

(No Model.)

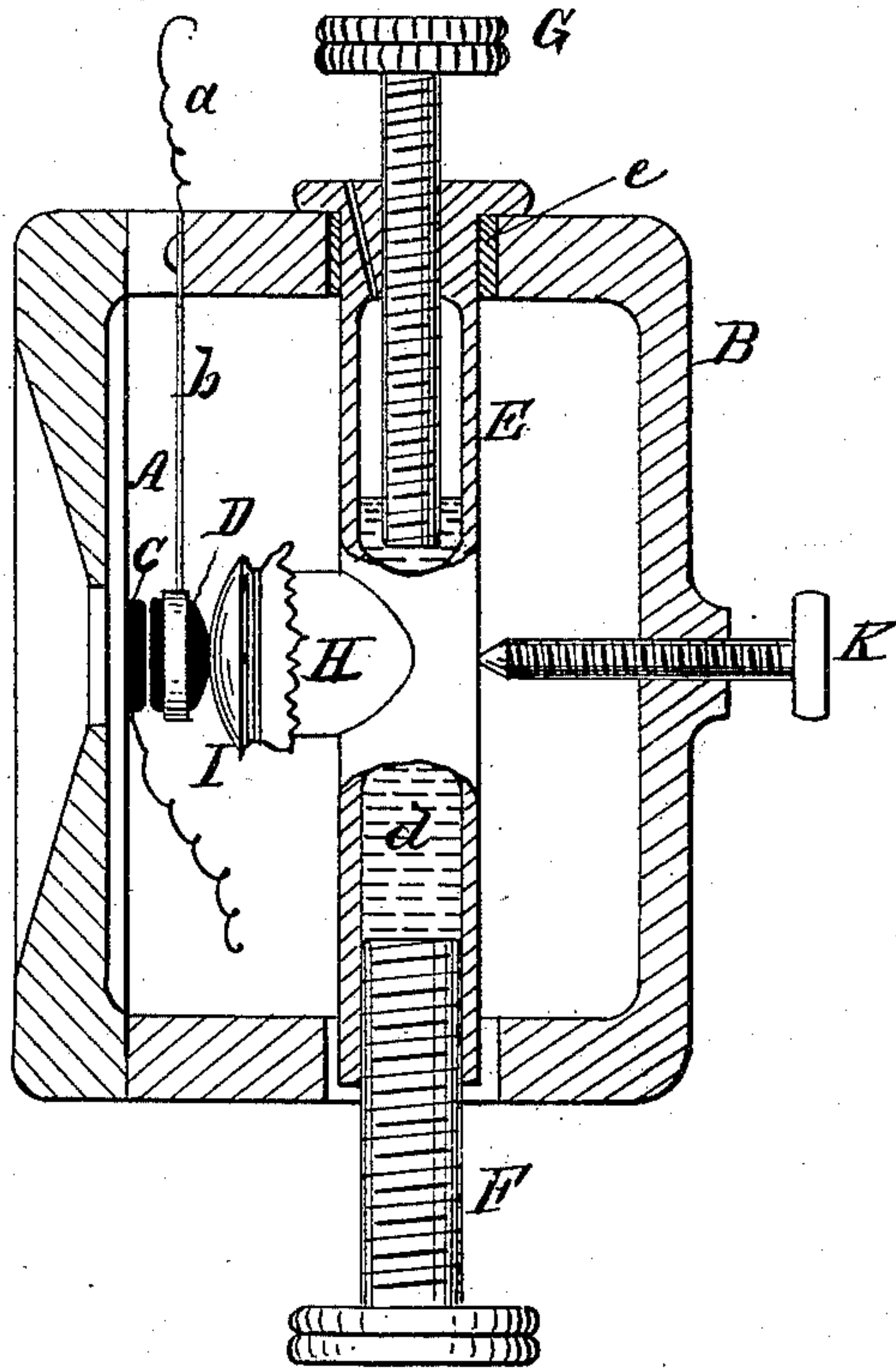
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G. M. HOPKINS.  
TELEPHONE TRANSMITTER.

No. 257,332.

Patented May 2, 1882.

*Fig. 1*



WITNESSES:

*E. L. Topliff*  
*James J. Torrey*

INVENTOR:

*Geo. M. Hopkins*

(No Model.)

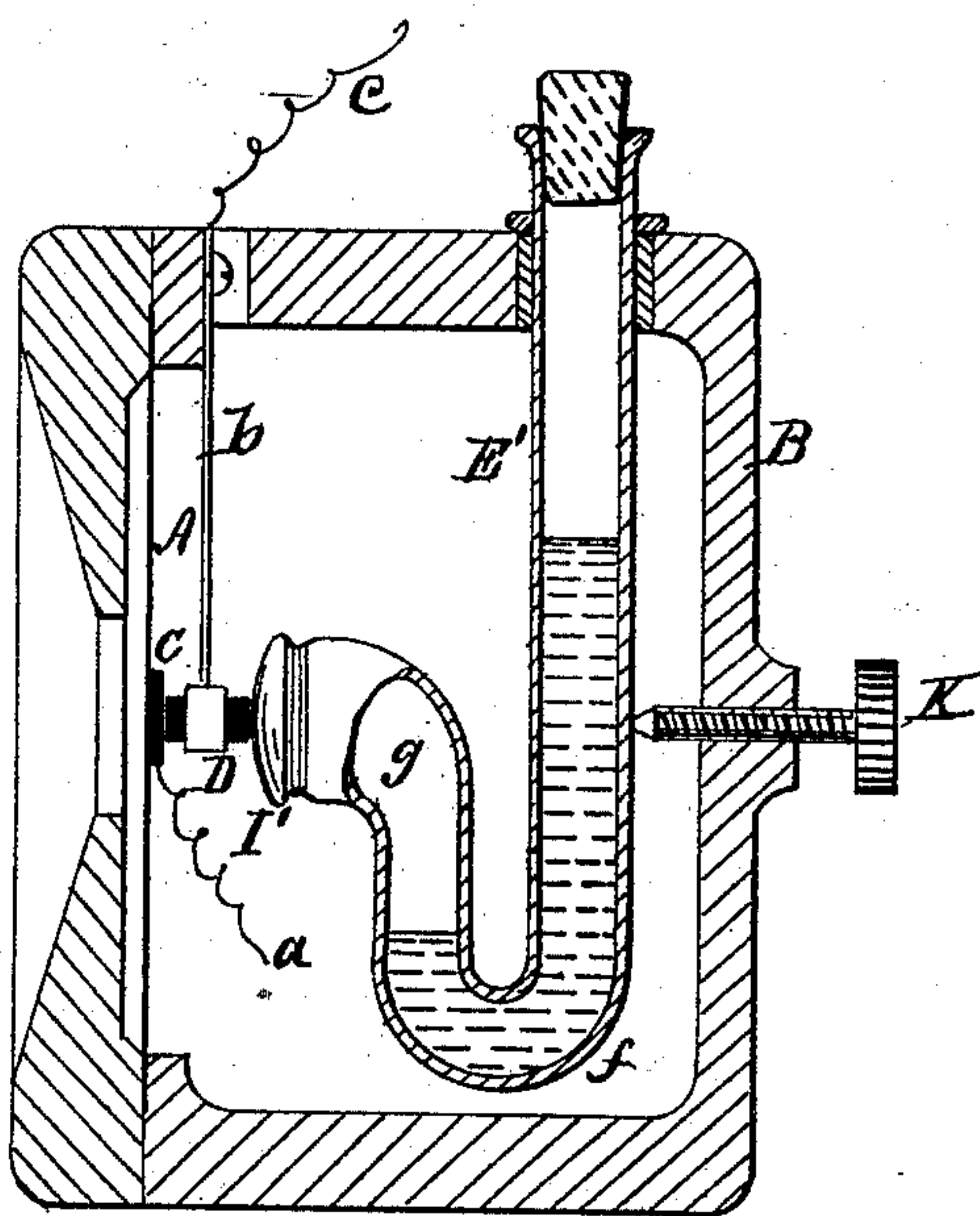
2 Sheets—Sheet 2.

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*Fig. 2*



WITNESSES:

*E. L. T. Luff*  
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*Geo. M. Hopkins*



# UNITED STATES PATENT OFFICE.

GEORGE M. HOPKINS, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PEOPLE'S TELEPHONE AND TELEGRAPH COMPANY, OF NEW YORK.

## TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 257,332, dated May 2, 1882.

Application filed May 31, 1880. Renewed August 6, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. HOPKINS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Telephone-Transmitters; 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.

Figure 1 in the drawings is a central vertical section of one of my improved transmitters. Fig. 2 is a modified form.

My invention relates to the class of telephone-transmitters in which two solid electrodes are used, one being attached to or connected with the diaphragm, so as to vibrate with it, the other being pressed into light contact with it; and it consists in a device for applying hydrostatic pressure to one of the electrodes to press it into contact with the other electrode.

In Fig. 1 in the drawings the diaphragm A, mounted in the case B, carries an electrode, C, of carbon, metal, or other electrical conductor, which is connected with the induction-coil or battery of the primary circuit by the wire *a*. An electrode, D, of carbon, metal, or other conductor of electricity, is suspended from the top of the case B by a slender spring, *b*, this spring being connected with one of the wires of the primary circuit by the wire *c*. A tube, E, suspended from the top of the case B, has a screw, F, entering the lower end and projecting upward, entirely filling the bore of the tube and supporting a column, *d*, of some heavy liquid, preferably mercury. A screw, G, enters the top of the tube and projects downward into the mercury. This screw is smaller in diameter than the bore of the tube E, and is designed for displacing the mercury to increase the depth of the same should it be required.

At about the middle of the length of the tube E projects a tube, H, at right angles to tube E, over the outer end of which is fastened a diaphragm, I, of very thin membrane or flexible rubber. The diaphragm is rendered outwardly convex by the pressure of the mer-

cury column. The convexity will be increased within certain limits by raising the column of mercury by means of the screw F, or by displacing the mercury by means of the screw G.

The tube E, containing the mercury, is surrounded at its upper end by a soft-rubber ring, *e*, to admit of moving the tube laterally by means of the screw K, projecting through the back of the case B. The diaphragm I is allowed to press lightly upon the electrode D to keep it in contact with the electrode C.

The pressure of the sound-waves on diaphragm A and the counter-pressure of the mercury thereon serve to move the electrode D in opposite directions. This operation varies the contact sufficiently to transmit articulate speech. The contact of the two electrodes may be made light or heavy by changing the height of the mercury column, or by adjusting the tube by means of the screw K.

In the modification shown in Fig. 2 the diaphragm A, case B, and electrodes C D, and adjusting-screw K are arranged in the same way as in Fig. 1; but the tube E is made in the form of an inverted siphon, and is provided with the flexible diaphragm I', which presses the electrode D. Mercury poured into the open end of the tube E' fills the bend F, and incloses a volume of air between it and the diaphragm I'. The air forms a more elastic pressure than the mercury, and may be used in some cases where a very sensitive transmitter is required. The operation of this transmitter is the same as the one previously described. The pressure of the diaphragm I' against the electrode D may be increased or diminished by increasing or diminishing the quantity of mercury in the tube E', or by turning the screw K one way or the other.

I am aware that it is not new to combine an air-cushion with a vibratory electrode. I also wish to make no claim in this application upon the combination of a hydrostatic column with a vibratory electrode or screws with a tube and diaphragm for varying the pressure of the mercury on the diaphragm, as these form the subject-matter of other applications.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a telephone-transmitter, a hydrostatic column confined by a flexible diaphragm, in  
5 combination with a movable electrode adapted to receive the pressure of the hydrostatic column through the medium of the flexible diaphragm, as herein specified.

2. In a telephone-transmitter, the tube E,  
10 diaphragm I, and mercury column *d*, in combination with the vibratory electrode D, as specified.

3. In a telephone-transmitter, the combination of the adjusting-screw K and elastic packing *e*, with the tube E, as shown and described. 15

4. In a telephone-transmitter, the siphon-tube E', containing an inclosed air-space, *g*, and provided with a diaphragm, I', in combination with the vibratory electrode D, as herein specified.

GEORGE M. HOPKINS.

Witnesses:

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C. L. TOPLIFF.