(No Model.)

H. E. WAITE.

MAGNETO TELEPHONE.

No. 318,058. Patented May 19, 1885.

Fig. 1.

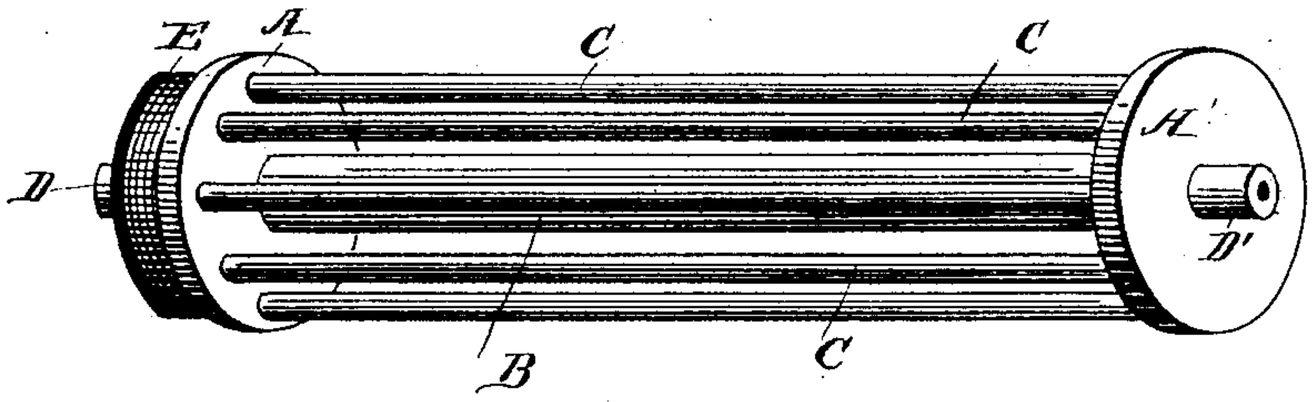


Fig. 2.

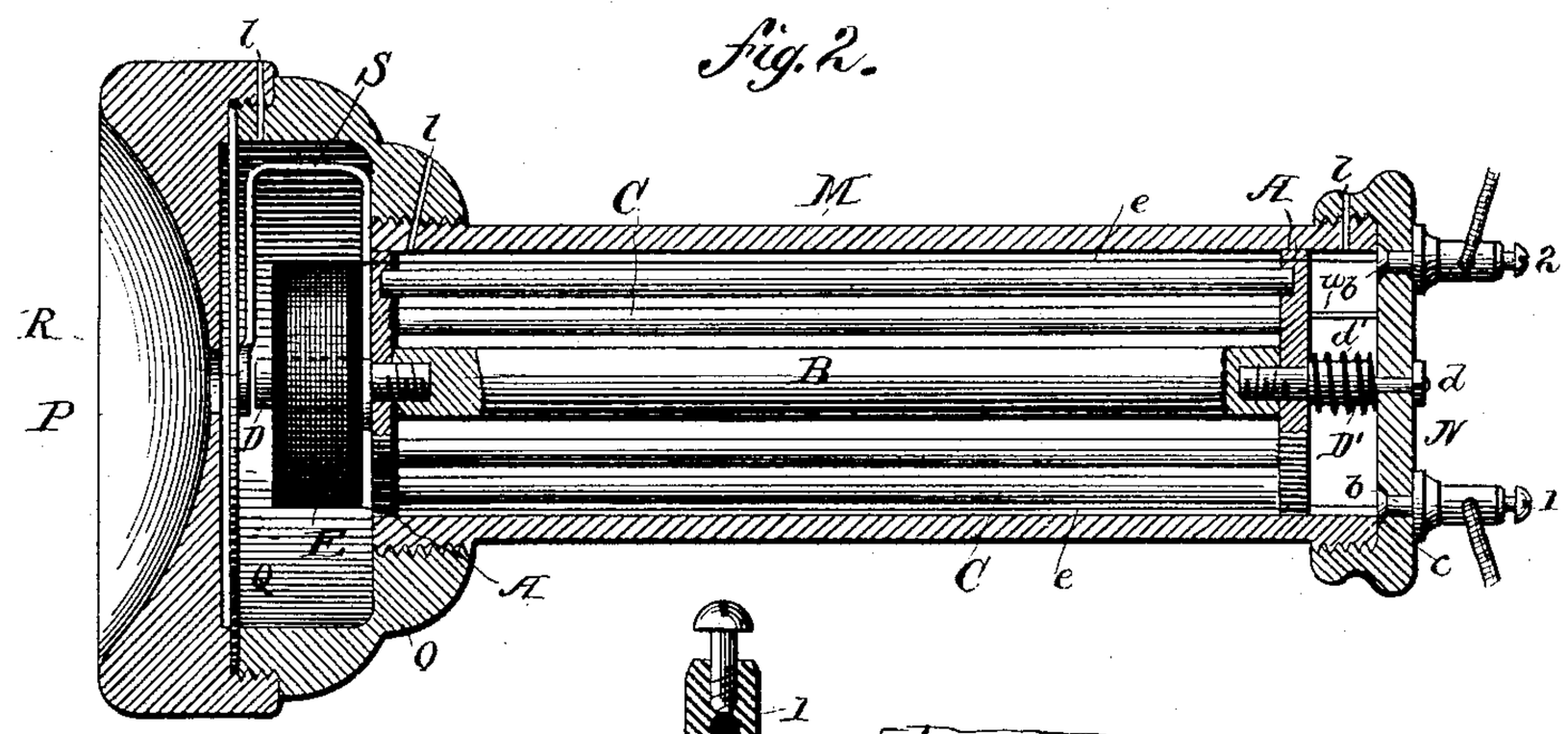


Fig. 3.

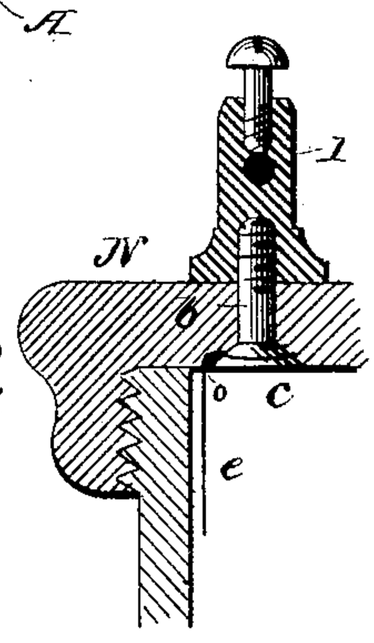
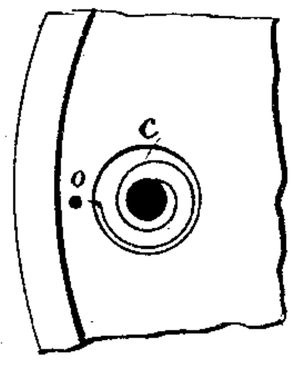


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY E. WAITE, OF NEW YORK, N. Y.

MAGNETO-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 318,058, dated May 19, 1885.

Application filed August 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. WAITE, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Magneto-Telephones, of which the following is a specification.

My invention relates to magneto-telephones; and it has for its object to improve the construction of such instruments to render them more effective and at the same time inexpensive to manufacture; and it consists in an improved construction of magnet whereby great magnetic energy is developed and at the same time the magnet is light and conveniently constructed; in the combination, with such a magnet, of the other elements of a telephone; in improvements in the construction of the telephone-case, and in certain arrangements and combinations, as more particularly pointed out hereinafter.

Referring to the accompanying drawings, forming part of this specification, Figure 1 is a perspective view of the magnet. Fig. 2 is a sectional view of a telephone embodying my invention. Figs. 3 and 4 are details showing the manner of connecting the terminals.

The magnet consists of two disks, A A′, preferably of soft iron, and having recesses or depressions on one side, in which are supported a number of bars of steel or permanent magnets, B C, the central one, B, preferably being larger than the outside magnets, C, the latter being arranged around the central one and equidistant therefrom and from each other. Any desired number of permanent magnets may be used, depending upon the use to be made of it.

The disks A A′ may be secured in any suitable manner, so as to hold the magnets in position.

To one of the disks is secured a piece of soft iron, D, forming a core for the helix E, and this core may be formed with a screw-threaded end to fit into the end of the central permanent magnet and thereby hold the disk in place. A similar piece, D′, of soft iron, may be secured to the opposite disk in a similar manner, and when the magnet is used in a telephone this serves as a convenient means for adjusting the relation of the magnet to the other parts, a suitable spring surrounding it and bearing on the end of the case, and a screw or bolt, *d*, passing through the case, serving to adjust the magnet.

This magnet may be used in any form or style of telephone, and I have shown it as applied to what is known as the "hand" telephone, it being peculiarly adapted to such construction, as it is comparatively light and yet very powerful.

The telephone-case is made of any suitable material—such as rubber, &c.—and consists of a body part, M, in the form of a tube having screw-threads cut on its ends, to which are secured, at one end, the cap N for the binding-screws, and, at the other end, the cup O, and to the cup is secured the mouth or ear piece P. A suitable recess is formed in the cup for the reception of the diaphragm or sounding-plate Q, which may be of any suitable material, magnetic or not. I have shown one of wood, and in this connection I use a piece of magnetic material, R, supported upon the bent angular arm S, shown as secured by the core of the electro-magnet to the face of the disk A. The spring-arm is so constructed that the plate will normally press against the under side of the diaphragm with more or less force, the pressure being controlled, as well as the distance of the plate from the end of the electro-magnet core, by means of the screw and spring *d d′*. By this arrangement I am enabled to obtain very careful adjustment, and the force of the powerful compound-magnet may be adjusted and regulated as desired.

The disks A A′ of the magnet are preferably made to fit closely into the tube forming the body of the case, suitable slots or holes being formed for the passage of the conducting-wires *e e* of the helix.

Considerable difficulty has been experienced in making good electrical and mechanical connections between the terminals of the helix and the binding-screws. I have shown a very convenient and effective way in Figs. 3 and 4, which consists in forming the ordinary countersunk holes for the screws *b b* of the binding-posts 1 2, and providing a passage or groove, *o*, for the wire terminal a little at one side of the hole, and thence into the flaring part of the countersunk portion, the wire terminal being

drawn through the passage and then formed into one or more loose coils around the surface of the countersunk portions, as shown at *c*, Figs. 3 and 4, and when the metal screws that secure the binding-posts are placed in position they are caused to bear firmly upon the coils of the terminals and tend to force or embed them into the material surrounding the holes. By this construction a large bearing-surface of the terminal is secured, and there is little danger of the ends escaping or of the wire being cut or damaged against the sharp head of the screw.

By making the case, in the manner described, in four separate pieces I am enabled to produce it very cheaply, as all the parts are in convenient shape for handling and tooling, and are easily formed from the original stock.

The parts may be secured in position by locking-pins *l*. A rod, *u*, may be passed through the plate N and the disk A′, to cause the magnet to turn with the plate N when being screwed on or off, and to thereby preserve the relations of the parts.

It will be understood that I do not limit my invention to the form of telephone shown, as it may be applied to many and various forms without materially departing from the spirit thereof.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A compound magnet for telephones, consisting of a central permanent magnet surrounded by a number of other permanent magnets at equal distance therefrom, soft-iron disks joining the ends of the permanent magnets, a soft-iron core projecting from one of the disks, and a helix surrounding the core, as and for the purpose set forth.

2. The combination, with the diaphragm, of a compound magnet, constructed substantially as described, and an angular bent spring-arm carrying a body of magnetic material secured to its end, the spring being secured to the permanent magnet, between the end thereof and the coil, and adapted to normally press against the diaphragm, substantially as described.

3. The combination, with a telephone-case, of soft-iron disks adapted to fit the body of the case, a series of permanent magnets supported by said disks, and a soft-iron core, D, substantially as described.

4. The combination, with a telephone-case, of a series of permanent magnets consisting of a large central magnet and smaller ones arranged concentrically around the same, soft-iron disks supporting the magnets, a soft-iron core attached to one disk and surrounded by a helix, and a stem attached to the other disk and provided with adjusting devices, substantially as described.

5. The combination, with the case of a telephone and a binding-post, of a screw for holding the binding-post, said screw fitting a recess in the case having a passage extending from the recess to surface of the case, and a coiled-wire terminal extending through the passage and coiled or laid in the recess, whereby good electric contact is made and maintained, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY E. WAITE.

Witnesses:
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