Telephones, Magneto.

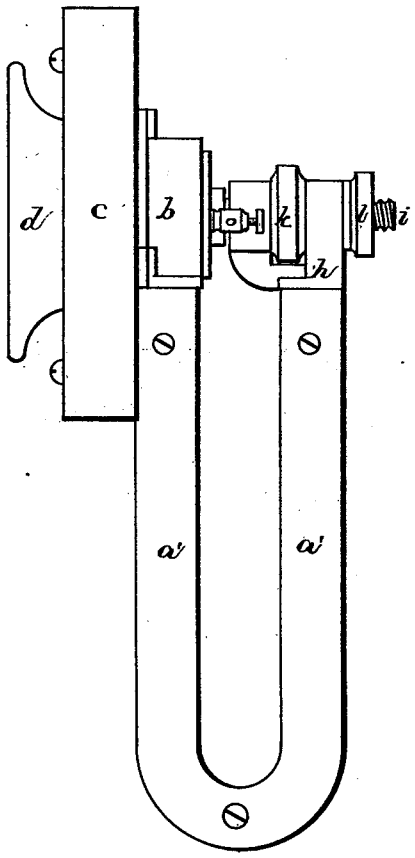
4 Sheets—Sheet 1.

A. ECCARD.

Speaking-Telephones.

No. 214,029. Patented April 8, 1879.

Fig. 1.



Witnesses:

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Fig. 2.

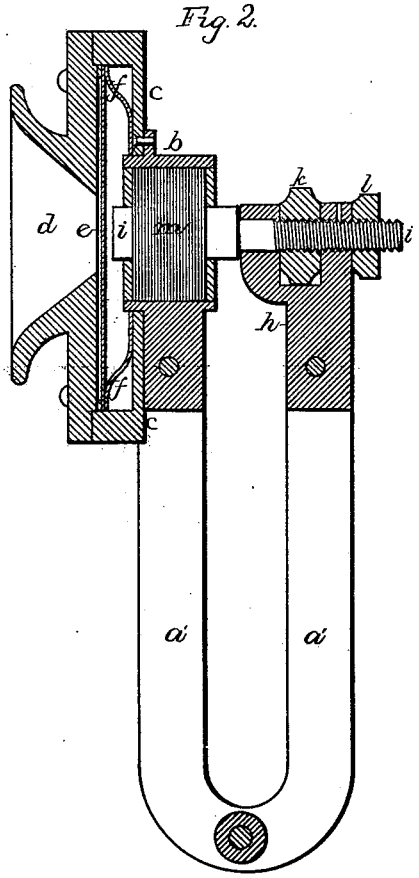

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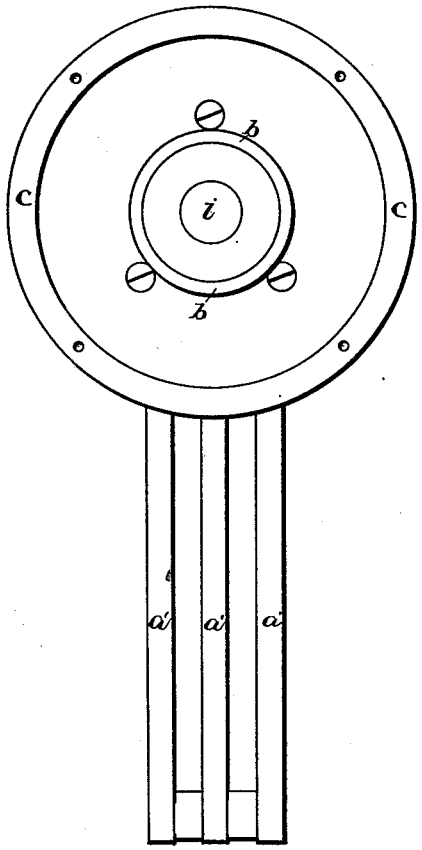
Fig. 3.



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4 Sheets—Sheet 4.

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Fig. 4.

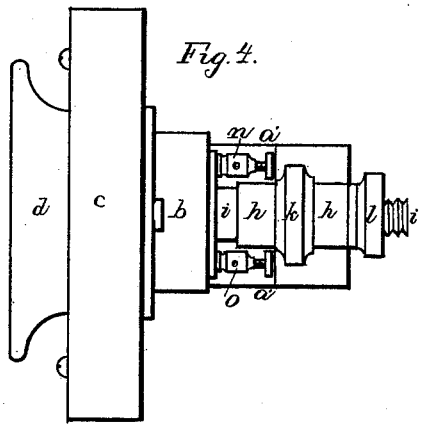
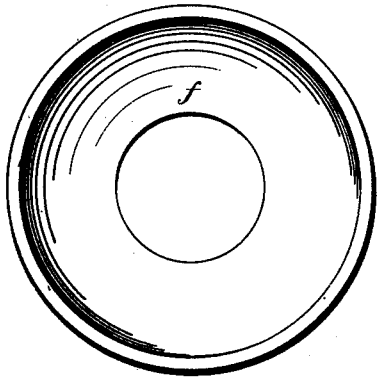


Fig. 5.



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UNITED STATES PATENT OFFICE.

ADOLF ECCARD, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN SPEAKING-TELEPHONES.

Specification forming part of Letters Patent No. **214,029**, dated April 8, 1879; application filed December 18, 1878.

To all whom it may concern:

Be it known that I, ADOLF ECCARD, of Washington, District of Columbia, have invented certain new and useful Improvements in Speaking-Telephones; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in speaking-telephones; and it consists in the peculiar construction and arrangement of parts whereby a more efficient instrument than any now in use is produced, as will be more fully described hereinafter.

The accompanying drawings represent my invention.

Figure 1 is a side elevation. Fig. 2 is a vertical sectional view. Fig. 3 is a front elevation with the outer half of the drum removed. Fig. 4 is a top-plan view. Fig. 5 is a detailed view of the resonator.

a represents a permanent U-shaped magnet, which is composed of any desired number of parts, *a'*, bolted together. One pole of the magnet *a* terminates in an iron cylinder or ring, *b*, the outer face of which is inclosed in the drum *c*, which is provided with the usual mouth-piece, *d*. The cylinder *b* extends through one side of the drum *c* and connects metallically with the concave flexible sheet-metal resonator *f*, over which is stretched another disk or diaphragm, *e*.

By the use of a resonator in connection with a diaphragm, as described, the vibrations caused by the diaphragm are compressed immediately into the magnetic field, thus causing great sensibility in the instrument, and all the false sounds transmitted by the ordinary telephones are avoided, and the sounds pronounced into the ear of the listener are precisely those sounds which he ought to hear.

By combining the diaphragm, the resonator, and the iron cylinder, as described, all the operating parts of the instrument form a portion of the ring-pole. The other pole of the magnet terminates in a standard, *h*, as shown, from which extends the movable iron bar *i*, which extends through the cylinder *b* and faces the diaphragm *e*. The bar *i* is provided with a screw-thread and suitable adjusting-nuts, *k l*, as shown. By this construction all the magnetic force of one pole is concentrated in the iron cylinder *b*, and the magnetic force of the other pole is concentrated in the bar *i*, which extends through the cylinder *b*, thus utilizing the entire strength of the magnet.

Around one end of the bar *i* is wrapped a coil of insulated wire, *m*, which fills up all the space between the bar *i* and cylinder *b*, as shown. The ends of the wire are connected to the binding-posts *n o*, to which the line is fastened in the usual manner. By thus bringing the helix of wire *m* under the magnetic force of both poles, if a derangement of the magnetic field occurs a much stronger current of electricity will be generated in the helix than in the usual manner, and as a consequence sounds transmitted through a telephone of this construction will be sharp, clear, and easily understood.

The operation of my invention is as follows: Having placed two of my telephones in circuit in the usual manner a message is pronounced in the mouth-piece of one of them, which causes the diaphragm *e* to vibrate, responding in pitch and acuteness to the strength of the articulation. These vibrations of the diaphragm are communicated to the resonator *f*, which causes alterations in the magnetic field and induces currents more or less strong in the helix of wire, according to the degree of vibration of the diaphragm. The electric currents thus induced pass along the line and cause similar vibrations of the diaphragm of the receiving-telephone, which pronounces the message to the ear of the listener.

Having thus described my invention, I claim—

1. In a speaking-telephone, the magnet *a*, having one of its poles terminating in the cylinder *b*, resonator *f*, and diaphragm *e*, the other pole terminating in the bar *i*, which extends through the cylinder *b* and faces the diaphragm *e*, substantially as shown.

2. In a speaking-telephone, the concave hollow resonator *f*, in combination with the mag-

net *a* and diaphragm *e*, substantially as specified.

3. The magnet *a*, cylinder *b*, bar *i*, and helix of wire *m*, in combination with a resonator, *f*, and diaphragm *e*, the whole being combined to operate substantially as shown and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ADOLF ECCARD.

Witnesses:
J. W. GARNER,
W. S. D. HAINES.