Feb. 7, 1950 L. R. REDDICK 2,496,749

MICROMETER-TYPE ADJUSTABLE SAXOPHONE MOUTHPIECE

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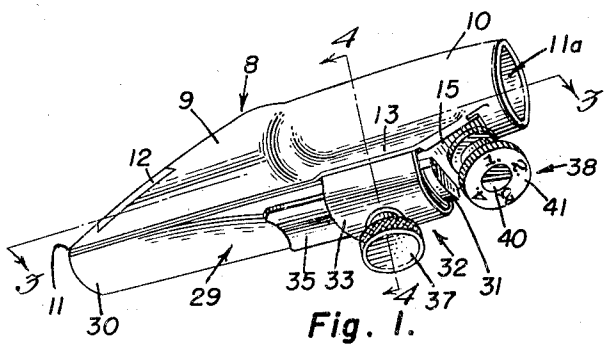

Fig. 1.

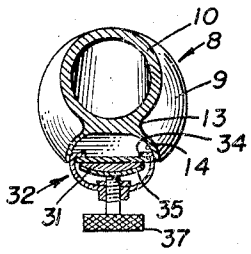

Fig. 4.

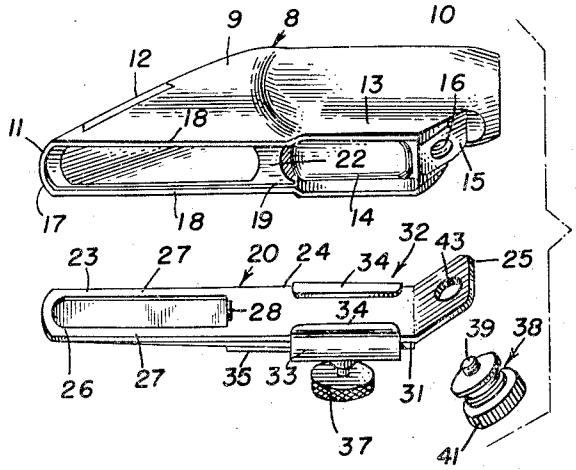

Fig. 2.

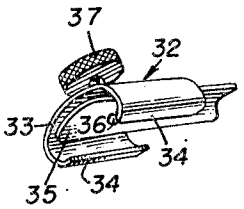

Fig. 5.

Fig. 3.

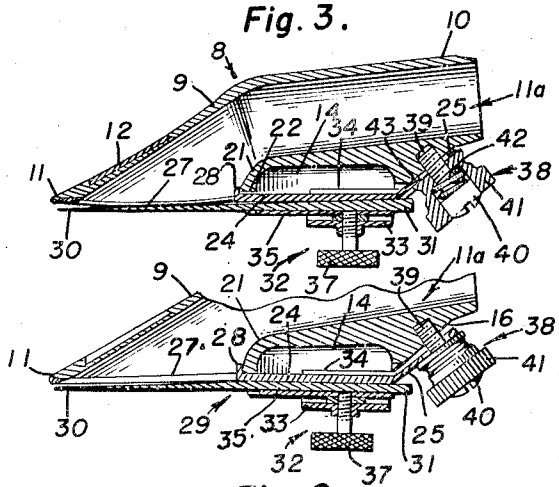

Fig. 6.

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MICROMETER-TYPE ADJUSTABLE SAXOPHONE MOUTHPIECE

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8 Claims. (Cl. 84—383)

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This invention relates to improvements in reed equipped mouthpieces such as are employed on saxophones, clarinets and the like, and has particular reference to improvements in the construction of the lay, affording facilities for adjusting the lay curvature and simultaneously regulating the angle of the reed; an improved ligature especially constructed to co-act with and conform to requirements; and a body of unique design and style which lends itself to accommodate the new lay and complemental ligature.

An object of the invention is to provide a mouthpiece having what is believed to be an ingenious lay construction which is such in make up as to permit the user to bodily tilt the plane of the reed toward and from the lay face of the mouthpiece proper to establish a precision space between the tip ends of both body and reed to provide predetermined orifice settings ranging from (A) wide "open" to (B) "close" and other intermediate positions between the two extremes. Adjustable reed mounts are, of course, not new. In fact, many types of so-called adjustable lays are currently in vogue. Therefore, it follows that my objective is to attain the desired ends through the instrumentality of structural adaptations possessed of recognized betterments and refinements which are such as to more satisfactorily and aptly meet the requirements of manufacturers and musicians alike.

More specifically, I have evolved and produced a reed instrument mouthpiece which is characterized by an insertable, removable and replaceable metal lay, the latter embodying a slotted shank or tip portion alined with the bore of the body, and a heel portion fashioned into a bendable tang, the butt end of the reed being clamped to said tang by a ligature, and the tang and ligature, in conjunction with the clamped portion of the reed, being precision adjusted toward and from the body, whereby to permit the tip of the reed to be angularly regulated with finesse to thus accommodate the established embouchure of the user.

It is the matter of common knowledge, among reed instrument players, that different textures of reeds and variable embouchures are employed depending upon varying orchestral combinations with or without brass, and also depending upon acoustical conditions of the enclosure in which orchestral renditions are performed. These recognized conditions have therefore given rise to the instant invention and the same is appropriate in that a lay construction of the aforementioned type is utilized and is enhanced through the medium of another improvement, a micrometer-type adjusting unit for the reed carrying flexible end of the lay.

In carrying out the unique principles of my invention I provide ways and means, chiefly a

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novel insertable and removable lay unit, wherein a reed is clamped, by a special type ligature to a bendably resilient tang portion, the latter, when flexed with micrometer-type control means, serves to angularly slant or tilt the reed in a manner to widen or lessen the tone wave orifice. At the same time, the shank portion of said lay unit, which is tapered and flexible, functions in a manner whereby the longitudinal limb portions bulge out, bow longitudinally and convexly toward the reed and varies the lay curve. Thus, novelty is predicated on a mouthpiece with an adjustable lay which, when actuated by said micrometer-type control, serves to (1) change the angle of the reed and to simultaneously (2) change the lay curvature, whereby to regulate the distance between the reed tip and tip of the mouthpiece while constantly keeping the reed at a tangent to each new lay curve.

Another object of the invention has to do with the shaping and styling of that portion of the mouthpiece proper which serves to accommodate the micrometer-type hand regulated adjusting unit, this phase of the construction employing a special boss formation on said mouthpiece which formation is pocketed to accommodate movement of the tang and ligature thereon, together with a conveniently disposed inclined abutment for said micrometer adjusting unit.

Another object of the invention is to provide a lay in the form of a brass or equivalent metal insert, the latter being particularly designed to provide an attaching shank at one end, a reed bed or adjusting tang at the opposite end, said tang having an actuator terminal for the adjusting unit, and the intermediate portion of the insert having a hook-like detent which when anchored in place provides the desired fulcruming action for said tang.

Another object of the invention is carried out through the medium of an ingenious ligature which while not usable on types of mouthpieces presently known, is expressly adapted and highly useful as a component part of the adjustable lay construction herein shown and described.

A further object relies upon novelty on the micrometer-type adjusting unit, this characterized by a stud and clamping nut, the clamping nut having graduations to enable the user to establish the adjustment for this with precision and resultfulness.

Other objects and advantages of the invention will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a perspective view of a reed instrument mouthpiece constructed in accordance with

the principles of the instant invention and illustrating the complete assemblage with the reed in place;

Figure 2 is an exploded or group type perspective view showing the mouthpiece proper, lay with reed and ligature in place, and micrometer-type adjusting unit to the lower right;

Figure 3 is a central longitudinal sectional view taken approximately on the plane of the line 3—3 of Figure 1, looking in the direction of the arrows;

Figure 4 is a cross sectional view taken approximately on the line 4—4 of Figure 1;

Figure 5 is a perspective view of the ligature per se; and,

Figure 6 is a fragmentary sectional view based on Figure 3 showing the reed adjusted to assume a "close lay" gage.

Reference is had first to the mouthpiece proper shown as the upper part in Figure 2. This is herein referred to as the body and denoted by the numeral 8. It is made of metal, or other suitable material, such as wood, plastic, ebonite rubber and other compositions used in the trade. Obviously, I am not concerned with the material of the part 8 but primarily with the designing and configuration. It is characterized by a somewhat customarily shaped outer end portion 9 and a neck 10 which, in practice, is attachable to the saxophone, clarinet or other instrument. These parts are formed with the customary bore 11*a* (see Figure 3). The contour of the walls defining the tone chamber vary in different makes of mouthpieces and here I use my own contouring for tone quality, quantity and best performance. The tapered tip of the mouthpiece is denoted at 11 and, incidentally, the numeral 12 denotes an embedded insert, of appropriate material, serving as a rest for the upper teeth of the user. The inner end portion (underside of the neck 10) is formed with a block-like boss 13 formed with a cavity 14 providing a ligature adapting and clearance pocket. The extreme end portion to the right of the cavity is fashioned into an inclined abutment 15 having a screw-threaded stud accommodation socket 16. The transverse marginal wall 17 and co-acting parallel longitudinal walls 18 are undercut to provide a groove 19 for keying the co-acting portion of the lay insert 20 in place. As shown in Figure 3 the down-curved partition 21 has its bottom terminating on an inset plane as indicated at 22 and this provides means for attaching and fulcruming the lay 20. Reference is had now to the insertable and removable and adjustable lay piece or insert. As a unit, this part is denoted by the numeral 20 and it is preferably constructed of brass. It is divisible into three essential portions; namely, the outer end portion 23 constituting a keying and anchoring shank, the inner end portion 24 which may be described as a bendable or flexible tang, and a deflected or oblique terminal 25 carried by the right hand end of the tang and constituting the adjustor or actuator. The shank has an elongated slot of appropriate dimension as at 26 and the side limbs 27 defined thereby are carefully machined and longitudinally tapered to render the shank sufficiently bendable to conform to the lay surface of the body with which same co-acts. As musicians know, contours and shapes vary according to tastes and alleged requirements and hence the part 23 is sufficiently flexible to meet the changing demands of the trade. Primarily, however, this is simply a slotted shank which is slipped

and keyed in place in the grooves 19. The tang is comparatively heavy in thickness and is provided at its outer or left hand end with a lateral hook-like detent 28 which is shown in Figures 3 and 4 is releasably connected with the partition, permitting the tang to have the desired fulcruming action. By keying the shank in place and also anchoring the shank by way of the hook detent 28 to the partition 21, the shank is relatively rigid in relation to the mouthpiece proper. The tang, however, is freely bendable toward and from the mouthpiece and it is this part of the lay that carries the reed 29. As shown in Figures 3 and 4 the tip or feathered end portion of the reed is denoted at 30 and the relatively rigid butt portion is denoted at 31. It is the part 31 which is clamped on the tang to move in unison therewith for adjustment purposes. The tang is encompassed within the wall portions of the aforementioned cavity and is freely bendable in and out and the cavity is also sufficiently large to accommodate the ligature 32. The ligature is the part which clamps the reed securely on the lay. This is a radically different type of ligature, compared to those ordinarily employed. The usual ligature surrounds the body and reed. Here the ligature is slipped endwise over the tang and is hung on and movable in conjunction with the tang. The preferred type of ligature is a U-clip 33 (see Figure 5), said clip having inturned suspension and retaining flanges 34. Referring to Figure 4, it will be seen exactly how the inturned flanges engage over the inner surface of the tang. The ligature also includes a thrust or pressure plate 35 which directly contacts the butt of the reed and said plate is swivelly connected as at 36 to the inner end of the shank of a milled binding screw 37. The thrust plate is encompassed within the principal confines of the U-clip.

The micrometer-type hand regulated adjusting unit is denoted by the numeral 38 and comprises a screw-threaded stud 39 which is screwed into the screw-threaded socket 16. The stud is provided on its outer end with a head 40 having a screw driver kerf and said stud serves as a post or mount for the thumb nut 41. The thumb nut is threaded on the stud and the outer face thereof is counterbored to provide a socket to accommodate the head 40 and also a cushioning and anti-rattling spring 42. This is a coil spring which surrounds the stud, is situated in the socket and is held in place by the head 40. The inner face of the nut is engageable with the terminal 25 and the terminal has a hole 43 to accommodate the stud.

The lay 20 is attached to the lay face of the body 8 by feeding and slipping the slotted end portion or shank 23 into the keying grooves 19 provided for the purpose. The detent 28 is snapped into place against the partition 21. Thus, the shank portion is substantially rigidly attached to the air intake end of the mouthpiece. The ligature 32 is slipped over the tang 24 to take the position seen for example in Figure 2. The reed is inserted so that it is clamped by the thrust plate 35 against the tang. Consequently, the tang, reed and ligature act in unison. Now, the stud or post 39 is threaded into the socket 16, the stud carrying the spring cushioned micrometer nut 41. It is obvious that the stud merely serves as a post for the nut and that the nut is the adjusting part for the deflected terminal 25 of the tang. The outer face of the nut, in practice, is provided with indicating ordinals

as shown for example in Figure 1. These may range from wide open to nearly closed position as indicated for positions though in practice it has been found that approximately seven different positions may be accurately bargained for. In Figure 3 the nut has been adjusted to flex the tang and to thus angularly tilt the tip of the reed from the tip of the mouthpiece and this forms an "open" lay. In Figure 6 the adjustment has been made and the inherent resiliency of the tang, as the adjusting nut 41 is backed off serves to spring the tang outwardly and away from the mouthpiece and this bodily tilts the reed to swing the tip to a "close" lay range. Other ranges between these two extremes can be had by properly adjusting the thumb nut.

Any restriction of reed vibration, other than by the lips of the performer, subdues overtones and is detrimental to good tone quality. In my device it will be noted that the reed is free and unrestrained, as on all standard mouthpieces, but that the lay itself, in its entire length, is regenerated by any movement of the adjusting nut 41.

The body design of this mouthpiece is new. It is unique in mouthpiece design as it is not designed around the center line of the neck piece, or bore, of the instrument to which it is attached. It is offset as at 13, to allow the ligature 32 to be installed on the body from the opposite end, away from the tip of the reed.

In a mouthpiece of this design, with or without the adjustable feature, the ligature never comes in contact with the tip of the reed, and it thereby avoids reed splits due to this very common cause.

It is necessary to employ a dial micrometer in balancing the bending characteristics of the spring lay to insure uniform lay generation through maximum and minimum adjustments. Therefore, the lay 20 is a precision part.

It is desirable to attain microscopic control of reed strength and consequent accurate control of volume and intensity of sound waves and consequent fine tone quality. The infinite adjustment possibilities of the position of the reed and the markings to attain this are important. Also adjustments of the lay and reed strength may be made while the instrument is being played, that is without removing the mouthpiece from the mouth of the performer.

For a more satisfactory and comprehensive understanding of the novel principles which are herein invoked, it seems advisable, before concluding and introducing my claims, to make broad reference to a common method of lay generation known to most clarinetists and saxophonists. The hand tools required are an abrasive lapping plate of general rectangular form and a plurality of selectively usable rollers. Thus equipped, the lay grinding procedure, a hand technique, is carried out by placing a mouth-piece on the stated lapping plate with a roller under the bridge of the mouth-piece while the latter is oscillated back and forth and while the tip end of the mouth-piece is pressed down. The roller under the mouth-piece is allowed to roll freely from bridge to heel while the mouth-piece is in motion in relation to the lapping plate, thus producing a "curve" on the tip end of the mouthpiece in direct relation to the diameter of the roller which, at the time, is being used. This curve is not a segment of a circle or any that I seem able to describe by geometrical or mathematical language. The curve thus produced defines the true lay of a mouth-piece and is the essential part. The distance between the reed and the tip of a mouth-piece is not the true lay.

In prior art devices, only the "angle" of the reed changes. The curve is a fixed quantity and does not change. This produces an unsatisfactory lay because the reed does not remain tangent to its lay curve. Devices which have come to my attention have a fixed fulcrum and do not provide a coacting lay with their adjustable reed angle. On the other hand, the spring lay which is incorporated in my mouth-piece does, in fact, produce a true lay with each adjustment of the stated control knob which results in simultaneously changing the "curve" of the lay while also changing the "angle" of the reed. That is to say, my mouth-piece lay, by being a flexible member, does, in fact, rise up toward the reed and the reed angle is changed simply by adjusting the knob and thus providing a new lay curve with each adjustment or increment of the reed angle. This has substantially the same result as regrinding a mouth-piece with a different diameter roller. The lay member, by being a full reed length properly tapered flexible unit, assures that the lay curve and angle of reed always remain tangent and coact under all adjustments.

It is submitted that with a mouthpiece of this construction the beginner will find it possible to master and conquer tormenting requirements which make for controllable and somewhat fixed embouchure results. One of the most difficult trials of the beginner is to adopt and formulate a standardized embouchure. With a mouthpiece as herein shown and described desired results may be attained with accuracy and reliability.

A careful consideration of the foregoing description in conjunction with the invention as illustrated in the drawings will enable the reader to obtain a clear understanding and impression of the alleged features of merit and novelty sufficient to clarify the construction of the invention as hereinafter claimed.

Minor changes in shape, size, materials and rearrangement of parts may be resorted to in actual practice so long as no departure is made from the invention as claimed.

What I claim is:

1. As a new article of manufacture and a component part of a reed instrument mouthpiece of the class described, a mouthpiece proper comprising a tubular body externally tapered to assume general conventional configuration at the usual tip end and having a neck at the opposite end, the last named end of said body having a pronounced boss, being axially elongated and said boss having a cavity and terminating at the neck end in an abutment oblique to the longitudinal axis of the body.

2. A mouthpiece of the class described comprising a longitudinally bored body having a lay adapting and supporting face, said face being provided at its tip end and coacting bridge portion with a lay shank accommodating groove to receive and retain the lay shank in place, the heel end of said face having an abutment oblique to the longitudinal axis of the body, and that portion of the face inwardly of the abutment having a ligature clearance cavity, and an insertable and removable lay having a slotted anchoring shank fitted into said groove, a flexible tang opposed to and coacting with said cavity and, a lateral tang flexing and adjusting termi-

nal opposed and parallel to and movable toward and from said abutment.

3. A mouthpiece of the class described comprising a longitudinally bored body having a lay adapting and supporting face, said face being provided at its tip end and coacting bridge portion with a lay shank accommodating groove, the heel end of said face having an abutment oblique to the longitudinal axis of the body, and that portion of the face inwardly of the abutment having a clearance cavity, and an insertable and removable lay having a flexible slotted shank fitted into said groove, a flexible tang opposed to and coacting with said cavity, and a lateral tang flexing and adjusting terminal opposed, parallel to, and movable toward and from said abutment, said terminal having an aperture, a screw-threaded stud mounted in and extending at right angles to said abutment and passing through the aperture in said adjusting terminal, and an adjusting and retaining nut threaded on said stud and contacting the adjusting terminal in a manner to move the latter toward and from the abutment and to simultaneously adjust the longitudinal curvature and angle of said tang in relation to said lay supporting face.

4. A reed instrument mouthpiece of the class shown and described comprising a longitudinally bored body having a substantially flat lay accommodating and supporting face including a tip portion, a longitudinally spaced heel portion and an intermediate bridge portion, the portion between the bridge portion and heel portion having a ligature accommodation cavity and said cavity being longitudinally elongated, said body, beyond said heel portion having a flattened abutment and said abutment being oblique to the longitudinal axis of the body.

5. A reed instrument mouthpiece of the class shown and described comprising a longitudinally bored body having a substantially flat lay accommodating and supporting face including a tip portion, a longitudinally spaced heel portion and an intermediate bridge portion, the portion between the bridge portion and heel portion having a ligature accommodation cavity and said cavity being longitudinally elongated, said body, beyond said heel portion, having a flattened abutment and said abutment being oblique to the longitudinal axis of the body, a lay unit embodying a plate of a length corresponding to the length of a conventional reed and including a centrally and longitudinally slotted projectable and retractible lay curve forming and changing shank mounted in said lay supporting face and ranging from the tip to the adjacent bridge portion and further including a longitudinally flexible reed supporting tang between the bridge and heel portion and bendable toward and from said cavity portion, said tang terminating at its heel end in an obliquely deflected adjusting member, said adjusting member being opposed and parallel to said abutment, and hand regulated adjusting means mounted on said abutment and cooperable with said member in a manner to move the same toward and from the abutment.

6. The structure specified in claim 5, together with a ligature slidably mounted on said tang inwardly of the adjusting member and opposed to said cavity, said cavity serving to permit free manipulation of the ligature between the tang and body.

7. A reed instrument mouthpiece of the class described comprising a longitudinally bored body having an adjustable lay unit accommodating and reed adjusting face, said face being provided at its bridge and tip end portions with a longitudinally extending shank accommodating groove, the heel end of said face being provided with an offset abutment oblique to the longitudinal axis of said body, a lay unit comprising a longitudinally tapered plate removably fitted in said groove and having a highly flexible lay curve shank portion and a resilient bendable tang portion, the tang portion at the heel end having an adjuster member opposed to said abutment, clamping means attaching said member to said abutment and for flexing the tang, said shank embodying parallel limb portions which are adapted to be flexed and convexedly bowed outwardly toward the reed to coact with the reed in defining a lay curve whereby it is possible to change the angle of the reed in respect to said face and change the lay curve in respect to the reed and coincident with the change in angle of the reed.

8. As a new article of manufacture and a component part of a reed instrument mouth-piece, a full reed-length flexible lay unit comprising an elongated metal plate proper corresponding in width and length to the width and length measurements of a conventional-type reed, said plate embodying a shank portion at one end which is adapted to be adjustably mounted on a companion portion of the lay face of a mouth-piece, said shank portion being longitudinally slotted and embodying sensitively flexible longitudinally bowable lay curve limb portions, said plate further embodying a resilient longitudinally bendable tang portion on which the stated reed is adapted to be superimposed and securely clamped, said tang being provided at its heel end with a limbs flexing and tang angling terminal, said terminal being laterally and obliquely disposed in respect to the longitudinal axis of said plate and being apertured to accommodate a stud and nut adjusting device, said plate also having a retaining element at the junctural portion of the shank and tang, which retaining element is adapted to be connected with a bridge portion of the stated mouth-piece to anchor the adjacent portion of said shank and to permit desired flectional actions of the shank as well as the tang.

LEO R. REDDICK.

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