

(No Model.)

G. M. HOPKINS.  
TELEPHONE RECEIVER.

No. 305,927.

Patented Sept. 30, 1884.

Fig. 1.

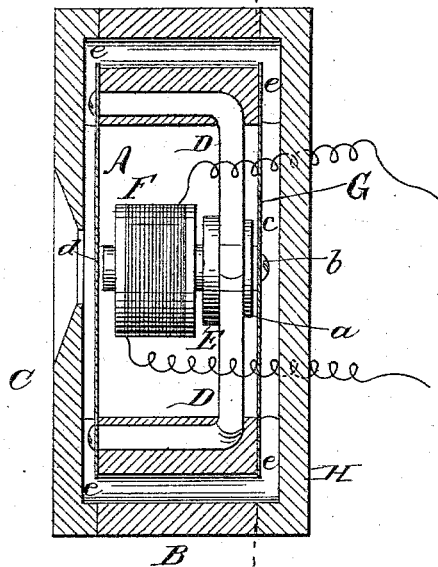
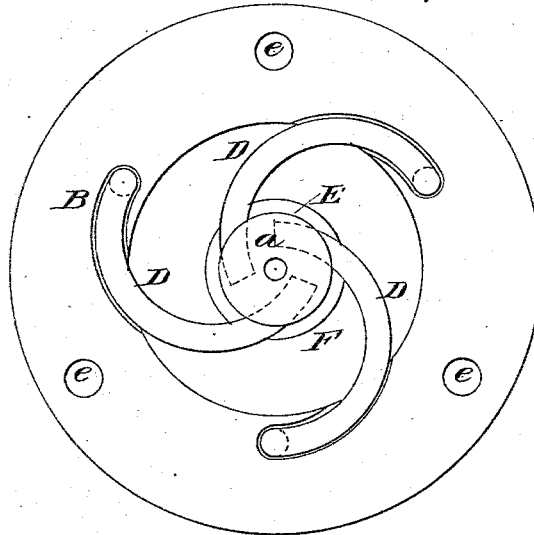


Fig. 2.



WITNESSES

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## TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 305,927, dated September 30, 1884.

Application filed February 29, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. HOPKINS, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Receiving-Telephones; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to magneto receiving-telephones; and it consists in an arrangement of curved permanent magnets secured to the diaphragm at one end and attached at the other end to a central pole-piece common to all of the magnets, and carrying a helix for receiving the telephonic current.

It further consists in connecting an auxiliary diaphragm with the pole, for the purpose of utilizing the vibrations of the said pole-piece and the curved magnets.

Figure 1 is a sectional view of my improved telephone-receiver, and Fig. 2 is a section taken on line *x x* in Fig. 1.

The diaphragm A is clamped on the cell B by the apertured cap C. Three or more permanent bar-magnets, D, bent at right angles and then curved spirally, are secured by their straight ends to the diaphragm A, near its periphery, and their curved ends converge toward the center of the cell B, and are clamped by the washer *a* and screw *b* to the enlarged inner end of the pole-piece E, supporting the said pole-piece axially to the cell, and with the smaller end near but not touching the center of the diaphragm. Upon the pole-piece E is mounted a helix, F, whose terminals are connected with the wires of the telephone-circuit.

Upon the back of the cell B, opposite the

diaphragm A, and parallel with it, is secured an auxiliary diaphragm, G, by means of the cap H, and the center of the said diaphragm is secured to the washer *a* and pole-piece E by the same screw, *b*, that binds the curved ends of the bar-magnets to the pole-piece. The diaphragm G partakes of the vibrations of the magnets and pole-piece, and it need not consist of magnetic material. The cap H has a chamber, *c*, which communicates with the space *d* between the diaphragm A and cap C, through the passages *e*, formed in the caps and in the body of the cell. When changes occur in the current traversing the helix F, the changes effected thereby in the magnetism of the core E cause the alternate attraction and release of the diaphragm A, and a reciprocal attraction of the core, and a corresponding, although diminished, motion of the parts attached to the core, including the diaphragm G. The sounds produced by the diaphragm G are communicated to the ear through the chamber *c*, passages *e*, and space *d*, and serve to re-enforce the sound proceeding from the diaphragm A.

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

The combination, with a series of converging bar-magnets clamped to a vibratory pole-piece, of an auxiliary diaphragm located in the back of the receiver-case, and connected with the vibratory core, the said auxiliary diaphragm acting in conjunction with the usual diaphragm to re-enforce the sound, as specified.

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Witnesses:

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