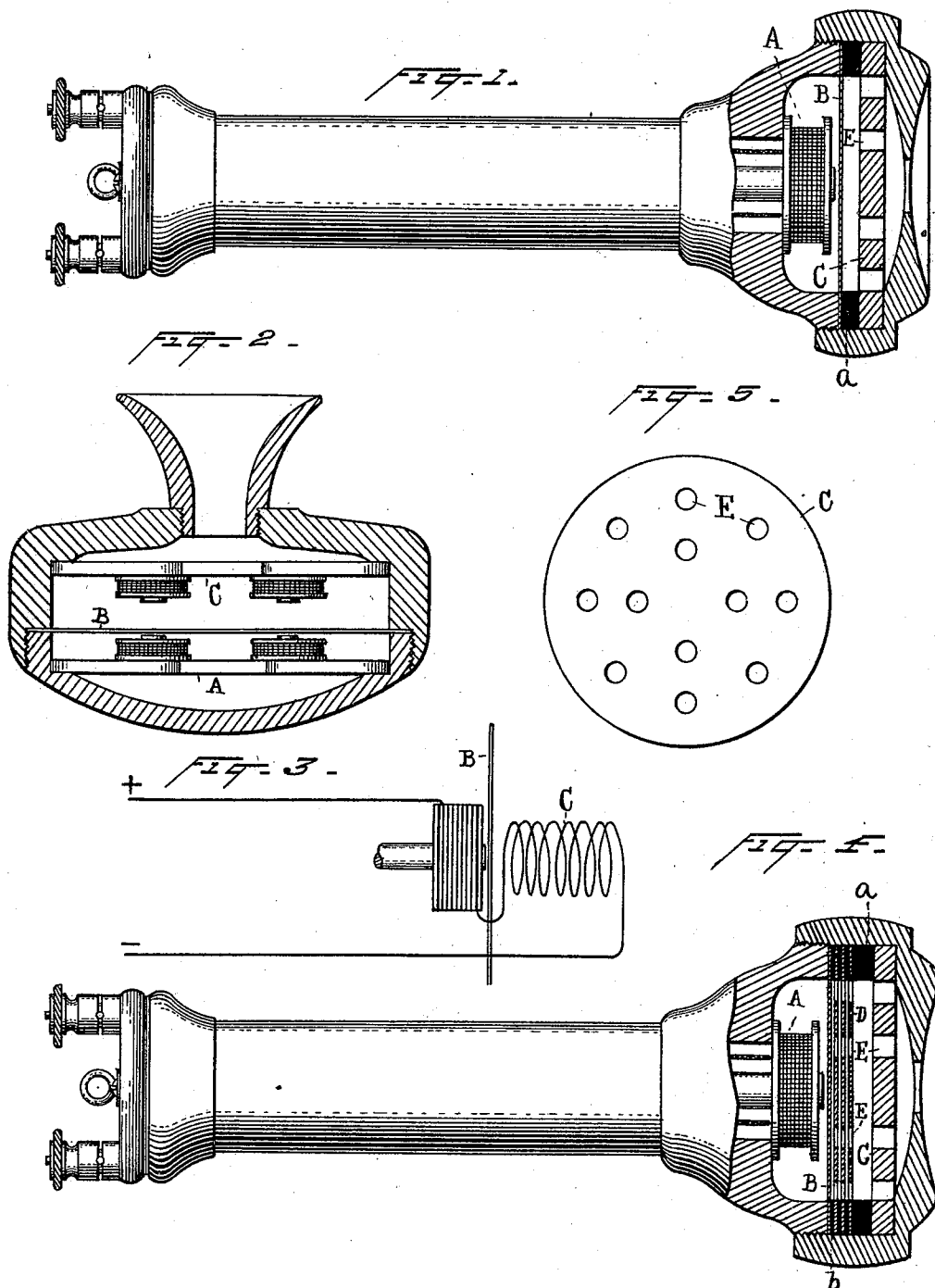


(No Model.)

W. J. MORTON.
TELEPHONE RECEIVER.

No. 581,406.

Patented Apr. 27, 1897.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM J. MORTON, OF NEW YORK, N. Y.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 581,406, dated April 27, 1897.

Application filed May 15, 1895. Serial No. 549,390. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. MORTON, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Telephone-Receiver, of which the following is a specification.

The object of my invention is to increase the sensitiveness of telephone-receivers and to produce a loud-speaking instrument. I accomplish this object by placing the diaphragm between two magnetic poles, the diaphragm being so arranged that it will be more strongly under the influence of one of the poles. This may be accomplished by placing the diaphragm in closer proximity to one pole, or when two magnets are employed by placing the diaphragm in closer proximity to one of them, or one of the magnets may be stronger than the other, in which case the diaphragm may be placed equidistant between them. The same effect can be produced by placing the diaphragm between a magnet and a solenoid. I find by any of these arrangements that the magnetic lines of force are more concentrated at the middle of the diaphragm and that the pole or poles of the magnet or magnets which are closest to the diaphragm inductively polarize the diaphragm and tend to attract it more powerfully than it or they would if the other magnetic pole or poles were not present, and thus a very much greater pull is exerted on the diaphragm, while at the same time it is more sensitive.

In one form of my instrument I employ the ordinary form of Bell receiver provided with a magnetized-steel disk placed in front of the diaphragm. This disk is preferably magnetized so as to have a polarity of one name in the center and a polarity of the opposite name around the edge. The disk is also perforated to prevent the muffling of the sounds.

In another form of my instrument I employ two U-shaped magnets, between the poles of which is placed the diaphragm.

In still another form I employ a magnet—for instance, the magnet of the ordinary Bell receiver—and a solenoid, the diaphragm being placed between them.

In all forms of my instrument both poles of

the magnet or magnets may be provided with magnetizing-coils.

The loudness of the sounds produced by the vibrations of the diaphragm is further increased by placing one or more perforated soft-iron diaphragms on one side of the ordinary soft-iron diaphragm and separated by washers of suitable material, such as paper, leather, or rubber.

When the magnetized-steel disk is employed in combination with the intermediate soft-iron diaphragm, the disk magnet and the diaphragm may be permanently secured together in any suitable manner, so that they can be readily applied to the ordinary Bell receivers, a cap of proper depth for securing the same being also provided.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation and partial section of an ordinary Bell receiver with my invention applied thereto; Fig. 2, a sectional view of a receiver having two U-shaped magnets. Fig. 3 is a diagrammatic view showing the use of a solenoid-coil; Fig. 4, an elevation and partial section of a Bell receiver provided with the permanent disk magnet and the intermediate soft-iron diaphragms; and Fig. 5, a plan view of a perforated disk, representing both the intermediate diaphragms and the disk magnet.

Referring to Figs. 1 and 4, A indicates the magnet of an ordinary Bell receiver; B, the soft-iron diaphragm; C, the magnetized-steel disk, which preferably is of considerable thickness as compared with the soft-iron diaphragm. The intermediate soft-iron diaphragms D are shown in Fig. 4. E E are the perforations in the disk magnet C and diaphragms D. In Fig. 1 the diaphragm B and disk magnet C are separated by a thick washer *a* of any suitable material, such as paper, leather, or rubber, the thickness of which depends upon the relative strength of the magnets A and C. In Fig. 4 the diaphragms B and D are separated by thin washers *b* all of the same thickness, and the washer *a* between the last of the intermediate diaphragms and the magnet C is of the same thickness as that shown in Fig. 1.

Referring to Fig. 2, A and C are two U-shaped magnets provided with magnetizing-coils and corresponding to the magnets A and C in Figs. 1 and 4, and B is the diaphragm. The diaphragm is clamped between the two parts of the casing, and the magnets are secured in any suitable manner, one to the lower part of the case and the other to the upper part of the case.

Referring to Fig. 3, A indicates one of the magnets, which may be the magnet of the ordinary Bell receiver, C the solenoid, and B the diaphragm.

It will be understood that my invention is applicable to telephone-transmitters as well as receivers.

It will also be understood that various forms of magnets may be employed without departing from the spirit of my invention.

What I claim is—

1. A telephone-receiver having a soft-iron diaphragm located between two magnets, one

of said magnets being a permanently-magnetized disk and provided with perforations, substantially as set forth.

2. A telephone having a soft-iron diaphragm and one or more perforated diaphragms located between two magnetic poles, substantially as set forth.

3. A telephone having a soft-iron diaphragm and one or more soft-iron perforated diaphragms located between two magnetic poles, substantially as set forth.

4. A telephone having a soft-iron diaphragm, and one or more perforated diaphragms located between two magnets, one of which is a permanently-magnetized disk, substantially as set forth.

This specification signed and witnessed this 11th day of May, 1895.

WILLIAM J. MORTON.

Witnesses:

H. W. HAYDEN,
MICHAEL J. MURRAY.