

(No Model.)

G. M. HOPKINS.
Telephone Transmitter.

No. 238,902.

Patented March 15, 1881.

Fig. 1

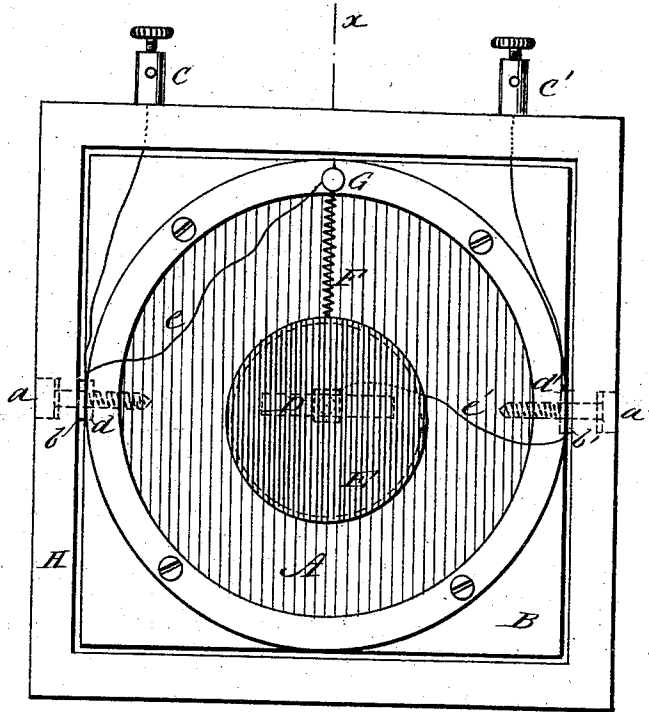
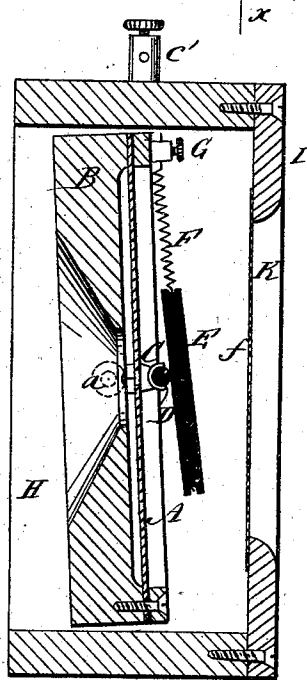


Fig. 2



WITNESSES:

C. Newell
A. Sedgwick

INVENTOR:

G. M. Hopkins
BY *Munn & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE M. HOPKINS, OF BROOKLYN, NEW YORK.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 238,902, dated March 15, 1881.

Application filed November 9, 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 Improvement in Telephone-Transmitters, of which the following is a specification.

My invention consists in the combination of a pendent rocking electrode with a diaphragm carrying a convex or cylindrical electrode; and it further consists in a pivoted support for the diaphragm and pendent electrode.

Figure 1 in the drawings is a rear elevation, partly in section, and Fig. 2 is a vertical transverse section taken on line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

The object of this invention is to avoid delicate adjustments and to provide a telephone-transmitter that is susceptible to the faintest sounds and is capable of receiving heavier sounds without jarring or rattling.

The diaphragm A is mounted on the back of the mouth-piece B, leaving a thin space between the diaphragm and mouth-piece. A socket, C, is secured to the center of the diaphragm, and supports a cylindrical carbon pencil, D, parallel with the diaphragm, in a horizontal position. The jaws of the socket reach a short distance beyond the middle of the carbon pencil and tend to spring together, and so clamp the carbon pencil. The carbon pencil may be turned in its socket to present a new contact-surface should occasion require.

A carbon disk, E, is supported by a small spiral spring, F, from a binding-post, G, projecting from the back of the mouth-piece B. The end of the wire forming the spring is straightened and inserted in the binding-post. This arrangement admits of adjusting the disk E to any desired height. Instead of employing the binding-post G, I may attach the spring F to a lever or screw, or any other suitable adjusting mechanism. The disk E rests against the carbon pencil D, and its center of gravity is below the line of contact between it and the carbon pencil D. In this arrangement of parts I take advantage of the property of inertia to prevent the carbon disk E from ever breaking contact with the carbon pencil D to such an extent as to cause a jar or rattle in the receiving-telephone. A forward movement of the

diaphragm pushes forward the upper portion of the carbon disk E, causing it to rock on the cylindrical surface of the carbon pencil D.

The mouth-piece B is pivoted in a box, H, on screws *a a'*, which pass through the sides of the box into the edges of the mouth-piece at diametrically opposite edges of the diaphragm, and in a line parallel with the carbon pencil D. The screws pass through metallic washers *b b'*, which are connected by wires with binding-posts *c c'* in the top of the box H. The screw *a* enters a metallic nut, *d*, inserted in the edge of the mouth-piece B, and the nut *d* is connected by a wire, *e*, with the binding-post G. The screw *a'* enters a metallic nut, *d'*, in the opposite edge of the mouth-piece B, and the nut *d'* is connected by a wire, *e'*, with the socket C supporting the carbon pencil D. The back of the box H is closed by a door, I, having an aperture, K, over which is placed a piece, *f*, of wire-cloth. The apertured back admits sound-vibrations at the back of the diaphragm and increases the useful effect.

The carbon disk E is made to bear with more or less force on the carbon pencil D by inclining the mouth-piece B more or less. This is done by loosening the screws *a a'* and turning the mouth-piece. A tangent-screw or other mechanical device may be used to move the mouth-piece.

This transmitter is connected up in the telephone-circuit in the usual way—that is, the binding-posts *c c'*, are connected with a local circuit, including a battery and the primary wire of an induction-coil, the secondary wire of the induction-coil being connected with a telephone-line in which are inserted the receiving-telephones. The local circuit is through the carbon disk E and the carbon pencil D, and whenever the diaphragm A is disturbed by sonorous vibrations the contact between the two carbon surfaces is varied or broken so as to produce a corresponding disturbance in the electrical condition of the local circuit. This induces the secondary current in the small wire of the induction-coil, which produces audible effects in the telephone connected with it.

Experiment has proven that this transmitter will receive and transmit articulate speech while the speaker is sixty feet distant from it,

and without any change of adjustment it will transmit speech when the speaker is in the immediate vicinity of the instrument. It has also been shown that the loudest tones produced by the human voice can be transmitted without causing rattling or jarring, and that without change of adjustment it will transmit a whisper. These important advantages are due to the rocking of the carbon disk on the carbon pencil and the consequent avoidance of any appreciable break in the electrical current.

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

1. In a telephone-transmitter, a rocking pendant consisting of a plane-surfaced disk of material capable of conducting electricity, in

combination with a vibratory cylindrically-convex electrical conductor, the two electrical conductors being relatively disposed so that the plane surface of the pendent conductor is tangent to the cylindrical surface of the convex conductor, substantially as specified.

2. In a telephone-transmitter, a pendent electrode having its line of electrical contact above its center of gravity, as herein specified.

3. In a telephone-transmitter, a pivoted mouth-piece, in combination with a diaphragm, a vibratory electrode, and a pendent electrode, as herein specified.

GEORGE M. HOPKINS.

Witnesses:

H. M. HOPKINS,
C. SEDGWICK.