

(No Model.)

G. L. ANDERS.
Microphone Transmitter.

No. 238,829.

Patented March 15, 1881.

Fig:1.

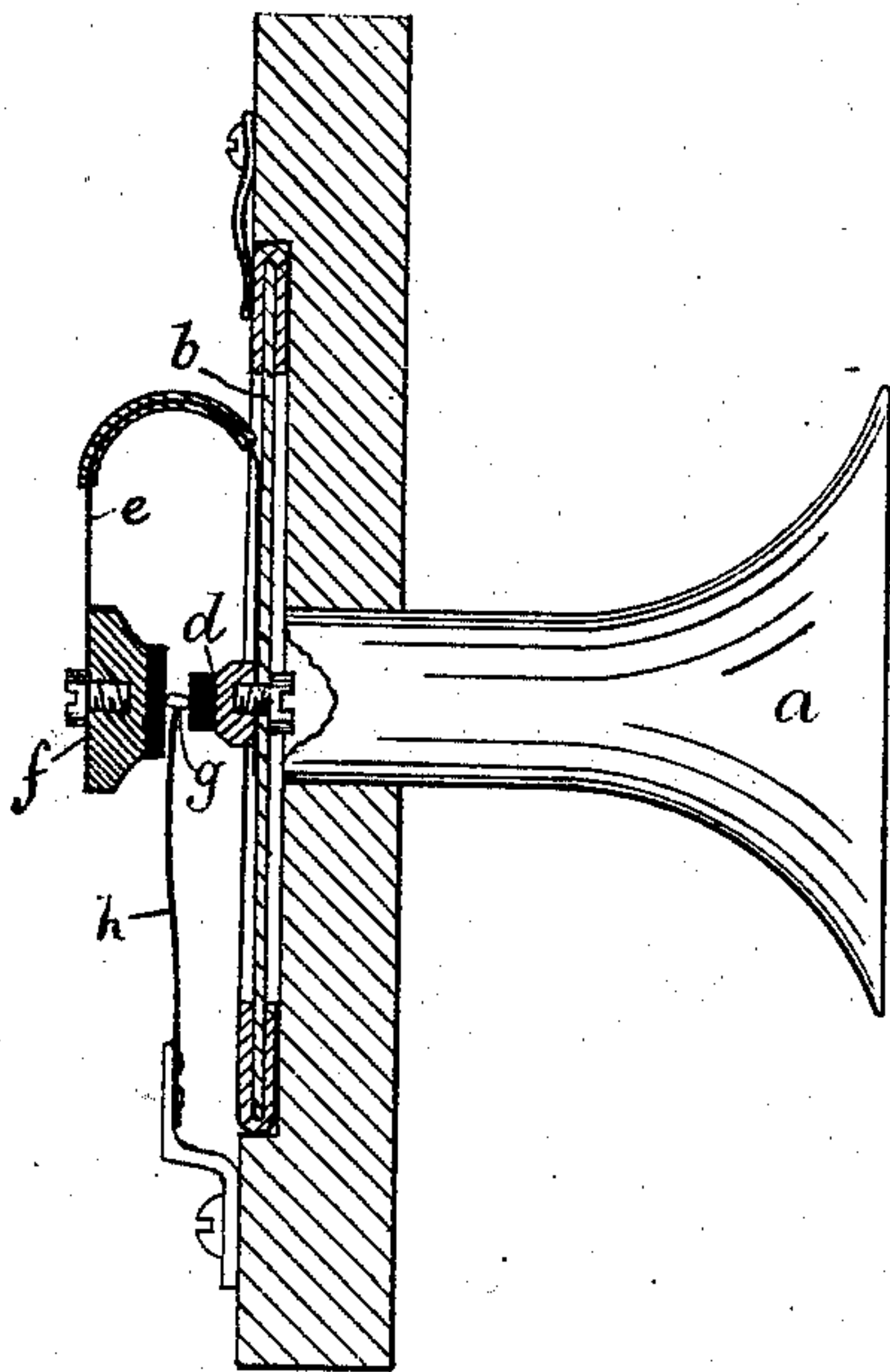
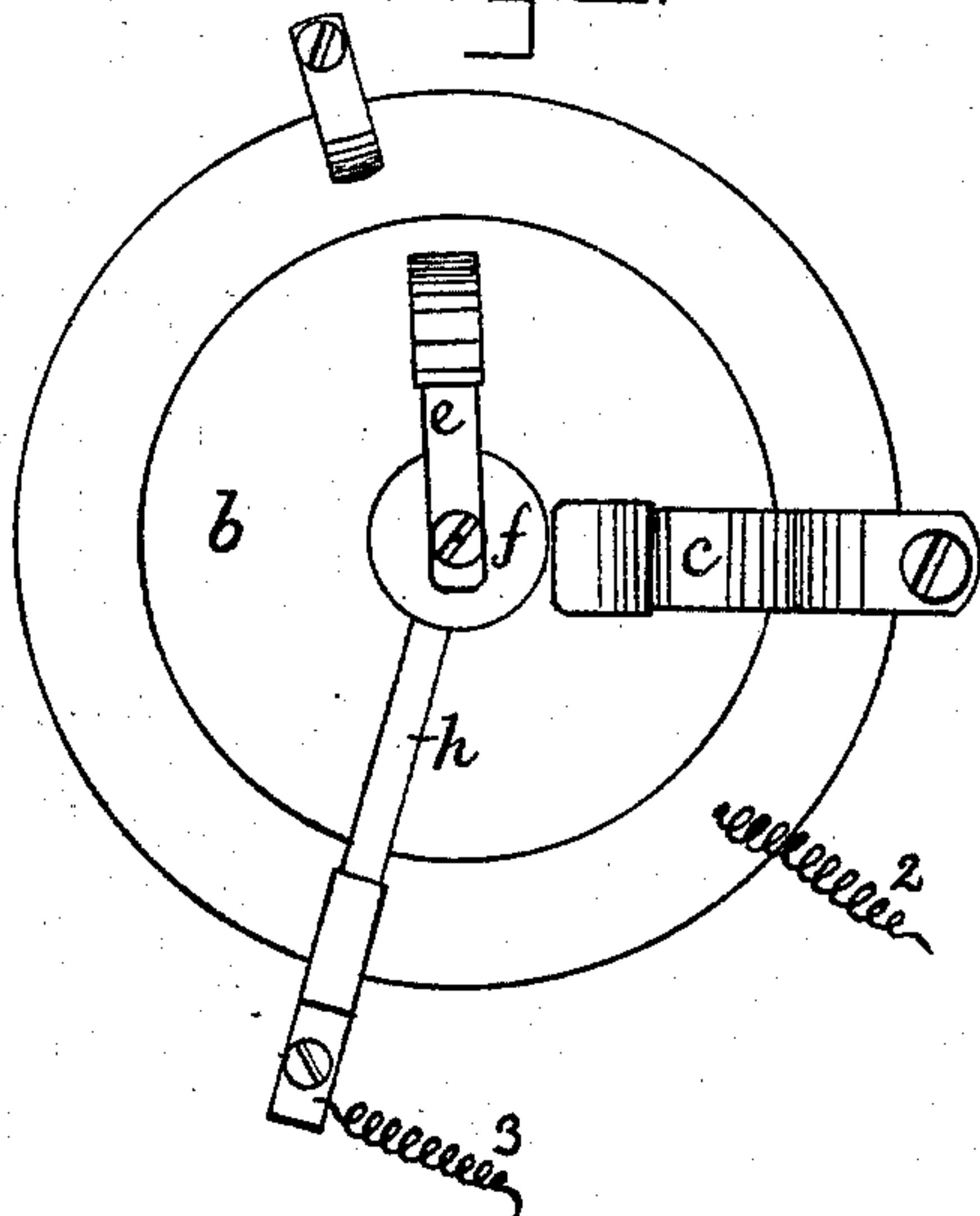


Fig:2.



Witnesses.

L. F. Connor.

Jon. P. L. Lermore.

Inventor.

George L. Anders.

by Crosby & Morgan
Attys

UNITED STATES PATENT OFFICE.

GEORGE L. ANDERS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN BELL TELEPHONE COMPANY, OF SAME PLACE.

MICROPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 238,829, dated March 15, 1881.

Application filed May 14, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE LEE ANDERS, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Microphone-Transmitters, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to a microphone-transmitter for telephones, and has for its object, among other things, to reduce the normal resistance of the electrodes, and also to prevent the breaking of the circuit and consequent confusion of sound produced by the transmitters now in use when the speaker is too near the mouth-piece or speaks in too loud a tone.

In the present invention one of the electrodes (shown as of carbon) is divided, and the other electrode (shown as of platinum) is interposed between the portions, so as normally to be in contact with both, and both portions of the divided electrode are connected with the same pole of the battery, so that the current flows from both sides to the interposed metallic electrode. This arrangement is not, however, broadly, new, a telephone-transmitter having been heretofore devised having a metallic electrode interposed between two vibratory diaphragms carrying carbon contact-points at the centers. In the present invention, however, the portions of the divided electrode are carried by the diaphragm, so as to partake of the vibration of the same, and the intermediate electrode or vibrating point, which is supported at the end of a small spring, as in the telephone referred to, has a normal pressure toward one portion of the divided electrode. The result of these dispositions is to keep the vibrating point or intermediate electrode with greater certainty always in contact with one portion, at least, of the divided electrode.

Another novel feature of the present invention consists in the method of suspending the electrode against which the vibrating point presses the said electrode, which is weighted, as usual, to resist, by its inertia, the rapid vibrations of another point, caused by sound-waves, so that the said vibrations will cause variations in pressure between the said vibrating and weighted points, being supported at

one end of a flexible spring that is curved into U shape, and connected at its other end with the vibrating point at the center of the usual diaphragm. By this arrangement the vibrating point at the center of the diaphragm and the weighted point (shown as both of carbon) are opposite but not in contact with one another, and are electrically connected by the supporting-spring, so that an electric current flows from both of them to the other electrode, which is placed between and in contact with both of them. When supported in this manner the weighted point follows, or rather accompanies, the diaphragm in all its slow movements, and consequently always remains in proper adjustment therewith, the initial or normal pressure being determined, once for all, by the stress of the flexible supporting-spring. An incidental advantage derived from this construction is that the position of the transmitter can be greatly varied without detriment to its operation, while in many of the transmitters in use a very slight change in position will throw them out of adjustment enough to seriously impair their effectiveness. With this transmitter a whisper can be heard, while a shout or loud tone close to the mouth-piece does not cause the instrument to break, but gives a distinct sound.

Figure 1 is a central vertical section of a microphone or battery transmitter embodying my invention, and Fig. 2 a rear elevation thereof.

The mouth-piece *a*, diaphragm *b*, and damper *c* are of any usual construction.

At the middle of the diaphragm *b*, which is electrically connected, as by wire 2, with one pole of the battery, is secured an electrode, *d*, of any suitable material, and at the same point is attached one end of a U-shaped spring, *e*, upon the other end whereof, opposite to the point *d*, is supported a weight, *f*, to resist, by its inertia, vibration of the point *d*, so that the latter, in its vibration, will cause the proper variations in pressure between either or, as herein shown, both of the points *d* *f* and the point *g* placed between and in contact with both of the said points and forming the other electrode, being supported on the spring *h*, connected by wire 3 with the other pole of the bat-

tery. As herein shown, the weight *f* is provided with a carbon button, and electrically connected, by the spring *e*, with the diaphragm *b* and point *d* thereon, so that the electric
 5 current from the wire 2 divides and flows from both *d* and *f* to the electrode *g*, thus reducing the resistance to the passage of the current to one-half what it would be if it only
 10 flowed from one of the points *d* or *f* to the point *g*. The spring *h* is so set as to give the point *g* a greater pressure toward one of the points *d* *f* (preferably *d*) than toward the other, and with this construction it is scarcely possible to absolutely break the circuit between the
 15 electrodes and cause the confusion of sound now common when the speaker is too near the mouth-piece or uses too loud a tone of voice.

It will be readily understood that the normal or initial pressure of the electrodes depends upon the stress of the spring *e*, and that
 20 any change in position of the diaphragm in its frame or warping thereof does not throw the electrodes out of adjustment. The position of the whole apparatus can also be varied
 25 through wide ranges without interfering with its proper operation.

It is obvious that either of the points *d* or *f* may be insulated and the current flow through but one contact in the usual manner, or, on
 30 the other hand, the electrodes may be still further divided, the terminals of the branches of one being placed between those of the other, and thus still further reduce the resistance for any given pressure. As an example of the
 35 last-named construction, the electrode *g* might be divided, (two similar beads on two supporting-springs, like *h*, being used,) and a carbon button be suspended between the two portions of said electrode *g* by a U-shaped spring, similar to *e*, but of less width between the branches.
 40 The carbon could be in contact with either or both portions of electrode *g*. The distance between the branches of the outer spring, *e*, would be increased to admit the additional button and
 45 electrode.

I claim—

1. In a microphone or contact-telephone, a divided electrode, with both portions carried by the diaphragm or vibratory plate, in com-

bination with a second electrode interposed 50 between said portions, and operating in connection therewith, substantially as described.

2. In a microphone or battery transmitter, the combination, with the diaphragm, of the weighted point suspended upon a flexible support, itself connected with the center of the diaphragm opposite said weighted point, substantially as described. 55

3. In a battery-transmitter, the combination of the diaphragm or vibratory surface, bent or 60 U-shaped spring, and a weighted point, one end of said spring being connected with the diaphragm, and the other with said weighted point, substantially as described.

4. In a microphone, the combination, with a 65 divided electrode consisting of two points at the ends of different branches of an electric circuit, of a second electrode interposed between and in contact with both of the said points, and having a normal pressure toward 70 one of them, substantially as and for the purpose described.

5. In a microphone, the diaphragm and an electric contact-point thereon, combined with a 75 U-shaped spring connected at one end with the said diaphragm, and a weight supported on the other end of the said spring, opposite to the said contact-point, and pressed by the said spring against an electrode placed between the said contact-point and the weight, 80 substantially as described.

6. In a microphone, the diaphragm, an electric contact-point thereon, and a weighted electric contact-point supported at the extremity 85 of a U-shaped spring opposite to and in electrical connection with the point on the diaphragm, the said two points thus forming a single electrode, combined with another electrode between and in contact with both the said contact-points, substantially as described. 90

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE LEE ANDERS.

Witnesses:

JOS. P. LIVERMORE,
 N. E. C. WHITNEY.