(No Model.)

D. DRAWBAUGH.

TELEPHONE TRANSMITTER.

No. 354,542. Patented Dec. 21, 1886.

Fig. 1.

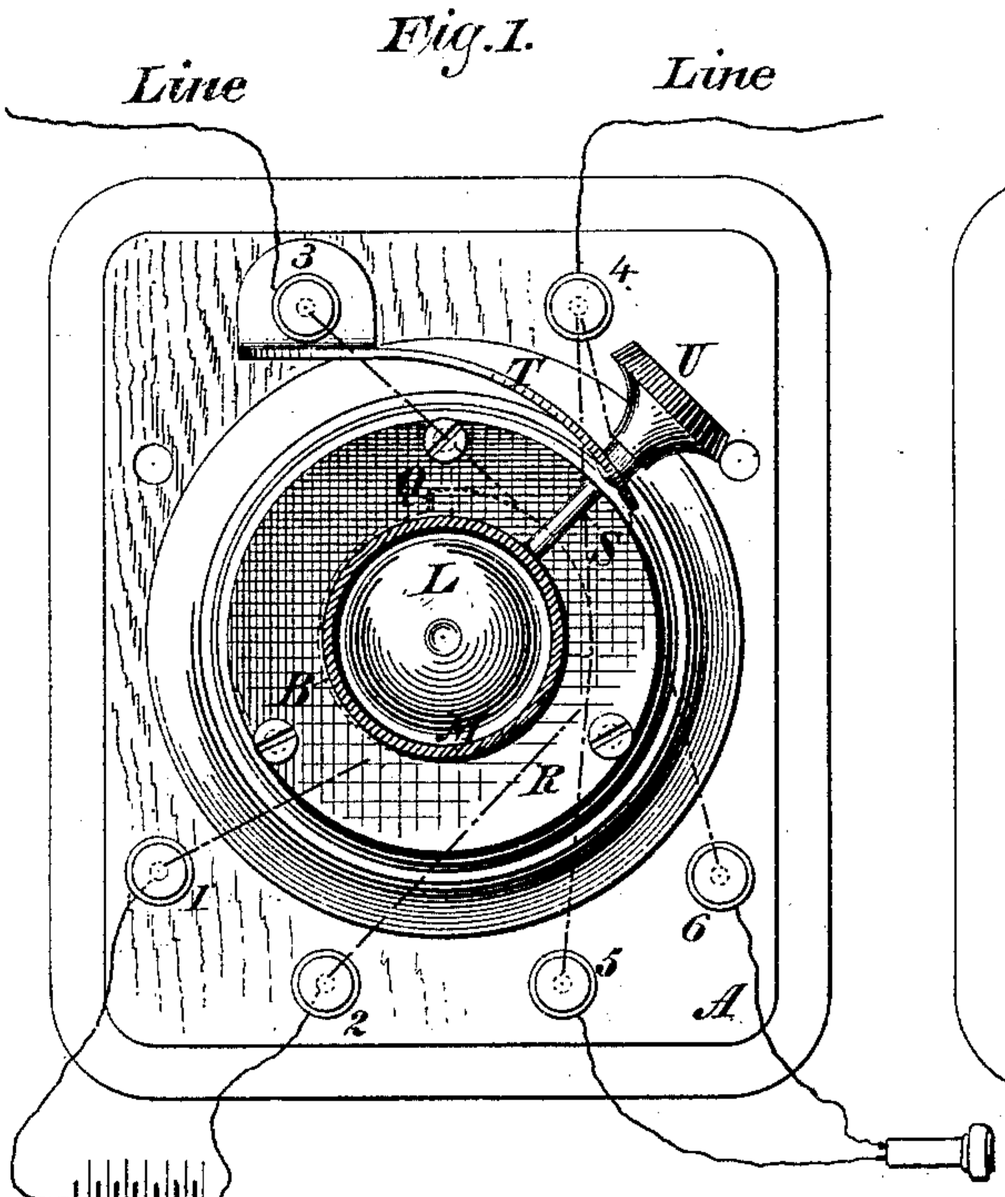


Fig. 2.

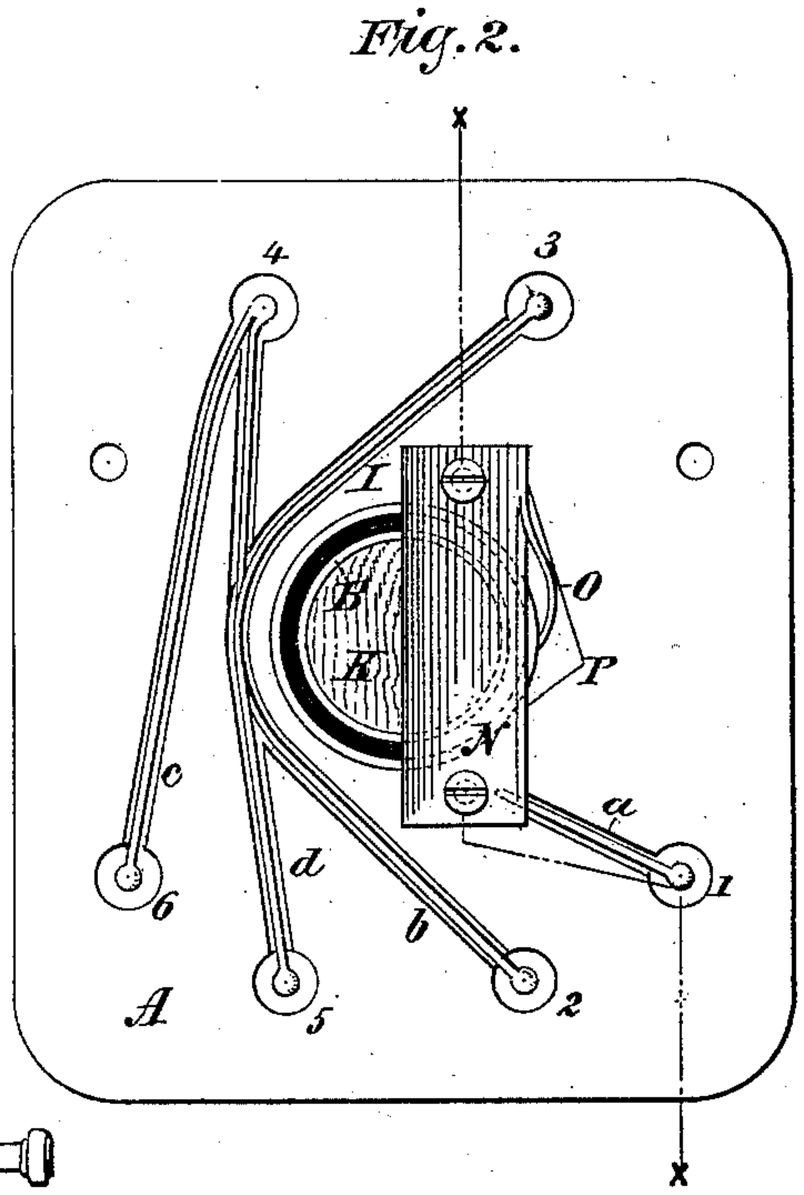


Fig. 3.

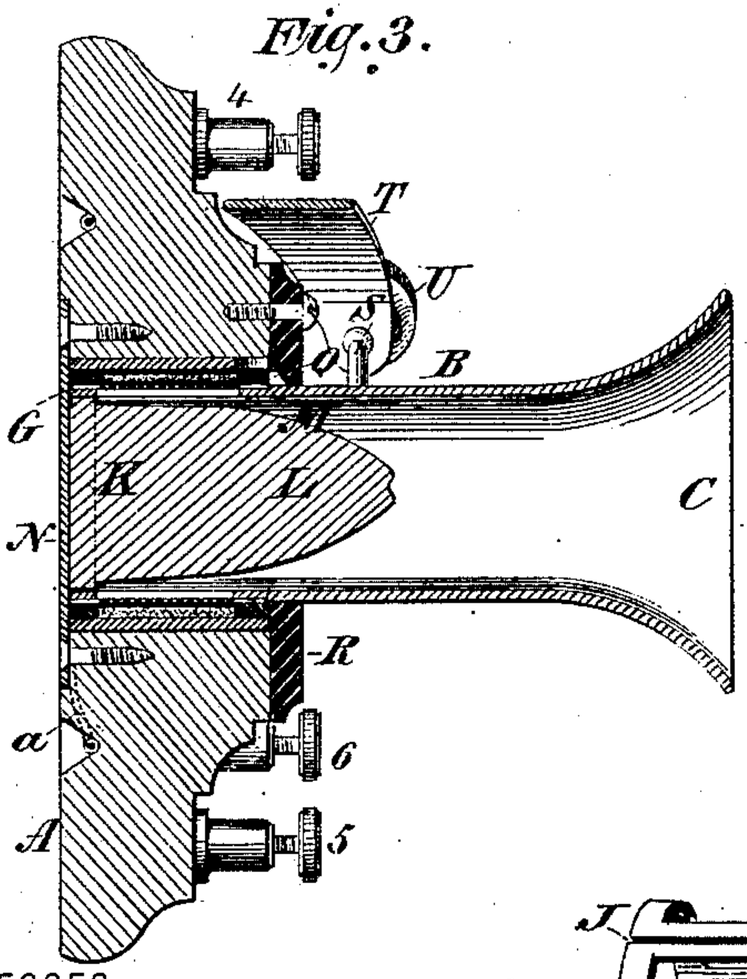


Fig. 4.

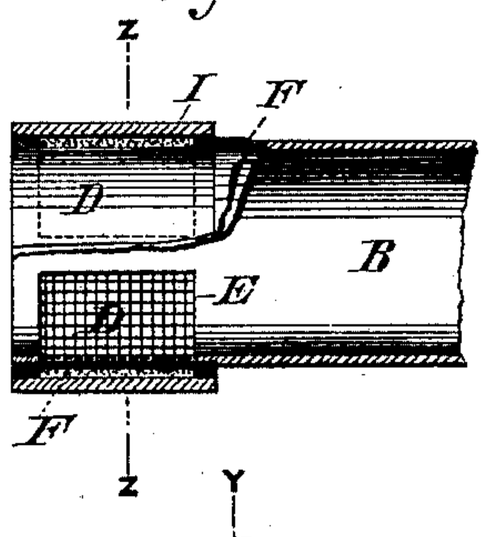


Fig. 5.

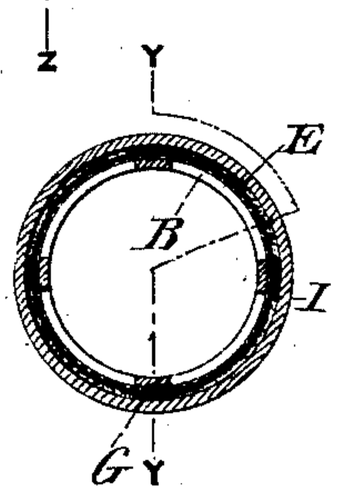
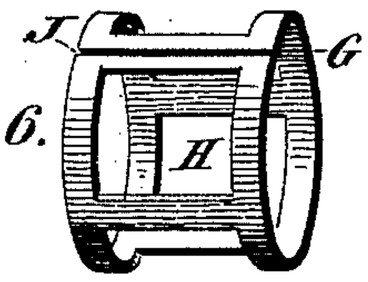


Fig. 6.



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DANIEL DRAWBAUGH, OF EBERLY'S MILL, PENNSYLVANIA.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 354,542, dated December 21, 1886.

Application filed September 8, 1886. Serial No. 213,005. (No model.)

To all whom it may concern:

Be it known that I, DANIEL DRAWBAUGH, of Eberly's Mill, Cumberland county, Pennsylvania, have invented a new and useful Improvement in Telephone-Transmitters, of which the following is a specification.

My invention relates to that class of telephone-transmitters in which the resistance-varying material is a comminuted conducting-body, such as carbon in granular form; and it consists in the construction and arrangement of the instrument hereinafter particularly set forth.

In the accompanying drawings, Figure 1 is a front view of the instrument, the sound-receiving tube being shown in transverse section. Fig. 2 is a rear view of the back or base board. Fig. 3 is a section on the line *x x* of Fig. 2. Fig. 4 is a detailed view showing the interior of the sound-receiving tube in longitudinal section on the line *y y* of Fig. 5. Fig. 5 is a transverse on the line *z z* of Fig. 4. Fig. 6 shows separately the tube of insulating material containing openings for the reception of the comminuted conducting material.

Similar letters of reference indicate like parts.

A is the base or back board of the instrument containing a central circular opening.

B is the sound-receiving tube flared at one end, C, which forms the mouth-piece. Near the opposite extremity of said tube are formed openings D. Surrounding said tube outside of said openings is a girdle or band, E, of wire-gauze or perforated sheet metal. Outside of said wire-gauze is a band, F, of thin sheet metal—such as tin, or, preferably, platinum foil. The bands E and F are soldered or otherwise permanently fastened to the tube B.

Placed outside of the band F is a tube, G, of insulating material—such as hard rubber—in which tube are formed openings H, as shown in Fig. 6. Finally, outside of the tube G is a metal tube, I. The aforesaid several parts are all tightly applied to the tube B.

The tube G may be divided or split at J, so that it acts as a spring, and thus makes a closer fit. The metal tube I is of such diameter as to fit in the aperture in the back board, A, loosely enough to be rotated by hand.

In the openings H in tube G, I place granulated carbon or other comminuted conducting material, which is thus interposed between the conducting-bodies F and I. The carbon may be placed in one or more of said openings, which form closed chambers.

Inside the rear portion of tube B is a tightly-fitting plug, K, of wood, provided with a projection, L, having a conical extremity. Said projection extends into the tube B, past the apertures D therein. Said projection is of smaller diameter than the tube B, so that between said projection and tube there is formed a thin sound-receiving space or chamber, M.

On the rear side of the base-board and extending across the opening therein is a metal plate, N. Secured to said metal plate is a contact-spring, O, which is received in a recess, P, on the rear of the base-board. Said spring presses against the outer periphery of the metal tube I.

On the tube B is a stop, Q. This stop, when the tube B is rotated, moves in a recess (dotted lines, Fig. 1) on the rear side of the annular cover R. Said cover is of hard rubber or other insulating material, and is secured to the back board by screws, as shown. By means of said cover R and the plate N the tube B and associated portions are retained in the opening in the base-board A.

Upon the tube I, outside the cover R, is a contact-post, S. Secured to the base-board A is a spring, T, provided with a button, U. Said spring is adapted to make contact with the post S when the tube I is rotated, so that said post comes beneath said spring.

The circuits in the instrument proceed as follows: From battery to binding-post 1, by wire *a*, rear of base-board, to plate N, to spring O, to tube I, through the comminuted conducting material in the openings of tube G, to the thin metal band F, to tube B, to post S, to spring T, to binding-post 3, and thence to line. The other pole of the battery is connected to binding-post 2; and the circuit thence is completed to the line binding-post 4 by the wire *b*, rear of case.

On the rear side of the case are branch wires *c d*, extending from binding-posts 3 and 4, respectively, to binding-posts 5 and 6, to which last-mentioned posts a receiving-instrument may be connected.

The operation of the instrument is as follows: When speech is uttered at the mouth-

piece, the sound-waves are concentrated in the thin space or chamber M, and thus are caused strongly to affect the thin metal band F, which where it crosses over the openings in the tube B acts similar to a diaphragm. In order to support this band the wire-gauze E is provided. In this way the comminuted conducting material in the openings of the tube G becomes shaken or vibrated, so that it acts to modify telephonically the current which is conducted through it, and this current, as already explained, passes to line.

Fig. 1 shows the post S beneath the button of the spring T. In using the instrument it is necessary to press down said spring, so that circuit is thus completed from post to spring. It will be observed that when the post S is in position beneath said spring the stop Q (dotted lines) is at the upper extremity of its recess. By rotating the tube B the post S can be moved from beneath the spring T, and the circuit thus remains broken until said tube is turned back to its original position.

The comminuted carbon may be placed in one or more of the openings in the tube G. The object of rotating the instrument as described is to shake the carbon and prevent its particles from caking or adhering together.

I claim—

1. In a telephone-transmitter, a sound-receiving tube closed at one extremity, openings in the periphery of said tube, a thin vibratory body extending across said openings, an outer tube, a chamber or interval between said outer tube and said thin vibratory body, and comminuted conducting material contained in said chamber and interposed in the telephone-circuit, substantially as described.

2. In a telephone-transmitter, a sound-receiving tube closed at one end and containing near said closed end a thin annular chamber or sound-receiving space, openings in the periphery of said chamber, a thin vibratory body extending across said openings, an outer tube, a chamber or interval between said outer tube and said vibratory body, and comminuted conducting material contained in said chamber and interposed in the telephone-circuit, substantially as described.

3. In a telephone-transmitter, the combination of the tube B, closed at one extremity and containing openings D, a thin metal vibratory body, F, tube G of insulating material containing openings H, tube I, comminuted conducting material in said openings H, and circuit-connections, substantially as described.

4. In a telephone-transmitter, the combination of the tube B, closed at one extremity and containing openings D, the conical projection K, thin metal vibratory body F, tube G of insulating material containing openings H, tube I, comminuted conducting material in one or more of said openings H, and circuit-connections, substantially as described.

5. In a telephone-transmitter, a base-board, A, having a circular orifice, a tube adapted to enter and freely rotate in said orifice, a sound-receiving tube within said first-mentioned tube, the said sound-receiving tube being closed at one end and containing openings in its periphery, a thin vibratory body extending across said openings, comminuted conducting material interposed between said vibratory body and the outer tube, a contact-spring on said base-board, a contact point or post on said sound-receiving tube, the said sound-receiving tube, contact-spring, contact-post, thin vibratory body, comminuted conducting material, and outer tube being in circuit, substantially as described.

6. The combination of the base-board A, tube B, closed at one end and containing openings D, thin vibratory body F, tube G, containing openings H, tube I, comminuted conducting material in said openings H, plate N, annular cover R, containing a recess, and stop Q on tube B, entering said recess, substantially as described.

DANIEL DRAWBAUGH.

Witnesses:

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M. W. JACOBS.