

(No Model.)

3 Sheets—Sheet 1.

W. BURNLEY.
TELEPHONE TRANSMITTER.

No. 335,501.

Patented Feb. 2, 1886.

Fig. 1.

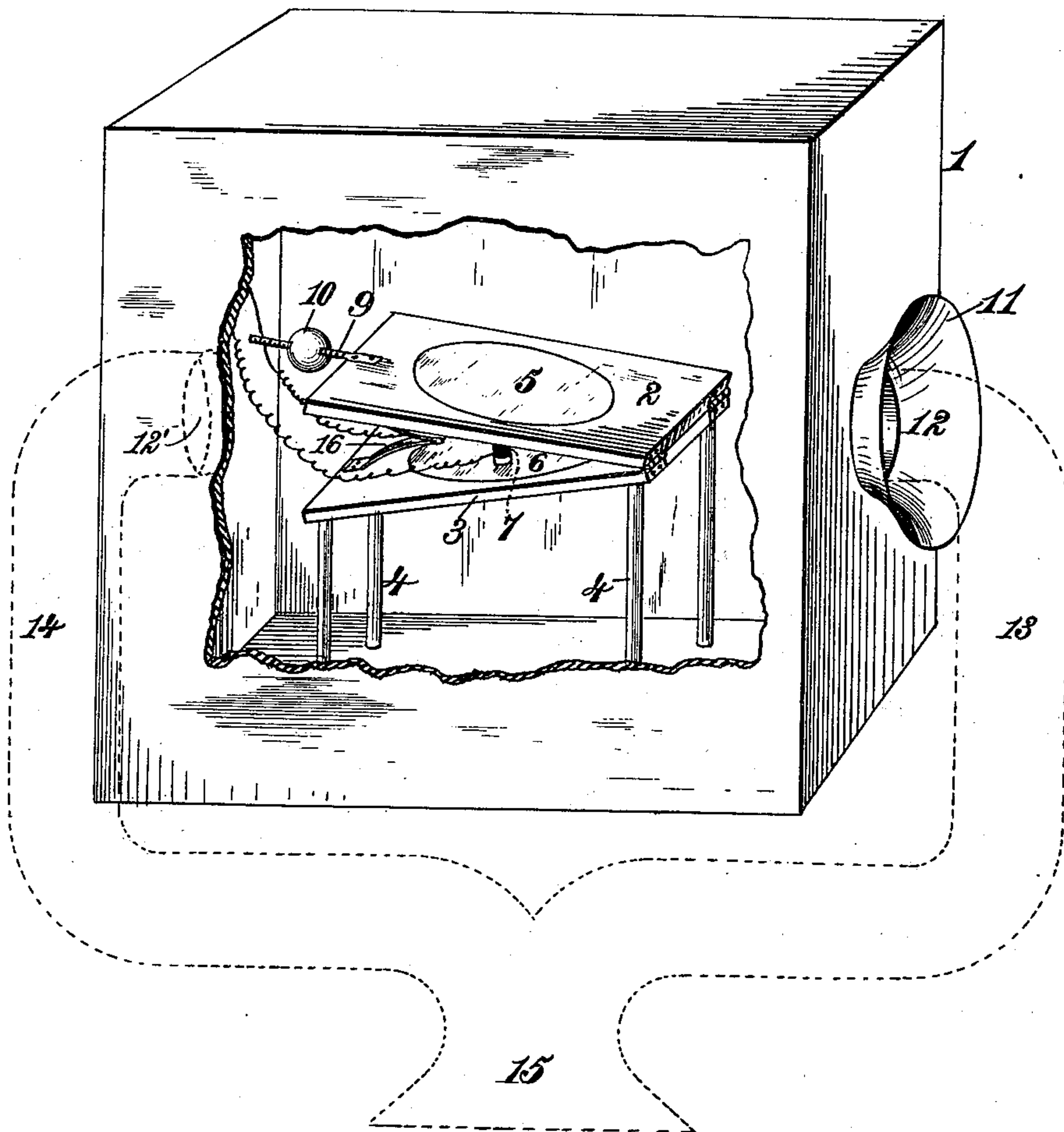
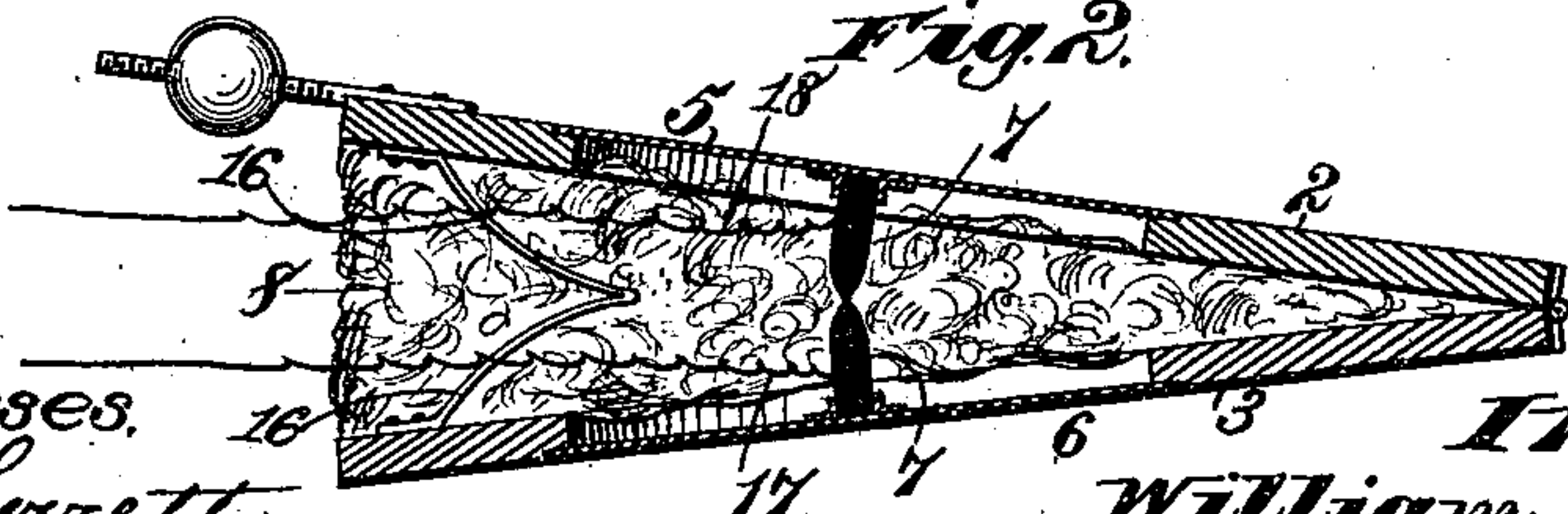


Fig. 2.



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(No Model.)

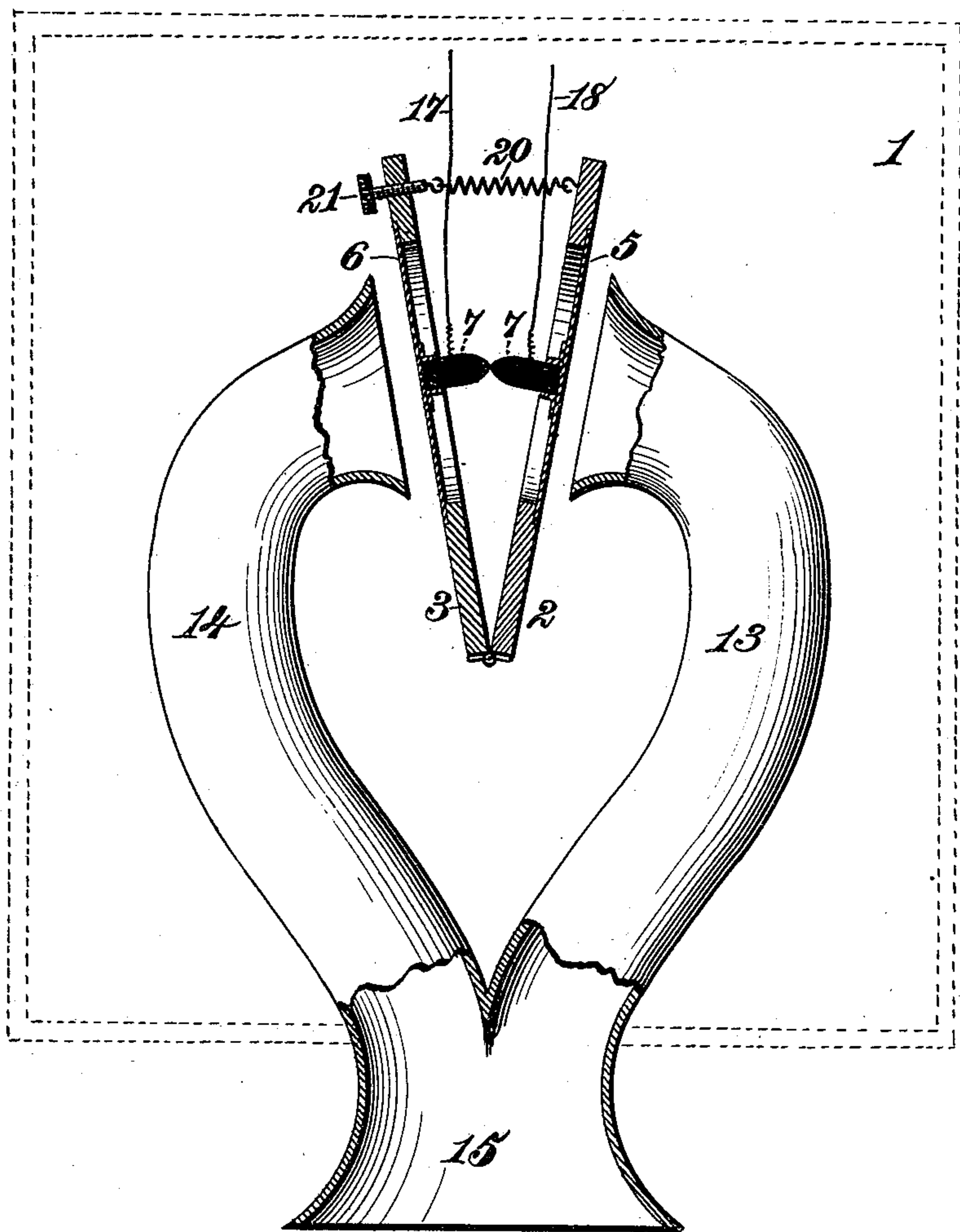
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Fig. 3.



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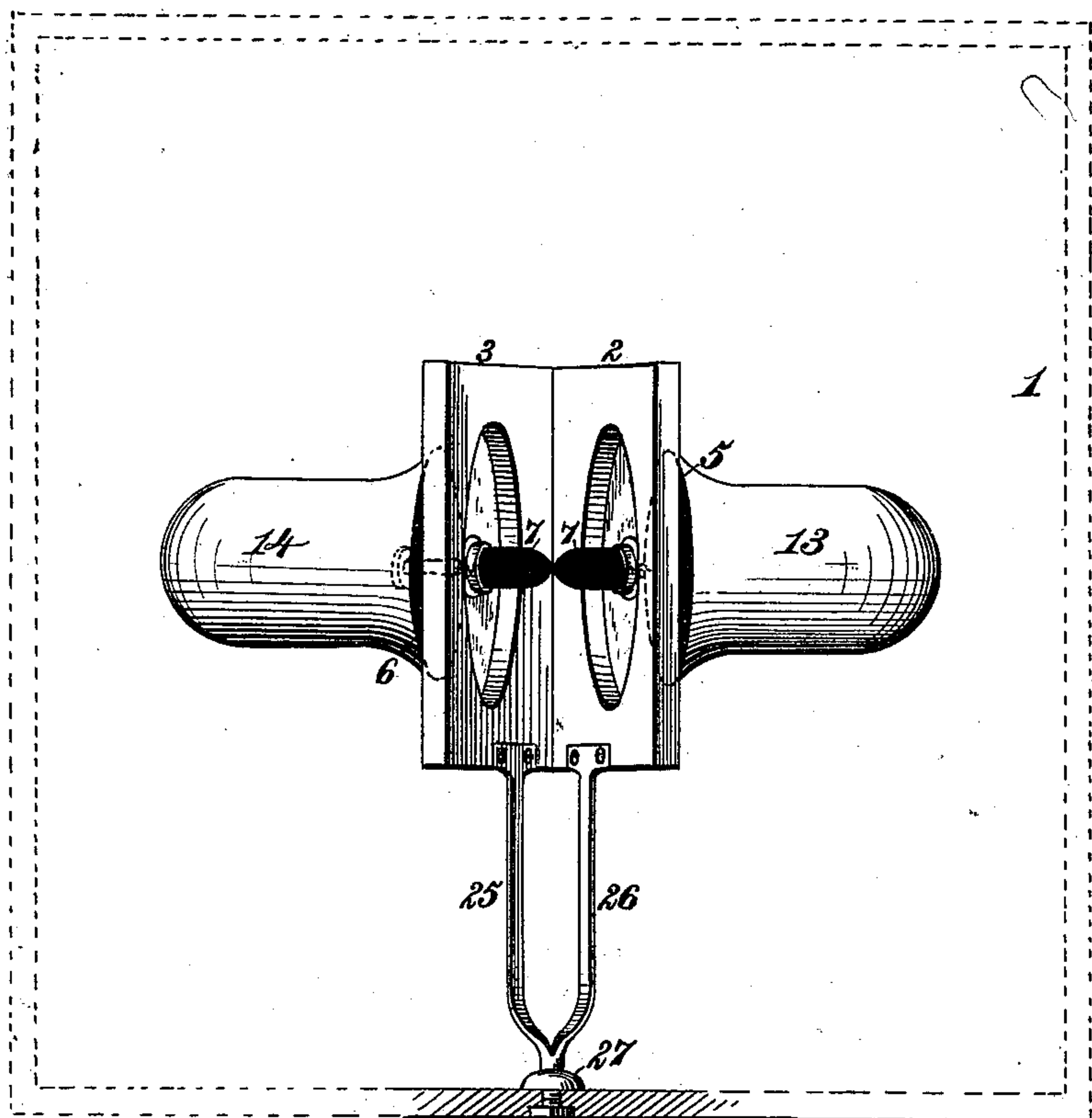
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Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM BURNLEY, OF NORTH EAST, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO CHARLES A. HITCHCOCK, OF SAME PLACE, AND LEWIS F. WATSON, OF WARREN, PENNSYLVANIA.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 335,501, dated February 2, 1886.

Application filed March 17, 1885. Serial No. 142,221. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BURNLEY, a citizen of the United States, residing at North East, Erie county, Pennsylvania, have invented new and useful Improvements in Telephonic Transmitters, of which the following is a specification.

My invention relates to telephone-transmitters or devices which are intended to be so affected by sound-vibrations as to throw an electric current into corresponding vibrations or undulations, so that the sounds causing the vibrations may be reproduced at a distant receiver, and which are especially intended for the transmission of articulate speech.

Its object is to produce a transmitter of great and increased sensibility, so as to be affected by any sound-vibrations.

To this end the invention consists in the features more particularly hereinafter described and claimed, and illustrated in the drawings, in which—

Figure 1 is a perspective view of a transmitter embodying my invention, a portion of the containing-case being broken away to show the operative parts. Fig. 2 is a section of such operative parts removed from the containing-case, and Fig. 3 is a sectional view of a modification. Fig. 4 is a top view of Fig. 3, showing means for sustaining the bases of the diaphragms.

1 is the containing box or case, which may, if desired, be provided with a single ordinary mouth-piece, 11, for concentrating and directing to the vibratory devices the sound waves or vibrations; or it may have upon opposite sides two orifices, 12 12', from which tubes 13 14 proceed, uniting at their outer extremity in a mouth-piece, 15, common to both, as shown in dotted lines in Fig. 1. This latter arrangement tends to equalize and evenly distribute the sound-vibrations throughout the case or box 1. This containing box or case 1, while here shown as a square or rectangular case, may, it is evident, be of any desired shape, that shape and proportion being preferred which shall cause a concentration of the sound waves or vibrations upon the diaphragms. Within this box or case 1 are situated the de-

vices to be affected by such vibrations, and so affected to correspondingly vary and control an electric circuit. These devices consist of the two diaphragms 5 6, each of which is mounted upon a thin base of wood or other suitable material. As shown, these are the bases 2 3.

When the transmitter is to be used in such position that the bases and diaphragms are nearly horizontal, one of the bases—say 3—is supported by legs 4 4, or in any other suitable way, from the bottom or bed of the containing-case 1. If desired to use it in such position that the bases and diaphragms are nearly vertical, the bases may be suspended from one of the sides of the containing-box and the legs or supports 4 4 dispensed with. In each base an aperture is made, over which is secured a diaphragm. Upon the inner side of each diaphragm is secured an electrode, 7, so arranged that they may contact with each other.

To each electrode is attached a wire forming part of the circuit, as seen at 17 18. Of these, one may come from the battery, while the other goes to the line or to the primary coil of an inductorium whose secondary coil is connected in the line-circuit. These connections are not illustrated, as they are well known in the art and in constant use in telephony.

Between the two bases 2 3, supporting the diaphragms 5 6, is placed any suitable spring, 16, whose resilience tends to keep 2 3 apart, and prevents too firm contact of the electrodes 7 7. This spring, as here shown, is a simple flat piece of springy material whose ends are bent back in the same direction and attached to the bases carrying the diaphragms. It might be composed, however, of two pieces of springy material whose free ends contact at the apex of the spring 16. (Shown.) To in part counteract the force of this spring and adjust and regulate the degree of firmness of normal contact, an arm, 9, is attached to the upper base, 2, upon which arm slides a weight, 10. It is convenient for capacity of delicate adjustment to make the arm 9 screw-threaded and the weight 10 as a nut thereon, so that the weight may be moved small distances and fine adjustments readily made.

It is to be noted that a cardinal feature—a part of the spirit of the invention—is the placing of both electrodes equally under the influence of sound-vibrations, each being connected to a diaphragm capable of vibration; hence it is evident that the exact methods and means herein shown for supporting the diaphragms and holding the electrodes into contact, and arranging both to be under the influence of sound-vibrations, may be modified without departure from that portion of my invention.

In order to prevent the action of sound-vibrations upon the inner sides of the diaphragms, whereby the transmission of the desired sounds might be injuriously affected, a loose filling, 8, of some non-vibratory material, is placed between the bases of the diaphragms. For this purpose loose cotton has been found to be very efficient, and seems to be a preferable material. This filling does not interfere with the vibration of the diaphragms, caused by sound-vibrations striking their outer surfaces, while at the same time it prevents the action of sound-vibrations on their inner surfaces.

It is evident that the diaphragms might be arranged in other than nearly horizontal planes. For instance, in Fig. 3 they are shown as in nearly vertical planes, in which case they are suitably supported, and a spring, 20, and adjusting-screw 21, or other equivalent adjusting devices, are used to give the electrodes 7 7 their normal adjustment relatively to each other. The diaphragms 5 6 and the concentrating-tubes 13 14 may also be used without any containing-case; or, as shown in dotted lines in Fig. 3, the containing-case 1 may be used and the tubes 13 14 inclosed therein, their common mouth-piece 15 alone projecting therefrom. These bases 2 3 and diaphragms may be supported by flexible springy arms 25 26, attached to the bases 2 3. These arms are sufficiently braced to be rigid in the direction of their width, while they are so thin as to be resilient in the direction of their thickness. These arms may be united to a common stem, 27, for attachment to the containing-case or other suitable base, whereby the diaphragms and their bases are properly supported. These arms being resilient in the direction of the adjustment and the movement of the diaphragms, do not interfere with either opera-

tion, while they support the same sufficiently in the other direction.

While the transmitter is sensitive to even the most delicate sounds, it is of simple construction, readily adjustable, and properly adjusted, not liable to get out of adjustment, and it is durable and reliable in operation.

Having thus described my invention, what I claim is—

1. In a telephone-transmitter, the combination of two diaphragms each supported or carried by a base, the two bases hinged together at an angle to each other, and a packing or filling of non-vibratory material between the bases, substantially as described.

2. In a telephone transmitter, the combination of two bases, two diaphragms, one mounted or secured on each base, two electrodes, one on each diaphragm and both in the same circuit, a spring tending normally to force the bases apart, and an adjusting device for regulating the degree of contact of the electrodes, substantially as and for the purpose set forth.

3. The combination, with a containing box or case, the hinged bases carrying diaphragms, and the electrodes 7 on the latter, of the double tube 13 14, entering such containing box or case on opposite sides, whereby the force of the vibrations is equalized and the vibrations equally distributed within the box or case, substantially as and for the purpose set forth.

4. In a telephone-transmitter, the combination of the bases 2 3, hinged together at one end, diaphragms 5 6, electrodes 7, spring 16, normally forcing them apart, and an adjusting device, 9 10, controlling the degree of contact, substantially as and for the purpose set forth.

5. In a telephone transmitter, the combination of the case 1, the two bases, diaphragms, and electrodes secured therein, and arranged as shown, mouth-piece 15, and tubes 13 14, leading thence to and leading on opposite sides into close proximity to the diaphragms within the case or box, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM BURNLEY.

Witnesses:

J. L. GREEN,
D. D. LOOP.