monwealth to issue such a certificate as has been offered in evidence. *Commonwealth* v. *Railway Co.*, 52 Penn. St. 52; *Bowling Green &c. Railroad Co.* v. *Warren County Court*, 10 Bush, 711; *Ellis* v. *Paige*, 1 Pick. 43; *Farmers' Loan and Trust Co.* v. *Carroll*, 5 Barb. 613; Angell and Ames on Corporations, §§ 81, 111. The Bell Telephone Company of Philadelphia is one of the complainants mentioned in the bill of complaint. It is described as "a corporation duly established under the laws of the State of Pennsylvania." Although, under the pleadings, the complainants were bound to prove the existence of the corporation, yet there was no act, law, charter, or evidence offered to prove that such a corporation ever did exist.

Mr. Ker also contended that the evidence showed that the complainants were not entitled to maintain a suit alone against the respondents; that Bell was not the original inventor of the inventions described in the patents; that material parts of the invention had been described in printed publications prior to the granting of letters patent; that the claims in the patent were not warranted by the descriptions and specifications set forth in it, or by the proofs and evidence; and that the apparatus was inherently unfit for telephonic purposes in the transmission of articulate speech.

Mr. Don M. Dickinson for the People's Telephone Company (the Drawbaugh Case) and for the Overland Telephone Company.

Two leading judgments of this court settle the rules applying to the issue of priority of invention between Bell and Drawbaugh. These are *Gayler* v. *Wilder* (the Fire Proof Safe Case), 10 How. 477, and *Coffin* v. *Ogden* (the Reversible Lock Case), 18 Wall. 120.

The simple question is, did Mr. Bell or Mr. Drawbaugh first conceive and apply the principle of the telephone and "clothe the conception in substantial forms which demonstrated at once its practical efficacy and utility?"

The principle is, that of transmitting articulate speech upon

wires by a continuous electric current, with the addition of means to cause incidental undulations of the current corresponding with the incidental tones of the human voice.

When applied in the electric speaking telephone the practical result is, that the same air vibrations set in motion by the human voice, and producing sound by their impact upon the tympanum of the ear, are repeated with comparative exactness upon the tympanum or diaphragm of the transmitting instrument, are then by the process carried to a distance, and there with equal exactness repeated upon the tympanum or diaphragm of the receiver, and thence again repeated upon the tympanum of the listening ear.

The issue of fact here has been heard and decided upon the merits but once in any court below.

There was no hearing of this defence before granting the preliminary injunction in the Circuit Court for the Southern District of New York; and the Circuit Court for the Eastern District of Pennsylvania — Judges McKennan, Nixon and Butler sitting — refused a preliminary injunction after full hearing deferring decision until a final decree should be reached on pleadings and proofs in the Southern District of New York. So that the only judgment of any court which needs to be attacked by or which can be said to be adverse to this defence is that of the learned judge of the Circuit Court for the Southern District of New York which is printed in this record.

Our positions may be summarized as follows:

The defendants' testimony-in-chief, excluding Drawbaugh's, is of such positive character, relating to exceptional and unusual facts; is so copious from many and widely disconnected sources, and withal so consistent and harmonious, that, in the language of the learned Judge below, it "*is sufficiently formidable to overcome the legal presumption of the validity of the complainants' patent.*"

The complainants' proofs in reply, do not, under the settled policy of the law of evidence, create a flaw upon the face of the case made, much less destroy it.

Case authorities to the point, that doubtful direct testimony in support of the claims of an alleged inventor may be over-

thrown by evidence of his inconsistent conduct, fraudulent fabrications or evil tendencies, have no application in weighing direct evidence of the higher order presented here. If it had been shown that he was a rogue and a falsifier, Drawbaugh would not be beyond the pale of the law for the protection of inventors, if the evidence otherwise established his claim to an invention.

But Drawbaugh's story, his character and conduct, and the conditions in which we find him, are all consistent with, and corroborate, the case otherwise made.

In this regard every premise of the opinion below, upon which this decree rests, is at fault. These premises are:

(*a*) That a man of Drawbaugh's education and environment could not have invented the telephone.

(*b*) That a man who busies himself with minor "mechanical contrivances" could not have produced a great invention. In other words, a great discovery in physics could not be made by a man unless his mind had always been on great discoveries; an *a priori* argument that to establish a claim to a great invention, the claimant must show some previous invention approximately as great.

(*c*) That the issue of an advertising card, to the farmers, millers, mechanics and housewives of a country village, soliciting trade for his shop, is an admission that he was not working upon and had no telephone at a period when seventy unimpeached witnesses, and himself, testify positively that he had the telephone, and that he was so working at that time.

(*d*) That Drawbaugh fabricated the story of his poverty, when the court records of his judicial district show judgment after judgment against him, on claims for the necessaries of life, medical attendance for his fatally ill children, and for the roof that covered his head; and when the community in which he lived corroborates the record.

(*e*) That Drawbaugh was a charlatan, because a provincial scribbler was florid in the style of a printed notice of him.

(*f*) That Drawbaugh and these witnesses, when they say that they talked through the more or less crude instruments made prior to 1875, falsify or are mistaken in their statements on the following grounds:

Some of the original parts have been lost or worn out, two sets of reproductions were made, both in exact correspondence with the original machines, and when tested at different times, one set being older and shaken out of adjustment, did not work perfectly; though the other with accurate and firm adjustments, stood all the tests as practical telephones.

The earliest possible date at which Bell's conception of the magneto instrument can be fixed is June 2, 1875.

Then from an accident in his experiment to the "Spring" instrument he was led to prepare a sketch for Mr. George Brown of Toronto. This sketch as he testifies was of his instrument of July, 1875, which was the result of experiments following and caused by the accident of June 2, 1875. He placed upon the sketch the words in his own hand: "*First attempt to transmit the human voice.*"

We present a history from the first idea conceived by Drawbaugh, of transmitting articulate speech over a telegraph wire in 1859–60, through various experiments by which the conception finally took on mechanical, though rude forms, and became of practical use, down to the finished and nicely adjusted mechanism; all prior to this as the date of Bell's invention.

This history rests for its general truthfulness, and for the accuracy of its details, not upon the testimony of interested witnesses; not upon the testimony of one, two, six or a dozen, but upon the direct and positive testimony of an entire community, and of the frequent and occasional visitors to that community, representing all classes of citizens, in every trade and occupation.

Over two hundred persons testify to knowledge of Drawbaugh's telephones as an accomplished invention prior to the date of Bell's. Over seventy talked through the machine. Over one hundred and thirty saw the machines, and most of these identify instruments.

There is nothing of inherent improbability in the proposition that so many people of various occupations and employments can give direct testimony in this case, as the fact comes in naturally, and is conceded on all sides, that in the country

village of Eberly's Mills, well known throughout that part of the country, Drawbaugh's shop was a common resort for many people of the village and of the country side, and it was a place to which visitors were frequently taken as a place of local note, while Drawbaugh himself was considered a remarkable man among the people.

The great mass of evidence for the defence is essentially not of a class frequently criticised in such cases as being dependent upon the memories of illiterate or careless witnesses as to conversations, statements, or even plans and specifications with or submitted by an alleged inventor at some former time; but on the contrary is that kind of testimony which in every branch of the profession is admitted to be even superior to that of a mere learned or scientific person, where it bears upon the practical truth of novel results and effects as facts. There is no room for mistake.

It cannot be conceived that any honest witness could have made a mistake, or that his memory could be beguiled by imagination, "wrought upon by influences to which his ears were subjected," as to his having done so marvellous a thing as conversing through a machine and recognizing the tones of a human voice, at a distance over telegraph wires, at the time in question.

In the condition of the art, and of their knowledge at the time, a greater proportion of such witnesses would be impressed by such a fact as by a miracle.

So strong and vigorous was this class of testimony that the court below was constrained to hold as we have seen that "the case made by these witnesses is sufficiently formidable to overcome the legal presumption of the validity of the complainants' patent."

It is true that in all branches of jurisprudence instances are frequent in the cases, and illustrations common in the books, of the fallibility of direct testimony, from honest mistake.

Such instances and illustrations occur and are drawn, throughout the history of the law of evidence, from one general class of oral testimony.

It is that which depends for credence upon the unaided

memory of the witness, in relation to some ordinary thing, not unusual, unnatural or striking, in and of itself. Thus, the testimony of an honest witness to the fact merely, that at a certain time and place, he saw two individuals together might be successfully assailed, while the statement of the same witness that he saw them together, and saw one of them strike the other or shoot the other, would be invulnerable.

So, by the same rule, direct testimony by the average witness as to ordinary conversations or statements at a distance of time, may be as unreliable as his recollection of the contents in detail of a letter, which, intrinsically, or to the witness, was of no particular interest; in both instances becoming less reliable in proportion to the lapse of time. Such evidence, while it may be competent, has little weight.

So, memory of such witness as to statements, and plans and sketches of inventors in ordinary machinery, or extraordinary machinery used for ordinary purposes; and even as to the parts and adjustment of the mechanical parts of such machine.

The history of patent litigation, judgments of courts in such cases, and the complainants' brief below and here, teem with modern instances of the application of proper caution and of absolute decision against this kind of direct evidence.

It is doubtless true that the misty and lineless impressions of men, especially of the unskilled and unlearned in the art, might easily be beguiled by subsequent events, interest or influences, into giving out a seemingly honest but mistaken description of well-defined parts and accurate adjustments. Strong circumstantial should overcome direct evidence in such cases, as in the *Howe Sewing Machine Cases*, 1 Fish. Pat. Cas. 162.

But the testimony here attacked is as far beyond the range of that doctrine as the target of a Columbiad is beyond the range of a bird gun.

Other and equally well-settled rules apply; if the circumstances narrated were likely to attract the attention of a person "in consequence of their importance, either intrinsic or with relation to himself, doubt is resolved in favor of the memory of the witness."

Mr. Dickinson's Argument for People's and Overland Cos.

It is said of the King of Siam that he believed everything the Dutch traveller told him, until he said that in Europe the water in winter became so solid that men and even elephants could walk upon it. This, his majesty said, was impossible, and at once accused his entertainer of lying. (Locke, on the Human Understanding.) There can be little doubt that after the interview, the monarch's memory remained good of the fact that he had been told of this thing, and he would have remained a good witness to that particular part of the conversation for the rest of his life. If, in addition, he had been, for the first time, brought to view and test the ice of a frozen river in a country where water sometimes freezes in the season of winter, his testimony, at any subsequent period, that the water was frozen on the particular day of his view of the wonder, would be worth that of a hundred residents of its banks who should testify from mere memory, that the river was or was not frozen on that day.

In this case we have hundreds of witnesses whose circumstances and relations are in perfect harmony with the theory that they could have seen and heard the thing alleged if it had occurred; each individual describing either the knowledge of his own senses of a result, or of the hearing of a result, which, if in fact it occurred, or if in fact he heard of it, was the most startling and unheard-of thing in all his experience. To him it was a sharp and vigorous departure from the course of nature; becoming known of men, this thing equally moved and astonished the civilized world. As put by the learned Judge below, "a result of transcendent scientific interest," and the greatest by far of all the marvels of the electric telegraph.

Imagine a suit for an infringement against Fulton, and the testimony of a witness that he was on board on the trial trip, and then imagine counsel making the charge against him that he was beguiled by his imagination into honestly thinking that he saw the boat propelled against the current by steam or by unseen forces!

In the then state of knowledge, especially in the community of Eberly's Mills, the transmission of the voice by wire,

and of the tones of the voice by electrical machinery beyond ordinary hearing distance, was to present such a marvel as to challenge attention in the very nature of things.

It was not merely a wonderful mechanical contrivance like the sewing machine, which accomplished the seemingly improbable combination in mechanics, which could perform rapidly and perfectly a familiar work; but this was an unseen and mysterious cause, whose processes were not discoverable to the vision, whose force seemed rather of the unnatural, and whose *results alone* impressed the mind and memory.

No detail of mere machinery or adjustment needs to be remembered. If the machine *talked*, and the witness *heard* it, there can be no doubt of the accuracy the impression made. If the machine talked, we might well dispense with the fallible memory of some unlearned and unskilled witnesses as to the mechanism employed, because we know that the appliances used in the magneto and variable resistance instruments were the invention here in issue, as none others would or can transmit articulate speech by the electric current upon wires.

This brings us to another oft-repeated criticism of several individual witnesses for the defence. If the shrewdest and most able cross-examination could lead a witness to say that he had seen and talked through a certain instrument of the exhibits in evidence, identifying it, when it could be argued that at the exact time of the act the particular instrument identified was not perfected or in use, according to the testimony of Drawbaugh, or some other witness, the learned counsel profess themselves satisfied, and urge the court to agree with them, that the testimony is quite demolished. Their theory as to the fallibility of honest, direct testimony, given by the unskilled and unlearned, as to the existence of the machines, here disappears, and in its place we have the proposition that these particular witnesses are wicked falsifiers; and this, of ignorant men and women, "Pennsylvania farmers, gullible now, and gullible then," as counsel are pleased to call them.

While we have the testimony of the learned, as well as of the ignorant, yet, even of the latter, we submit that it is the

strongest possible corroboration of their statements, and the strongest possible contradiction of the complainants' position (that these many witnesses either falsified wilfully, in concert, from corrupt collusion, or from the unconscious effect of consultation or "village tavern gossip"), that they do not agree in their memories of the, to them, novel parts of the instrument; or are at fault or are mistaken as to the identity of the instruments, or of the difference between the carbon or variable resistance machines and the magneto machines.

They are agreed in memory of the great, conclusive fact, that this machine *did talk.*

Running through the testimony from the population at and about Eberly's Mills, and its frequent visitors, we find repeated and constantly appearing support of the main facts testified to, in perfectly natural and consistent collateral matters.

For instance, we find the unlearned and unskilled remembering well the talking machine, when clothed in the familiar garb of a tin mustard box or common glass tumbler, and forgetting other details; we find others remembering the instruments with any peculiarity about them, like the spiral magnet, better than they can recall other parts, as that particularly struck their attention, and naturally would do so; we find the blacksmith remembering the shape and position of the permanent magnet with which he is familiar, and forgetting all about the electro-magnet, of which he knew nothing; we find many remember the common horse-shoe magnet as used, because they knew before what it was. We find a farmer, like Fetters, recalling all the details for applying electricity about the machines, but cease to wonder at his accuracy, when we find that the farmer had at some time before greatly interested himself about practical electrical machinery. We find the more familiar in such matters giving more details; the totally ignorant in such matters giving no details at all. The very diversity of detail, the absence of concurrence in circumstance, in occasion, and in time, presents this mass of testimony as impregnable against the complainants' theory, that it is the product of consultation or of preärrangement.

Neither their sharpest cross-examination, nor their swarm

of agents and detectives employed from among well-known members of the community, as well as from without, have been able to bring out any admission or circumstance tending to show that the witnesses have been impressed by an exchange of views among themselves, by undue influence from interested parties, or that they are in conspiracy in framing their evidence.

Is it possible that complainants' counsel have not been able to break the "fabrications" of even one ignorant and gullible Pennsylvania farmer?

It is not possible, if such a conspiracy existed, and an entire population in it, that, in the course of years, no one of the hundreds of conspirators, in every walk of life, has ever been weak or careless, or off his guard, so as to betray the slightest hint of it, even in the conversations with his co-conspirators; yet if he has, the secret agents of the complainants, among the friends and neighbors of the conspirators, have not found it out. The breaking down of two or three, and no more, of the witnesses called upon the question of dates, strongly aids in the demonstration that the mass are unshaken in their testimony. It is rather further evidence that we have called the population to testify, and that in every community there are one, two, or three, covetous of the ephemeral distinction of the witness-stand, of the importance of figuring in a case of so much interest, and willing to gain it by a stretch of conscience.

Care has been taken, however, in summoning witnesses to testify, to call no man whose character or whose word could be successfully impeached by any methods known to the law. And it is remarkable, we submit, that in a case of this magnitude, with every means and resource at their command, the complainants, after years of effort and search in near and in the most remote paths, and in every collateral by-way, now rest the charges of conspiracy and of gullibility against these witnesses, only upon the bare statements of counsel. The lives of all the witnesses are clean, their characters for truth and veracity unassailed, and the evidence of any attempt to influence the memory or the impressions of any man called, cannot be successfully pointed out in this record.

We submit in our brief an analysis of the testimony, and call particular attention to the absolute certainty of the dates as fixed by collateral matters in every instance.

Complainants' Testimony.

As tending to show that Drawbaugh did not invent and use in his shop the electric speaking telephone, as testified to by the witnesses for the defence, the complainants introduced forty-eight witnesses from Eberly's Mills and from various parts of the United States, who are put upon the stand for the purpose of showing that they never saw the machines in his shop, *and never heard them spoken of.*

We shall see that of these but ten stand the test of cross-examination and rebuttal, even as to the point to which they testify; while the ten are disposed of on other grounds. Among these witnesses, the first and most important, and one whose means of knowledge and relations with Drawbaugh are claimed to strengthen complainants' theory more than any other witness, is Theophilus Weaver.

He describes himself as a "solicitor of patents, pattern-maker, builder, and experimental machinery manufacturer," and as "counsel in patent cases."

He testifies that he had acted in getting up specifications for Drawbaugh in various minor inventions, and, in a word presents himself as the man to whom Drawbaugh would most likely make known his telephone inventions, if they had existed. He then proceeds to testify, in chief, that he never knew that Drawbaugh had invented a telephone until the first half of 1878, and then it was a mere device to be connected with a clock, "to announce the hours vocally."

It transpired in his cross-examination that he had been employed by the complainants to get up testimony in the neighborhood, and to influence sentiment in the community, and had been so employed by an agent of the complainants, who was visiting the vicinity under an assumed name. It also appeared that he was not on good terms with Drawbaugh, for the reason that he, the witness, had grossly betrayed Drawbaugh as a client in a patent litigation, and had also attempted

to pirate the invention himself by applying for an "improvement" upon it. He then endeavored to betray the person to whom he betrayed Drawbaugh. We cite the pages of the record to these points.

The cross-examination shows conclusively that this man has little notion of honor, and no regard for his word. It was a common practice with him to act as counsel or solicitor for mechanics, and others seeking patents on inventions, and then appropriate to himself the knowledge thus obtained in a professional capacity, by patenting "improvements" upon them. The man paints his own character clearly, and stamps his own testimony as unworthy of credence; a man of doubtful methods and of an easy conscience, we find him the accredited agent of the complainants, and he stands at the threshold of their testimony.

Complainants also called David A. Hauck in the same line of negative testimony. He is the person with whom Drawbaugh had the suit in which Mr. Weaver was counsel, above referred to. It appears clearly, from his cross-examination, that he was adjudged, both by the Examiner of Interferences, and subsequently upon appeal by the Board of Chief Examiners, to have made grave misstatements. Both these tribunals found not only that he had done so as to the facts in the case, but that his statements upon filing his application for a patent had not been true; that he was not at all the inventor of the faucet in controversy, but had it from his opponent Drawbaugh. He testified that, although frequently in Drawbaugh's shop, he had never seen any talking machine and never heard of one.

Without regard to the personal feeling or the character of the witnesses, especially in view of the fact that they contradict an exceptional number of men and women testifying as strongly to the memory of a positive and wonderful fact, we urge that this case affords an exceptionally striking illustration of the wisdom of those settled legal rules for valuing evidence, which give great weight to positive, and little weight to negative testimony.

This court has said of this rule, in *Stitt* v. *Huidekopers*, 17

Wall. 384, 394: "The court charged the jury, that 'it is a rule of presumptions, that ordinarily a witness who testifies to an affirmative is to be preferred to one who testifies to a negative, because he who testifies to a negative may have forgotten. It is possible to forget a thing that did happen; it is not possible to forget a thing that has never existed.' We are of the opinion that the charge was a sound exposition of a recognized rule of evidence of frequent application." See Collection of Cases, 14 U. S. Dig. 642; Gilbert on Evidence, 140; 1 Stark. Ev. § 32.

While no person possessing a memory could well forget having talked through one of these machines at the time in question, yet it may be true, that persons called to testify (as they are) that they never heard of it years before, or did not see it, tell the truth, from lack of opportunity to see or hear it. A very few, honest and disinterested, may be an exception to the rule, and may have actually forgotten the conversation or the view.

The differentiation in the ability of persons to recall facts, or impressions from the eye and ear, of things and conversations not in and of themselves remarkable, is a matter of common observation. In respect of this, may be considered the difference between the man of many affairs and the man of few; between the man of mental occupation and the man of other pursuits; between the man devoted to his own interests and the man interested in the affairs of his neighbors; and, finally, the difference of age and temperament which affect the proposition, that all men having seen or heard of a thing likely to make a greater or less impression, as men may vary, all would remember it.

And, too, the average lay mind has never yet comprehended that "don't remember" may not be resorted to in cases of self-interest; to avoid enmity, or to please a friend; or that it can amount to perjury or any wrong. Upon that answer no prosecution for perjury ever did stand, because of the practical impossibility of proving of the particular witness that his power of memory was equal to that of other men. No physical or psychological research, and no expert, could afford the proof, whether he in fact did remember; and witnesses are more

easily influenced not to remember, as has been done according to the evidence in repeated instances, as shown by the record.

The usual question put to these witnesses was substantially as follows: "If Mr. Drawbaugh, for five or six years before speaking telephones were heard of elsewhere, had at his shop a talking machine, by which people at different places could carry on conversation with each other along a wire, and had frequently shown it to people, and had had them carry on conversation over it, so that they knew that it would do what he claimed for it, and had represented that it was going to supersede the telegraph, do you think you would have known of it?" And so the witnesses are made to swear, not only to the premises and conclusion of the syllogism of counsel, but also to his syntax and rhetoric.

There is one consideration appearing in complainants' own proofs that is at once conclusive against the value of this testimony. With a few exceptions, the entire number of witnesses are *offered* to give testimony tending to show:

(1) That the telephone never existed in Drawbaugh's shop prior to the Bell patent; and

(2) That it was not heard of in the community prior to the Bell patent.

With the few exceptions, to which we shall refer, the witnesses testify not only that they did not hear of the machines or know of them from 1867 to 1876, but go further and extend the period to 1878 and 1879 and 1880; so that by fixing the dates, the strength of their testimony is no greater to the point that the machines did not exist up to 1876, than that they did not exist in the later years mentioned. If not seeing or hearing of them establishes that they were not there up to 1876, the not seeing or hearing of them by the same witnesses in the same circumstances and conditions, in 1877, 1878 and 1879, would establish that they were not there in the latter years; but we have from the mouths of the complainants' own witnesses offered to prove that Drawbaugh's later machines could not have been constructed as early as 1876, because he showed the earlier ones, that there can be no question that at the earlier dates of 1876, 1877 and 1878, machines were in the shop

in such a condition that they were perfect telephones, though in ruder forms than the later ones.

(Counsel here read at length from the testimony of complainants' witnesses, in illustration.)

As an illustration of the unsafety and utter worthlessness of this negative testimony, that of Nesbit is cited. He was called to prove that Drawbaugh did not mention telephones in 1878. Nesbit was there for the purpose of getting materials for an historical sketch of Milltown. In connection with his testimony the history compiled from the material was introduced, and it was silent as to the telephone, although treating quite fully of Daniel Drawbaugh. Upon the production of a manuscript made by Hull at the very same visit Nesbit made, it was shown conclusively that Drawbaugh did mention the telephones, both carbon and magneto, as his invention ("two kinds of telephones"). This manuscript is shown in the cross-examination of Nesbit, and then, on the demand of counsel, the complainants were obliged to put in another copy of the same history, which contained an appendix, with the substance of Hull's manuscript statement about telephones.

This testimony proves something else besides the unreliability of negative testimony.

Nesbit was an intelligent and honest man, telling of a comparatively recent visit, and had it not been for this manuscript his testimony would have stood to the effect that Drawbaugh did not mention telephones, and that he, Nesbit, did not hear of them there. It appears with perfect clearness that the agents of the complainants over and over again interviewed persons in Eberly whose memories were positive against their theories, and then failed to call them.

In this connection the history of the two Gregorys is interesting. One of the sharpest criticisms made upon the Drawbaugh defence at the first hearing was that those engaged about the shop with Drawbaugh, as workmen, were not called, and that it followed from the defendants' failure to call them, as well as by the testimony of Jacob Carnes, a workman for the complainant, that Drawbaugh's statement and the story of the witnesses for the defence were incredible,

because the very workmen about the shop did not know of his telephone.

Before the second hearing in the Overland case, Emanuel Gregory, a member of the Drawbaugh Manufacturing Company in 1870, and his son, who worked in the shop in 1870, were found living in Massachusetts. They both of them testified they had not been in the State of Pennsylvania from the 10th day of December, 1870, until the day when they gave their testimony. They further testified that while at work in the shop with Drawbaugh they had many times talked through the telephone with him and aided in his experiments. It appeared further that they had been visited by the agents of the complainants, and had made their statements to them in regard to this matter before the first hearing of the cause.

Of this class of witnesses, that which seemed to the Circuit Court to be most conclusive against the defence, is that of Mr. James P. Matthews, managing editor of the *Baltimore American*. He has the place of honor in the opinion; as the court observed, "with a memory unusually retentive and active," and as "a careful, conscientious man."

He testifies that he went to the shop of Drawbaugh especially to see the electric clock in April, 1878, and he made some brief notes of what he learned, and subsequently wrote from them an article for his paper, published *November 28, 1878*. His testimony is chiefly to the point that he understood from Drawbaugh, at the interview in April, that, while he had experimented somewhat upon telephones, yet he never expected to transmit articulate speech, and that he saw there "no telephone, and nothing that looked like a telephone." This testimony is of the same class as several newspaper articles of 1878, tending to show that Drawbaugh was merely experimenting. The article in question is a tissue of errors in its conception and description of the clock which it purports to describe, and would of itself stamp that portion of the evidence as without value. The witnesses subsequently wrote a letter (Appendix, Add. proofs, p. 776) to complainants' counsel, called out in the argument below, in which he says: "I ought to have said in my affidavit, and in my subsequent ex-

amination, that at the time of the interview I had probably never seen a working telephone, and knew little or nothing about its mode of operation. The impression in the newspaper paragraph referred to may have been modified, colored or changed by conversations with other people on the subject after the interview and before the article was written." He further states in his letter, that, "the two wooden hemispheres," which he testified that Drawbaugh showed as parts of the telephone, and had been in his hands, he was mistaken about, and he cannot say whether Drawbaugh touched them or said anything about them. Further: "My recollection of the whole transaction is so vague that I never ought to have ventured to say anything about it, and the portions of my testimony relating to this matter certainly ought not to be considered by the court in making up its decision." He had testified that his impression was that Drawbaugh had entirely thrown aside telephone experiments; but he is contradicted in this by the complainants' own witnesses, Shapley, D. A. Landis, C. A. Landis, Orlando Kanney, A. L. Rupp, Geo. C. Rupp, Henry R. Mosser and Theodore Grisinger. If this were not enough as to the testimony of this witness, held by the court below to be of sufficient importance to figure as a chief factor in the destruction of the defence, we now quote from the complainants' own brief in the court below, bearing in mind Matthews' testimony is material and competent only as showing there was no telephone at Drawbaugh's shop in April, 1878, and that all there ever was of it was futile experiment, as follows (Brief below, p. 20):

"Our belief is that the *tumbler instrument was first made as an electric speaking telephone in 1877–8;*" they could say no less, as their theory had been, and their witnesses had sustained it, that the electric telephone was there not only in the winter of 1877–8, but also in October, 1876.

It is evident that the complainants were not seeking the truth so much as witnesses to sustain their theory, and that even for this purpose negative testimony is obtained not as representing the knowledge of the community upon the subjects testified about, but, after being carefully culled and

selected, because it was thought, from the lapse of memory, from susceptibility to influence, or from other cause, the witnesses would be able to say, at least, that they had not seen the telephone, in such language as might be put into their mouths under the manipulation of shrewd examiners. The whole of it should be laid out of consideration.

The testimony of Kieffer and Wilson, persons to whom Drawbaugh had shown other inventions, and to whom he talked about his electrical business, standing by itself, has force; nevertheless, they are negative witnesses, and they cannot stand against the positive testimony of men who saw and talked through the telephone, remember the words, and identify the instruments.

Still, it is conceded that such negative testimony as Kieffer's and Wilson's and Lloyd's, unexplained and unanswered, would have greater value than that of ordinary negative testimony, and the Circuit Judge has given it almost controlling weight, because they were men with whom Drawbaugh had conversations about other inventions and electrical experiments, and because he did not speak of the telephone to them, and to whom it is assumed he would open his heart freely on the subject. As stated in the opinion in this connection, naming these witnesses with Weaver and Hauck (*supra*): "The proofs show that during the years from 1868 to 1878 he did not attempt to avail himself of opportunities for demonstrating his invention and bringing it to the notice of his friends, who were peculiarly qualified to appreciate it and were favorably circumstanced to assist him."

Without referring to the possible effect of influence upon the memories of these witnesses and complainants' influences upon all, we propose to show right here the radical error of this proposition, and to show by positive testimony that it has no material basis to rest upon.

Mr. Kieffer, Mr. Wilson, and Mr. Lloyd resided at Harrisburg, and were men of character without doubt. David A. Hauck resided at Mechanicsburg, and did not know Drawbaugh until he went to Eberly's Mills in the spring of 1873, for the Hauck Manufacturing Company. He is the witness heretofore discussed as having a litigation with Drawbaugh.

We reply as follows:

1. By the testimony of men of equal or of higher standing than these who figure in the opinion, who were more intimate and more likely to be applied to by Drawbaugh, that he did repeatedly apply to them and explain his invention to them; and,

2. As one reason why he did not speak of the telephone to the witnesses named in the opinion, or apply to them for help, that he was laughed at, derided and denounced as crazy by those men who knew him best, and were of as high character as those to whom he did not apply.

[Counsel here read from the testimony of twenty-seven witnesses on the first point and of many others on the second.]

We suggest that it would be presumable on such proof, aside from other reasons going to rebut this testimony, that the three or four witnesses testifying that Drawbaugh did *not* speak to them were omitted by him, because of discouragement or diffidence or experience of repeated rebuff, rather than that the positive testimony of himself, and of so many witnesses of character, is wickedly false.

Even Drawbaugh and his witnesses should now and then have the benefit of the old-fashioned, and still not obsolete, presumption, in favor of truth and honesty.

It was said by the learned Circuit Judge, that it was incredible that the statement of the witnesses could be true — that they could remember the words that they heard through the telephone.

We respectfully submit, that the criticism would be an apt as it is a usual one, if made of ordinary conversations, when the witness, after a long period of time, attempts to give the exact words; but, when a man is relating an exceptional experience, an astonishing result, a mystery connected with spoken words — it would be more incredible if he did not remember it.

Decrees and judgments cannot be based upon such reasoning, or against such testimony as we present, and they have not been.

To reach a result in this case resort has been had, not to

the testimony, but to the somewhat vague and ill-defined theory of the inherent incredibility of the defence, and especially of the story of Daniel Drawbaugh himself.

We defer a discussion of the overwhelming evidence adduced and remaining uncontradicted in support of the priority of Drawbaugh's conception and invention, to consider somewhat the story of Drawbaugh as given in evidence, and Drawbaugh himself.

I now call Attention to Daniel Drawbaugh as a Witness.

At the outset, in considering Drawbaugh as a witness, there can be no question but that his history of himself and of his experiments and labors upon the electric speaking telephone from 1860 to 1879, inclusive, must be either a truthful statement, or one manufactured, in general and in detail, by a wicked mind; a mass of irredeemable perjury from beginning to end; and yet, none of the legitimate methods known to the profession but have been applied in this case, and no resource has failed to bring these methods to bear for the purpose of breaking down that testimony.

Upon the course and paths of his life, and his relations and dealings with all men from his boyhood down to his fifty-eighth year, the complainants have focused a light which has made luminous every detail.

Presumably, if his testimony could have been impeached, either by attacking his character or contradicting his statements by the direct testimony of others, it would have been resorted to. But we find that notwithstanding his difficulties, lawsuits, and controversies with men, by the testimony in behalf of the complainants, as well as of the defendants, that he bore a character, and had a life record, whose honesty and truthfulness could not be assailed. All bear testimony to his steadiness, his industry, his enthusiasm in physics, and especially in electric science. The worst that any man ever said of him was that he was crazy on the subject of the talking machine.

The record is full of evidence of the employment of "agents" from the community by the complainants in a

search for matter wherewith to attack him. So that on the theory of the complainants and the theory of this decree, the wickedness and devilish cunning by which he sought to impose a fraud upon the public and to work out a great robbery must have been conceived after the publication of Bell's invention in 1876; and to further the scheme, that this witness fabricated a history in every detail and incident bearing on the controversy, covering a period of twenty years and over. He must have made and partially made telephones, having the necessary and harmonious appearance of age, of the most ingenious description, and prepared his story in that regard to stand the most scientific cross-examination in every detail, aided by trained experts.

While it may be true that a man may become suddenly vile, and change and radically contradict the evidence of the course of his life, and while there may be one or two or three illustrations of such monstrosities in the history of human nature, yet it has never been true in the history of jurisprudence that a fabricated story, lying in its general plan and lying in its detail, covering a long period and a series of transactions, could stand the tests applied to it in the courts of justice.

Drawbaugh's testimony covers 332 pages of closely printed matter in this record, of which 180 pages are cross-examination, and we think it may be said that the complainants commanded every available resource and all the ability and knowledge, both scientific, legal and common, in this work that could by any possibility be put into an attempt to break a witness by cross-examination.

A careful reading of this testimony, it seems to us, is convincing of itself and by itself of the truth of the story. The very faults of his memory, the immaterial contradictions and changing of immaterial dates only go to strengthen the conviction that the history as related is genuine and truthful. It is without a trace of the inflexibility which characterizes fabrication. The man that speaks is in harmony with the history of the man's character as related; in harmony with all knowledge of the honest, ingenuous, open-minded genius, as portrayed by the account of his life.

He will not corroborate Eberly, a preceding witness, as to a conversation in 1861–64 which was greatly in his favor, for the reason that he "cannot remember it."

He will not corroborate Lowrey's testimony that he was shown the cup instrument by Drawbaugh at an early time. He says: "I have been trying to recall it, but I cannot."

If he were cunning and corrupt, he certainly could, when examined in 1881, have been able to describe a rude receiving instrument, as he had described a rude transmitting one. Yet he says he cannot remember the first experiment in receivers, because there were so many different attempts and trials (11 Defts., p. 760), and so the instances of fairness occur throughout his testimony.

Drawbaugh not a Learned Man.

It is said by the complainants that Drawbaugh was not a learned man, and among the arguments to support their theory of inherent incredibility, they say in effect that in the nature of things, no one but a scientist from the curriculum of the schools could have invented the telephone; that it was beyond his mental grasp; and it is said to sustain this proposition, that his inventions were of barrel machinery, jig-saws, nail-plate feeders, measuring faucets, and sundry electrical contrivances; or, as suggested by counsel, "mere mechanical contrivances and improvements;" and the fact of his busying himself with other inventions in mechanical contrivances is further used in support of the theory of inherent incredibility, as showing that he could not have conceived or had his mind upon so great a discovery as that of the transmission of articulate speech.

So far as the learning is concerned, we believe it can be shown that successful inventors are not the product of the universities, but of natural conditions and of tendencies common enough in American civilization. The tendency here is to learn and advance by experience. American genius cannot be said to be produced, though greatly aided, by school training and discipline. Genius is innate, and the man possessing it, who, even without books, learns of a natural principle or

agent, like electricity, by handling and testing its properties, is the man who must advance in its use. No art and no words can portray upon the human mind the impression of a landscape that the actual view will give. No mere theory, though learned in all its technical formulæ, can give the accurate and ready knowledge which practice imparts.

Humboldt, in his "Personal Narrative of Travels in South America" (1799–1804), vol. 2, Bohn's ed., p. 111, says: "We found at Calabozo, in the midst of the Llanos, an electrical machine with large plates, electrophori, batteries, electrometers; an apparatus nearly as complete as our first scientific men in Europe possess. All these articles had not been purchased in the United States; they were the work of a man who had never seen any instrument, who had no person to consult, and who was acquainted with the phenomena of electricity only by reading the treatise of de Lafond and Franklin's Memoirs. Señor Carlos del Pozo, the name of this enlightened and ingenious man, had begun to make cylindrical electrical machines by employing large glass jars, after having cut off the necks. It was only within a few years he had been able to procure, by way of Philadelphia, two plates, to construct a plate machine, and to obtain more considerable effects. . . . I had brought with me electrometers, mounted with straw, pith-balls, and gold-leaf; also a small Leyden jar, which could be charged by friction, according to the method of Ingenhouse, and which served for my physiological experiments. Señor del Pozo could not contain his joy on seeing for the first time instruments which he had not made, yet which appeared to be copied from his own."

The Royal Society of London once elected to honorary membership a man who first demonstrated that lightning and electricity were one. It was the same man whose reports as to his experiments with a kite and a key it had formerly refused to receive and had made sport of. He stands in history and science as eminent, and is set down as among the most eminent of natural philosophers. He was a "Yankee tallow chandler's son, a printer runaway boy," for whom the schools did nothing.

Michael Faraday was the son of a blacksmith, and a bookbinder's apprentice. After attending four lectures of Sir Humphry Davy, he gave his attention to practical experiments with electricity. J. Clark Maxwell, Professor of Physics, Cambridge, says, of Faraday's "Experimental Researches," resulting in the discovery of the induction current: "It was at once made the subject of investigation by the whole scientific world, but some of the most experienced physicists were unable to avoid mistakes in stating, in what they conceived the more scientific language than Faraday's, the phenomena before them."

Maxwell on Electricity is largely devoted to reconciling the practical methods of Faraday with the theories of the professors.

Hugh Miller's great conceptions took form when, without education, he was working as a laborer at the Cromarty stone yards.

Ampère worked out difficult mathematical problems with sticks and stones before he had learned the names or forms of figures.

But, says the court below, "Drawbaugh was not only untutored, but he was isolated by his associations and occupation from contact with men of advanced science;" and on such reasoning it is found that he must be a swindler, because he dares to pretend that he invented the telephone.

But it is said Drawbaugh busied himself with mechanical contrivances of comparative insignificance.

In 1793, Robert Fulton conceived the idea of propelling vessels by steam, and we find, by a reference to his life (C. D. Colden, 1817): "His time was also much engrossed by devising a method of superseding the locks of canals by a plane of double incline, on which he obtained a patent in 1794. In the same year we find him obtaining patents for flax-spinning and rope-twisting machines and various other mechanical inventions," bearing upon the construction of canals. In 1797 he went to Paris and resided there seven years, during which time he projected the first panorama ever exhibited, and made important experiments in submarine explosives. It was not until

1806 that he made his successful experiment in propelling vessels with steam in America, and not until 1809 that he took out his first patent.

Guttenburg, pending the tardy recognition of his discovery of the art of printing, was engaged upon inventions for new methods of polishing stones, and manufactured looking-glasses. Franklin found time to acquire something of income from the printing-press invention, from improvements in stoves, "Poor Richard's Almanac," and various other contrivances.

Again, the attack is made upon the credibility of this story, upon the ground that such an invention would have been widely known, and would have commanded all the resources necessary to present it to the public. The great success of Bell after the exposition of 1876 is cited as an illustration. We suggest the marked contrast between the presentation of Bell's alleged invention, under the sanction of international commissioners, framed in the authority of the World's Exhibition at Philadelphia, and the invention of Drawbaugh, in the lowly village shop of Milltown, in a by-way not merely of the world, but a by-way of the State of Pennsylvania, and a by-way of County of Cumberland. We submit that the complainants can take nothing of benefit from the fact that such men as lived in that community, and such men as passed that way, should not care to invest in any telephone, which seemed a mystery and a novelty, but of no practical utility to the learned and the rich of the great cities, long after Bell's patents were issued.

Morse conceived the idea of the electric telegraph on the packet ship Sully, in 1832, and on that voyage made his rough drafts of the apparatus. For twelve years thereafter he struggled with poverty to perfect his invention, and to secure any consideration for it. During this struggle he denied himself the common necessaries of life. Not until 1836 was he able to exhibit it to his friends. In 1843 he got it sufficiently before the public to secure an appropriation, and it was used for the first time on the 24th of May, 1844.

Elias Howe for years suffered the pangs of poverty and failure to get friends or capital interested in the sewing ma-

chine in this country or in England. He never advanced to fame and fortune until his controversy commenced with Singer.

"And yet," says the learned court, following the theory of counsel, "such an invention is of a kind well calculated to excite public interest and to impress practical men with a quick appreciation of its commercial importance and its pecuniary value, . . . and its efficiency and importance as a factor in human intercourse could have been demonstrated to the public without appreciable inconvenience or expense. Drawbaugh fully appreciated its importance and value. He had the means to patent it himself, and friends to assist him in introducing it into public use. He had the talent to induce others to invest in his invention."

No better answer can be found than in Bell's own case. See New York *Tribune*, article November 9, 1876, C. Vol. 1, p. 250; *The Scientific American*, October 6, 1877, C. Vol. 1, p. 273; testimony of Hubbard, Bell's financial backer, C. Vol. 11, pp. 1, 613–4, 662; and Complainants' Exhibits, p. 959.

Exceptional Treatment of the Defence.

Now, what is there in this case that so distinguishes it in the domain of judicial investigation as to require a reversal of settled rules of evidence?

Direct and positive affirmative evidence, unimpeached and uncontradicted, seems to have failed of legal virtue when applied to this particular controversy; and the rule as to presumptions is so radically altered that the testimony of four doubtful witnesses, that they did not hear of a fact — nay, that they did not remember hearing of it — shall be received as finally closing the door against the possibility of its existence, and against the recognition of all direct and positive testimony of twenty-seven equally credible men and women, that they actually did see and hear of the thing.

Yet, we are told that if "he" (Drawbaugh) "had a practical telephone to exhibit, he would have selected just such men" as Kieffer, and Wilson, and Lloyd (who was "taken good care of," Compits., 1, 480); and Hauck (who was Draw-

baugh's enemyand of doubtful veracity), "to demonstrate it to them and to enlist them to demonstrate its utility and value to the public." And although he did apply to twenty-seven others, it is conclusively assumed that he did not have a telephone, because he did not apply to these four gentlemen. As well might it have been assumed that Howe did not invent the sewing-machine, because it appeared after repeated attempts among his nearest friends, after suffering contumely and reproach in these efforts, that his heart and courage so failed him that he ceased his applications and departed for England without risking further coldness and refusal.

But it seems that this case is not only *sui generis* in jurisprudence, but the ordinary experience and history of human nature, of men's motives, of men's probity and intelligence, can teach us nothing by which to judge of Daniel Drawbaugh "and the cloud of witnesses who corroborate him." Although the biographies of science are full of instances of great discoveries by men of little or no scholastic discipline and who have had no contact with scientific men, yet as Drawbaugh was not a college professor, but a common citizen of Milltown, where he seldom met learned physicists, he could not by any possibility have invented the telephone.

Although the greatest inventors and discoverers, from the earliest to the latest, have either died in poverty or succeeded only after long failure to obtain recognition of their discoveries, and year after year have suffered every discouragement and the greatest distress; although this has been a common experience even at the most learned and wealthy and enterprising of the world centres; yet, because Drawbaugh, in the little village of Milltown, could not at once command recognition and influence and capital for the new machine whose uses were unknown, "this story must be a fabrication from beginning to end," and the learned Circuit Judge so holds.

And because a community corroborate him, it must be a population of knaves or fools. Even the fact that his fertile mind has produced many other inventions of less note and importance, this very evidence of a mind active in the direction of invention is turned into testimony that greater discoveries are beyond his scope.

The logical conclusion of all this reasoning must be, and by the opinion of the learned court is, that Drawbaugh himself is the malign necessity that demands a new and a special law of evidence and a reversal of all the commonly received notions of human nature to fit this case.

If his story be false, he has built a colossal structure of fiction. The lies in it are bricks in a great building for number, and a flaw in one would bring destruction to the whole.

As the complainants' whole theory and the decision of the court below rests upon the basis that Drawbaugh is a fraud, and has had the ingenuity to set up the story and the influence to get it so overwhelmingly corroborated, we submit from the record a brief sketch of —

Daniel Drawbaugh's History, Surroundings and Testimony.

If a charlatan, as he is set down by the court below, unlike his kind, he has not led an itinerant life. All that can be told of him from boyhood to age, all the evil or good that is known of him, all the evidences of character that a man leaves in the places that have known him, all the impressions which the course and methods of life of men place upon their environment, exist and are written of Drawbaugh in one place and upon one community.

The story from his earliest to his latest years is a very simple and homely one. If it be true that he developed into a Machiavelli in his fifty-third year, the incongruity is worth consideration from the moral philosophers.

Born in 1827, he has passed his life in the small village of Eberly's Mills, or Milltown, in Cumberland County, Pennsylvania. It is three miles from Harrisburg, and the centre of a farming community. He attended the common schools part of five winters, and in his early years was a reader of *The Scientific American*, when he could afford to pay his subscription; his scientific library consisted of Comstock's Philosophy, Youman's Chemistry, and two volumes of Tomlinson's Cyclopædia of Useful Arts, together with a publication on the International Exhibition of 1851.

Before the spring of 1860 he attended a course of lectures on

physics by Professor S. B. Heighes, now Principal of the State Normal School, and for seven years professor of physical science at the York Collegiate Institute. During his attendance upon these lectures, we have it from Professor Heighes that Drawbaugh was giving attention to electric science, and the professor remembers distinctly that even at that early time he had conceived, and talked of, "*speaking through a telegraph wire by electricity.*"

The same witness remembers distinctly, and fixes the date positively between 1871 and 1874, that Drawbaugh showed him Exhibit "C," and told him that the voice produced "pulsations" upon the machine. It is undisputed that at that early time he was experimenting with electricity. Complainants' witness G. W. Heighes says: "He was an enthusiast on the subject of physics at that early time." He was familiar with the Everett acoustic telegraph and with the Leon-Scott phonautograph from about 1863. "The subject of electricity seemed to be his hobby."

He was a person of remarkable ingenuity and skill. At the age of thirteen he made a rifle for Daniel Balsey, and at a later period was remarkably skilful in wood-working. At the age of twelve he made a part of a clock. At the age of sixteen he manufactured a small steam engine, an automatic machine for sawing wooden felloes; the last being his own invention. In 1857–1859, he constructed and operated a photographic apparatus, making even the lenses himself. He made for his own use a solar transit and a machine for wrapping electric wires. He made his own galvanometers. Of his skill as a workman, complainants' own witness and his enemies have nothing but praise. Very few men would venture to offer advice to him, and he was applied to by others to invent, and did invent machines for them — the tack machine for Patton; the paper-bag machine for Sengiser; and a great many other machines for the pump company and for the axle company. A number of his inventions are enumerated in Dfts., vol. 2, pp. 895, 1061, 1062.

"He was a great mechanical genius" (Complts., vol. 2, p. 1550) and "a great inventor." (Id., vol. 1, p. 864.) All the

witnesses concur as to his sobriety, his truthfulness, and his incessant and tireless industry, and his labors, extending far into the night.

He was careless of his own interests and generous and kindly in his nature. His children were sickly and died, and his wife made constant opposition to his schemes, as tending to take his attention from providing his family with the necessities of life.

The story of Mrs. Drawbaugh presents a picture of the man as he appeared in domestic life, so naturally drawn by this plain woman, that it carries conviction of its truth in every particular. He was negligent in money matters, and when he had money "he would give away the last cent." She refused to sign the deed when Drawbaugh wished to sell their little home, to put money into the talking machine. There is a vast amount of testimony as to his poverty, in addition to Mrs. Drawbaugh's, abounding in illustrations, to which we only briefly refer. [Counsel here cited and referred to a mass of testimony as to Drawbaugh's financial condition.]

Notwithstanding the undoubted testimony that his wife refused to join in utilizing the equity in the property to raise money to put into the talking machine, it is gravely urged against Drawbaugh that his story is improbable because he did not sell the homestead to raise money to introduce the telephone.[1] But the court below says, in effect, that the story of his poverty was a fabrication formulated in the answer. The answer was "formulated" and filed in January, 1881. The complainants' witness, Matthews, of whom the learned Judge speaks most approvingly in the opinion, in his Baltimore American article, in speaking of the impression made upon his mind by a visit to Drawbaugh in April, 1878, says: "This unlettered 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.*"

And the court below says that Drawbaugh is "dishonest" in his pretence of poverty.

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[1] See opinion, p. 16.

Was Drawbaugh a Charlatan?

The able opinion of the Circuit Judge is exhaustive in its treatment of Drawbaugh as a conspirator, a perjurer, and a general fraud.

We have discussed the evidence upon which this theory rests, with the exception of that on which this charge rests. It is found in J. C. Nesbit's testimony in "The History of Cumberland County, Pennsylvania, by Rev. Conway P. Wing, D.D., and others, 1879," published by the Herald Printing Co., of Carlisle, Pa., and containing at page 200 of said publication an article headed "Lower Allen Township, by H. C. Nesbit."

The court assumed that the biographical sketch was written by Drawbaugh himself; but it appears distinctly on the defendants' cross-examination of the witness and the production of the original manuscript, which was under the control of the complainants, and not by them at first produced, that it was in the writing of Hull. It even left the date of Drawbaugh's birth blank, which was supplied in the published article.

Now, the main facts in this biographical sketch are undoubtedly truthful, as is shown by the whole record here. The florid style of the article, on which alone the charge of charlatanry is based, is evidently that of the provincial newspaper man, and entirely foreign to Drawbaugh's. It abounds in terms not possible to Drawbaugh, as shown by his simple methods of thought and expression in the 332 pages of his deposition, which conclusively answers this last attempt to picture his opposite as Daniel Drawbaugh.

We now submit a Brief Sketch of the Conception and Progress of Drawbaugh's Telephone.

He himself says he cannot remember the date when he began to study the subject, and that "it was a long while ago." He had experimented with the vocal organs by placing his hand upon the throat and feeling the vibrations of the vocal chords, and the fact that sound had the effect to set up vibra-

tions in solid substances, he had learned by noticing the effect upon the surface of partitions, and by experimenting in the effects produced by extending a light wooden bar between partitions, and then by causing a vibration upon one partition, discovering that the bar transmitted the same vibration to the opposite partition. He pursued the principle always, that the current must not be broken, and from the first his conception was of a continuous current.

His idea of pulverized matter is, in this connection, interposed in the current, not breaking it, but causing a greater or less flow, as the particles form a greater or less resistance to the passage of the current, as they might be pressed together with more or less force. He speaks of conversing with medical students at Washington, D.C., about the transmission of sound as long ago as January, 1861, the date of the visit being fixed positively by a receipt taken in Washington, and states that he then had his mind employed on the subject.

Henry B. Averly testifies that between 1861 and 1864, and during the war, Drawbaugh, in the mill office (Averly's grist mill), in the presence of several witnesses, including the witness, spoke of attaching an instrument to the office in the mill, by which he could hear all that was going on there without leaving his house. Averly moved away in 1873, in May, and has never been to the county since, and Drawbaugh moved out of that house in April, 1868, and never again lived in it while the witness was a resident of Cumberland County.

In the argument below, counsel for complainants said of David Stephenson, resident of Harrisburg, that he was a machinist, and "worked for and with the Faucet Company (of which Drawbaugh was superintendent), as a maker of patterns, in 1867 and 1868, and that he and Drawbaugh had many and intimate relations with each other ever since. They appear to have been partners or jointly engaged in the manufacture of certain pumps. He has been and still is a friend of Drawbaugh's. Now, here is a machinist and a machine-shop man, a keeper of machinist's supplies stores, intimate with Drawbaugh, having worked for him in his shop — quasi-partners. . . . If there was a telephone there, he must have

known everything about it; but they did not put him upon the witness-stand." In the additional proofs taken in the *Overland* case, this gentleman, who is highly spoken of, was put upon the witness-stand, and he testifies that he *did* know all about Drawbaugh's Electric Speaking Telephone; that Drawbaugh showed it to him while Drawbaugh lived in that house close to the grist-mill, during Drawbaugh's first occupancy of that house, which occupancy terminated in the spring of 1868. He shows that Drawbaugh repeatedly experimented with the instruments, with his assistance. He shows that the instruments were connected by wires, and that the wire came from the outside of the building from a porch, and that the wires ran zig-zag (back and forth) "to give length to the wires," and that Drawbaugh told him that it was operated by electricity. He talked through the instrument from one room to another. Later, in 1874–5, he says: "He sent me to the cellar, and after giving me a small instrument in my hand, he suggested that he would go on to the upper floor and speak to me and I should let him know what he said, and how distinctly I heard it. . . . I heard him speaking in short sentences and singing, and then went up-stairs and met him coming towards me, and told him what he said. I heard him very clearly, and I didn't miss any words in repeating what he said, excepting his singing; I didn't repeat that."

Q. — "How did the sounds, heard through the machine that day, compare in loudness and distinctness with those which you heard through the old machine at the shop at the grist-mill, as you have testified?"

A. — "With more force and clearness at that last time."

He is corroborated as to the later dates by his daughter.

We have the testimony of Prof. Samuel B. Heighes as to Drawbaugh's great interest in physics and particularly in electricity, and of his talking of speaking through an electric wire by electricity in 1859 and 1860, and witness *saw* the telephone there in 1871–4. And we here refer to the testimony of many other witnesses of a similar character.

The story of Drawbaugh, and of the record, overwhelmingly corroborated by the witnesses for the defence, is as follows:

Early conception and experiments with the continuous current, 1862, 1866, and 1867.

Teacup transmitter and receiver, 1866 and 1867.

Tumbler and tin cup and mustard can ("F" and "B"), 1867 and 1869.

Improvement upon "B" ("C"), 1869, 1870.

Further improvement upon "C" and the more perfect magneto instrument "I," 1870, 1871.

Mouthpiece changed to centre, and adjusting screw inserted (Exhibit "A"), 1874.

"D" and "E," perfectly adjusted and finished magneto instruments, January and February, 1875.

"L," "M," "G," and "O," from February, 1875, to August, 1876.

"H" August, 1876.

"J," "N," and "P," 1878.

With the exception of the old teacup transmitter (2 D. p. 756), representations of all the instruments are in evidence, in whole or in part; parts of those produced prior to the instrument "I" of 1871 being in evidence, and "I" with all thereafter produced being in evidence in their entirety. The temporary experimental structures, the changes in parts and constructions, great and small, in working out the great discovery are not here, and of the thousand and one efforts made in the progress of the invention there is no memorandum. We submit it is not to be conceived that any mere memory could recall them.

Faraday's experiments, which resulted in the discovery of the induction current, marked an era in electric science, and to reach it he experimented from 1824 to 1831. He kept a record of his experiments. Had he not, imagine Faraday at a period subsequent to his discovery attempting to give from memory the first and second, and the myriad of other things, and details small and great, the smallest of the greatest results, and the greatest of the smallest, during these years leading up to the result. And yet, one of the strongest criticisms of Drawbaugh appearing in the arguments of counsel, and even in the opinion of the learned judge at circuit, was that he was unable to describe all of his first experiments.

Mr. Dickinson's Argument for People's and Overland Cos.

In the series of instruments and drawings produced, the development from one to the other appears to have been perfectly natural, from the loose, pulverized, low conductor, to that of the closely confined, so that the pressure might be rendered more easily adjustable; the evolution from the first rude instrument sketched in Drawbaugh's testimony just referred to, to the tumbler transmitter "F." In this also is seen the progress to the wooden cover and mouthpiece upon the diaphragm, in which the membrane diaphragm had given place to the metal one.

In experimenting with the receiver we find him abandoning the unnecessary parts in the tin can "B," as from the latter is evolved the later and more perfect instrument. Upon using "C," and finding that it would transmit, though feebly, using "B" as a receiver, he then places a permanent magnet against the heel of the electro-magnet and finds a great improvement, and Exhibit "C" as a transmitter is the result.

In the next improvement in this machine he incloses the parts, and, of necessity, makes them compact. The experimental magnet is then arranged, and from this comes Exhibit "I" with its several improvements, until Exhibit "A" is the result; later "C" and "I," still having a large diaphragm, were observed to give out a false vibration, and then he conceived the idea of dampening them to prevent the false vibration, by means of an adjustable rubber pad, and then moved the mouth orifice to one side and applied the dampened pad and screw. This not succeeding, he then determined to reduce it in size, and found the best results. After having made crude instruments to test and settle the matter, and finding his conclusions verified, he reconstructed the two into two compact working instruments, "D" and "E," in February, 1875.

From the time of his discovery that the instrument "B," as improved in "C," would act as a transmitter by application of the permanent magnet, he had thus far proceeded directly in the line of improvement of the magneto transmitter, and had done nothing with the carbon instrument, although he used it quite commonly in connection with his other experiments. At this period, in 1875, he turned his attention again to "F," the

carbon transmitting instrument. He experimented with carbon, and Halsinger saw him baking carbon composition into cakes. After experimenting with these cakes in the trial tumbler instrument he rearranged them and produced Exhibits "L" and "N," and combined in them the receiver and transmitter. Then he constructed a pair of transmitters with hard carbon, without combining the receiving mechanism in the same instrument, and from this we have "G" and "O."

In connection with the later instruments there is a piece of testimony that seems to us conclusive in favor of Drawbaugh, upon the question of his ability to invent the telephone, and in favor of our theory of the gradual progress of his experiments from the crude instrument, patentable and a speaking telephone, to the perfected and nicely adjusted one.

It is a matter of history, as well as in the record, that the Blake carbon transmitter is in use upon most of the Bell instruments at this time. Blake's sworn statement in the Patent Office, in an interference, shows that he never even conceived the Blake transmitter invention until after July 4, 1878, and that he never made a Blake transmitter until late in the fall of 1878. The other side have put in evidence Blake's patent, which was not granted until long after the date of the commencement of this suit, so that by law and by the rules of the Patent Office, Drawbaugh could have got no knowledge from it. It is further in evidence in complainants' testimony, that the Blake transmitter instruments were not put into use until the spring of 1880, and that the telephones in use prior to that time, were of a form known as the "Phelps's Snuff-box" instrument, and the "Crown" and "Pony Crown" instruments, so that it is not possible, under any conceivable circumstances, that Drawbaugh could have derived any ideas from the Blake transmitter as early as May, 1878. Drawbaugh's perfected carbon instruments "N" and "J," as shown by Stees and Johnson, who testify in the most minute, circumstantial and positive manner, corroborating Drawbaugh in his testimony, were taken to the office of William J. Stees, in Harrisburg, in 1878. They fix the time absolutely beyond doubt, as the 10th day of May, 1878, and that the instruments

remained at Stees's office several months. They both identify the instruments positively, and testify that while they were at the office they put them on the telephone line and talked through them, and that they worked admirably; that they saw the instrument, Exhibit "J," and recognize the parts in it just as shown in the exhibit; and Stees further testifies to the important fact, that while the instrument "J" was at his father's office, he took it in his hands to carry it across the office, in order to change its location, when his father accidentally ran against him, and he dropped the instrument, and that he discovered at that time that the small, hard carbons which the instrument contained had become loose and fallen out.

William J. Stees is the gentleman who, the complainants show, introduced Drawbaugh to the Western Union Telegraph office, to look at a telephone, and was accidentally killed at the very outset of taking defendants' testimony in the case.

Drawbaugh was seen by Some of the Witnesses working with the Earlier Machines, after the Perfection of the Instruments "D" and "E," on other earlier Magneto Instruments. The Explanation is a simple one.

Some of the witnesses testify to seeing the tumbler "F" and the tin can "B" as late as 1877. But the fact loses all force against the defence, when it appears indisputably proved and is beyond the ability of conspiracy to have fabricated, that Drawbaugh, on discovering that the magneto receiver "B," as improved and organized in the improved "C" in 1870, would serve as a transmitter, temporarily abandoned the variable resistance transmitters "F" and "B," and did not return to experiments and progress on them till 1875. From them, through a series of experiments and improvements, came finally the perfect carbon instruments taken to Stees's office in 1878, above referred to.

Of the Comment that Drawbaugh was still experimenting, and said the Machine was not perfect, at times when defendants' evidence shows that he had accomplished the invention, we say:

Aside from the fact already shown, that he was at work on the magneto and carbon instruments at different times, there is a very simple answer which appears incidentally and naturally throughout the record. No effort was made to bring it out, and it appears in the testimony of witnesses, as in that of Drawbaugh, without consciousness on their part or his, that it was of any special consequence.

It is this: That the instrument in his view "was not loud enough for practical purposes" unless it would talk, without holding to the ear, and convey the sound as far as ordinary speech. He wanted it to talk out as a man talks.

As George Free puts it of his conversations with Drawbaugh in 1876, 1877, 1878 and 1879: "He told me that he wanted to accomplish, and could do it, to make a machine that you could stay in one corner of the room, and putting the machine in the other corner, and hear as distinctly as putting it to the ear," and that Drawbaugh told him that he had not done it yet, but "I am working at it, and I am going to get it accomplished."

When that journal of civilization, the *New York Tribune*, thought the only use of the telephone would be for "diplomats and lovers," when the *Scientific American* summed up the public opinion of it as "a beautiful scientific toy," when Gardner G. Hubbard, a telegraph manager and Professor Bell's financial backer, "did not then believe the transmission of speech could be made commercially valuable," when all his friends laughed at him, it cannot be wondered at that Drawbaugh, in the little village of Milltown, years before, should not have realized that his instrument had reached practical perfection, when it would talk only by holding the receiver to the ear.

Of the Criticism that Drawbaugh did not make known his Invention to his Associates in the Shops where he worked, we say:

This charge, like many others, has nothing to rest upon.

The Axle Company carried on business at the shop now occupied by Daniel Drawbaugh. It was composed of M. M. Grove, Wilson Baer and Captain J. A. Moore. It commenced on the 23d day of December, 1874, and dissolved on the 29th day of February, 1876. All three, Baer, Moore and Grove, testify to their knowledge of the talking machine during the operations of the company, and as we have seen, Drawbaugh applied for assistance to all of them.

Of the old Faucet Company, which commenced business in 1867, the secretary and treasurer, Dr. N. B. Musser, is dead; but it appears by the testimony of Prof. Samuel B. Heighes that Musser was with him at the examination of the talking machine in May, 1872. Musser was his brother-in-law. W. R. Gorgas, a bank clerk, now thirty-three years of age, residing at Harrisburg, testifies to the fact that the Faucet Company was a failure financially; that he left the shop in September, 1869, and took very little interest in the affairs of the company. He is not called by either party on the point of knowing anything about the talking machine. He testifies that he was sick of patent rights through the failure of the Faucet Company. He remembers that Drawbaugh came to him and wanted him to take a half interest in some invention, he forgets what; but as the witness had lost about $4000 in the old company, he "had had a surfeit of it and didn't pay any attention to it."

John F. Hursh was a member of the old Faucet Company until 1871, and he testifies that he didn't know of the talking machines. For the value of his testimony we have no comment to make, save to cite his manner of testifying.

Jacob A. Shettel, a member of the Clock Company, testifies, and fully and positively corroborates Drawbaugh.

Emanuel A. Gregory, a member of the old Faucet Company, and his son Joseph, who both worked in the shop, fully and positively corroborate Drawbaugh.

John C. Schrader and E. B. Hoffman, and David Stephenson, before referred to, connected with the Faucet Company, give the strongest possible testimony for the defence.

In the Axle Company, the work was largely done by Daniel, H. K. and J. B. Drawbaugh. Daniel Fettrow, John Wolf and Augustus Kahney, all testify to a perfect familiarity with the work on the machines and the machines themselves.

Theodore Grisinger (1 Comp., p. 511), a member of the Clock Company, testifies for the defence. The Clock Company started in the spring of 1878. He testifies to a conversation with Drawbaugh in the spring or summer. The tendency of his testimony is to show that there was no telephone there, and that Drawbaugh was merely experimenting; inasmuch as he swears he did not see Exhibits "F" and "B," and swears that, as a fact, he could not have seen them and forgotten them, while we know that they were there, from the complainants' testimony, and they are admitted to have been there in 1876 and 1877, as we have seen, we submit his testimony is of no weight. He did see two telephones at some time, and says that he has seen Exhibit "A" somewhere, and must have seen it at Drawbaugh's shop.

The other member of the Clock Company is dead.

Jacob Carnes (Comp. 1, p. 883), worked in the machine shop at Eberly's Mills for the Drawbaugh Manufacturing Co., from 1868 to 1871, and boarded in Drawbaugh's family. He testifies that he did not see any telephone and never heard that one had been invented *previous to 1880.* He is thoroughly contradicted by Mrs. Margaret Brenneman (D. Surreb., p. 103), who lived in the family at the time Jacob Carnes was a boarder there, and she is corroborated by her mother, Mary M. Darr (Id., p. 109), and by John C. Schrader, who boarded with him, *supra.* Of course, his testimony is absurd, because it is beyond question, and is admitted on all hands, that all the telephones were made prior to 1880.

Defendants' Testimony.

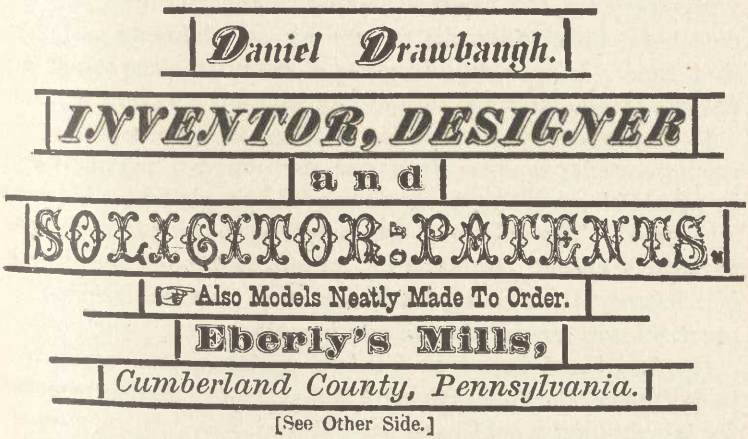
We now refer to the testimony at length, of the members of the community at and about Eberly's Mills, of the visitors

there, and of the former residents of that place, covering the period of Drawbaugh's history of his invention of the telephone, and of the various stages in its improvement.

Ephraim R. Holsinger and his Publication of a Card for Drawbaugh, not including in its List of Inventions the Talking Machine.

He was a newspaper man and a job printer and lived at Eberly's Mills from September 13th, 1873, to November 27th, 1876, but was never there after he moved away, at the latter date. During this time he was much at Drawbaugh's shop, and assisted the latter a great deal in experimenting. He identifies a large number of instruments as having been seen by him at Drawbaugh's shop, to wit: "A," "B," "D," "E," "F," "I," and testifies that he had helped to experiment with all of them. He describes the experiments at length.

This witness was called by the complainants who proved by him that he had published a card for Drawbaugh, before June, 1874, containing a partial list of inventions and not mentioning the telephone. This card figures in many places in complainants' brief, and seems to have taken up considerable space in the opinion of the court, and here it is:



[See Other Side.]

We say of it:

(1) It was prepared by Holsinger, without Drawbaugh's supervision, and as a sort of return for Drawbaugh's aid to him in getting him assistance to start a newspaper. It bears internal evidence of inaccuracy in describing inventions of Drawbaugh's, notably in its description of the electric clock.

(2) *It purports only to give a list of patented inventions.*—It omits the stamp canceller, the siphon pump, the machine for wrapping wire, the weather indicator, the gas governor, the automatic boiler feed, all proven by complainants as before that time. It inaccurately gives as patented some things not patented; but Holsinger knew well that the *telephone* was not.

(3) It purports to give a list of those things likely to bring money-earning business from the surrounding neighborhood, in practical every-day tools among the people where the card was issued. The only electrical machine mentioned is referred to with a special emphasis on its *simplicity* and the absence of a battery, thus giving assurance of a practical machine for practical uses among the country people.

(4) As a card issued to farmers, millmen, and nousewives in Milltown, the advertisement for sale of a double machine for telephoning would have been absurd.

(5) It was early in 1874, and Drawbaugh had no telephone machines ready for sale, and the card purports to advertise only for sale to the class of people about there, and it omitted the gas governor and wire wrappers and the stamp canceller, for the same reason, *i.e.*, such people did not use them.

(6) As Drawbaugh was then experimenting to make it "talk out," and had not patented it, but was negotiating to get financial aid in the enterprise, he would not care to advertise to patent pirates the matter of his greatest work, to no good purpose.

(7) Drawbaugh was said to be a fool and insane at the same time on account of his devotion to his invention; his labors had come to be unremunerative, and his object was, as shown by his moving to Mechanicsville, the next year, to get everyday work, and let the people know he was doing it without calling marked attention in that community to his "hobby," and the subject of adverse criticism, which was notorious, among the people whose custom he sought by the card.

(8) Holsinger talked through the, to him, perfect, because finished, machines "D" and "E" (not finished until February, 1875), in the summer of 1875, a year after the card; and the "Experiments," as he calls them, of 1874, were with the rude and unclosed machines "F," "B" and "C."

Finally. — After this testimony, and after his memory was refreshed by the card, the witness distinctly and emphatically states to the complainants that his testimony for defendants, as just analyzed, is correct, and says his memory is unchanged.

Any one of the foregoing reasons is a more complete explanation of the card, than the assumption that this reputable and unimpeached citizen and the host of corroborative witnesses are perjurers, or that Drawbaugh did not advertise the telephone because he did not have it.

Dates.

Of the witnesses, all, with the exception of those where later dates are given (eight), give their testimony as to having seen or talked with the machines prior to June 2, 1875, the date of Bell's invention; and in every case the testimony shows that

the date has been fixed accurately by collateral and convincing circumstances. To illustrate, the dates are as accurately fixed in a great majority of instances as in the case of ex-Congressman Haldeman, of Harrisburg. But to corroborate the dates we call a number of witnesses, who testify as to being told of the machines and of the common report of the machines at the dates which the foregoing witnesses have fixed as the time they saw them; and this latter class of witnesses as accurately fix the dates. There would seem to be no possible collusion here, as when a witness has testified to a collateral fact, we have in almost every instance called a stranger to the witness, giving the direct testimony, to establish the date of such collateral fact.

To illustrate the method of fixing these dates, Spafford and McHenry, and Bricker, were commissioners appointed under an act of the Pennsylvania Legislature, of April 3, 1869. Having filed their report of the complete adjustment in the Court of Common Pleas of Clinton County, November 1, 1869, — a certified copy is shown in this record. They never saw each other after this survey was completed until they met in Harrisburg to testify in this case — Bricker, Spafford, McHenry. Spafford and McHenry were persons of high standing in the community, and were personally named in the act of April 3, 1869, as commissioners for this important work. Spafford and McHenry were never in Milltown, but heard of Drawbaugh's talking machine from Bricker in October, 1869, while adjusting the Clinton County line, and it was talked of fully by the commissioners at the time. Bricker got his information with regard to it from Henry Drawbaugh at Newville.

Bolye, Brenziger, Goldsmith, Irwin, McGraffic, Stackpole, John H. Updegraff, Mrs. Fry, Mr. Hake, Mr. Young, Mr. Strouse, and Mr. Weaver fix the date of Dr. C. E. Updegraff's visit at May 1, 1875, and the dates are fixed by these witnesses conclusively by fixing the time of the visit and the place they started from in Harrisburg and the details of the visit, through the records of the Odd Fellows' lodge, of the places they were boarding in, and by the testimony of fellow-boarders, and of their talking of the talking machine on their return.

The witnesses for the defence who saw and talked through the machines, identify them as of dates in harmony with Drawbaugh's testimony as to making them; which, according to the latter's testimony, in the succession already shown, down to and including "D" and "E" (which are conceded by the other side to have been perfected machines), and all prior to March, 1875.

The New York and Philadelphia Tests of the Reproduced Tumbler Instrument "F" and the Tin Can Instrument "B," and the Magneto Instruments "C" and "I."

A number of the original parts of these instruments exist and are in evidence, and from the parts and from the testimony of Drawbaugh and other witnesses describing them, reproduced instruments were constructed, in order to show the court how they appeared and acted, when completed in all their parts. Of the reproductions, "F" was the only one of the four which was a carbon instrument. It is in evidence that they had been made some time before the New York tests, and had been very roughly handled, and their adjustments were in a loose and shaky condition. It is said that these instruments failed to operate successfully in the New York tests, although they all transmitted words, and even sentences. The court below lays great stress upon the failure of these instruments to do satisfactory work in these tests. The instruments were again reproduced and properly adjusted at Philadelphia, and worked perfectly. It was impossible for the complainants' experts to find any difference between the reconstructed and adjusted machines tested at Philadelphia and the description of them and of their parts and adjustment, as given by Daniel Drawbaugh in his testimony in 1882. It is difficult to see how the criticism could be justly made that the witnesses who testified that they talked through these old instruments, as they originally existed, must have falsified, because of any failure of the New York tests on the reproduced instruments, in the light of these considerations and in the light of the complainants' own testimony. In the original case, complainants' expert, Mr. Pope, testified, agreeing with the defendants' expert, Mr. Benjamin.

It is difficult to see wherein the essential parts of these machines differ, and it is perfectly plain that the New York tests failed of perfect action from the rough treatment the machines had had, and from having been shaken out of adjustment. Complainants' witness, Professor Wright, of Boston, in his notes of the tests of the instruments used in New York, states the results as follows: "'F,' reproduced as transmitter; Drawbaugh talking, Tisdale receiving — heard very well; understood very well, numerals counted, and conversation." Whatever instruments were used by complainants' experts, Pope, Cross and White, in their private tests, were not put in evidence, and they were unable to say they were reproductions of the instruments used at New York and Philadelphia, and they never tested the reproductions used by Professor Barker at Philadelphia.

Mr. George F. Edmunds for the People's Telephone Company, and for the Overland Telephone Company.

The court below was right in its theory in the treatment of this cause, and that theory was that either this method of transmitting speech through a wire, and by what are called electrical contrivances, actually existed at the time that the defendants' testimony in the court below said that it did, or the whole of the defendants' testimony is false.

After the utmost inquiry and the utmost contrivance and ingenuity that could be brought to bear, it was found by the court below, that these machines, which were said to have been used and practised by Drawbaugh, were in substance and fact the same sort of contrivances for transmitting articulate sounds through an iron or copper or any other metallic wire, as those of Mr. Bell, and therefore, as the court below held, there was only one way to get rid of this cause below, and that was to find that the story that was told by Mr. Drawbaugh, of himself and of his work, and the story that was told by his neighbors and visitors and the great mass and cloud of witnesses that came from that community, was untrue, and that, so far as this part of the case is concerned, is