

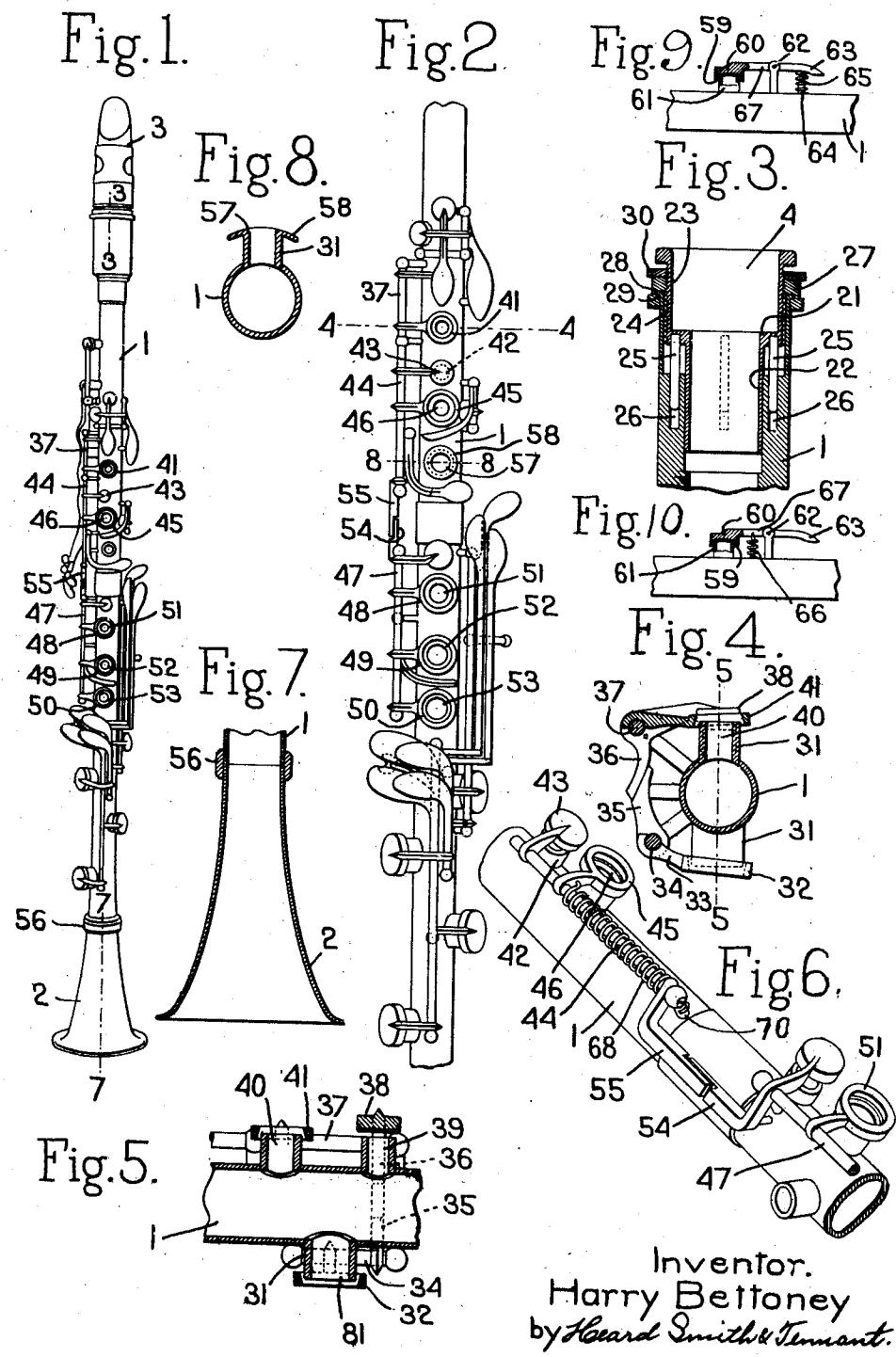
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CLARINET

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UNITED STATES PATENT OFFICE.

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CLARINET.

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This invention relates to musical instruments of the clarinet type.

One object of the invention is to provide a clarinet having a body made of a metal tube and having the special constructional features which will be more fully hereinafter set forth and claimed.

In order to give an understanding of the invention I have illustrated in the drawings 10 a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

Fig. 1 is a view of a clarinet embodying 15 the invention;

Fig. 2 is an enlarged view of the body portion of the clarinet;

Fig. 3 is an enlarged longitudinal section 20 through the end of the clarinet body on the line 3—3, Fig. 1;

Fig. 4 is an enlarged section on the line 4—4, Fig. 2;

Fig. 5 is a section on the line 5—5, Fig. 4;

Fig. 6 is a fragmentary perspective view of 25 a portion of the clarinet;

Fig. 7 is an enlarged sectional view on the line 7—7 Fig. 1 showing the manner in which the bell is fastened to the body;

Fig. 8 is a section on the line 8—8, Fig. 2;

30 Figs. 9 and 10 are fragmentary sectional views showing a type of spring which may be used for yieldingly holding a cap over a tone hole.

The clarinet herein shown is provided with 35 a metal body 1 which is made from a single metal tube, said body having the usual number of tone holes and being provided with suitable key arrangement by which the instrument is played. The lower end of the 40 body terminates in the bell 2. The construction of the body and bell will be more fully described hereafter.

3 indicates the mouthpiece which is detachably secured to the body as usual, the end 45 of the body 1 being provided with a socket 4 into which the mouthpiece is removably inserted.

The socket 4 into which the mouthpiece is inserted is formed in a socket member 21 50 which is adjustably mounted in the body of the clarinet. This socket member is provided with the neck 22 which telescopes into the interior of the body 1 and it is enlarged at the socket end as shown at 23, the 55 enlarged portion having exterior screw

threads 24. The socket member is provided with four pins 25 which telescope into recesses 26 formed in the body 1, said pins serving to prevent the socket member from turning while permitting it to move axially. 60 Swivelled on the end of the body 1 is an adjusting nut member 27 which has screw-threaded engagement with the exterior screw threads 24 on the socket. This member 27 is provided with an interior groove 28 in which 65 is received a lip 29 formed on the end of the body member, the lip and groove providing the swivel connection which permits the nut 27 to turn. By turning the nut 27 one way or the other the socket member 4 may be moved 70 axially of the body 1 thereby adjusting the tuning of the clarinet. 30 indicates a lock nut which also has screw-threaded engagement with the screw threads 24 and which serves to lock the adjusting nut 27 in its adjusted position. 75

The socket member 4 is removable from the clarinet body 1 and its removability may be effected by turning the adjusting nut 27 until the screw-threaded portion of the socket member has been screwed out of the nut. The pins 25 may be freely withdrawn from the recesses 26. The socket member 4 is preferably made of metal.

The body of the clarinet is made of a single 85 metal tube which has the correct interior bore and in order to provide for proper fingering each tone hole is formed by a metal sleeve 31 which is secured to the body 1 and extends at right angles thereto, said sleeves 31 being of 90 the proper length to bring the ends thereof at a radial distance from the center of the tube corresponding to the diameter of an ordinary wooden clarinet. The walls of the wooden clarinet are much thicker than the 95 walls of the metal tube and the sleeves 31 are of the right length to bring the outer ends thereof at substantially the same radial distance from the center of the tube as the exterior diameter of a wooden clarinet.

100 Some of the tone holes have rings associated therewith as usual in clarinets. In the construction herein shown, these rings encircle the raised tone holes and when depressed the ends of the raised tone holes project up through the ring. When any ring is 105 depressed the surface of the ring forms with the raised tone holes an enlarged surface to receive the finger of the player.

110 While in many respects the fingering of

the clarinet is the same as that usually employed yet in some respects it is slightly different and improved. For instance, the tone hole 81 (the F# vent hole) underneath the body of the instrument and which is usually covered by the thumb of the left hand and which when covered alone produces the F natural tone has associated therewith a ring 32 which is carried by an arm 33 fast on a rock shaft 34, said rock shaft having an arm 35 engaging an arm 36 rigid with the rock shaft 37. The rock shaft 37 carries a cap 38 adapted to close the tone hole 39 and which is the G vent hole. The F vent hole 40, which is closed by the first finger of the left hand also has a ring 41 associated therewith which is fast on the rock shaft 37 so that the G vent hole may be closed by either the thumb of the left hand or the first finger of the left hand.

The clarinet is provided with a tone hole 42 which when closed produces a tone of B flat above the staff and this is adapted to be closed by a cap 43 which is rigidly carried by the rock shaft 44 extending longitudinally of the tube 1. Means are provided whereby the tone hole 42 may be closed by its cap 43 either by the second finger of the left hand or the first, second and third fingers of the right hand.

The rock shaft 44 has a ring 45 fast thereon associated with the tone hole 46 which is closed by the second finger of the left hand so that by depressing the second finger the cap 43 is closed. This rock shaft has interlocking connection with another rock shaft 47 journaled in suitable bearings and having arms extending therefrom which carry rings 48, 49 and 50 associated with the tone holes 51, 52 and 53 which are covered by the first, second and third fingers of the right hand. The rock shaft 47 has the offset arm 54 which overlaps another offset arm 55 carried by the rock shaft 44 so that when the rock shaft 47 is turned by depression of either of the rings 51, 52 or 53 the cap 43 will be depressed to close the tone hole 42.

The bell 2 is rigidly and non-removably secured to the body 1. The small end of the bell abuts against the end of the body 1 as shown in Fig. 7 and the two parts are permanently connected together by a ring 56 which is soldered or brazed to the body and the bell respectively.

The tone hole 57 which is normally closed by the third finger of the left hand is provided with a flange 58 for the purpose of affording a broad surface to receive the finger. This flange in some respects takes the place of the ring so far as its making a rest for the finger is concerned. This eliminates any discomfort which might be caused by closing the finger directly against the raised end of a tone hole which of itself affords a relatively narrow or small surface to receive the finger.

I may, if desired, form the tubes which

provide the tone holes that are to be covered by the caps, such for instance as the tone hole 61 which is the A vent hole, with an enlarged upper end as indicated at 59. This makes a larger seat for the cap and one which is less liable to become leaky than if the seat were a narrow one such as furnished by the thickness of the wall of the tube forming the raised tone hole.

In Figs. 9 and 10 I have shown an improved arrangement of spring for normally closing the caps which is adapted for use in a musical instrument of this type having raised tone holes. In an instrument having the raised tone holes such as is provided by the tubes 31 the caps are situated a distance from the body of the instrument by the length of the raised tone hole. Owing to this fact it is possible to use a coil spring for yieldingly closing the cap onto the tone hole instead of the leaf spring or flat spring which is commonly used in clarinets that are made of wood.

In Fig. 9 I have illustrated a cap 60 for closing a tone hole 61, said cap being carried by a lever pivoted at 62 and provided with a finger piece 63. 64 represents a stop to limit the opening movement of the cap. In this embodiment the spring 65 for closing the cap encircles the spring post 64 and bears against the end of the finger piece, this spring being a push spring. In Fig. 10 an embodiment of the invention is shown wherein the spring for closing the cap is in the nature of a pull spring. In this figure the spring is indicated at 66, it being connected at one end to the lever 67 carrying the cap and at the other end to the body 1 of the clarinet.

In Fig. 6 another arrangement of coil spring is shown, said spring in said figure being indicated at 68 and it being wound about the rock shaft 44. One end of the spring may be fastened to the rock shaft or to an arm rigid therewith which carries one of the rings or cap and the other end of the spring may be anchored to the bearing post 70. This spring 68 is a coil spring, as are the springs 65, 66, but is also a tortional spring.

I claim:

1. In a clarinet, the combination with a body in the form of a single metal tube having an F# vent hole with a raised seat to be closed by the thumb of the left hand, and also having an F vent hole to be closed by the first finger of the left hand and further having a G vent hole, of a cap for closing the said latter vent hole, rings associated with the said tone holes, and connections by which the cap may be closed by the depression of either ring.

2. A clarinet having a body formed of a single metal tube provided with tone holes having raised seats, one of the raised seats

having a bore of uniform diameter throughout its length and provided at its end with an outwardly-extending flange which provides an enlarged surface to receive the finger when the instrument is played.

3. In a reed wind instrument, the combination with a single metal tubular body, said body having raised tone holes, the outer ends of which are well spaced from the outer

10 surface of the body, of a cap for closing one of

the tone holes, a lever carrying said cap and pivoted in bearings which are separated from the exterior surface of the metal tube, and a coiled metal spring engaging both the lever and tube for yieldingly holding the cap in place.

In testimony whereof, I have signed my name to this specification.

HARRY BETTONEY.