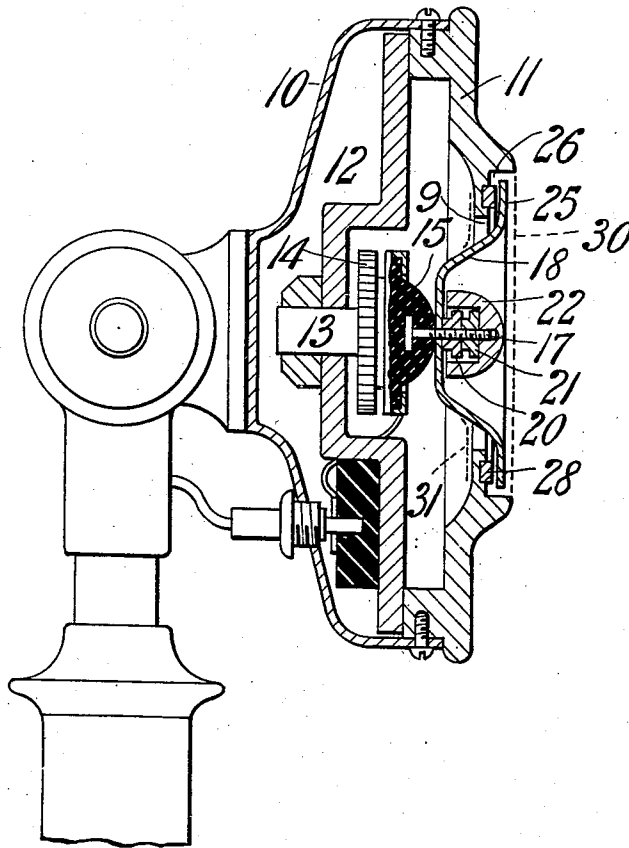


F. GOTTSCHALK.
SOUND REPRODUCING DEVICE.
APPLICATION FILED OCT. 25, 1909.

977,621.

Patented Dec. 6, 1910.



WITNESSES:

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FELIX GOTTSCHALK, OF NEW YORK, N. Y.

SOUND-REPRODUCING DEVICE.

977,621.

Specification of Letters Patent.

Patented Dec. 6, 1910.

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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-Reproducing Devices, of which the following is a full, clear, and exact description.

This invention relates to improvements in sound reproducing devices, and most especially to telephone transmitters.

The object of the invention is to provide in a sound reproducing apparatus, such as a telephone transmitter, a device which serves as a substitute both for the flat diaphragm as heretofore employed, and also for the forwardly projecting flaring mouth-piece, greatly simplifying the construction and efficiently protecting the interior of the transmitter against the atmospheric conditions and the breath of the speaker by which more or less moisture is carried within the casing to the injury of the mechanism.

Other objects of appreciable advantage, as hereinafter indicated, are attained in and by the organization of the improved sound producing apparatus which is fully and clearly described in conjunction with the accompanying drawings and set forth in the claims.

In the drawings:—the figure is substantially a central sectional view through a sound producing apparatus which is exemplified as a telephone transmitter.

In the drawings, 10 represents the casing of a telephone transmitter having the front wall 11, such casing having therewithin the bridge 12 on which is supported a post 13 carrying the resistance cup 14, which comprises, as usual, the rear and front electrodes,—the front electrode being represented at 15 in partial section behind and in axial alinement with the circular aperture 9 in the front of the casing.

The resistance cup, or more strictly speaking, the front electrode comprised as a part thereof, carries a stud 17 which engages the base or back of the cup shaped and forwardly opening shell 18, which, in the present organization of the transmitter, constitutes both the vibratory diaphragm and the mouth piece. The cup shaped forwardly flaring shell constituting both the diaphragm and mouth piece is balanced on the forwardly convexed front electrode with entire freedom for vibration.

The nut 20 screw engaging on the stud 17 at the front of the shell 18 holds the latter in its position as shown, and nut 21 also screwing on the stud against the forward end of the nut 20 locks said nut 20; while the circular member 22 which from its base portion to its front has its external surface convergent, as, for instance, by having the contour of a cone or conoid, screw engages on the outer extremity of the stud, and because of being chambered, incases and conceals the forward end of the stud and the confining nut 20 and locking nut screw engaged thereon.

The rim of the outwardly protruding and flaring shell 18 has its marginal portion made as an outwardly turned flange 25 which overlaps, and is slightly separated from, the forward surface of the front wall 11 of the transmitter casing and is accommodated within the rabbeted or countersunk border 26 of the aperture so that in this preferred arrangement the diaphragm-mouth-piece has the most forwardly prominent portion thereof flush with or slightly within the forward surface of the front wall 11.

28 represents a yielding or compressible material interposed between a portion of the front wall of the transmitter marginally of the aperture and a portion of the diaphragm-mouth-piece contiguous thereto, which is efficient for making substantially a closure at the front of the instrument, for serving as a cushion against the resistance of any undue pressure or blow against the part 18 and for acting as a damper for the latter.

The substantially conical member or cap 22 may also be made to act as an additional damper by being screwed with more or less pressure against the back of the diaphragm-mouth-piece 18. The said part 18 may be made of thin metal, glass, hardened fiber, hard rubber, or any material having fitness to the purpose, and it may be sprayed or otherwise treated with an antiseptic solution; and a gauze may be provided at either the front, or rear, or both, sides of the casing wall 11, as indicated at 30 and 31, as additional preventative against the entrance of particles often carrying germs into the instrument. Such gauze may be sprayed or treated also with an antiseptic solution.

In addition to the attainment of objects as set forth in the opening portion of this specification, it may be stated that other

advantages are attendant on the exercise of this invention:—The device here disclosed prevents the voice from being diffused over an unnecessary expanse within the transmitter, and it is not subject to the detrimental vibrations or echo which have heretofore taken place upon the rebound between the diaphragm and casing front; the device comprised in the present improvements may be applied to the transmitter of the well known and extensively used Bell type without any material structural change in such transmitter otherwise than the substitution of the very few parts which are, necessarily, components of the present improvements; and no dirt may enter into or lodge upon any of the parts of the instrument which are not easily accessible for cleansing. As, for good speech transmission, it is not necessary that the person talk close to the instrument and at any particular angle, in the present form of the device, the sound waves are not obstructed however they may be directed toward the instrument, as would be the case where the well known forwardly projecting mouth-piece is employed unless care were taken to direct the voice more or less nearly squarely relatively to the front of the transmitter; and now it is not required that the speaker shall for any reason distort his lips, and hence the voice in its most natural quality will be reproduced. And the combined diaphragm and mouth-piece being entirely efficient for the operation of the telephone even when of considerable less diameter than that of the diaphragm of the ordinary transmitter, the instrument may be made considerably smaller, of lessened weight, and at decreased cost; while the sightliness or attractive aspect of the instrument is enhanced.

I claim:—

1. In an apparatus of the character described, a casing, having an aperture in its front, a resistance cup therein, and a diaphragm of cup-shape having its base or back in proximity to the resistance cup, and having its forwardly extending rim portion in proximity to and free from contact with the margin of said aperture.

2. In an apparatus of the character described, a casing having an aperture in its front, a resistance cup therein, and a diaphragm of cup-shape having its base or back in proximity to the resistance cup, and having its forwardly extending rim portion extending through said aperture and disposed externally of the casing in proximity to and free from contact with the margin of said aperture.

3. In an apparatus of the character described, a casing having an aperture in its front, a resistance cup therein and a diaphragm of cup shape having its base or back in proximity to the resistance cup, hav-

ing its forwardly extending rim portion extending through said aperture and formed with an outwardly turned flange externally overlapping, and free from contact with the casing at the margin of its aperture.

4. In an apparatus of the character described, a casing, having an aperture in its front, a resistance cup therein, and a diaphragm of cup shape having its base or back in proximity to the resistance cup and having its forwardly extending rim portion in proximity to and free from contact with the margin of said aperture, and means for supporting and confining said cup shaped diaphragm in its relations to said casing and resistance cup.

5. In an apparatus of the character described, a casing having an aperture in its front, and formed rabbeted marginally of said aperture, a resistance cup in the casing, and a diaphragm of cup shape having its base or back in proximity to the resistance cup, having its forwardly extending portion protruding through said aperture and formed with an outwardly turned flange externally overlapping, and disposed within, the rabbeted marginal portion of the casing.

6. In an apparatus of the character described, a casing having an aperture in its front, a resistance cup in the casing, a diaphragm of cup shape having its base or back in direct contact against the front of the resistance cup, having its forwardly extending portion in proximity to the margin of said aperture, and a body of yielding material interposed between the cup shaped diaphragm, and the casing, and serving as a cushion for resisting the diaphragm in its deflections in an inward direction.

7. In a telephone transmitter, a resistance cup comprising the usual front and rear electrodes, and a diaphragm of cup-shape having its back or base in direct contact against the front electrode of the resistance cup and means for entirely supporting said cup shaped diaphragm in its stated relation to the said front electrode.

8. In a telephone transmitter, a resistance cup comprising the usual front and rear electrodes, a stud supported by and forwardly extending from the front electrode, a diaphragm of cup shape having a supporting engagement about said stud and having its back or base in direct contact against the front electrode.

9. In a telephone transmitter, a resistance cup comprising the usual front and rear electrodes, a stud supported by and forwardly extending from the front electrode and formed screw threaded, a diaphragm of cup shape having its base or back centrally perforated and having a supporting engagement about said stud and in direct contact against the front electrode,—a nut screwing on the stud and engaging the dia-

phragm base, another nut screwing on the stud and having a locking engagement with the first named nut, and a cap supported outside of and concealing said stud and the
5 nuts engaged therewith.

10. In a telephone transmitter, a resistance cup comprising the usual front and rear electrodes, the front electrode having a forwardly projecting screw threaded stud,
10 a diaphragm of forwardly open cup shape having a perforation in its base or back and supported on said stud, and a member, the surface of which is forwardly convergent, screw engaged on said stud forwardly of the
15 cup shaped diaphragm.

11. In a telephone transmitter, a resistance cup comprising the usual front and rear electrodes, a stud supported by and forwardly extending from the front electrode, a
20 shell to constitute a diaphragm made of a cup shape and forwardly opening, having a perforation through its back or base and having a supporting engagement upon said stud directly next to the front electrode,
25 and a cap member supported by, and adjustable along the length of, said stud, having its base in proximity to the front of said

shell, and adapted to be free relatively to the latter or tensioned thereagainst.

12. In a telephone transmitter, a resistance cup comprising the usual front and rear electrodes, a stud supported by and forwardly extending from the front electrode, a shell to constitute a diaphragm made of a cup shape and forwardly opening, having a
35 perforation through its back or base and having a supporting engagement upon said stud directly next the front electrode, a nut screw engaging on said stud and contacting against the front of said shell, and a hollow
40 cap member, the outer surface of which is forwardly convergent, adjustable along the length of said stud, having its base in proximity to the front of said shell, adapted to be free relatively to the latter or tensioned
45 thereagainst, and inclosing and concealing the said stud and the nut engaged thereon.

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

FELIX GOTTSCHALK.

Witnesses:

J. J. LOCKWOOD,
F. L. MARRAT.