AMERICAN BELL TELEPHONE CO. AND OTHERS *V.* SPENCER AND OTHERS.

Circuit Court, D. Massachusetts. June 27, 1881.

1. PATENT NO. 174,465—IMPROVEMENTS IN TELEGRAPHY—TELEPHONE—VALIDITY—INFRINGEMENT.

Letters patent No. 174,465, granted March 7, 1876, to Alexander Graham Bell, for improvements in telegraphy, *held valid* as to its *fifth* claim, "for a method and apparatus for transmitting vocal or other sounds telegraphically by causing electrical undulations similar in form to the vibrations of the air accompanying the vocal or other sounds," and *infringed.*

2. PATENT—COMBINATION OF OLD DEVICES—SUBSTITUTION OF A NEW ELEMENT—INFRINGEMENT.

If a patent is for a mere arrangement or combination of old devices to produce a somewhat better result in a known art, the substitution of a new element, not known at the date of the patent, may avoid infringement.

3. DISCOVERER OF NEW ART—BROAD CLAIM.

The discoverer of a new art is entitled to the broadest claim for it which can be permitted in any case; not to the abstract right to the art without regard to the means, but to all means and processes which he has both invented and claimed.

4. SECTION 4922, REV. ST., CONSTRUED—COSTS.

Section 4922, Rev. St., providing that where a patentee has claimed too much in any part of his patent, in a suit brought thereon, he shall not recover costs, does not mean that claims not in issue should be contested for the mere purpose of settling the costs.

5. PATENT NO. 174,465—TELEPHONE—ANTICIPATION—INFRINGEMENT.

Bell's invention, consisting of the method and apparatus for transmitting vocal sounds by transferring to a wire undulatory electrical vibrations like those which the sounds have made in the air, and carrying them to a receiving instrument capable of echoing them, *held, not anticipated* by the invention of Reis, in Germany, in 1860, consisting of an apparatus for transmitting sounds by the

use of membranes and electrodes, which was of no practical utility; and *infringed* by defendants' method and apparatus, in which undulatory vibrations of electricity corresponding to those of the air are produced and transmitted to a receiver, though the specific method of producing the undulations is supplemented by the use of an instrument which intensifies and makes audible very feeble sounds.

J. J. Storrow, Chauncy Smith, and *E. N. Dickerson,* for complainants.

Frederick H. Betts, for defendant.

LOWELL, C. J. The bill alleges an infringement of two patents (No. 174,465, dated March 7, 1876,—improvement in telegraphy; No. 186,787, dated January 30, 1877,—improvement in electric telegraphy) granted to Alexander Graham Bell. The defendants admit that they have infringed some valid claims of the second patent, but the plaintiffs are not content with this admission; they rely, besides, 510 upon the fifth claim of the first patent, which is much more comprehensive in its scope.

Patent No. 174,465, issued to Bell, dated March 7, 1876, is entitled "Improvement in Telegraphy," and is said in the specification to consist in—

"The employment of a vibratory or undulatory current of electricity, in contradistinction to a merely intermittent or pulsatory current, and of a method of and apparatus for producing electrical undulations upon the line wire."

The patentee mentions several advantages which may be derived by the use of this undulatory current, instead of the intermittent current, which continually makes and breaks contact, in its application to multiple telegraphy; that is, sending several messages, or strains of music, at once over the same wire, and the possibility of conveying sounds other than musical notes. This latter application is not the most prominent in the specification; though, as often happens, it has proved to be of surpassing value. This part of the

invention is shown in figure 7 of the drawings, and is thus described in the text:

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

With the figure 7 before us, this description is readily understood. A cone of pasteboard, or other suitable material, has a membrane stretched over its smaller end; at a little distance is a piece of iron magnetized by a coil through which is passing a current of electricity. When sounds are made at the mouth of cone, A, the membrane vibrates like the drum of a human ear; and the armature, which is directly front of the magnet, vibrates with the membrane, and its movements cause pulsations of electricity, like those of the air which excited the membrane, to pass over the wire; and the wire stretches to another similar magnet and cone with its membrane and armature. The second armature and membrane take up the vibrations and make them audible by repeating them into the condensing cone, L, which translates them into vibrations of the air.

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The defendants insist that the instrument represented in figure 7 will not transmit articulate speech; that this great result has been reached by Mr.

Bell entirely through the improvements described in his second patent, such as the substitution of a metal plate for the stretched membrane, and some others.

The importance of the point is that if Bell, who is admitted in this case to be the original and first inventor of any mode of transmitting speech, had not completed his method, and put it into a working form when he took his first patent, he may lose the benefit of his invention; because, in his second patent, he makes no broad claim to the method or process, but only to the improvements upon a process assumed to have been sufficiently described in his first patent. There is some evidence that Bell's experiments with the instrument, described in figure 7, before he took out his patent, were not entirely successful; but this is now immaterial, for it is proved that the instrument will do the work, whether the inventor knew it or not, and in the mode pointed out by the specification.

The fifth claim of this patent is for—

"The method and apparatus for transmitting vocal or other sounds, telegraphically, 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 defendants use a method and apparatus for transmitting vocal sounds which resemble those of the plaintiffs in producing electrical undulations copied from the vibrations of a diaphragm, and sending them along a wire to a similar receiver at the other end. The specific method of producing the electrical undulations is different. It is made on the principle of the microphone, which has been very much improved since the date of the first Bell patent. If the Bell patent were for a mere arrangement, or combination of old devices, to produce a somewhat better result in a known art, then, no doubt, a person who substituted a new element not known at the date of the patent might escape the charge of infringement. But 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.

The invention is nothing less than the transfer to a wire of electrical vibrations like those which a sound has produced in the air. The claim is not so broad as the invention. It was, undoubtedly, 512 drawn somewhat carefully, in view of the decision in *O'Reilly* v. *Morse,* 15 How. 62, and covers the method and apparatus; that is, any process and any apparatus of substantially similar character to those described. The patent points out distinctly that the undulations may be produced in other modes besides the vibration of an armature in front of a magnet; and the defendants make use of a mode not wholly unknown at that time, though much improved, in creating their undulations.

It seems to me that the defendants use both the method and the apparatus of Bell. 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. Granting that the defendants' instrument for converting the vibrations of the diaphragm into vibrations of electricity is an improvement upon that of the plaintiffs, still it does the same sort of work, and does it in a mode not wholly unknown at the date of the patent; though I do not consider that material.

An apparatus made by Reis, of Germany, in 1860, and described in several publications before 1876, is relied on to limit the scope of Bell's invention. Reis appears to have been a man of learning and ingenuity. He used a membrane and electrodes for transmitting sounds, and his apparatus was well known to curious inquirers. 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. It can transmit electric waves along a wire, under very favorable circumstances, not in the mode intended by the inventor, but one suggested by Bell's discovery; but it cannot transmute them into articulate sounds at the other end, because it is constructed on a false theory, and the delicacy of use required to make it perform part of the operation is fatal to its possible performance of the other part. A Bell receiver must be used to gather up the sound before the instrument can even now be adapted to a limited practical use. It was like those deaf and dumb pupils of Professor Bell who could be taught to speak, but not to hear. That was all, but it was enough. A century of Reis would never have produced a speaking telephone by mere improvement in construction.

I am of opinion that the fifth claim of patent No. 174,465 is valid, and has been infringed.

The statute declares that if a patentee has claimed too much in any part of his patent he shall not recover costs, and it has been 513 argued that certain claims of these patents, not relied on by the plaintiffs, are too broad. In this stage of the case the question of costs does not arise; but I may as well say that there is not sufficient evidence in the record to enable me to find whether these claims are valid or not and that the statute does not mean that claims not in issue should be contested for the mere purpose of settling the costs. More expense might be incurred in such a mode of trial than depended upon the main issue.

Decree for the complainants.