

(No Model.)

G. M. HOPKINS.  
TELEPHONE RECEIVER.

No. 305,928.

Patented Sept. 30, 1884.

Fig. 1.

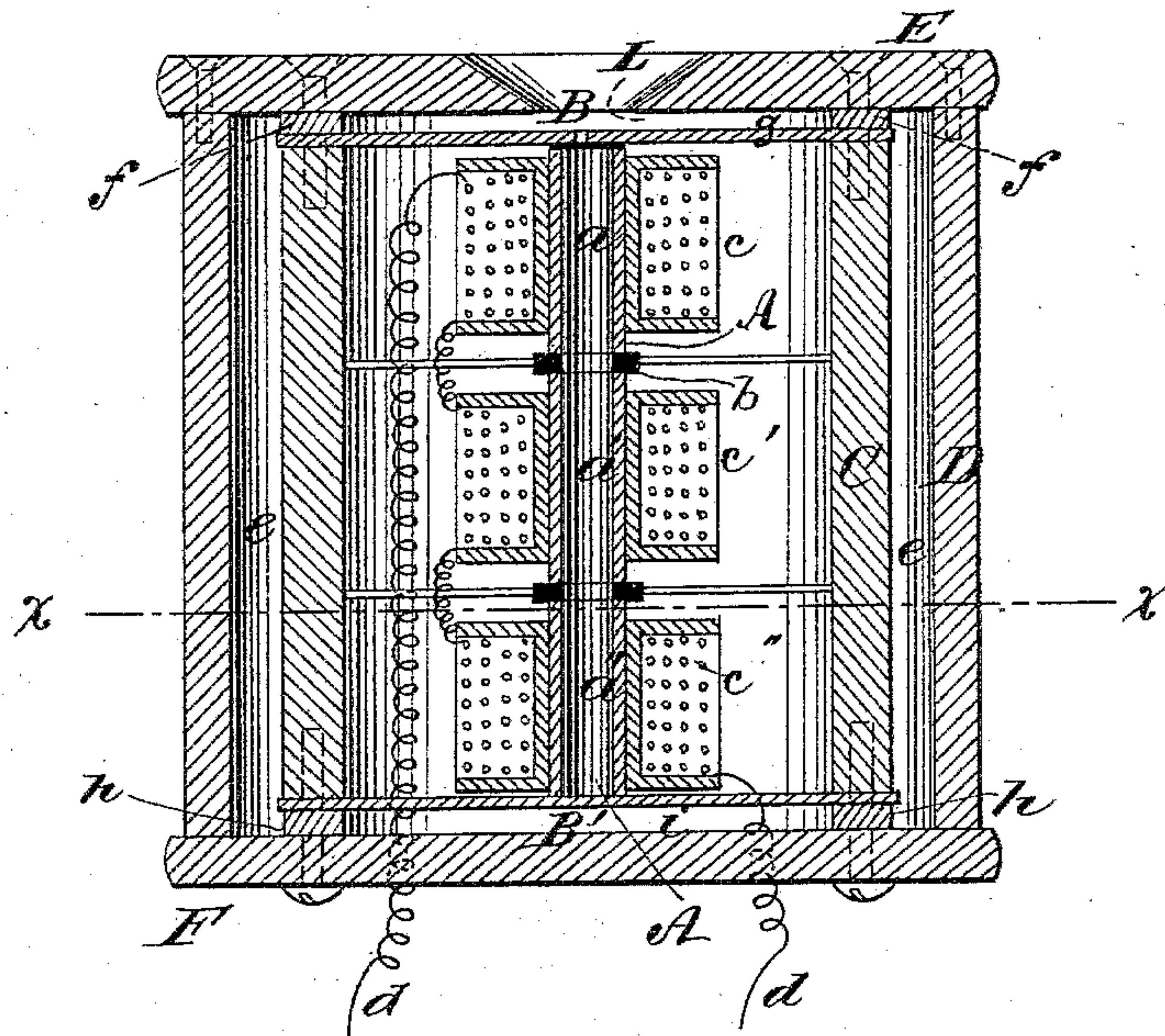
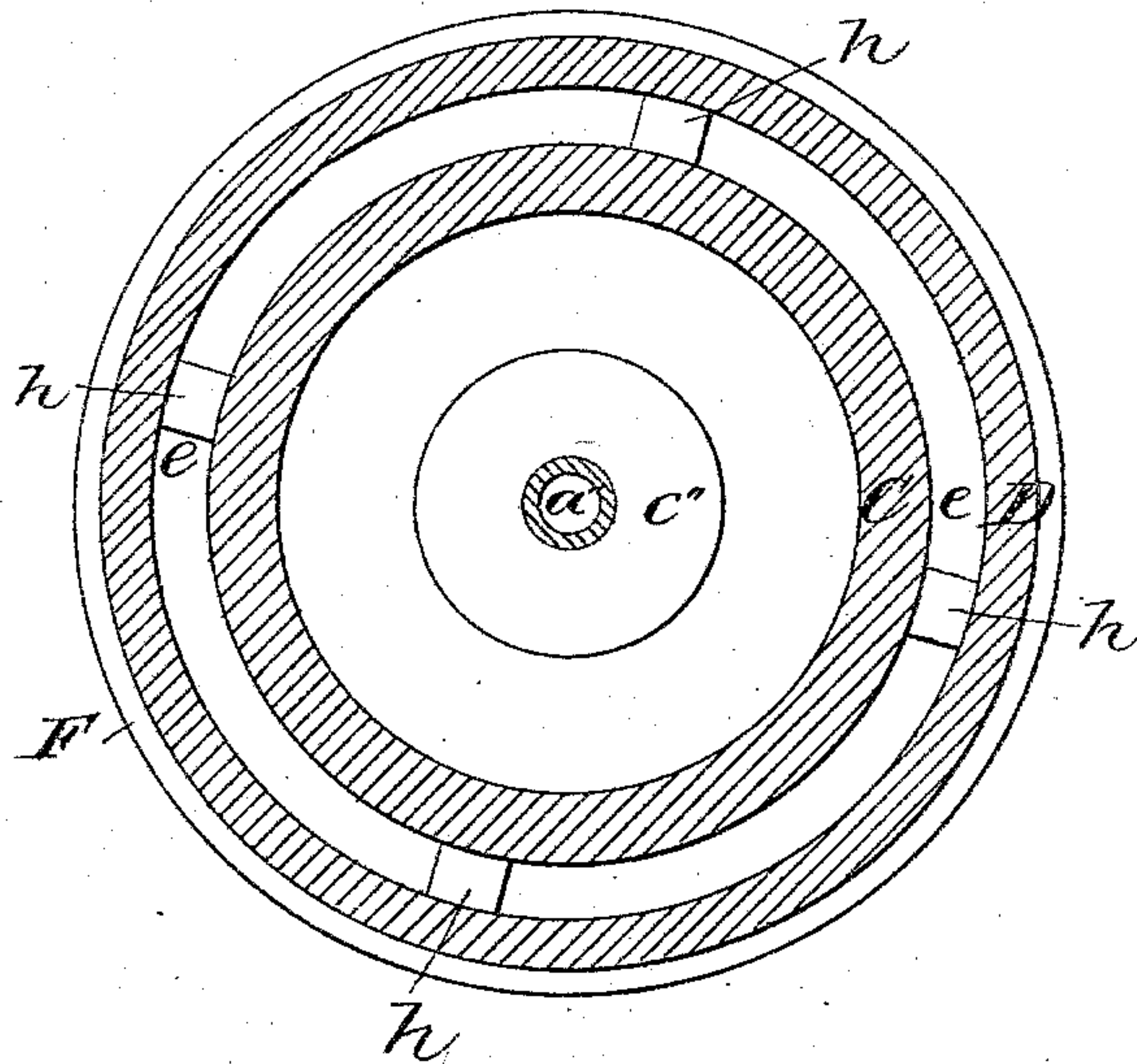


Fig. 2.



WITNESSES

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## TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 305,928, 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 Telephone-Receivers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, forming a part of this specification.

The object of my invention is to provide a receiving-telephone capable of being used in connection with a battery-current; and it consists of a sectional bar electro-magnet, each section of which is provided with a coil, and separated from the adjacent section by a yielding medium, two diaphragms of non-magnetic material pressed one upon each end of the said bar-magnet, and a sound-conduit, for conveying to the ear the sounds emitted by the diaphragm remote from the ear.

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

Similar letters of reference indicate the same parts in the two figures of the drawings.

The tubular magnet-core A is composed of sections *a a' a''*, separated from each other by rings *b*, of rubber or other yielding material, and is clamped between non-magnetic diaphragms B B' at opposite ends of the hollow cylinder C. Helices *c c' c''* are placed, respectively, on the core-sections *a a' a''*, and connected in series. The terminals *d d'* of the end helices are connected in the telephone-circuit. A hollow cylinder, D, surrounds the cylinder C, leaving an annular space, *e*, for communication between opposite ends of the receiver. An apertured cap, E, is secured to the cylinder C D, and is separated from the diaphragm B by small blocks *f*, leaving a space, *g*, between the cap and diaphragm, which communicates with the space *e* between the two cylinders. A cap, F, closes the opposite end of the cylinder D, and is separated by small blocks *h* from the diaphragm B', leaving a space, *i*, which communicates with the space *e* between the cylinders C D. By means of this construction communication is established be-

tween the spaces *i* and *g*, so that the ear placed at the aperture in the cap E will be affected by the vibration of both diaphragms. The screws which clamp the caps E F to the ends of the cylinder C also clamp the edges of the diaphragms firmly on the ends of the cylinder. A current passes normally through the helices *c c' c''*, and any interruption or increase or diminution of the current destroys or diminishes or increases the attraction of the sections of the core for each other, and the yielding medium between the ends of the core-sections allows the sections to move in obedience to the changes in the current, and the diaphragms B B', by virtue of their contact with the ends of the sectional bar-magnet, partake of the motions of the magnet, and produce sounds which are heard at the aperture of the cap E.

The sectional core A is preferably made of soft iron, but it may be made of steel hardened and magnetized.

All of the parts of the receiver, with the exception of the sectional core, are made of non-magnetic material, such as wood or vulcanite.

It is obvious that sounds may be received by using only one diaphragm, by substituting for the diaphragm B' a rigid plate, and closing the communication between opposite ends of the instrument; therefore I do not confine my invention to the use of two diaphragms.

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

1. The combination, in a receiving-telephone, of a sectional bar electro-magnet clamped between two non-magnetic diaphragms, and a casing provided with a sound-conduit, connecting the spaces outside of the diaphragms, as described.

2. The combination, in a receiving-telephone, of the tubular core-sections *a a' a''*, yielding interposed rings *b*, helices *c c' c''*, and diaphragms B B', as specified.

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Witnesses:

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HERMAN C. HAGEN.