

(No Model.)

G. M. HOPKINS.
Telephone Transmitter.

No. 231,226.

Patented Aug. 17, 1880.

Fig. 1

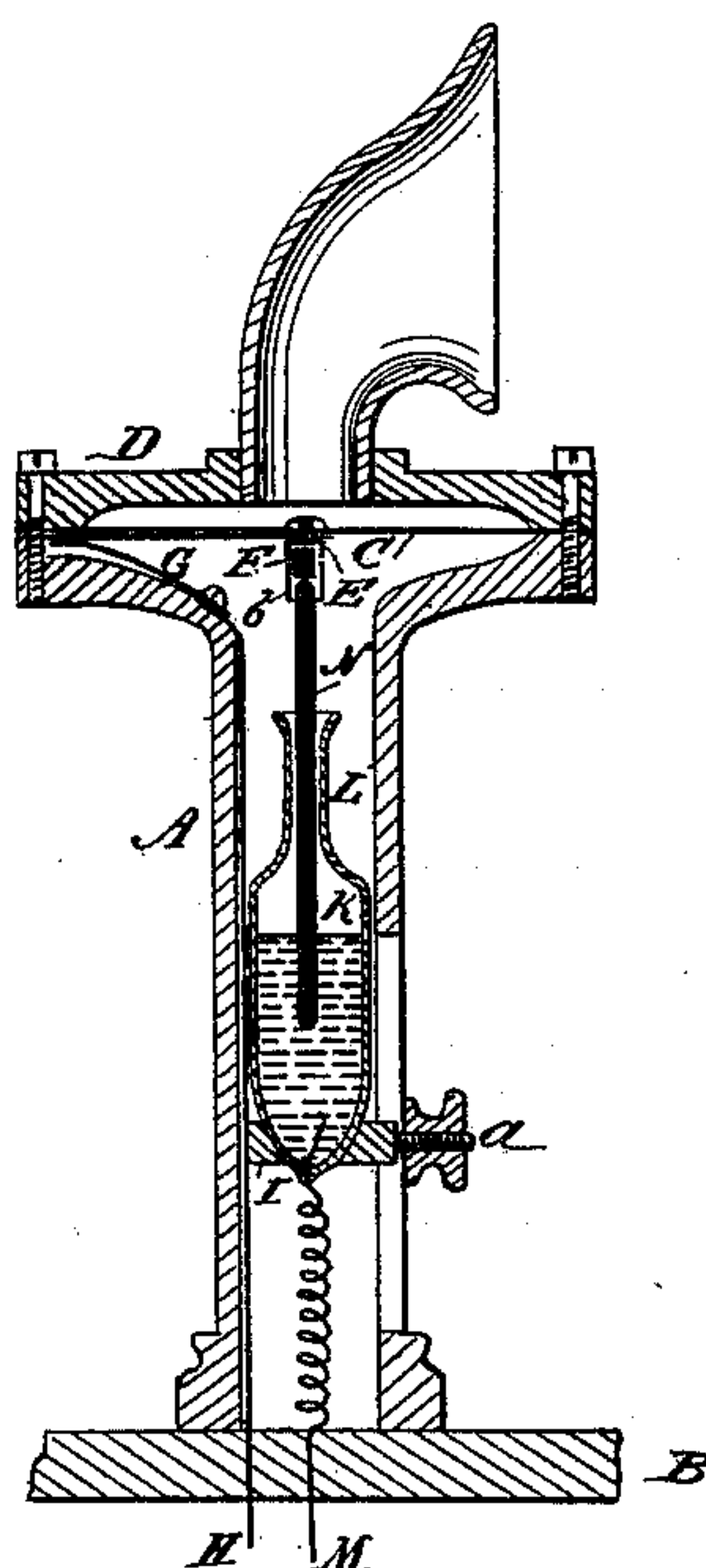


Fig. 3

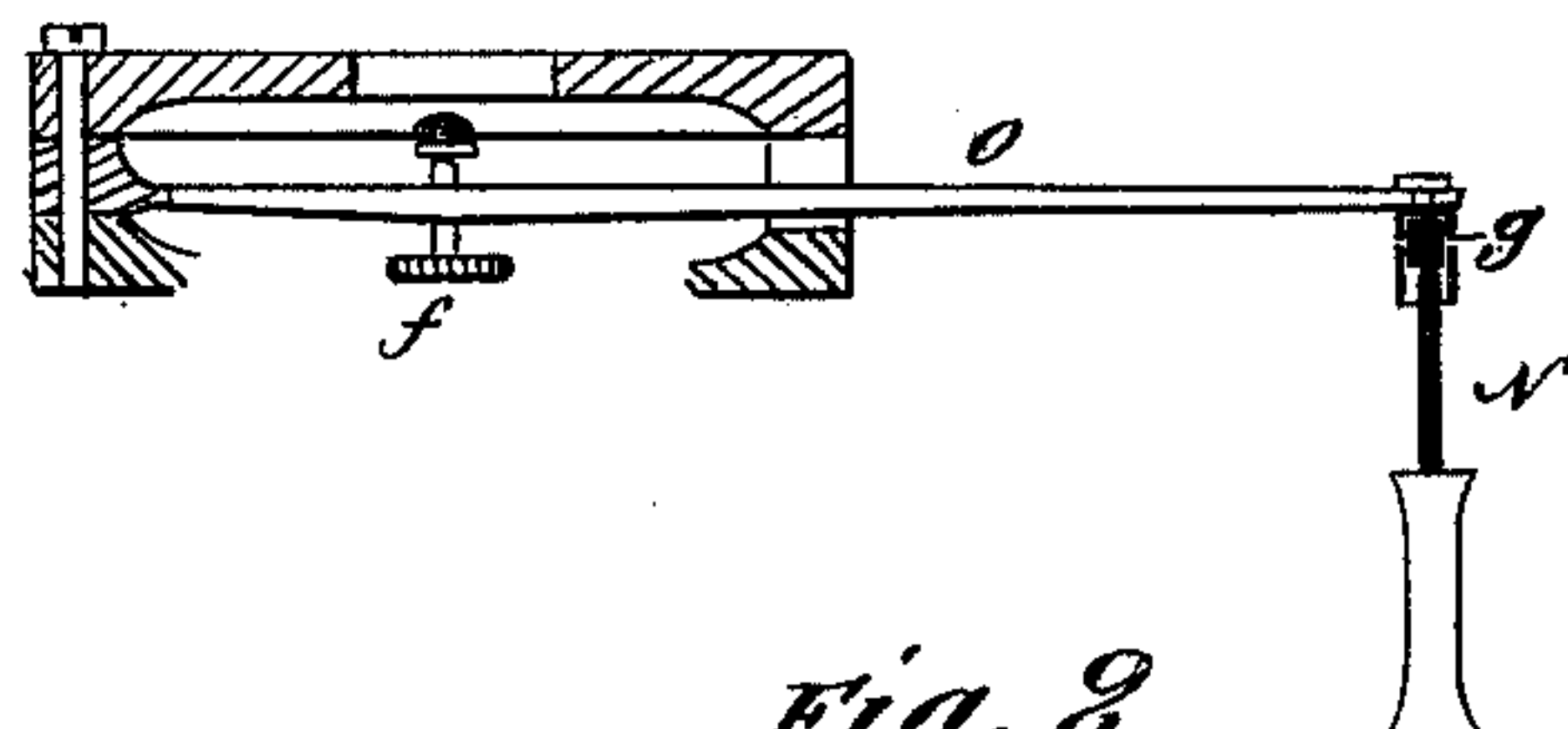
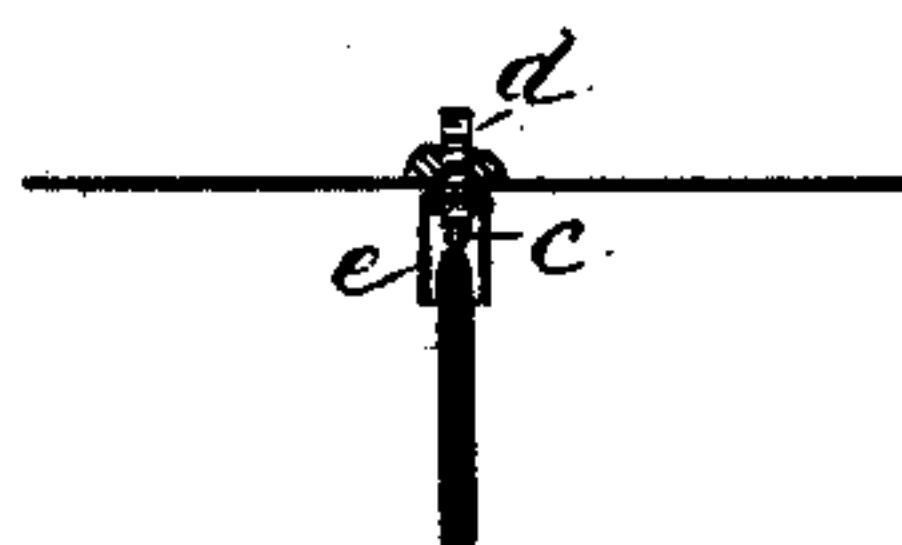


Fig. 2



WITNESSES:

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Geo M. Hopkins

UNITED STATES PATENT OFFICE.

GEORGE M. HOPKINS, OF BROOKLYN, NEW YORK.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 231,226, dated August 17, 1880.

Application filed April 26, 1880. (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 Telephone-Transmitter; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which are a part of this specification.

Figure 1 is a vertical section of the transmitter, showing the relation of the several parts. Fig. 2 is a detail view of a modified form of contact-point attached to the diaphragm. Fig. 3 is a sectional view of a transmitter employing a lever to move the contact-surface.

My invention relates to instruments for transmitting articulate speech, musical sounds, signals, and all kinds of sounds that can be made to produce vibratory motion in diaphragms, reeds, or other vibratory bodies by the agency of an electric current.

The invention consists, essentially, in a contact-surface attached to a vibratory diaphragm and a floating electrode pressed against the contact-surface by a column of liquid.

The hollow standard A is secured to a fixed support, B, and has formed on its upper end a support for the diaphragm C, which is clamped in its place by the cap D. To the center of the diaphragm is attached a small metallic cup, E, which contains a button, F, of ordinary battery-carbon.

The diaphragm C may be of metal or mica. If of metal the diaphragm is made part of the electrical conductor, the circuit being completed through the spring G, attached to the diaphragm-support and connecting with the wire H, running downward through the hollow standard A and its support.

In the standard A there is a ring, I, having a stud, a, that projects through a slot in the side of the standard, and is provided with a milled nut, by which it may be fixed in any desired position.

A bottle, K, having a long narrow neck, L, and a rounded base rests on the ring I, and may be supported at any desired height in the hollow standard A. A platinum wire enters the lower end of the bottle, and is connected with a coiled wire, M, the end of which extends through the base of the instrument.

The bottle K is partly filled with mercury, which comes into contact with the platinum wire at the bottom of the bottle and buoys up a pencil, N, of carbon, so that it is pressed lightly against the carbon contact-surface F, attached to the diaphragm. The carbon pencil N is of the kind commonly used for electric lighting by incandescence. The force with which the carbon pencil N may be made to press against the carbon button may be varied by raising or lowering the bottle K. The carbon pencil N is prevented from slipping from the surface of the carbon button F by a short paper tube, b, slipped over the button and projecting downward a short distance.

In Fig. 2 is shown a contact-surface consisting of a small rounded button, c, of platinum, projecting from the end of a brass screw, d, upon which is placed a small vulcanite cup, e. The brass screw d passes through the diaphragm and receives a nut, by which the vulcanite cup e is drawn tightly against the diaphragm, and the screw is put into electrical connection with the diaphragm. The vulcanite cup serves to keep the carbon pencil in the proper position relative to the platinum contact-surface.

Either platinum or carbon may be used for the contact-surface; but my experience has proven that platinum is to be preferred.

If a mica diaphragm be used in the instrument the communication between the spring G and the cup E may be effected by attaching a strip of copper-foil to the surface of the diaphragm, where it will be pressed by both cup and spring.

The movable mercury-bottle presents an easy means of altering the pressure of the carbon pencil on the contact-surface attached to the diaphragm; but instead of this device I may place the mercury in a tube and displace it, so as to vary the height, by means of a piston or screw entering the tube.

If it is desired to transmit sounds only, and not articulate speech, a metallic electrode may be used instead of the carbon pencil N, or a small electrode supported by a float of non-conducting material may be employed.

In Fig. 3 a spring-lever, O, is secured to one side of the diaphragm-support, and extends across the diaphragm, and is provided with an adjusting-screw, f. The free end of this lever

carries a carbon or platinum contact-surface, *g*, like that already described in connection with Figs. 1 and 2, and the surface is pressed by a floating pencil, *N*, of carbon, as in the device hereinabove described.

This transmitter is placed in an electrical circuit, in which there is a telephone-receiver or the primary wire of an induction-coil, the secondary wire of which is in circuit with one or more telephone-receivers. The current passes through the wire *H*, spring *G*, diaphragm *C*, carbon button *F*, carbon pencil *N*, the mercury contained in the bottle *K*, and the wire *M*, extending from the bottle through the base of the instrument. Any sound made in the vicinity of this instrument sets its diaphragm in vibration, and by moving the contact-surface varies the intensity of the current flowing through the electrodes. By means of this instrument articulate speech may be clearly transmitted, and vocal and instrumental music may be sent over the line in a very satisfactory manner.

To facilitate the collection of sounds I have attached to the cap *D* of the diaphragm-case a flaring mouth-piece, which is curved, so that the speaker may occupy a natural position while using the instrument.

The chief advantages possessed by this instrument over others of its class are its ex-

treme sensitiveness, it being capable of transmitting articulate sounds made ten feet or ten inches from the instrument with equal facility. It can never get out of adjustment, as no springs, weights, or adjusting-screws are used or required, and for musical tones it may be used both as transmitter and receiver.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a transmitting-telephone, a floating electrode, in combination with a vibratory contact-surface, as herein specified.

2. In a transmitting-telephone, an adjustable mercury-receiver, a floating electrode, and a vibratory contact-surface, in combination, as specified.

3. In a transmitting-telephone, a vibratory diaphragm carrying an electrical contact-surface provided with a tubular carbon-pencil guide, in combination with the carbon pencil *N* and a buoying medium, as specified.

4. The combination of the diaphragm *C*, lever *O*, contact-surface *g*, and floating electrode *N*, as specified.

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Witnesses:

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