work upon?

Ans. I remember some of the things that he was at work upon.

Q. 36. Will you state, if you remember, what you have seen him at work upon or what you have seen about his shop?

Ans. I saw an electric clock, a weather-guage, a nail-machine, a force-pump and his tools and machinery that belonged to the shop.

Q. 37. Was his electric clock a single clock, or were there two clocks connected.

Ans. There were two clocks connected.

Q. 38. Do you remember the general appearance of those clocks and in what way they were connected

Ans. The one was one of those old fashioned high clocks; the other was an eight-square clock; they were connected by electricity, but I don't remember how; the one run the other.

Q. 39. Did you see any machines for talking, or that Mr. Drawbaugh said were for talking, or hear Mr. Drawbaugh say anything about such machines?

Ans. Not to the best of my knowledge.

Q. 40. When Mr. Kissinger moved to Marysville, what business did he engage in?

Ans. Farming.

Q. 41. Who owned the farm?

Ans. Mr. Draper.

Q. 42. How long did you continue to live near Landisburg, and what were you doing while there? I mean after you went to keeping house.

Ans. I lived there at Landisburg until the fall of 1875; I worked on a farm part of the time, and part of the time I worked in a mill for William J. Graham.

Q. 43. When did you quit working at the mill, and when did you break up housekeeping?

Ans. I quit the mill about the first of November, 1875, as near as I can tell; I did not break up housekeeping.

Q. 44. Did you and your wife move away from the place where you commenced housekeeping, and if so, where did you both go?

Ans. We moved from where we commenced keeping house to the mill in the spring of 1875, and kept house at the mill.

Q. 45. What did you do after Nov., 1875, when, as I understand, you left Graham's mill?

Ans. I moved my family to Marysville; I rented two rooms from Mr. Kissinger in his house; I went back to W. W. Snyder's, and run his mill, within a mile of Landisburg.

Q. 46. How long did you run his mill?

Ans. I run his mill from the 16th of November, 1875, till January 26, 1876.

Q. 47. How long did you stay with your family when you moved them to Marysville?

Ans. About a week or ten days, more or less.

Q. 48. Have you any memorandum showing when you went to Snyder's to work, and when you left? If so, state what the memorandum is, and in what it is kept.

Ans. Yes, sir; here is my book showing when I went to work: "J. C. Zimmerman commenced working for W. W. Snyder, November 16th, at twelve dollars per month;" I have not got the entry when I left. The

last entry is, "27, by cash in full $10.69." The month is not written, but "27" is preceded by two dots, and higher up on the page is the word "December."

Q. 49. When did you commence keeping this book?

Ans. In the spring of 1874.

Q. 50. The entries which you have referred to do not, I believe, show the year in which they were made. Have you consulted Mr. Snyder's books to see what they contained? If so, will you state what you found.

[*Objected to by Mr. Hill, as incompetent and secondary.*]

Ans. Yes, sir; they contained the following: "Commenced November 16th, 1875, and quit January 26th, 1876."

Q. 51. Where did you go to reside when you left Mr. Snyder's?

Ans. I went to Marysville to my family.

Q. 52. Where have you lived since then?

Ans. I have lived at Marysville since then with the exception of about eight months; I have had my family there though all the time.

Q. 53. What houses have you lived in at Marysville?

Ans. I only have lived in the two houses at Marysville, the one Mr. Kissinger lived in and the one that I am living in at present.

Q. 54. How long did you live in Mr. Kissinger's house—till when?

Ans. Till the spring of 1880, as near as I can tell

Q. 55. Did you live there until he moved away from Marysville?

Ans. Yes, sir; I moved the day before he did.

Q. 56. You say you were away from Marysville eight months; when was that, and where did you go to?

Ans. That was last year, (1881.) I went to Iowa.

Q. 57. When you came down to live at Marysville early in 1876, whom did you go to work for?

Ans. I worked for the Pennsylvania Railroad Company.

Q. 58. Have you worked much for that company since then?

Ans. I worked on it till the fourteenth of June, 1881, off and on, that is.

Q. 59. What part of the road was your work on; what kind of work did you do?

Ans. I worked on track repairs. The two first years I worked in the floating-gang. We worked from Harrisburg to Newport, above Marysville. After that, I worked on section No. 4, at Mayrsville.

Q. 60. While you worked in the floating-gang, did you ever know of an opening for a coal mine in the Cove mountain, above Marysville?

Ans. Yes, sir.

Q. 61. Did you ever go to see it; and if so, when, and under what circumstances, and who went with you?

Ans. I was up in the after part of the summer of 1877. My wife and I walked up.

Q. 62. What sort of an opening did you find there.

Ans. They had a pretty good sized hole dug down, and there was an off-set in it, so that you couldn't see how deep it was.

Q. 63. Do you remember any circumstance that happened during that visit?

Ans. Yes, sir; my hat blowed down into it.

Q. 64. Did you get your hat out again?

Ans. No, sir.

Q. 65. Did you ever see it again?

Ans. Yes, sir; I did.

Q. 66. On whose head?

Ans. On Jacob Weaver's—a man who worked in the mine.

Q. 67. Had you ever worked with Weaver before he worked in the mine?

Ans. Yes, sir; I worked with him that same spring.

Q. 68. Whom did you and he work for that spring?

Ans. Mr. Galt; peeling bark.

Q. 69. If you have any entry in the memorandum-book that shows when you peeled bark for Mr. Galt, that spring, will you please refer to it, and tell us what dates it gives for the time you worked for him?

Ans. Here it is.

(The account produced covers a page and a half, and contains a charge for each day's work, as "peeling bark," "unloading bark," etc.

The first entry is April 23, 1877; the last is June 21, 1877.)

Q. 70. Do you think it was mentioned at home to the Kissinger family, that you had gone up there to see the opening, and had lost your hat?

(*Objected to by Mr. Hill, as leading, and calling for mere opinion; if the witness remembers mentioning, he should be asked to state his memory, and not what he thinks he may have done.*)

Ans. It was.

Q. 71. How near to the old bone-mill was the opening you went to

that day, and whereabouts was it situated with reference to the bone-mill?

Ans. It is near about opposite the bone-mill, near the top of the mountain, within about two hundred yards, I think, of the top of the mountain.

Q. 72. Did you know at the time who made that opening, or what men had worked sinking that shaft?

Ans. Mr. Foose was the manager; he had a man by the name of Lawrence Baker and Jacob Weaver—them two I know.

Q. 73. Did Jacob Weaver work with you all the time that you worked for Galt that spring?

Ans. No, sir; he didn't.

Q. 74. Which of you stopped working for Galt first?

Ans. Weaver.

Adjourned until November 25th, 1882, at 9.30, A. M.

NOVEMBER 25, 1882, 9.30, A. M.

Examination resumed pursuant to adjournment; present, same counsel.

Examination of J. C. Zimmerman, by Mr. Storrow, continued.

Q. 75. Will you name any other man who worked with you, for Galt, peeling bark, in the spring of 1877?

Ans. Yes, sir; there was Lawrence Baker, Peter Heisly, and Metz—I don't know his first name.

Q. 76. Did those three men stop working for Galt before you did or after you did?

Ans. Before I did.

Q. 77. You have spoken of a coal mine opening in the Cove mountain right up the mountain from the fertilizer-mill, which you say you went to in the spring of 1877, and where you say you lost your hat; was that visit in hot weather, or in cold weather, and what sort of a hat was it?

Ans. Hot weather; it was a straw hat.

Q. 78. Did you ever go to any other coal mine opening on Cove mountain?

Ans. No, sir.

Q. 79. Did you, at that time, know of any other coal mine opening on Cove mountain?

Ans. No, sir.

Q. 80. You have testified that you left Snyder's mill, near Landisburg, and came down to live at Marysville, January 27, 1876; how soon after that did you go to work for the Pennsylvania Railroad Company?

Ans. About a week or two afterwards.

Q. 81. What gang did you hire into first?

Ans. I hired to Alfred King's gang, and the gang being full I was transferred to Chambers' gang.

Q. 82. Were you afterwards re-transferred to King's gang, and if so, how soon?

Ans. I was, about a month afterwards, as near as I can tell.

Q. 83. Has Mr. Alfred King got a brother living at Marysville?

Ans. Yes, sir; George King, supervisor of the division of the Pennsylvania railroad between Harrisburg and Newport. He was supervisor at the time I moved there.

(Certificate of Mr. King, put in evidence as follows:

"PENNSYLVANIA RAILROAD COMPANY,

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I hereby certify, J. C. Zimmerman was employed by P. R. R. Co. in Floating Gang 4, during month of February and March, 1876, commencing Feb'y 2nd.

I know this man personally.

G. W. KING,
Supervisor."

[*Certificate objected to by Mr. Hill as incompetent.*])

Q. 84. Did Mr. Draper, the owner of Mr. Kissinger's farm, stay at Mr. Kissinger's during the few days while you were there in November, 1875, and before you went to work for Snyder?

Ans. He wasn't there.

Q. 85. Do you remember the fact of Mr. Drawbaugh's putting in a ram at Mr. Kissinger's while you lived there?

Ans. Yes, sir.

Q. 86. It appears from the books and papers put in evidence in the deposition of Mr. George W. Kissinger—

(*Mr. Hill objects to the memory of the witness being refreshed, or his testimony being directed, by any reference to the previous testimony as to dates.*)

—complaintant's testimony, pages 554 and 555, that some pipe for Mr. George Kissinger came to Marysville by railroad, and that it was receipted for by "J. C. Zimmerman;" are you the J. C. Zimmerman who receipted for it?

Ans. Yes, sir.

Q. 87. Did you receive that pipe, and what did you do with it?

Ans. Yes, sir; and I hauled it home to Mr. Draper's farm for Kissinger, for the ram.

Q. 88. What was that pipe afterwards used for?

Ans. It was used for the water-pipe for the ram.

Q. 89. Do you remember of Mr. Kissinger and Mr. Draper going over from Marysville to Mr. Drawbaugh's shop to see about getting a ram for the farm?

Ans. Yes, sir.

Q. 90. Did you know of their visit at the time that they made it, and if so tell me how you know about it, and what you know of it?

Ans. I knew that they were over and ordered a ram; I heard the family talking that that was where they went to.

[*Objected to by Mr. Hill as hearsay.*]

I can make it stronger than that; I heard the old gentleman, Mr. Kissinger, tell about it after he got back.

[*Objected to by Mr. Hill as hearsay.*]

Q. 91. How soon after he got back did you hear him tell of it?

[*Same objection.*]

Ans. That evening.

Q. 92. Where was Mr. Draper staying at that time?

Ans. At Mr. Kissinger's.

Q. 93. Tell me as near as you can when it was that this visit of Mr. Draper and Mr. Kissinger to Drawbaugh to see about the ram took place.

Ans. In the fall of 1877.

Q. 94. Was this visit before the time when you lost your hat in the mine-opening, or after you lost your hat?

Ans. After I had lost my hat.

Q. 95. Do you remember whether or not logs were bored for that ram?

Ans. There was.

Q. 96. Do you remember whether or not John Kissinger helped to bore those logs?

Ans. He did.

Q. 97. Do you remember whether or not Mr. Drawbaugh came over to put in that ram?

Ans. Yes, sir; he did.

Q. 98. If you saw him at Mr. Kissinger's when he came over to put in the ram, please state when you saw him there on that work and any circumstances which enable you to fix the date.

Ans. He came there on the fourth of November, 1878, the day before the election; I had went to Harrisburg, me and my wife, and when we came home Mr. Drawbaugh was there; that was on Monday, the fourth of November; on Tuesday was the election, the fifth of November. My wife and I started away on a visit to my folks, within a mile of Landisburg; we were away about one week. When we came home the ram was up and running. Mr. Drawbaugh was gone and Mr. Draper and his daughter were there.

Q. 99. What part of the day was it when you and your wife started for Landisburg on that visit?

Ans. It was in the morning. I voted before I started.

Q. 100. When you worked in the mill at Eberly's mills in 1871, whom did you board with?

Ans. L. C. Steinberger.

Q. 101. After you moved away from Eberly's mills did you ever work for Steinberger, and if so, when and where?

Ans. In 1874 I worked for him off and on a few days and sometimes a week, at Bridgeport, Perry county, within a mile of Landisburg, at milling.

Q. 102. Was he running a mill up there then?

Ans. Yes, sir.

Q. 103. Did he ever mention to you anything about Mr. Drawbaugh's having a talking machine?

Ans. No, sir.

Q. 104. You have testified that you went to live at Eberly's mills about February, 1871, and married Mr. Kissinger's daughter at Eberly's mills in July, 1873; how soon after you first went to Eberly's mills did you begin to be attentive to Miss Kissinger?

Ans. About a month, more or less.

Q. 105. While you worked at Zacharias' mill at New Cumberland, and at Hurst's mill on the Yellow Breeches, where did you get your mail?

Ans. When I worked at New Cumberland I got it at New Cumberland, and when I worked at Hurst's mill I got it at Eberly's Mills.

Q. 106. Whereabouts in Eberly's Mills was the post-office at that time?

Ans. At Mr. Kissinger's store.

Q. 107. Was Hurst's mill the mill which was afterwards known as Hake's mill, with a distillery near it?

Ans. Yes, sir.

Q. 108. While you lived in that neighborhood did they use to have gatherings of the neighbors at Mr. Kissinger's store Saturday nights, and were you in the habit of going there then?

Ans. Yes, sir; I used to go there.

Q. 109. Was it the habit at those gatherings to talk over and gossip pretty freely about what was going on in the neighborhood?

Ans. It was.

[*Objected to by Mr. Hill as incompetent.*]

Q. 110. Could it have been known or talked about in the village that Mr. Drawbaugh had a talking machine, by which a person could talk from one place to another and be understood, and you not heard of it during the years that you lived at Eberly's Mills?

[*Objected to by Mr. Hill, as leading, argumentative, incompetent, and calling for mere opinion.*]

Ans. No, sir.

Q. 111. If you had known or heard of such a thing would you or would you not have remembered it?

[*Same objections.*]

Ans. I would have remembered something about it.

Q. 112. Has Mr. Drawbaugh been to you within a year or two and asked you whether you remembered anything about his having talking machines?

Ans. He was.

Q. 113. What did you tell him?

Ans. I told him I knowed nothing about it.

Q. 114. Had anybody been to you before that to ask you about talking machines?

Ans. No, sir.

Q. 115. Was anybody with Mr. Drawbaugh when he came?

Ans. There was.

Q. 116. Do you remember whether it was hot weather or cold weather when Mr. Drawbaugh came to you?

Ans. I don't remember.

Q. 117. I believe that there are now two railroad stations at Marysville, the old one of which is called Marysville, and the new one is about a mile towards Harrisburg, and is called "Haley's;" which of them is nearer to the Draper house, where Mr. Kissinger and you lived?

Ans. There ain't much difference in distance. Haley's would be the nearest by the road, but there is a path that goes to Draper's from Marysville.

Cross-examined by Mr. Hill.

Cross-Q. 118. What do you say was the date of your marriage?

Ans. I was married on the 14th of July, 1873.

Cross-Q. 119. Who performed the marriage ceremony?

Ans. Mr. Drawbaugh's brother, Squire John B. Drawbaugh.

Cross-Q. 120. Who was present at the wedding ceremony?

Ans. Hiram Drawbaugh, Abraham B. Shank, and my wife's mother, Mrs. Kissinger.

Cross-Q. 121. Have you any children? If so, what are their names and ages, respectively?

Ans. I have three children. Benjamin Edward, between nine and ten; Charles, about eight years old; Harry, three years old.

Cross-Q. 122. What is Harry's birthday?

Ans. I didn't bring my family record along. I can't tell you.

Cross-Q. 123. What was Charles' birthday?

Ans. I have forgotten.

Cross-Q. 124. What was Benjamin Edward's birthday?

Ans. July 10, 1873.

Cross-Q. 125. He was born four days before you were married, was he?

Ans. Yes, sir.

Cross-Q. 126. Abraham B. Shank was constable of Lower Allen township, was he not?

Ans. Yes, sir.

Cross-Q. 127. How happened he to be present at your wedding?

Ans. He had the pleasure of fetching me.

Cross-Q. 128. In his official capacity as constable?

Ans. Yes, sir.

Cross-Q. 129. Was the ceremony performed in your wife's bedroom?

Ans. Yes, sir.

Cross-Q. 130. Was she in her bed at the time?

Ans. Yes, sir.

Cross-Q. 131. Do you know John Comfort, who resides not far from Eberly's mills?

Ans. Yes, sir.

Cross-Q. 132. Have you ever talked with him about this case?

Ans. Yes, sir.

Cross-Q. 133. When first and on how many different occasions?

Ans. This last spring, just the once.

Cross-Q. 134. Where was that?

Ans. At Marysville.

Cross-Q. 135. At any house or building?

Ans. He came to the foreman of the Northern Central yard, at Marysville, and asked to leave him take me aside to talk to; that was the first time and last that I talked with him.

Cross-Q. 136. Did anybody come with him; if so, who?

Ans. Mr. Storrow.

Cross-Q. 137. Do you know Mr. Geib, the station agent at Marysville?

Ans. Yes, sir.

Cross-Q. 138. Did he and Mr. Comfort ever come to see you about this case?

Ans. No, sir.

Cross-Q. 139. How were you notified to come down here and testify?

Ans. Mr. Storrow notified me.

Cross-Q. 140. Did he send you money to pay your expenses down here?

Ans. Yes, sir.

Cross-Q. 141. When did you come here?

Ans. Thursday afternoon.

Cross-Q. 142. Did you talk over the case pretty thoroughly with complainants' counsel before taking the stand to testify?

Ans. He asked me some few questions.

Cross-Q. 143. Did you read or hear read the testimony of Mr. Kissinger and his sons in this case, or any part of it?

Ans. No, sir.

Cross-Q. 144. Did complainants' counsel tell you what it was or what any of it was?

Ans. No, sir.

Cross-Q. 145. Then you don't now know what the testimony of Mr. Kissinger and his sons was, do you?

Ans. No, sir; I don't know a word that they gave in.

Cross-Q. 146. Did they read over to you Mr. Draper's testimony in this case, or tell you what it was?

Ans. No, sir.

Cross-Q. 147. Then you don't now know what Mr. Draper testified to, do you?

Ans. Mr. Storrow told me when he came to see me, that Mr. Draper give in testimony that he had ordered the ram in 1873 or 1874.

Cross-Q. 148. Do you mean the time that Mr. Storrow and Mr. Comfort came to see you together?

Ans. No, sir.

Cross-Q. 149. How many times has Mr. Storrow been up to see you, and talk the matter over?

Ans. Mr. Storrow was up three times, with the time that Mr. Comfort was with him.

Cross-Q. 150. Give the dates of those three visits of Mr. Storrow to you?

Ans. I will give them as near as I can. Him and Mr. Comfort was there in the spring I can't just give the date, and then he was up about two months ago, as near as I can tell. It might have been more, or it might have been less. He came to my house one evening after dark, and then he was up on last Wednesday, and gave me my subpœna.

Cross-Q. 151. How near can you come to the date when Mr. Storrow and Mr. Comfort came to see you?

Ans. I can't give no date.

Cross-Q. 152. Can you come within a month or two months or three months of it?

Ans. It was along about April or June. Somewheres along there, between the first of April or last of June. I don't remember the date. I didn't expect I would have to go this far.

Cross-Q. 153. You say Mr. Storrow came to see you about two months ago, it might have been more, it might have been less; how much more or how much less might it have been?

Ans. I can't give the exact date.

Cross Q. 154. Might it have been two months more or two months less?

Ans. I couldn't say.

Cross-Q. 155. Did Mr. Storrow tell you where he was at work, or what he was doing at that time; and, if so, was he taking testimony in this case at Harrisburg?

Ans. Mr. Storrow told me that he was at Boston. He didn't say what he was doing.

Cross-Q. 156. Did you ever talk over any of these matters you have testified to with your father-in-law, Mr. Kissinger, or any of his sons?

Ans. I never did with the old gentleman. The boys and I talked over some little things.

Cross-Q. 157. Which of the boys, and when, and how many times?

Ans. Frank, Cyrus, and John Kissinger. I can't give the dates. It was this last summer, though, that we talked over it. I couldn't tell you how many times.

Cross-Q. 158. Where is John now?

Ans. In Chicago.

Cross-Q. 159. Did you know of his coming on to testify in this case this last summer?

Ans. Mr. Comfort told me, when he was to see me, he thought they would fetch him in.

Cross-Q. 160. Did you talk it over with John while he was on to testify?

Ans. No, sir. I asked him some few questions, but he would not tell me.

Cross-Q. 161. Why wouldn't he tell you?

Ans. He told me if I would wait awhile, I would get a chance to find out myself, without him telling me.

Cross-Q. 162. Was that before or after he testified in the case?

Ans. After.

Cross-Q. 163. How long after?

Ans. About two or three days.

Cross-Q. 164. When did you talk it over with Cyrus?

Ans. Cyrus and I has talked it over several times this summer. We talked it over about two or three weeks ago.

Cross-Q. 165. Frank's full name is George Franklin Kissinger, is it not?

Ans. Yes. George F., we generally write it.

Cross-Q. 166. When did you talk it over with George F., and how many times?

Ans. I can't give the number of times. We talked it over, though, this summer.

Cross-Q. 167. Where is he at work now?

Ans. He is working at Rockville, Dauphin county; but he boards with his brother, Cyrus, at Marysville, Perry county, Pennsylvania.

Cross-Q. 168. How long has he been boarding with his brother, Cyrus, in Marysville?

Ans. About four months, as near as I can give it.

Cross-Q. 169. What is he doing at Rockville?

Ans. He is working on a new branch railroad that the Pennsylvania Company is building there; he is working as a laborer putting down track.

Cross-Q. 170. Have you seen him pretty often this summer and fall?

Ans. I seen him frequently, yes.

Cross-Q. 171. Have you talked over with him this fall anything relating to this case; if so, how many times?

Ans. I asked him, once, whether he ever saw anything about Mr. Drawbaugh's shop concerning a talking machine; he said, not that he remembered. I can't just give the number of times we have talked about this talking machine; when he would come to my house we would talk about it, sometimes; but I never kept no account of the number of times that we talked about it.

Cross Q. 172. Did you talk over the subject of the ram with him and the other boys, or anything relating to it?

Ans. Nothing more that I remember than that John said, when he was in, that he had helped to bore the wooden pipe for it before he went out to Chicago.

Cross-Q. 173. Did you talk over the subject of the coal mine, or anything relating to that, with the boys?

Ans. Not lately.

Cross-Q. 174. Have you within the last eight months?

Ans. No, sir.

Cross-Q. 175. You remember John's helping to bore the wooden pipe, do you?

Ans. Yes, sir.

Cross-Q. 176. Do you also remember that he helped bore that pipe before he went to Chicago?

Ans. Yes, sir.

Cross-Q. 177. How long did he help bore it before he first went to Chicago?

Ans. They hadn't more than finished the job—I couldn't say positively whether they were quite done—but they were working at it about the time when he went to Chicago.

Cross-Q. 178. Was he working for his father about that time; if so, how long had he been working for his father?

Ans. I can't give the exact time he was working for his father; he was working for him some, though, or had been working.

Cross-Q. 179. How long was the ram put in after he did that work on the boring?

Ans. The ram was put in commencing the fourth day of November, 1878.

Cross-Q. 180. Do you do any work on boring for the ram?

Ans. No, sir.

Cross-Q. 181. Who did work on it besides John?

Ans. I couldn't say; I remember that John worked on it and his father, but whether they had any strange men I could not say.

Cross-Q. 182. Do you remember that John came back from Chicago at one time and stayed five or six months about home?

Ans. Yes, sir.

Cross-Q. 183. The boring, if I understand you, was not done then, but before he *first* went; am I correct?

Ans. No, sir; it wasn't done before he went the first time, but before he went the second time.

Cross-Q. 184. If that statement is correct why did you testify in answer to Question 176, that you remembered that he helped bore that pipe before he went to Chicago?

Ans. He did help to bore that pipe before he went to Chicago *this last time;* I didn't make no dates when.

Cross-Q. 185. When you gave that 176th answer did you have distinctly in mind the two times of his going to Chicago?

Ans. No, sir; there was nothing said about the first time he went.

Cross-Q. 186. If there had been anything said about its being the first time, you would have noticed it, and answered correctly, would you?

Ans. If they would have asked me whether he helped to bore the pine before he went the first time, or before he went the last time, I would have said that it was before he went the last time.

Cross-Q. 187. As a matter of fact my 176th question to you was "Do you also remember that he helped bore that pipe before he first went to Chicago?" To which you answered: "Yes, sir," before the examiner wrote the question down. The examiner inadvertently omitted the word "first" in writing the question down; did you not hear me use the word "first," in that question, and did you not understand me to inquire whether he helped bore the pipe before he first went to Chicago, and did you not answer—"Yes, sir?"

Ans. If you did ask me whether he helped first, you hadn't asked me anything about the first time he went to Chicago, because I positively say that he helped to bore the pipe before he went the last time.

(Question repeated and answer required to the three interrogatories contained in it. Witness continues.)

I understood him to ask whether he bored the pipe before he *went* to Chicago; I didn't understand you to ask whether he helped bore the pipe before he first went to Chicago, because I knew that it was not before he went the first time; he didn't put the time in; he just asked me whether he helped bore the pipe first before he went to Chicago; he didn't ask me whether he helped to bore the pipe before he went the first time.

Cross-Q. 188. You heard the word "first" in the question then, did you?

Ans. Yes, sir; but if you had put the question to me properly I wouldn't have answered it "Yes, sir," but would have answered it "No, sir;" I aint positive whether he put that question to me or not; I have been asked a good many questions, but if I answered that question "Yes, sir," I didn't mean it, that is, if he put it the way he says he did.

Cross-Q. 189. I did put it the way I say I did, and I followed it with question 177, which was:—"How long did he help bore it before he first went to Chicago?" to which you answered:—"They hadn't more than finished the job," etc.; how do you reconcile that answer with your present statement?

Ans. I didn't understand it in that way.

Cross-Q. 190. When did John go to Chicago the first time?

Ans. I don't remember the date, nor the day, nor the month, nor the year.

Cross-Q. 191. In your 172d answer you say, that John told you this summer or fall that he helped to bore the wooden pipe before he went

out to Chicago; did he tell you that it was before he went out the second time?

Ans. Before he went out the second time.

Recess for dinner, until three, P. M.

Cross-Q. 192. Where did you vote in November, 1878?

Ans. At Marysville.

Cross-Q. 193. For whom did you vote?

Ans. I don't remember.

Cross-Q. 194. Don't you remember any of the persons for whom you voted at that election?

Ans. No, sir.

Cross-Q. 195. Did you vote for President?

Ans. I told you once I don't know who I voted for. I don't remember.

Cross-Q. 196. Don't remember whether it was a presidential election, State election, or borough election, do you?

Ans. It was no borough election. Borough election comes in the spring.

Cross-Q. 197. What precinct did you vote at?

Ans. Explain what you mean by precinct.

Cross-Q. 198. I mean at what particular voting place did you deposit your ballot?

Ans. At Shreiner's hotel, Marysville.

Cross-Q. 199. What officers received your vote, or were in charge of the ballot-box at the time?

Ans. I don't remember.

Cross-Q. 200. In how many different years did you ever vote at Marysville at presidential or State elections?

Ans. Three times, I think. I am not sure.

Cross-Q. 201. In what years were they?

Ans. I don't just remember.

Cross-Q. 202. Where were you living in November, 1876, and what were you doing?

Ans. In Marysville. I can't just tell you what I was doing in November.

Cross-Q. 203. Did you vote there November, 1876?

Ans. I don't remember whether I did, or whether I didn't.

Cross-Q. 204. What were you doing November, 1878?

Ans. Working for the Pennsylvania Railroad Company.

Cross-Q. 205. What were you doing for them?

Ans. Working on the track repairs.

Cross-Q. 206. In whose gang?

Ans. J. W. Beer's, division No. 4.

Cross-Q. 207. What were you doing November, 1874, and where were you living?

Ans. I lived within about two miles of Landisburg. I worked amongst the farmers at labor work.

Cross-Q. 209. What were you doing and where were you living in November, 1877?

Ans. I lived at Marysville, and worked for the Pennsylvania Railroad Company, on Division No. 4.

Cross-Q. 210. What were you doing and where were you living in November, 1875?

(Witness refers to his book.)

I wish to test your memory; please lay your book aside.

[*Mr. Smith instructs witness that he may refer to his book, after which witness refers to said book—a small pocket memorandum book which he had taken out of his coat pocket, and then continues:*]

Ans. About the first of November I moved my family to Marysville; I then went back within a mile of Landisburg, run a grist-mill for W. W. Snyder, from the 16th of November, 1875, till January 26, 1876. This is a memorandum I just wrote off from Mr. Snyder's books.

(Respondents' counsel asks leave to look at the book; witness shows it to him and he looks at it. Respondents' counsel then asks the examiner to certify an exact copy of the page in the memorandum book, to which page the witness refers.)

The page is as follows:

"Commense
Milling November
the 16th, 1875
And quit
January the 26, 1876.
Drawbaugh
Comenst to put the
Ram in
On the 4 of
November 1878."

[*Mr. Hill objects to any reference to this memorandum-book, because it is not original evidence; and objects to the witness' using it to refresh his memory, or fix dates; and to all testimony in connection with which the witness has used the book while testifying. Respondents' counsel turns over the leaves of the book, and examines the rest of it.*]

Cross-Q. 211. I find that more than half the leaves of your memorandum-book have been torn out; when was that done?

Ans. I have no dates. I tore them out as I needed the paper.

Cross-Q. 212. And on the page next before the one on which the above memorandum occurs there has been writing in pencil, which was afterwards erased; when was that done? When was that writing put there, and when was it erased, and why?

Ans. I put that there yesterday—wrote it, and rubbed it out. I didn't want it there. That was the reason I rubbed it out.

Cross-Q. 213. Why didn't you want it there?

Ans. I had no use for it.

Cross-Q. 214. Why did you put it there?

Ans. I was counting up my expenses in coming here; and, after I found it out, I rubbed it away.

Cross-Q. 215. Did it relate to your expenses in coming here?

Ans. Yes, sir.

Cross-Q. 216. Now, although the writing has been pretty carefully erased, yet there is enough of it remaining to read quite plainly as follows: "I went to Eberly's mills in the spring of 1871;" will you tell me what that has to do with your expenses in coming here?

Ans. I made a mistake in the place in the book.

[Book has not been shown witness from the time Mr. Hill first took it until after the last answer was made. Witness now looks at the book.]

Cross-Q. 217. The figures to which you now refer as your expense; memorandum are made on the stiff cover at the last end of the book, are they not?

Ans. Yes, sir.

Cross-Q. Why did you erase those words: "I went to Eberly's mills in the spring of 1871," and when?

Ans. I was going to write a memorandum of the time I went there till I left. Then I thought it wasn't necessary, and I rubbed it away yesterday.

Cross-Q. 219. And the other memoranda, on the next page, you thought were necessary, and so you left them stand, did you?

Ans. Yes, sir.

Cross-Q. 220. When did you put into the book the memoranda on the next page, a copy of which I have had entered on the record above?

Ans. On Thursday morning.

[*Mr. Hill repeats his objection to the book and its contents, and all testimony based upon it.*]

Cross-Q. 221. Do you say that Mr. Drawbaugh put in that ram himself?

Ans. He was the only one I seen, that is, stranger that came there.

Cross-Q. 222. Did you see him put in the ram?

Ans. I didn't just see him put it in, but he was getting ready to put it in when I left.

Cross-Q. 223. How do you know it was on the 4th day of November?

Ans. Because it was the day before election.

Cross-Q. 224. How do you know the election was on the 5th of November?

Ans. Because the election comes on the first Tuesday following the first Monday of November.

Cross-Q. 225. That does not indicate that it was on any particular day prior to the 7th day of November?

Ans. My calendar gives it on that day. I have the calendar of that year.

Cross-Q. 226. When did you examine the calendar, to see?

Ans. On Thursday morning before I started down here.

Cross-Q. 227. Had you ever examined it before, to see?

Ans. Yes, sir; once.

Cross-Q. 228. When was that?

Ans. I don't remember the date.

Cross-Q. 229. What time of day was it when Drawbaugh came up there to put in the ram?

Ans. I can't tell you just what time. Me and my wife went to Harrisburg. We came home in the afternoon and he was there.

Cross-Q. 230. He wasn't there before you went away in the morning, was he?

Ans. No, sir; he came some time through the day while we were away.

Cross-Q. 231. How long did he remain there after you got back home at night?

Ans. He was there on Tuesday morning.

Cross-Q. 232. Did he do any work on the ram on Tuesday morning?

Ans. Yes, sir; getting pipe ready.

Cross-Q. 233. Was the pipe put in Tuesday?

Ans. I don't know. Me and my wife started away on Tuesday and were away for a week, as near as I can tell. When we came home the ram was running.

Cross-Q. 234. Whom did you and your wife visit during that week that you were away?

Ans. My grandfather and mother and uncles and aunts.

Cross-Q. 235. Give their names and residences?

Ans. Benjamin Reiber and Mrs.; my uncle was Ely Dunkleberger, and Mrs.; Louis Sweger and Mrs. That's about all. My grandfather lived about two miles and a half east of Landisburg. Dunkleberger lived in part of the same house and farmed the place. Sweger lived at Bridgeport, a mile east of Landisburg.

Cross-Q. 236. Are they all living now?

Ans. They were living last week.

Cross-Q. 237. In the same places?

Ans. My grandfather lives at the old homestead yet; he bought a small place adjoining his, where Dunkleberger now lives and farms the place. Sweger sold his property at Bridgeport and bought a farm six miles east of Landisburg, at Shermansdale, and lives there.

Cross Q. 238. Did you take any of your children with you on that visit?

Ans. Two.

Cross-Q. 239. Which ones?

Ans. The two oldest.

Cross-Q. 240. Did yourself, your wife, and two children ever visit your grandfather at any other time except that?

Ans. That was the first time after we moved to Marysville.

Cross-Q. 241. Had you and your wife and those two children ever visited there together before you moved to Marysville?

Ans. Yes, sir; frequently.

Cross-Q. 242. Do you remember anything that took place at your grandfather's or aunt's or uncle's at that particular visit?

Ans. Nothing particular.

Cross-Q. 243. How did you go up there and how did you come back?

Ans. I rode up and I rode back.

Cross-Q. 244. With whose team?

Ans. Mr. Kissinger's beast and Mr. Couns' ambulance.

Cross-Q. 245. Who was Mr. Couns? Give his full, name please, and his business and present residence.

Ans. Mr. Couns is a farmer; he is now retired, and lives in Marysville, in the borough.

Cross-Q. 246. Was he living on his farm at the time you made that visit?

Ans. Yes, sir.

Cross-Q. 247. How long did he live on his farm after you made that visit?

Ans. He lived on his farm till last spring.

Cross-Q. 248. Have you ever, with your wife and those two children, visited your grandfather since that time?

Ans. No, sir.

Cross-Q. 249. Or visited any of the relatives whom you visited at that time?

Ans. No, sir.

Cross-Q. 250. Where were you living when Mr. Draper and Mr. Kissinger went together to Mr. Drawbaugh's shop to see about getting the ram?

Ans. In part of Mr. Kissinger's house on Draper's farm.

Cross-Q. 251. How long was Mr. Draper visiting there at Mr. Kissinger's at that time?

Ans. About a week or ten days, as near as I can tell.

Cross-Q. 252. Did you see him every day?

Ans. I can't just say whether I did, or not. He was there, though. That was his stopping place. I went to work early, and came home late. I didn't just run into the old folks' part to see whether he was there. I was in my own part of the house most of the time.

Cross-Q. 253. Had you ever seen Mr. Draper before?

Ans. No, sir.

Cross-Q. 254. Where were you working when Mr. Draper was there, when you returned home from your work every night?

Ans. For the Pennsylvania Company, on division No. 4, for J. W. Beers.

Cross-Q. 255. You say that that visit of Mr. Draper's was after you lost your hat, do you?

Ans. The visit of 1877. When he was there in the fall of 1877? (Mr. Hill asked the examiner to certify that while he was putting question No. 255, Mr. Smith remarked: "The witness hasn't testified to that yet." After which Mr. Hill added the last part of the question, "Do you!" The witness then answered as follows:) I don't know which visit of Mr. Draper you refer to. He made three visits.

Cross-Q. 256. Have I said anything to you about any visit except the one during which Mr. Draper and Mr. Kissinger went together to Drawbaugh's shop?

Ans. I don't just remember whether you did or whether you did not.

Cross-Q. 257. Well, I mean that visit. Did you lose your hat in the coal mine before that visit or after?

Ans. I lost my hat before he came up that time.

Cross-Q. 258. Now tell us exactly how you are able to fix that fact as the hat seems to have had no connection with Mr. Draper in any way.

Ans. Because it was in the summer time, and I wore a straw hat until I lost it. Mr. Draper came in the fall, after seeding time. If I remember right, seeding was done when he came there, and corn was away. I know it was in the fall, because the old gentleman had his corn put away already when he came there.

Cross-Q. 259. Did you talk with Draper about the hat?

Ans. No, sir.

Cross-Q. 260. Did you talk with Draper about the coal mine?

Ans. Not that I remember.

Cross-Q. 261. Do you remember having any conversation with Draper about the coal mine during that visit?

Ans. I heard him and Mr. Kissinger talking about it one evening as I passed through their room to my room; I don't know what particular conversation there was about it.

Cross-Q. 262. You didn't take part in the conversation then?

Ans. No, sir.

Adjourned until 9.30, A. M., November 27, 1882.

November 27, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Hill for respondents.

Cross-examination of J. C. Zimmerman, by Mr. Hill, continued.

Cross-Q. 263. When did you first become acquainted with Jacob Weaver, the man on whose head you saw your straw hat at one time?

(Witness refers to his account book.)

Ans. I became acquainted with him in the spring of 1877.

Cross-Q. 264. In answer 67 you say you had worked with Weaver before he worked in the mine—you had worked with him that same spring; how do you know that he had not worked in the mine before you worked with him that spring?

Ans. I wasn't acquainted with Weaver till the spring of 1877.

Cross-Q. 265. Then you don't know what he did before the spring of 1877?

Ans. No, sir.

Cross Q. 266. Where does he live now?

Ans. I don't know.

Cross-Q. 267. For whom did he work the last you knew of him, and where?

Ans. For Mr. Foose, at the coal mine.

Cross-Q. 268. When did you first become acquainted with Lawrence Baker?

Ans. In the spring of 1877.

Cross-Q. 269. Do you know where he resides now, and what he is doing?

Ans. No, sir.

Cross-Q. 270. When did you last know of him, where was he then, and what was he doing?

Ans. Working for Foose in the coal mine in 1877.

Cross-Q. 271. When did you first become acquinted with Peter Heisley?

Ans. In the spring of 1877.

Cross-Q. 272. Do you know where he is now, and what he is doing?

Ans. Yes, sir. He is carrying on a brickyard about four miles east of Marysville.

Cross-Q. 273. When did you first become acquainted with Metz, who worked with you for Galt in the spring of 1877?

Ans. I became acquainted with him that spring—1877.

Cross Q. 274. Where is he now, and what is he doing?

Ans. I don't now, sir.

Cross-Q. 275. Have you ever been up on Cove mountain since that visit when you lost your hat?

Ans. Yes, sir.

Cross-Q. 276. To the coal mine?

Ans. No, sir.

Cross-Q. 277. Were you ever up to the coal mine region before that visit when you lost your hat?

Ans. I never was up to the mine before. There is only one mine that I know of.

Cross-Q. 278. When you thought you saw your hat on Jacob Weaver's head, did you say anything to him about it?

Ans. No, sir; not at the present time. I didn't.

Cross-Q. 279. Did you ever say anything to him about it; if so, when first?

Ans. I don't just remember the date, but I talked to him and told him that he had got my hat—got the hat that was in the mine.

Cross-Q. 280. How long after you had lost your hat in the mine did you say that to Jacob Weaver?

Ans. I don't just remember. Three or four weeks or may be longer.

Cross-Q. 281. Did he have the hat on his head when you said that to him?

Ans. I think not. I think he wore a cap at that time.

Cross-Q. 282. Did you ever get the hat back from him?

Ans. No, sir.

Cross-Q. 283. What kind of a looking hat was that?

Ans. It was a straw hat with a black band on.

Cross-Q. 284. Is that the best description you can give of its appearance?

Ans. Yes, sir.

Cross-Q. 285. You say that Mr. Draper, the owner of the farm on which Mr. Kissinger lived, and his daughter, were at Mr. Kissinger's house when you returned from the visit to your grandfather and other relatives; how long did they remain there at Mr. Kissinger's on that visit?

Ans. About a week or ten days, more or less; I can't just remember the time.

Cross-Q. 286. What was the name of Mr. Draper's daughter, to whom you refer?

Ans. Jennie.

Cross-Q. 287. About how old was she at that time in your judgment?

Ans. About twenty or twenty-one.

Cross-Q. 288. Do you remember anything that took place during that visit while the Drapers were there?

Ans. Nothing particular.

Cross-Q. 289. Do you remember where they went, or who came there to see them?

Ans. They visited some of the neighbors there, Alfred Seidel and Fenn; I don't know Fenn's first name exactly; they generally call him Squire Fenn; they visited other neighbors, as they generally did when there.

Cross-Q. 290. Was Mr. Draper's daughter ever up there before or afterwards, to your knowledge?

Ans. No, sir.

Cross-Q. 291. Was Mrs. Draper ever up there with her husband? If so, when?

Ans. No, sir.

Cross-Q. 292. You have testified in substance in answer 98 that Mr. Drawbaugh put the ram in at Kissinger's place about the fifth of November, 1878; do you know who brought the ram up there from Mr. Drawbaugh's shop?

Ans. I did not state that he put the ram in on the fifth.

(Mr. Hill replies "I did not say *on* the fifth; I said *about* the fifth.") Oh! I misunderstood you; I ain't exactly sure, but it runs in my mind that Mr. Kissinger drove to Eberly's mills and fetched Mr. Drawbaugh and the ram up on the fourth of November, when I was at Harrisburg.

Cross-Q. 293. Had you ever seen the ram there at Mr. Kissinger's place before Mr. Drawbaugh came up to put it in at that time?

Ans. No, sir.

Cross-Q. 294. Are you confident that the ram was put in immediately after it was delivered to Mr. Kissinger?

Ans. To the best of my knowledge it was.

Cross-Q. 295. Can you swear that the ram was not there at Mr. Kissinger's a long time before it was put in and started to running?

Ans. I can swear that I never saw it there.

Cross-Q. 296. Could it have been there a long time without you seeing it?

Ans. Not handy.

Cross-Q. 297. Explain what you mean.

Ans. It couldn't have been there without I would have knowed something about it.

Cross Q. 298. Do you feel as confident of that as of anything else you have testified to in this case?

Ans. Yes, sir.

Cross-Q. 299. How long did it take to bore the wooden pipes for the ram?

Ans. I don't know how long they worked at it.

Cross-Q. 300. Were they several summers in boring those pipes?

Ans. No, sir.

Cross-Q. 301. Did they ever bore any other wooden pipes in Mr. Kissinger's place while you lived there, except the pipes for that ram?

Ans. No, sir.

Cross-Q. 302. Did they commence boring those wooden pipes prior to the summer of 1878?

Ans. I don't quite understand you.

(Question repeated by examiner.)

That is *before* 1878. I didn't understand what he meant. Do you mean *before*?

Cross-Q. 303. Yes, I mean before. Did they commence boring those wooden pipes before the summer of 1878?

Ans. Yes, sir.

Cross-Q. 304. When did they commence boring them?

Ans. I don't remember just the date when they commenced.

Cross-Q. 305. Did they commence boring them before the 1st of January, 1878?

Ans. Yes, sir; I think they did.

Cross-Q. 306. Did they commence boring them before you lost your hat in the coal mine?

Ans. No, sir.

Cross-Q. 307. Did they commence boring them before the 1st day of September, 1877?

Ans. I couldn't say.

Cross-Q. 308. Did they commence boring them before the 1st day of May, 1877?

Ans. No, sir.

Cross-Q. 309. Are you as confident of that as of anything else you have testified to in this case?

Ans. Yes, sir; if I mistake not, it was during the winter of 1877.

Cross-Q. 310. Do you mean the winter between the 1st of January, 1877, and the 1st of April, 1877, or before the 1st of January, 1877?

Ans. I said it was the year of 1877—that winter. The pipe was laid in 1878, then.

Cross-Q. 311. Then you mean the winter of 1877–8, do you, and not the winter of 1876–7?

Ans. I said 1877. They commenced to lay them on the 4th of November, 1878.

Cross-Q. 312. The year 1877 had two winters, one at its beginning, and one at its end; which of those winters do you mean?

Ans. I mean the winter at the end of 1877.

Cross-Q. 313. Are you sure that they did not commence boring any wooden pipe on Mr. Kissinger's farm before that winter at the end of 1877?

Ans. I am, sir; that was the only pipe that was bored there while I lived there.

Cross-Q. 314. Do you mean during all the time you lived there from the latter part of 1875 until the spring of 1880?

Ans. Yes, sir.

Cross-Q. 315. What was the size of that wooden pipe, and the size of the bore?

Ans. I couldn't say just what the size of it was.

Cross-Q. 316. Did you see the pipe and the auger?

Ans. Yes, sir.

Cross-Q. 317. Then give us your best recollection of the size of the pipe and the bore.

Ans. I don't know whether I can give you that.

Cross-Q. 318. Haven't you any best recollection about it?

Ans. I don't just remember now.

Cross-Q. 319. Give your best recollection of the length of the auger.

Ans. I didn't work with it. I seen the auger there, and paid no more attention to it, more than that it was there, and they used it.

Cross-Q. 320. Give your best recollection of the length of the wooden pipe sections—I mean the separate pieces of wood which were bored, and which were afterwards put together to form the pipe.

Ans. I didn't pay particular attention how long they were.

Cross-Q. 321. Haven't you any best recollection on the subject?

Ans. About twelve or thirteen feet, as near as I can tell.

Cross-Q. 322. Did you examine the ram and pipe after they were put down?

Ans. No, sir. They were all filled in when I came long, but a little of the iron piping. I went to see the ram work.

Cross-Q. 323. What were they filled in with?

Ans. With ground that was dug out of the trenches.

Cross-Q. 324. Filled in from the house down to the ram?

Ans. It was filled in from the spring to the ram, and part of it from the ram to the house.

Cross-Q. 325. You mean that the pipe was filled in, or covered up with earth, from the spring down to the ram, and part way from the ram up to the house, do you?

Ans. I mean that it was covered up from the spring to the ram, and part of the trench was filled from the ram to the house. I don't know whether it was clear full, or not—the trench. There was some trouble with the pipe.

Cross-Q. 326. What was that trouble?

Ans. After they had the ram up, they started it, and they had left the water—didn't take the water out of the pipe—and it froze during the night, and busted one of the pipes. The pipe wasn't covered, the reason that it froze—or wasn't covered thick enough, I don't remember exactly how it was. I remember of helping to fill up the balance of the trench of the iron pipe; that is, from the ram to the house.

Cross-Q. 327. Did the iron pipe extend from the ram to the house?

Ans. Yes, sir.

Cross-Q. 328. Where was the wooden pipe put in—between the spring and the ram?

Ans. Yes, sir.

Cross-Q. 329. Was there any iron pipe between the spring and the ram—I mean in the pipe that carried the water from the spring to the ram?

Ans. I think there was one or two pieces, more or less.

Cross-Q. 330. How far was the ram from the spring?

Ans. About a hundred yards, as near as I can tell.

Cross-Q. 331. How far was the ram from the house?

Ans. About a hundred and fifty yards, more or less. I don't just remember.

Cross-Q. 332. Is the ram there yet in the same place?

Ans. Yes, sir.

Cross-Q. 333. How long were the sections of iron piping that were used there?

Ans. About twelve or thirteen feet, as near as I can tell.

Cross-Q. 334. Where did the pipe burst; between the spring and the ram, or between the ram and the house?

Ans. I understood Mr. Kissinger that it was between the ram and the house.

Cross-Q. 335. When it was discovered that the pipe had burst, what was done about it?

Ans. He unjointed it, and took it down to the Northern Central railroad shop, and got it soldered.

Cross-Q. 336. Who took it down to the Northern Central railroad shop to get it soldered?

Ans. Mr. Kissinger.

Cross-Q. 337. Who carried it back, after it was soldered?

Ans. He did.

Cross-Q. 338. Do you know who soldered it there at the railroad shop?

Ans. There was a neighbor of mine, who lives alongside of me, told me about a week ago that he soldered pipe for him when he put the ram in. I don't know whether that was the pipe, or not.

Cross-Q. 339. Name the neighbor.

Ans. James Nesbit.

Cross-Q. 340. Where did he tell you that—at his house or yours?

Ans. At my woodpile.

Cross-Q. 341. How came he to tell you—who started the subject, you or he?

Ans. He commenced it.

Cross-Q. 342. Are you sure of that?

Ans. Yes, sir.

Cross-Q. 343. Did you ever take any of that iron pipe from Kissinger's place to get it mended?

Ans. No, sir.

Cross-Q. 344. After that first bursting was there ever any trouble afterwards with the pipes bursting or leaking?

Ans. Not that I remember.

Cross-Q. 345. Is the wooden pipe still down there doing duty in connection with the ram?

Ans. It is still in yet.

Cross-Q. 346. Has none of that wooden nor iron pipe ever been taken up and new pipe substituted for it since it was first down?

Ans. Not that I know of.

Cross-Q. 347. If such a thing had been done before Mr. Kissinger moved away from the farm, would you have known it?

Ans. I think I would.

Cross-Q. 348. Is your wife still living?

Ans. Yes, sir.

Cross-Q. 349. Was she in a position to know as much about the history of that ram as you were?

Ans. I think so; she was there every day except when her and I was away, when they put it in.

Cross-Q. 350. Have you ever talked the history of it over with her?

Ans. Nothing more than when the time was that they commenced to work at it.

Cross-Q. 351. How many times have you talked on that subject with her?

Ans. Once or twice.

Cross-Q. 352. When last?

Ans. About two weeks ago, or a little longer.

Cross-Q. 353. Was this suit ever mentioned between you and her in that connection?

Ans. It was.

Cross-Q. 354. Did you forbid her to give any information to the parties whom I here represent?

Ans. No, sir; he was there in the house talking to both of us.

Cross-Q. 355. Who was there?

Ans. Mr. Daniel Drawbaugh.

Cross-Q. 356. When, and who was with him?

Ans. It was in the fall of 1880, as near as I can remember; he mentioned the name of the person who was with him, who didn't come in; I don't remember whether he said he was outside or was in the town, but some person was with him, and he was in a hurry; I don't remember the name.

Cross-Q. 357. That was before you had talked with anybody representing the Bell Telephone Company, was it not?

Ans. Yes, sir.

Cross-Q. 358. In that conversation with Drawbaugh was the ram mentioned, or only the telephone?

Ans. Only the telephone, if I remember right.

Cross Q. 359. Now, referring to the ram, and the history of its being prepared for, put in, or operated, have you ever up to the present moment told your wife not to give any information about it? If so, when and why?

Ans. I have not.

Cross-Q. 360. Have you ever told her that in substance?

Ans. I never said anything to her about it, whether she should, or whether she shouldn't.

Cross-Q. 361. Have you ever directed or advised her not to answer questions about it, if anyone called to ask them?

Ans. I have not.

Cross-Q. 362. At the time when the ram was first put down, do you remember anything about any part of the ram or pipe being covered with straw?

Ans. They used straw and corn fodder to cover the ram part; and, I think, they used some on some of the pipe, before it was all covered up with dirt.

Cross-Q. 363. How long was the iron pipe there at Kissinger's place before the ram was put in?

Ans. About a week or ten days, as near as I can tell; it might have been two weeks.

Cross-Q. 364. Was that iron pipe which you hauled up from the railroad station as you have testified, all the iron pipe that was used in connection with that ram on that farm?

Ans. I don't know whether Mr. Drawbaugh fetched any with him with the ram or not.

Cross-Q. 365. If Mr. Drawbaugh did not fetch any with him with the ram, then was it all?

Ans. It was, as far as I know.

Cross-Q. 366. Where were you and what were you doing in the summer of 1876?

Ans. I worked for the Pennsylvania Railroad Company.

Cross-Q. 367. In what gang?

Ans. If I remember right I worked in the "floating-gang" that year.

Cross-Q. 368. Did you live at Mr. Kissinger's house on the farm that summer?

Ans. Yes, sir.

Cross-Q. 369. Did you get your meals at home?

Ans. Breakfast and supper I ate at home and my dinner I took with me.

Cross-Q. 370. At what hour were you accustomed to leave home in the morning for your work, and to return at night?

Ans. I left in the morning between five and six and would go home about six o'clock in the evening.

Cross-Q. 371. Do you remember of Mr. Kissinger's ever going down to Mr. Drawbaugh's shop at any time after the visit which he and Mr. Draper made there together?

Ans. I don't.

Cross-Q. 372. Don't you recollect of his ever going down there to hurry up the ram?

Ans. I don't; he might have been down, but I don't remember.

(Recess for lunch until 2, P. M.)

NOVEMBER 27, 1882.

Examination resumed pursuant to adjournment.

Present, Mr. Smith for complainants and Mr. Hill and Mr. Jacobs for respondents:

Cross-examination of J. C. Zimmerman, by Mr. Hill, continued.

Cross-Q. 373. Referring to the ram which was put in on Mr. Kissinger's farm; how long was the trench dug before the ram was put in?

Ans. I don't just remember; it wasn't very long, though.

Cross-Q. 374. Was it a month?

Ans. No, sir.

Cross-Q. 375. Was the pipe laid before or after the ram was put in?

Ans. I don't know, sir; they put it in the week I was away—me and my wife—the ram and the pipe.

Cross-Q. 376. Did they put in all the pipe that week?

Ans. Yes, sir; the ram was running when I came home.

Cross-Q. 377. I mean, didn't they put in any of the pipe before that week—iron or wooden pipe?

Ans. No, sir.

Cross-Q. 378. Then there was no pipe in at all before Drawbaugh came there on the 4th of November, was there?

Ans. There was not.

Cross-Q. 379. How long was it after the ram was put in before the pipe froze and burst?

Ans. I don't remember how many days it was.

Cross-Q. 380. Give us your best recollection.

Ans. I ain't sure; I think it was on Sunday night before I came home, and I came home on Monday.

Cross-Q. 381. When you came home you found the pipe had burst, did you?

Ans. Yes, sir.

Cross-Q. 382. Was the ram running when you came home, or had it stopped by reason of the bursting?

Ans. The ram was running; it must have been on Monday night, for the ram wouldn't have been running if it had bursted; the ram was running when I got home, for the water was running at the house when I drove up; I don't remember the exact date when it busted, but it had busted and gave trouble; it busted after I got home, for I fetched gas-pipe tongs to unjoint the pipe, when I came home from work.

Cross-Q. 383. From whom did you get those tongs?

Ans. From J. W. Beers, foreman of division No. 4.

Cross-Q. 384. After the pipe bursted, and put the ram out of order, how long did it remain in that condition before the pipe was soldered, and put back, and the ram put in working order again?

Ans. About one day. It might have been a day and a half.

Cross-Q. 385. Did any of that pipe ever burst afterwards?

Ans. Not while we lived there.

Cross-Q. 386. How deep was the trench in which the pipe was placed between the ram and the spring, and between the ram and the house?

Ans. Between two and three feet, as near as I can tell.

Cross-Q. 387. What portion of it was covered with earth before you returned from your visit?

Ans. The portion between the ram and the spring. There was some filled in the pipe from the ram to the house, but it wasn't finished.

Cross-Q. 388. At which end of the trench was this last-mentioned filling between the ram and the house?

Ans. They had filled it at different places along that portion of it.

Cross-Q. 389. Some up towards the house and some down towards the ram, and all along from point to point, do you mean?

Ans. It was; the most of it towards about the middle of it.

Cross-Q. 390. Where did the break occur; how far from the ram?

Ans. I don't know rightly, but I think it was at the lower end, near the ram; I ain't sure.

Cross-Q. 391. Do you know how many sections of pipe broke?

Ans. One.

Cross-Q. 392. Wasn't there more than one broke?

Ans. Mr. Kissinger told me there was one.

Cross-Q. 393. When did he tell you that?

Ans. In the morning before I went to work; he told me to ask whether they had pipe-tongs, and if they had, I should fetch them; that there was one joint of pipe broke.

Cross-Q. 394. You never knew of any other repairs to the ram or pipe except that repair of that broken section, did you?

Ans. Mr. Kissinger done a little fixing at the ram.

Cross-Q. 395. Once, or more than once?

Ans. Oh, he tinkered around several times; I don't just remember how often.

Cross-Q. 396. Do you remember when or anywhere near when?

Ans. Through the summer of 1879. I don't know the particular dates when.

Cross-Q. 397. How do you fix it as being in the summer of 1879, that he tinkered it?

Ans. Because I only lived there one summer after the ram was put in.

Cross-Q. 398. Is the ram still running?

Ans. No, sir.

Cross-Q. 399. How long since did it stop running?

Ans. I don't know exactly how long. It never worked very well when the water was low.

Cross-Q. 400. Did it finally stop running before Mr. Kissinger moved away from the farm?

Ans. It run, but it didn't work very well; and after he left, it run down altogether.

Cross-Q. 401. It continued to be used as long as he lived there, did it not?

Ans. When the spring was high and the water was plenty we could use it, and when the water got a little low we couldn't very well. It wouldn't force the water up when the water was low.

Cross Q. 402. You have testified that you saw Daniel Drawbaugh up there at the time that the ram was put in; did you ever see him up there before that?

Ans. I ain't positive. It seems to me he was there once. I wouldn't say for sure, though.

Cross-Q. 403. Did you ever see him there after that—I mean after the time the ram was put in?

Ans. Not that I remember.

Cross-Q. 404. You have an impression of seeing him there before that time; how long before?

Ans. I couldn't say. I don't know whether he was, or whether he wasn't there. Therefore, I won't say.

Cross-Q. 405. Have you any impression as to what he was there for at that earlier time?

Ans. No, sir.

Cross Q. 406. You say you talked with Mr. Nesbit about the ram, about a week ago; was that the first and only time that you ever talked with him about it?

Ans. I think him and I talked about it once before.

Cross-Q. 407. When and where was that?

Ans. At my house; I can't just remember what time it was; it was since this suit was running.

Cross-Q. 408. Was it this summer or fall?

Ans. It was in the spring, I think, about the time Mr. Comfort and Mr. Storrow was to see me.

Cross-Q. 409. You have endeavored to fix the year 1878 as the time when that pipe was bored and the ram put in; now will you tell me just what you rely upon to fix that year instead of the year 1877, or the year 1876?

Ans. November, 1878, was the only time that I had my wife up to Landisburg after we moved to Marysville, and I lifted the pipe at the station for the ram in 1878; the book shows it.

Cross-Q. 410. Then you rely upon the books and the visit with your wife to your relatives near Landisburg as the means of fixing the date, do you?

Ans. Yes, sir; and we only lived there about eighteen months after that ram was put in.

Cross-Q. 411. You rely upon your memory for that last statement, do you not?

Ans. Yes, sir; it might have been a little longer, but as near as I can tell, it was about that long, the ram was put in in November, and we moved; the ram was put in in 1878, and we moved away in 1880, so you can count.

Cross-Q. 412. You rely entirely upon your memory to fix the time when you and your wife made the visit to your relatives near Landisburg, do you not?

Ans. Yes, sir; it was on the 5th of November, 1878.

Cross-Q. 413. You have already said that. I want to know if you have anything to prove the fact, except your own memory?

Ans. I have no writings to show for it.

Cross-Q. 414. You say that the visit of Mr. Draper and Mr. Kissinger to Mr. Drawbaugh's shop, to see about ordering the ram, was in the fall of 1877; have you anything, except your own memory, to rely upon in fixing that time?

Ans. No, sir.

Cross-Q. 415. You have testified in substance that the boring of wooden pipes was not commenced at Mr. Kissinger's place until after the year 1876; have you anything except you own memory to rely upon to fix that fact?

Ans. No, sir.

Cross-Q. 416. Your memory is just as reliable upon that last-mentioned point as upon any other point in the case, is it not?

Ans. I am *sure* about *that* point, for I never saw Mr. Draper till the year 1877, and the pipe was bored after he went away.

Cross-Q. 417. You rely entirely upon your memory for the fact that you never saw Mr. Draper till the year 1877, and for the fact that the pipe was not bored until after he went away, do you?

Ans. Yes, sir.

Cross-Q. 418. And you are as sure of those facts as of any other thing you have testified to, are you?

Ans. There was things asked me that I wasn't quite sure of, but I am sure of these now asked me.

Cross-Q. 419. You havn't sworn to anything that you were *surer* of than you are of these, have you?

Ans. I was sworn to tell the truth, and I did it as near as I possibly could on both sides of the question, as near as was in my power.

Cross-Q. 420. That doesn't answer my question. What I want to know is, whether you have testified to anything that you are surer of than you are of the two facts stated in your 416th answer?

Ans. I hardly know how to answer that question. I told him that I was sure of it.

Cross-Q. 421. At the time Mr. Draper visited Mr. Kissinger, and they went down together to order the ram, was anybody there visiting with him at Mr. Kissinger's?

Ans. I don't remember.

Cross-Q. 422. Do you remember of anybody's ever visiting with him, except that once when his daughter came with him?

Ans. Not that I remember.

Cross-Q. 423. When was the last time you ever saw Mr. Draper at Mr. Kissinger's?

Ans. When Mr. Kissinger had sale in the spring of 1880.

Cross-Q. 424. Did you ever see any of Mr. Kissinger's old neighbors, who lived at Eberly's Mills or near there, up visiting at the Kissinger family on the Draper farm near Marysville?

Ans. Yes, sir.

Cross-Q. 425. Who were they?

Ans. Mr. Calvin Hart and his wife, and there were several other families; I have forgotten their names.

Cross-Q. 426. Mention the names of all the families around the village of Eberly's Mills that you can think of, that lived there when Mr. Kissinger lived there.

Ans. Commencing at the upper end of the town, there was John B. Drawbaugh, George Drawbaugh, Daniel Drawbaugh, Daniel Fettrow, Amos Frownfelter, George Heck. On the other side of the street, was George Leonard, and a family living next to him—I have forgotten his name; Gardner—I don't know what his first name was; I have forgotten that—and a Smith—I ain't sure that I ever heard his first name; he went by the name of Smith, still. There was a man there by the name of Kahney—I don't know what his first name was; L. C. Steinberger, Calvin Hart. That was about all that just lived there in the town; then there was the farmers around; there were several other families that had moved there and moved away; I don't just remember their names.

Cross-Q. 427. Did you ever see any of these people whose names you have mentioned visiting socially at Mr. Kissinger's house, while he lived on the Draper farm; if so, please to mention the persons?

Ans. I mentioned Mr. Hart; there was another man and his wife who used to come, a farmer living near there whose name I can't recollect, who used to visit there; those were the only two families that I remember that visited there.

Cross-Q. 428. Describe his farm, so that we can ascertain what farmer it was, if possible.

Ans. His farm lay right across the dam, near Mr. Hart's store; I don't know his name; maybe Mr. Drawbaugh would be kind enough to tell me his name.

(Mr. Drawbaugh suggests that it was "Gilbert." Witness continues:)

Yes, that is the name.

Cross-Q. 429. Was there a good deal of fruit produced on the Draper farm which Mr. Kissinger occupied?

Ans. Yes, sir.

Cross-Q. 430. A good many cherries and peaches?

Ans. Yes, sir.

Cross-Q. 431. Do you remember any of his old neighbors whose names you have mentioned, going up there in the fruit season to get cherries and peaches? If so, who were they?

Ans. None but the two families I have mentioned that I remember of.

Re-direct by Mr. Smith:

(*Complainants' counsel requests the examiner to note that the account book referred to by the witness in answer to interrogatories* 48 *and* 69, *and from which extracts were made, is not the book referred to and produced in answer to interrogatory* 210, *and from which also extracts were made. The examiner so certifies.*)

(*Complainant's counsel also offers in evidence a certificate of Thomas R. Davis, Auditor of Disbursements in the Accounting Department of the Pennsylvania Railroad Company, showing the time returned to that office of the labor of the witness J. C. Zimmerman in the month of November*, 1878, *and requests that the same be inserted at this place in the deposition.*)

[*Objected to by Mr. Hill as incompetent.*]

The certificate is as follows:

"ACCOUNTING DEPARTMENT, PENNSYLVANIA RAILROAD COMPANY,
OFFICE OF AUDITOR OF DISBURSEMENTS,
233 SOUTH FOURTH STREET,
PHILADELPHIA, *Nov. 27th*, 1882.

THOS. R. DAVIS,
Auditor of Disbursements.
J. D. GREENE,
Assis't Auditor of Disbursements.

This is to certify that J. W. Beers, foreman of laborers on the Middle Division of the P. R. R. and Maintenance of Way Dept., sub Div. 4, Check & Pay Roll Nos. 2520 has returned the time of J. C. Zimmerman, laborer, for the month of November, 1878, as follows: Days worked: 1st, 3rd, 10th, 13, 14, 15, 16 & 17, 21, 22, 23, 24, 25, 26, 27, 28, 29, & 30th; 180 hours at 10 c., $18.00.

No time was returned for the 2d, 4, 5, 6, 7, 8, & 9, 11, 12, 18, 19, & 20th of Novr., 1878.

THOS. R. DAVIS,
Aud. & Dist."

Q. Q. 432. In your answer to the 28th interrogatory, you stated that on the 5th of November, 1878, your wife and you started away on a visit within about a mile of Landisburg, and were away about one week; at the time when you answered that question, had you seen the certificate which I have just produced, showing the days in November, 1878, when you were at work for the Pennsylvania Railroad Company, or had you obtained from any of the officers or records of that company, any information as to specific days in November, 1878, when you were at work for the company?

(*All testimony based upon the certificate or referring to or adopting it as competent evidence in this cause, objected to by Mr. Hill, because the certificate itself is incompetent; and it not being sworn evidence nor a certificate authorized by law to take the place of sworn evidence; and the railroad official not being produced for cross-examination; and the same objection is made to the certificate of Mr. King that follows question 83, and to all questions that may refer thereto; and the contents of both certificates are further objected to as hearsay.*)

Ans. I had not.

Q. Q. 433. While you lived at Eberley's Mills or near there, did you

perform any duty at the funeral of one of Mr. Daniel Drawbaugh's children; if so, what was it?

Ans. I was a bearer at the funeral of his daughter.

Q. Q. 434. Did you go to his house on that occasion?

Ans. Yes, sir.

Q. Q. 435. Where you ever there at other times?

Ans. Not in his house, that I remember.

Q. Q. 436. Do you remember what was the appearance of his furniture and the furnishings of his house, so far as you saw it, as compared with the houses of his neighbors?

[*Objected to as new matter, not referred to in the cross-examination; and, also, as irrelevant and immaterial, and a matter of mere opinion, and for which there is not even a basis of comparison, as the style of the neighbors' housefurnishing is not in evidence.*]

Ans. Everything was nice and tidy, and the furniture, so far as I seen, was as good as that of any of his neighbors.

Q. Q. 437. Were you accostomed to see his children?

[*Same objection.*]

Ans. Yes, sir.

Q. Q. 438. Were they comfortably dressed?

[*Same objection.*]

Ans. Yes, sir.

Q. Q. 439. How did their dress compare with that of the other children you were accustomed to see?

[*Same objection.*]

Ans. As good as the rest of the folks that lived around there?

Q. Q. 440. Were you accustomed to see Mrs. Drawbaugh from time to time? If so, what was her appearance as respected dress in comparison with her neighbors.

[*Same objection.*]

Ans. She was always respectably dressed, about as good as her neighbors generally.

Without waiving the objection, re-cross-examination *de bene esse* by Mr. Hill:

Re-cross-Q. 441. Is it not the custom around Eberly's mills, as it is elsewhere around the country, to borrow the neighbors' furniture and

fix the house up extra nice on the occasion of funerals and other unusually large gatherings?

Ans. I don't know whether they borrow furniture or not.

Re-cross-Q. 442. And you don't know whether that furniture which you saw at Drawbaugh's house belonged to him or not, do you?

Ans. I couldn't say whether it was his, or whether he borrowed it; I seen it there.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 27th day of November, 1882.

FRED. M. OTT,
Examiner.

J. C. ZIMMERMAN.

Adjourned until 7.30, P. M.

NOVEMBER 27, 1882, 7.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

CYRUS BOWMAN, *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

My age is fifty-three; residence, Mongul, Franklin county, Penna.; occupation, miller.

Q. 1. Did you ever live at Eberly's Mills; if so, when did you go there to live, and when did you move away?

Ans. Yes, sir; I lived there; I moved there on April 1, 1874; I moved away March 1, 1876.

Q. 2. How came you to go there?

Ans. It was through John Drawbaugh that I got there.

Q. 3. What was your business while you were there?

Ans. The milling business.

Q. 4. Whose mill did you run?

Ans. Mr. Leonard's; I think his full name was George Leonard.

Q. 5. What was your arrangement with Mr. Leonard for running the mill; on what terms did you run it?

Ans. We bought the grain in partnership, and the half of the profits were his and the other half mine; the toll, he got the two thirds and I got the one third of.

Q. 6. Who was to pay for the repairs on the mill, or the mill-wright work that was necessary while you were running the mill?

Ans. George Leonard.

Q. 7. Did you have to bear any part of the expense of such repairs or mill-wright work?

Ans. No, sir.

Q. 8. Did your brother, George H. Bowman, work in the mill the last month that you were there, February, 1876?

Ans. Yes, sir.

Q. 9. For whom did he work, for you or for Mr. Leonard?

Ans. He worked for me.

Q. 10. What was he employed to do, what was his work?

Ans. His work was milling at the mill.

Q. 11. Who paid him for his work?

Ans. I paid him.

Q. 12. Did you know of Mr. Leonard employing him to do anything or paying him anything?

Ans. No, sir; I didn't.

Q. 13. Did he do any mill-wright work while he was there, to your knowledge?

Ans. Not that I can recollect.

Q. 14. If he had done any mill-wright work of any consequence, do you think you would have known it and remembered it?

[*Objected to by Mr. Hill, as calling for mere opinion.*]

Ans. He might have done a little mill-wright work, but if he did I don't remember it.

Q. 15. Do you remember that you paid him for his work at milling; and whether you paid him for all the time he was there?

Ans. I paid him as near as I can tell, fifteen dollars for the time he was there.

Q. 16. Did he board with you while he was there?

Ans. Yes, sir.

Q. 17. In what house did you live?

Ans. I lived in a white house that is called the "mill-house."

Q. 18. Did you know Daniel Drawbaugh while you lived there?

Ans. Yes, sir.

Q. 19. Had you known him before you went there to live?

Ans. I had saw him before, but had no acquaintance with him.

Q. 20. State whether or not you saw him frequently while you lived there?

Ans. Yes, sir.

Q. 21. State whether or not he was accustomed to come to your mill and whether or not you were accustomed to go to his shop, more or less?

Ans. Yes, sir; he was accustomed to come to the mill, and I would occasionally go down to his shop, too.

Q. 22. Did he trade with you while you lived there? If so, what did he buy?

Ans. Yes, sir. He would buy flour and feed.

Q. 23. Did he come to the mill himself to make his purchases, or did some other person come there for him?

Ans. He would mostly come himself.

Q. 24. Did he pay cash for what he bought, or buy on credit?

Ans. He paid cash for some, and some on credit?

Q. 25. State whether, or not, you ever hesitated to give him credit when he wanted it?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. No, sir.

Q. 26. When you went away, or before you went away, did he pay for all he had bought on credit?

Ans. The book shows so.

Q. 27. Will you look at the book which I now show you, and state whether it is the book which you kept for your credit business while you were running the mill; and, if so, will you state whether it contains Daniel Drawbaugh's account, and on what pages?

Ans. Yes, sir; it is the book; it contains Daniel Drawbaugh's account on pages 88 and 119.

Q. 28. In whose handwriting is this account?

Ans. It is my hand.

Q. 29. Will you read the heading of the account, or show it to the examiner to copy—on the first page?

Ans. "1864. Daniel Drawbaugh, Dr. Cr. June 19."

Q. 30. How came the date of this account to be 1864.

Ans. It was a mistake.

(*Counsel for respondents admit that the date is an apparent mistake, and that it should be 1874.*)

Q. 31. What is the date of the first item—what month and day—in this account?

Ans. June 19.

Q. 32. Will you hand the book to the examiner to copy the account as part of your deposition?

Ans. Yes, sir; here it is: (The account is as follows, page 88:)

"Daniel Drawbaugh,		Dr.	Cr.
June	19, to 1–16 sack flour,	$0 50	
July	1, " 1–8 " flour,	1 00	
"	13, " 1–8 " "	1 00	
Aug.	7, " 1–8 " "	95	
"	17, " 1–16 " "	50	
Sep.	1, " 1–8 " "	90	
"	18, " 1–8 " "	90	
"	30, " 1–8 " "	90	
Oct.	10, " 1–4 bush. corn meal,	25	
"	12, by cash,		25
Dec.	17, to 1–16 sack flour,	40	
"	19, by cash,		40
Jan.	5, to 1–8 sack flour,	80	
"	12, to 1–16 sack flour,	40	
"	13, to 1–4 bush. corn meal,	25	
"	22, to 1–8 sack flour,	80	
"	20, to 1–8 sack flour,	80	
Feb.	4, to 1–8 " flour,	80	
March	17, to 1 bush. chop,	50	
"	18, to 1–8 sack flour,	75	
"	22, to 1–4 bush. corn meal,	25	
April	1, to 1–8 sack flour,	75	
"	8, by cash,		65
"	9, to 1–4 corn meal,	25	
	To page 119, $12 35,	13 65	1 30"

Page 119 is as follows:

"119. Daniel Drawbaugh,		Dr.	Cr.
Transport from page 88,		$12 35	
April	21, to 1 bush. shorts,	54	
"	22, to 1–8 sack flour,	75	
"	27, to 1–4 bush. cornmeal,	25	
"	" to 1–2 " shorts,	25	
"	29, to 1–8 sack flour,	75	
"	30, to 1 bush. chop & shorts,	70	

May	6, to 1–8 sack flour,	$0 75
"	7, to 1 bush. shorts,	54
"	21, to 1 " chop,	52
"	" to 1–16 sack flour,	40
"	27, to 1 bush. stuf,	54
"	28, to 1–8 sack flour,	80
June	2, to 1 bush. shorts,	54
"	" to 1–8 sack flour,	80
"	9, to 1–8 " flour,	80
"	" to 1–2 shorts,	18
"	12, to 1 bush. chop,	70
"	16, to 1–8 sack flour,	80
"	19, to 1 bush. chop,	75
"	25, " 1–8 sack flour,	80
"	to 1 bush shorts,	54
July	1, to 1–16 sack flour,	40
"	2, " 1–8 sack flour,	80
"	3, " 1 bush. shorts,	54
"	8, " 1–8 sack flour,	80
"	10, " 1 bush. shorts,	54
"	14, " 1–4 " crack corn,	20
"	15, " 1 bush. shorts & chop,	52
"	16, " 1–8 sack flour,	80
"	21, 1 bush. bran & chop,	52
"	" 1–8 sack flour,	80
"	26, 1 bush. shorts,	54
"	31, " 1 sack flour,	80
"	31, " 1, 1–2 bush. shorts,	54
Aug.	2, " 1–6 bush. crack corn,	11
"	5, " 1–4 sack flour,	1 60
"	6, " 1 bush. shorts,	54
"	" " 1–16 " corn & bran,	11
"	10, " 1 " shorts,	52
"	14, " 1–2 " chop,	35
"	17, " 1–2 " shorts, white,	30
"	19, " 1–8 sack flour,	1 60
"	31, " 1–6 sack flour, brown,	40
Sept.	4, " 1 bush. screanings,	65
		$39 03

"	9, By cash, ...	$10	00
Dec.	20, "	14	10
"	31, " to Leonard, ...	14	93
		$39	03"

Q. 33. State whether or not these various purchases were made mostly or wholly by Mr. Drawbaugh himself at your mill?

Ans. Mostly by Mr. Drawbaugh.

Q. 34. Did you keep your cash sales in this book, or in a separate book?

Ans. A separate book.

Q. 35. In keeping that account, did you record the names of the persons making the purchase, or only the fact of the cash sale?

Ans. Part persons, and part not.

Q. 36. When you commenced keeping it, did you record the names of persons, or merely mention the fact of a cash sale, and if so, when did you commence recording the names of the purchasers?

Ans. I began the account without names, and begun recording names November 2, 1874.

Q. 37. Will you hand the book to the examiner to copy the record of sales to Daniel Drawbaugh?

Ans. Yes, sir; here it is.

(The account shows the following sales to Daniel Drawbaugh:)

" 1875.			
Jan.	26, Drawbaugh, oats, ...	$0	08
1874.			
Nov.	10, Drawbaugh, 1–6 corn meal, ...		12
"	20, D. Drawbaugh, 1–8 sack corn meal, ...		25
1874.			
Jan.	29, Drawbaugh, 1–2 shorts, ...		37
1875.			
Feb.	10, Drawbaugh, 1–8 flour, ...		80
"	26, Drawbaugh, 1–2 shorts, ...		37
Nov.	24, D. Drawbaugh, 1 bus. chop in ear, ...		40
"	27, Drawbaugh, 1–6 corn meal, ...		12
Apr.	8, D. Drawbaugh, 1 bus. chop, ...		60
"	16, Drawbaugh, 1–8 corn meal, ...		25
	" 4 chop, ...	2	40
	13, " 1 shorts, ...		75
	15, D. Drawbaugh, 1 bus. shorts, ...		35

	17, D. Drawbaugh, 3 bus. bran,		$0 90
	" " " 2 " shorts,		60
	" " " 6 " shorts,		2 47
May	21, Drawbaugh, 3 bus. bean,		90
June	7, D. Drawbaugh, crack corn,		10
"	19, D. Drawbaugh, 1 bus. shorts,		54
July	6, Drawbaugh, crack corn,		10
Aug.	28, D. Drawbaugh, 1 bus. chop,		70
Sept.	9, D. Drawbaugh, cash,		10 00
Nov.	12, D. Drawbaugh, 1–8 sack flour,		80
"	20, " " 1–8 "		80
Dec.	4, " " 1–8 "		80
"	10, " " 1–8 "		80
"	19, " " Cash,		40
"	25, " " 1–8 sack flour,		65
1875.			
Feb.	26, Drawbaugh, 1–8 flour, 1–8 corn,		1 00
March	24, D. Drawbaugh, 1–8 sack flour,		75
April	8, " " cash,		65"

Q. 38. Did you keep your cash sales of feed on the same pages with your cash sales of flour; if not, will you point out the pages on which you entered your cash sales of feed?

Ans. According to this book, the feed was kept separate from the flour.

(Witness shows book to examiner.)

Adjourned until November 28, 1882, at 9.30, A. M.

NOVEMBER 28, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Cyrus Bowman by Mr. Smith, continued:

Q. 39. I noticed in your cash book there are accounts of sales to D. Drawbaugh, G. Drawbaugh, J. B. Drawbaugh, H. K. Drawbaugh, and some which are simply "Drawbaugh;" and that those which are marked "Drawbaugh" simply are included in the list which the examiner has made; are you able to say whether these sales, which are made to Drawbaugh simply, were made to Daniel, or to some of the other parties of that name?

Ans. As near as I can say, they belong to Daniel Drawbaugh—those accounts that are just "Drawbaugh."

Q. 40. Is there another page in your account-book showing charges to Daniel Drawbaugh. If so, will you look at the account, and state whether it is in your handwriting; and whether, or not, you know anything about the sales?

Ans. There is another page containing some charges, but I know nothing about them, and the entries are not in my handwriting.

[The charges referred to are on a page having no number, and consist of six charges, amounting to $7.43, purporting to be in January, February, and March, 1876, and are marked paid.]

Q. 41. You have said, I believe, that while you lived at Eberly's mills you occasionally went down to Drawbaugh's shop; did you go there on business, or to talk to him and other people who might be there?

Ans. Sometimes I would go on business, and sometimes I would go down just to see him.

Q. 42. Was his shop a place to which the neighbors were apt to resort for the purpose of seeing each other?

(*Objected to by Mr. Hill, as leading.*)

Ans. Yes, sir; the neighbors would frequently go down to see him and his machinery.

Q. 43. Did you ever take friends of yours to his shop to see what he had, or send them there for that purpose?

Ans. Yes, sir.

Q. 44. Do you remember what business was carried on there at the shop while you lived there, and what parties were concerned in it?

Ans. When I first went there, they were working at the faucets. I think it was carried on by Hauck. I forget his name now. Afterwards they were making axles. This was carried on by Moore, Grove & Co. I can't remember the other names.

Q. 45. Aside from the machinery employed in the faucet and axle business, did you see any machinery or inventions of Mr. Drawbaugh's? If so, will you state what you remember seeing?

Ans. I seen, for instance, the clock. Mr. Drawbaugh showed me about the clock—how it worked. He told me that he had made it. He showed me a wire that run from the clock down to the ground. I had seen a kind of a bell-machine, and I don't remember of any more that

I saw, except a nail-cutter. He had a nail-cutter there. I can't remember of any more.

Q. 46. State whether or not you saw any talking machines while you lived at Eberly's Mills, or heard Mr. Drawbaugh or anyone else say anything about such a machine?

Ans. No, sir; I did't see anything of the kind, nor I didn't hear Mr. Drawbaugh say anything of the kind, nor anybody else.

Q. 47. Will you state whether or not Mr. Drawbaugh came to see you some time ago, and if so, when and where he came to see you, and what inquiry, if any, he made of you?

(*Objected to by Mr. Hill, as not in rebuttal of anything introduced by the respondents.*)

Ans. He came to see me, I think it was last May or June a year ago, as near as I can tell. He came to the place where I lived, Mongul, Franklin county. He came into the mill, and he had a box along with him, he opened the box and took out some patterns or machinery of some kind. He asked me whether I had ever seen anything of the kind in his shop; he told me that he didn't know whether he had showed me those things or not when I was in his shop; I told him that I had never seen anything of the kind in the shop, nor he had ever said anything to me about it.

Q. 48. Did any one come with him at that time, and if so do you know who it was?

Ans. There was a gentleman with him, but I can't say who it was.

Q. 49. How long did Mr. Drawbaugh remain at the mill and do you know where he went when he went away?

Ans. He was perhaps about a half an hour at the mill. Afterwards he went along up with me to the house and talked to my wife a little while? and then went to Shippensburg, I suppose.

Q. 50. Will you look at the various instruments which are now on the table, and state whether you recognize any of them as being the instruments which Mr. Drawbaugh showed you?

Ans. He had something similar to "F" and "B," but I couldn't say that they were the ones; there weren't over about three or four pieces, I think, that he had on the desk.

Q. 51. State whether, or not, Mr. Drawbaugh asked you to study over the matter, and to send him word, if you ever remembered anything?

Ans. Yes, sir.

Q. 52. Did the gentleman who came with him come into the mill?

Ans. No, sir. He wasn't out of the buggy.

Q. 53. While you lived at Eberly's mills were you accustomed to see Mr. Drawbaugh's family? If so, what was their appearance as to their dress compared with that of their neighbors'?

(*Objected to by Mr. Hill, for the same reasons given in the objection to question 437, of J. C. Zimmerman's deposition in this case.*)

Ans. I saw their family pass, and re-pass, and at our house. Their appearance was about as good as anybody else it that place.

Q. 54. Were you ever in Mr. Drawbaugh's house?

Ans. Not that I can remember.

Q. 55. Do you remember whether you ever heard anything said among the neighbors about his house, or the way it was furnished; and, if so, what was the talk?

Ans. I heard my own family say that the house was well furnished.

Q. 56. Were the people of that neighborhood accustomed to come together in the evenings, especially on Saturday evenings, at the store, to talk over matters that had occured in the neighborhood?

(*Objected to by Mr. Hill, as immaterial and irrevelant.*)

Ans. Yes, sir.

Cross-examined by Mr. Hill.

Cross-Q. 57. You have referred to some accounts in your book as being marked simply "Drawbaugh." How do you know that those accounts related to Daniel Drawbaugh?

Ans. I mostly, when I sold anything, if it was J. B. Drawbaugh I would put "J. B. Drawbaugh," and so with the others, and when it was Dan., I sometimes just put "Drawbaugh." To the best of my knowledge it was Dan. Drawbaugh.

Cross-Q. 58. Then you wouldn't swear positively that it was Dan. Drawbaugh?

Ans. No, sir.

Cross-Q. 59. In your account with Daniel Drawbaugh I observe that the last item is as follows: "December 31, by cash to Leonard, 14.93." Do you remember how that happened to be charged in that way "by cash to Leonard?"

Ans. Not, unless it was paid to Leonard.

Cross-Q. 60. Didn't Leonard assume that sum in settlement with you, he settling it with Drawbaugh in some other way.

Ans. I can't remember anything about it. I only know what the book states there.

Cross-Q. 61. It has appeared in evidence in this case that Drawbaugh made some settlements with Leonard by giving Leonard his note at different times; how do you know but that this item of $14.93 was assumed by Leonard in his settlement with you, and was included in one of Drawbaugh's notes to Leonard?

Ans. I know nothing about their notes.

Cross-Q. 62. You have put in evidence copies from two of your account-books, to wit: The large credit-book and the small cash-book. In the latter appears the following item: "Sept. 9, D. Drawbaugh, cash, $10 00." Please look at your large credit-book, and state if that same payment is not credited therein?

Ans. This same credit here in the cash-book is credited in the credit-book. It was paid on this account in the credit-book, and was first put in the cash-book, and then taken off, and put into the credit-book.

Cross-Q. 63. Please look at the item, "Dec. 19, by cash 40," which appears in both books, and state whether or not that was one payment charged on both books?

Ans. Yes; that came off of the account—forty cents.

Cross-Q. 64. Please look at the item, "April 8, cash .65," and state whether that was not an item charged on both books?

Ans. Yes, sir.

Cross-Q. 65. On your credit account-book, does it not appear that a running account, running from June 19, 1874, to December 31, 1875, a period of over eighteen months, the cash payments made to you by Mr. Drawbaugh, on that account were as follows:

"Oct. 12, 1874, $0 25.
Dec. 19, 1874, $0 40.
April 8, 1875, $0 65.
Sept. 9, 1875, $10 00.
Dec. 20, 1875, $14 10.
Dec 31, 1875, $14 93 to Leonard?"

Ans. According to the book it does.

Cross-Q. 66. These account-books contain a large number of accounts with different people. Whose account-books are they?

Ans. They had belonged to me and Mr. Leonard; the credit book now belongs to Mr. Leonard; the cash book belongs to me.

Cross-Q. 67. How does it happen that the credit-book belongs to one man and the cash-book to another?

Ans. The cash-book was settled up between me and Leonard; there was some unsettled accounts in the credit-book and Leonard took the accounts and the book.

Cross-Q. 68. Do you mean, took them in settlement with you.

Ans. Yes, sir; took them in settlement with me.

Cross-Q. 69. In what name was the business of the mill carried on while you run it?

Ans. "Leonard & Bowman."

Cross-Q. 70. Who paid the workmen in the mill?

Ans. What do you mean by "workmen?" The miller do you mean?

Cross-Q. 71. Yes, sir.

Ans. I paid the miller.

Cross-Q. 72. Did you ever have to bring suit for the collection of any of the accounts on the mill books?

Ans. I believe one person, J. B. Drawbaugh.

Cross-Q. 73. Was the suit brought before a justice, or in the county court?

Ans. Before a justice.

Cross-Q. 74. What justice?

Ans. I can't tell you his name; he lived in Carlisle; I don't know whether he lives there now or not.

Cross-Q. 75. Did you ever have anything to do in any other suit before a justice in Carlisle?

Ans. In this mill matter; not that I can recollect.

Cross-Q. 76. Did you ever at any time in any matter?

Ans. I have had suits; yes.

Cross-Q. 77. Before a justice at Carlisle.

Ans. Drawbaugh's account, I think, was about the only one in Carlisle.

Cross-Q. 78. Did Mr. Leonard and you get flour, meal, feed, or other articles from the mill, while you were running it? I mean, get them for your respective families?

Ans. Yes, sir; we couldn't well do without flour.

Cross-Q. 79. If any such articles are charged to you on the books,

or if there is any account there, in which you appear as debtor, will you please to point out where such matters appear?

Ans. I don't know as there is anything in this book, (the credit-book.) I think we had another book.

Cross-Q. 80. Another book for containing accounts between you and Leonard, or for containing accounts generally?

Ans. I can't remember.

Cross-Q. 81. Will you swear that there was any other book besides those two which you have produced here?

Ans. Not positively. It is so long that I have forgotton.

Cross-Q. 82. Would your account and Mr. Leonard's account appear in the same book, and if not, why not?

Ans. I can't remember, but we settled up every month all accounts.

Cross-Q. 83. Referring to the credit account-book which you have used here in giving your deposition, are there not ten pages of that account-book occupied exclusively with accounts against George Leonard, in which he is charged with materials, such as flour, feed, etc., furnished at the mill, and with work and grinding done at the mill, and do not some of those pages contain over fifty items to the page?

Ans. As near as I can remember this was flour and feed.

[*Objected to by Mr. Hill as irresponsive, and witness' attention is called to the nature of the question, which is repeated.*]

Witness continues: Yes, there are ten pages. I counted fifty-seven items on one page.

Cross-Q. 84. And that is not the page containing the most items; is it?

Ans. No, sir; there are some that have more.

Cross-Q. 85. If I understand you correctly, Mr. Leonard and you were engaged in partnership in the business of buying grain, grinding it at the mill, and disposing of the product; were you?

Ans. Yes, sir.

Cross-Q. 86. The mill was also used as a grist-mill for doing custom work for the neighbors, was it not?

Ans. Yes, sir.

Cross-Q. 87. Who run it as a grist-mill—you alone?

Ans. I had different hands.

Cross-Q. 88. Who paid those hands?

Ans. I did.

Cross-Q. 89. Was Mr. Leonard liable in any way for the wages of those hands, or did the hands look to you alone?

Ans. They looked to me alone; he was not liable to the hands for grist-mill purposes.

Cross-Q. 90. So far as the grist-mill business was concerned, you conducted that business for yourself and paid Mr. Leonard an agreed proportion of the tolls as rent, did you not?

Ans. I would better state how I had the mill; we bought the grain in partnership; Leonard got the half of the profit and I got the other half; the toll grain Leonard received two thirds and me one third.

Cross-Q. 91. You gave him two thirds of the toll for the use of the mill if I understand it, you paying the expenses of the mill; so far as it was run on custom work; am I correct?

Ans. It just depends on the meaning about "expenses." I paid no expenses concerning the millwright work; any millwright work that was to be done, Leonard was to pay that.

Cross-Q. 92. He was to pay that as the owner of the mill, I suppose; was he?

Ans. Yes, sir.

Cross-Q. 93. But the expenses of the wages of the millers who were employed on custom work you were to pay, as the tenant of the mill; were you?

Ans. Yes, sir.

Cross-Q. 94. Now, as to grinding the grain that you and Mr. Leonard bought in partnership, who paid the wages of the millers employed in grinding that grain?

Ans. I did.

Cross-Q. 95. Did you charge any of it against Mr. Leonard?

Ans. No, sir.

Cross-Q. 96. Was there any expense account of the mill kept?

Ans. Not in particular.

Cross-Q. 97. Mr. Leonard was to keep the mill in order and you were to be at the expense of running the mill, was that the idea?

Ans. Yes, sir.

Cross-Q. 98. Reference has been made to your brother George H. Bowman being employed at the mill in February 1876; and he has testified that he did some mill-wrighting work there; do you remember of his putting a mill-bush in there at one time?

Ans. I don't remember, but he might have repaired it or fixed it up.

Cross-Q. 99. Did you ever go to Drawbaugh's shop when you wanted to meet some neighbor, thinking that you might find him there.

Ans. I can't say. I might have.

Cross Q. 100. Do you know of anybody who ever did go there for such purpose?

Ans. Yes.

Cross-Q. 101. Who was it?

Ans. There was different persons came to see me from a distance. They would mostly all of them go down and see Mr. Drawbaugh and his shop before they would leave.

Cross-Q. 102. Because they were acquinted with him?

Ans. No, sir; I don't think they had any acquaintance with him, but because they knew he was an ingenious kind of a man.

Cross-Q. 103. Do you remember of anybody's ever going to Drawbaugh's shop for the purpose of seeing anybody there, except Drawbaugh? If so, who was it, and when?

Ans. I don't understand that right.

(Question repeated.)

Ans. I don't remember of any one.

Cross-Q. 104. Drawbaugh's shop was not a place of resort where the neighbors went for the purpose of seeing each other, but only where they went the same as they would go to your mill for the purpose of seeing a person employed there? Is not that a fact?

Ans. I suppose they went down to see the machinery.

Cross-Q. 105. It was not a place of resort for the neighbors to gossip, as the store was, for example?

Ans. No, sir; I don't think.

Cross-Q. 106. Did you understand at the time you lived there that Daniel Drawbaugh was a poor man?

Ans. No, sir; I didn't.

Cross-Q. 107. Did you understand anything about his pecuniary circumstances?

Ans. I didn't know much about his circumstances, but I knew that he owned a nice house and a blacksmith shop, when I moved there.

Cross-Q. 108. You didn't know about the encumbrances on that property; did you?

Ans. I had heard them talking about it; what I meant was, I heard the people talking about it.

Cross-Q. 109. Please state again all the machines that you remember of seeing at Drawbaugh's shop, while you lived there?

Ans. I seen the clock, the nail-cutter, and a bell-machine that he had, I don't know what he called it; that is all I can remember.

Cross-Q. 110. When did you move away from Eberly's Mills, and where did you move?

Ans. The first of March, 1876; I moved to Franklin county, four miles from Shippensburg.

Cross-Q. 111. How many different times can you remember being in Drawbaugh's shop while you lived there?

Ans. I can't remember; I have no idea.

Cross-Q. 112. Were you there in the year 1876?

Ans. Yes, sir; the beginning of it.

Cross-Q. 113. Well, if you remember the fact of being there in the beginning of that year, tell me what you were there for, and whom you saw there?

Ans. I understood you to say at Eberly's Mills.

(Mr. Hill replies: No, at Drawbaugh's shop.)

It is likely I was at Drawbaugh's shop in 1876.

Cross-Q. 114. But you don't know that you were; do you?

Ans. I couldn't positively say that I was.

Cross-Q. 115. Could you positively swear that you were in his shop in the year 1875 at any time?

Ans. Yes.

Cross-Q. 116. What were you there for then?

Ans. I can't tell you.

Cross-Q. 117. Whom did you see there then?

Ans. I seen the hands working there.

Cross-Q. 118. What were they doing?

Ans. They were working at the axles, I think.

Cross-Q. 119. Did you ever ask Drawbaugh to show you his new inventions; if so, when?

Ans. No, sir; I never asked him.

Cross-Q. 120. Then you only saw what happened to be lying around in the shop in sight, when you were there; is that the fact?

Ans. He had shown me several of his machineries of his own accord; I never asked him.

Recess for lunch until 2.30, P. M.

NOVEMBER 28, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents:

Cross-examination of Cyrus Bowman, by Mr. Hill, continued.

Cross-Q. 121. What did he show you of his own accord, and when did he show it?

Ans. He showed me the clock and the bell-machine, and explained some little about the nail-cutter. I think this was in 1875.

Cross-Q. 122. Where was the nail cutter when he showed it to you?

Ans. It was in the lower part of the building.

Cross-Q. 123. Do you mean in the cellar?

Ans. I suppose you may say cellar; I can't say whether it was ground or floor; it was down in the lower part of the house.

Cross-Q. 124. How many stories were above it?

Ans. I think it was a three story building.

Cross-Q. 125. Then there were two stories above where the machine was; were there?

Ans. At that rate, yes.

Cross-Q. 126. Where was the clock?

Ans. The clock was in his room that he worked in mostly, on the second story.

Cross-Q. 127. Do you mean on the next floor above the nail machine, or on the second floor above the nail machine?

Ans. As near as I can tell it was on the first floor from the nail machine.

Cross-Q. 128. Was that floor divided off into several rooms? If so, how many?

Ans. There was one room where the clock was in, and then there was another small room besides that.

Cross-Q. 129. Will you take a sheet of paper and pencil and make a sketch showing in outline how that floor was divided?

Ans. It is pretty hard for me to do, as I didn't pay much attention.

(Witness makes sketch.)

The lower part, *a*, is where the nail-cutter was. Here is where the room was on the second floor *b* where he had his clock and his bell-machine. Opposite that there was a small room, *c*. The balance of that room they had their machinery in. The upper floor, marked *d*, also had

machinery in it. I am telling this as well as I understand it. If there is a mistake, I can't help it.

(Sketch offered in evidence by Mr. Hill, to be marked "Exhibit Bowman Sketch.")

Cross-Q. 130. Can you make a plan-view of the middle floor on which you saw the clock and the bell-machine, so as to show how the rooms were arranged on that floor.

Ans. I don't know whether I can make it, or not.

(Witness makes sketch, which Mr. Hill puts in evidence as "Exhibit Bowman Sketch, No. 2.")

This was the large room, *m*. A door goes in there at *n*. The dots outside are steps going up on the outside to the door *n*. There is a door at *o*. Here is where the clock was at *p*. Here is where he had his bell-machine on a work bench—here at *q*. This door (*r*) goes into the little room *s*. The balance is the room *t*, where the machinery was. I give you a sketch of this just as well as I know how. I haven't seen it since 1876.

Cross-Q. 131. What was in the little room *s*?

Ans. I don't mind of anything but a large clock, I think I saw in that little room.

Cross-Q. 132. What kind of a clock?

Ans. It was a large old fashioned clock.

Cross-Q. 133. Did it run by electricity?

Ans. No, sir; I don't think it was running at all.

Cross-Q. 134. Was there any other clock in that room *s*?

Ans. Not that I recollect.

Cross-Q. 135. How many clocks were in the room *m*?

Ans. One. That is all I can remember.

Cross-Q. 136. Was that the one that had the wires leading into the ground?

Ans. Yes, sir.

Cross-Q. 137. Was that clock fastened up against the wall or not. How was it supported?

Ans. I think it was fast against the wall.

Cross-Q. 138. Tell us all that you remember about its construction and appearance—I mean the clock that had the wires to it in the room *m*?

Ans. The clock just appeared to me like any other clock, only that there was a wire running from the ground up into the clock.

Cross-Q. 139. What sort of a machine was the bell-machine that you speak of as being in the same room as the clock?

Ans. I don't know anything about the bell-machine, only that he told me it was calculated for hotels. That is all I know about it.

Cross-Q. 140. Did it go by electricity?

Ans. I can't tell you how he worked it no more.

Cross-Q. 141. Did he tell you what use it would be in hotels?

Ans. Yes; he was telling about rooms. If you wanted anything in any room you would make an alarm.

Cross-Q. 142. Did he ever show you a machine for wrapping wire with thread, or did you ever see one there?

Ans. Not that I remember.

Cross-Q. 143. Did he ever show you any kind of a telegraph machine, or did you ever see one there?

Ans. Not that I remember.

Cross-Q. 144. Did he ever show you an electric fire alarm, or did you ever see one there?

Ans. No, sir; not that I remember.

Cross-Q. 145. Did he ever show you a galvanometer, or did you ever see one there?

Ans. No, sir; not that I remember.

Cross-Q. 146. Did he ever show you a barometer, or did you ever see one there?

Ans. He never showed me any that I remember of.

Cross-Q. 147. Did he ever show you an electric shocking machine, or did you ever see one there?

Ans. He never showed me any, but I sent to Philadelphia with him for one.

Cross-Q. 148 When did you send to Philadelphia?

Ans. I think it was in 1874, as near as I can tell.

Cross Q. 149. Do you mean that you sent by him to get you one?

Ans. Yes, sir.

Cross-Q. 150. Did he ever show you a machine or device for sewing carpet-rags, or did you ever see one there?

Ans. I never seen one there, but I heard him talking about it.

Cross-Q. 151. What else did you see in that room besides the clock and the bell machine?

Ans. He had his tools in, some of his patterns, and some of his knicknacks that he was working.

Cross-Q 152. Do you know what the "knicknacks" were?

Ans. No, sir; he always had different machineries there that he was working at.

Cross Q. 153. And you didn't know what they were, did you?

Ans. No, sir; it would have been a little hard for a man to understand what they were.

Cross-Q. 154. Did you ever know of his having invented a tack machine?

Ans. What kind of a tack machine was it to be?

Cross Q. 155. Any kind of tack machine; I don't mean the nail machine.

Ans. I didn't see anything of that kind.

Cross-Q. 156. Did you ever hear of anything of that kind?

Ans. Not that I remember.

Cross-Q. 157. Did you know of his having invented a mill-tram, or red-staff?

Ans. Yes, sir.

Cross-Q. 158. When did you hear of that?

Ans. I think in 1873.

Cross-Q. 159. Before you moved to Eberly's mills?

Ans. Yes, sir.

Cross-Q. 160. While you were there at Eberly's mills did you ever hear of his putting in hydraulic rams for people?

Ans. There was one at Eberly's mills there, and they told me that Dan Drawbaugh had put it in.

Cross-Q. 161. Did you ever hear of his putting in any other except that one, anywhere, at any time?

Ans. Yes, sir; I heard of his putting in different ones.

Cross-Q. 162. Before you lived there, or while you lived there, or since?

Ans. There had some been put in before I came there; I don't know whether he put any in after I was there or not.

Cross-Q. 163. How soon after you moved to Eberly's mills did you see the electric clock there in his shop?

Ans. I think I saw it in 1874.

Cross-Q. 164. Mr. Daniel A. Hamacher has testified, printed pages 302–324, respondents' printed record, and is corroborated by John F. Rupp, pages 324–329, and by Robert J. Strong, pages 392–398, and S. S. Rupp, pages 596, 597; Mr. Hamacher states that at the beginning

of February, 1876, he was teaching school at Frogtown school-house, Lower Allen township, and went, with quite a number of his scholars, on a visit one afternoon to Drawbaugh's shop, to see the magnetic clock and the speaking machine; did you know anything of that school expedition to Drawbaugh's shop?

Ans. No, sir; I didn't; some of our children was going to school.

Cross-Q. 165. At that Frogtown school?

Ans. No, sir; to the Gorgas school.

Re-direct by Mr. Storrow:

Q. Q. 166. You were asked in the 83rd cross-interrogatory about an account of George Leonard in your account-book, in which he is charged with material such as flour, feed, etc., and for work and grinding done at the mill; was that for material which he got for use in his family, or what was it for?

Ans. It was partnership flour and feed; he received the flour and feed and took it to Harrisburg; when he would take any out of the mill I would charge him with it; the half of it was mine and the other half his; afterwards, then, every month, we would settle up our accounts.

Re-cross by Mr. Hill:

Re-cross-Q. 167. How do you know that some of that flour, feed, etc., in that account charged to Leonard, was not used in his house. For example, take the two casks of flour that are charged to him August 2d, or the one cask of flour charged to him Feb. 10th, or the one cask of flour charged to him October 9th, how do you know that none of those were used by his family?

Ans. One thing, he never used flour by the cask in his own houses, that I remember; and there was very often neighbors around Milltown would come to Leonard and say, "I want a barrel of flour;" for instance he would say to me: "such and such a man wants a barrel of flour, charge me with it;" that is about the way it happened.

Re-cross-Q. 168. How do you know he was accustomed to get his flour by the sack, instead of by the cask?

Ans. If he had got it by the cask he would have had to haul it up; this way he carried it up.

Re-cross-Q. 169. Did he get his flour at the mill?

Ans. Yes, sir.

Re-cross-Q. 170. Take then the following charges in his account: "January 6th, to $\frac{1}{4}$ sack of flour $1.38; Jan. 28, $\frac{1}{8}$ sack of flour .75; Feb.

25, to ⅛ sack of flour .75; Oct. 9, ¼ bushel corn meal .25; Dec. 24, to ¼ sack flour, $1.38; July 31, to ⅛ sack flour, .90; May 7, to ¼ sack flour, $2.00;" which I have picked at random out of his long accounts; can you swear that these items were not for flour and meal procured for his own family?

Ans. I couldn't swear to it; it is too long; but that was partnership flour; it is likely that Leonard got that flour for other folks around the mill there.

(*Last clause of answer objected to by Mr. Hill, as not responsive.*)

Re-Cross-Q. 171. Was there any business sign up, at the mill?

Ans. No, sir; not that I know of.

Re-Cross-Q. 172. Do these account books show anywhere the firm name "Leonard & Bowman?"

Ans. I can't say that they do; we never used the name much.

(Mr. Storrow asks the examiner to certify that the account of George Leonard for May, from which an item was taken in the cross-examination, foots up for that month $197.43; and that on the fifth contains a charge for one cask of flour; and on the sixth for one cask flour, 1-4 sack flour, 1-8 sack flour, one cask flour; seventh 1-8 sack flour, one cask flour, besides on each of those days, chop, corn, etc.)

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 28th day of November, 1882.

FRED. M. OTT,
Examiner.

CYRUS BOWMAN.

J. C. NESBIT, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

My age is forty-three; residence Lisburn, Cumberland county, Penna.; occupation, school teacher.

Q. 1. How long have you been engaged in teaching in Cumberland county, and what schools have you taught in?

Ans. From 1868, fourteen years, but then I have been away twice during that time and returned.

Q. 2. I show you a book entitled as follows: "1731, History of Cumberland County, Pennsylvania, with illustrations. By Rev. Conway P. Wing, D. D., and others. Philadelphia: James D. Scott, 439 Chestnut

St., 1879." And containing on the back of the title page the following: "Entered according to an Act of Congress, in the year 1879, by James D. Scott, in the office of the Librarian of Congress, at Washington, D. C.

Herald Printing Company, Carlisle, Pa."

I find, beginning on page 200 of that book, the history of Lower Allen Township, in said county, headed: "Lower Allen township, by J. C. Nesbit, Esq.;" are you the Mr. Nesbit there referred to?

Ans. I am; yes, sir.

Q. 3. How came you to write the history of Lower Allen township for this book?

Ans. Mr. Scott engaged me to write it.

Q. 4. This book appears to have been published in 1879; how long before that did you write the history of Lower Allen township?

Ans. I think it was the summer previous—the vacation previous—1878.

Q. 5. How long was your summer vacation; from what time to what time?

Ans. Six months. From the latter part of March to the first of September.

Q. 6. Where were you living and teaching then?

Ans. At Lisburn.

Q. 7. Was anybody associated with you in getting up this history of Lower Allen township; and, if so, who, and how was the principal part of the work divided between you?

Ans. Yes, sir. R. P. Hull, then living in Lisburn. We agreed that he would gather information concerning the township, and furnish me with it. I was to rewrite it then, and send it on to the *Herald* office for publication.

Q. 8. I call your attention to part of that history of Lower Allen township, on page 201, entitled: "Milltown, or Eberly's Mills," and which is as follows:

"Milltown, or Eberly's Mills. This village is located on Cedar run, one eighth of a mile from its confluence with the Yellow Breeches. It has 83 inhabitants, and is on a tract of land originally owned by a Mr. Thompson. It has fifteen houses one of which is of brick, two of stone, two rough cast and the remainder of wood. It has one church, one store, one blacksmith shop, one shoe shop and one machine shop. A merchant and grist-mill was built in 1817 by George Fahnestock,

but has since been owned by Price & Emmert, Fleck, Eberly, Beetem, Leonard & May and Dillinger the present proprietors. It is on Cedar Run, has four sets of stones, once had an engine, which has, however, been abandoned, and has once been thoroughly remodeled. Near it is an old mill which must have been built in the last century, but has been converted into a dwelling house. What was once a clover mill has been remodeled and fitted up as a machine shop. The present proprietor, Daniel Drawbaugh, some years since formed a stock company for the manufacture of measuring faucets and rotary pumps and for a while the machinery was used for the purposes of this company, but finally the faucet machinery was removed to Mechanicsburg and the works were much reduced. They are now applied, under the care of Mr. Drawbaugh, to the manufacture of his patent electric clock which is a marvel of ingenuity, and promises to supercede all other clocks. They are said to be run by a turbine wheel of fifteen horse power and to be worth not less than $7,000."

Did you assist Mr. Hull in procuring the information for that article about Milltown, or were you with him when he procured the information?

Ans. I was with him.

Q. 9. Did you procure that information in the village of Milltown? If so, state how you went there, and where you and Mr. Hull started from on that occasion.

Ans. Yes, sir; Mr. Hull and I procured the information in the village of Milltown; we started from Lisburn on that occasion and walked.

Q. 10. Whom did you first go to see for information in Milltown?

Ans. Squire John Drawbaugh.

Q. 11. Whom did you next go to?

Ans. Old Mr. Hart on the hill.

Q. 12. Who told you to go to Mr. Hart?

Ans. Squire Drawbaugh referred us to him.

Q. 13. Whom and where did you next go to after you had left Mr. Hart?

Ans. To Daniel Drawbaugh's machine shop.

Q. 14. Did you see Daniel Drawbaugh on that occasion?

Ans. I did.

Q. 15. I observe that the last half of that article about Milltown is occupied with an account of the machine-shop of Daniel Drawbaugh,

and the work carried on there; from whom did you and Mr. Hull obtain the information for that part of the article?

Ans. From Mr. Daniel Drawbaugh.

Q. 16. On the visit you have referred to, or at some other time?

Ans. On the visit I have referred to.

Q. 17. How long did you and Mr. Hull stay at Mr. Drawbaugh's shop on that visit?

Ans. About an hour.

Q. 18. During how much of that time were Mr. Hull and Mr. Drawbaugh together?

Ans. Mr. Hull and Mr. Drawbaugh were together the whole time.

Q. 19. During how much of the time were you with Mr. Drawbaugh?

Ans. About half that time, as near as I can tell.

Q. 20. How did you occupy yourself during the rest of the visit?

Ans. Looking at that electric clock, and viewing or examining machinery in the shop, and tools, etc.

Q. 21. Was anybody besides Mr. Drawbaugh working on electric clocks, and if so, who, and what was he doing?

Ans. There was a man working there—I think Squire Drawbaugh's son was working at cases for the electric clocks.

Q. 22. Did Mr. Drawbaugh know that you were obtaining information for the purpose of writing an article to go into this history of Cumberland county?

Ans. Yes, sir; Mr. Hull told him.

Q. 23. Did Mr. Hull write notes of what he learned that day from Mr. Drawbaugh and others about Milltown?

Ans. Yes, sir.

Q. 24. Please look at this paper now shown you, and state whose handwriting it is in and what it is.

Ans. It is Mr. Hull's handwriting—the writing which he did concerning Milltown and our trip that day.

Q. 25. When did Mr. Hull hand that paper to you?

Ans. When we arrived home, just before we separated that same day.

Q. 26. Was, or was not, the part of it which relates to Mr. Drawbaugh's shop written at his shop?

Ans. I am under the impression that it was. I went with him home, and he didn't write any on the way that I know of.

Q. 27. Did you stop anywhere on your way home, after leaving Mr. Drawbaugh's shop that day?

Ans. Yes, sir. We stopped to see Mr. Schell.

Q. 28. How long did you stop at Mr. Schell's?

Ans. Fifteen or twenty minutes, perhaps.

Q. 29. Did you afterwards write out an article for this Cumberland county history from those notes of Mr. Hull?

Ans. Yes, sir; from those notes.

Q. 30. What did you do with the article when you had written it out?

Ans. I sent it to the *Herald* office at Carlisle, where this history was being printed.

Q. 31. How soon after your visit did you write it out?

Ans. That same evening.

Q. 32. Did Mr. Drawbaugh tell you on that occasion or say in your hearing that he claimed to be the first inventor of the speaking telephone?

Ans. I have no recollection of it.

Q. 33. If he had told you on that visit that he was the first inventor of the electric speaking telephone, would you have mentioned that in in your history?

(*Objected to by Mr. Hill, as calling for mere opinion, and hypothetical.*)

Ans. I would.

Q. 34. Had your attention been attracted to the electric speaking telephone at that time by reading about it in the newspapers or otherwise?

Ans. I had noticed it in the newspapers previous to that time.

Q. 35. Is Mr. Hull dead; and if so, when did he die?

Ans. He is dead; he died, I think, in the month of April or May, in 1879.

Q. 36. Was this history of Lower Allen Township printed in this book exactly as you wrote it; or was it somewhat shortened and abridged?

Ans. It was abridged.

(Mr. Storrow puts in evidence the paper referred to by the witness, and marked "Exhibit Hull and Nesbit Manuscript." The examiner notes that it is in pencil neatly written, with some words crossed out and some interlineations, which are noted in the following copy. The words crossed out are put in brackets, and the words interlined are printed in italics; the paper is as follows:

"Milltown Eberly's Mills.

This village is located on Cedar Run ⅛ mile from its confluence with Yellowbreeches & on road leading from Harrisburg to Brooks mill formerly (now Hakes) this village has a population of 83 & was settled early in the last century the first resident was a Mr. Thompson who purchased a tract of land from the Penn heirs there are 15 Houses in the village of the following character 1 Brick 2 Stone 2 Roughcast the bal frame & Weatherboarded [The avocations are Represented as follows 1 Black Smith 1 Shoemaker and 1 Machine shop] there is 1 *church* one store one blacksmith shop—one shoe shop & [one machine] one mill & one machine shop the *present* mill *a merchant & Grist mill* was built 1817 by Geo. Fahnestock who sold to Price & Emmett & they sold to Heck & he sold Christn. Eberly, Eberly sold (½) to Beetem & they sold to Jno. Leonard & He sold to May & Dellinger *the present owners* this mill is on Cedar Spring run from which it derives its power & runs four sett of stones was once remodled & an engine attached which was never utilized to any considerable extent & was finally removed a short Distance south of this mill stands an old mill building (now converted into a Dwelling house) which was built in the past century the date of"

The first page ends here. The second page is as follows:

"Milltown or Eberly's Mills Vilage

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the erection of which cannot be obtained. the machine shop located on cedar Run is an old [Mill] *clover mill* building refitted & Remodled for its present *use* by the present proprietor Danl. Drawbaugh who upon the invention of his measuring faucett & Rotary pump formed a stock Co. & started their manufacture there under the imediate Superintendens of Mr. Drawbaugh the work was continued for a no of years When the faucett machinery was removed to Mechanicsburg reducing the gross valuation of the machinery *at this place* several thousand Dollars, the present compliment of machinery consists of 3 engine lathes 1 milling machine 4 lathes 2 Drill presses 1 extra lathe chucks Drifting tools &c in connection with machinery for the manufacture of his (Drawbaughs) patent electric clock (to which all his time at present is devoted [and] & *which* is a marvel in its way *and bids fair to supersede all other clocks.*) the valuation of this machinery is represented to be $7000, and is run by a turbine Wheel 15 Horse power."

(*The statements contained in said paper are objected to by Mr.*

Hill as incompetent and hearsay, it not appearing whether any of the statements of that paper are the statements of Daniel Drawbaugh, and if any of them are, it not appearing which; it not appearing how far they are the mere opinions of Mr. Hull or some other person unknown, nor whether the paper was ever seen or read by Mr. Drawbaugh.)

Adjourned until Nov. 29, 1882, at 9:30, A. M.

NOVEMBER 29, 1882, 9.30, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of J. C. Nesbit, by Mr. Storrow, continued.

Q. 37. You say that your school-term began about the first of September; had you completed writing this history before that? If so, was it a short time before or a long time before that? How long before was it?

Ans. As near as I can tell, it was three weeks before.

Q. 38. Had you known Mr. Daniel Drawbaugh personally, or been at his shop before the visit which you have described?

Ans. No, sir.

Q. 39. Had Mr. Hull known him, or been at his shop before this visit?

[*Objected to Mr. Hill, as calling for hearsay.*]

Ans. Mr. Hull knew him—was acquainted with him.

(Complainants' counsel puts in evidence the history referred to, and especially the passages and articles which have been copied into the record.]

[*Respondents' counsel makes the same objections as to the statements contained in said history, as to the statements contained in the exhibit "Hull & Nesbit Manuscript.*]

Cross-examined by Mr. Hill.

Cross-Q. 40. Do you mean that you finished your work on the history three weeks before your fall term commenced, or that you began it three weeks before that?

Ans. I mean that I finished it three weeks before that time, as near as I can tell.

Cross-Q. 41. Did you transmit the manuscript to the editor, Dr. Wing?

Ans. I sent it addressed to the *Herald* office, Carlisle.

Cross-Q. 42. By mail or express?

Ans. By mail.

Cross-Q. 43. Did you receive any written acknowledgment of its receipt at the *Herald* office?

Ans. I did not.

Cross-Q. 44. If I understand you, you had charge of preparing the history of Lower Allen township?

Ans. Yes, sir; Mr. Hull and I. I had Mr. Hull associated with me in writing up the history.

Cross-Q. 45. Did Mr. Hull associate you with him, or did you associate Mr. Hull with you, or were you both appointed jointly by the managers of the enterprise?

Ans. At my request, Mr. Scott engaged Mr. Hull to assist me.

Cross-Q. 46. Who is Mr. Scott, where does he live, and what had he to do with the enterprise?

Ans. I don't know his full name, but it is in the history. [Witness reads.] "James D. Scott, 439 Chestnut street, Philadelphia." I think he had the management of the enterprise—at least, in part. He solicited persons to write up the history in different parts of the country.

Cross-Q. 47. Where did Mr. Hull live at the time when that history was prepared?

Ans. In Lisburn, Cumberland county.

Cross-Q. 48. Did he continue to live there until his decease?

Ans. He did.

Cross-Q. 49. How long was it from the time when you were first employed to write this history until you finished it, and forwarded your manuscript to the *Herald* office?

Ans. As near as I can tell, about four weeks.

Cross-Q. 50. How long was Mr. Hill associated with you before you completed your work, and forwarded the manuscript to the *Herald* office?

Ans. The entire time, about four weeks from the beginning.

Cross-Q. 51. Did you forward the history of Lower Allen township to the *Herald* office in separate installments as fast as you completed portions of it, or did you wait until you had completed the whole of it and forward it all at once?

Ans. I recollect of forwarding but once; that was when I had it completed.

Cross-Q. 52. Do you think that was between the first and fifteenth of August, 1878?

Ans. As near as I can tell, that was about the time.

Cross-Q. 53 Then you would say that you were first employed in the work somewhere about the first of July, 1878, would you?

Ans. Yes, sir, to the best of my knowledge.

Cross-Q. 54. What part of the history did you first work up?

Ans. That part about home; Lisburn and that end of the township.

Cross-Q. 55. Did anybody assist you in that part of the work; if so, who?

Ans. Mr. Hull assisted me more or less all through.

Cross-Q. 56. Did anybody else assist you except Mr. Hull in any part of the work?

Ans. No one else assisted me in writing; Mr. Coble obtained information for Mr. Hull in the east end of the township, up the river.

Cross-Q. 56½. Who is Mr. Coble and where does he live?

Ans. He is a school teacher and lives at White Hill, Cumberland county, Pennsylvania; his name is Peter C. Coble.

Cross-Q. 57. What was Mr. Hull's business?

Ans. He was a clock and watch cleaner and repairer.

Cross-Q. 58. Do you know of anybody else besides Mr. Coble that assisted Mr. Hull on parts of the history? If so, who?

Ans. I do not know of any others.

Cross-Q. 59. Did you or Mr. Hull make any other trip to Milltown for the purpose of obtaining materials for that history, except the trip you have mentioned?

Ans. We did not make any other trip.

Cross-Q. 60. What time of day was it when you arrived at Daniel Drawbaugh's shop on that trip?

Ans. About ten o'clock in the morning.

Cross-Q. 61. Did you find Mr. Drawbaugh in the shop immediately on your arrival there?

Ans. We did.

Cross-Q. 62. Did you first have conversation with him in the presence of Mr. Hull?

Ans. No, sir; Mr. Hull spoke to him first and introduced me. I didn't know Mr. Drawbaugh. I had never seen him before.

Cross-Q. 63. I understand from your direct testimony that you were there about an hour, during which time you and Mr. Hull were conversing with Mr. Daniel Drawbaugh about a half an hour; and during about another half hour you were examining the place, while Mr. Hull remained with Mr. Drawbaugh conversing. Is my understanding correct?

Ans. Yes, sir.

Cross-Q. 64. The half hour during which you and Mr. Hull were together with Mr. Drawbaugh conversing, was the first half hour I suppose, wasn't it?

Ans. Yes, sir; the first half hour or so.

Cross-Q. 65. During the last half hour while you were examining the place and Mr. Hull and Mr. Drawbaugh were conversing by themselves, I suppose you do not know what the conversation was between them, do you?

Ans. I do not. I didn't hear it.

Cross-Q. 66. Then you do not know whether Mr. Hull correctly understood or correctly reported any matters communicated to him by Mr. Drawbaugh while they two were talking apart by themselves, do you?

Ans. I do not.

Cross-Q. 67. During the first half hour, while you, Mr. Hull and Mr. Drawbaugh were conversing together, was anything said on the subject of electric speaking telephones?

Ans. Not that I recollect of; the direct conversation was between Mr. Drawbaugh and Mr. Hull.

Cross-Q. 68. Do you mean by that that the direct conversation being between Mr. Drawbaugh and Mr. Hull, there might have been matters spoken of that you did not hear, or did not understand, or did not pay sufficient attention to, to remember?

Ans. There may have been; I depended entirely upon Mr. Hull for information, for he was to take notes and report.

Cross-Q. 69. Did he take any notes there in your presence?

Ans. He had his portfolio with him, but I can't say positively that I saw him write during the time that I was with him and Mr. Drawbaugh.

Cross-Q. 70. Referring to this manuscript, "Exhibit Hull & Nesbit Manuscript," do I understand you that it is in Mr. Hull's handwriting?

Ans. It is in Mr. Hull's handwriting.

Cross-Q. 71. How do you know it is?

Ans. I am perfectly familiar with his handwriting.

Cross-Q. 72. Where did you find this manuscript?

Ans. Mr. Hull handed it to me just before we separated when we arrived at home.

Cross-Q. 73. Have you kept it among your papers ever since?

Ans. No, sir.

Cross-Q. 74. Where has it been?

Ans. With Mrs. Hull. As soon as the history was written, it was returned to Mr. Hull.

Cross-Q. 75. Who found it among Mr. Hull's papers for the purposes of this case?

Ans. Mrs. Hull, Mr. Hull's widow gave it to Mr. Coble.

Cross-Q. 76. When was that?

Ans. Sometime during this last summer of 1882.

Cross-Q. 77. What did Mr. Coble do with it?

Ans. He delivered it, I think, to Mr. Comfort.

Cross-Q. 78. John C. Comfort?

Ans. Yes, sir.

Cross-Q. 79. Was John C. Comfort acting as detective or procurer of evidence for the Bell Company?

Ans. It is my impression that he is.

Cross-Q. 80. Have you had any interviews with him (Comfort) in regard to your testimony in this case?

Ans. I have not.

Cross-Q. 81. Whom have you talked to with regard to such matters?

Ans. I talked some to Mr. Storrow and Mr. Smith.

Cross-Q. 82. When were you first approached on the subject of what you knew of this matter?

Ans. Last summer; sometime during the summer of 1882.

Cross-Q. 83. Who approached you then on the subject?

Ans. Mr. Comfort told me it was likely I would be called upon some time.

Cross-Q. 84. What else did he tell you?

Ans. I don't think he told me anything else about it; just merely that I would be called upon to give evidence.

Cross-Q. 85. How did he know that you had any evidence to give?

Ans. He knew that I was connected with the writing of that history of Milltown.

Cross-Q. 86. Had he obtained the manuscript at that time?

Ans. He had.

Cross-Q. 87. How do you know?

Ans. I saw it at the Bolton House, Harrisburg.

Cross Q. 88. Was your interview with Mr. Comfort at the Bolton House?

Ans. Yes, sir.

Cross-Q. 89. How came you to be at the Bolton House at that time?

Ans. Mr. Comfort asked me to come over and stop there when I came to town.

Cross-Q. 90. Was it at the Bolton House that Mr. Comfort told you that you might be called upon to give testimony?

Ans. It was not.

Cross-Q. 91. Was it at the prior interview with him that you have referred to?

Ans. No, sir; it was on the day of the election, the seventh of this month (November, 1882,) at the polls in Lower Allen township.

Cross-Q. 92. When I asked you in question 84 what else Mr. Comfort told you, and you answered that you didn't think he told you anything else about it, just merely that you would be called upon to give evidence, which of the interviews with Comfort did you refer to?

Ans. The last one is the only time he told me that it was likely that I would be called upon to give evidence.

Cross-Q. 93. Then you had at least three interviews with Comfort, had you not, to wit: One on the 7th of November, 1882, when he told you you would probably be called upon to give evidence in this case; one at the Bolton House in the summer of 1882 when he showed you the manuscript, and one prior to that time when he asked you to come to the Bolton House?

(*Question objected to by Mr. Storrow for the reason that the witness' statement was that he saw the manuscript at the Bolton House, and not that it was in Mr. Comfort's possession at the time, nor that Mr. Comfort showed it to him at the time.*)

(*Mr. Hill states that the question is based on the witness' answers to questions 86, 87, 88, and 89.*)

Ans. Yes, sir; three interviews. One at my house; one at the Bolton House, where I saw the papers; and one at the polls on the 7th of November.

Cross-Q. 94. At the interview at the Bolton House, who showed you the papers that you refer to?

Ans. I think it was Mr. Storrow.

Cross-Q. 95. Was Mr. Comfort present at the time?

Ans. I am not certain whether he was present just at the time. He was there at the hotel, though.

Cross-Q. 96. Tell me all that Mr. Comfort said there at the hotel at that time.

Ans. He told me that Mr. Storrow desired to see me.

Cross-Q. 97. Is that all that he told you?

Ans. All that I can recall bearing upon the subject—the question.

Cross-Q. 98. Did he say anything about the manuscript that you have referred to?

Ans. Not that I recollect.

Cross-Q. 99. What made you think then that Mr. Comfort had procured the manuscript from Mr. Coble, if you did not see it in Comfort's hands, and had no conversation with Comfort about it?

Ans. Mr. Coble came to see me first concerning the manuscript, and told me he wanted it for Mr. Comfort.

Cross-Q. 100. In your 93d answer, you speak of seeing the "papers" at the Bolton House; what papers do you refer to?

Ans. All the manuscripts of the history of the township—all that were left.

Cross-Q. 101. You have stated that the "Exhibit Hull & Nesbit Manuscript" was given by Mrs. Hull to Mr. Coble, and you now say that Mr. Coble came to see you concerning the manuscripts, and told you he wanted them for Mr. Comfort; did you go to Mrs. Hull's house to examine the manuscripts left by her husband?

Ans. Mr. Coble came to me first, supposing that I had them. I sent him to Mrs. Hull, saying that I had none, but that she had them, if there were any preserved.

Cross-Q. 102. Then you never examined Mr. Hull's manuscripts after his death to see what manuscripts he had left relating to the history, or relating to Daniel Drawbaugh, did you?

Ans. That means, examined the papers to see what was in them, does it? No, sir; when these papers were sent over I went to see Mrs. Hull to ascertain whether there were any more papers than what she had delivered to Mr. Coble.

Cross-Q. 103. Do you mean after you saw the papers at the Bolton House?

Ans. Yes, sir.

Cross-Q. 104. Did anybody request you to go over to Mrs. Hull's to see whether she had any more papers than what she had delivered to Mr. Coble?

Ans. Yes, sir; Mr. Storrow requested me to see, and to get all the manuscripts that I could concerning Milltown and Mr. Drawbaugh.

Cross-Q. 105. How came Mr. Storrow to request you to do that; was there any talk of Mr. Hull's having left other papers relating to Milltown or Daniel Drawbaugh, besides the "Exhibit Hull and Nesbit Manuscript" which you have produced?

Ans. There was.

Cross-Q. 106. What was that talk?

Ans. Some person had been writing up individual biographies of persons, and I thought probably Mr. Drawbaugh's biography was with Mr. Hull's papers.

Cross-Q. 107. What person had been writing up individual biographies of persons, and why did you think Mr. Drawbaugh's biography might be found among Mr. Hull's papers?

Ans. Mr. Hamacher and Mr. Coble I know had written a few, and Mr. Hull I knew wrote Mr. Gorgas' biography.

Cross-Q. 108. What Mr. Hamacher do you refer to?

Ans. Mr. D. A. Hamacher, school teacher of Lower Allen.

Cross-Q. 109. Was Mr. Gorgas' biography published, if so, where?

Ans. It was published in some of the histories which have biographies in the back part of them.

Cross-Q. 110. Some of what histories?

Ans. Histories of Cumberland county.

Cross-Q. 111. Do you mean some of these histories by Rev. Conway D. Wing and others published by James D. Scott and an extract from which complainants have put in evidence here?

Ans. Yes, sir.

Cross-Q. 112. Is this book here, from which complainants have just put in evidence the extract, one of the books containing the biographies, or is it one of the books published without the biographies?

Ans. This is one published without the biographies; I don't see any in it.

Cross-Q. 113. Comparing the histories which were published with the biographies, and those which were published without the biographies, did they contain the same subject matter with the exception of the biographies, and were they published at the same time?

Ans. They contain the same subject matter except the biographies, and my impression is that they were published at the same time.

Cross-Q. 114. Do you own one of the histories?

Ans. I do.

Cross-Q. 115. When did you come into possession of it?

Ans. In the year 1879.

Cross-Q. 116. Does your copy of the book contain the biographies, or not?

Ans. It does not.

Cross-Q. 117. Do you know who has a copy that contains the biographies, or where one is to be found?

Ans. I think Mr. H. S. Mohler was one. He lives in Upper Allen township; his post-office is Shepherdstown, Cumberland county.

Cross-Q. 118. How far does he live from Shepherdstown, and in what direction, and what is his business?

Ans. He lives about a mile north, and is a farmer.

Cross-Q. 119. Do you know whether that book contains a biography of Daniel Drawbaugh, of Eberly's Mills or Milltown?

Ans. I am not positive of that; the book contained biographies, and I suppose Daniel Drawbaugh's biography is in it.

Cross-Q. 120. Did the book contain biographies of every person in the county, or only of the more noted citizens?

Ans. Not of everybody; of only a few.

Cross-Q. 121. Give me as correct an idea as you can of how many biographies it contained.

Ans. There were five or six were written up from Lower Allen township by some person.

Cross-Q. 122. Were the biographies that were published in that book of persons from any particular locality or scattered all over the county of Cumberland?

Ans. I do not know; I noticed only those from Lower Allen; they were all I happened to notice or looked for.

Cross-Q. 123. Were they biographies of men in any particular business or profession, or of men taken generally without reference to any particular occupation?

Ans. I suppose they were prominent men, without reference to any particular calling.

Cross-Q. 124. What Mr. Gorgas was it whose biography was contained in the book?

Ans. William R. Gorgas.

Cross-Q. 125. You say Mr. Hull prepared Mr. Gorgas' biography, if I understand you?

Ans. Yes, sir.

Cross-Q. 126. Do you know of any other biographies that Mr. Hull prepared for that book?

Ans. I do not.

Cross-Q. 127. Do you know whether or not Mr. Hull had charge of the biographical part of that book, so far as it referred to Lower Allen township?

Ans. I do not think he had.

Cross-Q. 128. What made you, then, expect to find biographical manuscripts or materials relating to Daniel Drawbaugh, or Milltown, among the papers left by Mr. Hull at his decease?

Ans. Mr. Hull told me at one time that he had engaged to write Mr. Gorgas' biography and expected to get something for it, and I thought it likely that he might have written others.

Cross-Q. 129. Did you find among his papers any biographical materials so far as you examined them?

Ans. I found that of Mr. Gorgas.

Cross-Q. 130. Did you find any other?

Ans. I did not.

Cross-Q. 131. You didn't examine the Hull papers at any time after Mr. Hull's death before they had been through John C. Comfort's hands, did you?

Ans. I did not. I did not have them in my possession.

Cross-Q. 132. Then, of course, you don't know of your own knowledge whether Mr. Comfort found among them any biographical sketch of Mr. Daniel Drawbaugh, or any materials for preparing a biographical sketch of Mr. Daniel Drawbaugh, do you?

Ans. I do not.

Cross-Q. 133. How many Hull papers did you see at the Bolton House?

Ans. I am not positive of its number—a small roll of papers.

Cross-Q. 134. Did you read or examine the contents of all of them, at that time?

Ans. I merely looked over them; I didn't read all the contents of any of them.

Cross-Q. 135. Referring again to the interview which you and Mr.

Hull had with Mr. Daniel Drawbaugh at his shop, state everything that you remember of Mr. Drawbaugh's saying during that interview.

Ans. We first went in where they were making cases for clocks, where we met Mr. Drawbaugh, and after talking a few moments, he told us about the clock, and about the cases, and that he had sold a few. We went on through the upper part of his shop then, and he spoke of his machinery and the number of lathes and tools; he spoke of the machinery being more extensive at one time, but part of it had been moved to Mechanicsburg. In regard to the clock, he told us that he had it connected with the earth; that it drew electricity from the earth. I believe that is all I can recall at this present time.

Cross-Q. 136. How do you fix the time of Mr. Hull's death?

Ans. His death occurred just before our school closed that year, and school closed that year in May.

Cross-Q. 137. Where was he buried; in what burying-ground?

Ans. In the Lisburn; there is but one burying-ground there.

Cross-Q. 138. Will you please look at the paper which I now hand you and state in whose handwriting it is, if you know?

Ans. I would say it was Mr. Hull's.

Cross-Q. 139. Do you mean the handwriting of Mr. R. P. Hull, the gentleman to whom you have been referring in your testimony?

Ans. I do.

(*Respondents' counsel requests the examiner to insert at this point a copy of said paper in the same manner that the copy of the paper "Exhibit Hull & Nesbit Manuscript" was inserted, and respondents' counsel puts the paper in evidence as "Exhibit Hull Manuscript.*")

(Respondents' counsel requests the examiner to certify on the record that the two sheets, to wit: "Exhibit Hull & Nesbit Manuscript" and "Exhibit Hull Manuscript," appear to be on paper of the same quality, thickness, and color; that the ruling lines of the two papers correspond; that the imprinted trade-marks or manufacturers' marks at the upper corners of the two sheets correspond; that the sheet "Exhibit Hull Manuscript" is about an inch and a quarter shorter than the other by reason of its having been torn off; that each sheet is apparently but half of the original sheet, from which it has been torn along its lateral edge, and that upon placing the torn edges of the two sheets in contact, with the top of one coming exactly to a line with the top of the other,

the torn edges appear to fit together, there being two slight projections at the edge of one sheet which fit into corresponding recesses at the edge of the other when the sheets are placed together, as above stated.]

Complainants' counsel objects to the examiner doing anything of the kind, and objects to the preceding statement of defendents' counsel, so far as relates to any alleged resemblance of the torn edges, because it is obvious that there are no resemblances there, except such as would naturally occur in case of sheets torn from the same quire, and because the examiner is not an expert nor a witness, nor appointed for the purpose of deciding such a question. He has no objection to the examiner certifying according to the first part of the request, if he sees fit, merely as a matter of convenience.

(Respondents' counsel states that there is no question to be decided, only a matter of fact now here appearing which ought to be stated on the record as a matter of protection to the defendants, since the paper is now going out of their possession and it will probably be a long time before the complainants close their rebutting testimony and give defendants the opportunity of examining witnesses concerning the paper, during which intervening time, these two exhibits being of writing paper and easily torn, might be accidentally, or designedly, altered, so that their edges would no longer correspond. And in making this last remark defendants' counsel disclaims any reflection upon complainants' counsel, or the examiner.)

Complainants' counsel objects to this persistent attempt to force upon the record the statements of the respondents' counsel, as if they were evidence; objects that it still more plainly appears from the second request, that it is an endeavor to have the examiner, who was appointed to take testimony, decide a disputed question of fact, and that it does not appear how long the defendants have had the paper in their possession, nor why they didn't produce it before.

(The examiner certifies that the statements of respondents' counsel are correct as to description of the two papers marked respectively "Exhibit Hull and Nesbit Manuscript" and "Exhibit Hull Manuscript," from the beginning as far as the words "torn along its lateral edge" and including said words, but that he declines to certify that the torn edges of the two half pages appear to fit together; that fact being disputed

by complainants' counsel raising a question of fact, which the examiner does not believe that he has jurisdiction to decide.

(Respondents' counsel calls upon the complainants' counsel to produce, either now or at some time before the close of complainants' rebutting evidence, the full history of Cumberland county, containing the biographies referred to by Mr. Nesbit, in order that any biographical sketch of Mr. Drawbaugh that may appear therein may be put in evidence, to the end that the Court may have information of all that the book states about Daniel Drawbaugh.

The "Exhibit Hull Manuscript," is as follows:

"Daniel Drawbaugh

One of the greates inventive geniouses of *this* [the] age (so prolific of great men) is the subject of this sketch, Danl Drawbaugh, who was born in the year —— in the quiet secluded village of Milltown three miles S. W. of Harrisburg where he has spent the greater portion of an active life conceiving & producing as a result of the conceptions of an unusually fertile brain, a score of useful ingenious machines & devices. It appears [that the] *by an* [in] examin*ation* [ing] the list of his inventions that the leading manufacturing intrests of the place (*Milltown*) in [his youthful] *his* boyhood days, gave direction to his thought & incentive to action. We propose to give herewith a sketch of his inventions but are sorry that we cannot accompany it with [a] *such* discription of each as their importance merits His first invention was an automatic sawing machine then a No. of machines used in wagon making next a machine for boring spoke tenets then a machine for sawing tenets a barrel-stave jointing machine patented 1851 this machine was pretty generally introduced & its merits apreciated, an automatic grinding machine was next invented to meet a demand created by the introduction of the jointer, then followed several machines for making staves heading & shingles all of which were patented 1855 after which machine for rounding heading crozing dressing & finishing outside of barrel were [next] invented these were again followed by a device for running mill stones one for dressing mill stones & a device for elevating [mill stones] *grain* in mills. He then invented & had patented 4 improvements in nail-plate feeding next a tack machine & a new design in tacks Photography next engaged his attention, he fitted himself for action in this field, by manufacturing his own camera ground & fitted acramatic lenses for camera prepared the necesorry

chemicals & improved *the* process for enlarging pictures. Next electricity & and electric machinery attracted his attention and an electric machine was produced throwing out of consideration the galvanic Battery & [voltaic] *electric* pile, then a machine for alphebetical telegraphing then the justly celebrated electric clock & the machinery necessary for its construction & several kinds of telephones one of which [was] is opperated by Batery & another by induction It will be seen from the foregoing that Mr. Drawbaugh has has penetrated vast fields in search of information & with what success we leave to the reader to determine. We are proud to own Mr. D. as a citizen of our Township & deem him worthy of a position [of] at the head of the list of our prominent men & are hapy to accord him that position."

The examiner has indicated the erasures in both documents by *square* brackets, for the reason that round brackets occur in the papers themselves.

Re-direct by Mr. Storrow.

Q. Q. 140. I understand you to say after you saw me at the Bolton House last summer you searched with Mrs. Hull at her house at my request, to find if you could any materials or manuscript left by Mr. Hull relating to Milltown or to Mr. Drawbaugh; is that the fact?

Ans. It is.

Q. Q. 141. When and where was it that you found the biographical materials for Mr. Gorgas' biography, as stated in your 129th interrogatory?

Ans. It appears to me that I saw that among the papers at the Bolton House.

Q. Q. 142. Did you and Mrs. Hull search pretty thoroughly upon the occasion when you went to search at my request.

Ans. We did.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 29th day of November, 1882.

FRED. M. OTT,
Examiner.

J. C. NESBIT.

Adjourned until Monday, December 4, 1882, at 10, A. M., at the same place.

DECEMBER 4, 1882.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow, for complainants, and Mr. Hill, for respondents.

Mrs. EMMA M. MCDOWELL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Storrow:

My residence is Cincinnati, Ohio; my husband's occupation is law-reporter, his name is George S. McDowell.

Q. 1. Please look at the history of Cumberland county, which I now show you, the title and imprint of which is as follows: "1731. History of Cumberland County, Pennsylvania, with illustrations. By Rev. Conway P. Wing, DD., and others. Philadelphia, James D. Scott, 439 Chestnut street, 1879," and containing on the back of the title page the following:

"Entered according to an act of Congress in the year 1879, by James D. Scott, in the office of the Librarian of Congress, at Washington, D. C. Herald Printing Company, Carlisle, Pa.," and tell me what relation you are to Mr. James D. Scott, the publisher?

Ans. A daughter.

Q. 2. Were you living at home and did you assist your father in the preparation of it in 1878?

Ans. Yes.

Q. 3. Please look at the biographies in the second column of the third page of biographical sketches at the end of that book, and tell me whether you wrote any of them yourself, and if so, which ones?

Ans. Yes; Daniel Drawbaugh's and William R. Gorgas'.

Mr. Storrow puts in evidence the biography of Daniel Drawbaugh as there printed, which is as follows:

"Daniel Drawbaugh:

An inventive genius of whom our country may feel justly proud, resides at his birth place, Milltown, three miles south-west of Harrisburg. His attention has, as a general thing, been devoted to the improvement of manufactures. His first invention was an automatic sewing machine, followed by various others, including a barrel stave pointer, which was patented in 1857 and pretty generally introduced. Several patents were also taken out in 1855. Many of his inventions, up to this time, had been devoted to the improvement of barrel-making. Mr. Drawbaugh understands photography thoroughly, preparing his own

instruments and chemicals, and improving the process. Telegraphy and electric machines followed. He is the inventor of the justly celebrated 'Electric Clock,' and of several kinds of Telephones, one of which is operated by a battery and the other by induction. It will thus be seen that Mr. Drawbaugh has penetrated large fields in search of information, and with very remarkable success."

Q. 4. Did you write that biography of Daniel Drawbaugh from information originally collected by yourself, or from a manuscript which was furnished you to revise and shorten for publication?

Ans. From a manuscript furnished for revision.

Q. 5. Who handed you that manuscript?

Ans. My father.

Q. 6. Did he tell you from whom he had received it; and if so, from whom?

[*Objected to by Mr. Hill as hearsay.*]

Ans. From Daniel Drawbaugh.

Q. 7. Was it written in pencil or in ink?

Ans. In ink.

Q. 8. Have you made careful search for that manuscript at your father's house and have you been able to find it?

Ans. I have, but have not found it.

Q. 9. How carefully have you searched?

Ans. I have taken the files of papers from the place where they were put and looked at each one.

Q. 10. In that search did you find any of the manuscript belonging to the Cumberland county history?

Ans. No.

Q. 11. Have you any recollection what became of the manuscripts belonging to this history?

Ans. They were placed in a bag and taken to an outbuilding, where they were used for kindling.

Q. 12. How long ago was that?

Ans. In 1880.

Q. 13. On Wednesday last, November 29, 1882, Mr. Ott, the examiner, showed you, at my request, a manuscript in pencil, marked "Exhibit Hull Manuscript;" was that, or was it not, the manuscript which your father gave you to write this biography of Daniel Drawbaugh from?

Ans. It was not.

(Examiner notes that he did so show said exhibit to the witness immediately after adjournment on Wednesday.)

Q. 14. Please to look at the exhibits already in this case entitled "Drawbaugh's Bills for Repairs done for Eberly and Lee, John F. Lee, and Lee & Bayler, Jan. 27, 1882." (See respondents' printed record, page 1020) and state whether this exhibit does or does not appear to you to be in the same handwriting as the manuscript which your father handed you to write the biography of Daniel Drawbaugh from as you have stated?

[*Objected to by Mr. Hill, as leading, immaterial, irrelevant, and incompetent to a degree amounting to an utter burlesque upon evidence, there being no foundation whatever laid for asking any opinion of this witness on the subject.*

Complainants' counsel objects to this attempt to put the remarks of counsel upon the record as if they were evidence or as if this were the proper place for argument.

Respondents' counsel adds that he further objects to this whole line of examination, as being an evident attempt of the complainants to rebut the testimony of their own witness, Nesbit, who was examined last week to prove that the work of collecting, revising, and forwarding to the publishers the materials for the history of Milltown or Eberly's Mills, and its inhabitants, as contained in said history of Cumberland county, was in the charge of Mr. Nesbit and Mr. Hull, as agents or employés of the publishers or proprietors of the history.

Complainants' counsel renews his objection, and requests the examiner to confine himself to his only function, which is to take and report the evidence.]

Ans. It appears to be in the same handwriting.

(The "Exhibit Drawbaugh's Bill for Repairs done for Eberly & Lee," &c., is now delivered into the custody of the examiner.)

Q. 15. State whether you have, or have not, been in the habit of examining handwriting, and noticing the differences between the different styles and the writing of different persons?

[*Same objection.*]

Ans. I have.

Q. 16. Please to read the "Exhibit Hull Manuscript," as copied on

the record at the close of Mr. Nesbit's deposition, and tell me how its contents compare with the manuscript from which you prepared the Drawbaugh biography?

[*Same objection.*]

Ans. It resembles it.

Q. 17. Please state more particularly whether the manuscript from which you prepared the biography contained substantially all that is in this "Exhibit Hull Manuscript," and whether it contained anything which is not in this Hull manuscript?

[*Same objection.*]

Ans. It contained substantially all that is in this. It contained some additional matter in regard to one of the inventions.

Q. 18. What invention; and what was the nature of that additional matter?

[*Same objections.*]

Ans. The electric clock; the dimensions of the clock were described.

Q. 19. In this "Hull Manuscript" I find that the only reference to telephones is a statement that among Mr. Drawbaugh's productions were "the justly celebrated electric clock and the machinery necessary for its construction and several kinds of telephones one of which is operated by a battery and another by induction." I find in the biography as printed the following sentence: "He is the inventor of the justly celebrated electric clock and of several kinds of telephones, one of which is operated by a battery and the other by induction;" is it or is it not your recollection that the manuscript furnished you contained substantially that phraseology?

[*Same objection.*]

Ans. It is my recollection that it did.

Q. 20. According to your recollection did or did not that manuscript furnished to you contain a statement that Mr. Drawbaugh was the first person in the world who had ever invented or made an electric speaking telephone?

[*Same objections.*]

Ans. I do not recollect that statement.

Q. 21. If there had been such a statement in it, would it or would it not have attracted your attention, and would you or would you not have retained it and had it printed in the biography?

(*Same objections, and further objected to as hypothetical, and calling for mere opinion.*)

Ans. It would have attracted my attention and I think I should have had it printed.

(*Without waiving the objections above stated, respondents' counsel cross-examines de bene esse.*)

Cross-Q. 22. When did you last see that alleged manuscript, from which you gathered the materials for that biographical sketch of Daniel Drawbaugh?

Ans. In the year 1880.

Cross-Q. 23. What part of the year 1880?

Ans. I cannot tell, but it was between the months of September and June.

Cross-Q. 24. Do you mean between September, 1879, and June, 1880?

Ans. No; between September, 1880, and June, 1881.

Cross-Q. 25. How came you to see it then?

Ans. I came across it when I was arranging some scattered papers in the outhouse where those papers had been placed.

Cross-Q. 26. Did you read it at that time?

Ans. I picked it up and read it over.

Cross Q. 27. How long did you have it in your hands at that time?

Ans. Probably two or three minutes.

Cross-Q. 28. When had you last seen it before that?

Ans. While preparing the history.

Cross-Q. 29. State just at what time you prepared that biographical sketch of Mr. Drawbaugh's?

Ans. I don't remember the exact time.

Cross-Q. 30. Was it in the summer of 1878?

Ans. I think it was.

Cross Q. 31. How long did it take you to prepare the biographical sketch of Mr. Drawbaugh?

Ans. About an hour.

Cross-Q. 32. That was, then, about all the time you had to spend with the manuscript, was it not?

Ans. It was.

Cross-Q. 33. When did you for the first time see those Lee & Eberly accounts referred to in your 14th question?

Ans. On last Wednesday.

Cross-Q. 34. How many other biographical sketches contained in this history of Cumberland county did you prepare?

Ans. I only recall those of Daniel Drawbaugh and William R. Gorgas; I know that I did more, but don't remember which ones.

Cross-Q. 35. How many more did you write do you think?

Ans. Probably five or six.

Cross-Q. 36. Do you remember any statements contained in the biography of any one of the parties whose biographies you wrote for that history, excepting that of Mr. Daniel Drawbaugh?

Ans. I remember some of the statements in the Gorgas biography.

Cross-Q. 37. You have read over the Gorgas biography within the last week, have you not?

Ans. I have.

Cross-Q. 38. You have also, of course, read over the biography of Daniel Drawbaugh within the last week?

Ans. Yes.

Cross-Q. 39. Then I understand you that you cannot remember any statements contained in any of the biographies except those of Daniel Drawbaugh and William R. Gorgas; am I correct?

Ans. I cannot at present recollect.

Cross-Q. 40. As you have read over the biography of William R. Gorgas within the last week, and as it comprises only thirteen lines in the printed history, I wish you as an illustration of the strength of your memory for a period of one week or less, to state to me all that you can remember of the contents of the said biography of Mr. Gorgas, I holding the history in my hand while you do so.

Ans. The biography states that the ancestors of Mr. Gorgas emigrated from Holland and settled near Germantown, Penna., and then there are some matters which I don't remember, and the sketch closes with a list of Mr. Gorgas' children with their names in full.

Cross-Q. 41. Is that all that you can remember of the biography of Mr. Gorgas, as printed in the history?

Ans. That is all.

(Respondents' counsel here puts in evidence a copy of said biographical sketch of Mr. Gorgas in the exact words of the history, as follows:

"William R. Gorgas

Is the descendant of an emigrant from Holland, John Gorgas, who settled in Germantown, near Philadelphia, prior to the year 1700. His

grandson, the father of Mr. William Gorgas, bought a tract of land in Lower Allen Township in 1803. The property originally belonged to the Penns. It contained a log house and barn, which have been enlarged and improved from time to time, and the barn entirely rebuilt, with various outbuildings. Wm. Gorgas was born in 1806, May 8th, and married in 1840 to Elizabeth Hummel. Five of his children are living. He has settled various estates, and acted as guardian for a number of children. Served in the Legislature 3 years, and 3 years in the State Senate. He has resided in Harrisburg since November, 1877. A considerable quantity of iron ore has been found upon his farm, but it has not been worked for some years."

Cross-Q. 42. On what day did you last read the biographical notice of Mr. Gorgas?

Ans. On last Wednesday, November 29th, 1882.

Cross-Q. 43. Please look again at the history, and count the biographical sketches, and tell me how many there are?

Ans. Twenty, besides one about Henry S. Rupp's nurseries, one about Schroeder & Sons' carriage-works, and one about the White Hall soldiers' orphan school.

Cross-Q. 44. How happened you to be reading in that history on last Wednesday, November 29th?

Ans. We were discussing the matter of Mr. Drawbaugh, and looking at this paper—the handwriting, [indicating the Lee & Eberly accounts above referred to,] and as the history was open, my eye fell on Mr. Gorgas' sketch, and I looked it over.

Cross-Q. 45. Who was discussing the matter of Mr. Drawbaugh at that time, and where was it that the discussion took place?

Ans. Mr. Storrow and myself, in Mr. Storrow's room.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 4th day of December, 1882.

FRED. M. OTT,
Examiner.

EMMA M. MCDOWELL.

Recess for lunch until 2.30, P. M.

DECEMBER 4, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents:

JAMES D. SCOTT, *being produced, sworn and examined, saith:*

Examined by Mr. Storrow.

Q. 1. State your age, residence and ocupation?

Ans. Age, fifty-four; residence, New Britain, Pennsylvania; my occupation is local atlas and map publishing; I have also published some local histories.

Q. 2. Are you the James D. Scott who published the history of Cumberland county now shown you and which has been referred to in the depositions of the two preceding witnesses?

Ans. Yes, sir.

Q. 3. This purports to be printed by the Herald Printing Company of Carlisle, Pennsylvania; did you make a contract with them for printing it; and if so when was it?

Ans. I did, and it was some time early in 1878 that I made the arrangement; the contract was finally signed in June.

Q. 4. It appears from the title page to have been edited by Rev. Dr. Wing. Did you arrange with him to edit it; and if so, when?

Ans. I did and it was in 1877 about the middle of the year some time; I can't tell exactly the time now.

Q. 5. The first part of it, through page 199, appears to be a general history and description of the county; on page 200 begins what is called in the book "History of the townships and boroughs of Cumberland county" and the first article under that heading is entitled "Lower Allen Township, by J. C. Nesbit, Esq."; did you personally arrange with Mr. Nesbit to write the history of Lower Allen township?

Ans. Yes, sir.

Q. 6. Please state generally how you came to make the arrangement with him, and what the nature of it was.

Ans. I was looking around for a local historian in connection with my canvassing, and I was referred to several parties who would probably be able to gather together, and write the local history, amongst others, Mr. Nesbit, to whom I went, and made an arrangement to write the local history. In connection, I associated with him a Mr. Hull of the same village.

Q. 7. Did Mr. Nesbit subscribe for a copy of the book?

Ans. Yes, sir.

Q. 8. Was his subscription made on the same day when you arranged with him for the preparation of the history of Lower Allen, or on a different day?

Ans. It was on the same day.

Q. 9. Please to look at your subscription-book, and turn to his subscription, and read the date under which it is entered; I refer to the book which I here produce.

Ans. His subscription is under date of July 7th, 1878.

Q. 10. Did Mr. Daniel Drawbaugh subscribe for this history; and, if so, will you point out his subscription, in order that the examiner may copy it into the record?

Ans. He did subscribe.

(Witness points out the subscription in the subscription-book; which is as follows: The pages are headed with the following printed matter:

"We, the undersigned, have purchased, and do hereby agree to take of JAS. D. SCOTT, one copy of his Illustrated History of Cumberland County, Penn'a, for which we each do separately agree to pay to him, or his order, the sum of ten dollars ($10) upon delivery of said work at our residence or place of business. Said history to be in size twelve (12) by nine (9) inches, and similar in detail and general character to sample exhibited by solicitor. And we subscribe, subject to the following conditions:—That our subscription is for the book alone; personal matter, such as views, portraits, and biographies, costing extra, and to be paid for by those having them inserted. The work to be delivered as soon as it can be completed, which shall not exceed one year from date of canvass. That no promise made by an agent which interferes with the intent of this contract is valid.")

☞ NOTICE. ☜

Read contract on opposite page.

AN AGENT IS NOT PERMITTED TO TAKE NAMES FOR INFLUENCE.

Post Office Address.

Names. Low All continued	Copies	Date of order	
Henry S. Rupp	1 Paid	— 16	Shiremanstown Pa
B. F. Miller	1	Aug 20	Lisburn, Cumb. Co. Pa
H. M. Bitner	1 Paid	" 20	Shiremanstown
A. L. Rupp	1	" 21	Shiremanstown
Danl. Drawbaugh	1	Note 21	Eberlys Mills
Wm S. Dellinger	1	Note 21	Eberlys Mills
Fredk. K. Sheeley	1	Paid 21	" "
Reuben S. Roth	1	" 23	Shiremanstown
S. L. Goodyear	1	" 23	Lisburn"

(The words "Low All continued" interlined in pencil.)

Q. 11. I do not see the year written on that page. Will you turn back in the book and read the entry nearest to Mr. Drawbaugh's subscription which has the year?

Ans. The first date on the next preceding page but one is July 23rd, 1878.

Q. 12. Then I understand the statement in the book to be that Mr. Drawbaugh subscribed August 21st, 1878: is that the fact?

Ans. Yes, sir.

Q. 13. Did you take that subscription; and did you see him write his name in the book, where you have just shown it?

Ans. Yes, sir; I saw him write his name in the book.

Q. 14. Where was it that you obtained his subscription, and that he so wrote his name?

Ans. It was at his mill or factory, in Lower Allen township.

Q. 15. Did you make any agreement or arrangement with him about publishing his biography in your proposed book; and if so, state generally the nature of that arrangement and what was done on that occasion about preparing his biography?

Ans. Yes, sir; I agreed to publish a short biography of subscribers at that time and in order to obtain this biography I had printed slips with questions to be answered; I commenced asking him the questions to fill up the slip and had it partly filled up when I found that I couldn't get in all he wanted on my slip; and I told him he had better write out a little sketch of what he wanted for himself; and he thought so too; and we agreed to leave it that way—for him to write out a short sketch of his history and mail it to me.

Q. 16. Did you afterwards receive that sketch by mail?

[*Counsel for respondents says: Inasmuch as a biographical*

sketch of Daniel Drawbaugh was found in the handwriting of Mr. Hull, one of the agents for the publication of that book, which bears a striking resemblance to the sketch in the book, he objects to the question, as indefinite and misleading unless the complainants shall afterwards show from what person the sketch referred to in a question, was received.

And he further objects to the whole matter of this deposition up to this point, as irrelevant and immaterial and not in rebuttal.]

Ans. Yes, sir.

Q. 17. Was or was not Mr. Hull employed by you to prepare a biographical sketch of Mr. Drawbaugh for publication in this book?

Ans. He was not employed to write biographical sketches.

Q. 18. Did you ever ask Mr. Hull to write a biographical sketch of Daniel Drawbaugh?

Ans. No, sir.

Q. 19. Did you or did you not ever have any conversation with Mr. Hull with reference to writing a biographical sketch of Mr. Drawbaugh for this book?

[*This and the last two preceding questions and answers objected to by respondents' counsel as immaterial and irrelevant and incompetent, it already having appeared from the testimony of complainants' witness Nesbit that Mr. Hull, at the time when the history was preparing, understood himself to be employed to prepare biographical sketches. And further, that as he is now dead, the respondents are deprived of his testimony on the subject. The testimony of this witness as to matters that passed between him and the deceased Hull will be but one sided and hearsay, besides being utterly irrelevant to the issues in this case.*

Complainants' counsel objects to the statements in the preceding remarks as unfounded, and further, because it is obvious that the complainants are the losers by the death of Mr. Hull, so far as his deposition would be of value.

Respondents' counsel objects to this last statement as an utterly unfounded assumption, the exact contrary of which respondents' counsel believes to be true.]

Ans. I never did; I don't think.

Q. 20. Did you or did you not ever ask anyone to prepare for you a sketch or the materials for it, except in the suggestion made to or by Mr. Drawbaugh on the occasion when you took his subscription?

[*Objected to by Mr. Hill, as immaterial and irrelevant, and only in rebuttal of complainants' own evidence.*]

Ans. I think not; I don't recollect that I did.

Q. 21. Was the biographical sketch of Mr. Drawbaugh which you received as you have stated written in pencil or in ink?

[*Same objection.*]

Ans. It was written in ink, I think; I am sure it was.

Q. 22. Whom did you hand it to to prepare the biography for publication as it was published in that part of the book which I now show you?

[*Same objection.*]

Ans. I handed that, with others, to my daughter to prepare, revise, or review I might say.

Q. 23. Did you read it before you handed it to her?

[*Same objection.*]

Ans. Yes, sir.

Q. 24. Please to read the "Exhibit Hull Manuscript," as entered on the record at the close of Mr. Nesbit's deposition, and state whether, according to your recollection, the manuscript of Daniel Drawbaugh's biography which you so handed to your daughter, did, or did not, contain substantially what is found in that exhibit; and whether it did or did not contain anything in addition to what is contained in that exhibit?

[*Same objection.*]

Ans. I think that this is very similar, but it seems to be in some places fuller and in others not so full as that biography. That is to say, I don't remember some of the mechanical matter. He went into some things more fully, for instance about the clock; otherwise I should say it is very similar.

Q. 25. At the time when you were at his shop and got his subscription and talked to him about his biography, did he or did he not tell you that he was or claimed to be the first man in the world who had ever invented or made an electric speaking telephone?

[*Same objection.*]

Ans. No, sir; he didn't tell me anything of that kind.

Q. 26. Is or is not a statement of that kind, if it had been made to you, one that would have impressed itself upon your recollection, and have been put into your book?

[*Same objection, and further objected to as hypothetical argu-*

mentative, calling for mere opinion, substantially leading, and otherwise incompetent.]

Ans. It certainly would have impressed itself on my mind, but I don't know whether it would have been put into the book unless it was in the written biography.

Q. 27. Referring now to the manuscript biographical sketch of Daniel Drawbaugh which you say you received, do you know where it is now or whether or not it exists?

Ans. That, with several other manuscripts, was received back from the printing office, kept for a time, and I suppose it was destroyed with others.

Q. 28. My question did not relate to your daughter's manuscript, from which that article was printed, but to the manuscript sketch which you say you received and handed to your daughter; have you got that or do you know where it is?

[*Objected to as almost directly instructing the witness to change the testimony just given in his last answer.*]

Ans. I think they were all destroyed together; we haven't got it—can't find it—all destroyed together, I think.

Q. 29. State whether or not you have made careful search for the manuscripts and papers connected with this history of Cumberland county.

Ans. Yes, sir.

Q. 30. I observe that the word "note" is written in ink opposite the pencil subscription of Mr. Drawbaugh in the subscription book; in whose handwriting is that word, and what does it signify?

Ans. It is my own handwriting, and it signifies a note taken in payment of a copy of the history delivered to him.

Q. 31. Please produce the note which was taken from Mr. Drawbaugh in payment for that history and read it as part of your answer.

[*Objected to by Mr. Hill as utterly immaterial and irrelevant.*]

Ans. Here it is. (Witness reads.)

"*1046*

$10\frac{00}{100}$ *Eberly's Mills, Feb. 27th,* 1879.

Forty days after date *I* promise to pay to the order of *James D. Scott* at the First National Bank of *Harrisburg ten* $\frac{00}{100}$ dollars without defalcation for value received.

Dan'l Drawbaugh.

Credit the drawer.

Apr. 11th."

(The italics represent words written in ink and the balance of the face

of the note is printed, as is also the word "Newville" which has been erased and the words "Eberly's Mills" substituted for it the first time, and Harrisburg the second time, indicating the place where the note was made and the place of payment respectively. The face of the note also has in pencil the words "Not paid" written across it; the endorsements are as folllows:

"1046 D. Drawbaugh 10 Apr. 11th" (in red ink). "James D. Scott" (in ink across the middle). "Pay F. C. First, Esq., Cashier or order for Collection & Credit; for account of Carlisle Deposit Bank.

S. Keller, Cas."

all stamped in red ink except the proper names which are written in black ink, and the whole erased in pencil. "Not good" written in pencil before the foregoing.)

Q. 32. It is made to the order of James D. Scott and bears across the back the name "James D. Scott"; in whose hand-writing is that name across the back?

[*Same objection.*]

Ans. My own.

Q. 33. Abraham B. Shank, a witness called for the respondents, testified and produced on page 33 of respondents' printed record an execution against Daniel Drawbaugh in favor of James D. Scott, for the total sum of seventeen dollars and fifty-four cents, including costs; did you or did you not put that note in the hands of an attorney for collection and suit?

[*Same objection.*]

Ans. I did, after it had become due and was unpaid.

(Without waiving any of the above objections respondents' counsel cross-examines *de bene esse.*)

Cross-Q. 34. The note which you have produced is in the form of an accommodation note; was it so intended and used at the time?

Ans. No, sir; it was received as payment for the subscription and used as such.

Cross-Q. 35. Was this history of Cumberland county the first local history that you were ever connected with?

Ans. Yes, sir; I believe it was the first history—not the first other publication.

Cross-Q. 36. What other subscription publication had you been connected with prior to that?

Ans. I had been publishing county maps previous to that: I had published perhaps fifty or sixty county maps and atlases; and I recall

now a mistake in my previous answer; I had put a short sketch of history in one or two of my atlases previous to this.

Cross-Q. 37. Were those county maps published on subscription?

Ans. Yes, sir; we always publish county maps by subscription.

Cross-Q. 38. Did you personally canvass or direct the canvassing for subscriptions for those maps?

Ans. I did both; the larger part was done through canvassers under my direction.

Cross-Q. 39. Then, in the year 1878, you were already an old hand at the canvassing and subscription publication business, were you not?

Ans. Yes, sir; I suppose so, although not considered a very good hand by some of my best canvassers.

Cross-Q. 40. How many visits did you ever make to Daniel Drawbaugh's shop at Eberly's mills?

Ans. I don't recollect of ever being there but the once, which was at the time I took his subscription.

Cross-Q. 41. That was on the 21st day of August, 1878, was it not?

Ans. Yes, sir.

Cross-Q. 42. How long did you stay there at his shop on that visit?

Ans. I can't tell exactly how long; some little while; some time, talking; I was there may be half an hour; may be an hour.

Cross-Q. 43. What time of day was it?

Ans. I can't recollect.

Cross-Q. 44. Did you see any telephones there at his shop on that visit?

Ans. No, sir; I don't think I did; I saw some other machinery and some other inventions; I saw an electric clock.

Cross-Q. 45. Are you sure that you never saw an electric speaking telephone at Mr. Drawbaugh's shop?

Ans. I am sure I never did; I don't think anything was said about it.

Cross-Q. 46. Are you sure about that last part of the statement, that nothing was said about telephones at his shop?

Ans. Yes; I am sure that if I had heard about that, it would have impressed my memory. I was interested in hearing about the telephone at that time; some of my friends were talking about it and I would have remembered it.

Cross-Q. 47. Did you have any talk with Mr. Drawbaugh during that

visit about his making any drawings for you, to be used by you in connection with the proposed history?

Ans. O, yes; I remember that; he told me he was an artist also, and could make sketches for me if I wanted any made; I told him I might have some for him to do.

Cross-Q. 48. Did he show you any specimens of his skill in sketching?

Ans. Yes, sir.

Cross-Q. 49. Now don't you remember that you held out the inducement to him that if he would subscribe for that history you would furnish him with work in making sketches or drawings to be published in it, and would pay him for such work?

Ans. No, sir; for he subscribed before anything was said about the pictures; I remember that well.

Cross-Q. 50. Did you mention to him any particular sketches that you were thinking of having made for the history?

Ans. I don't recollect; I may have mentioned some views that we had engaged by that time, that would have to be sketched by some one; I think likely I did.

Adjourned until Dec. 5, 1882, at 10, A. M.

DEC. 5, 1882, 10, A. M.

Examination resumed pursuant to adjournment; present, same counsel.

Cross-examination of James D. Scott, by Mr. Hill, continued.

Cross-Q. 51. Do you remember talking with him about making a sketch of Boiling Springs for the history?

Ans. Yes, sir; I think I mentioned Boiling Springs as one that I would have to have sketched.

Cross-Q. 52. Do you remember talking with him about making any sketches of Milltown or of anything there or in that neighborhood?

Ans. I do not recollect any special views that I mentioned, in that neighborhood; I do recollect that I mentioned that I had engaged views at Boiling Springs and Mount Holly Springs, but I don't think that I had those engaged in that neighborhood by that time.

Cross-Q. 53. Do you remember telling him that you had thought of employing some Philadelphia artist to make your sketches, but that as

he, Drawbaugh, was on the ground, it would be more convenient for you to employ him?

Ans. I didn't use that language—that I had thought of employing a Philadelphia artist, for I had a number of sketches in the western part of the county already done by a Philadelphia artist at that time. And yet I may have told him that it would be more convenient, if he could do it, for me to employ an artist there; not making it specific but indefinite.

Cross-Q. 54. A judgment against Daniel Drawbaugh in your favor for $17.54 has been referred to, and you have stated substantially that that judgment was on the ten dollar note which Drawbaugh gave you; how came you to have the note here in your possession, if it had been put in suit and judgment obtained upon it?

Ans. The note was deposited in the Carlisle Deposit Bank or in one of the Carlisle banks for collection among others; and at maturity, not being paid, I received it back from the bank and placed it with my attorney, Mr. Leidich, of Carlisle, for collection with request to write to him, Drawbaugh, before suit was brought, and it not being paid for some time Mr. Leidich was instructed to bring suit; on which he informed me judgment was obtained and execution issued, I believe; I don't know whether it was paid before actual levy or not. At any rate it was paid, debt and interest and costs, and Mr. Leidich remitted me the amount of my note. I gave no further thought, but supposed that the note was given up at the time of the execution and payment, and had no other knowledge of it until it was shown me by Mr. Comfort, I believe, sometime during the present summer or during the present year, when he informed me that he had received it from Mr. Leidich on an order that I had given him for any papers relating to Mr. Drawbaugh; I have not had it in possession myself.

Cross-Q. 55. Do you mean Mr. John C. Comfort, of Cumberland county?

Ans. Yes, sir.

Cross-Q. 56. How came the judgment to be for $17 54 when the note was only for ten dollars; what did the $7 54 represent?

[*Question objected to by Mr. Storrow, because the proper answer is to be found in the records of the suit and in the execution in the hands of respondents' witness Shank.*]

Ans. I believe it represents the interest and costs of the suit.

Cross-Q. 57. Did you have any account against Mr. Drawbaugh besides the note?

Ans. I had a memorandum of the subscriptions not paid; that might be called an account, but not in a very regular way.

Cross-Q. 58. You mean a memorandum of the ten-dollar subscription, which was covered by the note, do you?

Ans. Yes, sir.

Cross-Q. 59. That is all the account you had against him, is it?

Ans. Yes, sir; I believe so.

Cross-Q. 60. Had Drawbaugh ever paid you any money, up to the time when that note was put in suit?

Ans. No, sir; he had not.

Cross-Q. 61. Did he pay you anything at the time he subscribed for the book?

Ans. No, sir.

Cross-Q. 62. Did you have to bring any suits against other parties to collect subscriptions for the book?

Ans. I did; some others.

Cross-Q. 63. What was the regular subscription price of the book?

Ans. Ten dollars.

Cross-Q. 64. Do you mean ten dollars for the book, without any biographical sketch?

Ans. Yes, sir; that was the subscription price of the book, without anything else.

Cross-Q. 65. How came you to publish some of the books with biographical sketches, and some without?

Ans. It was because Doctor Wing, who had the editorial charge of the work, objected to publishing these small biographies; and, as we did not enter into the plan of publishing biographical sketches for subscribers until near the close of the subscription, I only had them bound in that part that we distributed in the eastern part of the country.

Cross-Q. 66. How many of the books did you have bound up with biographical sketches, and distributed to subscribers?

Ans. I do not recollect now; I think nearly half of the edition of four hundred.

(*Examination of this witness was suspended to take depositions of Levi Maish and George C. Maynard and resumed after said depositions were completed.*)

Adjourned until Dec. 6, 1882, at ten, A. M.

DECEMBER 6, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow and Mr. Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of James D. Scott, by Mr. Hill, continued.

Cross-Q. 67. How many biographical sketches were published in the book?

Ans. I did not count them, but I think there were about twenty of these at the end and then there were some more scattered through the work, some of which were in connection with the medical profession.

Cross-Q. 68. Can you name any subscriber of whom no biographical notice was contained in the book, but to whom one of the books containing biographical notices was delivered in performance of the subscription contract on your part?

Ans. I can't remember any particular subscriber, but I think they were generally delivered in the eastern part of the county with biographical sketches.

Cross-Q. 69. What charge did you make for inserting a biographical sketch without any illustration?

Ans. When the contracts were first printed we intended to charge from ten to twenty dollars, but the agents said they could get subscribers best without biographical sketches; and near the close of the subscription I made it gratuitous in soliciting their subscriptions.

Cross-Q. 70. Was Mr. Gorgas' biographical notice a gratuitous one?

Ans. Yes, sir; I think it was; Mr. Gorgas paid for a sketch or view extra.

Cross-Q. 71. Was Mr. Daniel Drawbaugh's biographical sketch gratuitous?

Ans. It was.

Cross-Q. 72. Was there a sketch or picture published of Mr. Gorgas' place of business or residence?

Ans. There was of his residence, or farm, rather. It is called the "Gorgas Homestead."

Cross-Q. 73. With reference to Mr. Gorgas' biographical notice and the picture of his homestead, who transacted the business with him on your part?

Ans. I don't remember who took the order. I think Mr. Swartz. I am not certain.

Cross-Q. 74. Please give a list of the twenty biographical sketches contained in the last part of this book.

Ans. John Eberly, Sr., Henry S. Rupp, nursery, H. M. Bitner, Shroeder & Sons, Julius B. Kaufman, Hon. George M. Mumper, William Brooks, George Walker, Daniel Drawbaugh, William R. Gorgas, George M. Rupp, Levi Hertzler, Major J. A. Moore, John G. Heck, J. T. Criswell, M. D., H. M. Rupley, Henry R. Mosser, George Messinger, H. K. Witmer, Samuel M. Hertzler, Matthias Bitner, James M. Ralston.

Cross-Q. 75. Did Mr. Coble do any work for you in getting up those biographical sketches, or any of them?

Ans. No, sir; I don't know him.

Cross-Q. 76. Did Mr. D. A. Hamacher do any work for you in getting up any of them?

Ans. I don't remember making any arrangement with him. I think one or two of the personal sketches came in with his name attached.

Cross-Q. 77. Did they come in direct, or through Mr. Hull's hands?

Ans. I think they were sent to the Carlisle *Herald* office. I don't know who sent them. I don't remember. Most of those sketches were sent to Carlisle to my name in care of the *Herald* office. Some were sent to Dr. Wing. I told them to send them either to me or to Dr. Wing, or *we* told them. I didn't always tell them myself. Sometimes the agents did.

Cross-Q. 78. What agents—those who were soliciting subscriptions, or those who were obtaining information to be put into the history?

Ans. Those who were obtaining subscriptions.

Cross-Q. 79. Did Mr. Hamacher obtain any subscriptions, or act as an agent for subscriptions?

Ans. No, sir; I think not. I don't remember, if he did.

Cross-Q. 80. Please look at the book, and see if Mr. Hamacher's name is not signed to one of the biographical sketches; and, if so, which one?

Ans. It is printed as having been signed to George M. Rupp's sketch.

Cross-Q. 81. Who employed Mr. Hamacher to get up that sketch of George M. Rupp's life?

Ans. I don't know. It may have been Mr. Rupp himself. The parties were sometimes left to write out their own lives, and he may have been employed by Mr. Rupp, as a neighbor, and the sketch received as authentic. I don't know anything about it.

[*The statement about what may have been, objected to by Mr. Hill, as irresponsive and mere guesswork.*]

Cross-Q. 82. Who furnished the materials for Mr. Gorgas' biographical sketch?

Ans. I don't recollect.

Cross-Q. 83. Who furnished the materials for Major Moore's biographical sketch?

Ans. I don't remember that either, now.

Cross-Q. 84. Who furnished the materials for Samuel M. Hertzler's biographical sketch?

Ans. I don't remember.

Cross-Q. 85. Who furnished the materials for John G. Heck's biographical sketch?

Ans. That was made out by one of the blanks being filled out by myself, asking him questions and receiving answers.

Cross-Q. 86. Who furnished the materials for Dr. Criswell's biographical sketch?

Ans. I don't recollect hardly any of these.

Cross-Q. 87. Do you recollect about H. M. Rupley's?

Ans. No, sir; I do not.

Cross-Q. 88. Or Mr. Walker's, or Mr. Eberly's, H. M. Bitner's, Matthias Bitner's, Mr. Witmer's, Mr. Messinger's, or Mr. Ralston's?

Ans. I don't remember any excepting Mr. Walker's and Matthias Bitner's. I know I made them out on blanks myself.

Cross-Q. 89. You state that you made Mr. Walker's, Mr. Heck's, and Matthias Bitner's, and made them on blanks which you had prepared for the purpose; and while answering the questions this morning you have had the history in your hand. Do you recognize in those three biographies so close a correspondence to the arrangement of the blanks that you are able so to testify, or would you have been able so to testify without looking at the book?

Ans. I would, for I remember distinctly of filling in those biographies.

Cross-Q. 90. When Daniel Drawbaugh's biographical sketch came to you by mail, where did it come, to Philadelphia or Carlisle?

Ans. I am not positive, but I think to my address at Carlisle.

Cross-Q. 91. Who opened the enclosure containing it?

Ans. I did.

Cross-Q. 92. Do you make that answer because you always opened

any communications that were addressed to you at Carlisle, or because you distinctly remember opening that enclosure?

Ans. Yes; I answer because I always opened communications addressed to me at Carlisle, and most of those biographical sketches were addressed to me at Carlisle, and those addressed to either myself or Dr. Wing were handed directly to me without change, I suppose.

Cross-Q. 93. Do you remember whether this particular enclosure was addressed to you personally, or in the other way that you have mentioned—to you or Dr. Wing?

Ans. I don't remember distinctly about that. It came into my hands.

Cross-Q. 94. Was there anything else inclosed in the same enclosure with it? If so, what?

Ans. I don't remember that there was anything else, except the blank which I had partly filled, and left with him to finish. I think that was with it.

Cross-Q. 95. Do you swear positively that that was with it?

Ans. Not positively. I know it was with it when I put it into my daughter's hands.

Cross-Q. 96. When that biographical sketch of Drawbaugh came into your hands at Carlisle, did you put it immediately into your daughter's hands?

Ans. As soon as I could conveniently.

Cross-Q. 97. Did you first read it, or merely glance at it to see what it was?

Ans. I kept them in my room until I returned home, and during the interval I read over the papers or sketches, and I read this one—this sketch.

Cross-Q. 98. Have you any distinct recollection of reading this particular sketch at that time, or do you merely suppose that you read it with the rest?

Ans. I remember reading it.

Cross-Q. 99. Did you read it more than once?

Ans. I don't remember that I did. I looked it over with my daughter after I went home.

Cross-Q. 100. Was that for the purpose of comparing it with what your daughter had made out as a sketch to be published?

Ans. That; and also we looked it over, and made suggestions, before she had written.

Cross-Q. 101. Suggestions as to what changes should be made in it for publication?

Ans. Yes, sir; I made suggestions where it might be cut down without impairing the value of the biography.

Cross-Q. 102. Did you ever see it afterwards?

Ans. I don't remember positively; I think I did. I put it away with my other papers, and never looked at it much after that.

Cross-Q. 103 When manuscripts were addressed in the alternative to you or Dr. Wing, as you have stated, did Dr. Wing open such as came into his hands from the post-office?

Ans. I never saw him do so; I suppose he did open his letters.

Cross-Q. 104. State what that address was that you refer to as being to you or Dr. Wing. How would the address of a letter so directed read?

Ans. I don't remember anything excepting "Rev. C. P. Wing, Carlisle," his address.

Cross-Q. 105. Then you directed parties to address their communications either to you or to Dr. Wing as they might elect or prefer; is that the idea?

Ans. Yes, sir. the sketches, though, probably were requested to be directed especially to me, though to either would answer.

Cross-Q. 106. I observe that three of the biographical sketches in the history, to wit, that of John Eberly, Sr., that of Wiliam Brooks and that of George M. Rupp are signed; do you remember the manuscripts of those particular sketches or any of them?

Ans. I don't remember those distinctly.

(The three referred to are signed respectively "Samuel Eberly," "James Brooks," "D. A. Hamacher.")

Cross Q. 107. Do you remember any other manuscript biographical sketch that was signed, except those three?

Ans. I don't remember any other.

Cross-Q. 108. In the printed biographical sketch, I observe certain statements, such as the following: "Daniel Drawbaugh, an inventive genius of whom our country may feel justly proud." "It will thus be seen that Mr. Drawbaugh has penetrated large fields in search of information and with very remarkable success." Would you not consider those rather remarkable statements for a man to make about himself?

Ans. I wouldn't consider them very remarkable for a man who has a high opinion of himself.

Cross-Q. 109. I wish to point out to you some peculiar correspond-

ences between the statements contained in "Exhibit Hull Manuscript" and the statements contained in the biographical sketch of Daniel Drawbaugh published in the history, as follows:

Extracts from Manuscript.	Extracts from Biography.
Daniel Drawbaugh, one of the greatest inventive geniuses of this age.	Daniel Drawbaugh, an inventive genius of whom any country may feel justly proud.
Milltown, three miles S. W. of Harrisburg.	Milltown, three miles south-west of Harrisburg.
His first invention was an automatic sawing machine.	His first invention was an automatic sewing machine.
Pretty generally introduced.	Pretty generally introduced.
All of which were patented 1855.	Several patents were also taken out in 1855.
Photography next engaged his attention; he fitted himself for action in this field by manufacturing his own camera, ground and fitted acramatic lenses for camera, prepared the necessary chemicals and improved process for enlarging pictures.	Mr. Drawbaugh understands photography thoroughly, preparing his own instruments and chemicals, and improving the process.
The justly celebrated electric clock.	The justly celebrated electric clock.
Several kinds of telephones, one of which is operated by a battery and another by induction.	Several kinds of telephones, one of which is operated by a battery and the other by induction.
It will be seen from the foregoing that Mr. Drawbaugh has penetrated vast fields in search of information, and with what success we leave to the reader to determine.	It will thus be seen that Mr. Drawbaugh has penetrated large fields in search of information and with very remarkable success.
We are proud to own Mr. D. as a citizen of our township.	Of whom our country may feel justly proud.

These expressions, follow in the same order in each, except in case of the last quoted, in which the statement of being proud of Mr. Drawbaugh is at the beginning in the history, and near the end of the manuscript. I also call your attention to the fact that the general order and sequence of all the matters referred to in both are substantially the

same; would not these coincidences of expression suggest to your mind a probable connection between the Hull manuscript and the sketch in the history?

Ans. It does, as I admitted before. He must have had the penciled paper to copy from. It is called the Hull manuscript, but I don't know where it came from.

[*All but the first six words objected to by Mr. Hill, as irresponsive.*]

Recess for lunch until two, P. M.

DECEMBER 6, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of James D. Scott, by Mr. Hill, continued.

Cross-Q. 110. Who prepared the material for Mr. Gorgas' biographical sketch?

Ans. I don't recollect, if I do know.

Cross-Q. 111. You have stated that you had to bring some suits for the collection of your subscriptions for that history; was there not a good deal of dissatisfaction with it among the subscribers; and did they not very generally complain that it did not conform to the representations that had been made to them to induce them to subscribe?

Ans. Not very much—generally satisfactory.

Cross-Q. 112. How many suits did you have to bring to collect subscriptions?

Ans. I don't remember the number—not very many.

Cross-Q. 113. Had you any attorney in Cumberland county; if so, mention the names of all?

Ans. I had one attorney in Carlisle, S. M. Leidich.

Cross-Q. 114. How many subscription accounts and notes did you have to put in his hands for collection?

Ans. I don't remember the number.

Cross-Q. 115. A good many?

Ans. Several, not very many compared with the list, the usual percentage of delinquents.

Cross-Q 116. What is your usual percentage of delinquents?

Ans. I can't say any definite amount, sometimes more, sometimes less.

Cross-Q. 117. How many subscribers did you have for the history in Cumberland county?

Ans. About four hundred.

Cross-Q. 118. Did you bring as many as forty suits to collect subscriptions?

Ans. No, sir; I think not.

Cross-Q. 119. Did you put as many as forty of them into your attorney's hands for collection?

Ans. I don't remember. There may have been claims up to that number placed with him—that I hadn't time to go to see them again.

Cross-Q. 120. How were the books delivered to subscribers, and who delivered them?

Ans. They were mostly delivered by the agents. I delivered some myself in the boroughs and towns.

Cross-Q. 121. Who delivered Daniel Drawbaugh's to him, and when?

Ans. I think it was delivered by a Mr. Foust, in the early part of 1879.

Cross-Q. 122. What is Mr. Foust's full name and where does he reside?

Ans. Robert G. Foust; resides in Philadelphia.

Cross-Q. 123. When did you first talk to anybody connected with this suit in any way about the matters referred to in your testimony; and who was it?

Ans. I don't remember when it was, but it was probably over a year ago. Mr. John C. Comfort called upon me at my residence. That was the first conversation I had about this matter.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of December, 1882.

FRED. M. OTT,
Examiner.

JAMES D. SCOTT.

ROBERT G. FOUST, *being produced, sworn and examined, saith:*

Examined by Mr. Storrow.

Q. 1. State your age, residence and occupation?

Ans. Thirty-one years of age; residence, 1025 Wallace street, Philadelphia; and business now, the asphalt paving block and roofing business.

Q. 2. Look at the history of Cumberland county, which has been referred to in the testimony, and tell me whether you know Mr. James D. Scott, the publisher of it, and how long you have known him?

Ans. I recognize this as the history that was published by Mr. Scott; I have known him since either the latter part of 1873, or the beginning of 1874.

Q. 3. How long have you been connected with the publication of maps or county publications, and with whom, and in what capacities?

Ans. I was connected with G. M. Hopkins for nearly three years as surveyor and draftsman, and with Mr. Scott at different times for a period of about six years in the capacity of surveying, drafting, canvassing, delivering and collecting.

Q. 4. Were you employed by Mr. Scott in connection with the publication of this history of Cumberland county, and if so, in what capacity?

Ans. Yes, sir; in soliciting subscribers for the book and the views contained therein, and in the delivery of the work and collection of the money.

Q. 5. What part of the county did you canvass for subscribers?

Ans. Principally in the north-western portion of the county and a portion of the territory lying between Carlisle and Mechanicsburg, north and south.

Q. 6. Did you deliver the histories in the eastern part of the county, including Lower Allen township?

Ans. I did.

Q. 7. Did you deliver the history to Mr. Daniel Drawbaugh, of Eberly's Mills, whose name appears in the subscription book of Mr. Scott?

Ans. I did.

Q. 8. There has been produced in evidence (see Scott's deposition, p. 719) a promissory note of Daniel Drawbaugh for ten dollars, dated Feb. 27, 1879, to the order of James D. Scott; in whose handwriting is the manuscript part of the body of that note?

Ans. In my own handwriting.

Q. 9. Did you receive that note from Mr Drawbaugh yourself, and did he sign the note in your presence?

Ans. Yes, sir.

Q. 10. When you delivered this history to Mr. Drawbaugh, did you or not deliver to him a copy which had at the end the various biographies, including his?

Ans. The copy I delivered to Mr. Drawbaugh included his biography.

Q. 11. Where was this that you delivered it to him?

Ans. In his mill at Eberly's Mills.

Q. 12. When you delivered it to him, did you or not show him the sketch of Milltown, on page 201, and his biography over at the end of the book?

Ans. Yes, sir; he looked at both of them.

Q. 13. Did he make any complaint or remark about either, and if so, what was it?

Ans. After reading his biography he said, "Oh, this is not as long as the one I sent."

Q. 14. Did he or not accept the book on that occasion before you left the shop?

Ans. He did.

Q. 15. Did you leave the book with him or take it away with you on that occasion?

Ans. I left it with him.

Q. 16. Did he pay for the book on that occasion, or not?

Ans. He did not.

Q. 17. Will you state what passed between you and him on that occasion about paying for the book—what was done about it?

Ans. He said he did not have the money ready, but offered to give his note. I told him it was a small matter; that I would rather have the money; and, as I was not through with that section of the county, I would leave it for a few days, and call again. I called once or twice after that, and he still not having the money ready, I concluded to accept his note, which he gave.

Q. 18. This note is dated February 27, 1879; is it the note that he gave you for the book?

Ans. Yes, sir; it appears to be the identical note.

Q. 19. Was, or was it not, dated the day it was given?

Ans. Yes, sir; on the same day. He signed it immediately after I filled it up.

Q. 20. When Mr. Drawbaugh remarked upon the length of his biography in the book, as you have stated, did you make any reply to that remark; and, if so, what did you reply?

Ans. I told him that his was like many others, too long and too expensive to print. That we did considerable culling out of the manu-

scripts sent us, but that his contained all the essential points that he had sent, when he remarked: "I suppose it's all right."

[*Respondents' counsel objects to the whole deposition, as irrelevant, immaterial, and not in rebuttal; and, without waiving any of said objections, cross-examines de bene esse.*]

Cross-Q. 21. How long have you lived at 1025 Wallace street?

Ans. A little more than a year.

Cross-Q. 22. Where did you live next before that, and from what time to what time?

Ans. Prior to moving there I lived at 617 Vine street, Philadelphia, from about the 1st of October, 1881, to the time I moved to Wallace street.

Cross-Q. 23. State the time when you moved to Wallace street.

Ans. About the 14th of November, 1881.

Cross-Q. 24. Where did you live next prior to living at 617 Vine street, and from what time?

Ans. In Atlantic City, from the 7th of June, 1881.

Cross-Q. 25. Where did you live next prior to living at Atlantic City, and from what time?

Ans. In Carlisle, Cumberland county, from December, 1879, with the exception of a short period when I remained in Philadelphia, prior to going to Atlantic City, on June 7.

Cross-Q. 26. State more definitely the place of your residence in Carlisle.

Ans. I was proprietor of the "Bentz House," now known as the "Florence Hotel."

Cross-Q. 27. Where did you live next prior to living at Carlisle, and from what time?

Ans. I made Philadelphia my home, when not traveling, for about ten or twelve years.

Cross-Q. 28. What was your place of residence in Philadelphia during that ten or twelve years' time?

Ans. I boarded at several places during that period. I boarded with my brother-in-law most of the time, on North Sixth street, and also on North Seventh.

Cross-Q. 29. Mention the streets and numbers of all the places where you boarded during that time, and the names of the proprietors of the houses.

Ans. On North Sixth street, I can't remember the numbers—twenty-two hundred and something—eight or ten or along there somewhere—and then another number in the same block on the same street, higher up. I can't tell that number. H. R. Alderfer is the name of the proprietor of both numbers. He is my brother-in-law. The last place, prior to moving to Carlisle, was 2214 North Seventh street, with the same party.

Cross-Q. 30. How long have you been in the asphalt paving-block and roofing business?

Ans. Since last March, (1882.)

Cross-Q. 31. What business were you in immediately prior to that?

Ans. Keeping books.

Cross-Q. 32. Where, and for whom, and how long?

Ans. On the corner of Seventeenth and Wallace streets, Philadelphia. A four months, more or less. For F. M. Bush.

Cross-Q. 33. What business were you engaged in next before keeping books for Mr. Bush?

Ans. I was connected with the Stockton Hotel, Atlantic City.

Cross-Q. 34. In what capacity?

Ans. Room-clerk, cashier, and had a general supervision of the books.

Cross-Q. 35. Who was the proprietor of that hotel at that time?

Ans. Walter H. Kirk.

Cross-Q. 36. What business were you engaged in next before being connected with the Stockton Hotel?

Ans. I was proprietor of the Bentz House, Carlisle.

Cross-Q. 37. What business were you engaged in next before keeping the Bentz House?

Ans. I was canvassing for publication of local works.

Cross-Q. 38. How long were you engaged in that business?

Ans. At different times since 1870 or 1871.

Cross-Q. 39. For what different local publications, besides this history, did you ever canvass; and give the names of their several proprietors, or the persons by whom you were employed, and for whom you worked?

Ans. The "Atlas of Bucks County," the "Atlas of Montgomery County," in Pennsylvania; and the "Atlas of Burlington County" in New Jersey; maps of the cities of Long Branch, Atlantic City, and Cape May, all by James D. Scott. The "History of Franklin County,"

Pennsylvania, by D. F. Purcell. The "History of the Jersey Coast," by Woolman & Rose. That is about all, I believe, that I can recall that I canvassed for.

Cross-Q. 40. When were you first spoken to by anybody on behalf of complainants in this case, respecting any information you might have about Mr. Drawbaugh, or any facts relating to the subject of your testimony; and by whom were you so spoken to?

Ans. It was some time last October by Mr. Storrow.

Cross-Q. 41. How long have you known Daniel Drawbaugh?

Ans. I never met him to my knowledge prior to delivering his history.

Cross-Q. 42. Have you ever seen him since the time when you took that note from him?

Ans. I have no recollection of meeting him since.

Cross-Q. 43. Had you ever heard of him before you went to deliver that history to him; if so, when first did you hear of him?

Ans. I think I heard his name mentioned by some parties in Mechanicsburg in connection with a very fine clock, about two or three weeks probably before I went to his place; and I was told that when I got to Eberly's mills it would be worth my while to stop at Drawbaugh's mill to see the clock.

Cross-Q. 44. Do you remember who told you that?

Ans. I can't recall any particular name, but think I heard it spoken of by more than one person.

Cross-Q. 45. How many times were you at Drawbaugh's shop from the time of delivering the history to the time of receiving the note, and including those two visits?

Ans. Not more than three or four times.

Cross-Q. 46. Did you see any electric clock there when you were there?

Ans. I saw what he said was an electric clock.

Cross-Q. 47. What else did you see there?

Ans. Quite a number of things, I suppose, that I couldn't enumerate now.

Cross-Q. 48. Did you see any telephones there?

Ans. I can't remember whether I did, or not. I saw something lying on the work-bench which looked like a tube, about four or six inches long—probably longer—and about two inches in diameter, with a cord or string attached to one end.

Cross-Q. 49. Was the subject of telephones mentioned while you were there?

Ans. I think it was.

Cross-Q. 50. Do you clearly recollect whether it was, or not?

Ans. That is my recollection.

Cross-Q. 51. How came the subject to be mentioned?

Ans. I can't remember whether I called his attention to it, or he mine.

Cross-Q. 52. At which visit was that subject mentioned?

Ans. On the first visit, I think.

Cross-Q. 53. How long were you there on that first visit?

Ans. All of a half hour, I judge—probably longer.

Cross-Q. 54. Was the subject mentioned at any other visit?

Ans. I think not.

Cross-Q. 55. How many of the histories did you have present with you in the shop when you delivered to Mr. Drawbaugh his copy—any more than that one copy?

Ans. That is all; one copy.

Cross-Q. 56. Was any one present with you at the time, except Mr. Drawbaugh?

Ans. Part of the time. A man passed through the room once or twice while we were talking, and, I think, he directed him to do something about the mill.

Cross-Q. 57. Did you take any of the histories there into his shop at any subsequent call which you made upon him?

Ans. No, sir.

Cross-Q. 58. Then you never had but that one copy in his shop at any time, did you?

Ans. That is all.

Cross-Q. 59. And that was the copy that was delivered to Mr. Drawbaugh and received by him on his subscription, was it?

Ans. Yes, sir.

Cross-Q. 60. Have you stated all of the conversation with Mr. Drawbaugh at that interview, that you can remember?

Ans. He said considerable about his clock, but I can't remember much of the conversation outside of the business for which I called on him.

Cross-Q. 61. How came mention to be made of the shortness of the biographical sketch in the history?

Ans. He mentioned that; I didn't.

Cross-Q. 62. How came he to mention it?

Ans. I don't know, unless he thought his manuscript would make a larger show in print.

(*All after the words "I don't know" objected to by Mr. Hill as irresponsive and mere supposition.*)

Cross-Q. 63. Was he looking at the biographical sketch in the history when he made that remark about its being short?

Ans. He was.

Cross-Q. 64. Are you aware that he still has that copy of the history in his possession, which you delivered to him, and that it does not, and never did contain any biographical sketch of Daniel Drawbaugh?

Ans. I am not.

Cross-Q. 65. Do know anything of any advantage to the defendants in this case, or to Mr. Drawbaugh; if you do, state what it is?

Ans. Nothing, unless it is in reference to the telephones I saw there, or what were called telephones; I have reference to those tubes that I described.

Cross-Q. 66. Were they called telephones?

Ans. That is what I understood during our conversation in the shop at that time; at least my recollection is that he referred to those.

Cross-Q. 67. You don't remember just what he said about them, do you?

Ans. I can't recollect the conversation sufficiently to repeat it.

Cross-Q. 68. Didn't Mr. Drawbaugh at that time complain that the history did not come up to the representations that had been made to him about it, to induce him to subscribe?

Ans. He may have made some remark, I can't recollect. There were several remarks of that kind made by others, and Mr. Drawbaugh may have been one of them.

Cross-Q. 69. You have given one remark that he made, will you please state any other remark that he made during that conversation giving his words?

Ans. After he said it was shorter than he expected to see it, and I explained the reason to him he said he supposed it was all right, but he couldn't pay for it and offered to give his note, which I refused to take at that time. We then went through the mill, when a general conversation may have occurred to which I paid but little attention.

Cross-Q. 70. Will you repeat again the remark which he made about the biography being shorter than he expected, giving his very words?

Ans. My recollection is, that he said "Oh! it is shorter than the one I sent"—that is the recollection I have of it.

Cross-Q. 71. Can you swear that he did not say "Oh! it is shorter than the one that was sent," instead of the words "Oh! it is shorter than the one I sent?"

Ans. My recollection is that he used the phraseology that I have just given.

Cross-Q. 72. Explain how your recollection is so very particular about the exact phraseology of this one remark, and so very uncertain about what else was said in that half hour or more.

Ans. That part of the conversation was directly connected with my business whilst the other was not; I being in a hurry to get through with my work, wanted to get away as soon as I could and made such answers to his explanations of his clock and other things in the mill as I thought proper; and did not impress my mind with them.

Cross-Q. 73. How long were you and he on that visit conversing on the subject of your business there.

Ans. Probably about fifteen minutes, more or less.

Cross-Q. 74. Give the entire conversation exactly as it occurred, so far as it related to your business there?

Ans. I don't think we had any conversation except what I have already given, directly with my business, except a few general remarks that may have been made about the history whilst he was looking at it

Cross-Q. 75. State those general remarks about the history, so far as you remember them.

Ans. I think his remarks were confined to making comments on the sketches that were in the book; he would pick out some of those he would recognize; I can't remember the words used in the conversation, but the time was chiefly spent in looking through the work.

Cross-Q. 76. Do you remember his saying anything about an agreement or promise that he should make some of the sketches for the book?

Ans. I can't recollect whether he did or not.

Cross-Q. 87. Does that idea of his sketching for the book strike you as a new one or as one you had heard before now?

Ans. It is one that I had heard before now, but I can't recollect who has mentioned it to me, and I wouldn't like to swear that Mr. Drawbaugh did not mention it or say something about it at the time.

Cross-Q. 78. Don't you recollect that he mentioned that as one reason why he did not want to take the book?

Ans. He never said he didn't want to take the book.

Cross-Q. 79. How many of these histories did you deliver to different subscribers?

Ans. I can't remember exactly, but I think between two and three hundred; may be more.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of December, 1882.

FRED. M. OTT.
Examiner.

R. G. FOUST.

Adjourned until December 7, 1882, at ten, A. M.

LEVI MAISH, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

Q. 1. State your age, residence, and occupation.

Ans. I am forty-five years of age; a lawyer by profession; and reside in York, Pennsylvania.

Q. 2. When were you in Congress, and for how long?

Ans. I was elected to Congress in the autumn of 1874, and again in 1876. I served four years in the lower house of Congress.

Q. 3. Do you know Urias R. Nichols, of Newbury township, York county?

Ans. Yes, sir.

Q. 4. Did he, at any time, have any conversation with you, or make any communication to you, concerning Daniel Drawbaugh, of Eberly's Mills, or concerning any speaking telephones which he said had been made by Mr. Drawbaugh?

[See pages 93 and 97 of respondents' printed record.]

Ans. Yes, sir.

Q. 5. Please state what he told you on those subjects, as near as you can recollect.

[*Objected to by Mr. Hill, as hearsay and incompetent, and not in rebuttal.*]

Ans. To the best of my recollection, he told me that he visited the shop of Daniel Drawbaugh in Cumberland county; and among other things he described as having seen there was the telephone. I don't know that he called it a telephone. He told me that Drawbaugh showed this telephone to him, and told him that it was connected with his house, and asked him to speak into it, which he did, as he told me. He asked the time of day, as I remember, and he told me he was answered. That is all that I can now recall concerning the conversation about the telephone. I believe there was more, but I do not remember what it was.

Q. 6. Did he tell you about any other things that he had seen at Drawbaugh's shop; and, if so, please mention some of them?

[*Objected to by Mr. Hill, for the same reasons as before.*]

Ans. I had several conversations with Nichols about Drawbaugh's inventions; my belief is, that he told me about an electric clock at the same time that he described the telephone to me.

Q. 7. Was Cumberland county in your congressional district?

Ans. It was part of my congressional district.

Q. 8. At the time Mr. Nichols first told you about Drawbaugh's telophone, had you read of telephones in the newspapers, or had your yourself used electric speaking telephones?

[*Objected to by Mr. Hill as irrelevant, immaterial and not in rebuttal.*]

Ans. My recollection is, that Nichols' account of Drawbaugh's telephone was not the first knowledge I had of the subject; I believe that I both read about and saw telephones before that.

Q. 9. Will you state where and under what circumstances you had seen telephones before Mr. Nichols first told you of Drawbaugh's telephone?

[*Same objection.*]

Ans. At Washington, D. C. I was invited by a Mr. Painter, a newspaper correspondent at Washington, to visit the office of a Mr. Maynard—I believe that is his name—opposite the Riggs House on G street, to witness an experiment to be made with telephones. I went there. It was in the evening. Of course, I don't know, excepting from what I was told, where the other end of this telephone line was; but I conversed with the Hon. James G. Blaine and others through that telephone there

exhibited; and, also, there were experiments made with musical instruments. My recollection is that the one was a small music-box, and the other sounded to me like a hand-organ. I saw none of the musical instruments. They were at the other end of the line. I was informed that the other end of the line was at the house of Mr. Painter, in Washington city. I was told it was about a quarter of a mile distant.

Q. 10. If you had any talk with Mr. Blaine about that exhibition, the next day, will you please state what, and where it was?

[*Objected to Mr. Hill, as hearsay, irrelevant, and immaterial.*]

Ans. I met Mr. Blaine on the following morning in Galt's jewelry store in Washington; and, after exchanging salutations, I said to him that I supposed I had had the pleasure of conversing with him last evening, without his knowledge, or words to that effect. He asked me how that was, and I told him that I was at the other end of the telephone line when he spoke into it; and I informed him that I distinctly recognized his voice. He then told me that he was there, and spoke through it. I don't know that this is the exact language of our conversation, but what I have given is substantially what occurred between Mr. Blaine and myself.

Q. 11. You say that your recollection is that you had taken part in this exhibition at Mr. Maynard's before Mr. Nichols first told you about Mr. Drawbaugh's telephone; how strong is your recollection on that point? How sure do you feel about it?

Ans. I feel certain I had no such knowledge of the existence of Drawbaugh's telephone, as Nichols described it to me, before reading newspaper accounts of Bell's and Edison's telephones, and witnessing the experiment that I have described.

Q. 12. In your fifth answer, you have testified to what Mr. Nichols told you about Drawbaugh's telephone. If such a statement had been made to you before you had ever heard of telephones elsewhere, would it, or would it not, have made an impression on your mind?

[*Objected to Mr. Hill as hypothetical, and calling for mere opinion.*]

Ans. I think now it would have made a deep impression. Mr. Drawbaugh was a constituent of mine, and, I believe, I would have regarded the invention as one of very great importance, if I would have had such a description of it as I remember Nichols gave me.

Q. 13. If you had had such a description of the work of one of

your constituents given to you a year or two before you had heard of such inventions elsewhere, and before the exhibition at Washington which you have referred to, do you think you would have mentioned it at the time of said exhibition?

[*Objected to by Mr. Hill as hypothetical, argumentative, and as calling for mere opinion.*]

Ans. Provided I had recollected it, I think I certainly would have mentioned it.

Q. 14. Please give me some idea of the shape of the telephone which you used on that occasion at Mr. Maynard's.

Ans. They were loose boxes attached to the wire—I mean not fixed to the wall or table—about eight inches in length and about five inches broad and about five inches high; I am not clear about the size; the box had a tube attached to it in which we spoke and at which, I think, we also listened.

Q. 15. Do you remember whether or not at that exhibition you heard through the instrument singing by a female voice?

Ans. Mr. Maynard was present and I think several other gentlemen and we all listened turn about; I have no recollection of hearing the singing, but I have an indistinct recollection that one of the others said he heard it.

Q. 16. Do you recollect whether they said that the singing, if there was any, was by a man's voice or by a woman's voice?

Ans. I have no recollection about that.

Cross-examined by Mr. Hill:

Cross-Q. 17. Have you stated all that you can remember of the conversation with Mr. Nichols concerning Drawbaugh's telephones?

Ans. All that I certainly remember of the first conversation that I mentioned.

Cross-Q. 18. Did you tell Mr. Nichols in that conversation of ever having seen or heard anything concerning telephones before?

Ans. I have no recollection that I did.

Cross-Q. 19. Where did that first conversation with Mr. Nichols take place, and who was present?

Ans. It took place in my office; I have no recollection of anyone being present.

Cross-Q. 20. How many times have you talked with Mr. Nichols concerning the Drawbaugh telephone, so far as you can remember?

Ans. About three or four times, I think.

Cross-Q. 21. When did those conversations take place and who was present at any of them?

Ans. All of them, I believe, in my office; I can't tell now who was present at any of them, or whether any one was present at any of them. Mr. Nichols was a client of mine and I was engaged in getting a patent for him at the time of some of these conversations, and that brought him frequently to my office; of course there were frequently persons in my office, but who they were I don't know.

Cross-Q. 22. Was it in connection with that patent-right that he was at your office, at the time that you had that first conversation with him relative to Drawbaugh's telephones?

Ans. I don't remember that; I don't remember whether that first conversation was before, or after I was engaged in getting that patent-right.

Cross-Q. 23. Do you remember what the invention was about which he was conferring with you relative to obtaining a patent-right through the Messrs. Evans?

Ans. Yes, sir; it was a patent dump-cart.

Cross-Q. 24. Do you remember whether the patent was granted or not, and if yea, have you any recollection as to the time when it was it issued or about the time?

Ans. The only knowledge I have upon the subject is what Nichols told me; he told me, I think, within a year that the patent-right was granted; at what time, I think, he did not tell me.

Cross-Q. 25. Is it not possible that there was another conversation between you and Mr. Nichols in which the Drawbaugh telephone was mentioned, a long time prior to the first conversation which you now recall to memory, and which prior conversation you may have totally forgotten, perhaps by reason of its being at such an early date?

Ans. Yes, it is possible, but I don't think probable, that I had one of such minuteness as I have detailed.

Cross-Q. 26. I do not make my meaning quite clear to you, I see; what I mean is this: Assuming, for the purposes of this question, that the conversation which you remember with so much minuteness is the first which you are able to recall to memory at this time, and assuming that Mr. Nichols has testified that he mentioned Drawbaugh's telephone to you in the winter of 1875, at your office, is it not possible that Mr. Nichols' recollection may be correct; and that he may have made some mention of that telephone to you, at your office in the winter of 1875,

but perhaps not so fully as to excite any very great interest on your part; and that by reason of seven years or more intervening since then, you may have totally forgotten about that conversation and been able to recall to memory only long subsequent conversations?

Ans. Yes, sir; that is possible.

Cross-Q. 27. You have had some acquaintance with Mr. Nichols, I perceive. Have you never observed that he is gifted with a remarkably fine memory of events?

Ans. I have not had opportunities of discovering that fact, but I think he has a good memory of events.

Cross-Q. 28. In the winter of 1874–5 you had just been elected to Congress, and I suppose you took your seat at the beginning of the long session in the subsequent December, did you not?

Ans. Yes, sir.

Cross-Q. 29. During the winter, prior to taking your seat, you were actively engaged in the practice of your profession, and had a pretty large practice on your hands, I suppose, had you not?

Ans. Yes, sir.

Cross-Q. 30. You would not, I presume, undertake at this time to remember all the different conversations you had at your office that winter, or even to remember all the different persons who called at your office to talk to you about different matters that winter, would you?

Ans. Certainly not.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 5th day of December, 1882.

FRED. M. OTT,
Examiner.

LEVI MAISH.

Recess for lunch until 2, P. M.

DEC. 5, 1882, 2, P. M.

Examination resumed.

Present, same counsel, with the addition of Mr. Smith for complainants.

GEORGE C. MAYNARD, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow.

Q. 1. What is your age, residence, and occupation?

Ans. Forty-three; my residence is Washington, D. C.; my occupation is electrician.

Q. 2. What was your occupation in the last half of the year 1877; and did you at that time have anything to do with the speaking telephones made and licensed by Alexander Graham Bell and his associates?

Ans. I was engaged then in Washington, D. C., at 1423 G street, North-west, opposite the Riggs House, in a general electrical and telegraphical business; I was the sole agent for the District of Columbia for the telephones referred to.

Q. 3. Did you, during the fall of 1877, put up and operate a telephone line between your office and Mr. Painter's house in Washington; and if so, will you please give the date when that line was first put up and first used, referring to any memoranda made by you at the time which give the date?

Ans. I operated a line between those two points, a portion of which I constructed and connected with an old line already constructed. The old line extended along 14th street, from G to I street, North-west; I connected that with a wire running from 14th and G streets to my office, and run a wire across I street into Mr. Painter's house, on the corner of 14th and I streets. The date at which that line was completed between the points named was Saturday, October 13th, 1877; and the first day it was used, to the best of my knowledge, was Monday, October 15th, 1877.

Q. 4. After that line was completed, will you state whether or not Mr. Painter was in the habit of bringing Congressmen and others to witness and take part in the transmission of speech over it?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. He was.

Q. 5. Do you know Col. Levi Maish, at that time member of Congress; and did he ever come to your office, and witness, or take part in, the transmission of speech over that line?

Ans. Col. Maish came to my office, and examined the telephones, and took part in operating them. I think I had no acquaintance with him before that time.

Q. 6. If you have here your memorandum-books for that period, will you please point out to the examiner all the entries that relate to the construction of that line, and all the use of telephones connected with it, during the month of October, 1877.

[*Respondents' counsel states that to save time he admits that*

the line was operated in the month of October, 1877, in Col. Maish's presence, as Col. Maish has described; but that he objects to the whole matter as immaterial, and not rebutting.]

Cross-examined by Mr. Hill:

Cross-Q. 7. Are you still connected with the telephone business?

Ans. Yes.

Cross-Q. 8. What connection have you with the telephone business?

Ans. I am a stockholder in the National Capital Telephone Company, and it is a part of my business to sell wires, and to construct telephone lines.

Cross-Q. 9. Is that company operating under the patents of A. G. Bell?

Ans. It is.

Cross-Q. 10. What kind of transmitters does that company use?

Ans. The company uses Blake transmitters.

Cross Q. 11. The Blake transmitter is a form of carbon telephone, is it not?

Ans. Carbon is used in the construction of the Blake transmitter.

Cross-Q. 12. It operates with a battery, and a variable resistance in the circuit, does it not?

Ans. It operates with a battery. I don't quite understand the question as to variable resistance.

Cross-Q. 13. Is not the carbon interposed in the circuit, and subjected to the variable pressure of the diaphragm, when the machine is in operation?

Ans. It is.

Cross-Q. 14. How long has that company been in operation?

Ans. I think about a year.

Cross-Q. 15. Were you connected with any telephone companies prior to the organization of that company; if so, what ones?

Ans. I was, with the National Capital Telephone Company and the National Telephone Exchange, both of the District of Columbia.

Cross-Q. 16. When did they first begin to operate telephone lines?

Ans. I cannot give the dates from memory.

Cross-Q. 17. Have you a pretty general knowledge of the telephone business throughout the country?

Ans. I know something of the business generally, but have not given it special attention for a year past.

Cross-Q. 18. So far as you know, are not the Blake transmitters generally employed on telephone lines throughout the country?

Ans. So far as I know they are.

Cross-Q. 19. Do you know of any line equipped only with magneto instruments?

Ans. I do.

Cross-Q. 20. What line and where?

Ans. Unless very recent changes have been made in the equipments, the lines at the Columbia Institution for the Deaf and Dumb, in the District of Columbia, and a line at the Maryland Agricultural College are being worked with magneto telephones.

Cross-Q. 21. How long are those two lines mentioned in your last answer?

Ans. I think they are about one mile long.

Cross-Q. 22. Are they worked with or without batteries?

Ans. Without batteries.

Cross-Q. 23. Are those all the lines you know of that are equipped only with magneto instruments?

Ans. I do not now recall any others.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 5th day of December, 1882.

FRED. M. OTT,
Examiner.

GEO. C. MAYNARD.

DECEMBER 7, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

JACOB S. KUNKEL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Smith:

My age is fifty-seven; residence, Lisburn, Cumberland county, Pennsaylvania; occupation, running a grist-mill, saw-mill, and farming a little.

Q. 1. Are you the owner of that mill, and if so, how long have you owned it?

Ans. I have owned it fifteen years in April next—since 1868.

Q. 2. Is there any other mill at Lisburn?

Ans. No, sir.

Q. 3. Has there been any other during the time that you have owned it?

Ans. No, sir.

Q. 4. Is that mill generally known as Kunkel's mill?

Ans. Yes, sir.

Q. 5. When you purchased it did you make any repairs upon it; and if so, state how extensive they were?

Ans. Yes, sir; I repaired it; I put in four new water-wheels and a bolting arrangement, all new, return bolts, and new gearing; I didn't use any of the old gearing; that is about the most; of course there were other things that were connected with it.

Q. 6. Have you run the mill yourself, ever since you purchased it?

Ans. Yes, sir.

Q. 7. Did you, when you commenced running it, employ any person as a miller; if so, state who it was first, and how long he worked for you?

Ans. Yes, sir; a man by the name of Joel Gochenauer; he worked for me two years.

Q. 8. Whom did you next employ as miller, and how long?

Ans. Peter Kunkel, one year.

Q. 9. Who was your next miller, and how long did you employ him?

Ans. Elijah Kunkel; three years.

Q. 10. And whom did you next employ, and how long a time did he work for you?

Ans. William Peck, six years.

Q. 11. During the time that you have owned and run that mill, what instruments have you employed for dressing the millstones?

Ans. Nothing but a redstaff and the common mill-picks that are used.

Q. 12. Is the redstaff used for securing a level surface for the stones when sharpened with a pick?

Ans. Yes, sir.

Q. 13. How long have you known it to be used by millers?

Ans. Since I know anything at all about it—a great many years.

Q. 14. Have you ever used in that mill any instruments for dressing millstones, which were invented or made by Daniel Drawbaugh, of Eberly's Mills?

Ans. No, sir.

Q. 15. Have you ever had any knowledge of instruments of that kind

or known of burr-dressing machines that were invented, made, or sold by Daniel Drawbaugh?

Ans. No, sir; I have not.

Q. 16. Do you know Daniel Drawbaugh; and if so, how long since you first knew him; in what year was it?

Ans. In 1878—the fall of 1878.

Q. 17. How came you to know him at that time?

Ans. I went to his shop.

Q. 18. For what purpose did you go there.

Ans. I was about putting up cider works, and a man by the name of Hall told me that Mr. Drawbaugh had some sort of an idea about pressing the cider out of the pomace.

Q. 19. What passed between you and Mr. Drawbaugh in respect to the machine for pressing cider?

[*Objected to by Mr. Hill, as immaterial and irrevelant.*]

Ans. I don't suppose Mr. Drawbaugh knew me. I made myself known, and told him what I had heard. I wanted to know something about it. He told me then something about it. I just don't remember what, any more than I asked him why he didn't have a cider works there at his place, at that water-power. Mr. Drawbaugh told me then that that principle of pressing would be too expensive for that neighborhood, meaning that he wouldn't be justified in going to that expense. I wanted to know something about the expense; and he thought, if my memory serves me right, that for getting the patterns made would cost about two hundred and fifty dollars. Of course, I just dropped, it and put it up on the old principle.

Q. 20. Before you went there on that occasion, had you heard anything about any other machine or invention of Daniel Drawbaugh, if so, what was it?

Ans. Yes, sir; Mr. Kutz was carrying on a mercantile business there at my place. He used the Drawbaugh faucet. And then I heard about that electric clock. That clock I saw when I was there at Drawbaugh's shop.

Q. 21. How had you heard of this clock?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. It was reported around there considerable in the neighborhood. I couldn't just say how.

Q. 22. If Mr. Drawbaugh gave you any explanation about the clock, while you were there at his shop, state what it was?

[*Same objection.*]

Ans. He just merely showed me the clock and the nature of its working.

Q. 23. Do you know Urias R. Nichols, of Newbury, and if so, how long have you known him?

Ans. Yes, sir; twenty-five years, anyhow.

Q. 24. Was he ever, to your knowledge, at your mill at Lisburn?

Ans. Not to the best of my knowledge.

Q. 25. Was he ever at your house at Lisburn? If so, how many times, and how came he to be there?

[*Objected to by Mr. Hill as immaterial.*]

Ans. He was only there once that I remember of; that is, him and his wife together. Him and his wife had been on a visit to Mechanicsburg, and I had been there, and on my home road they overtook me, and said that they were going to stop at our place for dinner. That is the only time that I recollect that he ever was there.

Q. 26. Did he take dinner with you?

[*Same objection.*]

Ans. Yes, sir.

Q. 27. On what stream is your mill situated?

Ans. The Yellow Breeches.

Cross-examined by Mr. Hill.

[*Respondents' counsel objects to the whole deposition as immaterial, and not in rebuttal; and, without waiving his objections, cross-examines de bene esse.*]

Cross-Q. 28. How long have you had four water-wheels in your mill?

Ans. For fifteen years, next April. I put them in in 1868.

Cross-Q. 29. How many run of stones have you in your mill?

Ans. Four.

Cross-Q. 30. Are they all for wheat; or some for wheat, and some for corn?

Ans. Two for chopping and two for grinding wheat.

Cross-Q. 31. What is the capacity of your mill per day?

Ans. That I couldn't tell. We don't do anything but run on custom-work.

Cross-Q. 32. How long has it been equipped with four run of stones?

Ans. It has been there ever since I have it, and it was there when I came there and bought it.

Cross-Q. 33. How many men do you employ in and about the mill, without reference to the saw-mill?

Ans. Two.

Cross-Q. 34. What is their business in the mill?

Ans. They attend to the grinding and chopping and the customers.

Cross-Q. 35. How long have you employed two men to attend to the grinding and chopping?

Ans. Ever since I had it, except may be for a week or so that there has been one, generally there has been two men.

Cross-Q. 36. What do you mean by chopping for customers?

Ans. That is making horse-feed and chop to feed cattle.

Cross-Q. 37. Coarse grinding without bolting.

Ans. Yes, sir.

Cross-Q. 38. Name all the men that you have had employed in your mill to attend to grinding and chopping, so far as you can remember, from the time when you first owned or run it to the present time?

Ans. I have only employed the one man, and they had to employ the second man; that I couldn't tell. There was Gochenauer two years; and then he had to hire the second man; sometimes they would get an apprentice, you know, to learn the trade; Peter Kunkel, one year; Elijah Kunkel, three years; William Peck, six years; then my son took the mill after Peck left, and he is in it yet, and has an apprentice.

Cross-Q. 39. Do you do any thing about the mill yourself; if so, what?

Ans. I furnish the grain—buy the grain.

Cross-Q. 40. Has that been your part of the business ever since you started to operate the mill?

Ans. No, sir; not all the while.

Cross-Q. 41. What else have you done at the mill at any time?

Ans. Kept up repairs. We had another building there where we run three circular saws—the saw-mill, and there was some farming to do—to attend to.

Cross-Q. 42. Are you a practical miller yourself?

Ans. No, sir; I never learned the trade.

Cross-Q. 43. Did you ever dress any mill stones?

Ans. I never dressed any myself. I helped dress the choppers. Never on burrs.

Cross-Q. 44. How often are your burrs dressed?

Ans. Indeed that I dont know.

Cross-Q. 45. In running a flour-mill all the time it is ordinarily necessary to dress the burrs at least once a week. Do you know whether your burrs were dressed as often as that or whether they were allowed to run undressed, without regard to the quality of the flour produced?

Ans. The time they have for dressing, that I don't know. I know they dressed them. It is their business to dress them when they need it. That I don't know. They know better than I do.

Cross-Q. 46. Do you make a good quality of flour in you mill on the average?

Ans. I suppose about as good as—I know some praise it and some have inferior wheat, and then it don't get so good. I suppose the average is about as good as can be expected.

Cross-Q. 47. How many barrels of flour and chops do you average per day in your mill?

Ans. That I couldn't tell. To sit down and tell the bushels and half bushels of corn meal, etc., is something I couldn't tell. I wouldn't like to say anything I don't know.

Cross-Q. 48. How many barrels of flour do you average per day?

Ans. That comes about under the same head—commences with very small grists and then up. I am not prepared to do that.

Cross-Q. 49. Do you use wheat-cleaning machinery in the mill, or do you run the wheat into the stones just as it comes from the farmer?

Ans. We have a Wilson smut machine and cleaner combined?

Cross-Q. 50. Do your flour stones all have the same dress, or are they dressed differently?

Ans. What do you mean by that; the draft on them or how they are laid off in sections?

Cross-Q. 51. Yes; how are they dressed?

Ans. I don't know that there is any difference in them; and yet there may be in the rigging and pitch, as one has a very large eye and the other a smaller one; yet I wouldn't say; I don't know.

Cross-Q. 52. Have they always been dressed the same as they dress them now, or do you know anything about it?

Ans. How do mean; in the grinding down and laying them off different?

Cross-Q. 53. Yes.

Ans. They have never been ground down and laid off different since I had them; if they have been I don't know it.

Cross-Q. 54. Is the dress of the chop stones the same as that of the flour stones.

Ans. I don't know whether they are laid off in the same sections as the burrs or not; I never did anything on the burrs in my life and very little on the choppers.

Cross-Q. 55. How much of the day, on the average, does your business require you to spend in the flour-mill?

Ans. I am not prepared to answer that at all.

Cross-Q. 56. Give us the best answer you can to it?

Ans. I don't like to answer anything that I have to make a rough guess on.

Cross-Q. 57. You say that you furnish the mill with grain; how do you furnish the mill with grain.

Ans. For the retail trade.

Cross-Q. 58. How do you get the grain? Is it brought to you at the mill, or do you have to go around the country and engage it from farmers?

Ans. It is brought there and we buy it; sometimes we go and see people, but it is very seldom that we need to go away anywhere for it?

Cross-Q. 59. How far is your farm from the mill and how long have you been farming it?

Ans. The mill is right on the property; the land runs along the creek above and below; there is only thirty-seven acres; we have been farming it ever since we are there—since 1868.

Cross-Q. 60. Do you live on the farm?

Ans. Yes, sir.

Cross-Q. 61. And have ever since you have been running the mill?

Ans. Yes, sir.

Cross-Q. 62. Do you personally attend to the farming?

Ans. Not just all the while myself.

Cross-Q. 63. Do you personally attend to the business of the saw-mill?

Ans. I do.

Cross-Q. 64. Have you any other business besides grain-milling, saw-milling, and farming?

Ans. No, sir.

Cross-Q. 65. Have you always made it your business to go into the mill every time the stones were dressed and see what instrument they were dressed with?

Ans. No, sir.

Cross-Q. 66. Do you suppose you have particularly noticed the in-

strument they were dressed with, half the times that they have been dressed, since you have been at the mill there, so that you could state on oath whether it was one instrument or another?

Ans. I never seen any instrument only the one specified there—the redstaff. I don't know whether I seen them dress the stones half the times; I couldn't say in regard to that.

Cross-Q. 67. Do you know of anything to prevent a miller or his assistant from bringing in some other instrument and dressing the stones with it, at some time or times, or from allowing somebody else to do so?

Ans. I do not.

Cross-Q. 68. Did you ever see Drawbaugh's millstone dressing instrument?

Ans. I did not.

Cross-Q. 69. Then you wouldn't know one of them if you saw it, so far as you are able to swear, would you?

Ans. No, sir.

Q. Q. 70. Do you know anything to prevent Mr. Nichols from having been at your mill a good many times without your seeing him or knowing that he was there?

Ans. No, sir.

Redirect by Mr. Smith:

Cross-Q. 71. How far is Newbury from Lisburn?

Ans. Nine miles.

Re-cross by Mr. Hill:

Re-cross-Q. 72. Is Lisburn on the road between Newbury and Harrisburg?

Ans. Yes; only it is a good bit too high up you know; yet he might go that way; his direct road from Newbury town is by way of New Cumberland.

Re-cross Q. 73. But the road by way of Lisburn is a better road and avoids the mountains more; is not that the fact?

Ans. He hasn't as big a mountain to cross; I don't know that it is any better, with the exception that the mountain is a little harder by way of New Cumberland; after reaching New Cumberland you have the pike.

Re-cross-Q. 74. And after reaching White Hill station or a little beyond by the other road you have the pike, have you not?

Ans. Yes, sir.

Re-cross-Q. 75. And for about the same distance?

Ans. It is about a mile by going through Milltown, and about two miles from New Cumberland to Bridgeport—I think they call it. There would be about a mile difference, I guess.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 7th day of December, 1882.

FRED. M. OTT,
Examiner.

JACOB S. KUNKEL.

Recess for lunch, until two, P. M.

DECEMBER 7, 1882, 2, P. M.

Examination resumed.

Present, Mr. Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

JOEL GOCHENAUER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Smith:

My age is sixty-two years. My residence is Washington township, York county, Pennsylvania. Occupation, miller.

Q. 1. Were you ever employed as miller in Mr. Kunkel's mill at Lisburn; and, if so, when, and how long?

Ans. Yes, sir. I came there in the spring of 1868, and was there till the spring of 1870—two years.

Q. 2. Did you have charge of the running of the mill?

Ans. Yes, sir.

Q. 3. Who did the dressing of the stones when they required dressing?

Ans. I did superintend the whole of it.

Q. 4. What instruments did you use in dressing the stones, or in leveling them?

Ans. I used nothing but a spirit-level to level the stones, and an old-fashioned redstaff to bring the face even, and old-fashioned mill-picks.

Q. 5. Did you have any instrument of your own for trueing the redstaff, if it required to be made true; and, if so, what was it?

Ans. Yes, sir; an iron proof-staff.

Q. 6. Did you, before you took charge of that mill, know of an instrument, invented or made by Mr. Daniel Drawbaugh, to be used in connection with dressing mill-stones? If so, what was it, and what was it called?

Ans. I saw a machine—I called it a redstaff—to make the face true of the stones.

Q. 7. How long before you went there had you known of that instrument?

Ans. To the best of my knowledge it was in 1863.

Q. 8. Was that instrument or any instrument invented or made by Mr. Daniel Drawbaugh, used in dressing the mill-stones at Mr. Kunkel's mill, while you had charge of it?

Ans. No, sir; I used nothing but the common redstaff and mill pick.

Q. 9. Do you know Mr. Urias R. Nichols, of Newbury?

Ans. No, sir.

Cross-examined by Mr. Hill.

Cross-Q. 10. What assistance did you have while you were running the mill?

Ans. I had a hired hand.

Cross-Q. 11. Did you have the same hand all the time or different hands?

Ans. No, sir; I had two different hands.

Cross-Q. 12. Didn't you have more than two?

Ans. No regular hands. I had sometimes for a week or sometimes for a few days, that I had hired extra hands.

Cross-Q. 13. What did your hired hands do?

Ans. They helped to dress the chopping stones, but never helped to dress the burrs, and they helped to do most of the work.

Cross-Q. 14. Your charge of the mill was from 1868 to 1870, was it?

Ans. Yes, sir; from the 1st of April, or near that time, until the 1st of April, 1870.

Cross-Q. 15. How often did you have to dress or clean the stones?

Ans. That is more than I can tell you. I can't tell how often we dressed them—just according what kind of grain we ground. If we ground garlic grain we had to clean them every day sometimes, and sometimes every two or three days, and sometimes not for a month.

Cross-Q. 16. Do you remember every time the stones were dressed while you were there?

Ans. I don't remember it; I was present all the times when they were dressed, but I couldn't give you the date of it.

Cross-Q. 17. Do you remember everybody who was present every time that the stones were dressed while you were there?

Ans. No, sir.

Cross-Q. 18. You were pretty familiar, I suppose, with Drawbaugh's mill-stone dressing instrument, were you not; that is, you knew what it was, and how it was used, did you not?

Ans. I only saw it once, and I never saw it used on stones.

Cross-Q. 19. Might you not have seen it used on stones and have forgotten it after a lapse of more than twelve years?

Ans. No, sir; I am certain that I never used them and never saw anybody else use them.

Cross-Q. 20. When did you go to work in that mill?

Ans. In the spring of 1868.

Cross-Q. 21. From the spring of 1868 to the first of April, 1870, were you on duty in the mill every day of the whole time?

Ans. No, sir.

Cross-Q. 22. How much of the time were you off duty?

Ans. That is more than I can tell you; there was sometimes a half a day and sometimes a day that I was out of the mill.

Cross-Q. 23. How do you fix the dates of your beginning and ending work there?

Ans. I come there—and it is generally the rule when you go to a mill or any place that way, to go on the first of April; I don't know whether it was exactly the first of April, but it was close to it, and the same way when I left; I was to take charge on the first of April, but I don't know whether it was the first or second, and the same way when I left.

Cross-Q. 24. You say you saw Drawbaugh's redstaff in 1863; where did you see it?

Ans. I saw it either at Drawbaugh's shop or else at the mill my brother run, close—about a mile from there.

Cross-Q. 25. You can't remember which place you saw it at, can you?

Ans. No, I can't remember any more.

Cross-Q. 26. How did you happen to see it; did any one have it in hand?

Ans. My brother recommended it, and we walked up to Drawbaugh's shop.

Cross-Q. 27. What did you walk up to Drawbaugh's shop for?

Ans. I don't know that; we just took a walk up there.

Cross-Q. 28. Did your brother recommend it while you were walking up to Drawbaugh's shop, or before you walked up?

Ans. I don't know.

Cross-Q. 29. What did you see at Drawbaugh's shop while you were there?

Ans. I don't remember anything but a carpet-tack machine.

Cross-Q. 30. Where was Drawbaugh's shop at that time?

Ans. At Milltown, Cumberland county.

Cross-Q. 31. Do you know where his shop is now, that is, do you know the building?

Ans. No, sir; I was never there since we was there; I could find it though, middling handy.

Cross-Q. 32. Do you remember where you found it then—what building it was?

Ans. I don't understand the question.

Cross-Q. 33. I mean, do you remember in what building Drawbaugh's shop was at that time when you were there?

Ans. It was in a building close to the mill, north-east, I think, from the mill.

Cross-Q. 34. Close to Eberly's mill do you mean?

Ans. I don't know who owned the mill; I was not acquainted at that time up there.

Cross-Q. 35. How long have you been living at Washington township, York county?

Ans. I was born there.

Cross-Q. 36. Do you mean to say that you have been living there ever since you have been born?

Ans. No, sir.

Cross-Q. 37. Well, I ask you how long you have been living there, from the last time you moved there, until the present time?

Ans. I moved there when I left the Lisburn mill, in 1870. I moved there and have been there most of my time, and had my home there.

Cross-Q. 38. Did you have a family and keep house in 1868 and 1870?

Ans. No, sir; I never had no family.

Cross-Q. 39. I suppose you don't know what kind of a mill-stone

dressing instrument was in use at Kunkel's mill before the 1st of April, 1868, do you?

Ans. No, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 7th day of December, 1882.

FRED. M. OTT,
Examiner.

JOEL GOCHENAUER.

ELIJAH S. KUNKEL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Smith:

My age is forty-three years. Residence, Warrington township, York county. Occupation, milling.

Q. 1. Did you ever have charge of a mill at Lisburn, Cumberland county? If so, who was the owner of the mill, and during what time did you have charge of it?

Ans. I had charge of the mill of Mr. Jacob Kunkel at Lisburn. I came there in the spring of 1872. I had charge of it three years.

Q. 2. Do you know who had charge of it immediately before you?

Ans. Peter Kunkel.

Q. 3. Do you know how long he had been there?

Ans. Yes, sir; about a year.

Q. 4. Do you know who was there before him?

Ans. Joel Gochenauer.

Q. 5. Mr. Gochenauer has testified that he left the mill in the spring of 1870. If Mr. Peter Kunkel stayed there but one year, he would have left in the spring of 1871; do you think, on reflection, you went there in 1872, or may it not have been in 1871?

[*Objected to by Mr. Hill as leading, and trying to make the witness contradict himself.*]

Ans. I may have been mistaken. I was there three years. Kunkel bought the mill in 1868, and Gochenauer was there two years. I didn't count over that. That would make my time begin in 1871. I guess I came there in the spring of 1871, and was there three years.

[*Answer objected to by Mr. Hill, as hypothetical, argumentative, and based upon assumptions not proven.*]

Q. 6. While you were there, who attended to the dressing of the mill-stones when they required dressing?

Ans. I did do that myself.

Q. 7. What instruments did you use in dressing the mill-stones?

Ans. The well-known mill-pick. I never used anything else myself.

Q. 8. What instrument did you use for ascertaining when the surface of the stone was true or level?

Ans. A redstaff, the well-known redstaff that has been used for many years.

Q. 9. Were any other instruments used while you were there for dressing or leveling the mill-stones?

Ans. There had been a man there with a diamond dressing machine that he wanted to show me—how it dressed the stones—it was a machine that you draw across the stone, cutting instead of picking; he dressed a pair of stones for me with it.

Q. 10. With the exception of that diamond dressing machine, were any other instruments used in dressing the mill-stones while you were there, than the pick and redstaff you have mentioned?

Ans. No, sir; nothing more than the common spirit-level, to see whether the bed stone is laying level; it has nothing to do with the dressing of the stones; it is a machine all millers have to use.

Q. 11. While you were there did you know of any instrument used in dressing millstones, invented or made by Daniel Drawbaugh called a tram, or by any other name?

Ans. No, not of a tram; I never heard of it; it is not used for dressing a burr—a tram.

Q. 12. Have you since that time had any knowledge of any tram or any instrument used in dressing millstones, that was invented or made by Daniel Drawbaugh?

Ans. There was one man came there in the summer, to that place where I am living now, and he asked me whether I used the Drawbaugh redstaff; I never heard, before that man come and asked me that question, that there was a redstaff by that name; that is the way I understood the man; that it must have been a redstaff; that is all that I could make out of what he said.

Q. 13. Was that this last summer?

Ans. Yes, sir; this last summer after harvest.

Q. 14. Did you know Mr. Daniel Drawbaugh at that time last summer, or before?

Ans. I never was acquainted with Daniel Drawbaugh.

Q. 15. Do you know Urias R. Nichols, of Newbury, York county, Pennsylvania?

Ans. No, sir.

Cross-examined by Mr. Hill.

Cross-Q. 16. How do you know that Peter Kunkel had charge of the mill before you went there?

Ans. He is a brother of mine.

Cross-Q. 17. Well, how do you know that he had charge of the mill? Did you see him there, or did he or some one else tell you?

Ans. I had been there several times on visits and seen him there.

Cross-Q. 18. How do you know that he had charge of it just one year? Did you get that from what some one told you?

Ans. No, sir; I know it by—I moved there after he left—he was there one year; Gochenauer was there two years; there is where I made a mistake before.

Cross Q. 19. Where did your brother work just before he took charge of Kunkel's mill?

Ans. He was at the mill then called Bair's mill, now owned by Andrew Kline, deceased, at Strinestown, Newbury township, about a mile away from Strinestown.

Cross-Q. 20. Where did your brother work immediately after he left Kunkel's mill?

Ans. Kunkel's mill, Warrington township; that is the name of the place where I now live; it has been called Kunkel's mill fifty or sixty years already; he moved from Kunkel's mill, Lisburn, to Kunkel's mill, Warrington township.

Cross-Q. 21. Where did you work immediately before you took charge of Kunkel's mill, Lisburn?

Ans. Dover township, at a place called Mount Royal, York county.

Cross-Q. 22. Whom did you work for at Mount Royal, and in what mill?

Ans. I didn't work at milling that year; I didn't work much that year.

Cross-Q. 23. Mention anybody that you worked for that year before you took charge of Kunkel's mill, Lisburn.

Ans. I could mention several; Jesse Miller, my brother-in-law, and several other farmers that I helped sometimes around the neighborhood.

Cross-Q. 24. Where did you work immediately after you left Kunkel's mill, Lisburn, and for whom?

Ans. I worked for myself. I own a farm in Dover township, York county; I moved on that. That is the same township that I moved out of when I went to the mill; but I didn't move from the same place—about two miles from there; that is, when I moved back again to the farm, I moved to a place about two miles from where I lived before I went to the mill.

Cross-Q. 25. Did you take your family with you to Lisburn?

Ans. Yes, sir.

Cross-Q. 26. Did you live in the same house all the time that you were at Lisburn?

Ans. Yes, sir.

Cross-Q. 27. What and whose house was that?

Ans. A frame house belonging to Jacob Kunkel, the owner of the mill. It was situated in Lisburn, close by the mill. It wasn't the closest house to the mill; but it wasn't very far from it.

Cross-Q. 28. In what year and month did you finish your work at the mill and move away from Lisburn?

Ans. In the spring of 1873, in the latter part of March, I moved away—1871, 1872, 1873, wouldn't that make three years? (*Mr. Smith requests that the fact that the witness is counting up the dates be noted, and Mr. Hill requests notice of the fact that the remark of Mr. Smith called the attention of the witness to the dates. Witness continues:*) That would be the spring of 1874, wouldn't it, if I came there in the spring of 1871?

Cross-Q. 29. How long had you been there at the Lisburn mill when the man came there with the diamond dressing instrument? Was it towards the beginning or end of your work there?

Ans. If I recollect right, it was the second year, after harvest, that I lived there.

Cross-Q. 30. Do you know the man's name who brought the diamond dressing instrument there and dressed two mill-stones with it, as you have testified?

Ans. No; I could't tell the man's name. I don't remember asking his name. He came there in the forenoon and dressed the bed stone and the runner. By that time it was dinner, and after that he left.

Cross-Q. 31. Describe the man, if you remember his personal appearance.

Ans. I couldn't just give you a close description of him, but he wasn't a very large man. A middle aged man I took him for.

Cross-Q. 32. Have you ever seen him since?

Ans. No, not as I know of. I might have seen him and not known him. I didn't take particular notice of his features.

Cross-Q. 33. Do you remember everybody who was present while he was dressing those stones?

Ans. No; I do not. I can't remember.

Cross-Q. 34. Did he operate the instrument himself, while the work of dressing the mill stones was going on, or did you?

Ans. He did.

Cross-Q. 35. Describe the instruments he used, as nearly as you can remember.

Ans. It was an iron thing about two feet long. and then there was a handle above, and every time he drew the instrument along there was a screw that he gave a turn to give it the width of the next cut.

Cross-Q. 36. I suppose you don't remember the name that he gave the machine, except that it was a diamond dressing machine or instrument, do you?

Ans. No, sir.

Cross-Q. 37. And you don't remember whose make the machine or instrument was, do you?

Ans. No, sir.

Cross-Q. 38. You spoke of drawing the machine along on the stone; did the man draw the whole machine along on the stone, or did he hold a part of it fast while he drew the handle back and forth?

Ans. The machine was stationary. He just drew the knife. He had to move the machine around to make another cut, for he couldn't cut all over the bed-stone from one place, as the machine was only eight or ten inches wide.

Cross-Q. 39. I understand you that there was an adjusting-screw on the machine; do you remember what that was for?

Ans. That was for to regulate the cutting.

Cross-Q. 40. To regulate the depth of the cut, or the width of the cut; do you remember which?

Ans. I suppose it was for the depth of the cut, for there was a

ratchet-wheel, too. I didn't work with the machine, but, I suppose, that was to regulate the width of the cut—the ratchet-wheel.

Cross-Q. 41. This last answer is only your supposition, is it not? You do not swear positively that the screw was to regulate the depth, or the ratchet the width?

Ans. No; just to the best of my understanding—I think so.

Cross-Q. 42. The adjusting-screw had a little hand-wheel on the end of it, had it not?

Ans. I couldn't describe the machine that close, any more. I didn't examine it that closely, and it has been a good while, so I couldn't tell.

Cross-Q. 43. Did you notice that the machine made a sound or click, when it was adjusted?

Ans. Yes, sir; every cut it made a tick, like the sound of a tick of a clock.

Cross-Q. 44. There was a small base-board of wood to the machine, was there not?

Ans. I couldn't positively tell, but I think the whole machine was iron, brass, etc. There might have been some wood in it, but it is so long that I cannot tell, hardly.

Cross-Q. 45. Do you remember that when he took the machine off of the mill-stones, at the close of his work, he separated the diamond cutter from the machine, and put it in his pocket, or put that away by itself?

Ans. No, sir; I did not.

Cross-Q. 46. You mean you do not remember?

Ans. I did not take notice. It would have taken a man watching all the time. I had business going on at the time, and I attended to *my* business, too.

Cross Q. 47. In using the machine he would set it to a land, and dress that land by operating the handle of the cutter, and then move the machine to the next land and dress that, and so on around the stone; would he not?

Ans. Yes, sir; he did.

Cross-Q. 48. And in dressing one land he would move the cutter handle several times, to make the number of cuts or scores in the land, that were required, would he not?

Ans. I didn't take particular notice of that. Of course he had to move it as often on one land as there were cuts in that land.

Cross-Q. 49. Did the agent, or man, who was using the machine show

you how it would operate on a piece of glass, before he put it on the mill-stone?

Ans. No, sir; I don't remember as he did.

Redirect by Mr. Smith:

Q. Q. 50. Was Kunkel's mill in Warrington township, that you spoke of, owned by your father?

Ans. Yes, sir.

Q. Q. 51. Had you ever worked in that mill before you went to Lisburn?

Ans. Yes, sir; I did.

Q. Q. 52. How long before?

Ans. It was in 1856 or 1857 I commenced working in that mill; the first milling I done. I learned my trade there.

Q. Q. 53. How long did you work there?

Ans. That I couldn't tell accurately. I was there about a year at the first start, and then I worked at different places and at different works, too. I wasn't just every year at milling.

Q. Q. 54. I believe you are now running that mill. How long have you been running it?

Ans. Five years till next spring.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 7th day of December, 1882.

FRED. M. OTT,
Examiner.

ELIJAH S. KUNKEL.

Adjourned until Dec. 8, 1882, at 10, A. M.

DECEMBER 8, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

JACOB S. KUNKEL, recalled.

Examined by Mr. Smith:

Q. 1. Did you know of a diamond dressing machine being brought to your mill and used in dressing a pair of stones, while Elijah Kunkel had charge of the mill?

Ans. No, sir.

Q. 2. Mr. Urias R. Nichols, in his testimony, refers to the fact that he used an artificial arm; do you know what kind of an artificial arm he wears?

Ans. I never seen him wear anything but a kind of an iron hook; he has the use of the elbow; I never seen exactly where the arm was taken off; all that I ever seen him wear was an iron hook.

Q. 3. Have you seen him use this iron hook about his work, in lifting things?

Ans. Yes, sir; I saw him haul wood, or load wood; he hauled it to his brick kiln; and then I bought some brick of him, and he got the brick out of the kiln himself, and slid them down into the wagon.

Q. 4. Is he in any way related to you?

Ans. By marriage on my wife's side.

Q. 5. Which arm is it which is the artificial one?

Ans. I think it is his right arm.

Cross-examined by Mr. Hill:

Cross-Q. 5. You don't know whether or not he had an artificial arm besides the iron hook, do you?

Ans. No, sir; I never seen it.

Cross-Q. 6. You don't know but that he uses the iron hook sometimes, now, do you?

Ans. I haven't seen him since the fifth day of August, 1882, and that time he had it.

Cross-Q. 7. Did he lose his arm in the army during the war of the rebellion?

Ans. Yes, sir.

Cross Q. 8. Do you remember of ever hearing him refer to that hook as his artificial arm?

Ans. That I don't know.

Examination taken, reduced to writing, and by the witness subscribed to before me this 8th day of December, 1882, he having been sworn upon his previous examination.

FRED. M. OTT,
Examiner.

JACOB S. KUNKEL.

ELIJAH S. KUNKEL, *being recalled, saith:*

Examined by Mr. Smith:

Q. 1. You testified yesterday about a diamond dressing machine, which was brought to Mr. Kunkel's mill by a stranger while you had charge of it; do you remember whether Mr. Daniel Drawbaugh's name was mentioned in connection with the instrument?

[*Objected to by Mr. Hill, on the ground that the witness has already been fully examined and cross-examined on the subject of that machine and his deposition closed, and it is improper now to recall him to continue an examination on the same subject.*]

Ans. No, sir; I do not.

Q. 2. Do you mean that you do not remember hearing his name?

[*Objected to by Mr. Hill, as leading, the witness having already testified that he did not remember whether he heard it or not.*]

Ans. No, I can't remember that I heard Drawbaugh's name; I cannot.

Q. 3. Did you take up the upper mill-stone, in order to give the stranger an opportunity to try the machine?

Ans. Yes, sir; I did.

Q. 4. State whether or not he wanted to sell the machine to you?

Ans. Yes, sir; he wanted to sell the machine to me; seventy-five dollars is what he asked for the machine.

Q. 5. Do you remember any man being present while he was dressing the mill-stones, who wore an artificial arm or iron hook?

Ans. No, sir; there was no such a man present.

Q. 6. Do you remember of any stranger being present, except the man who had the machine?

Ans. No, sir; not to the best of my recollection; there was no stranger present.

Q. 7. Do you remember whether customers or neighbors were coming in and out of the mill while he was dressing the stones?

Ans. Not that I know of, on that floor where the dressing was done.

[*Without waiving the objections above stated, respondents' counsel cross-examines de bene esse.*]

Cross-Q. 8. Since the adjournment here last evening, you have been talking to somebody about this case, have you not?

Ans. There was some talking, I remember; there was some talking done about this telephone case, and so on.

Cross-Q. 9. With whom did you talk about it since your deposition was closed yesterday?

Ans. Kunkel and Gochenauer talked about it.

Cross-Q. 10. Didn't you talk about it with Mr. Storrow or Mr. Smith or somebody else, besides Mr. Kunkel and Mr. Gochenauer?

Ans. No, sir; I did not.

Cross-Q. 11. What did you and Mr. Kunkel and Mr. Gochenauer talk about—what particular points?

Ans. About the cost of it—what great expense, etc.—that is about all.

Cross-Q. 12. Have you talked with anybody about a one-armed man?

Ans. Yes; we had conversation some, since we are down here, about this one-armed man.

Cross-Q. 13. Whom did you talk to about the one-armed man?

Ans. The party that came with me; Kunkel and Gochenauer.

Cross-Q. 14. Haven't you talked to anybody else, since you came here, about the one-armed man?

Ans. No, sir; I didn't; I am not intimately acquainted with no other persons.

Cross-Q. 15. Hasn't Mr. Storrow or Mr. Smith asked you any questions about the one-armed man since you closed you deposition last evening?

Ans. I don't really recollect whether there was any; I might have been asked whether I knowed the man or not—was acquainted with him.

Cross-Q. 16. Since yesterday's adjournment, who has asked you whether you remembered a one-armed man being there at the time of the use of that diamond dressing machine?

Ans. I forget his name; a man that stays at this house. Morrett I think is his name; I am not sure, though.

Cross-Q. 17. Was the name Tompkins?

Ans. Tompkins, I think, is the name; I had forgotten the name.

Cross-Q. 18. He is here assisting the counsel for complainants, Mr. Storrow and Mr. Smith, in some way; is he not?

Ans. That I cannot really tell; I didn't inquire into their business.

Cross-Q. 19. In what room did you have the talk with him?

Ans. I think it was 526.

Cross Q. 20. Who is occupying the room?

Ans. That I cannot tell; I didn't inquire.

Cross-Q. 21. How came you to be in the room?

Ans. My friends was in there, and I was in different rooms through the house.

Cross-Q. 22. Who was present in the room while you were talking with Mr. Tompkins?

Ans. I think a man by the name of Croll; and Kunkel just came in.

Cross-Q. 23. Is that all that were in the room?

Ans. Yes, sir; at that time.

Cross-Q. 24. Did you talk with Tompkins in any other room in the house?

Ans. No, sir; I didn't.

Cross-Q. 25. Who invited you to go into that room No. 526?

Ans. Mr. Gochenauer.

Cross-Q. 26. Did he tell you what he wanted you to go in there for?

Ans. No; he just simply invited me in there directly when I came there.

Cross-Q. 28. You say you talked with Mr. Tompkins there in that room. Now when you went into that room, at the time when you had the talk with Mr. Tompkins, did you find Mr. Tompkins in the room or did he come in afterwards while you were in there?

Ans. Mr. Tompkins wasn't in the room when I entered the room, the first time when I came here.

Cross-Q. 27. Since you came here you have entered the room a number of times, have you?

Ans. I have been in, yes; off and on.

Cross-Q. 29. Now I shall refer to one particular time when you say you were in the room, namely, the time when you had the talk with Tompkins there. How happened you to go into the room then; did some one ask you to go in? if so, who?

Ans. No person asked me to go in; I went in of my own accord; I came in from the street, and went right in to see Mr. Kunkel, expecting that he might be in there.

Cross-Q. 30. Mr. Jacob S. Kunkel?

Ans. Yes, sir.

Cross-Q. 31. Whom did you find in the room when you went in there?

Ans. Mr. Croll.

Cross-Q. 32. Give Mr. Croll's name in full, and where does he live?

Ans. That I cannot do; I am not acquainted with the gentlemen; I

don't know that I ever seen him to know his name before this day in the room.

Cross-Q. 33. You say that you entered the room and found Mr. Croll there; did you find anybody else there; if so, who was it?

Ans. There was no person in when I came in the room but Mr. Croll.

Cross-Q. 34. Mention all the persons who came afterwards while you were in the room.

Ans. As far as I remember it was J. Kunkel and Tompkins.

Cross-Q. 35. Did they come in together?

Ans. No, sir.

Cross-Q. 36. Are you rooming in this hotel?

Ans. Yes, sir.

Cross-Q. 37. What room?

Ans. 604.

Cross-Q. 38. Are Mr. Jacob S. Kunkel and Mr. Gochenauer rooming in this hotel?

Ans. Yes, sir.

Cross-Q. 39. Is Mr. Tompkins rooming here in this hotel?

Ans. I did not inquire.

Cross-Q. 40. You testified yesterday that you could not remember all the persons who were present at the time those two stones were dressed with the diamond dressing machine; did you not?

Ans. I think I did.

Cross-Q. 41. That event was from eight to ten years ago, was it not?

Ans. It was between the spring of 1871 and the spring of 1874.

Cross-Q. 42. You also testified that you do not know Mr. Urias R. Nichols, of Newbury township, York county, did you not?

Ans. Yes, sir; I don't know him.

Cross-Q. 43. While the stranger was dressing those stones, how long did it take him to complete the operation with his diamond dressing machine?

Ans. That I couldn't tell exactly, but it may be between three and four hours.

Cross-Q. 44. You were giving your attention chiefly to the operation of the machine, I suppose; were you not, to see how it worked?

Ans. Yes, of course, when I hadn't any business of my own I was about him when he was dressing.

Cross-Q. 45. Did you have any other business of your own at that time, that took you into other parts of the mill, or out of doors?

Ans. No, sir; my business was in the mill all the time, especially that time he was there.

Cross-Q. 46. While he was there, was the mill shut down, or were the other three run of stones running?

Ans. The mill was running.

Cross-Q. 47. Who was attending to the running of it?

Ans. I myself was one, and then I had a hand.

Cross-Q. 48. Who was the hand?

Ans. That I couldn't tell exactly. I had several hands that summer, and I couldn't tell which one was there at the time the dressing-man was there. If I had my book here, I suppose I could tell which one was there; and then he might have been away, too. I couldn't tell whether the miller I had was there at the time, or not.

Cross-Q. 49. I suppose you don't mean to testify positively that no one-armed man was in the mill at any time during the whole three or four hours while the stranger was using the Diamond dressing-machine; but only that, after the lapse of from eight and a half to eleven and a half years, you cannot remember of seeing any present; is not that the fact?

Ans. As a general thing, if a one-armed man—whether there was a stranger there, or not—would come to a place, there would be some talk—a man that had one arm, especially if he had his arm fixed as this man had. He would be an especial object to remember. There would be some talk on the subject, too, how this man lost his arm.

Cross-Q. 50. And that is what makes you think that you didn't see a one-armed man there at that time, is it?

Ans. Yes, sir; I am positively sure that there wasn't such a man there.

Cross-Q. 51. By "such a man" you mean a man "having his arm fixed" the way this man had; do you?

Ans. Yes; and I wasn't out of the mill long enough for a man—if he had been there, of course I would have seen the man, because I was in the mill, except when I went to dinner. I can't recollect that I was out of the mill.

[*This answer and the 29th answer objected to by Mr. Hill, as hypothetical, argumentative, and not responsive.*]

Cross-Q. 52. Referring now to the mere matter of your memory, please answer this question, without argument: Can you swear to anything more, as a matter of memory, than that you don't remember seeing a one armed man there at that time?

Ans. I wouldn't know, but as concerns my business and any other business, there is hardly ever a man goes in unless he has an object in view; and he doesn't go in and not say anything about it. On that ground I believe I could be qualified to it—unless it was an insane man.

[*Answer objected to by Mr. Hill, as argumentative and not responsive.*]

Cross-Q. 53. Then that is the ground on which you have qualified about a one-arm man being present or not present, is it?

Ans. Yes, sir; and not seeing him there.

Cross-Q. 54. You don't recollect seeing him there, that is as far as your memory goes; is it?

Ans. No, sir; I didn't see him there.

Cross-Q. 55. You have referred to a man having his arm fixed as this man had. Did you ever see Mr. Urias R. Nichols?

Ans. No; I didn't see him, but I heard his arm described, how it was fixed, that he could work with it. I haven't seen the man, never, not since he has had his arm lost. I might have seen him, and not known him. I might have seen you, too.

Cross-Q. 56. When did you hear his arm described, and who described it to you?

Ans. Since I am here. Mr. Kunkel.

Cross-Q. 57. You were not present in this room while Mr. Kunkel was giving his deposition yesterday or to-day, were you?

Ans. No, sir.

Cross-Q. 58. How did Mr. Kunkel describe Mr. Nichols' arm?

Ans. It was an iron fixed arm with a hook at its end—a kind of a hook to work with—to grab. That is the way I understood him.

Cross-Q. 59. Now, do you mean to swear that such a man could not possibly be in your presence, or be in the same room with you for five minutes, eight or eleven years ago, without your observing the hook and remembering it to this day?

Ans. Did you mean, forgetting that I seen the man? Yes, sir. Of course he couldn't be in my presence without my observing a thing like that, and it still being in my memory.

Cross-Q. 60. What would attract your attention so quickly and earn-

estly—the mere fact of his having lost a part of his arm, or the peculiar appearance of the iron hook?

Ans. Both; the hook and minus the arm.

Cross-Q. 61. If he had been there without the hook and simply minus the arm, could you swear positively that you would have noticed, that the lower end of one sleeve was empty, and have remembered the circumstance to this day, so long after?

Ans. If he would not have had an artificial arm, I think I could; that is, a wooden arm the shape of the arm and hand.

Cross-Q. 62. But if he had an artificial arm resembling the natural arm and hand, then you might not have noticed it; is that the fact?

Ans. Yes, sir.

Cross-Q. 63. Then he might have been present a portion of the time with such an arm or hand, for aught you know to the contrary; might he?

Ans. There was no stranger present there to the best of my knowledge, but the man dressing the stones.

Cross-Q. 64. But you have sworn that you don't remember all the people who were there, and don't even remember whether your own assistant was there; nor what the assistant's name was, if he was there; in view of such a failure of memory as that, are you able now, after more than eight years, to testify to anything more than that you don't recollect of any stranger being present?

Ans. There was no—of course there was people there, through the day, customers going back and forth, that I wouldn't remember; a man would have to have a whole book full of memorandums to remember all that; but as concerns a man with one arm being there, I can be qualified that I didn't see nor hear of such a man being there; that is about all I have to say.

Cross-Q. 65. Can you mention the name of any customer who was there at the mill that day, while the man was dressing the stones with the diamond dressing machine?

Ans. No, sir.

Cross-Q. 66. Can you testify how many customers were there that day during that time, or any part of it, while that man was dressing the mill-stones?

Ans. No, sir.

Cross-Q. 67. Can you testify that you personally knew every customer who came there during that three or four hours?

Ans. No, sir.

Cross-Q. 68. Can you testify that all the customers who came, during that three or four hours, came alone, and that no one had a friend with him?

Ans. No, sir; I didn't watch that close outside.

Cross-Q. 69. Can you testify whether all the customers who came during that three or four hours were men, or whether some of them were women or children?

Ans. No, sir.

Cross-Q. 70. Was Mr. Kunkel's mill at Lisburn situated right in the village?

Ans. Yes, sir.

Cross-Q. 71. How far from the post-office?

Ans. May be about thirty or forty yards, or fifty; I couldn't tell accurately.

Cross-Q. 72. Who was the postmaster while you were there?

Ans. I think, Mr. John C. Bowman; I am not positive.

Cross Q. 73. Were there any stores in the village; if so, how many?

Ans. Yes, sir; there were two stores in it.

Cross-Q. 74. Who kept those stores?

Ans. Bowman kept the one at the post-office, and Starr kept one in the village.

Cross-Q. 75. How far was Starr's store from the mill that you had charge of?

Ans. I couldn't tell exactly; about five hundred yards, more or less.

Cross-Q. 76. Was there a tavern in the place?

Ans. Yes, sir.

Cross Q. 77. Was the mill that you had charge of alongside of the public road?

Ans. Yes, sir.

Cross-Q. 78. Was it on the road that a person would take in going from Harrisburg to Newbury, by way of Lisburn?

Ans. Which do you mean, the mill? By branching off you could go by that road to Newbury, but the direct road don't go to Newbury.

[*Answer objected to by Mr. Hill, as evasive and not responsive.*]

Cross-Q. 79. Is there a road leading from Lisburn to Newbury?

Ans. I think so.

Cross-Q. 80. Does not that road pass over the bridge and directly by the mill?

Ans. Which road?

Cross-Q. 81. The road from Newbury to Lisburn.

Ans. I don't know the name of the road. It must be a branch road.

Cross-Q. 82. Do you know where Newbury is?

Ans. I have been there several times.

Cross-Q. 83. Did you ever go from Lisburn there, or from there to Lisburn?

Ans. No, sir.

Cross-Q. 84. Then you don't know anything about the roads between Lisburn and Newbury, do you?

Ans. Yes, sir; I went the road from Lisburn to Lewisbury.

Cross-Q. 85. Did you go over that bridge near the mill, when you went that road?

Ans. Do you mean the bridge at Lisburn?

Cross-Q. 86. Would the bridge near the mill be anywhere else than at Lisburn?

Ans. There is a bridge at my mill—right where I live. The place wasn't specified where the bridge was to be.

Cross-Q. 87. Do you mean at Warrington township, where you live?

Ans. Yes, sir; that is the place.

Cross-Q. 88. How far is the place where you live, in Warrington township, from the mill at Lisburn?

Ans. I guess it is about eight miles.

Cross-Q. 89. How far is Lewisbury from the mill at Lisburn?

Ans. I think, about three miles.

Cross-Q. 90. Is Lewisbury on the road from Lisburn to Newbury?

Ans. That I can't tell. I don't know whether it is called the Lewisbury road, or not; but the road from Lewisbury to Lisburn is called the Lisburn road. That is about as far as I went on those roads—to Newbury. That is the way the mail went on those roads—from Lisburn to Lewisbury, and from there to Newbury, but on what road I cannot tell.

Cross-Q. 91. Do you mean that the mail went over the bridge at your mill in Lisburn, in going from Lisburn to Lewisbury?

Ans. Yes, sir.

Cross-Q. 92. And then the mail was carried on from Lewisbury to Newbury, but you don't know by what road; is that what you mean?

Ans. Yes. I never seen the mail starting from Lewisbury to New-

bury, and don't know which direction it took. It might have taken five or six roads, if it went around. It went from Newbury to Goldsboro'. There is a post-office at Newbury.

Cross-Q. 94. As you understood it, the mail went from Lisburn to Lewisbury, and from Lewisbury to Newbury; did it?

Ans. So I was told. Yes, sir.

Cross-Q. 95. And in going from Lisburn to Lewisbury, it passed over the bridge near Jacob S. Kunkel's mill, did it not?

Ans. I think so; it went that direction, towards the bridge.

Cross-Q. 96. How far is the bridge from Jacob S. Kunkel's mill?

Ans. I cannot tell exactly; maybe two hundred yards or three.

Cross-Q. 97. So that is your best recollection about it?

Ans. What shall the recollection be; about the road, or the bridge, or the mill, or the mail?

Recess for lunch until 2 30, P. M.

DECEMBER 8, 1882, 2.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Elijah S. Kunkel, by Mr. Hill, continued:

Cross-Q. 98. Is that your best recollection of the distance from the bridge to the grist mill?

Ans. Yes, sir.

Cross-Q. 99. Can you swear it is as much as one hundred yards, from the bridge to the grist mill?

Ans. I couldn't tell exactly how far it is; I wouldn't be qualified to the fact.

Cross-Q. 100. Did you ever see any one-armed man in the mill at Lisburn during the three years that you lived there?

Ans. Yes, sir.

Cross-Q. 101. How many?

Ans. Two.

Cross-Q. 102. Name them.

Ans. Michael Smyser and Rudy; his first name I don't remember.

Cross-Q. 103. Where does Rudy live, and what is his business?

Ans. He lived in Lisburn the time I lived there; he peddled bones and old iron, etc, so far as I know.

Examination taken, reduced to writing, and by the witness subscribed to before me, the 8th day of December, 1882.

FRED. M. OTT,
Examiner.

ELIJAH S. KUNKEL.

MARTIN S. CRULL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Storrow:

My age is forty-one. Residence, Newburytown, York county, Pennsylvania. Occupation, farmer.

Q. 1. Do you live at the present time in the village?

Ans. No, sir; about a mile east.

Q. 2. When did you begin to reside on your present farm, and where did you reside last before that?

Ans. I moved there in 1875. I resided in the village of Newbury immediately before that.

Q. 3. How long have you lived in that part of the country?

Ans. I have lived within three miles of that place all my life time; I was born within three miles of that place.

Q. 4. Did you ever own a mill in that neighborhood, and if so, when did you buy it?

Ans. I did. I bought it in 1871.

Q. 5. When did you sell it?

Ans. In the spring of 1882.

Q. 6. Was it ever burnt down; if so, when?

Ans. It was, on the 7th of April, 1881, on the night of the 7th.

Q. 7. How near was that mill to where you now live?

Ans. One mile and a half.

Q. 8. Is there any other Mr. Crull near there, who owned a mill between 1871 and 1880?

Ans. No, sir; there is not.

Q. 9. Do you know Mr. Urias R. Nichols, a one-armed man, about forty years old, who resided near Newbury a couple of years ago?

Ans. Yes, sir; I do.

Q. 10. When did you first know him—how many years ago?

Ans. I suppose thirty years. We were boys together at school. I can fix no date.

Q. 11. Do you know the house he lived in a couple of years ago; and, if so, how far is it from your present farm?

Ans. I do. It is about one mile.

Q. 12. About how far was it from the place where you lived in Newbury village, before you moved on to your present farm?

Ans. About the same distance, I think.

Q. 13. Was he customer at your mill?

Ans. He was.

Q. 14. Did Mr. Nichols ever meet you in Col. Maish's office in York, and tell you that he had seen a talking-machine at the shop of Daniel Drawbaugh, at Eberly's Mills?

Ans. No, sir; he did not.

Q. 15. Were you ever with him at Col. Maish's office in York?

Ans. No, sir; I never was in Col. Maish's office in my life before yesterday.

Q. 16. Did Mr. Nichols ever speak to you about Drawbaugh, or about any telephone or talking-machine in connection with Drawbaugh, or about any suit concerning a talking-machine?

[*Objected to by Mr. Hill as not rebuttal, and because it is incompetent to prove any conversation with Nichols, except that referred to in Nichols' testimony, and which Nichols only says he thinks took place.*

Complainants' counsel objects that that is not a correct statement of Nichols' testimony.

Respondents' counsel refers to Nichols' 42d answer.

Complainants' counsel refers to his 44th answer also, page 97 of respondents' printed record.

Respondents' counsel says that the statements of Nichols about that conversation are all to be taken in connection with his 42d answer, which modifies the entire statement.

Complainants' counsel says that they are all to be taken, and not the 42d answer only]

Ans. He did.

Q. 17. What did he say about it, and when was it?

[*Objected to by Mr. Hill, as incompetent and not in rebuttal; Mr. Nichols not being a party to this cause, his ex parte and hearsay statements cannot be received in evidence.*]

Ans. He told me he was a witness and had to appear in Harrisburg in connection with this suit; that was sometime in April, 1881, very shortly before he had to appear there.

Q. 18. Was it or was it not, any time near the time when your mill was burned?

[*Same objection.*]

Ans. I can't say that it was before the time or after; it was some time about the beginning of the month, somewhere, I can't tell when.

Q. 19. Had he, or had he not ever spoken to you before that about Mr. Drawbaugh in connection with a talking machine?

[*Same objection.*]

Ans. He had not, to my recollection.

Q. 20. When he told you that he was going to be a witness in that case, did it surprise you, or did it strike you as something natural?

Ans. It surprised me very much to know how he could know anything about so important a case.

Q. 21. Did Mr. Nichols ever tell you about any burr-dressing machine made, or said to have been made, by Mr. Drawbaugh?

Ans. He did not; not that I have any recollection of.

Q. 22. When did you first see Mr. Daniel Drawbaugh, and where, and under what circumstances?

Ans. I went to Eberly's Mills sometime in 1866 or 1867—I ain't positive what time—for a load of flour; my uncle, Lafayette Crull, took me to Drawbaugh's shop to see a self-feeding nail-cutter that he had invented.

Q. 23. How near to the grist-mill was Drawbaugh's shop when you went into it?

Ans. I can't say positively about the distance, but I think it was very close to the mill.

Q. 24. Between the time when you bought your mill in 1871, and the time when it was burned down in 1881, did you put in any new bolt-cloths, and if so, when did you put in the first one?

Ans. The first one I put in in 1872, when I rebuilded the mill.

Q. 25. By rebuilding the mill, do you mean rebuilding the building, or rebuilding the machinery?

Ans. I mean rebuilding the machinery. I put in new machinery entire.

Q. 26. If you have any paper or data by which to refresh your recollection as to the time when this rebuilding took place, will you please produce it and state what it is, and how it helps you to give the date?

Ans. I have a catalogue from the York Manufacturing Company, containing a testimonial to the Bollinger Turbine Company, giving the date.

(The book produced by witness is entitled "Illustrated and Descriptive Pamphlet and price list of the Bollinger Turbine Water-wheel, manufactured by York Manufacturing Company, York, Penna, York, Pa. Small & Welch, printers, 1875." On page 57 is the following:

"NEWBURYTOWN, PA., Sept. 26, 1872.

"O. J. Bollinger, Esq.,

"Dear Sir: Since my last to you, we have had plenty of water and gave your wheel a fair trial; I am now satisfied that they are far superior to an overshot. Yours respectfully,

M. S. CRULL.")

Q. 27. When did you next put in any new bolting cloths?

Ans. In 1880; I replaced the one put in in 1872, by a new cloth.

Q. 28. When was the cloth put in in 1880 bought?

Ans. Perhaps a year before it was put in.

Q. 29. Since you have been living on your present farm, have you been in the habit of sending your produce to market to York?

Ans. We do; all goes to York.

Q. 30. Who has been in the habit of going with it—which of your family at various times?

Ans. My wife generally done the marketing.

Q. 31. Was there any time when you were in the habit of going yourself, and if so, when?

Ans. During the peach season of 1879 I marketed the fruit myself.

Q. 32. The defendants' record, page 338, contains the deposition of Isaac B. Millard; he said that he was thirty-six years old; resided in Newbury township; was a farmer; moved on to his present farm in 1874; that he had worked as a house-carpenter and mill-wright, and had been president of the school-board in his township; that the farm was bought by his father-in-law from the estate of Michael Strominger, deceased; do you know that Isaac B. Millard?

Ans. I do.

Q. 33. How near does he live to Urias R. Nichols?

Ans. I suppose it is about three miles north-east.

Q. 34. Do you happen to know whether he and Mr. Nichols are acquainted?

[*Objected to by Mr. Hill as immaterial and irrelevant.*]

Ans. I think they are.

Cross-examined by Mr. Hill:

Cross-Q. 35. Why did you go to Col. Maish's office yesterday?

Ans. I went there to inquire for Mr. Storrow.

Cross-Q. 36. Had you been directed or requested to go there?

Ans. Mr. Storrow requested me to call there.

Cross-Q. 37. Did he say what he wanted you to call there for?

Ans. He brought me to York, and I was looking up some little dates, and he requested me to call there preparatory to taking the train for Philadelphia.

Cross-Q. 38. What little dates were you looking up?

Ans. I went to Mr. Bollinger to get an old catalogue to fix the date of the repairing of my mill.

Cross-Q. 39. What did you want to fix the date of repairing your mill for?

Ans. Mr. Storrow requested me to get something to refresh my memory.

Cross-Q. 40. How long have you known Col. Maish?

Ans. I only know Col. Maish by reputation; I have known him, when I would see him, ever since he was in the army; there is where I first saw him. I never had no personal acquaintance with the man.

Cross-Q. 41. You mean ever since the war of the rebellion, do you?

Ans. Yes, sir.

Cross-Q. 42. Do you remember of ever being in York, in company with Mr. Urias R. Nichols?

Ans. We met frequently during market hours; at no other time.

Cross-Q. 43. You don't remember all the conversation you had with him during those frequent meetings in York, do you?

Ans. I would hardly remember all of an ordinary conversation.

Cross-Q. 44. You don't remember all the subjects that were discussed during all those conversations in York, do you?

Ans. No, sir; I don't suppose there was anything very important, or it is likely I would have remembered some part of it, at least.

[*All of the last answer after "No, sir," objected to by Mr. Hill, as irresponsive, and as argumentative and mere guess-work.*]

Cross-Q. 45. How far do you live from York market?

Ans. We call it thirteen miles.

Cross-Q. 46. How far do you live from Harrisburg?

Ans. I think it is about the same distance.

Cross-Q. 47. How many bolts did you put in your mill when you rebuilt it, in 1871 or 1872?

Ans. I put in but one.

Cross-Q. 48. Have you never had but one bolt in the mill at a time?

Ans. My father put a custom bolt in, about a year before I purchased the mill from him; this one that I put in was a merchant bolt.

Cross-Q. 49. Then, after you rebuilt the mill, was there one custom bolt and one merchant bolt in it?

Ans. There was.

Cross-Q. 50. When you rebuilt the mill, did you reclothe the custom bolts, or continue to use the same old cloth on it?

Ans. We used the same old cloth, but I think we built a new chest partly out of the old chest.

Cross-Q. 51. How long did you use that same old cloth on the custom bolt?

Ans. The same cloth was on the reel when the mill was destroyed; we only used it for making buckwheat and rye, the last few years.

Cross-Q. 52. Did you ever have to patch the cloth on either of those bolts, or repair it?

Ans. Yes; on both of them.

Cross-Q. 53. How often, and when first, so far as you remember?

Ans. That I could have no memory of, as my miller put the patches on the cloth; I saw the patches, and he reminded me of it—said we ought to have a new cloth; I put it off as long as I could.

Cross-Q. 54. Name all the millers whom you had there from the time when you rebuilt the mill, in 1872, to the time when it was burned; and give their present places of residence, so far as you know them.

Ans. David Boyer was my miller when the mill was burned, and the only one I ever had; he run the mill all the time I owned it; he resides in Newbury township; his post-office address is Newburytown.

Cross-Q. 55. Where did you buy the bolting-cloth which you put on to the merchant reel, in 1872?

Ans. Of P. A. & S. Smalls, in York, Pennsylvania.

Cross-Q. 56. Where did you buy the bolting cloth which you put on in 1880?

Ans. I bought it of the same firm.

Cross-Q. 57. It is possible that Mr. Nichols might have said something to you, at some time eight or ten years ago, about Drawbaugh's talking-machine, or burr dressing-machine, and you have entirely forgotten the circumstance; is it not?

Ans. I think not; I think I would have hardly forgotten so important a circumstance.

Cross-Q. 58. There have been a good many burr dressing-machines brought before the milling public during the last ten or eleven years; have there not?

Ans. Yes, sir; I admit the fact; as my miller done the dressing of the stones it was immaterial to me what he used; I paid no attention to such matters at all.

Cross-Q. 59. If you had heard of a talking-machine as long ago as 1875, before anything was known of the telephone, do you think you would have been any more interested about it, at that time, than you would about a burr dressing-machine which was directly connected with your business as a miller?

Ans. I think I would have, from the fact that burr dressing-machines were numerous, and a telephone would have been rather a new thing to me—or a talking-machine, rather.

Cross-Q. 60. Do you know anything about the subject of electricity and its application in the arts?

Ans. I do not; I never studied anything connected with electricity.

Cross-Q. 61. You never have taken any particular interest in the subject of electricity and its applications in the arts, have you?

Ans. Never did.

Cross-Q. 62. You wouldn't have understood anything about it, if anybody had described an electrical machine to you; would you?

Ans. I would likely have understood the purpose for which it was intended; that is about all, I suppose.

Redirect by Mr. Smith:

Q. Q. 63. How long were you at Col. Maish's office yesterday?

Ans. Long enough to pass across his office and make the inquiry and return. I suppose it occupied perhaps a minute or perhaps more.

Q. Q. 64. Do you mean, make the inquiry for Mr. Storrow?

Ans. Yes, sir.

Q. Q. 65. Did you find him at that office?

Ans. I did not.

Q. Q. 66. Were you told where to go to find him?

Ans. Col. Maish directed me to Mr. Stambaugh's hotel.

Q. Q. 67. Was that all the conversation that took place at Mr. Maish's office?

Ans. Yes, sir.

Q. Q. 68. Had you ever been spoken to about testifying in this case, before Mr. Storrow called on you yesterday?

Ans. I was not.

Q. Q. 69. You said Mr. Storrow brought you to York; did he bring you there from your own place?

Ans. He did.

Q. Q. 70. Did you have any conversation yesterday with anyone, except Mr. Storrow, about this case?

Ans. I did not, except my wife, when she asked me what was the matter.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 8th day of December, 1882.

FRED. M. OTT,
Examiner.

M. S. CRULL.

Adjourned until December 9, 1882, at 10, A. M.

DECEMBER 9, 1882, 10, A. M.

Examination resumed pursuant to adjourment.

Present, same counsel.

DAVID A. HAUCK, *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

My age is thirty-six; residence, Mechanicsburg, Pa.; occupation, machinist.

Q. 1. How long have you resided in Mechanicsburg?

Ans. During the whole of my life, excepting a few months.

Q. 2. How long have you known Daniel Drawbaugh, of Eberly's Mills, if you have known him?

Ans. I have known him intimately for nine years.

Q. 3. If you had known him before that time, state what you knew of him and where you met him.

Ans. For five or six years previous to the year 1873, he came to my father's shop at Mechanicsburg, perhaps as often as twice a year, where I

saw him, and knew him to be Daniel Drawbaugh; although I did not exchange words with him except on one occasion, when he came there with an automatic boiler-feeder, perhaps during the years 1869 or 1870, when we did have some conversation over the merits of this machine.

Q. 4. Did you understand that that was a machine of his invention or construction?

[*Objected to by Mr. Hill as immaterial, irrelevant, and not in rebuttal.*]

Ans. He said it was.

Q. 5. Do you know for what purpose he brought it to your father's shop, and what was done with it there?

[*Same objection.*]

Ans. I do not know for what purpose he brought it there, and he took it away with him the same day; it was a working machine, but a very small one; I would say it was not a full-sized working machine.

Q. 6. Do you recollect anything about the construction of the device, and how it was intended to operate? If so, please describe it as far as you are able.

[*Same objection.*]

Ans. It consisted of a casing, similar to an ordinary stop or plug-cock, in which there was a plug or cylinder, having pockets or cavities, which cylinder was revolved by hand when he showed it to me. It was intended to have a water supply, or head of water, which would fill the cavities or pockets when they were on the upper side of the casing, and be discharged into the boiler when the pockets came to the under side of the casing, during the revolution of the cylinder.

Q. 7. Did you afterwards go to Mr. Drawbaugh's shop, at Eberly's Mills; if so, will you state when you first went there, and what was the occasion of your going there?

Ans. I went there for the first time during the latter part of June, 1873, for the purpose of examining the works of the Drawbaugh Manufacturing Company, with a view of purchasing.

Q. 8. Did any one go with you on that occasion?

Ans. Either George W. Hauck, Samuel F. Hauck, or both of them, were with me; I cannot remember exactly.

Q. 9. Did they propose to be parties to the purchase, if one was made?

Ans. They did.

Q. 10. Whom did you meet there, and what examination did you make of the premises and machinery?

Ans. There were several persons there at the time, but I knew none, except Daniel Drawbaugh. We examined the tools and machinery very carefully, Mr. Drawbaugh explaining to us the various uses, and telling

us what belonged to the Drawbaugh Manufacturing Company, to himself, and others.

Q. 11. Do you remember what parts of the building you went into? If so, state generally what you found in the several rooms.

Ans. My impression is that we went into all parts of the building at that visit; in the basement was a lot of rubbish or scrap-iron, which we looked over casually; on the first floor was nearly all of the machinery; on the second floor one room was occupied by Mr. Drawbaugh, partly as a private room, one room as a work-shop by him, and the other room had a few tools or machines, and was used for painting and packing; the third floor or loft was filled with patterns and a few finished pumps.

Q. 12. Did Mr. Drawbaugh take you into his private room at that time; and if so, what did you see there?

Ans. He did; and passed through his private room to get to the third floor or loft; there was a large table or desk, a number of books and papers scattered over it, some drawing materials; and there was an old-fashioned high clock standing in a corner of the room, which he told us he was then using, or meant to use to drive another clock in the next room or work-shop by means of an electric current generated by a chemical battery. There were on the walls some comic drawings or portraits, also some specimens of wood carving; that is about all I can recall.

Q. 13. If Mr. Drawbaugh showed you any machines in other parts of the building, which he spoke of as his own invention, will you state what they were?

Ans. He showed us a great many things, although he did not say they were his inventions; still, we were impressed to believe they were, or to think they were; there was a steam syphon or pump, the automatic boiler-feeder before spoken of, a second pump which I understood was to supply boilers with water, a machine for insulating wire for telegraph purposes, a pressure blower, two stamp cancellers, a hydraulic ram, a nail plate feeding-machine or appliance; that is about all I can recall; there may have been others, but I don't remember of them now.

Q. 14. Did you make other visits to the shop before purchasing the property; if so, how many, and what persons were with you, and whom did you meet while there?

Ans. I made two visits; one was about a week after my first visit; I was in company with my father, George Hauck; another was a few days subsequent, in company with G. W. Hauck, S. F. Hauck, and J. A. Eberly, when we met the members of the Drawbaugh Manufacturing Company, and tried to effect a purchase, but did not succeed at that time. During these two last visits I again looked over the place, with a view of becoming better informed as to what was there.

Q. 15. Was Mr. Drawbaugh present at these last two interviews?

Ans. He was.

Q. 16. Did you subsequently make the purchase of the property? If so, state when it was, and when you took possession of the property.

Ans. We did purchase it subsequently, and took possession on or near the fifteenth of July, 1873.

Q. 17. If there was a written contract between the parties for the purchase of the property, will you refer to it to ascertain the date; and if there is a memorandum of the time when the property was delivered to you, will you give a copy of that memorandum?

Ans. I have an indenture made on the first of July, 1873, between William R. Gorgas and others, and George W. Hauck and others, conveying the property of the Drawbaugh Manufacturing Company, but the transfer was not really made and possession taken, until the fifteenth; there is a memorandum on the back of the paper as follows:

"Countersigned by the President, Secretary, and Treasurer of the Company; sealed with the corporate seal of the same, and deed delivered without recourse and possession given this fifteenth day of July, 1873.

Wm. R. Gorgas, President,
M. B. Mosser, Secy and Treasurer,
Drawbaugh Mfg Co."

Q. 18. Who were the parties who signed this contract with William R. Gorgas, on the first of July, on behalf of the vendors, and who signed it as purchasers?

Ans. William R. Gorgas, M. B. Mosser, S. M. Hertzler, William L. Gorgas, John Sheely, Daniel Drawbaugh, Henry S. Rupp, A. H. Gardner, Joseph C. Hursh, George Wise, J. F. Hursh; they are the vendors. The purchasers do not appear as signers, but are mentioned in the body of the deed as follows: George W. Hauck, D. A. Hauck, S. F. Hauck, and John A. Eberly.

Q. 19. Will you state whether you then took possession of the property; and if so, what business you carried on at that shop?

Ans. We took immediate possession; our principal business was the manufacture of measuring faucets, although we did some little mill repairing, etc.

Q. 20. Which one of the purchasers had the immediate personal superintendence of the work of manufacturing faucets at that mill?

Ans. Myself; inasmuch as I was the only member of the firm who was capable of superintending the manufacture of them.

Q. 21. How long was the business actively carried on there, and when, if ever, was it finally removed with the machinery you had purchased?

Ans. The business was carried on there until some time in May, 1876, although not actively all the time.

Q. 22. Will you state, as nearly as you can, what part of the time it was actively carried on, and what work you personally did at the shop, and during what time you personally worked there?

Ans. We operated pretty regularly from the time when we took possession until about the 1st of August of the following year, 1874, and from that time until the time of our removal I was not there nearly so often as during our first year; while there, I usually worked upstairs turning wood handles for faucets, making strainers, and painting, although, when not kept busy at this, I did lathe work and fitting on the first floor.

Q. 23. Did you reside at Eberly's Mills while you were carrying on the business there; and if not, where did you reside?

Ans. I did not; I resided at Mechanicsburg.

Q. 24. Did you go down in the morning and return at night usually?

Ans. I did.

Q. 25. Did you take any meals at Eberly's Mills, and if so, with whom?

Ans. I took one or two dinners with Daniel Drawbaugh, and with J. B. Drawbaugh, and the balance of the time I took dinner there I took it with Mr. George Leonard.

Q. 26. Did you sometimes carry your dinner with you, or spend half days there, when you dined elsewhere?

Ans. For about two weeks before I made arrangements to dine with Mr. Leonard I took my meal with me. I frequently went there for a half day and took no meal there.

Q. 27. Have you any means of telling how many times you dined with Mr. Leonard, and during what period it was?

Ans. I have means of telling how many times I dined, but not exactly what period it occurred in. I have a copy of ledger account with George Leonard,

[*Copy objected to by Mr. Hill, as secondary.*]

which shows his bill at our shop, for repairing at his mill, to amount to twelve dollars and fifty cents. On November 22, 1875, he desired a settlement; his bill for meals amounted to twenty-five dollars and ninety-five cents, including one horse-feed, twenty cents; the balance in his favor being thirteen dollars and forty-five cents, for which I gave him a due bill, which I sometime afterwards paid. The price of a meal was to be twenty-five cents; taking the amount, twenty-five dollars and seventy-five cents, would pay for one hundred and three meals, at twenty-five cents each.

[*All testimony relating to the alleged copy, or based upon it, objected to by Mr. Hill, as secondary and incompetent, and because the original is not produced.*]

Q. 28. Have you that due bill with you; if so, will you give its date?

Ans. I have; it is dated November 22, 1875.

Q. 29. You say you have a copy of ledger account; do you mean that it is a copy of your ledger account with Mr. Leonard while you were carrying on business at Eberly's Mills?

Ans. Yes, sir; that is it.

Q. 30. After August, 1874, when, as I understand, your business was not carried on there as actively as before, was there any period of increased activity; and if so, when was it?

Ans. There was; it commenced during the month of May, 1876, when we removed all the machinery necessary for the manufacture of faucets to Mechanicsburg.

Q. 31. During the latter part of 1874, the year 1875, and the early part of 1876, how often did you go to the shop, and for what purpose?

Ans. I might have been there five or six times, several times I went for faucets, and once or twice in company with a gentleman to whom I sold some machinery; and then I was there two or three days removing the machinery.

Q. 32. Was any other business started and carried on in that shop before your removal by another company? If so, state what that business was and the name of the company, if you knowit.

Ans. There was; there was manufactured a patent wagon spindle by a company which, I think, was called the Harrisburg Axle Company or Spindle Company, I don't remember which.

Q. 33. You have spoken of working on the upper floor, I believe, of the shop. Was that the floor on which Mr. Drawbaugh's private room and work room were situated?

Ans. It is.

Q. 34. During the time that you carried on business there down to the time of your final removal, did Mr. Drawbaugh continue to work at the shop; if so, what rooms did he work in and upon what work was he engaged?

Ans. He worked there very regularly and principally in the room in the north-west corner of the building, on the second floor, where was his work-bench and lumber. When I first went there he was working on the clock I have before spoken of; sometime afterward he made an apparatus for telegraphing by means of a horse-shoe magnet, without a battery; that is the way I understood it; he then did some repair work for the farmers of the neighborhood, as well as pattern-making and general machine repairing.

Q. 35. Was that room the one which you have before spoken of as Mr. Drawbaugh's work-room?

Ans. Yes, sir; that is the room I mean, in which the work-bench was.

Q. 36. Was the room which you spoke of as his private room in the opposite or north-east corner, on the same floor?

Ans. It was.

Q. 37. Did he continue to occupy this room while you were there?

Ans. He did.

Q. 38. Did you have access to this room, and also to the work-room, and were you accustomed to go into either or both of the rooms?

Ans. I had access to the private room, and passed through it to get to the pattern loft, and was obliged to pass through his work-room to go to my work-room.

Q. 39. Will you look at the diagram on page 921 of respondent's printed record, and state whether that shows the rooms on that floor as they were while you carried on business at the shop; and if not, in what respect they differed?

Ans. It does not; the gangway as shown, running from the north end of the building to the large room at the south end, was not there, and a partition, running nearly east and west, was continued to the corner of the north-east room; the partition between the gangway, as shown here, and the north-west room, not being there.

Q. 40. Were the stairs leading up to this floor within the building when you went there, or outside of it, and was a change at any time made in that respect?

Ans. There was a stairway inside only, when I went there. The Axle Company made a stairway on the outside of the building, on the north end, and changed the arrangement of the rooms upstairs, as it is shown in the diagram.

Q. 41. If Mr. Drawbaugh had occasion to use any machinery for any work for himself, was he allowed to use your machinery, and did he do so to any extent?

Ans. He had permission to use any of our tools when not in use by ourselves, and availed himself of the privilege, having no lathes of his own at that time.

Q. 42. What did you pay for the machinery and other property which you bought from the Drawbaugh Manufacturing Company?

Ans. We paid them seven thousand dollars.

Q. 43. Did you employ Mr. Drawbaugh to do any work for you while you were there, or have any talk with him about working for you?

Ans. He did no work for us; but at one time, when we were behind orders, I tried to get him to work on faucets for us. He promised me he would on the following day; but, on my coming there, said he had some work to do that he had promised other parties; and he never did any work for us, other than a little assistance he rendered, at different times, without compensation.

Q. 44. Was there anything said about the price you were to pay him; if so, what was it?

Ans. When I approached him on the subject, I asked him what he would work for a day; he replied that he would not work by the day, but would by the piece. I then asked him what he would want a piece to finish the faucets ready for packing; he said he would make them for forty cents each; I then said, "Why, Dan, you can't make wages at that, but if you will make them at sixty cents I will give you that, and you won't make a fortune at that," or words to that effect; I told him he wouldn't make a fortune out of it, or a mint. I don't remember the exact words; he accepted my proposition, with the result before mentioned.

Q. 45. Did you name any price which you would be willing to pay by the day?

Ans. I am not positive, but think not.

Recess for lunch until 2.30, P. M.

December 9, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of David Hauck, by Mr. Smith, continued:

Q. 46. You mentioned that some time after you went to Eberly's Mills, Mr. Drawbaugh made an apparatus for telegraphing by means of a horse-shoe magnet, without a battery; did you see him working on the instrument before it was finished?

Ans. I did.

Q. 47. Did you see it after it was completed?

Ans. I did.

Q. 48. Can you give any further description of it—the manner in which the magnet was arranged and operated?

Ans. My recollection is that there was a magnet in the shape of a horse-shoe, made of three or four thicknesses of steel, mounted on pivots or trunnions, with a knob at the larger or curved end, by which to swing it or operate it. In front of this horse-shoe magnet was what, I believe, is called an electro-magnet, which, I think, was permanently fixed or fastened to a base, which, I think, was of walnut wood; that is about all the description I can give; I don't understand the theory of its operation.

Q. 49. Did you see Mr. Drawbaugh operate this instrument in the shop; and if so, how much and what did he do with it, and was it connected with any other apparatus?

Ans. I saw it in operation; at the time he was using it to ring a small bell or gong either in a corner of the same room or in the next room; I don't remember exactly which.

Q. 50. If you heard Mr. Drawbaugh say anything about trying it on

a telegraph line, will you state what he said and what, if anything, was done in consequence of what he said?

[*Objected to by Mr. Hill, as irrelevant and immaterial.*]

Ans. Some time after he had it completed—he had been trying it in the shop for different purposes—he expressed a desire to try it on a long line of wire. Feeling interested, by his request for permission, I applied to George A. Zacharias, who was the agent of the Cumberland Valley railroad at Mechanicsburg, asking him to give Mr. Drawbaugh an opportunity of testing his instrument. He said he would, and some time after Mr. Drawbaugh and I went to the telegraph office, and Mr. Zacharias connected the instrument to his relay or sounder; I don't remember which, and endeavored to write with it, as he said; but said it was too cumbersome and unwieldy; he could not do much with it. I went away after about ten minutes, leaving Mr. Drawbaugh there.

Q. 51. Do you know whether Mr. Drawbaugh brought the instrument away with him when he came away, or whether he left it there?

Ans. I do not know.

Q. 52. Do you remember whether you ever saw the instrument afterwards at Mr. Drawbaugh's shop?

Ans. I don't remember of seeing that same one afterwards.

Q. 53. Did you ever see one of the same kind, or similar to it, at the shop?

Ans. I think I saw one at the shop afterwards differing from the first one in having the horse-shoe magnet permanent, and a sliding core in the electro-magnet. Mr. Drawbaugh told me this obviated the objection to its being cumbersome and unwieldy.

Q. 54. When you say that the horse-shoe magnet was permanent do you mean that it was stationary—did not rock?

Ans. I do.

Q. 55. Did you see anything of a fire-alarm apparatus while you carried on business there. If so, state what it was and when it was that you saw it.

Ans. I saw an automatic fire-alarm during one of my visits, which I think was in the fall of 1874—or spring of 1875, I can't remember which; it consisted of a bar of metal, which was very sensitive to a change of temperature; he made use of this feature, that is, the expansion or contraction of this metal, to make or break an electric current and sound an alarm by ringing a bell.

Q. 56. Did you have any conversation with him about this apparatus; if so, what was it?

Ans. I either said so to him at that time or during a visit shortly afterwards, that I had saw advertised and read a description of a very simi-

lar apparatus; when he replied that his was entirely different in construction, saying it was more reliable than the other, because it completed the circuit or current to sound the alarm, while the other broke it, or *vice versa;* I can't remember which.

Q. 57. Did you know anything about a rag-carpet instrument which he had; and if so, what did you know about it?

Ans. I knew of an apparatus for joining carpet-rags instead of sewing them; it was a blade something the shape of a shuttle, with a small wood screw soldered to the blunt end—I would call it—for the purpose of fastening it to a board or table, and having two pointed ends at one end of an opening—I suppose you would call it—for the purpose of holding the end of the rag to be joined.

Q. 58. Do you remember seeing any dial telegraph instrument, or any transmitting instrument resembling a key-board. If so, state what you know about them.

Ans. I remember of seeing, during one of my later visits to the place, a key-board with the letters of the alphabet engraved or painted on the keys, and also a dial, but I cannot say that the two were connected; Mr. Drawbaugh told me it was a printing telegraph.

Q. 59. Which did he tell you was a printing telegraph, the dial or the key-board?

Ans. I cannot remember whether they both belonged to one apparatus or were distinct and separate machines.

Q. 60. You spoke of seeing a clock at your first visit to Drawbaugh's shop, which was made to operate another clock; did you see him doing anything on any other clocks excepting these two, while you carried on business there? If so, state what you know about it, and how much interested Mr. Drawbaugh manifested in it

Ans. He either finished or had under construction a clock to be driven by earth plates—I think he termed them. I saw a finished clock there at one time, but whether it was before or after we moved away I am not positive. He seemed to be very much engrossed with his clocks.

Q. 61. How much was he in the habit of talking with you about his inventions or new things he was making?

Ans. He would talk with me a great deal; or very frequently, when a new idea would occur to him, he would call me to him and ask what I thought of it. Sometimes I would not understand it and he would use every effort to make it clear to me, sometimes without success. I might say there was hardly a day passed that he did not converse over things he was making or other mechanical matters.

Q. 62. Did he have at his shop any publications of the Patent Office, and if so, what were they?

Ans. He did. He had Patent Office reports in bound volumes, also copies of the *Gazette.*

Q. 63. You have spoken of having access to his private room; were you or were you not frequently in that room, and did you meet him there; and did you see or meet other people there?

Ans. I cannot say that I was there frequently. Perhaps I would go there and spend an hour once in a week. I cannot remember of having any other person there with me, except Mr. Drawbaugh and one or both of my partners, G. W. and S. F. Hauck.

Q. 64. To what extent was that shop resorted to by the people of the village socially or for business purposes?

Ans. I would say that it was a sort of a rendezvous for loafers, some of whom annoyed me considerably.

Q. 65. Did you ever hear Mr. Drawbaugh say anything about talking-machines, or did you see any such instruments about the shop?

Ans. I did not.

Q. 66. Will you look at the various instruments which have been placed on the table, and which are marked respectively "A," "B," "C," "D," "E," "F," "G," "I," "K," "L," "M," "N," "O," and "Q," and state whether you ever saw them or any of them at Mr. Drawbaugh's shop?

Ans. I have no recollection of seeing either of them.

Q. 67. Will you look at the instrument marked "C reproduced," and state how the magnet on it corresponds in size and shape with the magnet on the telegraph instrument, which you spoke of and which was carried to Mr. Zacharias' office, in Mechanicsburg?

[*Objected to by Mr. Hill, as utterly immaterial.*]

Ans. The horse-shoe magnet here represented is nearly the same in size and shape, while the electro-magnet, I think, is somewhat smaller.

Adjourned until December 11, 1882, at 10, A. M.

DECEMBER 11, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants and Mr. Hill for respondents.

Examination of David A. Hauck, by Mr. Smith, continued:

Q. 68. State whether or not you saw at Drawbaugh's shop, on your first visits there, or before he made the magneto key, any horseshoe magnets similar to that on "C reproduced."

Ans. I did not.

Q. 69. At the time he was getting up the key did you see him doing any work on horseshoe magnets? If so, state what it was, and what conversation, if any, you had with him about such magnets.

Ans. I saw him at work upon them; he either forged them or cut them out of sheet steel, filed them up, fitted them together; then tempered them; and I remember, in riveting one together he broke one of the sections, or one of the layers; he came and told me of his mishap, when I asked him why he did not leave them softer—they would not be so liable to break. When he answered that it was necessary to have them real hard; I don't remember whether he said they were to be hard all over, or at some particular point.

Q. 70. You have spoken of working personally at the shop at Eberly's Mills after you purchased the property. Did you employ other men there, and if so, will you state who they were, and as nearly as you can, when and how long they worked?

Ans. We had other men employed at work for us. One was J. B. Drawbaugh. He worked from the time we went there in July, 1873, pretty regularly for about a year. From that time until May, 1876, the time of our removal, he worked at intervals, probably fifty or sixty days during that time. We also had employed George Drawbaugh, a son of J. B. Drawbaugh, who, I think, worked during the summer of 1874. We also employed Edward Nicholas, who, I think, came there in March or April, 1874, and worked for us during the summer. Also a man named Davis Major, who worked there during the months of March and April, 1874, I think about eighteen or twenty days in the two months.

Q. 71. In your answer to the twenty-seventh interrogatory you referred to a due-bill which you gave to George Leonard for a balance of account. Will you hand that due-bill to the examiner to be made an exhibit in the case and copied into the record?

Ans. I will; here it is.

(The exhibit is marked by the examiner "Exhibit Hauck Due-bill" and is as follows:

$13 45 MECHANICSBURG, *November* 22, 75.

Due Geo. Leonard,

Thirteen dollars and Forty five cents for value received.

D. A. HAUCK."

It is written in ink, and bears at the top, in pencil, the following: "Oct 12, 76, Eberlys Mills P. O." accompanied by another character resembling the letter "w," but which the examiner cannot decipher; it

has on the back the following: "Geo Leonard vs." in pencil, and "D. Hauck $13 45" in ink.)

[*Due bill objected to by Mr. Hill as immaterial and irrelevant.*]

Q. 72. Did you, in 1879, have a controversy with Mr. Drawbaugh, concerning an invention relating to faucets, for which each of you had made an application for a patent, upon which applications an interference was declared by the Patent Office?

Ans. I did have such a controversy.

Cross-examined by Mr. Hill:

Cross-Q. 73. In your first answer, you state that you have resided in Mechanicsburg during the whole of your life, excepting a few months; where did you reside during those few months, and when was it?

Ans. I was in the United States service during the fall of 1864.

Cross-Q 74. The military service?

Ans. Yes, sir.

Cross-Q. 75. Drafted in?

Ans. No, sir.

Cross-Q. 76. To what command were you attached, and where did you serve?

Ans. I was in company I, One Hundred and Ninety-fifth Pennsylvania Volunteers. The principal time that I was in the service I spent at Monocacy Junction, near Frederick city, Maryland. A small portion of the time I was at a place called Hedgesville, in West Virginia.

Cross-Q. 77. Did you serve as a private?

Ans. I did not; I was a musician.

Cross-Q. 78. When, where, and with whom did you learn your trade as a machinist?

Ans. I think I commenced to work at the machinist trade exclusively, about the year 1869, at a shop belonging to my father and uncle, at Mechanicsburg, where I have since worked, with the exception of the time I was at Eberly's Mills, and also about a year that I worked at Harrisburg.

Cross-Q. 79. Give the names of your father and uncle, and the name under which they carried on business at Mechanicsburg at the shop where you commenced to work for them.

Ans. My father's name is George Hauck; and that of my uncle is Samuel Hauck; the firm name was S. & G. Hauck.

Cross-Q. 80. What business did they carry on at Mechanicsburg?

Ans. They manufacture agricultural implements and do a general foundry and machine business.

Cross-Q. 81. Are they still in that business there under the same firm name?

Ans. They are still in the business, but not under the same firm name; about two years ago Mr. George S. Comstock purchased an interest, and the firm name is now Hauck & Comstock.

Cross-Q. 81½. What did you do from the time you left the army until the time you went to work for S. & G. Hauck about 1869?

Ans. Immediately after leaving the army I went to school for a few months; a few days before or after the 22d of February, 1865, I went into the drug business, and continued in that until the fall of 1867, when I went to work for S. & G. Hauck, and worked in the wood shop until sometime in 1869.

Cross-Q. 82. Were you in the business of manufacturing or selling drugs from February, 1865 until the fall of 1867?

Ans. I was engaged in the retail drug business.

Cross-Q. 83. In what capacity?

Ans. Part of the time as clerk or assistant and part of the time as proprietor, or joint proprietor.

Cross-Q. 84. During what time as joint proprietor and with whom and where?

Ans I think I first became joint proprietor with Dr. J. J. Clark in the fall of 1865; I was joint proprietor with him for perhaps a year, when he sold his interest to John A. Eberly, who is my brother-in-law and I was joint proprietor with him until we sold out in the fall of 1867, during all the while in Mechanicsburg.

Cross Q. 85. To whom was the drug business sold in the fall of 1867?

Ans. To Dr. J. W. Coble.

Cross-Q. 86. You have stated that you did not become joint proprietor of the drug business until the fall of 1865; for whom were you clerking during the period from February until the fall of 1865, when you became joint proprietor?

Ans. For Dr. J. J. Clark.

Cross-Q. 87. You have stated that you worked a year in Harrisburg; when was that?

Ans. During the years 1871 and 1872.

Cross-Q. 88. What did you do there, and for whom did you work?

Ans. I worked for Willson Brothers in their machine shop.

Cross-Q. 89. When did you go to work for them, and when did you cease to work for them?

Ans. I first went to work in the fall of 1871, and worked until on or about the first of January, 1872; I then returned to Mechanicsburg for

a short time, and worked for the Willson Brothers again during the summer of 1872. I worked there until fall, or well on towards the election.

Cross-Q. 90. Where did you reside while you were working for the Willson Brothers?

Ans. I resided in Mechanicsburg.

Cross-Q. 91. What did you do from January 1, 1872, until the summer of 1872, when you again went to work for Willson Brothers?

Ans. I worked for S. & G. Hauck, in Mechanicsburg.

Cross-Q. 92. What did you do from the fall of 1872, when you quit Willson Brothers, till you went into the faucet business in July, 1873?

Ans. I also worked for S. & G. Hauck, during that time.

Cross-Q. 93. What did you do from August, 1874, till May, 1876?

Ans. Part of the time I was traveling selling faucets; part of the time working for S. & G. Hauck, and some part of the time doing nothing.

Cross-Q. 94. What have you done from May, 1876, to the present time?

Ans. From May, 1876, until the last of June, 1876, I was working on faucets; during the early part of July I spent about ten days attending the Centennial Exhibition. After returning home, I again worked at intervals for S. & G. Hauck, and on faucets, until early in November, I think it was, when I again commenced the manufacture of faucets. I worked on them until the time I began to take my testimony in the interference above referred to. During the year 1879, my time was pretty well taken up attending to matters concerning the interference; after the final decision was made in that case, I again went to work for the firm of S. & G. Hauck, as it was then yet. It soon afterwards changed to Hauck & Comstock, and I have been working for them ever since.

Cross-Q. 95. From November, 1876, till the time of the interference, during which period you say you were manufacturing faucets, were you carrying on the business alone or did you have anybody associated with you; if the latter, who was it?

Ans. I think there is a mistake in that date. I think I said I went to the manufacture of faucets again, exclusively, in November, 1878, but I can answer, though. There were associated with me in the manufacture of faucets all the time G. W. Hauck, S. F. Hauck, and J. A. Eberly.

Cross-Q. 96. Am I to understand from your 94th answer, as now amended, that you again commenced the manufacture of faucets in November, 1878, and not in November, 1876?

Ans. There should be inserted "1878" after the word "November," in my 94th answer.

Cross-Q. 97. You say you spent ten days at the Centennial Exposition in July, 1876. Did you see any speaking telephones there?

Ans. I do not remember of seeing any.

Cross-Q. 98. Who worked with you for Willson Bros. in the fall of 1871?

Ans. Do you mean who else was working in the shop, or whether there was anyone else working particularly with me?

Cross Q. 99. I mean both. Give the names of all the workmen that you can remember; their present residences, so far as you know; and state who of them worked more particularly with you, or near you.

Ans. John Gable, present residence Mechanicsburg; Albert L. Willson, a son of one of the proprietors, at present residing at Harrisburg. Joseph Forsyth; I don't know where he resides at present; Nelson Davenport; I don't know his present residence; Musser Shank, who, I think, still resides in Harrisburg; William Donnelly; I am not aware of his present residence; Loren A. Webster; I don't know his present residence; I haven't seen him for five or six years; George Murray, who still resides in Harrisburg; Theodore Jones, whose residence, I think, is in Harrisburg; Isaac Kauffman, who resides in Mechanicsburg; Isaac Zarker, who resides in Harrisburg. I believe those are all the names I can recall at present. Those who worked near me were A. L. Willson, L. A. Webster. Mr. Gable worked near me part of the time, and Mr. Forsyth; all above mentioned; and Musser Shank. That is all that worked near me.

Cross-Q. 100. Answer the same questions as to the workmen who worked with you for Willson Brothers in the summer and fall of 1872.

Ans. My previous answer refers to both periods of my working there.

Cross-Q. 101. Now tell me which of the persons mentioned in your 99th answer worked with you there in 1871, and which of them worked with you there in the summer and fall of 1872?

Ans. In 1871 there were Davenport, Webster, Gable, Murray, and, I think, Jones; I am not positive as to Jones in 1871; I recall another, Frank Hillegas; in 1872 there were Donnelly, Forsyth, Zarker, Jones, Kauffman, A. L. Wilson; I guess that includes them all. Hillegas resides in Harrisburg; I won't say that he resides there now, but he did a few years ago; I haven't seen him for several years.

Cross-Q. 102. You state in your 18th answer that the parties who, in July, 1873, purchased of William R. Gorgas and others the property of the Drawbaugh Manufacturing Company, were George W. Hauck, D. A. Hauck, S. F. Hauck and John A. Eberly; and in your 95th answer you state in substance that George W. Hauck, S. F. Hauck and John A. Eberly continued to be associated with you in the faucet business so

long as you carried it on; under what firm name did those parties, George W. Hauck, D. A. Hauck, S. F. Hauck, and John A. Eberly associate themselves and carry on the business?

Ans. The firm was styled Hauck Brothers and Company.

Cross-Q. 103. Which of the parties were brothers?

Ans. G. W. & S. F. Hauck.

Cross-Q. 104. Are they relatives of yours; if so, how?

Ans. They are cousins.

Recess for lunch, until 2.15, P. M.

DECEMBER 11, 1882, 2.15, P. M.

Examination resumed.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of David A. Hauck by Mr. Hill, continued:

Cross-Q. 105. Will you give me the names and residences of all the workmen employed by Hauck Brothers & Co., at different times, and state the time or times when they were severally employed?

Ans. J. B. Drawbaugh in our employ from July, 1873, I think until the fall of 1875, but worked for us principally during 1873 and 1874. Residence, Eberly's Mills, Pennsylvania. George Drawbaugh, son of J. B. Drawbaugh, worked for us during the summer of 1874. I don't know what time he commenced or when he quit exactly, but think he quit towards the fall. He worked during the summer, I know. I think he now resides at Eberly's Mills. Edward Nicholas worked for us during the summer of 1874 also. I think he began in April and quit in July. I am not certain about that, though. His residence is Bridgeport, Pennsylvania. Davis Major worked for us in March and April, 1874, and in June and July, 1876. His residence is near Mechanicsburg. Preston Heffelfinger, I think, worked for us in the fall of 1876, for a few months. His present residence is Mechanicsburg. Harmon K. Drawbaugh worked for us from the beginning of December, 1878, till some time in the spring of 1879. I don't remember what month—April or May or somewhere along there. These are all the persons that were regularly employed by us.

Cross-Q. 106. Give the names and residences of the persons who were irregularly employed by your said firm, and give the time when they were so employed.

Ans. By my previous answer, I mean that these are all the persons we had employed to do work for us, with our tools, on our premises.

Cross-Q. 107. State how many, and which of these persons whom you have mentioned worked for Hauck Bros. & Co., in the shop which they occupied at Eberly's Mills.

Ans. J. B. Drawbaugh, George Drawbaugh, Edward Nicholas, Davis Major.

Cross-Q. 108. Give the names and present residences, so far as you know them, of all the employés of S. & G. Hauck at the different times when you have worked for them.

Ans. That I cannot do. There would be several hundred.

Cross-Q. 109. Then give me the names and residences of fifteen or twenty of them who have worked there with you the most.

Ans. William Klinedinst, residence Mechanicsburg; Joseph R. Potts, Mechanicsburg; John C. Moore, Mechanicsburg; Preston Heffelfinger, Mechanicsburg; C. M. Hyers, Mechanicsburg; Davis Major, near Mechanicsburg; A. S. Martin, Mechanicsburg; Benjamin Landis, Mechanicsburg; Martin Arnold, Mechanicsburg; D. B. Binder, Mechanicsburg; John S. Weaver, Mechanicsburg; Samuel Landis, Mechanicsburg; B. C. Painter, Mechanicsburg; Adolphe Slape, Mechanicsburg; Parker Moore, Mechanicsburg; John M. Landis, Mechanicsburg; James Ready, Mechanicsburg; Abner Mohler, Mechanicsburg; John Smith, Mechanicsburg; Jacob Duey, Mechanicsburg.

Cross-Q. 110 What books did the firm of Hauck Brothers & Company keep relating to their manufactures, sales or employment of workmen, during the time covered by your testimony?

Ans. G. W. Hauck did all the bookkeeping and attended to the financial part of the business, and as he has a peculiar way of keeping books, I am not able to tell what books were used.

Cross-Q. 111. Are you able to tell whether the books showed the names of the workmen and the times of their employment?

Ans. His books did not, but a book which I kept showed the time of their employment, as to all except H. K. Drawbaugh; which book has been mislaid.

Cross-Q. 112. What period was covered by the entries in that book which you kept?

Ans. From the time of our starting business in July, 1873, until November or December, 1876.

Cross-Q. 113. When did that book disappear?

Ans. I do not know; I have not saw it for a year, perhaps more.

Cross-Q. 114. What search have you made for it, if any?

Ans. I have searched for it thoroughly.

Cross-Q. 115. When?

Ans. During the last six months.

Cross-Q. 116. Why?

Ans. I wanted to help fix the time I was engaged at Eberly's Mills.

Cross-Q. 117. Would it have shown the days when you were at Eberly's Mills?

Ans. It would.

Cross-Q. 118. When did you first talk with any representative of the complainants with reference to any matters bearing upon this suit?

Ans. As near as I can tell, about a year and a half, or between that and two years ago.

Cross-Q. 119. Give the name of the person with you then talked about said matters.

Ans. It was Mr. Fred. Weeks.

Cross-Q. 120. Do you know of any other name by which Mr. Fred. Weeks goes?

Ans. I do not.

Cross-Q. 121. Do you know where he professed to reside?

Ans. I am not positive, but think he told me he resided in Boston, Mass.

Cross-Q. 122. How many conversations did you have with him on the subject?

Ans. As many as four, and perhaps six.

Cross-Q. 123. Covering about what length of time in all, from the first to the last?

Ans. As near as I can recollect, from eight to ten months.

Cross-Q. 124. Give the time of the last conversation that you had with him.

Ans. I am unable to do so.

Cross-Q. 125. State it as near as you can.

Ans. It may be a little over a year ago, probably a year and a half.

Cross-Q. 126. At the time of the first conversation which you had with him, do you know whether the motion for a preliminary injunction in this case was pending or not?

Ans. I do not.

Cross-Q. 127. Where was that first conversation with him?

Ans. At the establishment of Hauck & Comstock, Mechanicsburg.

Cross-Q. 128. Was any person present at it besides yourself and Weeks?

Ans. There was not.

Cross-Q. 129. What time of year was it?

Ans. I do not recollect.

Cross-Q. 130. Do you not remember whether it was warm weather or cold?

Ans. My recollection is, that the weather was rather pleasant, but not midsummer.

Cross-Q. 131. Do you know whether this suit had been begun, at that time?

Ans. I do not.

Cross-Q. 132. Did you understand anything about it from Weeks—whether it had been begun or not?

Ans. I cannot say that I did so understand, while I am not entirely certain that he didn't mention something about it; but I can neither recall his language nor the meaning thereof.

Cross-Q. 133. Did you ever have any conversation with Mr. Weeks at which any other person was present, besides yourself and him?

Ans. Do you mean any other conversation, or a conversation regarding this controversy?

Cross-Q. 134. I mean any conversation regarding this controversy, or the subject matter of your recollection about facts relating to this controversy.

Ans. I do not remember of a third person being present at any of our conversations.

Cross-Q. 135. What time of the year was the last conversation that you had with Weeks about the matter?

Ans. I really do not remember when I had the last one, or what time of the year it was.

Cross-Q. 136. Do you remember where it was, and whether the weather was warm or cold at the time?

Ans. I do not.

Cross-Q. 137. What other other representatives of the complainants have you ever talked with about this case, or any of the facts relating thereto?

Ans. Mr. Storrow, Mr. Smith and Mr. Comfort.

Cross-Q. 138. When and where did you first talk to Mr. Storrow or Mr. Smith about it?

Ans. With Mr. Storrow in Harrisburg a few months—perhaps as many as six months—after my last conversation with Mr. Weeks, and with Mr. Smith in Hauck and Comstock's office in Mechanicsburg some time after that.

Cross-Q. 139. Fix the date of your first conversation with Mr. Storrow as nearly as you can.

Ans. I have no means at hand to fix any date.

Cross-Q. 140. Was it at the Bolton House, Harrisburg?

Ans. It was.

Cross-Q. 141. Did you register there at the time?

Ans. I did not.

Cross-Q. 142. Did you have any other business there at Harrisburg that day, except to see Mr. Storrow, by which the time can be fixed?

Ans. I did not.

Cross-Q. 143. When did you first talk with John C. Comfort about this case?

Ans. I cannot fix the time.

Cross-Q. 144. How many times have you talked with him about it?

Ans. Perhaps three or four.

Cross-Q. 145. Was Mr. Weeks boarding at Mechanicsburg at any time covered by your conversation with him?

Ans. I think he was.

Cross-Q. 146. Where did he board?

Ans. At the American House.

Cross-Q. 147. Was he boarding there at the time of your first conversation with him?

Ans. I cannot say.

Cross-Q. 148. Did you ever show any of these representatives of the complainants the book which you say disappeared about a year ago?

Ans. I think I did.

Cross-Q. 149. To whom did you show it?

Ans. I am reasonably certain that I showed it to Mr. Weeks, but not certain as to any other.

Cross-Q. 150. Have you any impression on your mind of showing it to any of the other gentlemen you have mentioned, Mr. Storrow, Mr. Comfort, or Mr. Smith?

(After question 149 was answered, and before question 150 was put, Mr. Storrow stated to Mr. Hill that the memorandum-book was shown to him by Mr. Hauck, and that he (Mr. Storrow) made, not a copy of it, but a memorandum from it, at the time, and that he proposes to put that fact into the record somewhere, and that he will show his said memorandum to respondents' counsel, if he desires to see it. This is now noted at Mr. Hill's request.)

Ans. I have no distinct recollection of showing it to anyone but Mr. Weeks.

Cross-Q. 151. Is the firm of Hauck Bros. & Co. still in existence, or has it been dissolved?

Ans. The partnership has not been dissolved, but at present they are not engaged in business.

Cross-Q. 152. When did they go out of business?

Ans. I might qualify my previous answer by stating that we are still disposing of some faucets, although we have sold nearly all of our machinery. Therefore, I cannot say that we have gone out of business entirely as yet.

Cross-Q. 153. When your firm purchased the property at Eberly's Mills in July, 1873, did it put in any new machinery in the shop at Eberly's Mills, or did it continue to work with the old machinery already there?

Ans. We put in no new machinery, but improved some of the machinery then in use.

Cross-Q. 154. State what improvements you made and what workmen did the work in making them.

Ans. One consisted in using a fluted reamer, guided by a mandrel, for boring the chamber, or body, of the faucet, making them all of a standard size, whereas by the old mode of boring with an ordinary lathe-tool, the size of the bore would vary according to the skill of the operator. I constructed this myself. Another was the substitution of a jointed lathe tool for a rigid lathe tool in turning the hubs of two-point wheels. The advantage gained was, that the work did not revolve continuously, but oscillated, and in going backwards broke the point, or cutting edge, of the rigid tool, while the jointed tool, yielding upon pressure, remained intact, and avoided frequent grinding or dressing. I did some of the work on that. This man Major, whom I had employed, started it—roughed it out—and I finished it. That is all. I don't mean by that, that those were all the improvements we made. There were others of minor importance.

Cross-Q. 155. That building which your firm occupied as a shop at Eberly's Mills, has been described as a building containing a cellar or basement, a first floor, a second floor, and an attic; will you please state the location of all the machinery which was used by your firm in making faucets there, having reference to whether it was in the cellar or the first floor, or the second floor, or in the attic?

Ans. Our machinery was all on the first floor, except the machinery for making strainers, and a turning-lathe on which we turned the wood handles, which was in the south room on the second floor.

Cross-Q. 156. On what floor did J. B. Drawbaugh do his work while he was there?

Ans. Principally on the first floor.

Cross-Q. 157. What did he do?

Ans. Most of the time he was engaged in fitting up the faucets; sometimes he did lathe-work on all parts of the faucets.

Cross-Q. 158. So far as he did any work on the second floor, what was that work?

Ans. If any, it was painting the faucets or turning wood handles or making strainers, but I think he did very little of either, as the principal part of the painting was done on the first floor, and I made a great many or nearly all of the wood handles and strainers myself.

Cross-Q. 159. On what floor did George W. Drawbaugh do his work while he was there?

Ans. On the first floor; these answers have reference to the time when these men were working for me or for Hauck Bros. & Co. They were working sometimes when they were not working for us, and then they were working upstairs.

Cross-Q. 160. On what floor did Edward Nicholas do his work for Hauck Bros. & Co.?

Ans. Principally on the first floor, although he may have did a little painting and a little work on strainers on the second floor.

Cross-Q. 161. On what floor did Davis Major do his work for your firm?

Ans. On the first floor only.

Cross-Q. 162. What was his work?

Ans. Boring the chamber or body of the faucet.

Cross-Q. 163. What was Edward Nicholas' work?

Ans. Principally centering and turning the two and five-point wheels, or cams.

Cross-Q. 164. Did Nicholas or Major do any other work at that shop, so far as you know, except what they did for Hauck Bros & Co.?

Ans. I am not aware that they did any work for any other person.

Cross-Q. 165. Did you do any work there, except for your firm?

Ans. Not that I can remember of.

Cross-Q. 166. What machinery did you move away from that shop in May, 1876?

Ans. We moved the shafting, pulleys, and belting, which were on the first floor; three small engine-lathes, one speed or hand-turning lathe; one special machine for turning the hub of the two-point wheel, a special machine for finishing the lid of the faucet, a drill-press, the machinery for making strainers, which was on the second floor, together with the small tools and appliances used in the manufacture of the faucets.

Cross-Q. 167. Did you leave any machinery there after May, 1876, which belonged to your firm? If so, what?

Ans. We did. There remained a large engine-lathe, a large column

drill-press, and the wood-turning lathe before mentioned as being upstairs.

Cross-Q. 168. How long did that machinery remain there after May, 1876, and what finally became of it?

Ans. The large lathe mentioned we rented to George A. Plank, and it was removed in the summer of 1877 or 1878, I think; I think it was before 1879, but am not positive, though, to his shop in Churchtown, Cumberland county. The drill-press we sold to E. W. Chellis of Harrisburg about a year ago; I don't know what he did with it. The wood turning lathe, spoken of as being upstairs, we have not yet removed, and I suppose it is still there.

Cross-Q. 169. Were you at that shop at any time during the year 1876, after May?

Ans. Not that I can remember.

Cross-Q. 170. Were you there during the year 1877, at any time?

Ans. I think I was there two or, perhaps, three times during that year, but can fix no date.

Cross-Q. 171. Were you there at any time during the year 1878?

Ans. I think I was there a few times during 1878, also.

Cross-Q. 172. Do you remember what you were there for in 1877, at any time?

Ans. I was there twice in company with George A. Plank to look at the lathe we rented to him, and at another time to look at some shafting and pulleys, which I afterwards sold him.

Cross-Q. 173. In what part of the shop were the shafting and pulleys, which you afterwards sold him?

Ans. They were fastened or hanging overhead in the rooms on the second floor.

Cross-Q. 174. When you were there with Mr. Plank in 1877, did you, on either occasion, see Mr. Daniel Drawbaugh there?

Ans. I am quite positive I saw him at one of the visits, but not positive as to the other.

Cross-Q. 175. Did you see any telephones there in 1877?

Ans. I did not.

Cross-Q. 176. What were you there for in 1878?

Ans. I went there with Mr. Plank to help him load the lathe before mentioned, in which Daniel Drawbaugh and J. B. Drawbaugh both assisted.

Cross-Q. 177. At what time in 1878 was that?

Ans. I am not certain that it was in 1878. I think I said before that it was either in 1878 or 1879. It was in the summer, I think.

Cross-Q. 178. Was it before or after the faucet interference commenced?

Ans. I am impressed to believe it was before, but the removal of the shafting which was upstairs, was after the beginning of the faucet interference.

Cross-Q. 179. Have you any doubt about the lathe being removed before the faucet interference commenced?

Ans. At present, I have.

Cross-Q. 180. What were they doing in the shop at the time the lathe was removed?

Ans. I cannot remember.

Cross-Q. 181. What parts of the shop were you in at the time the lathe was removed?

Ans. Principally on the first floor, although I think I went to the attic or garret to fasten the block and tackle we used to swing the lathe-bed out of the shop to the wagon.

Cross-Q. 182. You went through Drawbaugh's private room, then, did you?

Ans. I did.

Cross-Q. 183. Did you see any telephones there or about the shop?

Ans. I did not, as I went through the room hurriedly, and would not have seen them had they been there.

Cross-Q. 184. You have spoken of a lathe that you removed at that time, and of some pulleys and shafting that you removed afterwards; how long was the lathe removed before said pulleys and shafting were removed?

Ans. Probably nine months or a year, although it might have been only a few months. I have no distinct recollection of the time that elapsed.

Cross-Q. 185. Were the pulleys and shafting removed while the interference was pending?

Ans. I think they were.

Cross-Q. 186. In what season of the year were they removed?

Ans. In the spring or summer.

Cross-Q. 187. Do you think the lathe was removed the summer before?

Ans. That is my impression at present.

Cross-Q. 188. Who, if anybody, assisted in removing the pulleys and shafting?

Ans. George A. Plank assisted me, or rather I assisted him. I had sold it to him, and it was his then. There may have been others, but I am not positive about it.

Cross-Q. 189. Have you any paper, book-entry, or memorandum to show the date of the delivery of that lathe, or to show the date of the delivery of those pulleys and that shafting to Mr. Plank?

Ans. I have not.

Cross-Q. 190. Has your firm?

Ans. Not that I know of.

Cross-Q. 191. Did Mr. Plank pay for the lathe at the time he bought it?

Ans. I can only answer by saying that he didn't buy the lathe, but only rented it; he didn't pay any rent on it then, and in fact never did.

Cross-Q. 192. Did he pay for the shafting and pulleys at the time he got them?

Ans. I think he paid a small portion of it in cash and for the balance he transferred to us a note he had received from some farmer in the neighborhood in payment for a reaping machine, that he had sold him, which note we had discounted; after which we had nothing more to do with it, as it was paid when it matured.

Cross-Q. 193. At what bank did you have that note discounted?

Ans. At the First National Bank of Mechanicsburg.

Cross-Q. 194. The taking of the testimony in the faucet interference was going on both before and after you delivered the shafting and pulleys to Mr. Plank, was it not?

Ans. That is my impression.

Cross-Q. 195. Did you see any telephones there at the time of the delivery of the shafting and pulleys to Mr. Plank?

Ans. I did not.

Cross-Q. 196. Were you there at Mr. Drawbaugh's shop at any other time in 1878, except when the lathe was delivered to Mr. Plank?

Ans. I may have been there sometime previous to delivering the lathe, with Mr. Plank to examine it, but do not think I was there any other time during the year.

Cross-Q. 197. Were you there at any time during the year 1879, except when the shafting and pulleys were delivered to Mr. Plank?

Ans. I was, on the 15th of January.

Cross-Q. 198. Were you there at any other time during the year 1879, except those two occasions?

Ans. Not that I can remember. I was there again during the following winter.

Cross-Q. 199. Do you mean the winter of 1879-80?

Ans. Yes. I was going to add that it might have been after the 1st of January, 1880.

Cross-Q. 200. Have you ever been there since that time?

Ans. Not that I can remember.

Cross Q. 201. Did you see any telephones there in 1879 or 1880?

Ans. I did not.

Adjourned until December 12, 1882, at ten, A. M.

DECEMBER 12, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Cross-Q. 202. You state that you were at Drawbaugh's shop in May, 1876, when you moved the machinery, and you were there again on the fifteenth day of January, 1879; you do not recollect any particular occasion when you were there between those dates, do you?

Ans. No more than the time of moving the large lathe before mentioned, which was either in the summer of 1877 or 1878.

Cross-Q. 203. Are you positive that it was either in the summer of 1877 or 1878?

Ans. Not positive, but I think so.

Cross-Q. 204. Which summer do you think it was?

Ans. I rather think, in 1878.

Cross-Q. 205. You have spoken of being at the shop with Mr. Plank, once or twice before the lathe was removed, to enable him to examine it; have you any idea how long those visits were before the lathe was removed?

Ans. One of them was, I think, in the month of April, 1877, and another about a year afterwards.

Cross-Q. 206. Are there any circumstances by which you fix those two dates?

Ans. On the occasion of the first visit spoken of, when we returned to Mechanicsburg, there was a building burning in the eastern portion of the town, and it became impressed on my mind, by some means that I do not remember, that that building was burned during the month of April, 1877; it was a barn or stable belonging to Mr. S. P. Gorgas that was burned.

Cross-Q. 207. Was that at the time of the first visit that you and Mr. Plank made?

Ans. It was.

Cross-Q. 208. Is there any circumstance by which the time of your second visit there with Mr. Plank can be fixed?

Ans. None but the lapse of time, which I suppose was about a year.

Cross-Q. 209. Is there any circumstance by which the time of the delivery of the lathe can be fixed?

Ans. I have no means at hand of fixing the time.

Cross-Q. 210. What parts of the shop did you go through at the time of your first visit with Mr. Plank?

Ans. On the occasion of that visit, I think we examined the shaft and pulleys which were upstairs; I think that was the purpose of going there at that time, and the examination of the lathe was incidental; I think we spent the greater portion of the time, upstairs in the south room.

Cross-Q. 211. Did you see Daniel Drawbaugh there at that time?

Ans. I think I did; I am not positive.

Cross-Q. 212. Were you in his private office at that time?

Ans. I think not.

Cross-Q. 213. Who else did you see there at the shop at that time?

Ans. I cannot recall having seen any other person.

Cross-Q. 214. What parts of the shop were you in on the occasion of your second visit to the shop with Mr. Plank, which you think was in the spring of 1878?

Ans. I think we were on the first floor only.

Cross-Q. 215. How long do you think that second visit was before the lathe was delivered to Mr. Plank?

Ans. A few months; probably from two to four.

Cross-Q. 216. Did you superintend the work of removing the machinery in May, 1876?

Ans. I did.

Cross-Q. 217. How many times were you in Drawbaugh's shop in that month?

Ans. Four times, I think.

Cross-Q. 218. Do you remember being in his private office at any one of those four times?

Ans. I am pretty certain I was; I think I made a pretty thorough search or examination of every part of the building, in company with Mr. Daniel Drawbaugh, for small tools that were scattered around; Mr. Drawbaugh telling me which of the tools belonged to the Drawbaugh Manufacturing Company, and which were his individually.

Cross-Q. 219. Are you willing to swear that you were in his private room at any time during May, 1876?

Ans. I am reasonably certain that I got some tools from the loft or attic, and was obliged to pass through his private room to get there.

Cross-Q. 220. Will you swear that you were in that room, during that month, in any other way than as just passing through to the attic and back?

Ans. I will not.

Cross-Q. 221. Were you at Drawbaugh's shop at any time between the first of January, 1876, and the first of May, 1876?

Ans. I think not.

Cross-Q. 222. Were you there at any time during the year 1875?

Ans. I am not certain as to more than once, which, I think, was early in the spring.

Cross-Q. 223. Was it in February, March, or April?

Ans. One of those months, I think.

Cross-Q. 224. What was the occasion of your going there at that time?

Ans. To get some measuring faucets.

Cross-Q. 225. Faucets to fill any particular order?

Ans. I think not.

Cross-Q. 226. Did you get any; if so, how many?

Ans. As near as I can recollect, it was three dozen.

Cross-Q. 227. Do you remember what was done with that three dozen faucets?

Ans. I do not.

Cross-Q. 228. Did anybody go with you to Drawbaugh's shop on that occasion; if so, who?

Ans. I was accompanied by my cousin, S. F. Hauck.

Cross-Q. 229. How did you go?

Ans. By private conveyance.

Cross-Q. 230. Did you ever go there with S. F. Hauck, in a private conveyance, to get faucets, at any other time than that?

Ans. I did, several times.

Cross-Q. 231. When—in 1874?

Ans. I do not remember exactly the time of our several visits, but remember the one spoken of distinctly, because at the time of that visit Daniel Drawbaugh showed us an automatic fire-alarm which he had constructed, which I had not seen before, and about which my cousin and I had a controversy on the way home.

Cross-Q. 232. Had you ever seen any automatic fire-alarm at his shop before?

Ans. I had not.

Cross-Q. 233. How long were you at his shop on that occasion?

Ans. Perhaps an hour.

Cross-Q. 234. In what parts of the shop were you at that time?

Ans. On the first floor, and in Daniel Drawbaugh's work-shop, and the large south room on the second floor, which contained the axle company's machinery.

Cross-Q. 235. What do you mean by the expression, "Daniel Drawbaugh's work-shop?"

Ans. I mean the north-west room on the second floor.

Cross-Q. 236. Then you were not, at that time, in his private room or office—the north-east room—were you?

Ans. I am not positive, but think not.

Cross-Q. 237. In what room did he show you the automatic fire-alarm?

Ans. The instrument proper was placed by the stove in the large south room, and the bell or gong, which it caused to ring, was in the north-west room, or his work-shop.

Cross-Q. 238. Describe that automatic fire-alarm which you then saw, including the entire device and its connections.

Ans. As near as I can recollect, it consisted of a strip or bar of copper, or some other metal, very sensitive to a change of temperature, which expanded under an increased temperature and either completed or broke an electric current, which caused the ringing of a bell; I do not remember whether the current was generated by a chemical battery or horse-shoe magnet; it was one or the other.

Cross-Q. 239. Describe the bell apparatus more particularly.

Ans. I can give no correct description of it, as it was fastened to the ceiling, or to the wall near the ceiling.

Cross-Q. 240. In what part of the room was it fastened?

Ans. I am not positive, but think in the north-west or south-east corner.

Cross-Q. 241. How large was it?

Ans. I cannot say; I don't remember whether it was an ordinary shaped bell or a gong.

Cross-Q. 242. Was it included in a case, or were the works exposed?

Ans. I think it was exposed; the whole apparatus had an appearance of being rudely and temporarily constructed.

Cross-Q. 243. Did you see any body else at the shop, at the time of that visit; if so, whom?

Ans. I saw J. B. Drawbaugh, a young man named Kahney, whose first name I don't know; there may have been others, but I can't recall them now.

Cross-Q. 244. Do you know whether Kahney's first name was Ira or Norman?

Ans. I do not.

Cross-Q. 245. What were young Kahney and J. B. Drawbaugh doing there at that time?

Ans. J. B. Drawbaugh was finishing the faucets we took away, on an emery wheel belonging to the axle company; I cannot remember what Kahney was doing, if anything.

Cross-Q. 246. Were the manufacturing operations of the axle company going on there at that time, or was it before they had got started in manufacturing?

Ans. They had been manufacturing, but were not in active operation at the time.

Cross-Q. 247. Do you remember of any particular occasion when you were there at Daniel Drawbaugh's shop, between August, 1874, and January, 1875?

Ans. I do not.

Cross-Q. 248. Now, taking the time from the latter part of June, 1873, to the last of August, 1874, during that time, I understand you to say, in substance, that you were at Daniel Drawbaugh's shop something over a hundred times; am I correct?

Ans. I do not think I limited the time to the last of August, 1874; the time ran on until the latter part of May, 1876.

Cross-Q. 249. From the time when your firm took possession of the shop at Eberly's Mills, until the first of August, 1874, which of your firm had occasion to be most often at the shop at Eberly's Mills?

Ans. Myself.

Cross-Q. 250. Was your firm running any other shop during that time?

Ans. The firm of Hauck Brothers & Co. was not, but G. W. and S. F. Hauck were running a tin and stove establishment at Mechanicsburg, under the firm name of Hauck & Co.

Cross-Q. 251. Where was John A. Eberly, and what was he doing during that period, from the first of July, 1873, to the latter part of August, 1874?

Ans. He was operating a leather net and harness manufactory at Mechanicsburg, part of the time, under the firm name of Eberly & Burkholder, and latterly as J. A. Eberly & Co.

Cross-Q. 252. Have George W. Hauck and S. F. Hauck been engaged

in the tin and stove business at Mechanicsburg from July, 1873, to the present time?

Ans. They have, but not under the original firm name.

Cross-Q. 253. Has John A. Eberly been engaged in the harness and leather net business at Mechanicsburg from July, 1873, to the present time?

Ans. He has not.

Cross-Q. 254. State where he has been and what he has been doing—and give the dates, as nearly as you can—from the first of July, 1873, to the beginning of 1879.

Ans. He ran the net and harness factory until the spring of 1876 or 1877, when he removed to Kansas, and has been there ever since, with the exception of one year, during which he lived in Charleston, West Virginia.

Cross-Q. 255. Did he remove to Kansas before you removed the machinery from Drawbaugh's shop, in May, 1876?

Ans. I am not positive, but think he removed to Kansas in April, 1876.

Cross-Q. 256. When did the firm of Hauck & Co. change their firm name, and what changes have been made in it?

Ans. It was changed about two years ago, and is now run under the name of G. W. Hauck; S. F. Hauck being a silent partner.

Cross-Q. 257. Did the firm of Hauck & Co. run a store and a manufacturing shop?

Ans. They did.

Cross-Q. 258. I suppose the private business of Hauck & Co. and John A. Eberly monopolized most of their time, devolving the faucet business mainly upon you. Was such the fact?

Ans. It is. In explanation, I would say, I had charge of the mechanical part of the business, while G. W. Hauck attended to the books and financial matters.

Cross-Q. 259. Where was the business of attending to the books and financial matters transacted—at Eberly's Mills or Mechanicsburg?

Ans. In Hauck & Co.'s office, at Mechanicsburg.

Cross-Q. 260. What did S. F. Hauck and John A. Eberly have to do as members of the firm of Hauck Bros. & Co., prior to the removal of the machinery to Mechanicsburg?

Ans. They both traveled, introducing and selling, while S. F. Hauck only was with me a few days at Eberly's Mills, working in the shop.

Cross-Q. 261. Was he with you a few days continuously, or at different times?

Ans. At different times; at intervals.

Cross-Q. 262. In what year?

Ans. In 1873 and 1874.

Cross-Q. 263. How came he to be there then—because the work was crowding at those times?

Ans. I might say he went for a mere whim or out of curiosity; I did not solicit his assistance.

Recess for lunch, until two, P. M.

DECEMBER 12, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Cross-Q. 264. To whom did you sell any machinery from the Drawbaugh shop in the latter part of 1874, the year 1875, or the early part of 1876?

Ans. We sold none during that time, but removed a milling machine in the latter part of 1873 or early in 1874, and a lathe some time in 1875, to the shop of S. & G. Hauck, in Mechanicsburg.

Cross-Q. 265. Did you go to Drawbaugh's shop, at Eberly's Mills, at any time within the period covered by my last question, in company with a gentleman to whom you sold any machinery?

Ans. I think not.

Cross-Q. 266. You don't know of any such person to whom you sold machinery during that time, do you?

Ans. I do not; I am reasonably certain we sold no machinery until some time after we removed to Mechanicsburg.

Cross-Q. 267. In your 31st question, complainants' counsel asked you: "During the latter part of 1874, the year 1875, and the early part of 1876, how often did you go to the shop, and for what purpose? Answer: I might have been there five or six times; several times I went for faucets, and once or twice in company with a gentleman to whom I sold some machinery, and then I was there two or three days removing the machinery." Now, if you were never there during the latter part of 1874, the year 1875, or the early part of 1876, in company with a gentleman to whom you sold any machinery, and never sold any machinery to any gen-

tleman during that period, as you now testify, what did you mean by your 31st answer?

Ans. I meant that I was there to look at the shafting which I subsequently sold him; but not until a year or a year and a half after we removed the large lathe spoken of; the gentleman saying at the time that the shaft was heavier than he needed, and that he could get a lighter one for less money, which he told me he did. After getting the large lathe, before mentioned, and some other tools in his shop, he found his shaft was too light, and then bought of us the one we examined at the visit spoken of.

Cross-Q. 268. That gentleman was Mr. Plank, was it?

Ans. It was.

Cross-Q. 269. According to your 31st answer above quoted, you testified in substance that Mr. Plank was there with you once or twice in the period comprising the latter part of 1874, the year 1875, and the early part of 1876; you have since testified in substance that his visits there were in 1877 and 1878; your 31st answer was erroneous; was it?

Ans. That is a mistake; I evidently made that answer under the impression that the question related to the whole time we were there. Mr. Plank's visits did not commence until after 1876; that is, 1875. I meant to say, during 1876, or after 1875.

Cross-Q. 270. Do you now mean to say that any of Mr. Plank's visits with you were during 1876?

Ans. I cannot say so positively.

Cross-Q. 271. What is your impression about it?

Ans. It is, that the first one was at least six months or perhaps a year after we removed the machinery to Mechanicsburg; I remember when he first came to me about purchasing the shafting; I was working at the shop in Mechanicsburg, and we there examined a lot of pulleys that I had brought there from Eberly's Mills, but did not have in use.

Cross-Q. 272. Referring to the first visit which you made to Drawbaugh's shop in the latter part of June, 1873, state whether Mr. Drawbaugh showed you any machines there of his own invention at that time; and if so, mention all of them that you saw.

Ans. He showed me a great many machines, but I do not know that he claimed specifically to have invented them. I can't mention the machines that he invented, because he didn't claim to have invented any; I can mention those that he showed me.

Cross-Q. 273. Mention all those that he showed you at that time, that you were impressed to believe were his inventions.

(Witness now draws a paper from his pocket, opens it, and glances at it, and is interrupted by Mr. Hill, when witness says: "I was going to ask whether I might be permitted to refer to a memorandum;" to which Mr. Hill replies, "No.")

Ans. He showed me a weather indicator; two stamp cancellers; a steam syphon, or pump; an automatic boiler feeder; a clock, which was either in course of construction or completed—I can't remember whether it was completed at the time or not—which was to be propelled by another clock, by an electric current; a pressure blower; a hydraulic ram. That is all that I can recall from memory. I believed at the time that these were his inventions, from his manner of explaining to me their construction.

Cross-Q. 274. Now, if you please, you may produce and put in evidence the memorandum which you just took from your pocket.

Ans. I will explain, in this connection, that this memoranda contains the names of all the machines or appliances that I can recall ever having seen there, constructed or invented by Daniel Drawbaugh, with the exception of the rotary measuring faucet, which he had patented in 1866, and which we bought.

(Witness produces memorandum, which is as follows:

"1. Machine for insulating wire.
2. Steam syphon, or steam pump.
3. Automatic boiler feeder.
4. Postage stamp cancellor.
5. Carpet-rag needle.
6. Printing telegraph.
7. Horse-shoe magnetic telegraph.
8. Automatic fire-alarm.
9. Magnetic clocks of several varieties.
10. Pressure blower.
11. Weather indicator.
12. Automatic nail-plate feeder.
13. Mill-stone tram.
14. Hydraulic ram."

Respondents' counsel requests that the list be not at present read to the witness.

Mr. Smith requests the examiner to read the paper as part of the answer of the witness.

Mr. Hill requests that the paper be not read at present to the witness, as he desires to cross-examine him further upon it first.

The paper is not read to the witness.)

Cross-Q. 275. Who made that memorandum which you have just produced?

Ans. I made it.

Cross-Q. 276. When did you make it?

Ans. Within the last three days.

Cross-Q. 277. Was it since you commenced this deposition?

Ans. I think it was.

Cross-Q. 278. Where did you make it?

Ans. In the room I occupy in this building.

Cross-Q. 279. Was any person present with you when you made it; if so, who?

Ans. There was not.

Cross-Q. 280. You say you think you made it since you commenced this deposition; don't you know whether you did or not?

Ans. I am not positive, but I think I commenced making it in the evening preceding the day I began my deposition.

Cross-Q. 281. Why did you make it?

Ans. In order to aid my memory in recalling the machines or appliances shown me by Daniel Drawbaugh.

Cross-Q. 282. How long since did you leave your home to come here to give this deposition?

Ans. I left home on Sunday, December 3.

Cross-Q. 283. Did you arrive here that Sunday night, or on Monday, December 4?

Ans. I arrived here on Sunday night at about eight o'clock.

Cross-Q. 284. And were here continuously from that time until you commenced giving your deposition, on December 9, were you?

Ans. I was.

Cross-Q. 285. During that time you had frequent conversations with complainants' representatives with respect to your knowledge of the facts of this case; had you not?

Ans. I had.

Cross-Q. 286. Do you know why the complainants sought you out so early in the history of this case, as a desirable person to confer with for their purposes?

Ans. I do not; I can ascribe no motives for the doings of anyone other than myself.

Cross-Q. 287. Have you never suspected that it was because of your supposed personal hostility to Daniel Drawbaugh?

Ans. I have not, inasmuch as I never intimated to any of them that I entertained feelings of hostility; neither do I.

Cross-Q. 288. Have you never intimated to anybody that you felt hostile to Daniel Drawbaugh; think carefully before answering?

Ans. I have; I might add that I have spoken very plainly, and more so to Daniel Drawbaugh himself than to anyone else.

Cross-Q. 289. When did you last intimate such disposition towards him, so far as you can remember; I mean, in speaking to him or to anyone else?

Ans. I had a controversy with him during the time of taking depositions in his behalf, during the faucet interference; but have not since met him on other than friendly terms, and we have met frequently since.

Cross-Q. 290. Am I to understand from your 287th answer that you now feel personally friendly to Daniel Drawbaugh?

Ans. That is the meaning I mean to convey.

Cross-Q. 291. When was the faucet interference declared between the application of yourself and the application of Daniel Drawbaugh in the Patent Office?

Ans. I do not know the exact date; I think it was some time in April, 1879.

Cross-Q. 292. Did you testify as a witness in your own behalf in that interference?

Ans. I did.

Cross-Q. 293. How many times; I mean how many depositions did you make in your own behalf in that interference?

Ans. I think two, exclusive of the preliminary statement.

Cross-Q. 294. The final judgment of the Patent Office was in favor of Daniel Drawbaugh, as the prior inventor of the faucet in controversy, was it not?

Ans. It was.

Cross-Q. 295. The first decision made in that interference was made by the Examiner of Interferences in favor of Daniel Drawbaugh, was it not?

Ans. It was.

Cross-Q. 296. Did you appeal from that decision to the Board of Examiners in Chief?

Ans. I did.

Cross-Q. 297. When your appeal came up for hearing before the Board of Examiners in Chief, they also decided in favor of Daniel Drawbaugh, did they not?

Ans. They did.

Cross-Q. 298. Did you appeal from their decision to the Commisioner of Patents, in person, as the law provides may be done?

Ans. I did not.

Cross-Q. 299. Then you accepted the decision of the Board of Examiners in Chief as the final decision in the case, and made no further objection in the Patent Office to the issuing of a patent to Daniel Drawbaugh, did you?

Ans. I did.

(Respondents' counsel offers in evidence as "Exhibit Patent Office Judgment No. 1," a certified copy from the records of the Patent Office, of the decision of the Examiner of Interferences, dated November 18, 1879, in the matter of the interference, Hauck *vs.* Drawbaugh, for improvement in measuring faucets.

Also as "Exhibit Patent Office Judgment No. 2," a certified copy from the records of the Patent Office of the decision of the Examiner-in-Chief, dated on the back January 15, 1880, in the matter of the interference, David A. Hauck *vs.* Daniel Drawbaugh, for improvement in measuring faucets, and asks to have them copied at length here in this deposition.

[*Objected to by Mr. Storrow, as immaterial and incompetent.*]

EXHIBIT PATENT OFFICE JUDGMENT NO. 1.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, greeting:

This is to certify, that the annexed is a true copy from the Records of this office of the Decision of the Examiner of Interferences in the matter of the Interference

Hauck *vs.* Drawbaugh
for
Improvement in Measuring Faucets.

In testimony whereof, I, V. D. Stockbridge, Acting Commissioner of Patents, have caused the seal of the Patent Office to be affixed this ninth day of December, in the year of our Lord, one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and seventh.

Seal.

V. D. Stockbridge,
Acting Commissioner.

IN THE U. S. PATENT OFFICE.

In Re Interference
Hauck
vs.
Drawbaugh.
"Measuring Faucet."

Before the Examiner
of
Interferences.

The issue involved is defined as follows: "In combination with the ro-"tating piston and its actuating shaft, a crank arm attached to said shaft "and having its pin working in a bearing in the piston whereby the piston "is rotated."

It is shown that Drawbaugh has made several inventions, some of which he has patented. Among his patented inventions was a measuring faucet, manufactured and sold by Hauck for some years back. Among his unpatented ones was a rotary blower, made by him in 1870, and which eventually went to the shop of Samuel Hauck, brother of David Hauck, one of the contestants.

The faucet here in issue is undoubtedly made upon the principle of that blower.

Immediately upon the making of the blower, Drawbaugh saw that its principle could be applied to a rotary measuring faucet. Exhibit C, filed by him, embodies the issue, and it is shown clearly that it was made immediately upon the occurrence of the thought that the blower principle could be applied to faucets; this was sometime in 1870.

It is clearly shown that in 1877 he made exhibit D, which also embodies the issue. That he delayed doing anything more than make models and explain his invention because of his inability to persuade anyone with the necessary capital to go in with him and develop and put upon the market his invention. That finally in November or December, 1878, he persuaded Messrs. Moffitt and Chellis to extend him the necessary aid, whereupon he and they commenced the manufacture of the faucet. He applied for a patent January 14, 1879.

The earliest date Hauck sets up, even for conception of the subject matter of the issue, is November 18, 1878. He applied for a patent January 17, 1879.

Of course, prior to his earliest date, no question of comparative diligence could arise. Drawbaugh could only be called to account for lack of diligence after Hauck entered the field; there could be no race between the parties till then. Drawbaugh coming to the office first, lack of diligence cannot be imputed against him.

It is clear, as stated, that Drawbaugh had made, exhibited, and tested working models before Hauck alleges that he conceived of the invention.

In fact, upon the record presented, there is warranted the finding that Hauck never made the invention. Hiram Drawbaugh had seen sketches of the invention of his uncle Daniel, the contestant. In December, 1878, Hiram went to work for Hauck; he explained his uncle's new faucet to Hauck; thereafter Hauck got up sketches. This is clear from the testimony of Hauck and Hiram, called by him as a witness. A postal card is put in by Drawbaugh as his exhibit M, dated Mechanicsburg, [Hauck's residence,] Dec. 9, 1878, reading as follows:

"D. Drawbaugh,

"Sir:

"Hiram tells me you have made a new faucet. We "should like to see it; send or bring it up soon. Yours, &c.,

Haucks."

Hauck denies having written it. A comparison of it with writing which is confessedly his own, leads only to one conclusion, that he did

write it. Hence, that his knowledge of the invention in issue was derived directly or indirectly from his opponent, Drawbaugh.

Priority of invention, as to the matter here in view, is awarded Daniel Drawbaugh.

Z. F. Wilbur,
Examiner of Interferences.

Nov. 18, 1879.
Exd., A. N.

EXHIBIT PATENT OFFICE JUDGMENT No. 2.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, greeting:

This is to certify that the annexed is a true copy from the Records of this Office, of the Decision of the Examiner-in-Chief, in the matter of the Interference

David A. Hauck *vs.* Daniel Drawbaugh,
for
Improvement in Measuring Faucets.

In testimony whereof, I, V. D. Stockbridge, Acting Commissioner of Patents, have caused the Seal of the Patent Office to be affixed, this Ninth day of December, in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and seventh.

Seal.

V. D. Stockbridge,
Acting Commissioner.

No. 5713. U. S. PATENT OFFICE, *January* 13, 1880.

Before the Examiners-in-Chief, an appeal.

In the matter of the interference between the application of David A. Hauck, filed January 17, 1879, and the application of Daniel Drawbaugh, filed January 14, 1879.

Impd' Measuring Faucets.

The matter in contest is expressed in the following claim:

"In combination with the rotating piston and its actuating shaft, a crank arm attached to said shaft and having its pin working in a bearing in the piston, whereby the piston is rotated."

It is not necessary for us to go into a full review and analysis of the evidence in this case.

Sufficient to say that his own witness, H. K. Drawbaugh, introduced to prove invention on the part of Hauck, and who swears to his having been shown rough sketches showing the invention on the 4th or 5th of December, (1878,) states, on his cross-examination, that on the same day and *before* Hauck made such sketches, he, witness, told him that Drawbaugh, on Sunday, the 1st of December, had told him of a faucet he was going to make with a circular chamber, and witness had made a sketch of it to explain it to Hauck, and it was just like what Hauck sketched, with only a slight difference in the "bar" or "abutment," which is not material in this matter.

In fact, if this witness is to be credited, and being his own witness, it is

very difficult for Hauck to discredit him, the device in controversy was fully disclosed and described to Hauck on said occasion as the invention of Drawbaugh, and from such disclosure and description he was enabled to make the sketch which he now claims as the first reduction to form by himself of the invention.

There is abundant evidence besides that Drawbaugh had made this invention prior to this time as an improvement on a faucet he had patented, and which Hauck was manufacturing.

To fully corroborate this statement of his own witness, we find a postal made Exhibit "M" of Drawbaugh's exhibits—which is postmarked at Mechanicsburg, the residence of Hauck, December 8, and addressed to Drawbaugh, and the communication is as follows:

"MECHANICSBURG, December 7, 1878.

D. Drawbaugh,

Sir,

Hiram tells me you have made a new faucet; we should like to see it; send or bring it up soon.

Yours, etc.,

Hauck."

This "Hiram" is the witness H. K. Drawbaugh, and though Hauck denies having written the card, and all knowledge of it, yet it is proved to be in his handwriting, and a comparison with his acknowledged signatures appearing on papers in his application, seems perfectly conclusive that the card was written by him.

We are, therefore, constrained to find that Drawbaugh is the only inventor of the matter in contest, and we affirm the decision awarding him priority.

R. L. B. Clarke,
H. H. Bates, Examiners-in-Chief.

Cross-Q 300. I have in my hand a printed pamphlet of eighty-four pages, with a yellow paper cover, entitled on the cover as follows:

"Before the Commissioner of Patents, in the Matter of the Interference Between the Application of David A. Hauck for Improvements in Measuring Faucets, and the Application of Daniel Drawbaugh for a Similar Invention.

Testimony in behalf of David A. Hauck, In Chief and In Rebuttal.

Mechanicsburg, Pa.; Independent Journal Print., 1879."

Please look at this pamphlet and state whether it is a printed copy of the testimony taken in your behalf in the interference above mentioned, as printed for use in the Patent Office in accordance with the requirements of the Patent Office rules and regulations.

Ans. It is.

Cross-Q. 301. It is one of the copies which you yourself had printed for use in the Patent Office in the said interference, is it not?

Ans. It is.

(Respondents' counsel puts in evidence as "Exhibit Hauck Interference Deposition No. 1," a copy of the deposition of David A. Hauck, printed in the pamphlet last above referred to on pages 31 to 56 thereof, inclusive.

Also as "Exhibit Hauck Interference Deposition No. 2," a copy of the deposition of David A. Hauck, printed in the same pamphlet on pages 66 and 80, inclusive.

But respondents' counsel does not offer either of said depositions as evidence of any matter stated in them, and does not admit any statement contained in them to be true; but offers them merely to prove, as a fact, what it was that the witness *testified to* in said interference, in order that his testimony may be compared with the official judgment of the Patent Office, with reference to it and to the character of the witness as shown by the two exhibits "Patent Office Judgment No. 1" and "Patent Office Judgment No. 2" hereinabove put in evidence.

Complainants' counsel objects, that it is not competent to introduce statements made by the witness upon an entirely collateral matter, simply for the purpose of contradicting them, or showing that they are erroneous; that it is not competent nor proper to encumber this case with collateral inquiries which involve, among other things, an inquiry into the merits of the faucet case, and the means resorted to by the parties thereto, including Mr. Drawbaugh and Mr. Chellis, to sustain the issues therein; and that the papers being introduced by the respondents, they may be used for any purpose for which they may be legally competent.

Respondents' counsel states that he fully agrees with complainants' counsel, that it is not competent here to inquire anew into the merits of the faucet case, but he submits that, inasmuch as complainants' counsel introduced the subject of that interference into this deposition, by his seventy-second question, it is competent for respondents' counsel to cross-examine fully upon it, and to show what the decisions in the interference case were, and how they involved a judicial or official finding affecting the character of this witness.

And it is competent, inasmuch as both of the decisions aforesaid comment directly upon the testimony of this witness in that case, for respondents' counsel to show what said testimony of the witness was, by producing copies of his depositions referred to in said official decisions. Respondents' counsel does not pro-

pose to enter upon any inquiry into the facts involved in said interference, as all that matter was finally determined by the judgment of the Patent Office.

Referring to the last remark in the objection of complainants' counsel, respondents' counsel calls attention to the fact that complainants' counsel have heretofore in this case, put in evidence the entire testimony taken on behalf of Drawbaugh in said interference.

Complainants' counsel says that his objection does not bear the meaning imputed to it by the first part of the preceding remarks.)

Cross-Q. 302. Please look at the two depositions which I have put in evidence, and state whether you are the David A. Hauck who made those depositions at the times and in the manner therein stated.

Ans. I am.

Cross-Q. 303. Did you ever have any other interference in the Patent Office with Daniel Drawbaugh, except the one referred to?

Ans. I did not.

Adjourned until December 13, 1882, at ten, A. M.

DECEMBER 13, 1882, ten, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Cross-Q. 304. Those two depositions "Exhibit Hauck Interference Deposition No. 1" and "Exhibit Hauck Interference Deposition No. 2" were filed and used as evidence on your behalf on the interference; were they not?

Ans. They were.

Cross-Q. 305. I wish to call your attention to the following extract from "Exhibit Hauck Interference Deposition No. 1," the same being your deposition in the direct evidence taken in your behalf, my extract consisting of that part of said deposition from cross-question 123 to cross-answer 133, inclusive, as follows:

"*Cross-Q.* 123. What brought Mr. Daniel Drawbaugh to your shop "on that occasion?

"*Ans.* 123. I can't say positively; I could merely guess.

"*Cross-Q.* 124. We will admit your guess.

"*Ans.* 124. I believe he came there to see my new faucet, or learn "how it was constructed, because I believe that H. K. Drawbaugh on the "Sunday previous told him that I was making a new measuring faucet "and partially explained it to him.

"Adjourned at twelve, M., to meet at two o'clock, P. M.; hearing re- "sumed; parties and their counsel all present. D. A. Hauck on the "stand.

"*Cross-Q.* 125. Then you did not send for Daniel Drawbaugh to come "to see you?

"*Ans.* 125. I did not.

"*Cross-Q.* 126. You are sure of that?

"*Ans.* Quite sure.

"*Cross-Q.* 127. You are sure that you did not send for him at any "time previous to the visit of J. B. Drawbaugh to your shop?

"*Ans.* 127. Not during a month previous, but I do not know that I "sent for him at all.

"*Cross-Q.* 128. Did you not send him word that you had heard he "was making a new faucet and that he should come to see you and bring "it with him, or send it?

"*Ans.* 128. No, sir.

"*Cross-Q.* 129. Then you never authorized anyone to deliver such a "message to him?

"*Ans.* 129. I never did.

"*Cross-Q.* 130. Nor to write to him to that effect?

"*Ans.* 130. I never did.

"*Cross-Q.* 131. And you did not write yourself to that effect?

"*Ans.* 131. I did not.

"*Cross-Q.* 132. Did any one of your partners write to him to that "effect with your knowledge?

"*Ans.* 132. Not with my knowledge or consent.

"*Cross Q.* 133. You have answered all these questions very positive- "ly, and you are entirely certain that no such message was ever written "or sent by you, or by anyone else at your instance or with your knowl- "edge?

"*Ans.* 133. I am."

Also to the following extracts from the Exhibit Hauck Interference Deposition No. 2, the same being your rebutting deposition in said interference, the first extract consisting of questions and answers five to eight inclusive, as follows:

"*Q.* 5. At the hearing in Harrisburg spoken of, Daniel Drawbaugh "produced a postal card which was marked letter "M" and testified that "it was from you, state if you please whether that is true or not.

"*Ans.* 5. I have no recollection whatever of ever writing such a "message to Daniel Drawbaugh.

"*Q.* 6. State if you please whether or not you ever authorized any- "body to write that postal card for you.

"*Ans.* 6. I did not.

"*Q.* 7. State if you please whether or not you examined the writing "of that postal card.

"*Ans.* 7. I did hurriedly.

"*Q.* 8. State if you please whether or not upon the examination you "gave it you recognize it as being in your handwriting.

"*Ans.* I did not, although it is somewhat similar."

The second extract consists of cross-questions and answers one and two as follows:

"*Cross-Q.* 1. You were asked by Mr. Ritner in question No. 5, "whether what Daniel Drawbaugh testified to with regard to the postal "card marked "M" namely, that it was from you, was true or not and "you answered that you had no recollection whatever of ever writing "such a message to Daniel Drawbaugh, do you undertake to swear that "you never wrote that postal card?

"*Ans.* 1. I can only swear that I have no recollection of it whatever, "from the fact that at the date which appears upon that postal card, I "had no knowledge which would lead me to write such a message, and "furthermore, the card is signed simply "Haucks," and I am quite posi-"tive that I never signed any message in that way.

"*Cross-Q.* 2. Then you are prepared to swear, notwithstanding the "testimony of Harmon K. Drawbaugh in this case, that you had no "knowledge on the 9th of December, 1878, of the invention of a new "measuring faucet by Daniel Drawbaugh?

'*Ans.* 2. I am."

The third extract is contained in cross-questions 13, 14, and 15, as follows:

"*Cross-Q.* 13. Do you still swear that the first knowledge you had "that Daniel Drawbaugh was at work on a new faucet, was obtained "after the visit of J. B. Drawbaugh to your shop in December last?

"*Ans.* 13. I do.

"*Cross-Q.* 14. You have said that you examined the handwriting "upon the postal card; are you prepared to swear that it is not your "handwriting?

"*Ans.* 14. I am.

"*Cross-Q.* 15. Can you tell whose handwriting it is?

"*Ans.* 15. I cannot."

The fourth extract commences at cross-question 31, and is as follows:

"*Cross-Q.* 31. Then, notwithstanding that you do not believe that the "postal card was written by any member other than yourself of any of "the Hauck firms in Mechanicsburg, and that you admit that there is a "similarity between the handwriting upon it and your handwriting, you "are prepared to swear that you did not write it?

"*Ans.* I am.

"*Cross-Q.* 32. You are certain of that?

"*Ans.* 32. Quite certain.

"*Cross-Q.* 33. And as certain as that Daniel Drawbaugh did not make

"a sketch of his faucet for you in the presence of J. B. Drawbaugh last "October?

"*Ans.* 33. I am.

"*Cross-Q.* 34. And as, that Harmon K. Drawbaugh did not tell you "about Daniel Drawbaugh's faucet, on the 4th or 5th of December last?

"*Ans.* 34. Yes, sir.

"*Cross-Q.* 35. And as, that he did not make the chalk sketch upon "the work-bench which he testified to at any time prior to the visit of "Daniel Drawbaugh to your shop on his return from his father's funeral

"*Ans.* 35. Yes, sir.

"*Cross-Q.* 36. And as, that Daniel Drawbaugh did not at that visit "tell you that the faucet you were working on was his?

"*Ans.* Yes, sir.

"*Cross-Q.* 37. And as, that on the occasion of your visit to the shop "of Daniel Drawbaugh on the fifteenth of January, 1879 you did not "tell your partner, Samuel F. Hauck that you had not spoke to Daniel "Drawbaugh about his "faucet" that you didn't care about saying "anything to Daniel Drawbaugh at the time about his new faucet?

"*Ans.* 37. Yes, sir.

"*Cross-Q.* 38. And you are as certain that you did not write that "postal card as you are of any other fact to which you have testified in "this case.

"*Ans.* 38. Quite as certain as to some, but not as to all.

"*Cross-Q.* 39. Then you are not entirely certain of it?

"*Ans.* 39. As certain as it is possible to be of an event that might "have occurred as long ago as that.

"*Cross-Q.* 40. Then you are prepared to admit that you might have "written it and forgotten it?

"*Ans.* No, sir; for the reason that I did not possess the knowledge "at that time that the postal card conveys.

"*Cross-Q.* 41. And that is the reason why you say you did not write "it, notwithstanding the admitted similarity between the handwriting on "the postal card and your own?

"*Ans.* 41. Not the only reason.

Cross-Q. 42. What other reasons have you?

"*Ans.* 42. I have already answered that I am quite positive that I "never signed any message or postal card "Haucks".

"*Cross-Q.* 43. Are those the only reasons?

"*Ans.* 43. I have no recollection of writing the card, without giving "any reasons for my conviction.

"*Cross-Q.* 44. Are you prepared to swear that you could not have "signed the word "Haucks" to a postal card or any message six months "ago and forgotten it?

"*Ans.* 44. I don't think I could have forgotten such an unusual man- "ner of signing a message during this short time that has elapsed."

It would appear from the above quotations that the counsel in the interfence case very carefully and repeatedly called your particular attention to said postal card; is not such the fact?

Ans. It is.

Cross-Q. 306. Did you not conduct that interference case upon the theory that Drawbaugh stole the faucet invention from you?

Ans. I did not.

Cross-Q. 307. Your rebutting deposition in the Exhibit Hauck Interference Deposition No. 2, purports to have been taken on the sixteenth and seventeenth days of July, 1879; such is the fact is it not?

Ans. It is.

Cross Q. 308. I call your attention to your first and second answers in said rebutting deposition as follows:

"*Ans.* 1. It is not, as I am very certain that I was not at Daniel "Drawbaugh's shop during the fall and winter of 1878 and 1879, prior "to the 15th of January, 1879.

"*Q.* 2. How long prior to the 15th of January, 1879, was it that you "were there?

"*Ans.* 2. I can't say positively but have no recollection of being "there during the year 1878 at all."

Do you think your recollection was as good in the summer of 1879 in regard to whether you were or were not at Drawbaugh's shop in the year 1878, as it is now, more than three years later?

Ans. It was not.

Cross-Q. 309. Your memory then, is of a kind which strengthens by lapse of time, is it?

Ans. It is not, but at that time I did not expect to be asked those questions and was obliged to answer them on the spur of the moment, without due reflection. But prior to coming here to make this deposition I have thought over these occurrences, and my recollection of them is somewhat clearer now than it was then.

Cross-Q. 310. At the time when you commenced to testify in this suit, did you expect to be asked about the dates of your visits to Drawbaugh's shop, in company with Mr. Plank?

Ans. I cannot say that I expected to be asked particularly about my visits there with Mr. Plank, but I did expect to be questioned concerning all of my visits there.

Cross-Q. 311. State the earliest time at which you remember seeing a magnetic clock at Daniel Drawbaugh's shop at Eberly's Mills?

Ans. I saw a magnetic or electric clock on the occasion of my first visit.

Cross-Q. 312. State the earliest time at which you had any knowledge of a clock there connected by wires with plates buried in the ground.

Ans. I think not before the winter of 1874 and '5, although Daniel Drawbaugh and I may have conversed in regard to propelling a clock by an earth battery prior to that.

Cross-Q. 313. If there had been such a clock there as early as the year 1873, would you have seen it?

Ans. I think I would.

Cross-Q. 314. How certain are you about that—whether you would or not?

Ans Reasonably certain from the fact that I felt more interested in his experiments on that particular clock, than in most of his other experiments, and I believe he would have communicated the completion of the clock to me on the first opportunity, although I may not be correct in the date.

Cross-Q. 315. From your greater interest in that magnetic clock invention, do you think you would have been more likely to remember the fact of having seen it than to remember the fact of having seen other inventions in which you were less interested?

Ans. I think I would.

Cross-Q. 316. If you had seen it there in 1873, then, you would be able now to remember the fact, would you?

Ans. Not positively as to the time, but reasonably certain as to seeing it soon after its completion.

Cross-Q. 317. Mr. Theophilus Weaver, a witness examined in this case on behalf of the complainants, has testified that he visited that shop of Daniel Drawbaugh in the year 1873, and that that magnetic clock with the wires running to plates buried in the ground was there then and was seen by him at the time of that visit, and that he had heard of it previously, and made the visit expressly to see it; do you know of any reason for doubting the truth of his testimony on this point?

Ans. I have no reason to doubt the truth of his statement, and will concede that it might have been as early as November or December of 1873 that I first saw it.

Cross-Q. 318. Might that clock not have been there as early as your first visit to Drawbaugh's shop in June, 1873?

Ans. I am positive it was not.

Cross-Q. 319. Are you as positive of that fact as you are that you did not see speaking telephones there in 1873?

Ans. I am not, inasmuch as there was at least one form of electric clock there, but no speaking telephone in any form.

Cross-Q. 320. Do you mean to testify that there was no speaking telephone, in any form, there in 1873, or merely that you did not see any, or hear of any?

Ans. I mean that I did not see or hear of any.

Cross-Q. 321. And after all that took place in the faucet interference, in the taking of the testimony, and the decisions in the case, are you again prepared to say, under oath, that you remain entirely friendly to Daniel Drawbaugh?

Ans. I am.

Recess for lunch until 2.15, P. M.

DECEMBER 13, 1882, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-Q. 322. I have been informed that a good deal of the time, while you superintended the shop at Eberly's Mills, you used to lie around the shop asleep, and sometimes had to be waked up, even to take the train for Mechanicsburg to return home, towards evening; is my information correct, or have you any recollection about the matter?

Ans. It is unqualifiedly false.

Redirect by Mr. Smith:

Q. Q. 323. In your answer to the 168th cross-interrogatory, you mentioned the fact that you sold a drill-press to E. W. Chellis, of Harrisburg, about a year ago; have you had any other dealings with Mr. Chellis, and if so, state what they were and when and where they took place?

(*Objected to by Mr. Hill, as immaterial and as new matter not referred to on cross-examination.*)

Ans. I also sold him an incomplete turning lathe at the time of selling him the drill-press, and a year or a year and a half previous to that sale, I sold him a complete engine lathe, which we had used in the manufacture of faucets. The transactions occurred in Mechanicsburg, either at the shop of Hauck and Comstock, or the store of G. W. Hauck.

Q. Q. 324. How many times did he see you in relation to these several purchases?

Ans. Certainly four, and probably five times.

Q. Q. 325. Did he or not, at any of these interviews, make any inquiry of you as to what you knew in relation to the invention or use of the telephone by Mr. Drawbaugh? If so, state what it was?

Ans. He did once during a visit; he asked me very bluntly whether I ever saw a telephone at Dan's shop; I answered him that I did not; that was all the conversation that took place in regard to it.

Q. Q. 326. You have been inquired of, in the cross-examination, about a man called Weeks, who talked with you about what you knew in relation to the invention or use of the telephone by Daniel Drawbaugh; and in the 290th cross-interrogatory you were asked if you knew why the complainants sought you out so early in the history of the case as a desirable person to confer with for their purposes. How did you first become acquainted with this man Weeks?

Ans. I was introduced to him either by M. W. Jacobs, Esq., or E. W. Chellis, at a Granger's picnic some time before he approached me on the subject of my knowledge of Drawbaugh's invention of the telephone.

Q. Q. 327. During the cross-examination you produced a paper containing a list of things which you had seen at Drawbaugh's shop. Have you, since you produced that paper, thought of anything else that you saw there which is not on that list, and which did not occur to you when you made it up? If so, will you state what it was and when it came back to your memory?

Ans. I have; I also saw what is called a gas-governor, which recurred to my memory during the controversy about the reading of the list I produced.

Q. Q. 328. Two depositions have been introduced in evidence by the respondents. Do you remember whether or not you were cross-examined when you gave those depositions by Mr. M. W. Jacobs, who has been present on behalf of the respondents, as you understand it, during the taking of your present deposition?

Ans. I was cross-examined by the gentleman mentioned.

Q. Q. 329. I wish to call your attention to some questions proposed by Mr. Jacobs on that occasion and your answers thereto.

His third cross-interrogatory, referring to Mr. Drawbaugh, is this:

"He is a machinist, is he not?" and you answered, "That is one of the trades he is proficient in."

"*Cross-Q.* 4. Then he is a man of versatile talents, is he?

"*Ans.* 4. He is.

"*Cross-Q.* 5. And a born inventor, is he not?

"*Ans.* 5. That I cannot say, as I have only known him for about ten "years."

This opinion that you expressed as to his versatile talents was an opinion that you really held at that time, notwithstanding your controversy with him, was it not?

Ans. I certainly did.

Q. Q. 330. These questions were followed by others:

"*Cross-Q.* 6. You are aware, however, that he has made a great many "useful and ingenious inventions, are you not?

"*Ans.* 6. What he has made since I have become acquainted with him, "that I have any knowledge of, I would call imitations, although some "of them might be patentable.

"*Cross-Q.* 7. To what inventions do you refer?

"*Ans.* 7. I refer to the blower spoken of in this controversy; also, to "an automatic boiler-feeder, and to a magnetic clock, and to a steam "syphon or a steam pump, and a hydraulic ram; that is all I can think "of at present."

Was the opinion which you have expressed in the first of these answers one which you really entertained at that time in respect to all of Mr. Drawbaugh's inventions which were then present to your mind?

Ans. It was.

Q. Q. 331. Mr. Jacobs proceeded to call your attention to another invention of Mr. Drawbaugh's, which, he apparently thought, might not come within the class of imitations, as follows:

"*Cross-Q.* 8. Mr. Drawbaugh also invented a measuring faucet, did he "not, the patent upon which you subsequently purchased?

"*Ans.* 8. He did.

"*Cross-Q.* 9. Was that an imitation, too?

"*Ans.* 9. It was to a great extent."

I suppose you really entertained that opinion at that time?

Ans. I did.

Q. Q. 332. Mr. Jacobs proceeded to cross-examine you at some length as to the grounds of that opinion, if I understand it, and then asked you this question:

"*Cross-Q.* 28. Of what was his magnetic clock an imitation?

"*Ans.* 28. It is an imitation of a clock represented in either Knight's "or Appleton's Mechanical Dictionary—I don't remember which one— "which I saw during the time Mr. Drawbaugh was perfecting his clock.',

And the inquiries then proceeded as follows:

"*Cross-Q.* 29. While be was perfecting his clock, he told you about "his invention and his experiments upon it, did he not?

"*Ans.* 29. He did.

"*Cross-Q.* 30. Once, or more than once, did he talk to you?

"*Ans.* 30. He talked to me about it a great many times.

"*Cross-Q.* 31. Did he ever talk to you about any of his other inven- "tions?

"*Ans.* 31. He did.

"*Cross-Q.* 32. He was generally pretty free in communicating his ideas "to friends, wasn't he?

"*Ans.* 32. He was."

Were these answers which you gave to Mr. Jacobs at that time true?

Ans. They were.

Q. Q. 333. Mr. Jacobs then proceeded with a series of questions, some of them relating to the clock and some of them to a new faucet, inquiring particularly as to your knowledge of the clocks until he reached his 49th interrogatory, which is in these words:

"*Cross-Q.* 49. But still you undertake to swear that Daniel Draw-"baugh's clock was an imitation of the one you saw in the Mechanical "Dictionary?

"*Ans.* 49. I do, so far as I am able to comprehend.

"*Cross-Q.* 50. Don't you know that Daniel Drawbaugh was at work on "his clock for about ten years, and perfected it step by step?

"*Ans.* 50. I do not know that.

"*Cross-Q.* 51. You emphasize the words, "know that;" how long, to "your knowledge, was he at work on it?

"*Ans.* 51. The earliest that I can remember was about the year 1874 "or 1875, and I believe, only from what I heard, that he completed it "about two years ago."

"*Cross-Q.* 52. And you undertake to swear that Daniel Drawbaugh is "an imitator, and not an original inventor?

"*Ans.* 52. I believe him to be an excellent imitator, while I do not say "that he could not be called an inventor."

You seem to have entertained the belief that Mr. Drawbaugh was an imitator in respect to the inventions he made, notwithstanding all which Mr. Jacobs could suggest to you at that time; was that so?

[*Objected to by Mr. Hill, because the quotation made by complainants' counsel is not sufficiently full to show to the Court the exact character of the testimony of the witness, who was forced, by the questions immediately preceding the forty-ninth question, in same deposition, to admit that he was giving his opinion as to Drawbaugh's clock being an imitation of a prior clock, while he could not tell whether the magnetic power was applied in a similar manner in the two clocks, nor could he claim to possess a complete knowledge of the construction of them.*

Complainants' counsel replies that he expects the Court to read all the testimony which the defendants have put into the case, bearing upon this subject.

Respondents' counsel asks why in that case complainants' counsel is getting the witness to repeat certain portions of it, and only suggests that if there is any object in having portions of

it repeated, such portions be taken fully enough to represent the testimony on that point correctly.

Counsel for the complainants replies that he hasn't asked the witness to repeat any portion of the testimony, but that he has himself repeated as much of it as he thinks necessary to insure the attention of the Court to the whole of it.]

Ans. It was.

Q. Q. 334. If you had known when you were thus cross-examined by Mr. Jacobs that Daniel Drawbaugh had invented the speaking telephone before 1876, would you have thought that he was a mere imitator, or that all his inventions were only imitations of prior inventions made by other people?

[*Objected to by Mr. Hill, as leading and hypothetical.*]

Ans. If I had known that he had invented or constructed a speaking telephone prior to 1876, I would certainly have regarded it as new and startling.

Q. Q. 335. Do you remember whether Daniel Drawbaugh was present during this cross-examination in the interference and in consultation with Mr. Jacobs?

Ans. He was present nearly all the time of taking the entire testimony, but I cannot say positively that he was there at the time specified.

(Counsel for complainants calls the attention of the witness to a memorandum between the 16th and 17th answers of his deposition No. 1, dated at the beginning of the session during which the cross-examination above referred to took place, as follows:

"Hearing resumed Monday June 2, 1879, at 2, P. M.

"Parties and their counsel all present."

And asks him whether this memorandum aids his recollection upon the subject. Witness continues:)

I can say that Mr. Drawbaugh sometimes went out for a few moments, and notwithstanding the statement that he was there at the opening of the session, it is not conclusive to me that he was there at the time specified, although I am positive he was there when Mr. Jacobs asked me what was the name of the clock I saw in the Mechanical Dictionary, for at that time Mr. Drawbaugh whispered the name "Bain's" to Mr. Jacobs, loud enough for me to hear.

Re-Cross by Mr. Hill:

Re-Cross-Q. 336. Complainant's counsel, in his 330th redirect inter-

rogatory, has called your attention, among other things, to the answer which you made to cross-question 7, of your "Interference deposition, No. 1," in which you mentioned Drawbaugh's blower, automatic boiler-feeder, magnetic clock, steam syphon or steam pump and hydraulic ram, as all the inventions which you could, at that time, think of, that he had made, that you had any knowledge of, since you became acquainted with him. Was your said answer to said cross-interrogatory 7 true or untrue?

Ans. It was true. I will qualify that by adding, so far as my memory served me at the time.

Re-Cross-Q. 337. In your 13th answer in the deposition now taking in this suit, you have mentioned several inventions that you did not think of in giving your 7th cross-answer, in that interference deposition, No. 1, to wit: A pump to supply boilers with water, a machine for insulating wire for telegraph purposes, two stamp cancellers, and a nail-plate feeding machine or appliance, have you not?

Ans. I have.

Re-Cross-Q. 338. Your 7th cross-answer in the interference deposition, No. 1, thus enumerates five of Drawbaugh's inventions which you then remembered, and fails to enumerate five others, which you testified to in your 13th answer in this case. Is not that the fact?

Ans. It is.

Re-Cross-Q. 339. It also failed to enumerate the gas governor, to which you referred in your 327th redirect answer in this case, did it not?

Ans. It did.

Re-Cross-Q. 340. It also failed to enumerate the apparatus for telegraphing by means of a horse-shoe magnet without a battery, referred to in your 34th, 46th, 47th, 48th, 49th, 50th, 51st, 52d, 53d, and 54th answers in this case; did it not?

Ans. I believe it did, although I cannot remember whether or not the magnet telegraph was mentioned in the answers named.

Re-Cross-Q. 341. It also failed to enumerate the automatic fire-alarm mentioned in your 55th answer and elsewhere in your deposition in this case; did it not?

Ans. It did.

Re-Cross-Q. 342. It also failed to enumerate the rag-carpet instrument mentioned in your 57th answer in this case; did it not?

Ans. It did.

Re-Cross-Q. 343. It also failed to enumerate the telegraph instrument having a key-board with letters of the alphabet on the keys, mentioned in your 58th answer in this case; did it not?

Ans. It did.

Re-Cross-Q. 344. It also failed to enumerate the telegraph instrument having a dial, mentioned in your 58th answer in this case; did it not?

Ans. I think I did not allude to the latter instruments as certainly being distinct and separate machines, although I did not mention it in my 7th cross-answer in interference deposition No. 1.

Re-Cross-Q. 345. In your 7th cross-answer in the interference deposition referred to, you remembered to mention five of Daniel Drawbaugh's inventions, but forgot to mention ten or eleven of his other inventions which you now remember in giving this deposition; is not that the fact?

Ans. It is.

Re-Cross-Q. 346. Don't you think that if you were to give another deposition four or five years hence, you might then remember even to have seen Drawbaugh's telephone during your superintendence of the faucet buiness at his shop?

Ans. Most certainly not.

Re-cross-Q. 347. Will you please describe Drawbaugh's magnetic clock that had the earth-plate connection? Describe it as it was when you first remember seeing it.

Ans. The portions of it which were different from ordinary clocks were the pendulum, the works or gearing containing no springs or drum for winding cord, and the pendulum was caused to vibrate by means of an electro-magnet fastened to the case behind and near the pendulum rod, by which the pendulum was attracted towards the magnet and repelled from it by means of an electric current generated by the earth-battery, which current was changed to favor the propulsion of the pendulum by means of completing and breaking the current near the point of suspension of the pendulum.

Re-cross-Q. 348. Give now the earliest time at which you are positive that you saw this clock at his shop in the condition in which you have described it.

Ans. I can give no date nearer than that I have already given.

Re-cross Q. 349. I want you to restate the date in this connection.

Ans. It might have been as early as November or December, 1873, and as late as the spring or summer of 1875.

Re-cross-Q. 350. But not later?

Ans. I think not.

Re-cross-Q. 351. You are sure that it was not so late as the time when you moved the machinery away in May, 1876, are you not?

Ans. Not sure, but think not.

Re-cross-Q. 352. You are sure that it was at least as early as the month of May, 1876, are you?

Ans. Reasonably certain.

Adjourned until December 14, 1882, at ten, A. M.

DECEMBER 14, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Re-cross-Q. 353. You have been asked in redirect examination very fully with reference to an opinion which you expressed while giving your interference deposition No. 1, to the effect that Daniel Drawbaugh was a mere imitator; it was for your interest in that interference to represent him to the Patent Office as a mere imitator, just as it is for the interest of the complainants here in this suit to represent him to the Court as a mere imitator, was it not?

Ans. Notwithstanding the effect it might have it was, nevertheless, and is yet an honest opinion.

[*Answer objected to by Mr. Hill as volunteered and not responsive.*

Counsel for the complainants calls attention of the counsel for respondents to the fact that the opinion in question was called out by Mr. Jacobs in his cross examination of the witness in the deposition in the interference case, which respondents have put in evidence in their present cross-examination.

Counsel for respondents replies that the opinion, nevertheless, was immaterial and incompetent in that case, and is immaterial and incompetent in this case; that the deposition was put in evidence in this case merely to give the Court an opportunity to compare what this witness swore to in that interference with what the Patent Office officially found to be the fact and the truth, notwithstanding his sworn denial of it; and that for the purposes of the last interrogatory and those which are about to follow, it makes no difference who drew the expression of opinion out of the witness in the interference case.]

Re-cross Q. 354. I did not ask you, nor do I care, whether the opinion was your honest opinion or not; but I leave the Court to judge of that.

What I asked you and what I wish to know is this: Whether it was not for your interest in that interference case, as it is for the complainants' interest here, to represent Daniel Drawbaugh as a mere imitator, and you will please answer whether such was the fact or not.

Ans. I cannot answer the question pointedly in its present shape, as it implies that I misrepresented Daniel Drawbaugh in my testimony in my interference deposition, which I do not admit.

[*Answer objected to by Mr. Hill, for the same reasons given in his objection to the last answer.*]

Re-cross Q. 355. The question, whether or not it was for your interest in that interference to represent him as a mere imitator, is entirely independent of the further question whether the representation was true or not. Now, without reference to its truth or falsity, I ask you again, whether it was not for your interest in that interference as it is for the complainants' interest here to represent him as a mere imitator?

[*Objected to by Mr. Storrow, for the reason that the question as to the character of Mr. Drawbaugh, as an inventor, and whether his inventions were original in their character, or in the nature of imitations of and improvements upon the work of his predecessors, was first introduced into the faucet case as an issue by Mr. Drawbaugh and his counsel, Mr. Jacobs, in the cross-examination referred to.*

Respondents' counsel replies that this objection has nothing to do with the question now put to the witness.]

Ans. It was.

Re-cross-Q. 356. Do you know when the first patent of Alexander Graham Bell, that is involved in this suit, was issued and dated?

Ans. I do not.

Re-cross-Q. 357. Then I will inform you that it was the 7th day of March, 1876. Assuming that to be the date, do you know of any knowledge that the world had of Alexander Graham Bell's invention prior to that date?

Ans. I do not to a certainty, although it occurs to me I had read an account of telephones, said to be the invention of Bell, Edison, or both, during the year 1875.

Re-cross-Q. 358. Your recollection, then, is a great deal more favorable to Mr. Bell and Mr. Edison than their own recollection, and far outruns any claim they have ever set up, besides being directly opposed

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