

AMERICAN BELL TELEPHONE CO. AND OTHERS V. MOLECULAR  
TELEPHONE CO. AND OTHERS.

*Circuit Court, S. D. New York.*

June 24, 1885.

1. PATENTS FOR INVENTIONS—BELL TELEPHONE—ANTICIPATION.

In the apparatus made by Reis, of Germany, in 1860, with its several modifications, as described by Legat, Pisco, Vanderwyde, and others, an intermittent or pulsatory current of electricity was employed, the transmitter, when actuated by the sound waves, making and breaking the circuit at each vibration. *Held*, that the apparatus was from its very nature unable to send and receive articulate speech, and was not an anticipation of letters patent No. 174,465, of March 7, 1876, to Alexander Graham Bell for improvements in telegraphy, the essential elements of which are the employment of the undulatory, as contradistinguished from the pulsatory, current of electricity, to transmit and copy air vibrations corresponding exactly in amplitude, rate, and form to those produced by the human voice, and the apparatus therefor.

2. SAME.

One Holcomb, who in May, 1860, obtained a patent for an extremely sensitive polarized electro-magnet, constructed in the fall of that year an apparatus which he claimed was capable of sending and receiving articulate sounds. The only witness besides himself who testified that it did such work was his wife. Others testified that he then made no such claim. He filed no application for a patent until January, 1878, and the only parts of the instrument produced were a permanent steel magnet, a sounding box, a steel bow with a brass attachment, a brass clamp, and some broken pieces of the diaphragm. *Held*, that the evidence was insufficient to overthrow the presumption of priority and validity arising from the grant of the telephone patent to Bell

3. SAME.

Holcomb got one Beardslee interested in his apparatus who made several organizations to test for his own satisfaction the correctness of Holcomb's claims. He became satisfied that the apparatus would not operate at great distances, and abandoned it. *Held*, not an anticipation of the Bell telephone patent.

4. SAME.

The fifth claim of letters patent No. 186,787, of January 80, 1877, to Alexander Graham Bell, for improvements in electric telephony is as follows: "The formation, in an electric telephone, such as herein shown and described, of a magnet with a coil upon the end or ends of the magnet nearest the plate." *Held*, the claim not being for the combination of which the magnet is a constituent, that that part of the patent was void, being anticipated by the magnet in Hughes' printing telegraph as described in Schellen's work.

5. SAME—BELL TELEPHONE—EXTENT OF CLAIM.

The fifth claim of letters patent No. 174,465, of March 7, 1876, to Alexander Graham Bell for improvements in telegraphy, is for "the method of, and apparatus for, transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds substantially as set forth." *Held*, that the claim and method were not confined to an apparatus in which a magneto-transmitter is used and that the use of a telephone apparatus consisting of a speaking microphone-transmitter and a magneto-receiver was an infringement.

6. SAME—INFRINGEMENT.

AMERICAN BELL TELEPHONE CO. and others v. MOLECULAR TELEPHONE CO. and  
others.

Such an apparatus is also an infringement of the sixth, seventh, and eighth claims of letters patent  
No. 186,787, of January 30, 1877, to Alexander Graham Bell for improvements, in telephony.

In Equity.

*Edward N. Dickerson and Chauncy Smith*, for plaintiffs.

*Wheeler H. Peckham*, for defendants.

WALLACE, J. Infringement is alleged of the fifth claim of the patent granted to Alexander Graham Bell, No. 174,465, bearing date March 7, 1876, for improvements in telegraphy, and of the fifth, sixth, seventh, and eighth claims of the patent granted to Bell, No. 186,787, bearing date January 30, 1877, for improvements in electric telephony. The fifth claim of the first patent is for "the method of, and apparatus for, transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth." The scope of the invention thus claimed, and the construction which the claim should receive, were considered and decided in the cases of *Telephone Co. v. Spencer*, 8 Fed. Rep. 509, and *Telephone Co. v. Dolbear*, 15 Fed. Rep. 448, by the circuit court for the District of Massachusetts. In the *Spencer Case* it was held by Lowell, J., that Bell "discovered a new art, that of transmitting speech by electricity, and has a right to hold the broadest claim for it which can be permitted in any case; not to the abstract right of sending sounds by telegraph, without any regard to means, but to all means and processes which he has both invented and claimed." It was also held that the essential elements of the method are the production of what the patent calls "undulatory vibrations of electricity," to correspond with those of the air, and transmitting them to a receiving instrument, capable of echoing them; and that an apparatus in which the transmitter was made on the principle of the microphone was an infringement of the fifth claim of the patent. In *Dolbear's Case*, it was held by GRAY, J., that the invention claimed is not merely the apparatus described, but also the general process or method by Which the human voice produces, in a current of electricity, a succession of electrical disturbances, not sudden and intermittent or pulsatory, but gradual, oscillatory, vibratory, or undulatory, so as to give out at the further end of the conducting wire sounds exactly corresponding in loudness, in pitch, and in tone, character or quality, to the sounds committed to it at the nearer end.

The defendants use a telephone apparatus consisting of a speaking microphone transmitter and a magneto-receiver. The defense upon which they principally rely is that their apparatus is substantially such as was made by Reis, of Germany, in 1860, and described in numerous publications before the date of Bell's invention; and they insist that, if the fifth claim of the patent is not void for want of novelty, in view of its anticipation by Reis, its scope is restricted, and that the claim and method of Bell is confined to apparatus in which a magneto-transmitter is used; and upon this construction, as they use a microphone transmitter, they insist that they do not infringe.

In the *Spencer Case* the Reis instrument was relied upon to defeat the patent, or limit the construction of the fifth claim. It was said of his apparatus, in that case, by Judge

AMERICAN BELL TELEPHONE CO. and others v. MOLECULAR TELEPHONE CO. and  
others.

Lowell, that “the regret of all its admirers was that articulate speech could not be sent and received by it.

The deficiency was inherent in the principle of the machine. \* \* \* A century of Reis would never have produced a speaking telephone, by mere improvement in construction." Unless the evidence, so far as it relates to this branch of the defense, materially distinguishes the case from the *Spencer Case*, the decision there should be controlling, and it would be Unseemly, when the parties can resort to an appellate tribunal for review, to disregard the rule of comity which should prevail between courts of co-ordinate jurisdiction.

Additional testimony has been introduced by the defendants to show that the Reis apparatus is a speaking telephone, although the inventor never supposed it to be capable of transmitting articulate speech, and although it has always been conceded, by the most eminent authorities, to be incapable of doing so, until some of the experts in the present case have brought themselves to a different opinion. Reis himself Undoubtedly believed that the transmitter in his apparatus acted by making and breaking the electric circuit; and it is conceded that an apparatus operating upon this principle is not capable of the transmission of musical sounds.

Bell's method consisted in employing an undulatory current of electricity, in contradistinction to an intermittent or pulsatory one. He was not the first to employ the so-called undulatory current of electricity, but he was the first to utilize it for copying and transmitting air vibrations, exactly corresponding, in amplitude, rate, and form, to those produced by the human voice. His discovery was that these vibrations could be transmitted and copied by the use of such a current, and his invention, consisted in devising suitable apparatus for producing the undulations, upon a line-wire, and communicating the vibrations to this current at one end of the wire, and reproducing them at the other end. It is essential that such apparatus should not operate to interrupt or break the electric current, but shall operate by means of a practically continuous electric current or circuit. Bell pointed out different ways of generating the undulatory current, as by a vibrating armature in front of an electro-magnet, or by varying the resistance in the electric current, but these were not of the essence of his invention.

The microphone, according to Prof. Hughes, "introduces into an electric circuit an electrical resistance which varies in exact accord with sonorous vibrations, so as to produce an undulatory current of electricity from a constant source, whose wave-length, height, and form is an exact representation of the sonorous waves."

As early as in 1854, Bourseul described essentially the apparatus made by Reis in 1861. He said:

"Could there now be invented a metallic plate which should be so movable and pliable that it reproduces all the vibrations of tones like the air, and should this plate be so connected with an electric current that it should alternately make and break the electric current according to the air vibrations by which *it is* affected, it would thereby be possible also to arrange electrically a second similarly constructed metal plate, so that it would

AMERICAN BELL TELEPHONE CO. and others v. MOLECULAR TELEPHONE CO. and others.

repeat simultaneously exactly the same vibrations as the first plate, and it would then be exactly the same as if one had spoken in the immediate vicinity against the second plate.

or the ear would be affected precisely as if it had received the tones directly through the first metallic wall.”

Several modifications of the apparatus devised by Reis are described by Legat, Pisco, Vanderwyde, and others, and all agree that the diaphragms of the transmitters were intended to operate so as to sever or break the electric circuit at each vibration, when actuated by sound waves, and, as constructed, did operate in this way. The first transmitter made by Reis, a model of which is among exhibits in the case, was a block of wood having a conical perforation, with a membrane diaphragm covering the smaller end. A strip of platina was fastened to the center of the diaphragm, upon which rested a platina point, located upon a thin strip of metal. This point with the platina strip upon the diaphragm were the terminals of the circuit. In another form, the diaphragm was fastened to the smaller end of a metal cone, a pivoted lever was held by a light spring in contact with the center of the diaphragm, and the other end of the lever was in contact with an adjustable spring. In both of these forms, as well as in the other modifications, which it is not necessary to describe, the contact point is so arranged that it does not follow the retreating membrane responding to the air vibration, but an interval occurs which intercepts the next outward movement of the diaphragm. During part of a vibration the two electrodes approach each other, move together, separate, and then move in the same direction but not together. In 1869, Mr. Vanderwyde exhibited and made public experiments with the Reis apparatus in the city of New York, and shortly after published a description of the instrument used by him. In his description he distinctly states that it is entirely clear that no quality of tone can be transmitted. “Much less,” he says, “can articulate words be sent, notwithstanding the enthusiastic prediction of some persons, who, when they first beheld this apparatus in operation, exclaimed that now we would talk directly through the wires. It is from its nature, able to transmit only pitch and rhythm, consequently, melody, and nothing more.”

The theory now is that the Reisapparatus really embodied the method of microphone transmission, and that its mechanism will operate to vary the resistance in the electric circuit. Mr. Vanderwyde is produced, and testifies that he considered, at the time of these experiments, that the mechanical action of the adjustment was an alternate make and break of the current, but now he has learned to understand it better, and is convinced that the vibration of the diaphragm supporting the platinum foil produces a more or less intimate contact between that foil and the platinum point and thereby produces a variation in the resistance to the battery current resulting in a corresponding variation in the amount of current transmitted.

It is asserted in argument, by the defendant’s counsel, that the Reis apparatus needs “but the mechanical improvement of the apparatus, such as a slight weight on the top of the platinum rod, or a substitution of carbon for the electrodes, to make that apparatus

AMERICAN BELL TELEPHONE CO. and others v. MOLECULAR TELEPHONE CO. and  
others.

a better speaking telephone than can be made of the Bell apparatus, as described in his  
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patent." The testimony of Mr. Yeates may be referred to as illustrating the character of the mechanical modifications which are practicable. After describing some improvements made by him in the receiver, he says he turned his attention next to the Reis transmitter, and discovered "that the chief defect in it was the too freely tossing of the little contact pin from the platinum plate on which it rested;" and the first plan which occurred to him to obviate this defect was to make the pin dip into a conducting fluid, and he made the experiment by simply wetting the pin with his tongue. He states that this greatly improved the sounds transmitted, and shortly after, when experimenting with the instrument, songs sung into the transmitter were distinctly heard, and some of the words were clearly recognized by the receiver in another part of the building. What modifications were made by him intermediate his first and latter experiments are not described. As the experiments of Mr. Yeates were made in England; the evidence is only important for the purpose of showing the capacity of the Reis apparatus, with mechanical modifications, to anticipate the invention of the speaking telephone. After Bell has pointed out the way, it may now seem to be a simple thing to introduce his: method into the Reis apparatus. Some of the experts have doubtless convinced themselves that these modifications of the Reis apparatus do not involve any difference in the principle of the apparatus. It is too late to accept this theory, after the lapse of so many years of fruitless experiment with the method of Reis, as originally suggested by Bourseul, and with the apparatus of Reis as modified by various experimentalists, down to the time of the promulgation of Bell's method. It seems impossible to escape the conviction, that, had the speaking telephone been left where it was left by Reis, and by those who endeavored to develop and perfect its theory, it would only have realized the speculations of Bourseul. The testimony which has been introduced by the defendants only serves to confirm the opinion of Judge Lowell, that "a century of Reis would never have produced a speaking telephone, by mere improvement in construction."

The answer alleges the invention and public use of the speaking telephone by various persons named therein, prior to the invention of Bell. The argument of counsel has been addressed to the question of priority as between Bell and one Holcomb, and as between Bell and one Beardslee, who is not named in the answer as a prior inventor. Holcomb asserts that he made his invention in 1860. His theory is, that in the winter of 1859-60 he invented a polarized electro-magnet, which was an extremely sensitive one, and was capable of receiving articulate speech, and was patented by him in May, 1860; that, about the time of procuring that patent, he conceived the idea of converting the force of the human voice into electricity; that, early in the fall of 1860, he; constructed a telephone consisting of one; of his polarized magnets, a wooden diaphragm mounted on a box or mouth-piece, and a u-shaped soft iron armature attached to the diaphragm, extending towards and in

AMERICAN BELL TELEPHONE CO. and others v. MOLECULAR TELEPHONE CO. and others.

proximity to the ends of the polar extension of the magnet, but not touching them, the diaphragm-box and magnet being secured to and held in their relative

positions by a base common to both. He states that soon after completing this instrument, he made a duplicate of it, and connected the helices of both the magnets in a complete or closed electrical circuit; that, while listening at one of the instruments, he was able to hear and recognize articulate words spoken into the mouth-piece of the other instrument by other persons, and that he used those instruments on several occasions and showed them to several persons. He states that his telephone then embodied all the essential features of the present telephone. He did not file an application for a patent until January, 1878. The instruments which he says he constructed are not produced, but all the parts are lost except a permanent steel magnet, a sounding-box, a steel bow with a brass attachment, a brass clamp, and some broken pieces of the diaphragm. No witness is produced in corroboration of Holcomb, who heard the instrument used, except Holcomb's wife, or who were present when they were used. Several witnesses are produced, however, men of intelligence, who were interested in Holcomb's electrical mechanism, and were more or less familiar with what he had accomplished, but none of them seemed to be aware that he had claimed to have succeeded in transmitting speech by the apparatus which he had made. In June, 1861, he obtained a patent for other electrical mechanisms. From 1862 or 1863 to 1875 he does not seem to have made any efforts to perfect his telephone mechanism, and it was not until Bell's invention had attracted general public interest that he resumed his efforts to perfect it. During this period he was so indifferent to the importance of what he had accomplished that he suffered the instruments which he had made to be lost. He was not in indigent circumstances, and it appears that he bought a farm in Maryland in 1862. He was fully competent to appreciate the great merit and value of his invention, if he had actually succeeded in transmitting speech with his mechanism. He does not vouchsafe any explanation why, for a period of fifteen years, he permitted his invention to lie dormant. The presumption of priority and validity arising from the grant of letters patent cannot be overthrown by a case like this; it suggests too many improbabilities to merit serious consideration.

In August, 1878, a suit was brought by the present complainants against the Western Union Telegraph Company, for infringement of the patent in suit. Mr. Pope was then the electrician of that company, and was aware that Holcomb had made an application for a patent. The company set up the priority of Holcomb, among other defenses, in that suit. Mr. Pope investigated Holcomb's pretensions, and had an interview with him in reference to the defense of the suit. He questioned Holcomb, to ascertain whether he could produce any witnesses to substantiate his statement that he had transmitted articulate speech by means of his apparatus. Holcomb could tell him of no living witnesses. As a result of this interview, Mr. Pope concluded that it was not advisable for the Western Union Telegraph Company to purchase Holcomb's rights, and Holcomb was not called as a witness

AMERICAN BELL TELEPHONE CO. and others v. MOLECULAR TELEPHONE CO. and  
others.

to substantiate the defense. The impression produced upon Mr. Pope was such as would  
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derived by any sensible man by an investigation of the facts and circumstances.

For the purpose of corroborating Holcomb, the defense produced Mr. Beardslee as a witness. He testified that Dr. Bradley, an acquaintance of his, brought Holcomb to see him, and he described an instrument which Holcomb exhibited to him on that occasion, which he thinks was some time in 1861 or 1862. He testified that Holcomb claimed that, by the use of such instruments, he could communicate sounds and words at a distance, through an electric current. Upon the cross-examination of this witness, he testified that he himself made, immediately after that interview, several organizations, to test for his own satisfaction the correctness of Holcomb's assertions, about his instrument. He said the instruments thus made demonstrated that the human voice could be conveyed by the means pointed out by Holcomb, but he saw nothing to indicate that they would operate at great distances, and he never took any further interest in them, but regarded them as a mere toy. Upon this testimony, it is urged, for the defendants, that the, Beardslee instruments defeat the novelty of the patent. It suffices, without further remark, to say of this defense, that the instruments are not produced, and were never publicly used, and that the witness, who is a mechanical engineer, fully qualified to appreciate their merits, never regarded them as of any practical value.

The questions respecting the novelty and infringements by the defendants of the several claims of the second patent in controversy have not been discussed by counsel. The fifth claim of that patent is, "the formation, in an electric telephone, such as herein shown and described, of a magnet with a coil upon the end or ends of the magnet nearest the plate." The novelty of the magnet described in the specification is controverted by defendants' expert, Mr. Young, and he relies upon a reference to the magnet in Hughes' printing telegraph, as described in Schellen's work. This reference apparently describes the magnet of the patent. The claim is not for the combination of which the magnet is a constituent; and, in the absence of any explanation upon the part of the complainants, of the description in Schellen, the novelty of the claim seems to be negated. Infringement of all the claims of this patent is established by the testimony of Mr. Cross.

There should be a decree for the complainants upon the fifth claim of the first patent, and upon the sixth, seventh, and eighth claims of the second patent.