

F. GOTTSCHALK.
SOUND PRODUCING INSTRUMENT.
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928,651.

Patented July 20, 1909.

Fig. 1.

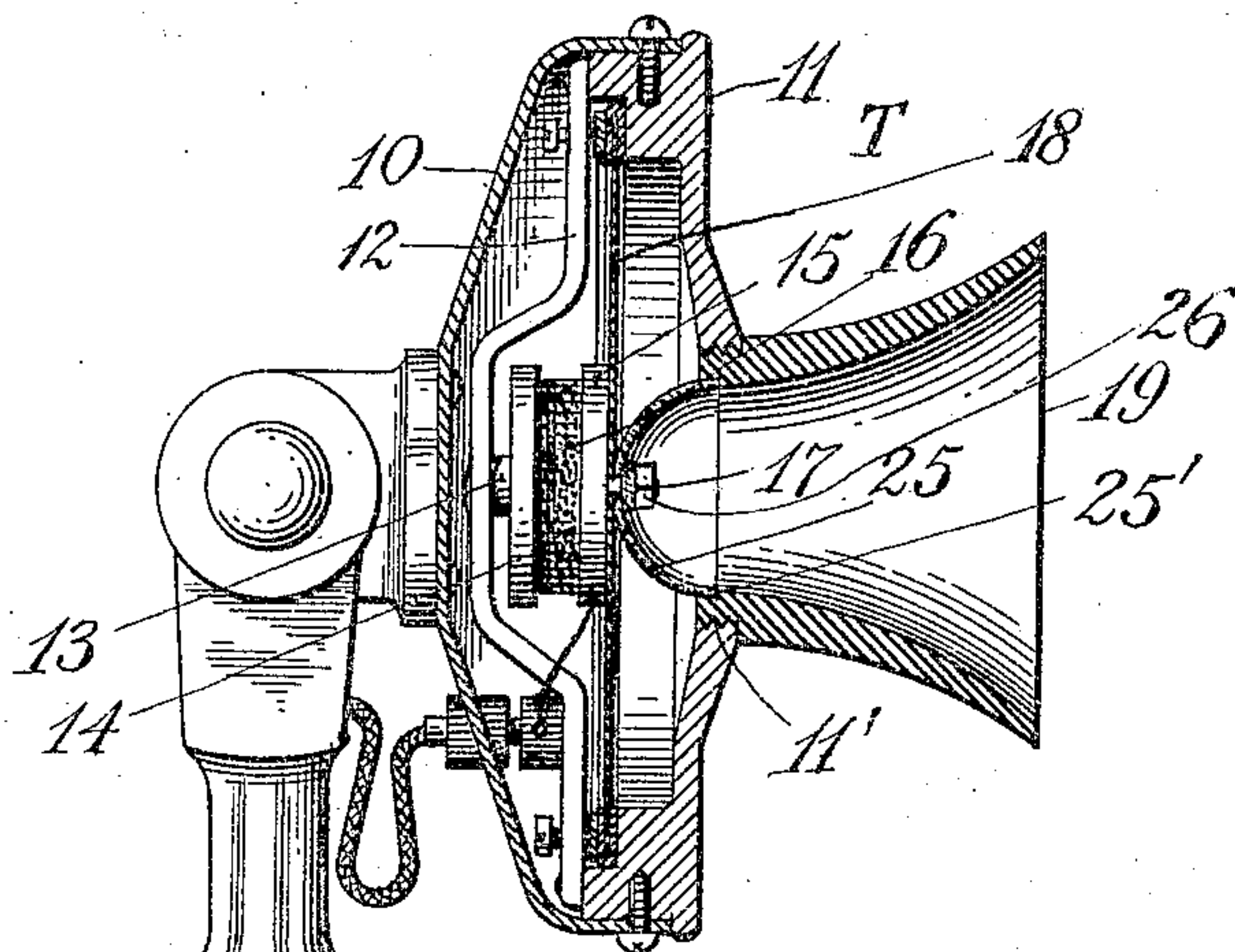
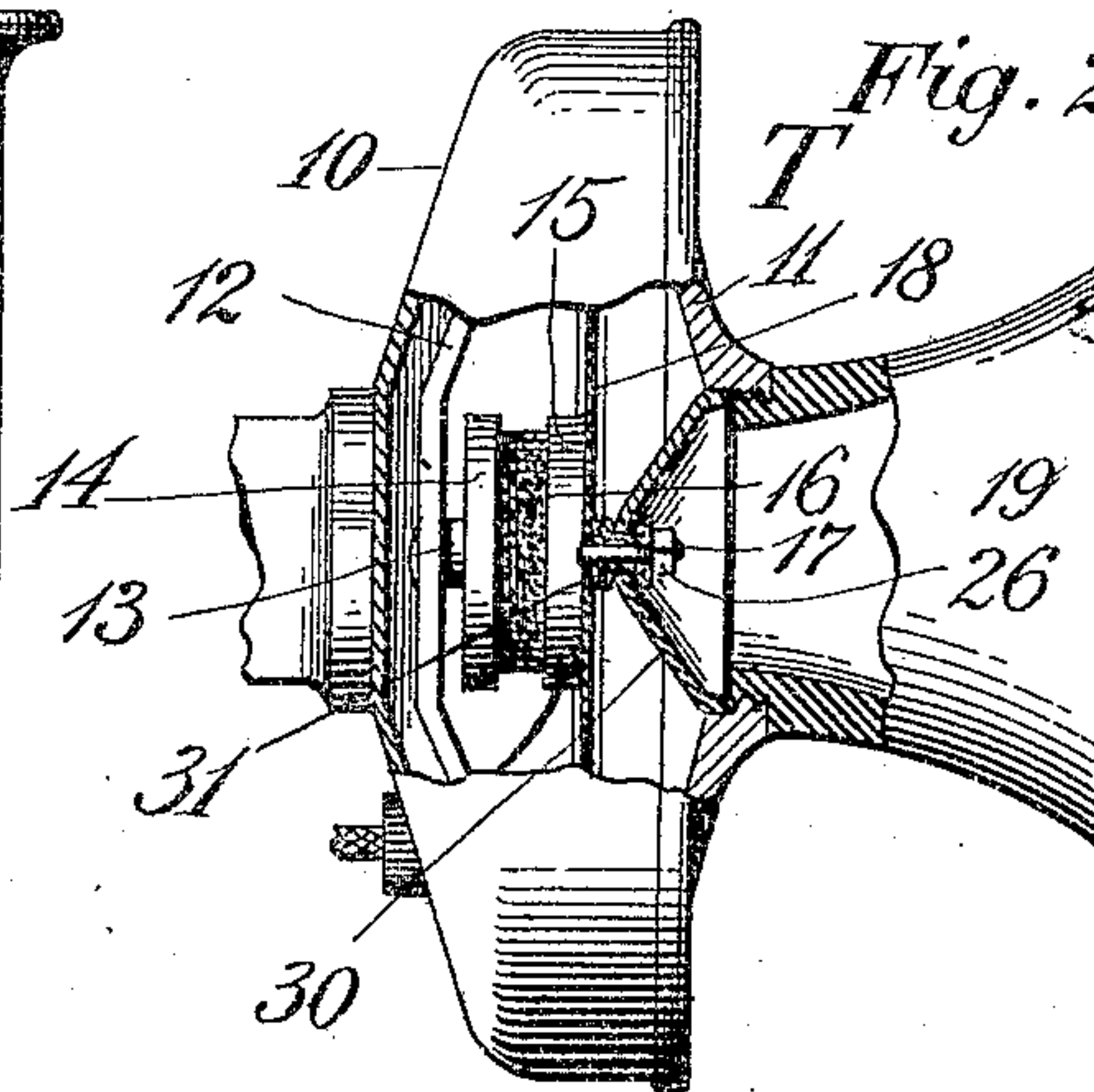


Fig. 2.



WITNESSES:

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SOUND-PRODUCING INSTRUMENT.

No. 928,651.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FELIX GOTTSCHALK, a citizen of the United States of America, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sound-Producing Instruments, of which the following is a full, clear, and exact description.

10 This invention relates to sound-producing instruments, and more especially to that class thereof in which a diaphragm is subjected to the action of sound-waves, such for instance as telephone transmitters, phonographs, and other similar devices, and it has for one of its objects the provision of means whereby the waves are concentrated or directed toward the central portion of the diaphragm.

20 My invention has, furthermore, for its object the combination, with the diaphragm of such an instrument, of a device for protecting the same against atmospheric influences, especially in connection with telephone-transmitters in which the speaker's breath has thus far always come into direct contact with the diaphragm, this condition producing more or less moisture apt to corrode or work other injury to the diaphragm.

30 Further objects of the invention will hereinafter appear and the means for their attainment will be particularly set forth in the claims.

In the accompanying drawings, in which 35 similar characters designate similar parts,—Figure 1 represents a section of a telephone transmitter embodying my invention, and Fig. 2 illustrates a modification.

40 It is the aim of my present invention to obviate the many objections and troubles which manifest themselves especially in telephone transmitters as constructed and generally used, not only in view of their mechanical features but also on account of unsanitary conditions arising from the speaker's breath as well as from the accumulation of dust on the diaphragm, the entire expanse of which has heretofore been exposed without affording any opportunity of cleansing the same. Furthermore, the fact that practically the entire surface of the diaphragm was thus permitted to be influenced by the sound-waves, naturally tended to diffuse the force of the sound to cause vibration, a feature which is important inasmuch as the distinctness of the diaphragm-vibrations depends principally upon the concentration of the sound-waves onto a certain point, which should be as close as possible to the electrodes.

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In applying my invention to a telephone transmitter, in the manner shown in the accompanying drawing, I have produced a sensitive instrument which experience has demonstrated as obviating the objections existing heretofore; moreover, the tension of the diaphragm has been considerably increased, so that in the present instance the natural vibration-speed is higher, while at the same time the vibration-amount is lessened, and the action or modulation of the current due to the resistance and co-action of the usual granulated carbon is consequently more rapid.

75 Referring to the drawings, T denotes in a general way the transmitter of a telephone, comprising a shell 10, and a casing or cap 11 on which the several elements of the device are supported.

80 Secured to the cap 11, is a bridge 12, carrying a post 13, which carries the bottom electrode 14 and the top electrode 15 between which granulated carbon 16 is disposed as usual.

85 The electrode 15 carries a screw-stud 17 and is attached to the diaphragm 18 which is supported on the cap 11 but insulated therefrom.

90 Secured to the front of the cap 11 and entering an aperture 11' thereof, is the mouth-piece 19.

All the parts thus far described, are well known in the art, and perform similar functions as heretofore.

95 It has been above stated that it is one aim of the present invention to concentrate the sound-waves at a certain point of the diaphragm, and I accomplish this result by means of cup-shaped receiver 25, closely attached to the diaphragm 18 by a nut 26 on the screw-stud 17. This receiver is preferably made of flexible material so that its edge 25' may contact with the inner surface of the shell-cap 11 and yet not interfere with the vibration of the diaphragm. By referring to Fig. 1 it will be understood, that the sound waves produced by a person speaking into the mouthpiece, will necessarily be focused at the center of the diaphragm and directly in line with the contact of the electrode. Furthermore, it will be seen that, inasmuch as the edge 25' of the receiver-cup 100 105 110

is recessed into the inner end of the mouth-piece 19 (a construction which may be modified in many ways), the diaphragm, as a whole, is thoroughly protected against moisture due to condensation, and against the accumulation of dust; and also, the cup 25 will act as a damper on the diaphragm, and prevent excess in "rattling" thereof.

By virtue of the fact that in the present instance the sound waves are directed and confined to a small portion of the diaphragm, it is obvious that the large air space between the diaphragm-front and the inner surface of the casing-cap can be very much reduced, only sufficient room being required so as not to interfere with the vibration of the diaphragm.

In Fig. 2, I have illustrated a modification, the cup 30 in this instance being made of non-elastic material and held in the cap 11, while a bushing 31 or washers of yielding material may be employed for forming a close union between the diaphragm and the cup.

Many changes may be made in the construction and organization of the several co-operative elements, without departing from the spirit of the invention, and the latter may be advantageously applied to many other sound producing or transmitting devices.

I claim:—

1. The combination, with a casing having an aperture, and a diaphragm supported by said casing, of a device connected with said diaphragm and extending to said aperture and for concentrating all of the sound waves

passing through said aperture, toward a certain point of said diaphragm.

2. The combination with a casing having an aperture, and a diaphragm carried by said casing, of a cup-shaped receiver contacting with the wall of said aperture and secured with its bottom portion to the diaphragm.

3. The combination, with a diaphragm, an electrode carried thereby, and a casing for supporting said diaphragm and having an aperture, of a receiver-cup having its edge contacting with the walls of said aperture, and means for securing said electrode and diaphragm and receiver cup together.

4. The combination, with a diaphragm, an electrode carried thereby, and a casing for supporting said diaphragm and having an aperture, of a receiver-cup having its edge contacting with the walls of said aperture, and means for yieldingly securing said electrode and diaphragm and receiver cup together.

5. The combination, with a diaphragm, an electrode carried thereby, and a casing for supporting said diaphragm and having an aperture, of a receiver cup extending from the diaphragm to the aperture, and yielding means for securing said cup to the diaphragm.

Signed by me at New York, N. Y., in presence of two subscribing witnesses.

FELIX GOTTSCHALK.

Witnesses:

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