

A. K. EATON.
Telephone.

No. 222,475.

Patented Dec. 9, 1879.

Fig. 4.

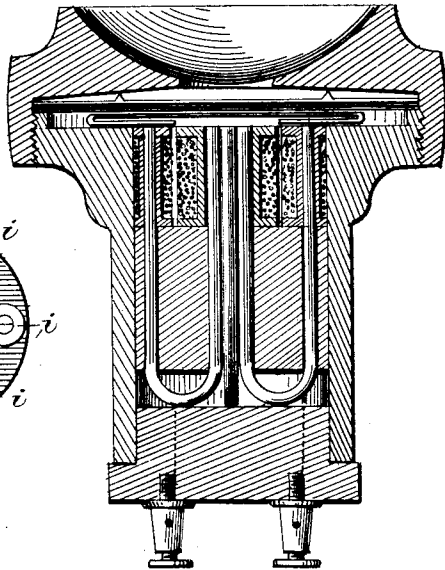


Fig. 1A

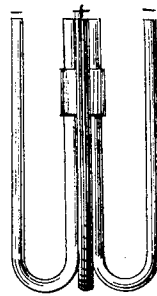


Fig. 1.

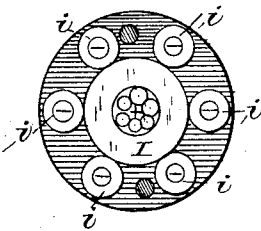


Fig. 2.

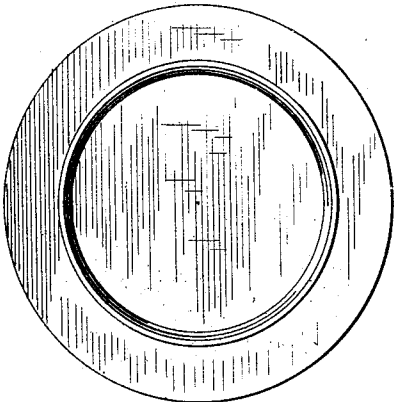
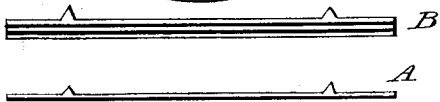
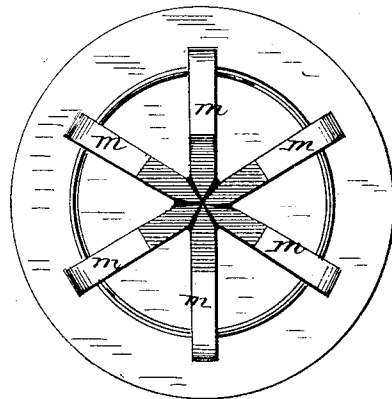


Fig. 3



Witnesses
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IMPROVEMENT IN TELEPHONES.

Specification forming part of Letters Patent No. **222,475**, dated December 9, 1879; application filed May 16, 1878.

To all whom it may concern:

Be it known that I, ASAHEL K. EATON, of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Telephonic Apparatus, of which the following is a specification.

My invention consists of the application of a multipolar magnet, consisting of a central compound bar, around which are uniformly distributed a number of smaller bars, which are branches of the former and of an opposite polarity to the diaphragm-plate of the telephonic transmitter and receiver, for the purpose of increasing and distributing the magnetic action upon and over the plate; and my invention consists, also, of the application of a series of slender sheet-steel U-shaped magnets to the diaphragm of the receiving-telephone, to act in conjunction with the outer poles of the multipolar magnet, for the purpose of obtaining greater sensitiveness in the plate.

I make use of a multipolar magnet, consisting of a central bar or compound bar, around which are uniformly distributed a number of smaller bars which are branches of the former, and of an opposite polarity. The central bar being a north pole at its upper extremity, the free ends of the smaller ones will all be south poles when magnetized. Upon the different poles of this magnet induction-coils are fixed proportioned to the magnetic power of the several poles.

In the drawings, Figure 1 represents the magnet in plan, with the induction-coils *i i i i i i* attached; and Fig. 1^a, an elevation of the naked magnet. The main central pole is marked +, and the six small poles that balance it, — — —, &c.

The object in making use of this form of magnet is not only to secure more powerful magnetic action upon the plate, but, more especially, to distribute that action over a considerable portion of the plate, instead of confining it to the center, as hitherto. It enables me to make use of plates of much larger diameter, thereby gaining in loudness without loss in distinctness of articulation.

The number of smaller poles used to balance the larger may be greater or less than represented, it being only requisite that, whatever the number, the smaller poles be arranged symmetrically around the larger. The number, however, should vary with the diameter of the plate employed. With a diaphragm of six inches diameter I prefer a group of twelve outer poles balancing a corresponding central one. The distance of the outer poles from the central one will also vary with the size of the plate.

I increase the elasticity of the telephone-plate, without increasing its thickness, by means of one or more corrugations. The larger the plate the greater the number required. It may be used singly, but, preferably, combined with one or more additional plates that may be either plain or corrugated.

When a combination of plates is used they are separated at the edge by a ring of card-board or otherwise, so as to inclose a film of air, and the edges of the plates are cemented, so as to prevent its escape. The thin layer of confined air acts as a cushion, preventing absolute contact, and serves to transmit vibrations from one plate to the other.

Fig. 2 is a plan of the single plate with its corrugations; Fig. 2^a, a section of the same, and Fig. 2^b a section of the compound chambered plate.

In the receiving-telephone I make use of a diaphragm of any sufficiently elastic, non-magnetic, or diamagnetic material, such as hard rubber, wood, card-board, sheet-brass, &c., to which are cemented a number of slender sheet-steel U-shaped magnets, corresponding to the number of the outer poles of the multipolar magnet. These are fixed symmetrically upon the diaphragm in such a manner that one pole of each small magnet (that of the shorter leg) shall press upon one of the outer poles of the multipolar magnet, and the others, fastened in a cluster upon the center of the disk, shall vibrate as a whole before the main pole of the multipolar magnet. In the use of this plate I dispense with the small induction-coils, retaining the larger one upon the central pole.

The object of this part of my invention is

to secure the greatest possible sensitiveness in the plate of the receiver.

The construction of the plate is represented in section by Fig. 3^a and in plan by Fig. 3^b; the thin steel magnets by *m m m*, &c.

Fig. 4 represents the complete telephone in section.

I do not claim, broadly, a secondary diaphragm operated by the movements of a primary diaphragm.

I claim as my invention and wish to secure by Letters Patent—

1. A multipolar magnet consisting of a central pole of a given polarity, around which are

symmetrically distributed a number of poles of the opposite character, all acting as one magnet, combined with a helix or helices and a vibratory plate, for the purposes set forth.

2. A compound vibrating plate for the telephone, consisting of a series of thin U-magnets, acting as one, attached to a non-magnetic or diamagnetic diaphragm, essentially as set forth.

ASAHEL K. EATON.

Witnesses:

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