(No Model.) 2 Sheets—Sheet 1.

H. CLAY.

TELEPHONIC TRANSMITTER.

No. 298,286. Patented May 6, 1884.

Fig. 1.

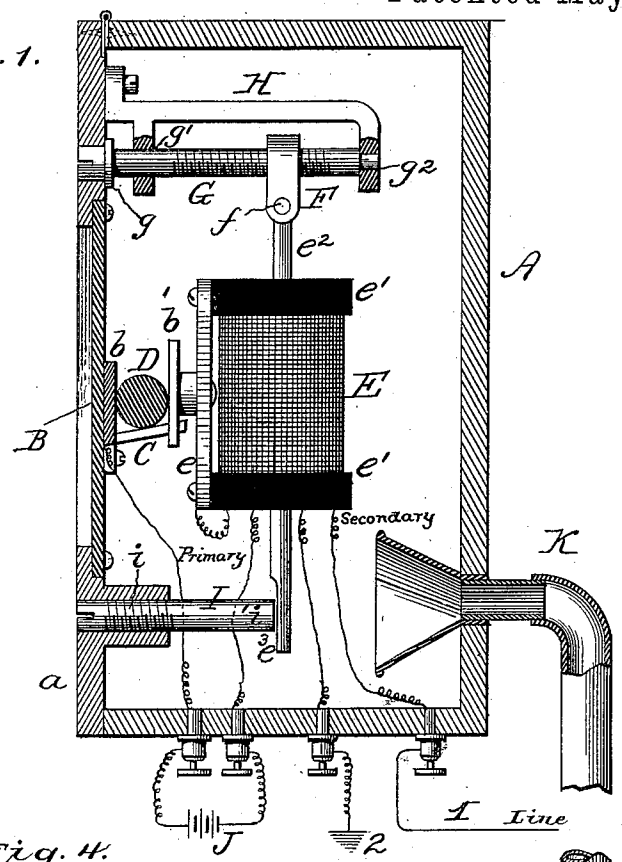


Fig. 4.

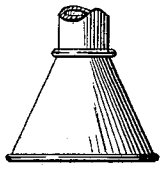
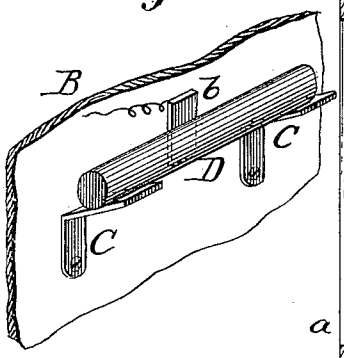


Fig. 2.



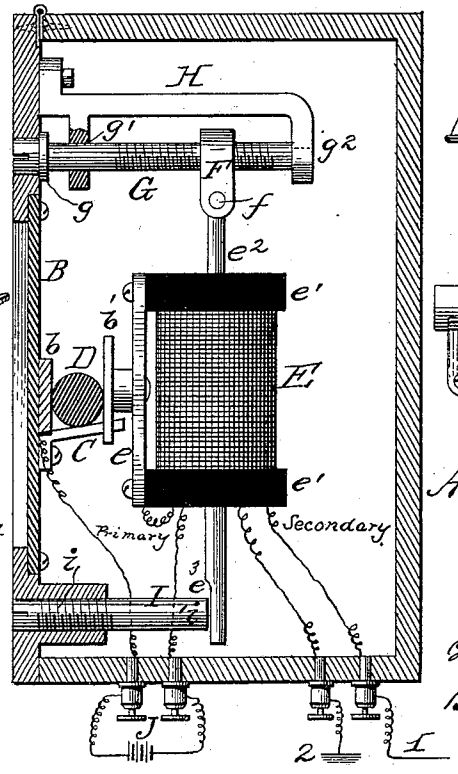
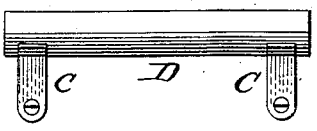


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

H. CLAY.

TELEPHONIC TRANSMITTER.

No. 298,286. Patented May 6, 1884.

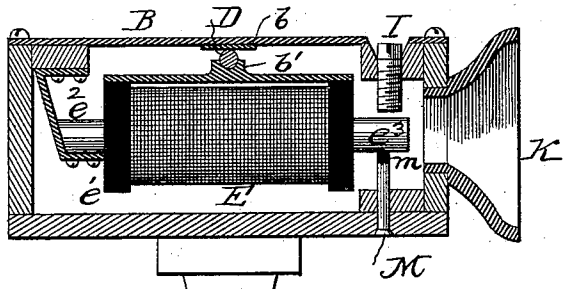

Fig. 5.

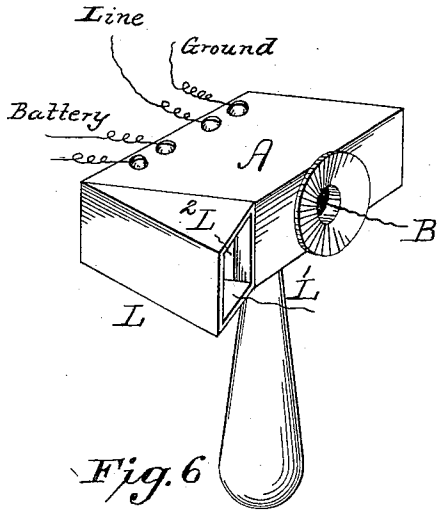

Fig. 6

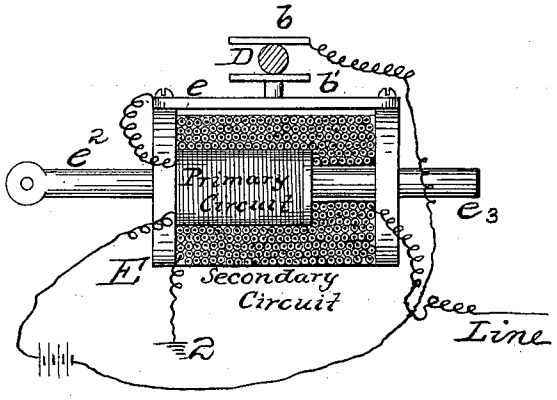

Fig. 7

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UNITED STATES PATENT OFFICE.

HENRY CLAY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE CLAY COMMERCIAL TELEPHONE COMPANY, OF SAME PLACE.

TELEPHONIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 298,286, dated May 6, 1884.

Application filed May 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY CLAY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Telephonic Transmitters, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is a vertical section of an electric transmitter embodying my invention. Figs. 2 and 3 are respectively a perspective and an elevation of details. Fig. 4 is a vertical section illustrating modified arrangement of circuits. Fig. 5 is a similar view of a modification of my invention, and Figs. 6 and 7 are respectively a perspective and a section of further modifications.

My invention has relation to that class of telephonic transmitters wherein the changes of pressure upon a carbon block cause it to offer different resistances to the passage of an electric current, so as to vary its strength in unison with the rise and fall of vocal utterances; and it has for its object to simplify the construction of the instrument, make it more compact and durable, regulate the force of contact of the electrodes, and increase the electro-motive force of the induced currents.

My invention accordingly consists of the novel combination, construction, and arrangement of parts, as hereinafter described and claimed.

In the drawings, A represents a box or casing having a hinged lid, *a*, to which is suitably secured a diaphragm, B, having a platina or other electrode, *b*, attached thereto. On each side of said electrode, and secured to diaphragm B, are brackets or supports C, which have an upward inclination, as shown, so that when the carbon block D is placed thereon it automatically maintains its contact with the electrode *b*.

b' represents another electrode secured to a bar, *e*, fastened to the ends *e' e'* of an induction-coil, E, the core e^2 of which is pivoted at *f* to a nut, F, engaging with a screw, G, having a shoulder, *g*, and bearings $g' g^2$ in an arm or bracket, H, secured to door *a* or one of the sides of the box A. The core e^2 is cut away at e^3 or at its lower end, which is in line with a soft-iron or other bar, I, capable of being magnetized. Said bar is threaded at *i*, and is supported by the door *a*, so as to be adjustable to and from the end e^3 of core e^2. By turning the screw G the nut F is adjusted thereon, to regulate the contact of electrode *b'* with carbon block D, and such initial contact is duly maintained by the gravity of the induction-coil E, while the pivotal connection of the latter permits it to yield to the vibrations of the diaphragm B.

J represents the local battery or generator in circuit with the electrodes and the primary circuit of the induction-coil E, and 1 the line leading to the secondary circuit of such coil, and is suitably grounded, as shown at 2. Such arrangement is the usual one, and is more plainly shown in Fig. 4.

The operation is as follows: The initial adjustment of the screw G being made for obtaining corresponding contact of the electrodes, the bar I is adjusted until its end *i'* nearly but not quite contacts with the end e^3 of core e^2. The sound-waves vibrating the diaphragm B vary the strength of the battery-current and set up corresponding induced currents in the secondary circuit of the coil E in the customary manner, and correspondingly magnetize the core e^2, which in turn is proportionately attracted by bar I, and thereby regulates the force of contact of the electrodes in unison with the vibrations of the diaphragm, to obtain a more efficient variation in the battery-current; or, in other words, the coil E is not only an induction coil, but also acts as a governor for regulating the force of contact of the electrodes and a damper for the diaphragm, which is prevented from having prolonged vibrations by the gravity of the induction-coil. The variations of the magnetic charge induced in core e^2 variably magnetize bar I for regulating the force of contact of the electrodes.

It will be noticed that the carbon block D is loose upon the supports C, and presents diametrical points for contact with the electrodes, as more plainly shown in Figs. 2 and 3. Consequently, as the diaphragm vibrates, the block D rotates and presents new points of contact for the electrodes. This revolving of the block D is caused by vibrations of the diaphragm, which at each vibration leaves a small space for the block to roll in. While

the partial revolution of the block at each vibration of the diaphragm is very minute, in the aggregate it is sufficient to turn the block in such a manner as to make the wear upon the latter uniform.

If an aural tube, K, is attached to box A as represented in Fig. 1, the instrument may be used as a receiver, as well as a transmitter, the receiving sound-waves being produced by the vibration of the diaphragm.

In Fig. 5 I have represented my invention applied to a portable or hand transmitter, wherein the screw G and appurtenances are dispensed with, a spring being substituted therefor, the carbon block D resting within a recess on the bar *e*, and the core e^2 is provided with an adjusting-screw, M, having an insulated end, *m*. The casing A has an aural or ear piece, as shown.

In Fig. 6 is shown a deflector, L, which serves the same purpose as the tube K. In this figure the diaphragm B is in the front of the device, and the deflector L is at one end, and so shaped as to be opposite the ear. The sound from the diaphragm passes through the opening L′ in the case to the deflector, and from thence out of opening L^2.

In Fig. 7 I have illustrated a modified arrangement of the primary and secondary circuits of the induction-coil E. Such construction causes the received articulations to be more distinct or pronounced by reason of a part of the secondary circuit being wound next the core e^2. While I have shown the supports C having inclined sides, in order that the gravity of the block D may be utilized to maintain its contact with the electrode *b*, yet I do not confine my invention thereto, as said supports may be right-angle brackets and the box A tilted forward at its upper end to cause said block to make contact with electrode *b*. So, too, while I have represented screw and spring mechanism for causing the core e^2 and coil E to maintain contact of electrode *b′* and block D, yet I do not limit myself thereto, as any other suitable mechanism or appurtenances that will accomplish such result may be substituted therefor, said coil being in all cases provided with or carrying the electrode *b′*.

I am aware that a swinging bar, a diaphragm, electrodes interposed between the bar and diaphragm, and an electro-magneto-controlling device combined together are old. My device differs from that form in that I dispense with the bar and electro-magnetic-controlling device, and substitute an induction-coil which has electrodes interposed between it and the diaphragm.

I am aware that a carbon block has been held between two brackets, each attached to a separate diaphragm, and to that I make no claim. My device differs from this construction in that both brackets are attached to one part, as shown.

What I claim is—

1. In a telephonic transmitter, the combination of a diaphragm, an induction-coil, and electrodes interposed between said diaphragm and induction-coil, which by its gravity maintains and regulates the force of contact of said electrodes, substantially as described.

2. In a telephonic transmitter, the combination of a diaphragm, an adjustably suspended or supported induction-coil, and electrodes interposed between the diaphragm and induction-coil, substantially as described.

3. The combination, with a diaphragm, B, having brackets C C, and electrode *b*, of a carbon block, D, held on said brackets, and electrode *b′*, substantially as described.

4. The combination of a diaphragm carrying an electrode, a suspended and adjustable induction-coil having an electrode, and a carbon block between said electrodes, substantially as shown and described.

5. The combination of a diaphragm, B, induction-coil E, having a projecting core, electrodes interposed between the diaphragm and coil, and magnetic bar I, substantially as described.

6. In a telephonic transmitter, the combination of a diaphragm and an induction-coil arranged to regulate by its gravity the force of contact between the electrodes and to dampen the prolonged vibrations of said diaphragm, substantially as set forth.

7. The combination of diaphragm B, induction-coil E, having core e^2, electrodes interposed between the diaphragm and coil, and magnetic bar I, substantially as shown and described.

8. The combination of diaphragm B, induction-coil E, having core e^2, electrodes interposed between the diaphragm and coil, bar I, and ear piece or tube K, substantially as shown and described.

9. The combination of diaphragm B, the pivoted or suspended induction-coil E, having core e^2, electrodes interposed between the diaphragm and coil, and adjustable bar I, substantially as shown and described.

10. The combination of diaphragm B, pivoted and adjustable induction-coil E, electrodes interposed between the diaphragm and coil, and adjustable bar I, substantially as shown and described.

11. In a telephonic transmitter, the combination, with the induction-coil E, of core e^2, nut F, and screw G, substantially as shown and described.

12. The combination of diaphragm B, carrying electrode *b*, and brackets C C, the adjustable induction coil E, carrying electrode *b′*, and the carbon block D, supported upon said brackets, and presenting diametrical points of contact to the electrodes, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY CLAY.

Witnesses:
S. J. VAN STAVOREN,
C. W. WILLIAMS.