

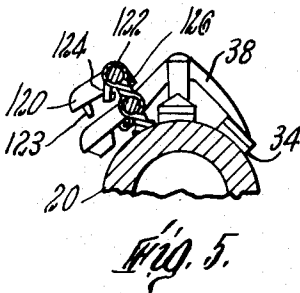
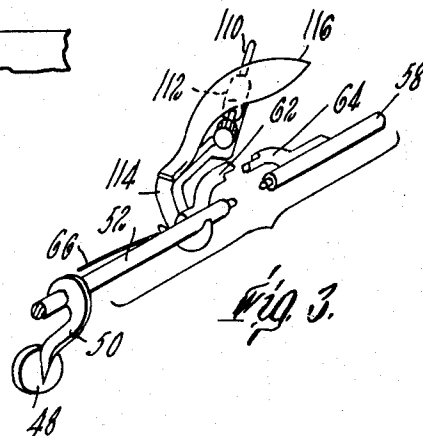
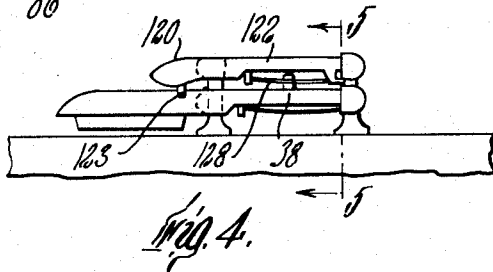
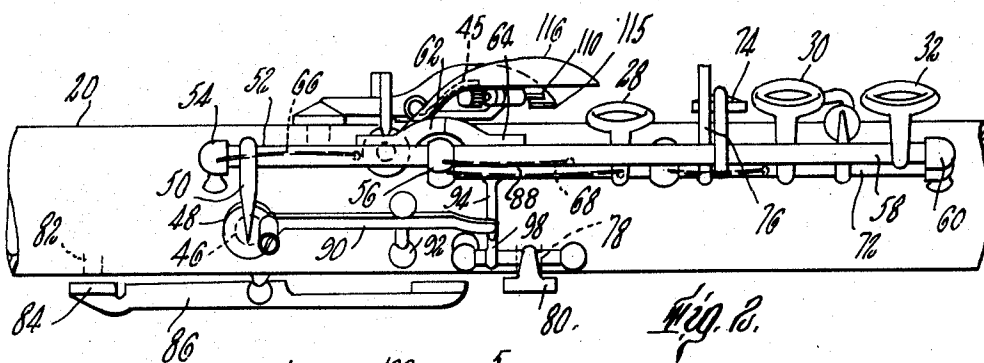
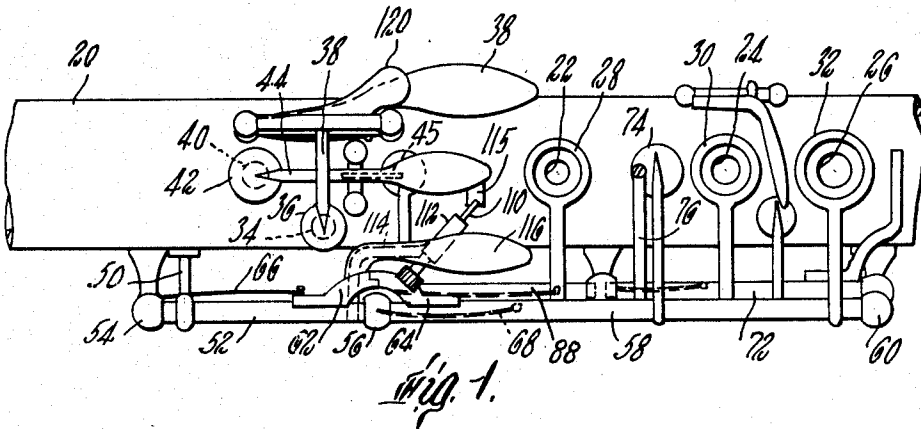
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3,150,553

CLARINET

Filed June 22, 1962



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3,150,553
CLARINET

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The present invention relates to an improvement in clarinets and is intended more particularly as an improvement upon a clarinet described and illustrated in my U.S. Patent No. 2,867,146.

The finger control throat note B \flat producing mechanism of my prior patent comprises a throat note B \flat tone hole, a normally closed pad on said B \flat tone hole, a B \flat lever carrying said pad, spring means biasing said B \flat lever and pad to open, in combination with interlocking devices controlled by the pressing of the finger hole ring associated with the first finger tone hole left hand or by the pressing of the thumb hole closing key for maintaining the B \flat lever and pad closed, and permissive operating connections between said B \flat lever and any one of a plurality of finger control elements employed to produce lower notes of the instrument which operate when pressed to permit the opening of said B \flat lever and pad to sound B \flat assuming that the throat note A key is pressed also at the same time.

It is an object of the invention to provide an improved control means for a Boehm system clarinet having a finger control note B \flat producing mechanism as above set forth providing alternative and more accessible ways of rendering the throat note B \flat which will modify the operation of said finger control B \flat producing mechanism to permit any or all of the rings below that actuated by the forefinger left hand to be left down while playing throat notes G and G \sharp , lower register.

It is a further object of the invention to provide a new and simple way of playing B \flat using only the forefinger of the left hand.

It is a further object of the invention to provide an improved fingering for producing a high E note including a new high E key, which has for its function to open the G \sharp key to a slight extent.

With the above and other objects in view as may hereinafter appear a feature of the invention consists in the provision of a disconnectable one-way connector between the B \flat lever and pad which are biased to open and the normally closed A lever, said one-way connection being arranged when in the connected position to lock the B \flat lever and its pad in a closed position excepting only when the A lever is pressed. When the one-way connector referred to is in its disconnect position finger control throat B \flat producing mechanism operates in the precise manner set forth in my prior issued patent above referred to.

Another feature of the invention consists in the provision of a novel B \flat operating finger tab which is attached to the B \flat lever and pad in a position to be actuated by the tip of the forefinger left hand which is bent to pass over and beyond the G \sharp and A keys.

Another feature of the invention consists in the provision of a novel high E key which operates when pressed by the second joint of the forefinger left hand to partially raise the G \sharp pad. The requisite fingering to produce high E will then consist of closing the thumb key and opening the register key with the thumb, pressing the first, second and third finger rings left hand and simultaneously pressing said high E key with the second joint of the forefinger left hand.

With the above and other objects in view as may hereinafter appear the several features of the invention consist also in the devices, combinations and arrangement of parts hereinafter set forth which together with the ad-

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vantages to be obtained thereby will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawing in which:

FIG. 1 is a detail plan view of a portion of the first joint of a B \flat clarinet illustrating portions of the finger control throat note B \flat producing mechanism, including a B \flat finger tab on the B \flat lever, and a slidably mounted locking pin providing a disconnectable connection between the B \flat lever and pad and the normally closed A lever, and a high E key;

FIG. 2 is a view in side elevation of substantially the parts shown in FIG. 1;

FIG. 3 is a perspective view of the B \flat lever including the finger tab and the locking pin mounted thereon;

FIG. 4 is a fragmentary detail view looking from the rear side of FIG. 1 and illustrating particularly the added high E key; and

FIG. 5 is a sectional view taken on line 5—5 of FIG. 4.

The invention is disclosed in the drawings as embodied in a B \flat clarinet which is constructed in accordance with the Boehm system of fingering, and is further provided with the finger control throat note B \flat producing mechanism of my prior Patent No. 2,867,146 above referred to. Only so much of the instrument is shown as is believed necessary to illustrate the connection of the present invention therewith.

Referring more particularly to the drawing, there is shown a portion of the upper joint 20 of a B \flat clarinet having the usual first, second and third finger holes 22, 24 and 26 left hand, and finger rings 28, 30 and 32 overlying the respective finger holes. The disclosure includes also the usual G \sharp tone hole 34, lower register, with its normally closed covering pad 36 and G \sharp finger actuated lever 38, together with the A tone hole 40 with the normally closed covering pad 42 and A finger actuated lever 44. The A lever and covering pad 42 are biased to the closed position in the normal manner by means of a spring 45.

Portions of the finger control note B \flat producing mechanism which forms the subject matter of my prior patent above referred to are shown including the B \flat tone hole 46, the normally closed covering pad 48 and B \flat pad supporting lever 50. The B \flat lever 50 is secured to a rock rod 52 which is supported between bearings formed in two posts 54 and 56. A separate rock rod 58 is mounted in alignment with the rod 52 being supported between a bearing formed in a post 56 and a bearing formed in a post 60. A broken one-way connection is provided between the two rods comprising an arm 62 on the rod 52 and a cooperating arm 64 on the adjacent rod 58. A light torsion spring 66 fastened at one end to the underside of the rod 52 and at its other end to post 54 acts to bias the rock rod 52, lever 50 and B \flat pad 48 toward the open position, this tendency to open being normally opposed by a heavier bias exerted on rod 58 and connection by means of a torsion spring 68 connected at one end to the post 56 and at its other end to the rod 58. The rod 58 is connected directly with the finger ring 32 associated with tone hole 26. The rod 58 can be rocked by means of connections with a second rock shaft 72 which connections include tuning pad 74 connected with the rock shaft 58 and finger tone hole ring 32, and a contact arm 76 which is secured to rock shaft 72 together with finger ring 30 so that a rocking movement of the finger ring 30 will depress the arm 76 and pad 74 engaged thereby to correspondingly rock the shaft 58. The rocking movement of shaft 58 referred to operates to open the broken connection 62, 64 with the B \flat lever supporting shaft 52 thus permitting the B \flat lever 50 and pad 48 to rise, opening the B \flat hole 46.

It will be understood that the invention in its broader

aspects is not limited to the particular construction and arrangement of the operating connections illustrated including the broken operating connection between one of a number of finger operated elements and the B \flat lever, and that other arrangements of said connections including said broken connection may be employed for use in other clarinets within the spirit and scope of the invention.

There is also illustrated in FIG. 2 the usual thumb hole 78, with the normally open thumb hole covering pad 80, and the register hole 82, with covering pad 84 and register lever 86. The first tone hole ring 28 is mounted on a short rock shaft 88 in line with but separated from the rock shaft 72.

The finger control throat note B \flat producing mechanism referred to also includes positive stop devices which are rendered operative either by pressing the thumb hole pad 80 or the first tone hole ring 28 to lock the B \flat lever 50 and covering pad 48 in the closed position thus to render the finger control throat note B \flat producing mechanism in operative. This mechanism generally shown in FIGS. 2 and 6 consists of a lock lever 90 mounted on a pivot pin 92 and having at one end a stop surface overlying the pad 48 of B \flat lever 50, the other end overlying a rearward arm extension 94 of the supporting pivot shaft 88 for the first finger hole ring 28, which in turn overlies an arm extension 98 of the thumb hole pad 80. As more specifically pointed out in my patent above referred to the arrangement is such that the pressing of any one of the finger hole rings second or third finger left hand or first, second or third finger right hand will cause the shaft 58 to rock in a direction which will open the broken connection 62, 64 and permit the movement of the B \flat lever 50 and covering pad 48 to the raised open position to sound B \flat . Further in accordance with the teaching of said patent the pressing of either the thumb hole pad 80 or the first finger hole ring 28 will have the effect of rocking the locking lever 90 in a direction to hold the B \flat lever 50 and pad 48 firmly in the closed position thus permitting the several finger actuated elements of the instrument connected with the shaft 58 to function in the normal manner without sounding B \flat .

Many musicians when playing G or G \sharp in the lower register of the clarinet are accustomed to leave the first, second and third fingers of the right hand and the second and third fingers left hand in hole closing position, the forefinger left hand and thumb being raised to sound G, or said forefinger left hand pressing the G \sharp lever with the thumb hole open to sound G \sharp . This technique when applied to a clarinet having the finger control note B \flat producing mechanism above described will normally sound the throat note B \flat if the A lever is pressed or the throat note A if the A lever is not pressed to open. This result follows from the fact that the B \flat producing mechanism referred to will permit the B \flat lever to shift to the open position whenever any one of said finger rings on the lower part of the instrument is pressed provided only that both the first finger hole ring left hand and thumb hole pressing pad are left open.

In order to adapt a clarinet having said finger control throat note B \flat producing mechanism for the playing of throat notes G and G \sharp lower register optionally with some or all of the second and third fingers left hand and the first, second and third fingers right hand held down, I provide a disconnectable interlocking connection between the B \flat lever and the A lever which operates so long as the A lever remains in its closed position in which the finger tab thereof is raised to maintain the B \flat lever 50 and pad 48 closed. The locking connection referred to comprises a locking pin 110 slidably mounted in a sleeve holder 112 secured to an arm 114 attached to the rocker shaft 52 which supports the B \flat lever 50 (see FIGS. 1, 2 and 3). When in its advanced position the locking pin overlies an abutment 115 formed on the finger tab of the A lever 44. The B \flat producing mechanism is now dis-

abled and the instrument may be played using any desired conventional technique for the sounding of the throat notes G and G \sharp .

In accordance with the invention a finger tap 116 is attached to the B \flat lever assembly in such a manner to permit B \flat readily to be sounded by pressing said finger tab 116 with the tip of the forefinger left hand, and the finger tab of the A lever 44 with the first joint of said forefinger left hand. In the event that the retractable locking pin 110 is in its advanced position overlying the abutment 115, the pressing of the B \flat finger tab 116 alone will produce B \flat . As best shown in the perspective view FIG. 3 the finger tab 116 is mounted on the arm 114 attached to the rocker shaft of the B \flat assembly and substantially overlies the retractable locking pin 110. It will be noted that the newly available B \flat finger operated key provided by the finger tab 116 is available for playing B \flat irrespective of the adjustment of the locking pin 110.

While in the preferred embodiment of the invention shown the finger tab 116 is attached to the B \flat rock shaft 52 and lever 50 assembly in the position and in the manner shown it will be understood that said tab 116 may be attached to said B \flat lever in other locations and may be adapted for actuation by fingers other than the first finger left hand if so desired.

In the illustrated embodiment of the invention there is also provided a high E lever 120 which is operable in accordance with a preferred fingering of the instrument to produce a high E note of greatly improved quality. As best shown in FIGS. 1, 4 and 5 the high E lever 120 is mounted on a rocker shaft 122 which overlies the rocker support for the G \sharp lever 38. A downwardly extending projection 123 of the finger tab portion of the high E lever 120 is arranged to engage against the finger tab of the G \sharp lever and acts when the high E lever is pressed downwardly to rock the G \sharp lever 38 sufficiently to raise the pad 36 slightly off its seat over the throat note G \sharp tone hole 34. The downward movement of the high E lever in each direction is limited by engagement with a stop 124 on the rocker shaft for the G \sharp lever. Upward movement of the high E lever is limited by engagement of a projection 126 on the rocker shaft 122 with one of the supporting posts. A spring 128 acts to maintain the high E lever 120 normally in a raised inoperative position. This element is operated by engagement of the second joint of the forefinger left hand therewith. The preferred fingering employed for the playing of high E consists in closing the first, second and third ring finger holes left hand, closing the thumb hole and opening the register key while at the same time the overlying high E key 120 is pressed to slightly raise the G \sharp lever 38 as above set forth.

The invention having been described what is claimed is:

1. In a clarinet having the Boehm system of fingering with finger operated elements operable to produce the several tones of said clarinet including a throat note A tone hole, a pad on said A tone hole, an A lever for said pad, and means biasing said A lever and pad to close, and a finger control throat note B \flat producing mechanism including a throat note B \flat tone hole, a normally closed pad on said B \flat tone hole, a B \flat lever for said pad, means biasing said B \flat lever and pad to open, and a broken operating connection between a said finger operated element and said B \flat lever arranged to be opened by operation of said finger operated element permitting said B \flat lever to open, the combination of a disconnectable locking device between said B \flat lever and A lever connecting said A lever when in said normally closed position to obstruct movement of said B \flat lever and pad from the closed position, said A lever biasing means being of sufficient strength to over-ride said B \flat lever biasing means and thereby to maintain said A lever and B \flat lever closed.

2. A clarinet according to claim 1 in which the disconnectable locking device between the B \flat lever and A lever comprises an abutment on said A lever and a lock-

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ing pin slidably supported on said Bb lever for adjustment into and out of an engaging position relative to said abutment.

3. A clarinet according to claim 1 in which the A lever is formed with a finger tab, and said Bb lever is formed with a finger tab positioned adjacent to said A lever finger tab to be actuated together with said A lever finger tab by the forefinger left hand to produce the throat note Bb.

4. A clarinet according to claim 1 in which the Bb lever has formed thereon a finger tab operable to move said Bb lever and tab to the open tone sounding position.

5. In a clarinet having the Boehm system of fingering with a plurality of finger operated elements operable to produce the several tones of said clarinet, the combination of a throat note A hole, a normally closed pad on said A hole, and an A lever for said pad, and a finger control throat note Bb producing mechanism which comprises a Bb tone hole, a normally closed pad on said Bb tone hole, and a Bb lever for said Bb hole covering pad, means biasing said pad and Bb lever to open, operating means for said Bb lever including a said finger operated element, and a broken operating connection between said finger operated element and said Bb lever opened by the pressing of a said finger operated element to permit movement of said biased Bb lever to open, biasing means resisting actuation of said finger operating element, and through said broken connection over-riding said first mentioned biasing means to maintain said Bb tone hole covering pad and lever closed, and a disconnectable locking device between the said Bb lever and A lever connecting said A lever to obstruct the opening of said Bb lever and pad, and biasing means for said A lever and pad over-riding said Bb lever biasing means to maintain said A lever and Bb lever closed.

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6. A clarinet having the Boehm system of fingering with finger operated elements operable to produce the several tones of said clarinet including a throat note G# tone hole, a pad normally closing said G# tone hole, and a G# lever for said pad movable between tone hole closing and raised positions, the combination of a high E lever overlying said G# lever, stop devices on said high E lever for limiting movement between raised and pressed positions, and a contact surface on said high E lever actuated by the pressing of said high E lever to engage and partially raise said G# lever and pad.

7. A clarinet having the Boehm system of fingering with finger operated elements operable to produce the several tones of said clarinet including a throat note G# tone hole, a pad normally closing said G# tone hole, and a G# lever for said pad, a thumb hole, and a normally open pad for said thumb hole, a register hole, a pad normally closing said register hole, and a register lever for said pad, and finger holes including first, second and third finger holes both right and left hands, and a high E lever overlying said G# lever adapted when pressed to engage and partially raise said G# lever and pad and thereby, when accompanied by a simultaneous pressing of the thumb pad to close, the register key to open, the pressing of each of the first, second and third fingers left hand against their respective holes to close with each of said first, second and third fingers right hand raised from their respective holes to open, to produce high E.

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