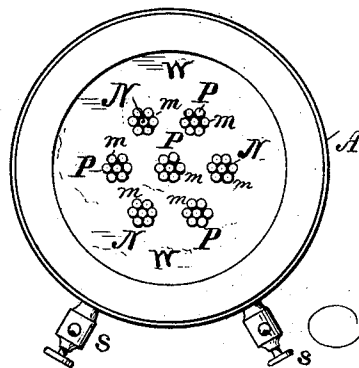
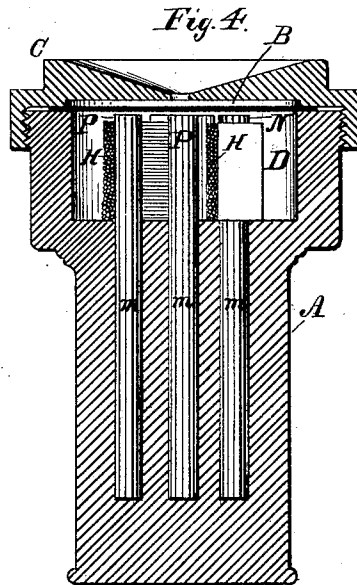
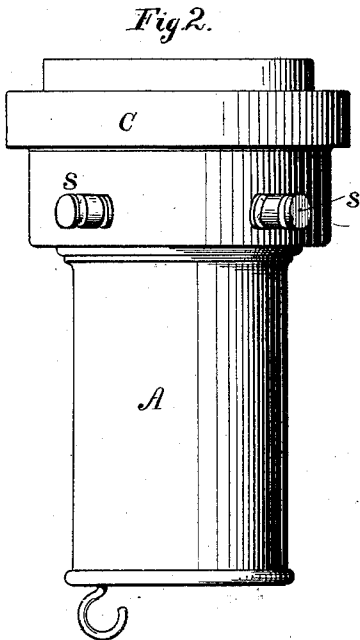
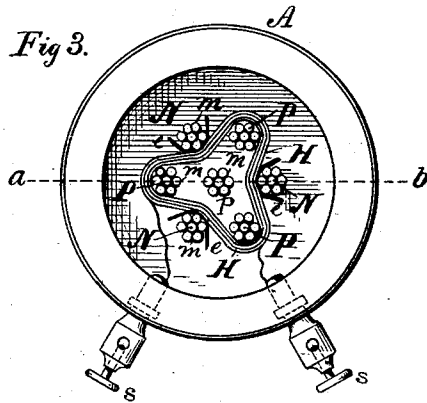
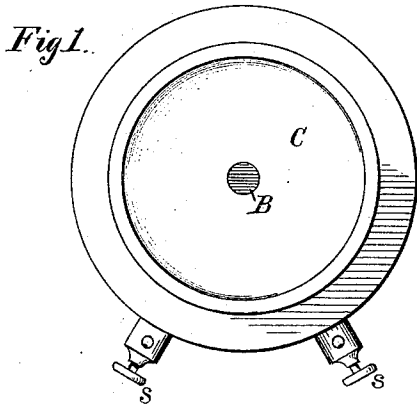


(No Model.)

N. DOWLING.
TELEPHONE RECEIVER.

No. 333,932.

Patented Jan. 5, 1886.



WITNESSES:

John Nolan,
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UNITED STATES PATENT OFFICE.

NORTH DOWLING, OF PHILADELPHIA, PENNSYLVANIA.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 333,932, dated January 5, 1886.

Application filed February 14, 1885. Serial No. 155,926. (No model.)

To all whom it may concern:

Be it known that I, NORTH DOWLING, a citizen of the United States, residing at the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Telephone-Receivers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a view looking into the ear-piece of the receiver. Fig. 2 is a side elevation thereof, which in external appearance does not materially differ from the ordinary hand telephone-receivers in most general use. Fig. 3 is a view looking into the diaphragm end of the handle, the ear-piece, diaphragm, and wax filling of the cavity being removed. Fig. 4 is a longitudinal section, as on line *a b*, Fig. 3, with the diaphragm and ear-piece in position. Fig. 5 is a view looking into the diaphragm end of the handle, with the cavity therein filled up with wax and diaphragm removed.

My invention relates to the class of electrical telephone-receivers of which the "Bell receiver" in the form now in general use, is a type; and it consists in certain novel construction and arrangement of magnets, in connection with the insulated coil or helix, whereby I obtain improved results as to clearness and accuracy in the reproduction of speech or sounds transmitted through the usual transmitter and connecting-wires, all as hereinafter explained.

I shall proceed to describe that specific construction of my improvement which practical experience has shown to be the most efficient or desirable.

Referring to the annexed drawings, A is the body or handle of the receiver, B the diaphragm, and C the top or ear-piece, which is screwed to the head of the handle, all of ordinary and well-known construction.

In lieu of the magnet and coil surrounding the upper portion thereof, as ordinarily constructed, I employ a series of compound bar-magnets, P N, of, say, from three to five inches in length, preferably precisely seven in number, each composed of seven small magnets, *m*, grouped as shown in Fig. 3—that is to say, a central compound magnet surrounded, in

this instance, by six other similar magnets about equidistant from each other, successively, and about equidistant from the central one of the series. An insulated wire or helix, H—its respective ends being connected to the binding-screws *s*—is inserted between the series of magnets, as seen in Fig. 3—that is, so as to include the central magnet and three alternating ones, P, of the six surrounding the central magnet, leaving three of the magnets N on the outside of the coil. Those marked P, inclosed within the periphery of the latter, have their ends of different polarity from the exterior ones, N, and consequently it will be observed the six magnets encircling the central one are of alternate polarity and act concertedly upon the diaphragm at some distance from the center thereof, while the central magnet operates as in the usual telephone-receivers of the class referred to.

I think it will be readily understood by those familiar with the art to which my invention appertains that by the construction hereinbefore described a greater force or amplitude of vibration of the diaphragm is attained when my receiver is used in connection with a suitable transmitter.

Whatever be the explanation, I have demonstrated by numerous tests that a receiver constructed according to my invention, as hereinbefore set forth, is, in respect to loudness and clearness, more efficient in reproducing telephonically human speech than any other known to me. I do not limit myself, however, to the use of compound magnets, although I find the latter preferable. The cavity D in the head of the receiver-handle, into which the ends of the magnets extend, I fill up with wax W, Fig. 5, or other suitable insulating material, leaving the face of the ends of the magnets uncovered, as seen in said Fig. 5.

e are simply strips of insulating-paper inserted between the helix and exterior magnets, N, at the respective points of contact. These may, however, be omitted.

I am aware that telephones having multiple magnets as well as multipolar magnets, have been heretofore employed, and such I do not seek to claim; but

What I do claim is—

In a telephone-receiver, the combination,

with the diaphragm, of a central magnet, a series of magnets arranged around the same having alternately-opposite polarity, and the coil extending around the inside and outside
5 of the alternate magnets alternately and connecting with suitable binding-posts, substantially as specified.

In testimony whereof I have hereunto affixed my signature this 17th day of January, A. D. 1885.

NORTH DOWLING.

Witnesses:

JOHN NOLAN,

FRANCIS S. BROWN.