

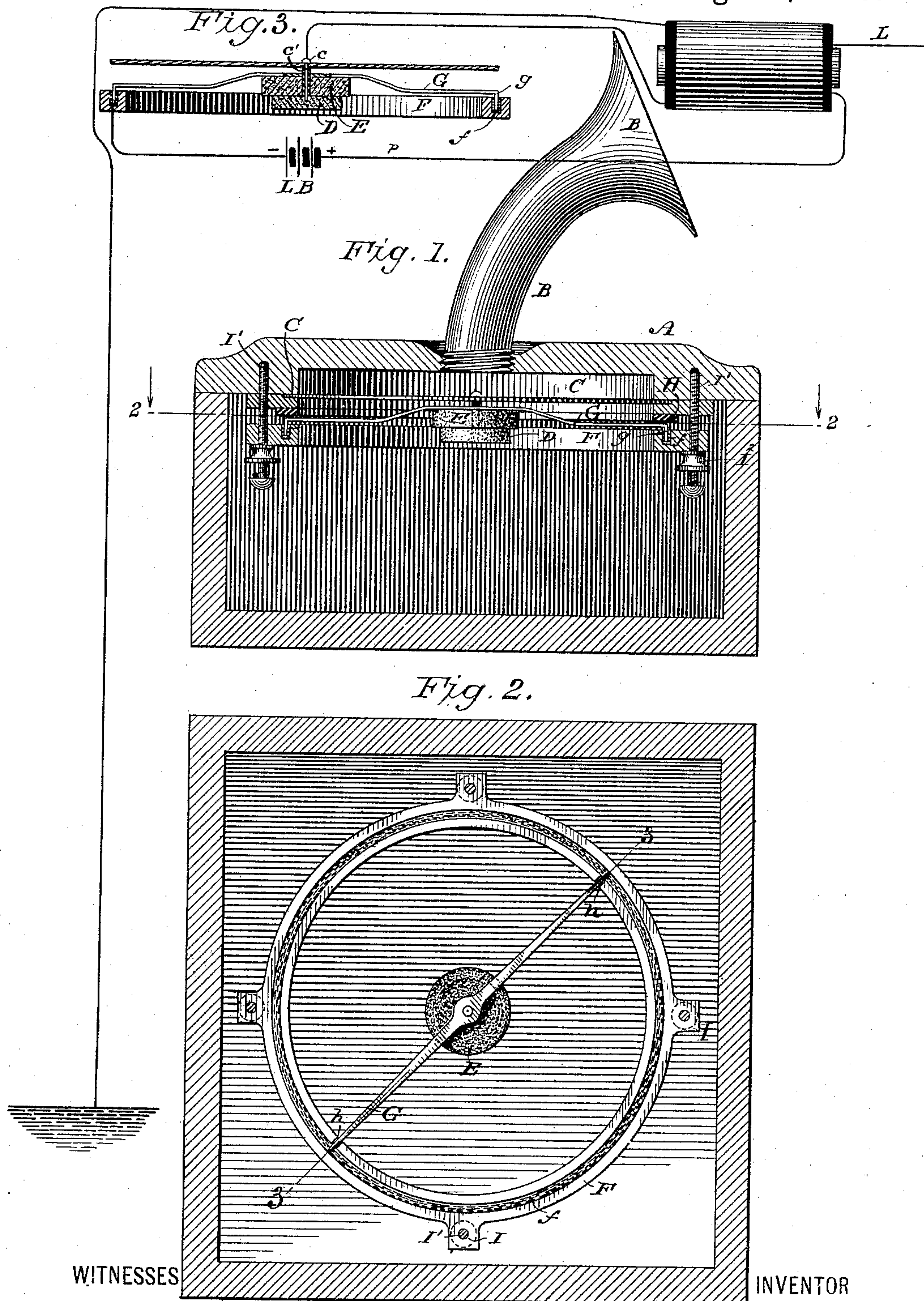
(No Model.)

2 Sheets—Sheet 1.

T. J. PERRIN,
TELEPHONE TRANSMITTER.

No. 324,729.

Patented Aug. 18, 1885.



WITNESSES

INVENTOR

Ed. A. Newman,
Cel. C. Newman.

By his Attorneys Thomas J. Perrin
Daldwin, Hopkins & Pappas.

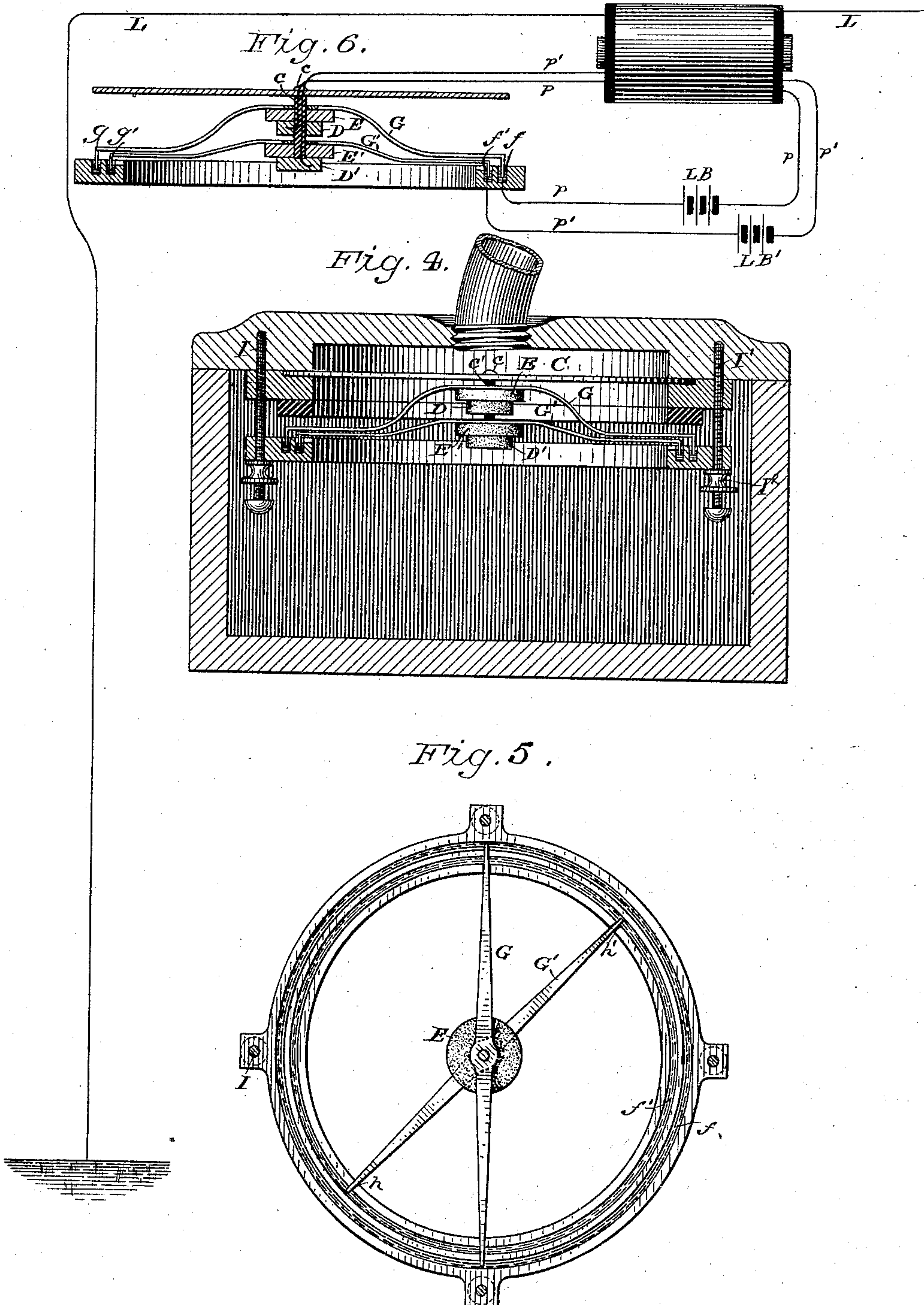
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UNITED STATES PATENT OFFICE.

THOMAS J. PERRIN, OF NEW YORK, N. Y., ASSIGNOR TO THE NATIONAL IMPROVED TELEPHONE COMPANY, OF NEW ORLEANS, LOUISIANA.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 324,729, dated August 13, 1885.

Application filed March 27, 1885. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. PERRIN, of New York city, State of New York, have invented certain new and useful Improvements in Telephonic Transmitters, of which the following is a specification.

My invention relates to that class of transmitters in which the electrodes rest in contact by gravity; and the primary object of the invention is to provide a connection between the loose electrode and the conductor of the primary circuit in which it is placed which will permit the free jostling or rotation of the electrode around its support without in any way impairing its connection with the circuit.

In the accompanying drawings, Figure 1 is a vertical section through one form of my improved instrument in which a single pair of electrodes for connection in a single primary circuit are employed. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1. Fig. 3 is a detail view showing the diaphragm and electrodes. Fig. 4 is a transverse vertical section through another form of instrument, in which two pairs of electrodes are employed. Fig. 5 is a horizontal section through the same; and Fig. 6 a detail view of the diaphragm and electrodes of the same, showing the circuit-connections.

A is the case of the instrument, which is of any ordinary construction, and is provided with a curved mouth-piece, B, which is secured in the top of the case centrally over the horizontal diaphragm C.

Referring now specially to Figs. 1, 2, and 3, the diaphragm carries a downwardly-projecting pin, *c*, on the lower end of which is secured a contact button or electrode, D, of any suitable material—preferably carbon. The opposite contact or electrode E rests loosely upon the upper face of the button D, and is centrally bored for the passage of the pin *c*. Where the connection of the primary circuit is from the diaphragm through the pin, the pin may be a conductor of electricity, as shown in Fig. 3, in which case it should be covered with an insulating-sleeve, *c'*, to prevent electrical contact with the button E; or the pin itself may be a non-conductor of electricity, as illustrated in Fig. 6, in which event a wire or conductor should pass through it to make contact with the under button, D.

An annular ring or frame, F, is arranged below the diaphragm around and concentrically with the support of the electrodes. In the upper face of this ring an annular channel or well, *f*, which is also concentric with the pin which supports the electrodes, is formed. A thin light metal strip or arm, G, is secured upon the upper face of the contact-button E. This arm is preferably shaped as shown in the drawings, so as to project radially from the button on opposite sides to give a proper balance. Its outer ends are either turned down at *g* to dip into the annular channel *f*, or are provided with independent platinum or steel pins for this purpose. The channel *f* is for the reception of some suitable conducting fluid—preferably mercury—with which the ends *g* of the arm G are in electrical contact.

The circuit-connections are shown in Fig. 3. The primary circuit *p* runs from the + pole of the local battery LB through the induction-coil, thence to the pin *c*, electrode D, upper electrode, E, metal strip G, and mercury in the annular well *f*, to the opposite pole of the battery. The secondary or main line is marked L. It will be obvious that with this construction the vibration or jostling of the upper electrode, which rests merely by gravity on the under electrode, D, will not in any way disturb its direct electrical connection with the primary circuit, because no matter what amount of motion is imparted to the electrode E around its central pin, the metal strip G will travel with it and always maintain the integrity of the circuit between it and the mercury, and yet the electrode will be perfectly free to move under the action of the vibrations imparted to it through the medium of the diaphragm.

Great objection has heretofore existed to the use of transmitters in which unconfined fluid conductors have been used, for the reason that the transmitter could not be removed or transported in working condition, because there was great danger of throwing the mercury or other conductor out of its cup or chamber, and in the case of mercury producing very serious damage to the instrument. This difficulty is overcome in my present improvement.

The annular ring F, which carries the mercury, is shown as constructed so that it may

be drawn up against an annular soft rubber washer, H, arranged on the diaphragm-support just above the ring. This washer closes the channel *f* completely, and prevents any leakage or spilling of the mercury in transportation. Of course, when the ring is squeezed up against the annular washer H, as will presently be described, the ends of the metal strip G will be interposed between the washer and the upper face of the ring. In order to prevent any possibility of leakage at these points, I form very slight depressions, *h*, in the upper face of the ring for the reception of the ends of the metal strip G, so that the upper face of the ring presents a substantially uniform face, which is pressed up against the rubber washer.

Of course my invention is not dependent upon the specific details for supporting and pressing the ring F up against the rubber washer. I have shown in the drawings the following way of accomplishing this result: The ring is provided with several lugs, I, through which downwardly-projecting bolts I', secured in the diaphragm support or upper face of the case, project. These bolts carry thumb-nuts I², by which the ring F may be adjusted and screwed up tightly against the rubber washer, as described, for transportation. This instrument is a very delicate transmitter, requires no adjustment when once set, and may be screwed up tightly, as described, for transportation, with the mercury or fluid conductor in its receptacle, without danger of spilling the mercury or injury of the instrument.

In Figs. 4, 5, and 6 I have shown an instrument constructed in exactly the same manner as already described, with the exception that I show two pairs of electrodes for connection in two independent primary circuits to act upon a single secondary or main line. In this instrument the pin *c* is of non-conducting material, and carries or has attached to it two buttons or electrodes, D D'. The lower one, D', is carried on its end, and the upper one, D, about midway between its end and the diaphragm. Corresponding electrodes, E E', rest loosely upon their upper faces and carry metal fingers or arms G G', the ends of which respectively travel in wells *f f'*, containing mercury, as already described. In this figure the primary circuit-connections are also made through the diaphragm, and conductors extend through the pin to the electrodes D D'.

The construction of the instrument will be obvious from what has already been said.

These independent pairs of electrodes are connected in independent primary circuits, both of which may be wound in the same induction-coil in connection with a continuous secondary line, as fully set forth in Letters Patent No. 307,728, granted to me November 4, 1884, and specific description or illustration is therefore unnecessary. It will be sufficient for the purposes of this case merely to point out the circuit-connections, which are clearly shown in Fig. 6. The secondary or main line

is represented by L. The primary batteries are marked LB and LB'. The circuit of the battery LB is indicated by *p*, and runs from the battery to the induction-coil, thence to its conductor, through the pin *c*, to its electrode D, thence by way of electrode E, metal arm G, mercury in well *f* to opposite pole of the battery. The other primary circuit is represented by the letter *p'*. It runs from its local battery LB' through the induction-coil, thence to its conductor through the pin *c*, to electrode D', then by electrode E', metal arm G', and mercury in well *f'* to the opposite pole of the battery.

The operation is obvious and will be well understood.

I do not of course limit my invention to the use of two pairs of electrodes, nor to the specific details of construction herein set forth.

I claim as my invention—

1. The combination, substantially as set forth, of the diaphragm, the electrode-supporting pin connected therewith, the bottom electrode, the upper electrode through which the supporting pin passes, the metallic arm carried by the upper electrode, and the mercury-well.

2. The combination of the diaphragm, the electrodes, the ring or frame with the mercury-well, the washer H, and mechanism for clamping the ring up against the washer to seal the well.

3. The combination of the diaphragm, the pairs of electrodes, the upper electrodes of which rest by gravity on the lower ones, the metal strips or conductors carried by the upper electrodes, and the mercury-wells, one for each pair of electrodes, arranged concentrically relatively to the electrodes.

4. The combination of the diaphragm, the transmitting-electrodes, the upper one of which rests loosely by gravity on the lower one, a central pin or guide which passes centrally loosely through and prevents the displacement of the upper electrode, a metal conductor carried by said upper electrode, and a mercury-well, into which said conductor dips, arranged on an arc concentric with said central pin.

5. The combination of a diaphragm, a pin or electrode support secured thereto and projecting therefrom, an electrode fixed on said pin, and the second electrode which rests loosely upon the fixed electrode and through which said pin loosely passes.

6. The combination of a horizontal diaphragm, a depending pin or electrode support carried thereby, an electrode carried by the pin, and a second electrode through which said pin loosely passes resting on the first electrode.

In testimony whereof I have hereunto subscribed my name.

THOMAS J. PERRIN.

Witnesses:

JNO. R. JUDEN,
E. C. DAVIDSON.