W. F. COOK.

Electric Telephone.

No. 227,736. Patented May 18, 1880.

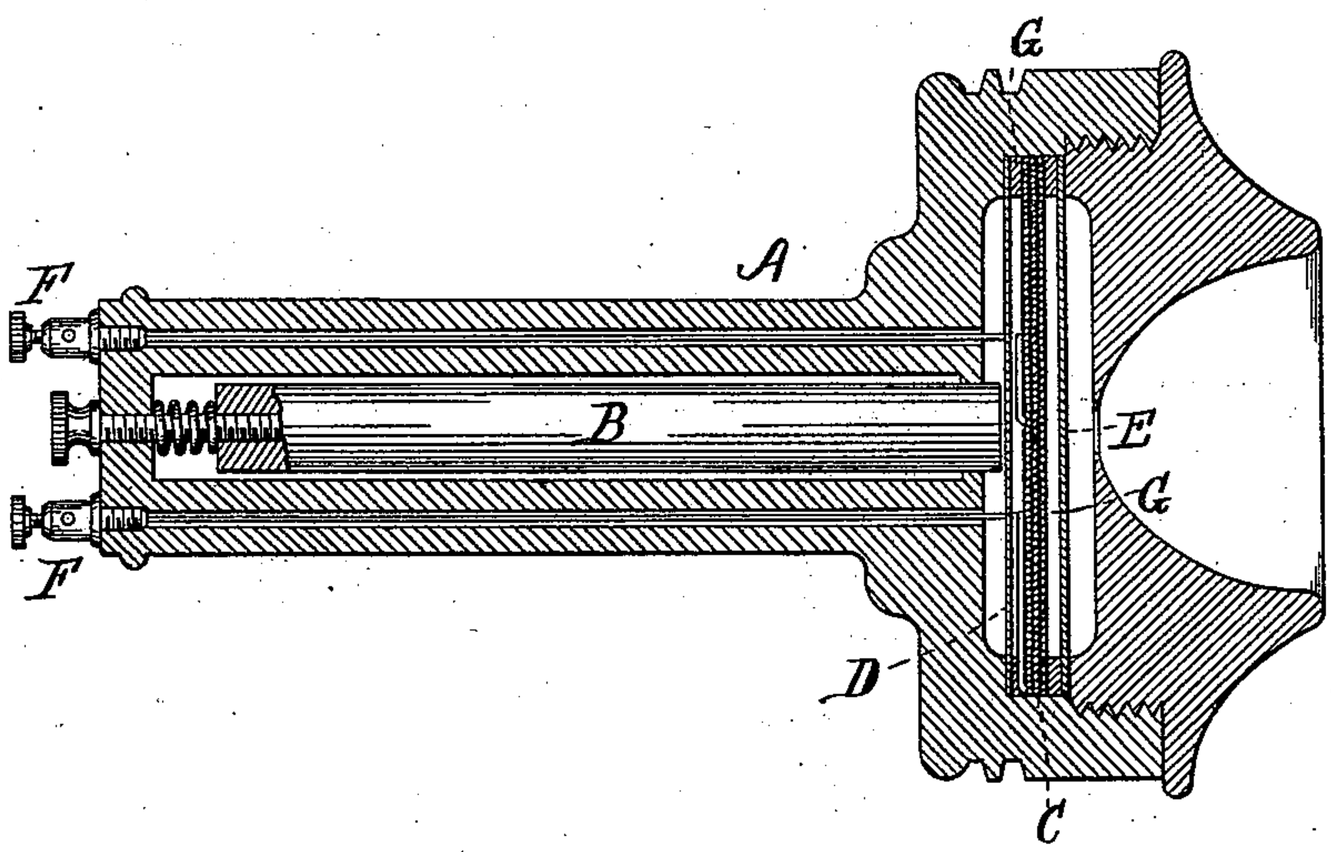

FIG. 1

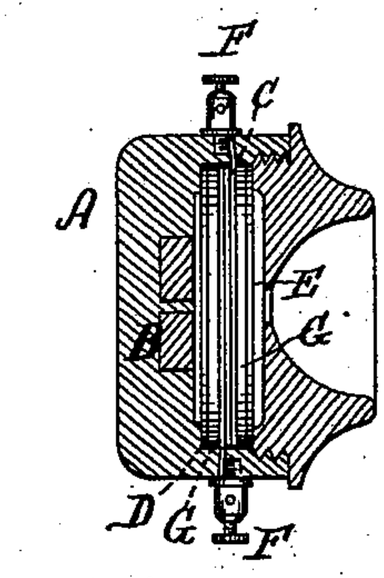

FIG. 2

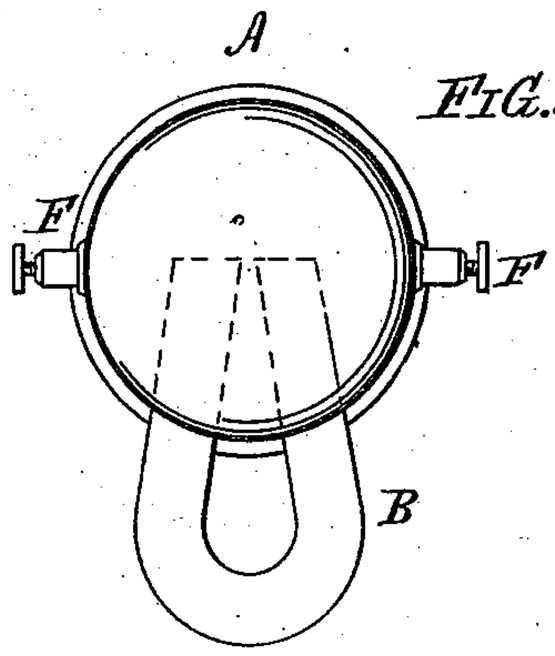

FIG. 3

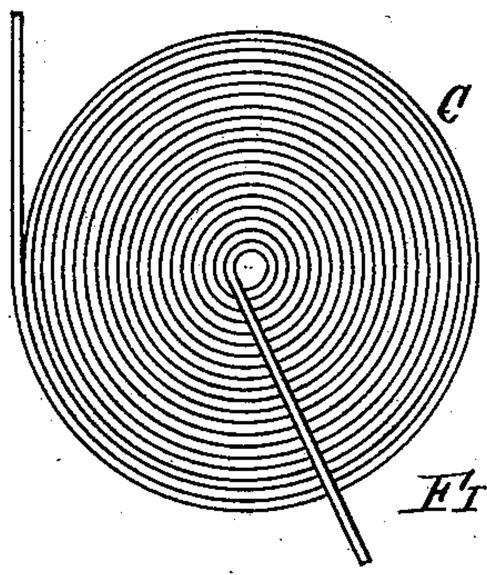

FIG. 4

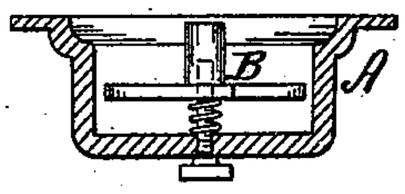

FIG. 5

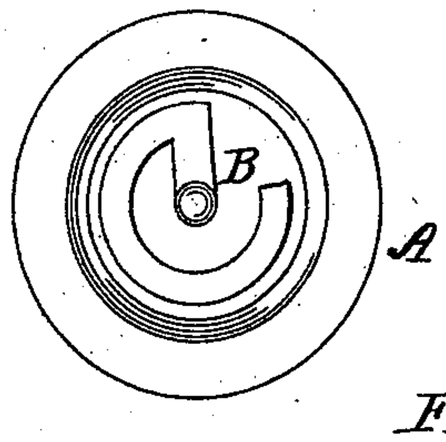

FIG. 6

WITNESSES:

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INVENTOR,

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By Connolly Bros.,

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM F. COOK, OF IVY MILLS, PENNSYLVANIA.

ELECTRIC TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 227,736, dated May 18, 1880.

Application filed January 27, 1880.

To all whom it may concern:

Be it known that I, WILLIAM F. COOK, of Ivy Mills, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Telephones; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a longitudinal vertical section of a telephone embodying my invention. Fig. 2 is a like view of a modification thereof. Fig. 3 is a rear elevation of Fig. 2. Fig. 4 is a plan of one of the vibrating volutes or coils. Fig. 5 is a detail section of case, showing an elevation of a modified form of magnet; and Fig. 6 is a plan of the same.

My invention has for its object to provide an improved telephone capable of use both for transmitting and receiving in which the coil is caused by the action of the sound-waves or of corresponding currents of electricity or magnetism to vibrate in inductive proximity to a permanent magnet.

My invention consists of a telephonic instrument having a permanent magnet or other device capable of producing induced currents of electricity, and a helix or volute of insulated wire separate from and not mounted on said magnet, but capable of being vibrated in the neighborhood thereof by sound-waves, with one or more diaphragms and a sounding-case, substantially as hereinafter set forth.

In the accompanying drawings, A indicates a case of the usual or any suitable construction. B is a permanent or an electro magnet adjustably secured therein. C is a coil or volute of fine insulated wire, the coils or convolutions of which are fastened together by an adhesive substance, or in any other suitable manner, so as to form practically a homogeneous plate or disk capable of being vibrated by sound-waves. Said volute is located in front of the end of the magnet, or with its center opposite one of the poles of the latter, and in close proximity thereto, its edges being firmly secured while its center is free, so that when said volute is vibrated by sound-waves induced currents will be set up in it.

D represents a diaphragm or plate, which may be a membrane, a piece of wood, or a sheet of any metal, such as brass, steel, or iron, preferably the latter. This diaphragm is located between the end of the magnet B and the volute C.

E represents another like plate, which may be advantageously, but is not necessarily, employed, and which is located, as shown, on the opposite side of the volute C, so that the latter, when said part E is used, is interposed between two diaphragms.

F F are the binding-posts with which the ends of the wire forming the volute C connect, and by means of which two of the instruments of the construction described are placed in circuit. The diaphragms D E, either or both, may under some circumstances be dispensed with, but I think better results are obtained by employing both.

The operation is as follows: Sounds thrown upon one of the diaphragms E (or directly upon the volute C, if the diaphragms E be dispensed with, as they may be) will be reproduced and given off in the other instrument. The vibration of the coil or volute in the transmitter in the neighborhood of its magnet induces currents in said coil, which currents, of course, extend to the coil or volute in the receiving-instrument. The induced currents thus obtained in the receiver tend toward the magnet in the latter, and produce a disturbance or excitation thereof, which correspondingly affects the diaphragm D or diaphragms D and E in the receiver, causing the latter to vibrate and reproduce the transmitted sounds. The coil or volute C is separated around its edges from the diaphragms by gaskets G G, of india-rubber, bibulous paper, or other equivalent material.

In the center of the coil or volute, if desired, may be fastened a core of soft iron, or a small metallic plate may be fastened to one side of the coil, directly in the center thereof.

It will be noted that the construction herein described differs from that of other magneto-telephones in this respect, that in the others the diaphragm vibrates in front of the pole of a magnet, the latter being surrounded by a stationary coil of wire, while in the present case there is no coil surrounding the magnet,

the coil used being separated and detached from the magnet and so arranged that it vibrates instead of, as heretofore, remaining stationary.

I have described two of the above-described instruments as being employed in a circuit, one as a transmitter, the other as a receiver; but one of the instruments may be used either as a transmitter or receiver with any other suitable transmitting or receiving telephone.

I have shown only one magnet—a straight-bar permanent magnet; but two or more magnets, either permanent or electric, and of any suitable shape or construction, may be employed. Several volutes may also be used in one instrument with their appropriate magnets and diaphragms.

In the accompanying drawings several modifications are shown. Figs. 2 and 3 show my invention embodied in a telephone having a horseshoe-magnet, B, of which both poles are utilized. For convenience the coil faces the side of the magnet. Figs. 5 and 6 show a bent-bar magnet of an approximately-volute form having a radial branch, from which rises the pole opposed to the diaphragm. This form is adopted for the sake of compactness.

What I claim as my invention is—

1. A telephonic instrument having a permanent magnet and an insulated coil or volute, forming a disk or plate and capable of being vibrated toward and from said magnet, substantially as and for the purpose specified.

2. In a telephonic instrument, a coil or volute of insulated wire rendered practically homogeneous by fastening the coils or convolutions together by an adhesive substance or equivalent means, substantially as set forth, so as to form a diaphragm or plate capable of being vibrated in the neighborhood of a magnet, substantially as and for the purpose set forth.

3. The combination, in a telephonic instrument, of a permanent magnet, a separate coil or volute of insulated wire, forming a disk or plate capable of being vibrated toward and from said magnet and independently thereof, and a diaphragm, D, substantially as shown and described.

4. The combination, in a telephonic instrument having a case, A, and permanent magnet B, of a vibratory coil or volute, C, and diaphragms D E on either side of said volute, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of January, 1880.

WILLIAM F. COOK.

Witnesses:

WILLIAM M. MCKNIGHT,

S. J. VAN STAVOREN.