(No Model.)

J. & H. M. GOODMAN.

TELEPHONE TRANSMITTER.

No. 525,201. Patented Aug. 28, 1894.

Fig. 1.

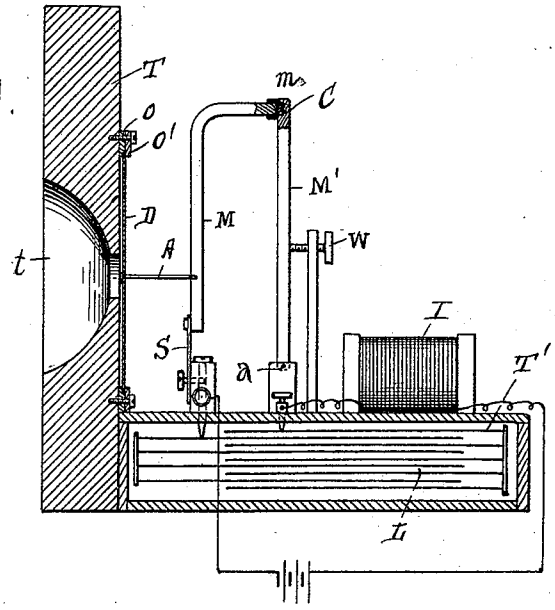


Fig. 3.

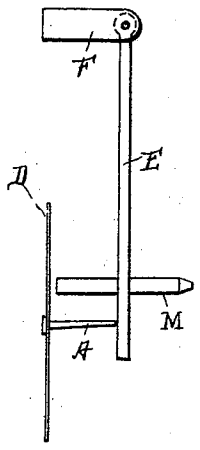


Fig. 2

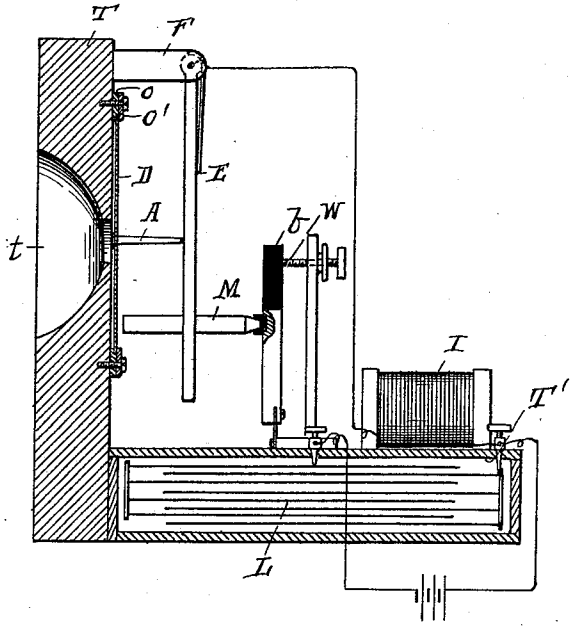
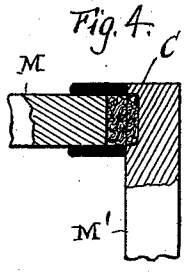


Fig. 4.



WITNESSES

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JOHN GOODMAN AND HENRY M. GOODMAN, OF LOUISVILLE, KENTUCKY.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 525,201, dated August 28, 1894.

Application filed May 1, 1894. Serial No. 509,686. (No model.)

To all whom it may concern:

Be it known that we, JOHN GOODMAN and HENRY M. GOODMAN, both citizens of the United States, and residents of the city of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Telephone-Transmitters; and we do declare the following to be a full, clear, and exact description of the invention, such as 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 letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a side elevation of the invention, partly sectional and partly diagrammatic. Fig. 2 is a side elevation of modification partly in section and partly diagrammatic. Fig. 3 is a detail of modification when the arm A impinges upon lever E below magnet. Fig. 4 is a detail of receptacle containing the magnetic material.

This invention appertains to that class of telephone transmitters in which the opposite poles of two magnets are approximated, with intervening magnetic particles, one of the magnets being mechanically related or connected to a vibratory diaphragm.

The invention consists in arranging the movable magnet of the pair in such a manner as to receive the impulses propagated from the diaphragm on the principle of a lever, such impulses being thereby increased or diminished according to the point at which the mechanical connection is made. When the movements of the magnet are amplified, the sounds heard in a receiver are increased in volume; when diminished, they are more sharp and accentuated.

Referring to the accompanying drawings, Fig. 1, represents one form of an instrument embodying our invention, the letter T designating a frame having a mouth piece *t* in its vertical portion, and a cavity or receptacle T′ in its base in which is an electrical condenser L.

D is the diaphragm resting upon supports *o*, *o*′.

M′ is a stationary magnet which is movably supported at *a*, and whose relative position is regulated by a suitable adjustment, such as the screw W.

M is a movable or vibratory magnet, connected to the diaphragm D by a rod or arm A, or other medium which will transmit the movements of the diaphragm to the said magnet. Said magnet is also affixed to the base of the frame by a movable or flexible attachment S.

C designates a body or mass of magnetic material in a comminuted state, and placed between the opposite poles of the magnets.

It will be observed that the movement of that part of the magnet M corresponding with the connection A, will be the same as that of the diaphragm, but that from such part thereof to the distant extremity the arc of movement will gradually increase. The magnet in this case acts as a lever of the third kind, the fulcrum being at S, the power at *a*, and the weight at *m*, but it may be made to constitute a lever of the first kind with the same result, the power acting at *a*, with the fulcrum a short distance beyond. A lever of the first kind may be substituted when it is desired to decrease the arc of movement at *m*.

It is not necessary that the whole of the beam of the lever should be magnetic, but a part, or even a whole, may consist of other metal; in this latter event the beam of the lever acts simply as a carrier for the magnet.

I is an induction coil having its primary in the local circuit.

B indicates the battery.

The path of the current is from the battery through the primary of the induction coil, thence through the magnet M′, magnetic material C, magnet M and its lever, and back to battery. The condenser L forms a shunt of the circuit.

The relative position of the magnets to each other, or to the horizon, may be varied.

Fig. 2 shows a modified form of the instrument wherein the movable magnet M is carried by a beam or lever E, depending from an arm F of the frame to which it is attached by any suitable form of movable joint. The arm or rod A in this case is not connected to the said beam or lever, the latter being held in contact therewith by gravity, or, if necessary, gravitation may be aided by a spring. As thus arranged, the movement of the mag-

net is augmented as compared with that of the diaphragm, but if the arm A should be made to impinge upon the beam or lever E below the magnet, as shown in Fig. 3 the arc of movement will be reduced.

b is a non-magnetic extension of the magnet M′ for the accommodation of the mechanical adjustment at W.

It will be observed that the current need not pass through the diaphragm, hence we are at liberty to construct this of any suitable material, either conductive or non-conductive.

In our Patent No. 518,142, dated April 10, 1894, and in our applications, Serial No. 498,019, filed January 25, 1894, and Serial No. 497,539, filed January 20, 1894, we have set forth and claimed telephone transmitters wherein two magnets are placed with their opposite poles approximated, with intervening comminuted magnetic material, but in such instruments the movable magnet is not related to the diaphragm upon the principle of a lever.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A telephone transmitter, consisting essentially of two magnets having their opposite poles opposed to each other, a mass of magnetic material in a comminuted state between such poles, and a vibratory diaphragm connected with one of said magnets, the movable magnet being mechanically related to the diaphragm upon the principle of a lever, whereby the movements of said magnet may be augmented or diminished relatively to the movements of the diaphragm, substantially as specified.

2. In a telephone transmitter, the combination with a vibratory diaphragm, of a magnet movable about a fulcrum, a connection between said magnet and the diaphragm, whereby the movement of the magnet is either augmented or diminished relatively to the movement of the diaphragm according to the relative relations of the points of fulcrum and diaphragm connection, and a mass of magnetic material in a comminuted state acted upon by the pole of the said magnet, and forming a part of the local circuit, substantially as specified.

3. A telephone transmitter having a magnet mechanically connected to a vibratory diaphragm, and movable about a fulcrum, whereby the movement of the pole of said magnet may be augmented or diminished according to the relative relations of the points of fulcrum and diaphragm connection, a second magnet having one of its poles approximated to the opposite pole of the first magnet at substantially right angles thereto, and magnetic material in a comminuted state, interposed between the approximated poles, substantially as specified.

4. A telephone transmitter, having a vibratory diaphragm, a pair of magnets with their opposite poles approximated, a mass of comminuted magnetic material between the said poles, one of said magnets being movable about a fulcrum, a connection between such magnet and the diaphragm, an induction coil having its primary coil in the local circuit, and an electric condenser forming a shunt of the circuit, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN GOODMAN.
HENRY M. GOODMAN.

Witnesses:
J. W. HELM,
H. A. COTTELL.