



# PATENT SPECIFICATION

626,478

Convention Date (Denmark): Aug. 28, 1945.

Application Date (in United Kingdom): July 23, 1946. No. 21931/46.

Complete Specification Accepted: July 15, 1949.

Index at acceptance:—Class 88(ii), L, O2.

## COMPLETE SPECIFICATION

### Improvements in and relating to a Mouthpiece for Wind-Instruments and Reed Holder for such a Mouthpiece

I, ERNST KJELDSEN, a subject of the King of Denmark, of Nr. 15, ved Bommen, Gentofte, Denmark, do hereby declare the nature of this invention and in what manner the the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a mouthpiece for wind-instruments such as clarinets, saxophones, and the like, in which for the production of acoustic vibrations a reed is clamped against the mouthpiece in such a manner that one end is able to vibrate freely, the free end of the reed being adapted to be pressed, to varying degrees, against a lay formed by two curved parts on the mouthpiece while the instrument is being played. The invention further relates to a reed holder for such a mouthpiece.

In practice the life of such reeds is comparatively short and for only a rather limited period of their life have they the exact form and resilience which make them best suited for their purpose. The object of the present invention is amongst other things to increase the durability, and thus the life, of such reeds.

Another object of the invention is to provide an improved mouthpiece for wind instruments in which the distance between the mouthpiece proper and one end of the reed is adjustable in a way known *per se*.

Formerly it has been proposed to prolong the life of the reeds by making the mouthpiece bipartite in such a way that the outermost part of the latter can be turned at an angle in relation to the remaining part, in order that thereby the distance between the end of the reed and the end of the mouthpiece can be altered by an adjustment made previously to the playing of the instrument. This construction has not, however, been used very much in practice, which must be supposed to be due to the fact that it does not pro-

tect the reed against the varying pressure to which they are subjected while the instrument is being played, and which will just give rise to permanent sets.

In accordance with the present invention the prolonged life of a reed is attained by an arrangement wherein the said pressure is spread over the greater part of the reed and not at one point only, such arrangement being characterised in that the reed is clamped resiliently against the mouthpiece so as to be yieldable along the whole of its length.

By the application of the construction in accordance with the invention other advantages are attained at the same time, amongst which may be mentioned that the production of the tone and the blowing of the instrument become easier. Furthermore it is possible, without affecting the life of the reed perceptibly, to make the lay on the mouthpiece more curved and thereby the slots between the reed and the mouthpiece larger, which may also contribute to making the playing easier.

In one embodiment of the mouthpiece according to the invention the reed is held pressed against the mouthpiece by one or more springs and touches the latter only at the two curved paths, at about the middle of the reed, and at a point at one end of the reed. By a support of this kind, which may approximately be termed a three-point support, a pressure of the vibrating end can be spread by alterations of shape over the whole length of the reed, and thereby a local overload of the fibres is avoided.

Generally a mouthpiece has a pertaining reed holder or clamping ring for the clamping of the reed. In such a mouthpiece the clamping ring, according to a further feature of the invention, carries one or more springs on its inner side, which springs press the reed yieldably against the mouthpiece.

In an advantageous embodiment of the

[Price 2/-]

mouthpiece in accordance with the invention, the clamping ring on its inner side carries one, two, or more leaf springs which extend in the longitudinal direction of the clamping ring, and are secured at one end, and which at the other, free end have sharp edges which are pressed against the reed and keep the latter in place.

In accordance with other features of the invention there are expediently provided on the clamping ring means for the adjustment of the pressure of the spring or springs against the reed. Furthermore the mouthpiece according to the invention is, in an especially advantageous embodiment, provided with means, by which the distance between the underside of the end of the reed facing away from the tip and the substantially plane surface of the mouthpiece can be adjusted; in this case there will be used, as with other embodiments, special sealing means between the reed and the mouthpiece between the points with which it presses against the latter. The said adjustment means, which may consist of suitably mounted adjustment screws, make it possible, as is known *per se* conveniently and quickly to switch to different interpretations, e.g. high or low pitch, staccato, legato, etc. while the instrument is being played, but not until the sealing means which may be provided in accordance with the invention, are used in combination herewith will it be possible to procure a construction that is applicable in practice and in which the air does not leak out of the mouthpiece and the vibration of the reed is not hampered, because it presses only against the lay.

The invention is further explained in the following with references to the drawing, which in

Fig. 1 shows an embodiment of a reed in accordance with the invention;

Fig. 2 an embodiment of a mouthpiece in accordance with the invention, viewed in section, but without reed and clamping ring;

Fig. 3 the mouthpiece in Figure 2 viewed from above;

Fig. 4 another embodiment of the mouthpiece in accordance with the invention with its reed mounted and clamped by means of an adjustable and detachable clamping ring;

Fig. 5 an embodiment of a clamping ring in accordance with the invention;

Fig. 6 an embodiment of a mouthpiece with fixed clamping means for the reed and

Fig. 7 a reed with adjustment means. The reed 1 for a clarinet shown in Fig. 1 has at its thick end a hole 3, through

which an adjustment screw 4 on the mouthpiece 5 shown in Fig. 2 can be passed, when by means of a clamping ring (see Fig. 5) the reed 1 is pressed resiliently in the direction of the substantially plane surface 6 of the mouthpiece 5. The head of the screw 4 has a larger diameter than the hole 3.

In the direction towards the tip of the mouthpiece the surface 6 is transformed into two surfaces 7, which are shown in Fig. 3, and form the so-called lay for the reed. The transition is of such a kind that upwardly projecting lists or ridges 8 are formed. The depth of such lists or ridges is preferably about 0.1 mm. or more and serves as a bridge for procuring a clearance between the reed and the mouthpiece.

To effect a special air-sealing there is a thin yieldable plate 9 which is shaped so that it presses on the underside of the reed with its edge 10, when the reed is placed in its working position on the mouthpiece. This method of effecting the sealing is of special importance as regards modification of mouthpieces already in the market. When constructing a new mouthpiece in accordance with the invention the sealing means can be incorporated as an integral part of the mouthpiece. It is of vital importance that the reed only rests securely on the two surfaces forming the lay and the sealing means must therefore be yieldable.

By adjustment of the screw 4, e.g. through the opening 3 in the reed 1 it is possible to adjust the reed for different pitches, the said adjustment causing the reed to turn or bend at the edges 8.

The clamping proper of the reed is illustrated in Fig. 4 where the reed 1 is mounted in its working position on a mouthpiece 11 by means of a reed holder or clamping ring 12. As will be seen, the reed rests on the edges 8 and the end of an adjusting screw 16. The form of the surface, against which the reed is usually pressed but from which it is here raised clear, will thus be of no importance provided it does not hamper the motion of the reed. The clamping ring 12 carries two leaf springs 13 which at their free ends have sharp edges or points 14. Hereby the reed is prevented from being displaced longitudinally or laterally. Nevertheless it is possible for the reed to take up stresses along its whole length when, while the instrument is being played, the thin end is forced in against the lay 7, shown in Fig. 3, by lip-pressure. By this pressure the vibrating part of the reed is shortened, and the tone becomes higher.

In the mouthpiece generally used about one half of the reed is held immovably

fast against a substantially plane surface of the mouthpiece, which must be supposed to be the reason why the reed has only so short a life. The fact is that under the influence of the lip-pressure the thin part of the reed is, on account of the clamping of the reed at the middle, subjected to a stress beyond the limit of elasticity, so that comparatively early it will assume a permanent curvature which makes it useless. In accordance with the present invention the principle that the reed must be secured immovably is departed from. In accordance with the invention the reed on the contrary is able to yield slightly throughout its length so that at no point is it strained beyond the limit of elasticity and therefore its life is very considerably prolonged, viz. to about ten times the normal life.

The pressure with which the reed 1 is pressed down against the mouthpiece can in the construction in Fig. 4 be adjusted by means of adjustment screws 15. The adjustment for attaining the different sizes of the slots, between said reed and the mouthpiece is here effected by means of a continuous adjustment screw 16 which can be operated from the underside of the mouthpiece.

An embodiment of clamping ring is shown in Fig. 5. The clamping ring 12 is slit and can be tightened by means of winged screws 17. On the inner side of the ring there are distance pieces 18, and between them there are two leaf springs 13. The distance pieces can serve as guides for the reed. The adjustment screws for the adjustment of the spring pressure are, as is the case in Fig. 4, designated by 15.

The essential for ensuring long life for the reed is, as mentioned above, that the reed has a certain freedom of movement also along that part which is usually clamped securely to the mouthpiece. This does not prevent, in certain embodiments of the invention, not shown in the drawing, the reed from being clamped at one end, if the reed possesses the necessary elasticity. Here a special reed is therefore required.

In the embodiment shown in Fig. 6 in which for the sake of perspicuity the reed is not shown, there are supports 19 fixed stationarily on the mouthpiece 5, to which supports a plate-shaped reed holder 21 with two springs 22 and 23 is secured by screws 20. These two springs may be replaced by one continuous spring. The spring 22 presses against the reed (not shown) in the vicinity of the point where the reed presses against the lay 7. Between the paths, e.g. in a groove in the mouthpiece, there is a rubber strip 24 which serves for procuring an air-sealing

between the reed and the mouthpiece.

In some constructions an air-seal may be formed by filling the groove with a liquid but this method can of course only be adopted when the groove is in the form of a trough and a reed with a sufficiently plane smooth undersurface is used.

The adjustment of the reed may, instead of as shown on the drawing, be effected by means of a finger screw on the upper side of the mouthpiece or conveniently by means which are mounted in a manner known *per se* on the clamping ring or even on the reed proper. The latter case is shown in Fig. 7, where at its thick end the reed has a threaded bore for holding an adjustment screw 2.

For attaining the object of the invention, viz. applicability in practice, it is not absolutely necessary that special measures are taken for procuring an air-sealing. On the drawing is shown how the sealing can be attained by means of a yieldable plate 9. It is, however, also possible, e.g. by means of caoutchouc which is conveniently partly sheathed by thin metal plate, to provide other means of sealing without affecting the scope of the invention.

In Fig. 4 springs 13 are shown which project out of the holder 12. The spring facing the point of the mouthpiece presses against the reed at 8 and is to press the reed firmly against the lay 7; the oppositely directed spring is to regulate the lift of the reed. The number may be varied.

The adjustment of the spring pressure can be effected by adjustment screws as shown on the drawing. If it is only a question of discontinuous adjustment, a small lever system, not shown on the drawing, may be used for attaining a stepwise adjustment. If there are several springs there may be adjustment means for each individual spring or an adjustment means mutual to them all.

The reeds generally used can be used in the mouthpiece in accordance with the invention. The length of the thin part of the reed fixes the placing of the springs.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A mouthpiece for wind instruments comprising a reed for producing acoustic vibrations and two curved surfaces forming the lay along which the contact points of said reed can be displaced under the influence of lip pressure characterised in that the reed is clamped resiliently against the mouthpiece so as to be yieldable along the whole of its length when

the vibrating part of the reed is pressed on the said lay.

2. A mouthpiece for wind instruments comprising a reed for producing acoustic vibrations and two curved surfaces forming the lay along which the contact points of the reed can be displaced under the influence of lip pressure, characterised in that the reed is held resiliently against the mouthpiece in such a manner that it is yieldable along the non-vibratory part, when the vibratory part of the reed is pressed on the said lay, and is itself pressed air-tightly against the mouthpiece.

3. A mouthpiece for wind instruments according to claim 1 or 2, wherein the reed is held resiliently against the mouthpiece by a spring or springs carried by holding or clamping means.

4. A mouthpiece for wind instruments according to claims 1 or 2 and 3, wherein the non-vibratory part or thick end of the reed is held between a spring or springs carried by a clamping or holding means and the curved paths of the mouthpiece.

5. A mouthpiece for wind instruments according to claim 4, wherein the curved paths at their ends adjacent the middle of the mouthpiece project from the surface thereof in the form of salient paths ending in edges.

6. A mouthpiece for wind instruments according to claims 3, 4 or 5, wherein the non-vibratory or thick end of the reed is supported by the paths adjacent their edges and an adjustable supporting means acting against the action of the spring or springs, the arrangement being such that the reed is yieldable throughout its length and the distance between the tip or vibratory part of the reed and the mouthpiece can be adjusted by said adjustable supporting means.

7. A mouthpiece for the wind instruments according to claim 6, wherein the adjustable supporting means consists of a finger screw passing through a threaded bore in the reed and pressing with its end against the mouthpiece.

8. A mouthpiece for wind instruments according to claim 6, wherein the adjustable supporting means consists of a finger screw passing through the mouthpiece and pressing with its end against the under side of the reed.

9. A mouthpiece for wind instruments according to claim 6 and 7 or 8, wherein the reed rests only against the list or bridge piece and against the adjustable supporting means.

10. A mouthpiece for wind instruments according to any of claims 3 to 9 wherein the spring or springs is or are carried by clamping or holding means comprising a split clamping ring detachably mounted on the mouthpiece.

11. A mouthpiece for wind instruments according to claim 10 wherein the clamping ring is provided with a finger screw or screws for adjusting the pressure of the spring or springs against the reed.

12. A mouthpiece for wind instruments according to any of the preceding claims wherein means are provided for forming an air-tight seal between the reed and the mouthpiece.

13. A mouthpiece for a wind instrument according to claim 12, wherein the sealing means comprises a list of rubber, metal or the like extending transversely of the mouthpiece and pressing yieldingly against the underside of the reed.

14. A mouthpiece for wind instruments according to claim 12, wherein the sealing means comprises a transverse groove for holding the liquid and forming a liquid seal between the reed and the mouthpiece.

15. Mouthpieces for wind instruments constructed substantially as herein described with reference to the accompanying drawings.

Dated this 23rd day of July, 1946.

A. A. THORNTON & CO.,  
Chartered Patent Agents,  
Napier House, 24—27, High Holborn,  
London, W.C.1,  
For the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]



