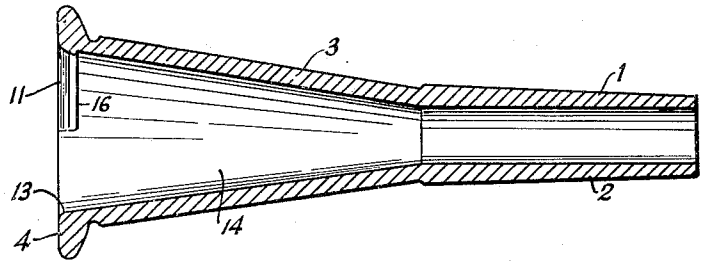
Feb. 2, 1954 P. L. JONES 2,667,803

MOUTHPIECE FOR MUSICAL INSTRUMENTS

Filed April 29, 1950

Fig. 1.



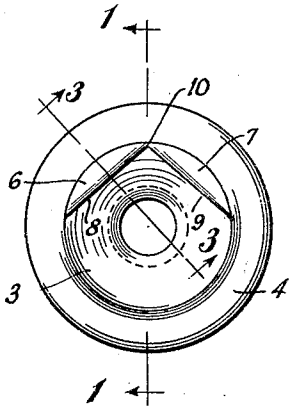


Fig. 2.

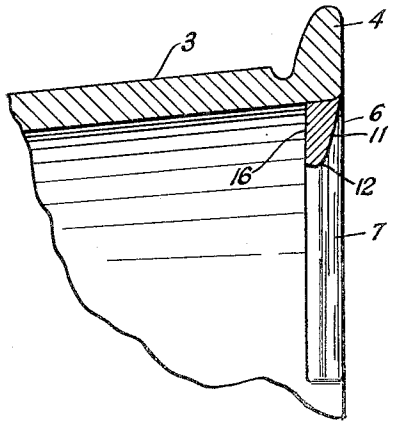


Fig. 3.

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Patented Feb. 2, 1954 2,667,803

UNITED STATES PATENT OFFICE

2,667,803

MOUTHPIECE FOR MUSICAL INSTRUMENTS

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Application April 29, 1950, Serial No. 158,942

5 Claims. (Cl. 84—398)

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This invention relates to a mouthpiece for musical instruments and, in particular, to a mouthpiece for brass, wind instruments such as the trumpet or French horn.

It is a well-recognized fact that, in such wind instruments, the attainment of high-pitched notes is difficult and the results lacking in quality, and any sustained holding of a note or run of notes is well-nigh impossible except when played by a relatively few performers of high skill.

The musical sounds from reedless, wind instruments are merely amplifications of sounds caused by vibrations of the lips of the player. The shift from notes of one frequency to those of another involves not only an adjustment of the configuration of the lips, but also a shift of the lips upwardly or downwardly across the opening of the mouthpiece. In particular, the higher notes require a reduction in the effective span of the vibrating portions of the lip and this is accomplished by moving the lips upwardly across the mouthpiece opening. Since the distance across the circular opening diminishes in moving toward the circumference, and since it is this distance which determines the effective length of the vibrating lips, such shifting of the lips provides for the high-pitched notes.

However, the difficulty has been that distance across the opening does not diminish sharply except near the outer extremity of the opening, and the range of high notes are thus crowded into a small available area.

I have found that this condition is remedied by changing the configuration of the mouthpiece opening so that the span thereof decreases in a gradual fashion in a direction radially outwardly of the center of the opening. In particular, an opening having one half in V form is quite effective in overcoming the difficulties.

Mouthpieces having openings other than circular have been heretofore proposed, but in each case such modifications have also involved a change in the configuration of the resonance chamber within the mouthpiece.

It is therefore an object of the invention to provide a mouthpiece for musical instruments in which the sounding of high-pitched notes is facilitated. In particular, it is an object to facilitate the sounding of high-pitched notes by modification of the opening of the mouthpiece to a configuration other than circular. A further object is to accomplish the foregoing objects without deleterious change in other parts of the mouthpiece.

These and other objects will be apparent to

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those skilled in the art from the specification to follow, as illustrated in the drawings, in which:

Fig. 1 is an axial, sectional view of a mouthpiece, taken along the line 1—1 of Fig. 2,

Fig. 2 is an end view of the mouthpiece as seen from the left of Fig. 1, and

Fig. 3 is a sectional view of a part of Fig. 2 taken along the line 3—3 thereof.

Referring to the drawings by characters of reference, there is shown a hollow mouthpiece having a substantially cylindrical, tubular portion 1 adapted for insertion in the outer opening of the sound passage of a musical instrument, such as a trumpet, and having an outer, tapering wall 2 to ensure a tight fit.

Outwardly of tubular portion 1 is a flared chamber 3 of frusto-conical form, terminating in an outwardly flanged rim 4.

Secured, as by brazing, in the inner wall of flared portion 3, at the outer end thereof, is a ledge, having portions 6, 7, extending perpendicularly to the axis of the mouthpiece, with their outer faces flush with the end surface of flanged rim 4, and their inner faces parallel to their outer faces and extending from the inner wall of flared portion 3.

The radially inner edges 8, 9 of the parts 6, 7 are straight and in the form of cords of the circular opening of the mouthpiece. These cords each subtend slightly less than a quarter of the circumference of the circular opening and meet at a common point 10 near the circumference, to partake of a V-form, or chevron. The meeting line of the edges 8, 9, at 10, is preferably rounded and the ends of the edges may be somewhat spaced at this point, with part 10 partaking of an arcuate form.

Preferably, the outer surfaces of the ledges 6, 7 are slanted inwardly, as at 11, so as to preserve the accustomed form of curvature of the lips as they extend inwardly of the mouthpiece, rather than to confine such curvature to the space between the ledges, as would be the case if the outer surfaces were strictly perpendicular to the mouthpiece axis. Thus, not only is the form of the lips preserved, but the "feel" as well, and the benefits of the invention may be had without the necessity for a player to develop a new technique. The inner ends 12 of the slant surfaces 11 are rounded to about the same degree as the edges 13 of the normal opening of the circular mouthpiece.

The ledge need have a thickness only sufficient to provide necessary strength. Its prime mechanical function is to narrow the span of the

mouthpiece opening, to facilitate lip action, and by providing this element in ledge or shelf form the resonance chamber **14** retains its conventional shape and volume, thus preserving the accustomed fidelity of tone. In addition, it has been found that a mouthpiece according to the present invention provides such improved tonal qualities that the ledge feature would seem to contribute favorably, otherwise than in the mere matter of preserving the form of the resonance chamber. As an example, it has been found that tonal qualities resulting from the ledge form of mouthpiece restrictor are markedly superior to those obtained in a structure wherein the V form is continued throughout the resonance chamber, either by means of a thickened wall throughout, or by deforming the wall of the chamber into V form.

While the ledge has been shown as a separate piece attached to the mouthpiece, it could, of course, be formed integrally therewith. Also, in the case of a separate ledge, the parts **6**, **7** thereof could be formed separately.

Although the underside **16** of the ledge is shown as strictly perpendicular to the mouthpiece axis, it may, of course, be slanted somewhat without undue sacrifice of volume in the chamber **13**. In particular, this inner side may have a slant which is incident to the use of brazing or soldering materials. The essential thing is the presence of a re-entrant angle behind the edges **8**, **9**, so that there is an abrupt change from restricted opening to full resonance chamber, as distinguished from the case where edges **8**, **9** are continued down through the resonance chamber. Therefore, in the claims to follow, the expression "generally radially inwardly," as applied to the ledge surfaces, is not intended to limit the claims to a case where these surfaces are strictly perpendicular to the mouthpiece axis.

The invention has been demonstrated by outstanding specialists of brass instruments to offer the following improvements: Firm, comfortable seating of the lips; a wider range of both high and low tones; clear, full, brilliant tones; relaxed embouchure; relief from undue strain in lengthy passages; and the instilling of confidence in the player.

In general, whereas a preferred embodiment of the invention has been shown and described, the invention is not limited thereby, since changes in the size, shape and arrangement, for instance, of the various parts, may be resorted to, without departing from the spirit or scope of the appended claims.

What is claimed is:

1. A mouthpiece for musical instruments comprising a wall member defining an air chamber, having a gradually changing circular cross-section throughout, and open at both ends, and a thin wall element at the outer opening, said wall element having outer and inner surfaces extending generally radially inwardly from the margin of said outer opening, whereby to partially close said opening, said wall element having its radially inner terminus closely adjacent said margin in one portion, and receding radially inwardly from said margin on either side of said one portion.

2. A mouthpiece as in claim 1, said radially inner terminus of said wall element defining a pair of chords of the circle of said outer opening in divergent relation from a point near the said circle.

3. A mouthpiece as in claim 2, said chords each subtending approximately one-quarter of the circumference of the circle of said outer opening.

4. A mouthpiece for musical instruments, comprising a wall member defining an air chamber, having a gradually changing circular cross-section throughout, and open at both ends, and a ledge with closely adjacent outer and inner surfaces extending radially inwardly from said wall member at one end of said chamber, said ledge having an inner edge of generally V-form with the apex of the V near said wall member and the extremities of the V each near said wall member adjacent the respective extremities of a diameter of the said chamber.

5. A mouthpiece for musical instruments comprising a wall member defining a substantially frusto-conical air chamber of circular cross section throughout, open at both ends, and a thin wall element at one of said ends, said wall element having outer and inner surfaces extending inwardly from the margin of said one of said ends, transversely to the axis of the mouthpiece and partially closing the opening at said one of said ends, the outer surface of said wall element being inclined to the axis of the mouthpiece in a direction inwardly of said mouthpiece.

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