

L. STEINBERGER.
MOUTHPIECE.
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989,076.

Patented Apr. 11, 1911.

Fig. 1.

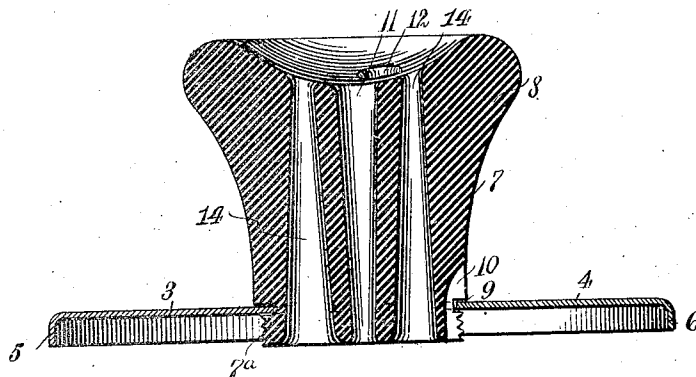


Fig. 2.

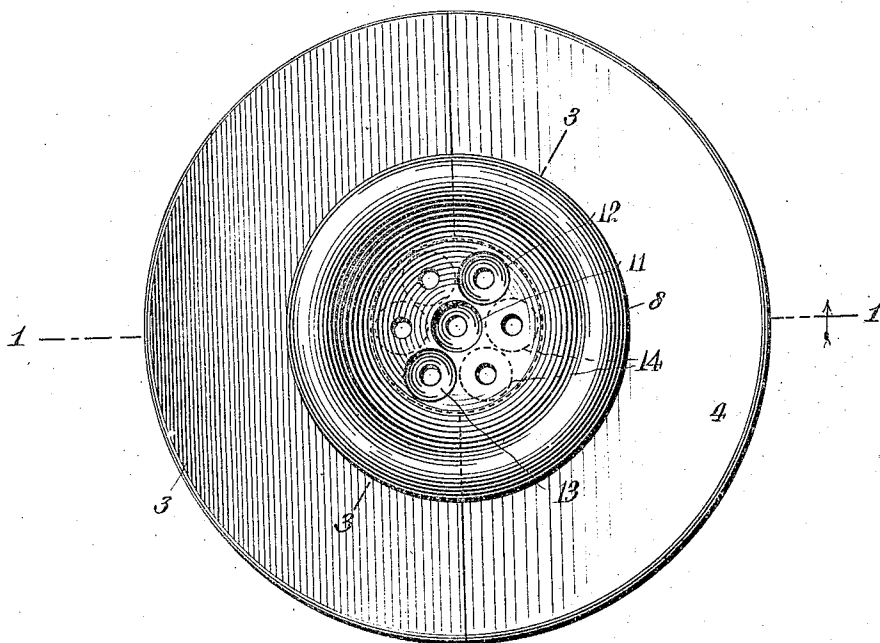
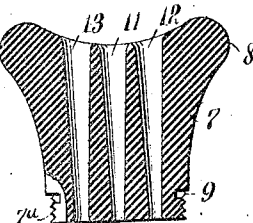


Fig. 3.



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MOUTHPIECE.

989,076.

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To all whom it may concern:

Be it known that I, LOUIS STEINBERGER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Mouthpiece, of which the following is a full, clear, and exact description.

My invention relates to mouth pieces, my more particular purpose being to improve the acoustical action of the mouth piece, especially as applied for use in connection with telephone transmitters and the like, and I seek at the same time to provide a form of construction that will effectually prevent chipping or breaking away of portions of the mouthpiece, my construction thus combining great mechanical strength and efficiency.

My invention also provides a novel manner for mounting the mouthpiece in operative position.

My invention comprehends a mouthpiece provided with a number of separate passages, each having the form of a cone frustum, the ends of the passages, however, being rounded, and the various individual passages being so disposed that the larger end of one passage extends in the same general direction of the smaller end of another passage, this arrangement of the passages tending to preserve, and practically to increase, the sound vibrations transmitted through the various passages. By my arrangement some of the passages concentrate the sound waves at a point adjacent to the diaphragm, while other of the passages expand the sound waves at a point adjacent to the diaphragm; the combined action improving greatly the general effect.

My invention further comprehends giving the mouthpiece such a conformity as renders it especially adaptable for connection with either an old style face plate provided with a thread, or a two-part face plate having a smooth surface for engaging the mouthpiece.

My invention also comprehends the construction of a mouthpiece made up of a single integral block or mass of material, solid throughout, except for the apertures for receiving the sound waves; hence, I am enabled to provide a mouthpiece possessing the greatest possible mechanical strength. It is well known by those familiar with this art that a very large percentage of the

mouthpieces in common use are soon chipped or broken, and must be replaced with new ones, thereby creating a considerable and constant loss to the owners of the apparatus.

My invention still further comprehends giving the mouthpiece such conformity that glass, porcelain or other brittle material may be employed with good effect. When such materials are employed, the mouthpiece becomes hygienic in the best sense of the word, as it may be boiled in water or other liquid, or cleansed in acids, alkalis or other disinfecting solutions. Mouthpieces made in accordance with my invention, when made up of suitable material, are practically indestructible.

I have made the discovery that many mouthpieces now in common use are exceedingly wasteful of the energy of the sound vibrations associated with them. I have also made the discovery that by giving the mouthpiece a proper conformity hereinafter described, the effectiveness of the mouthpiece, from an acoustical standpoint, may be very greatly increased.

One feature of my invention is based upon the idea that, a passage of substantially frusto-conical form, if placed with its portion of smallest diameter in immediate proximity to the center of the diaphragm, avoids the undue production of over tones, and causes the diaphragm to vibrate as nearly as possible under the influence of the principal harmonics, thereby increasing the loudness of the sounds.

Another feature of my invention is based upon the idea that a passage of frusto-conical form, if so placed relative to a diaphragm, that the portion of largest diameter of the passage is in close proximity to the diaphragm, but not in the center thereof, the over tones are greatly amplified and the fidelity of the speech or other sounds at the same time is therefore preserved. In fact, the practical effect is that of amplifying the sounds most difficult to transmit. I attribute this singular effect to the well known properties of a horn or trumpet. The frusto-conical passages acting upon the principle of the horn or trumpet, are so placed that the portion of the passage corresponding to the large end of the horn or trumpet is in close proximity to the diaphragm.

In some instances I deem it desirable, in arranging the various passages, to have a

plurality of them disposed with their portions of smallest diameter in close proximity to the diaphragm. While this arrangement is not necessary in all cases, or even desirable in all instances, it sometimes has its advantages, especially where loudness of articulation is a great consideration.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is an enlarged section on the line 1—1 of Fig. 2, looking in the direction of the arrow, and showing my improved mouthpiece, which, in this instance, is mounted upon a face plate made in halves and provided with smooth surfaces; Fig. 2 is a plan view of the mechanism shown in Fig. 1; and Fig. 3 is a section on the line 3—3 of Fig. 2.

At 3, 4 are the two halves of a face plate. These two parts are provided with downwardly turned flanges 5 and 6, and so formed as to facilitate their application to other parts forming the transmitter. The mouth piece is shown at 7, and is provided with a massive portion 8. This massive portion is very strong, and is not liable to break or chip. As will be understood from Fig. 1, the mouth piece is provided with a threaded portion 7^a of reduced diameter, and is also provided with an angular groove 9, and with the usual kerfs, one of which is shown at 10, to equalize or determine the strains.

The mouth piece is provided with a central passage 11, the passage having generally the form of a cone frustum, the mouth piece, however, being slightly rounded at the end of this passage, as will be understood from Fig. 1. The axis of the passage 11 coincides with the general geometric axis of the mouth piece, so that the portion of smallest diameter of the passage 11, occupies such a position that when the mouth piece is in use upon a diaphragm, this portion of smallest diameter is in close proximity to the middle of said diaphragm. The passages 12, 13 are shaped like the passage 11, and differ from the latter merely in the fact that they are not located in the middle of the diaphragm, but upon the opposite sides of said middle. The mouth piece is provided with other passages 14, all having the shape above described, but differing from the passages 11, 12, and 13 in that they extend in the opposite direction. The passages 14 perform the peculiar horn-like function above described, and conserve the loudness, as well as the richness and purity of the over tones.

By making the face plate in halves, as above described, the mouth piece may be firmly clamped into position as indicated in

Fig. 1, and only separation of the face plates will remove it from its fastenings. The reduced threaded portion 7^a, however, enables the mouth piece to be mounted in a face plate of ordinary construction after the manner of the operation of a screw.

I do not limit myself to any particular material to be used in the construction of the mouth piece above described, as I may use porcelain, glass, or such like material, or hard rubber, fiber, wood or such like materials, but I prefer in many instances to employ for this purpose the insulating material well known in this art as "electrose". Nor do I limit myself to employ in every instance apertures tapering in opposite directions, nor to employ in every instance apertures of tapering form, nor to employ in every instance a plurality of apertures.

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

1. A mouth piece comprising a plurality of passages, each having substantially the form of a cone-frustum, the portion of large diameter of one of said passages extending in the same general direction as the portion of smallest diameter of another of said passages.

2. A mouth piece comprising a body member having a single central passage extending entirely through it and coinciding substantially with its general geometric axis, said passage having portions of different diameter, its portion of largest diameter being at one end of said mouth piece, and its portion of smallest diameter being at the opposite end thereof, said mouth piece being further provided with a second passage having portions of different diameter, the portion of greatest diameter of said second mentioned passage being disposed adjacent to the portion of smallest diameter of said first mentioned passage.

3. A mouth piece comprising a body member provided with an annular groove, and a face plate made in halves and provided with semi-circular edges for fitting into said groove.

4. A mouth piece comprising a body member provided with sound passages and with portions separating said sound passages, said mouth piece being further provided with an outer portion having a thickness great as compared with the thickness of the portions separating said passages.

5. A mouth piece comprising a body portion provided with passages of substantially frusto-conical form, said mouth piece being further provided with a portion having a thickness greater than that of portions between said passages.

6. A mouth piece, comprising a body portion having an axial length great as compared with its cross diameter, said body por-

tion being provided with sound passages, and further provided with a solid portion encircling the outer ends of said sound passages, said solid portion being rounded upon its external surface.

7. A mouth piece comprising a body member of solid form provided with an aperture extending along its geometric center and having generally the form of a cone frustum, said body member being further provided with a plurality of other sound passages each having the form of a cone frustum, said last-mentioned passages having their portions of smallest diameter extending in the same direction as the portion of greatest diameter of said first-mentioned sound passage.

8. A mouth-piece of the usual form having the flaring outer end and the usual reduced attaching portion, the length of the mouth-piece being greater than its smallest diameter, said mouth-piece being composed of a solid block having a plurality of independent air passages extending there-through, the solid material between the passages serving to strengthen the mouth-piece.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS STEINBERGER.

Witnesses:

WALTON HARRISON,
PHILIP D. ROLLHAUS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
