

(Model.)

A. E. DOLBEAR.

Mode of Transmitting Sound by Electricity.

No. 240,578.

Patented April 26, 1881.

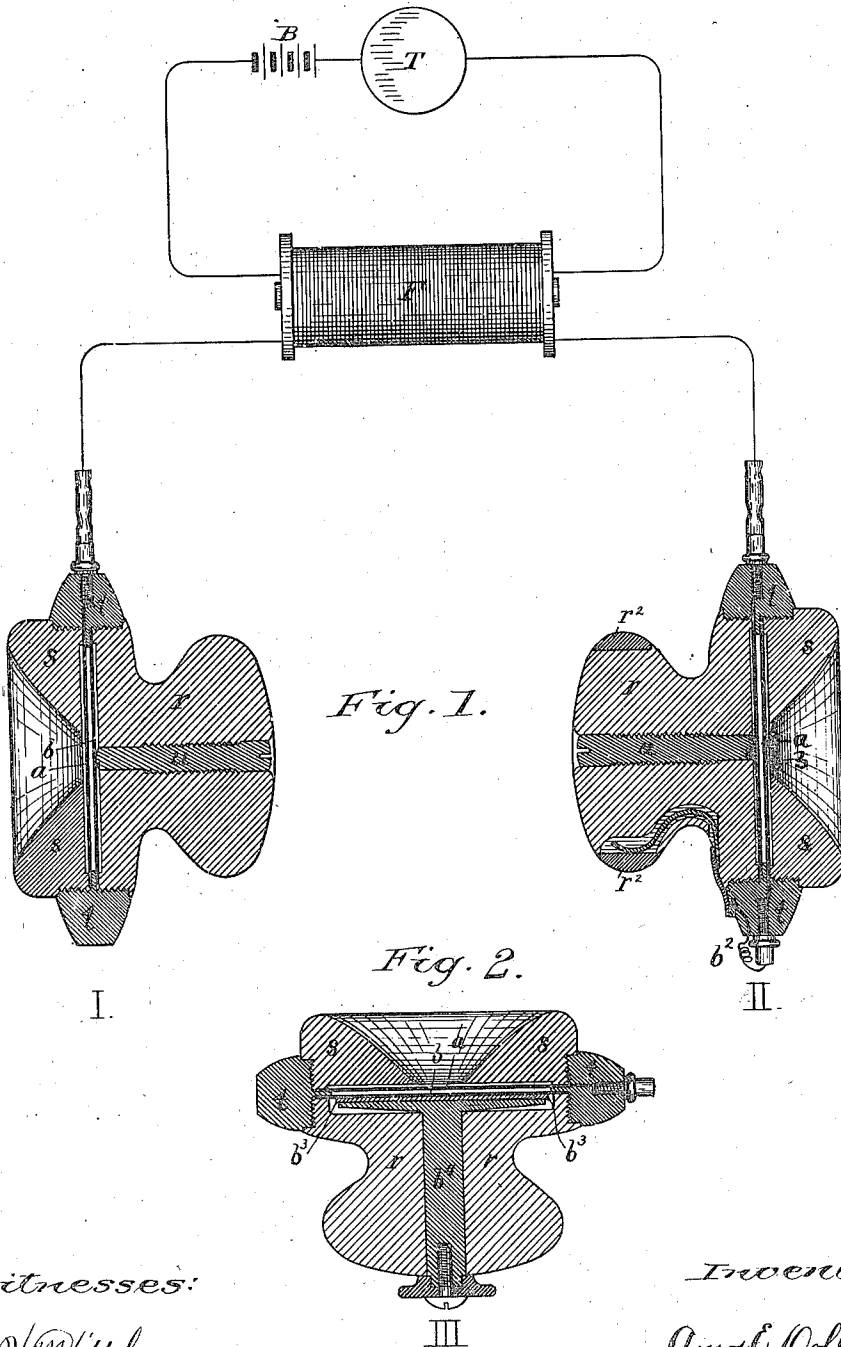


Fig. 1.

Fig. 2.

III

Witnesses:

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MODE OF TRANSMITTING SOUND BY ELECTRICITY.

SPECIFICATION forming part of Letters Patent No. 240,578, dated April 26, 1881.

Application filed February 24, 1881. (Model.)

To all whom it may concern:

Be it known that I, AMOS E. DOLBEAR, of Somerville, in the county of Middlesex and State of Massachusetts, have invented a new mode of Transmitting Sounds by Electricity, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, making a part hereof.

My invention consists, mainly, in a new mode of transmitting articulate and other sounds by an open circuit.

It also consists in new apparatus for this purpose.

My receiver is based upon the discovery that one terminal of an open circuit will attract and be attracted by a neighboring body when the terminal is charged.

Figure 1 shows two modifications of my receiver, in section, connected in circuit with a transmitter and induction-coil. Fig. 2 shows another modification of my receiver.

Three forms of my receiver are shown in the drawings. In each the casing is formed of three pieces, *r* being the back-piece, *s* the ear-piece, and *t* the connecting-piece, which connects *r* and *s* together. The plate *a* of receiver I is a thin elastic disk, preferably of iron, the vibrations of which reproduce the sound which causes the diaphragm of the transmitter T to vibrate, T representing a transmitter of suitable construction, the form preferred being that shown in my application for a patent filed May 31, 1880, the transmitter T and the battery B being in circuit with the primary coil, as will be clear without further description.

In receiver I the plate *a* is one terminal of the secondary coil F, and any change in the electrical state of coil F varies the potential of this plate *a* in receiver I and causes it to attract plate *b*, which is mounted close to, but not in contact with, plate *a*; but as plate *b* in receiver I is so mounted that it cannot vibrate, plate *a* will vibrate as its potential varies. In receiver I the plate *b* and back-piece *r* and adjusting-screw *u* are all of metal.

It will be seen that neither the plate *b* nor back-piece *r* nor screw *u* of receiver I is connected to the coil F, but that only one terminal of coil F—viz., plate *a*—forms any part of the receiver I. The plate *b* may be made in

one piece with back-piece *r*; but for purposes of adjustment is best made as shown.

The force of the attraction between the charged terminal *a* and any neighboring body is slight, unless the neighboring body is many times larger than the terminal and itself capable of being readily electrified, and for this reason, when the neighboring body is a plate, (as it is best made for purpose of adjustment,) it should be electrically connected with a larger body. Consequently the back-piece *r* of the case of receiver I is made of metal, and is in metallic contact with plate *b*. The neighboring body, which is attracted by plate *a* in receiver I, (being, in fact, the plate *b*, piece *r*, and screw *u*, which are all of metal and in metallic contact,) acts as one body in this receiver I; but, as will be clear, the back-piece *r*, plate *b*, and screw *u* may be one single piece of metal, and some other provision be made for the necessary adjustment.

In receiver I I the terminal *a* is mounted upon back-piece *r*, so that it cannot vibrate, and must therefore be insulated. Consequently the back-piece *r* is made of hard rubber. The plate *b*, which is the neighboring body in receiver I I, is connected by the wire *b*² with a metal band, *r*², upon back-piece *r*, in order to increase the attractive force due to the electrification of a greater mass than plate *b*, and without interfering with the proper vibration of plate *b*, which, in receiver I I, vibrates as the potential of terminal *a* varies.

It will be clear that either of the plates *b* may be grounded, and thereby increase the electrification of these plates; but it is not necessary to ground either of them, and the audibility of the sounds reproduced is practically as great when the back-piece of the receiver is held in the hand as when the plates *b* are both grounded; and it makes no difference whatever whether both be grounded or only one. In other words, receiver I will reproduce articulate and other sounds, even if back-piece *r* be of hard rubber or other non-conductor and plate *b* be wholly disconnected from coil F, but the sounds reproduced are faint, although distinct and audible. The sounds will be louder if the piece *r* be of metal, as above described, or if the plate *b* or metallic piece *r* be grounded; but the difference is very slight, the sounds being practically as loud when the

metal piece *r* is used as when the plate *b* is grounded. And so of receiver I I the sounds are distinct and audible when wire *b'* and metal band *r'* are omitted, but louder when metal band *r'* and wire *b'* are used, as shown, or when plate *b* of receiver I I is grounded. Moreover, the reproduction of sound by receiver I does not depend at all upon the grounding of any part of receiver I I, for receiver I will act with plate *b* of receiver I I not grounded precisely as it does when plate *b* of receiver I I is grounded, and receiver I I will act when plate *b* of receiver I is not grounded precisely as it acts when that plate of receiver I is grounded.

In my application filed October 31, 1880, I have described a receiver in which both the plates *a* and *b* are connected with the coil F, and I therefore disclaim in this application any receiver having both the plates connected with that coil, my present invention consisting in a receiver in which only one terminal of the coil is used, as above explained.

Instead of making plate *b* of metal and connecting it metallically with back-piece *r* or band *r'*, it may be made of any non-conductor, and in this case the increased loudness is produced by electrifying plate *b* before it is put in place; or, as shown in receiver I I I, where *b* is a rubber plate, and *b'* is a disk of felt fast to the hard-rubber support *b'*, which is turned by the thumb and finger to electrify rubber plate *b* by friction.

What I claim as my invention is—

In combination, a primary coil in circuit with battery B and transmitter T, and a secondary coil with its enlarged terminal *a* mounted in case *r s t*, and arranged near plate *b*, plate *b* being also mounted in case *r s t*, but not connected with the secondary coil, all substantially as described.

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Witnesses:

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