Telephones Invented Previous to Bell's

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We present here to our readers an engraving for which we are indebted to our esteemed contemporary, the *Scientific American*. It was made from photographs taken of the original telephones which had been made and used previous to the Bell patents, upon which he founded his claims with so much legal ability that he succeeded in monopolizing that business in the United States for the full term allowed by his patent. Those familiar with telephone experiments, will see that each of these is far superior to that described in Bell's first application, upon which he made improvements, which long afterward led to the now extensively-used magneto-telephone. This consists in a magnetized steel bar, partly surrounded by a coil, and which, by the intermittent magnetic action produced by the electric current caused intermittent attractions upon a thin iron disk. It can be used only for very short distances, either as a transmitter or receiver.

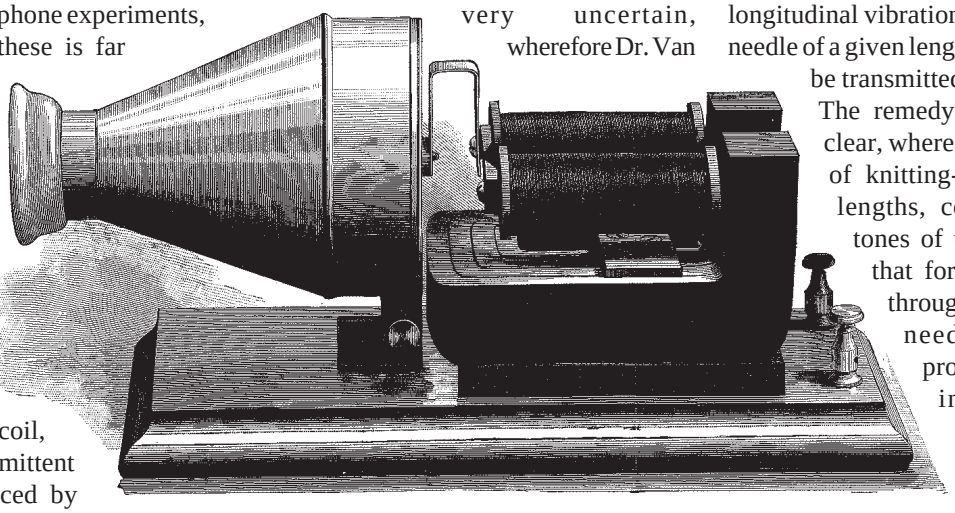

Figure 1

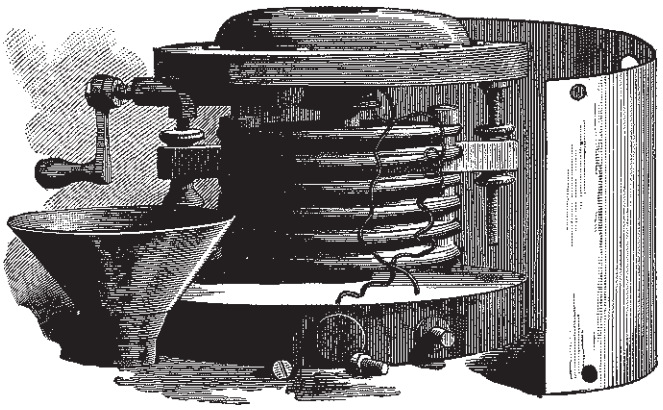

Figure 2

The earliest instrument is represented in Fig. 4, which is the Reiss transmitter, invented by the German schoolmaster Philip Reiss, and was first constructed in New York about 1866, by Dr. Van der Weyde, after the woodcuts published in a German periodical, which in that year reached him. The principal part is a membrane stretched on top of a box, and which membrane is put in vibration by talking in the side mouthpiece. A thin strip of platinum is attached to the membrane, and has a platinum point in very slight contact with it. The original instrument of Reiss had no adjusting screws, making its operation very uncertain, wherefore Dr. Van der Weyde found it necessary to provide such as seen in the figure. He made two such instruments, one with a box of sheet tin, another with a wooden box, which worked the best. Of course a suitable battery was used to generate the current which was led to the platinum contact points and the transmitting line, It worked very satisfactorily.

Not so with the receiver. He had considerable trouble to make this work satisfactorily. Reiss prescribed a knitting-needle surrounded by a coil, which coil was intended to put the knitting-needle in vibration, which vibration was then communicated to a wooden sounding-board, on which the needle rested by proper supports, so as to transmit its vibrations and make them more audible.

He then made his experiments for the purpose of transmitting musical melodies, which interested him more than the transmission of speech. While experimenting, he soon found that some tones were perfectly transmitted, and others not at all. The cause was evidently that those tones which corresponded to the velocity of longitudinal vibration for which a knitting-needle of a given length was capable, would be transmitted, and not other tones. The remedy for this defect was clear, wherefore he took a number of knitting-needles of different lengths, corresponding to the tones of the musical scale, so that for every tone received through the coil there was a needle capable of producing this tone. This involved a considerable reduction of the effect of the magnetizing action of the coil upon the many needles, which, with their necessary insulation, occupied too much space inside the coil and made an increase of its diameter necessary, and at last the effect was very unsatisfactory.

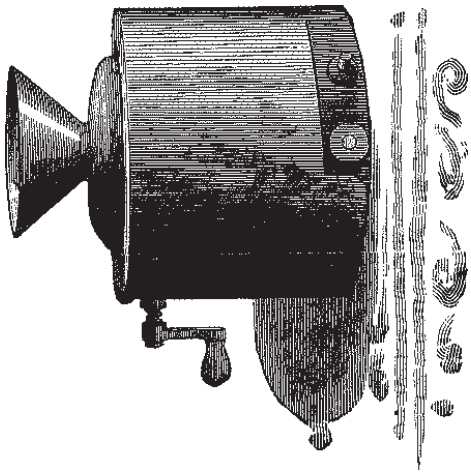

Figure 3

He concluded to give up the principle of

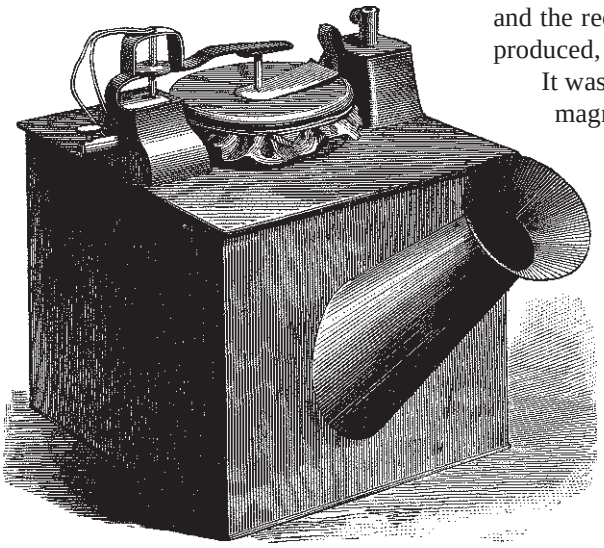

Figure 4

Reiss, which was the production of an intermittent elongation of the iron needles by the intermittent currents, and concluded to make use of the intermittent magnetization of an iron bar, and let the attraction of this intermitted magnetization act upon a vertical spring with an iron button on top placed close before the polar end of the bar. This gave a much stronger sound than the longitudinal vibration of the knitting-needles, as the magnetic attraction gave a far more powerful transverse vibration. But here the same trouble showed itself; the spring had a pitch of its own, and he could not place springs of different pitches all at the end of the same bar. Then the idea came to him that with a thin iron plate a vibration of very different pitch could be produced, as he had done years before, by acting upon glass plates, steel or iron plates, etc., with a violin bow, thus producing the celebrated sound figures of Chaldni. This was done, and the receiver represented in Fig. 5 was produced, which worked perfectly.

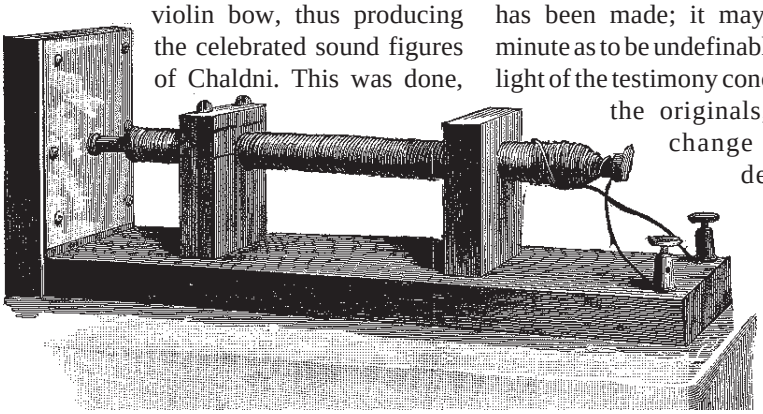

Figure 5

It was soon improved by doubling the magnetic attraction by passing the current through two coils of an electromagnet of horseshoe form, and increasing the size of the thin iron plate fixed to a proper frame, as represented in Fig. 6.

Of this receiver, the *Scientific American* of May 29, 1886, says:

"Prof. Van der Weyde was not content to rest with the instruments of these two types only. A year or so later, in 1870, he made the magnet shown in Fig, 6. Here we have a horseshoe magnet mounted back of and facing a plate armature. It is simply a powerful electromagnet receiver, something like, but immeasurably superior to, the instruments shown in the Bell patent of six years later. Like all the other instruments shown, it will play its part in transmitting speech. Placed in circuit with a battery and a microphone, such as shown in Fig. 4, it will talk.

"Our readers will feel, with us, that the above represents a most interesting collection of instruments. In many instances (even in suits) alleged anticipating telephones are shown by models. This always casts a shade on their testimony, for the suspicion always exists that some change in construction has been made; it may be so minute as to be undefinable in the light of the testimony concerning the originals, yet enough to change inoperative devices into practical working implements. Such, at least, is the suspicion that is apt to be aroused by model telephones. But in the instruments here shown, we have what are testified to as being instruments actually made fifteen or twenty years ago."

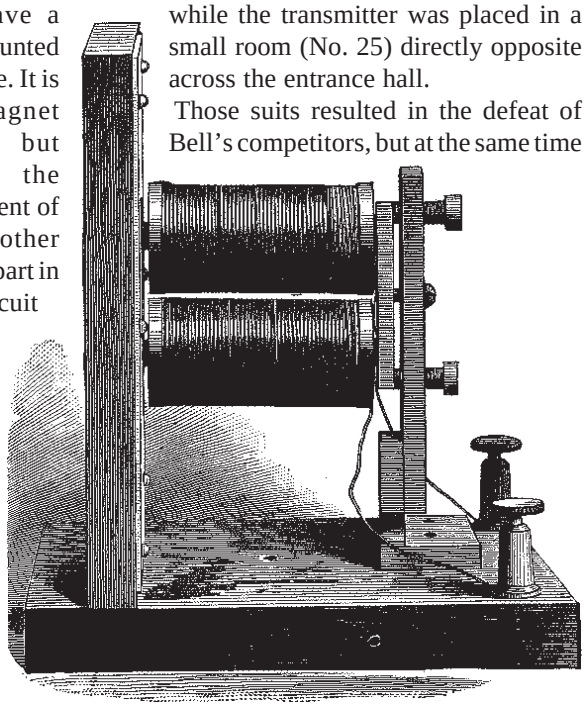

Figure 6

When, some years ago, the Bell Telephone Company sued the Overland Telephone Company, the Molecular Telephone Company, and the People's Telephone Company, each of them engaged Prof. Van der Weyde as a witness to defend itself, he exhibited these very instruments in the court, while witnesses appeared who testified, under oath, that they had been present at his lecture when he exhibited his telephones before the members of the American Institute, which then occupied three large rooms in the Cooper Union building. The receiver was placed in room No. 24, which was then the lecture room, while the transmitter was placed in a small room (No. 25) directly opposite across the entrance hall.

Those suits resulted in the defeat of Bell's competitors, but at the same time proved that Dr. Van der Weyde was the first to exhibit, operate and explain to the public in the United States telephones which he had made himself.

It is a curious coincidence that at present he occupies the very room in which, at the time of these exhibits and experiments, the transmitter represented in Fig. 4 was placed, while the audience in another locality heard the transmitted songs, words and all, which, on purely theoretical grounds, was more than he expected.