March 21, 1939. H. SELMER 2,151,337

MUSICAL INSTRUMENT

Original Filed March 27, 1935 4 Sheets-Sheet 1

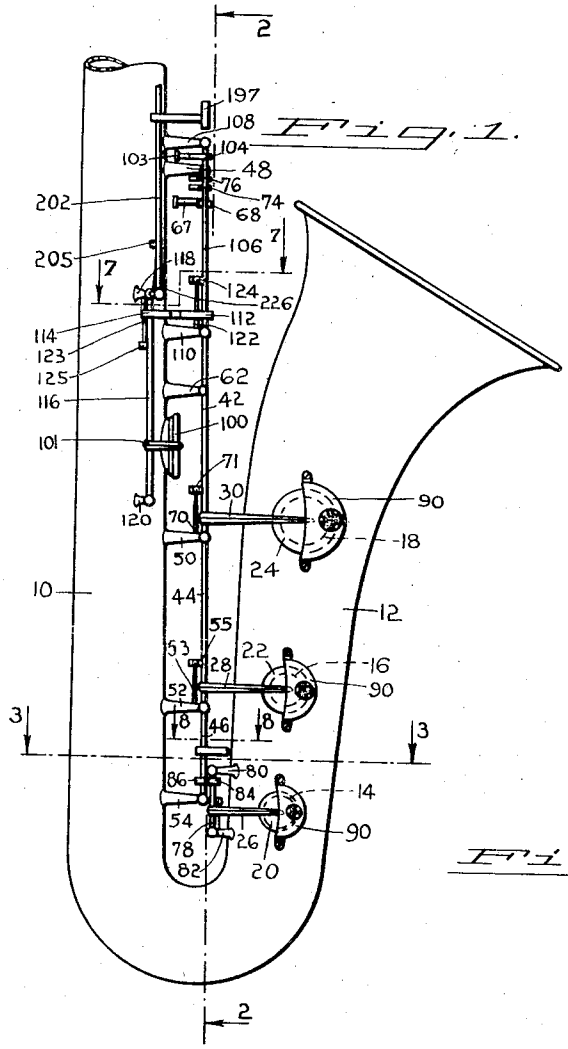


Fig. 1.

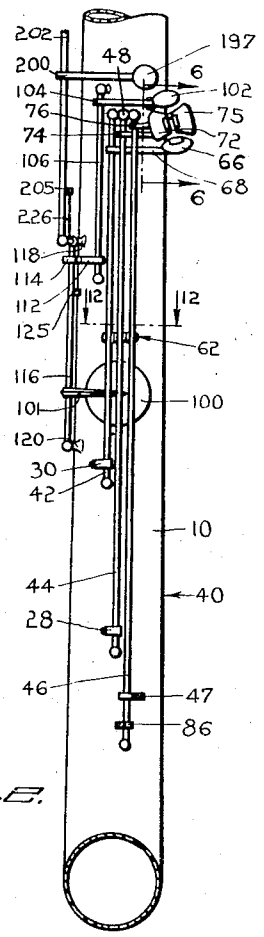


Fig. 8.

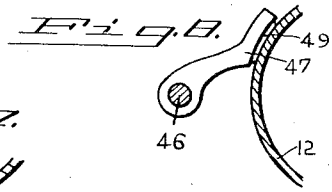


Fig. 8.

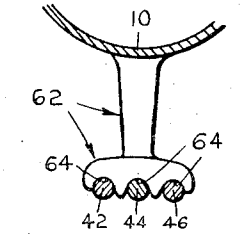


Fig. 1B.

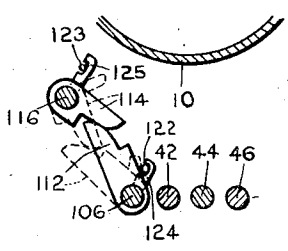


Fig. 7.

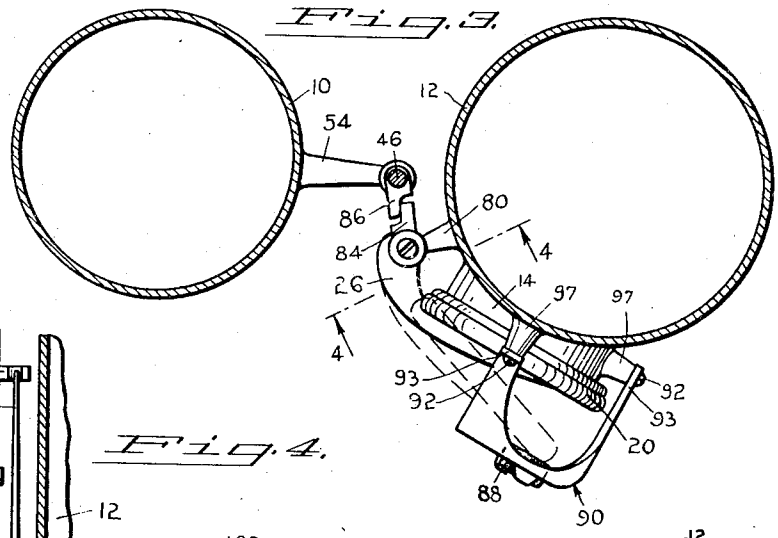
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MUSICAL INSTRUMENT

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Fig. 3.



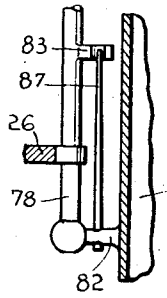


Fig. 4.

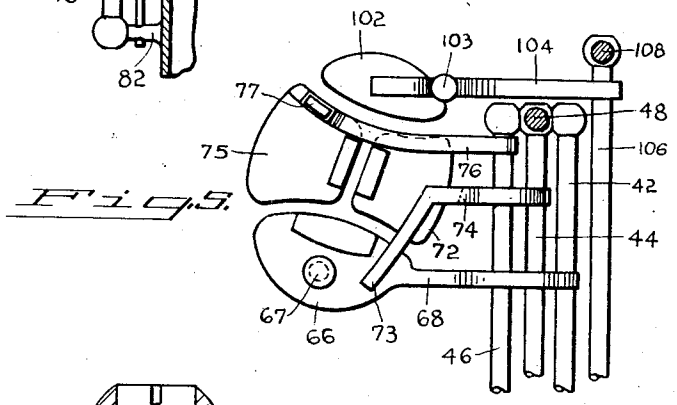


Fig. 5.

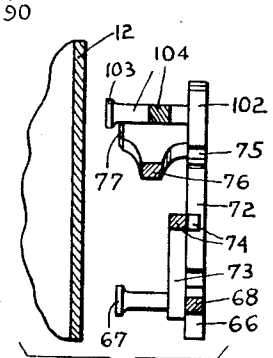


Fig. 6.

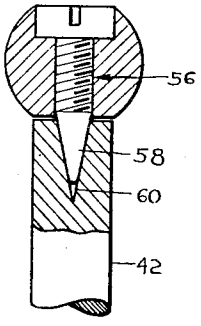


Fig. 11.

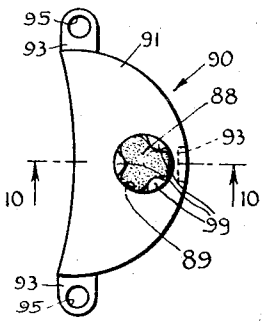
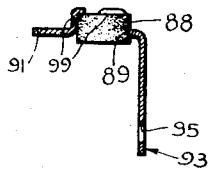


Fig. 9.

Fig. 10.



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Fig. 13.

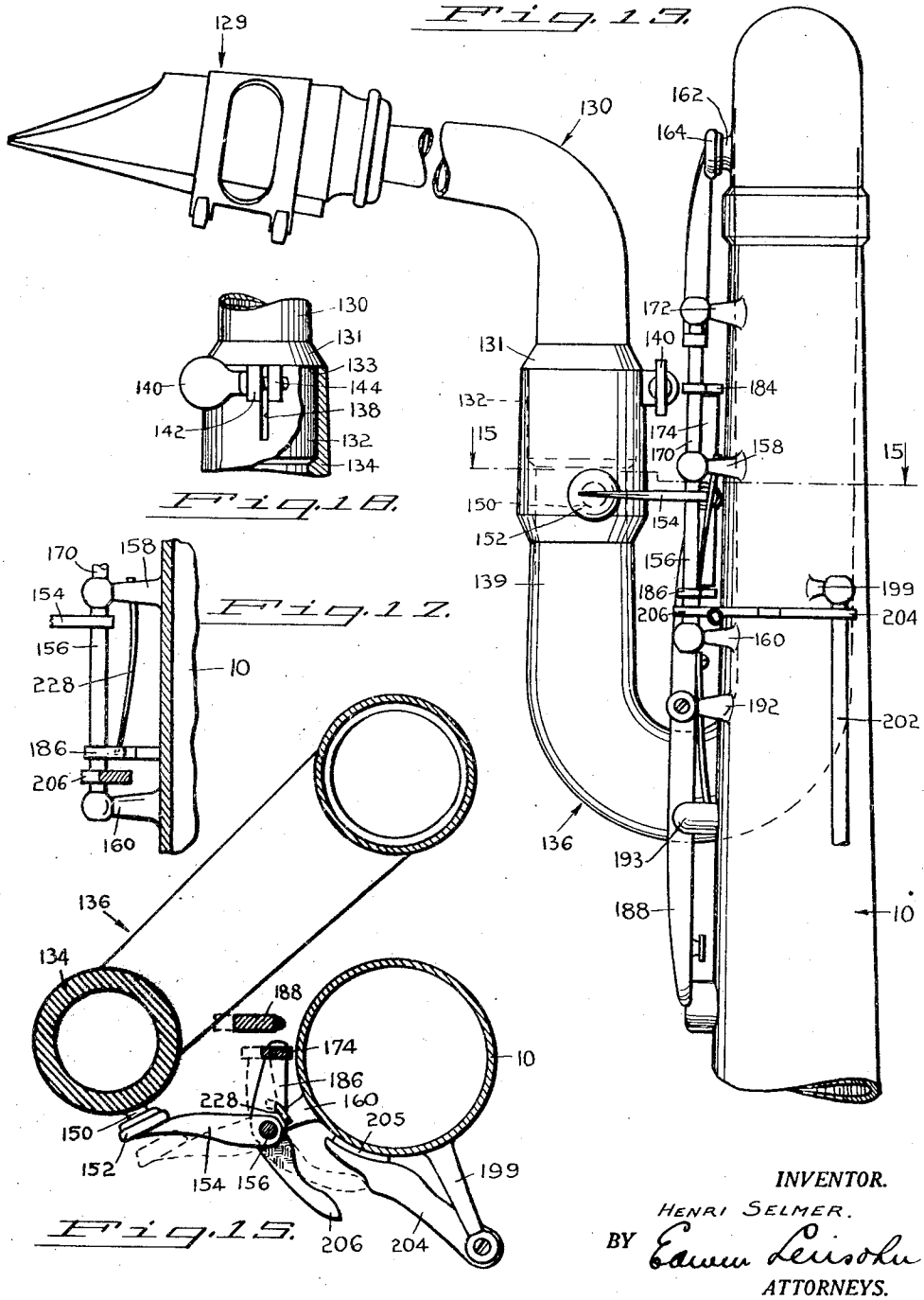


Fig. 18.

Fig. 17.

Fig. 15.

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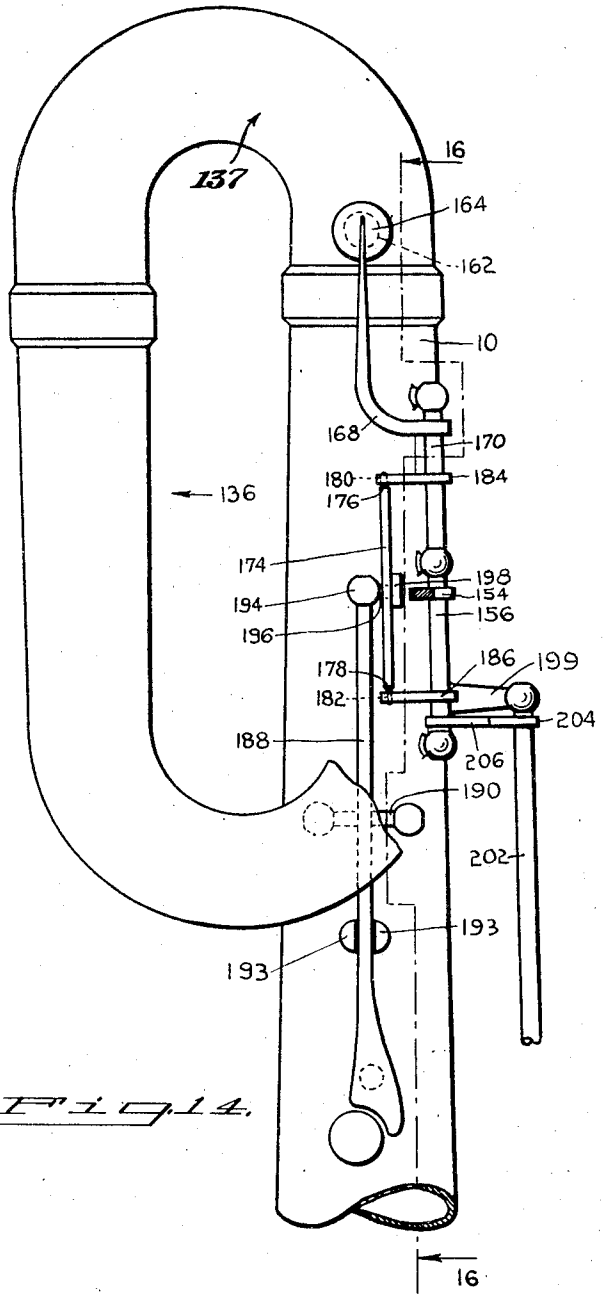
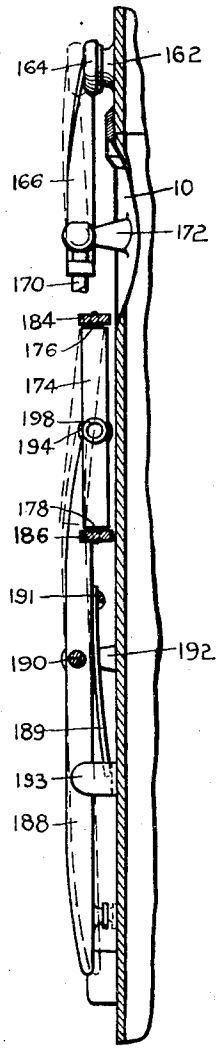


Fig. 14.

Fig. 16.



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UNITED STATES PATENT OFFICE

2,151,337

MUSICAL INSTRUMENT

Henri Selmer, Paris, France

Original application March 27, 1935, Serial No. 13,228, now Patent No. 2,090,011, dated August 17, 1937. Divided and this application July 10, 1937, Serial No. 152,944

12 Claims. (Cl. 84—385)

The present invention relates to musical instruments of the wood wind type and more particularly to saxophones or similar musical instruments. This is a division of my application, Serial No. 13,228, filed March 27, 1935.

In saxophones of the prior art constructions, the mechanisms for operating the tampions, which control the vents in the bell of the instrument, are so positioned that they project beyond the side of the instrument opposite to the side of the bell in which the vents are provided. This projection of the tampion operating mechanisms is very undesirable because it is frequently necessary for the player, when playing the instrument, to hold the latter against his body, with the result that portions of the mechanisms are caught in the clothing of the player and with the further harmful result that certain portions of the mechanisms, such as the actuating rods or shafts, are bent. It is, therefore, an object of the present invention to position the mechanisms for actuating the bell-vent tampions so that said mechanisms do not project beyond the side of the instrument.

Saxophones of the prior art constructions are also open to the objection that the tampion operating mechanisms are so mounted that they offer unequal frictional resistances to their actuation by the operating keys, and by the springs which oppose the actuation of the keys, by reason of the fact that said mechanisms include interfitting rods and sleeves of unequal length. For this reason it is necessary to provide springs capable of exerting different forces on the actuating mechanisms in accordance with the different frictional resistances of said mechanisms, and by reason of the provision of such springs of unequal strength, the forces required to actuate the keys by the fingers of the player vary considerably with respect to the several keys. This is a serious objection because it interferes with the ability of the player to exert the proper uniform touch on the keys to obtain the desired musical effects. It is, therefore, another object of this invention to mount the tampion-actuating mechanisms so that the frictional resistances are substantially equal, thereby permitting the use of springs of equal strength and as a result substantially equalizing the forces which are necessary to actuate the several keys, so that the player can actuate the keys by an even or uniform touch.

In the prior art constructions, the neck or mouthpiece of the instrument carries the octave vent and the tampion operating mechanism therefor. By reason of this construction, it is impossible to adjust the position of the neck of the instrument, although it is very desirable to provide for adjustment of the neck so that the player can position the same in a manner best suited to his convenience. It is, therefore, a further object of the invention to mount the neck in position independently of the octave vent and the tampion operating mechanism therefor so that said neck can be readily adjusted by the player to suit his convenience.

A further object of the invention is to provide a saxophone or like instrument with improved mechanisms for operating the first and second octave tampions in such a way as to obtain an evenly balanced operation of said mechanisms.

A yet further object of the invention is generally to improve the construction of wood wind instruments, such as saxophones or like instruments, especially for the purpose of obtaining evenly balanced operating mechanisms.

The above objects of the invention and other objects ancillary thereto will best be understood from the following descriptions considered in connection with the accompanying drawings.

In the drawings:

Fig. 1 is a side view of a portion of a saxophone embodying the present invention, parts being omitted for the sake of clearness in illustrating the novel construction;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a rear view in elevation of the keys and parts of the tampion operating rods actuated thereby;

Fig. 6 is a sectional view on the line 6—6 of Fig. 2;

Fig. 7 is a sectional view on the line 7—7 of Fig. 1;

Fig. 8 is a sectional view on the line 8—8 of Fig. 1;

Fig. 9 is a side view in elevation of a guard for the bell tampions;

Fig. 10 is a sectional view on the line 10—10 of Fig. 9;

Fig. 11 is a fragmentary view partly in elevation and partly in section showing one end of a tampion operating rod and a bearing therefor;

Fig. 12 is a section on the line 12—12 of Fig. 2;

Fig. 13 is a side view of the upper portion of

the saxophone with parts omitted for the sake of clearness in illustrating the novel construction;

Fig. 14 is a fragmentary rear view of the upper portion of the saxophone;

Fig. 15 is a transverse sectional view on the line 15—15 of Fig. 13;

Fig. 16 is a sectional view on the line 16—16 of Fig. 14;

Fig. 17 is a detail view partly in elevation and partly in section of part of the tampion octave mechanism;

Fig. 18 is a detail view partly in elevation and partly in section of a portion of the first bow of the saxophone and a portion of the neck or mouthpiece mounted therein.

In the drawings many of the well known parts of the saxophone have been omitted in order not to obscure the illustration of the novel features of the present invention. It is, therefore, to be understood that the present illustration is to be considered as relating to a saxophone having all the necessary parts including such parts and mechanisms as are well known to those skilled in the art and the novel parts and mechanisms disclosed herein, whereby a practically operative instrument of the improved construction herein contemplated is provided.

Referring to the drawings in detail the saxophone, embodying the present invention, comprises the usual stack 10, the bell 12 provided with the usual bell vents 14, 16 and 18 for producing the C♯, B natural and B♭ notes respectively, and controlled by the tampions 20, 22 and 24, respectively. Said tampions are carried by arms 26, 28 and 30, respectively, secured to rods which are actuated by the keys for operating the tampions.

An important feature of the present invention resides in the location of the rods at the front of the stack between the latter and the bell whereby said rods are disposed inwardly of the side 40 of the instrument opposite to the side of the bell in which the vents are provided, so that said side 40 is free from any projecting parts at the portion thereof which frequently comes in contact with the clothing of the player when the latter holds the instrument in certain positions. Thus, as best shown in Fig. 2, the mechanisms for operating the bell tampions include a group of rods 42, 44 and 46 mounted at the front of the stack 10 between the latter and the bell 12. Said rods extend longitudinally of the stack and are disposed laterally thereof in spaced relation with respect to each other. The upper ends of said rods are individually mounted in bearings carried by a bracket 48, secured to the stack 10 and projecting forwardly therefrom. The lower ends of said rods are pivotally mounted in bearings carried by individual posts 50, 52 and 54 also secured to the stack 10 and projecting forwardly therefrom. In each case, as illustrated in Fig. 11, the pivotal bearing for each end of the rod comprises a screw 56, having a conical bearing surface 58 engaged by the conical walls 60 of a recess in the end of the rod, here shown as the rod 42. A bracket 62 is secured to the front of the stack 10 and is provided with arcuate bearing surfaces 64 which are engaged by the rods intermediate the ends thereof whereby said rods are held in proper relative position and are prevented from being bent as the result of forces which may be applied thereto during the actuation thereof.

The rod 42 operates the B♭ tampion and for this purpose the arm 30 is fixed to said rod and is oscillated by the latter to open and close the said tampion. The rod 42 is actuated by the B♭ key 66 carried by an arm 68 secured to said rod near its upper end. The operation of said rod by the key 66 is resisted by a needle spring 70 secured at one end to the post 50 and at its other end to a lug 71 provided on the rod 42, said spring serving to return the tampion to open position when the key 66 is released. The B natural tampion 22 is operated by the rod 44 to which the arm 28 is secured and said rod 44 is actuated by the B natural key 72 carried by an arm 74 secured to said rod near its upper end. The B natural key is provided with a projection 73 extending into the path of movement of the B♭ key 66 and is engaged by the latter whereby its actuation also results in the actuation of the B natural key 72. The B natural key is normally held in open position by a needle spring 53 secured at one end to the post 52 and at its other end to a lug 55 projecting from the rod 44.

The rod 46 operates the C♯ tampion 20 under the control of the C♯ key 75 carried by an arm 76 secured to said rod near its upper end. However, the tampion arm 26 is not actuated directly by the rod 46 because said tampion is operated under the control of the C♯ key 75 in a direction opposite to that in which the B natural and B♭ tampions are operated so that the C♯ tampion is closed when said other two tampions are opened and vice versa. For this purpose there is provided a counter rod or shaft 78 pivotally carried by posts 80 and 82 mounted on the bell 12. The arm 26 of said C♯ tampion is secured to the rod 78 and is actuated by the latter through the medium of a rocker arm 84 secured at the upper end of the rod 78 and adapted to engage a rocker arm 86 secured at the lower end of the rod 46. The C♯ tampion 20 is normally held in closed position by a needle spring 87 secured at one end to the post 82 and at its other end to a lug 83 projecting from the rod 78, and said spring 87 also serves to return the C♯ key to its normal position. To prevent excess rotation of the rod 46 by the spring 87 and the interengaging rocker arms 84 and 86 when the key 75 is released, the rod 46 is provided with a stop arm 47 secured thereto and adapted to engage the bell 12 to limit the return movement of said rod, said arm 47 having a sound muffling pad 49 of any suitable material, such as hard rubber, secured thereto. The C♯ key 75 is provided with a stop 77, which, upon the actuation of said key, engages the stack 10 to limit the degree of rotation of the rod 46 thereby eliminating unnecessary stresses on the needle spring 87 and equalizing the movement of the key with respect to the other keys for operating the bell tampions. The B♭ key 66 is also provided with a stop 67 which is adapted to engage the stack 10 when said key is actuated.

The bell vent tampions 20, 22 and 24 are disposed for movement between the mouths of the vents and resilient stop members 88 carried by guards 90 which are secured to the bell over the vents therein by screws 92. As the guards 90 are of the same construction and differ from each other only in size, only one of said guards will be described in detail. Referring to Figs. 1, 3, 9 and 10, it will be observed that the guard 90 comprises a segmental plate 91 carried by three symmetrically arranged arms 93 disposed in right angular relation thereto and provided with apertures 95 through which the screws 92 are passed for securing the guard to posts 97 projecting from the bell 12. The plate 91 is provided with an aperture 89 within which said resilient stop member 88 is mounted in frictional engagement

with the edge of the plate adjacent said opening and with the top surface of said resilient stop engaged by upwardly and inwardly reflexed fingers 99 provided in plate 91. Said resilient stop 88 is preferably constituted by a soft felt pad.

Another important feature of the present invention resides in an improved arrangement for operating the G♯ tampion 100 which is operated by mechanisms, which will be described presently, under the control of the G♯ key 102. Said key 102 is carried by an arm 104 secured at the upper end of the rod 106 which is pivotally mounted in bearings of the construction illustrated in Fig. 11 carried by posts 108 and 110 on the stack 10 as shown in Fig. 1. The rod 106 is provided with a rocker arm 112 adapted to engage a rocker arm 114 at the upper end of a counter rod or shaft 116 pivotally mounted at its ends in bearings of the type illustrated in Fig. 11 carried by posts 118 and 120 fixed to the stack 10. The tampion 100 is carried by an arm 101 which is fixed to said rod 116. Said G♯ tampion 100 is normally held in closed position by a needle spring 122 fixed at one end to said post 110 and at its other end to a lug 124 projecting from the rod 106. The movement of the key 102 against the force of the spring 122 is limited by a stop member 103 which is carried by the arm 104 in position to engage the stack 110. As best shown in Figs. 1 and 7, the shaft 116 is urged to tampion opening position by a needle spring 123 secured at one end to the post 118 and bearing at its other end against a lug 125 projecting from said shaft. Accordingly, when the shaft 106 is actuated against the spring 122, the pressure of the rocker arm 112 on the rocker arm 114 is reduced or released thereby permitting the spring 123 to actuate the shaft 116 to open said tampion 100.

Another feature of the present invention resides in the provision for mounting the neck or mouthpipe of the saxophone independently of any tampion or tampion operating mechanism and in the provision of means to permit the adjustment of the neck to suit the convenience of the player. Thus, as best shown in Figs. 13 and 18, the neck 130 is provided with a sleeve 132 which is received within a socket portion 134 at one end of the first bow 136. The opposite free end of the neck is provided with the usual mouth piece 129. The neck 130 is provided with a short collar 131 at the upper end of the sleeve 132 providing a shoulder 133 which engages the upper or free end of the socket 134. For the purpose of securing the neck in adjusted position, the socket 134 is provided with a slot 138 to permit contraction of said socket by means of a clamping screw 140 in threaded engagement with lugs 142 and 144 secured to the socket 134 at opposite sides of said slot 138. By virtue of this construction, the socket 134 can be clamped to the sleeve 132. It will be observed that said first bow 136 is connected to the stack 10 by the upper bow 137.

The first octave vent 150 is provided in the first bow 136 and, more particularly, in said socket portion 134, and is controlled by a tampion 152 carried by an arm 154 secured to an operating rod 156. Said rod 156 is pivotally mounted at its end in bearings of the type illustrated in Fig. 11, carried by posts 158 and 160 projecting from the upper end of the stack 10.

The second octave vent 162 is provided in the upper bow 137 adjacent the top of stack 10, and the second octave tampion 164 is carried by a vertically extending arm 166 having a lower curved portion 168 secured to an operating rod 170. Said rod 170 is pivotally mounted at its ends in bearings of the type illustrated in Fig. 11 carried by the post 158 and a post 172 projecting from the stack 10.

The rod 156 for actuating the first octave tampion 152 is operated by a yoke mechanism constituted by a bar 174 having reduced ends 176 and 178 mounted somewhat loosely in apertures 180 and 182 provided in the free ends of lever arms 184 and 186 fixed to the rods 170 and 156, respectively. The bar 174 is actuated by a lever 188 extending longitudinally of the stack 10 and pivotally mounted by means of a transverse shaft 190 carried at its ends by pivotal bearings of the type illustrated in Fig. 11 mounted in posts 192 fixed to the stack 10.

The upper end of the lever 188 is connected to the bar 174 intermediate the ends thereof by a member 194, having a shank 196 passing somewhat loosely through an aperture in the bar 174 and having a pivotal bearing in the sleeve 198 fixed to said bar whereby the bar 174 can pivot about the shank 196. In its specific construction, the shank of said pivotal bearing may include a screw-threaded portion at its free end beyond the bar 174 in engagement with a screw-threaded recess in the member 194. A spring 189 is fixed at one end by a screw 191 to the lever 188 at a point above the pivot shaft 190 and at its other end between the guide lugs 193 for the free end of said lever.

The second octave tampion 164 is operated by the second octave key 197 which, as shown in Fig. 2, is positioned adjacent the G♯ key 102. Said second octave key 197 is carried by an arm 200 fixed to an operating rod 202 pivotally mounted at its ends in the same manner as the other operating rods hereinbefore described on the posts 118 and 199. A rocker arm 204 is secured to said operating rod 202 near the upper end thereof and is adapted to engage a rocker arm 206 secured at the lower end of the operating rod 156 when the latter is moved to the dotted line position illustrated in Fig. 15 as will be more clearly described. Normally said rocker arm 204 is in engagement with the stack 10, being held in said position under the control of the needle spring 226 secured at one end to the post 118 and at its other end to a lug 205 projecting from the operating rod 202, as best shown in Fig. 2. The rocker arm 204 is provided with a sound muffling pad 205, shown in Fig. 15.

The first octave tampion 152 is normally held in closed position under the control of a needle spring 228 secured at its upper end to the post 158 and its lower end to the arm 186 fixed to the operating rod 156. It will be understood also that this spring is effective to normally hold the rocker arm 206 in spaced relation to the end of the rocker arm 204 and that the space is such that the rocker arm 204 is ineffective to actuate the rocker arm 206 since, in the normal position of the latter, movement thereof is prevented by the engagement of the tampion 152 with the mount of the vent 150. Accordingly, in order to operate the second octave tampion 164 it is necessary to depress the lever 188 whereby to move the first octave tampion 152 to the open position shown in dotted lines, whereupon the rocker arm 206 is moved close to the rocker arm 204 for engagement by the latter when the second octave key 197 is actuated. Upon actuation of the second octave key 197, the rod 202 is turned bringing the rocker arm 204 in engagement with the rocker arm 206 thereby actuating the lever arm 186 and causing

the bar 174 to pivot about the shank 196. This pivotal movement of the bar 174 actuates the lever arm 184 causing movement of the rod 170 and the consequent movement of the tampion arm 166 thereby moving the second octave tampion 164 to open position. When the second octave tampion 164 is thus moved to open position, the first octave tampion is moved simultaneously to closed position. It will be observed that the operation of the rocker arm 205 and the second octave tampion actuating mechanism operated thereby is resiliently opposed by the needle spring 228. The action of the mechanism for thus operating the octave tampions is exceedingly well balanced and a uniform touch in operating the mechanism is accordingly assured.

Thus, it will be seen that the present construction is well adapted to accomplish the several objects of the invention. It will be understood, however, that certain changes in the construction and arrangement of the parts may be made and will occur to those skilled in the art in view of the present disclosure. It will be understood also that certain features of the present invention may be embodied in the saxophone without others, although a saxophone embodying all of the features disclosed herein is preferred. Therefore, I do not wish to be limited to the precise structures illustrated herein except as may be required by the appended claims and the prior art.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a musical instrument of the wood wind type comprising a stack, a bow connected to the stack, and a mouthpipe, the provision of a vent in said bow independently of said mouthpipe, said vent having a fixed position in said bow in relation to said stack and an adjustable connection between said mouthpipe and bow whereby said mouthpipe can be adjusted in relation to said bow and stack.

2. In a musical instrument of the wood wind type comprising a stack, a bow connected to the stack, and a mouthpipe, the provision of a vent in said bow independently of said mouthpipe, said vent having a fixed position in said bow in relation to said stack, an adjustable connection between said mouthpipe and bow whereby said mouthpipe can be adjusted in relation to said bow and stack, said adjustable connection comprising a socket portion at one end of said bow and an end portion at one end of said mouthpipe received in said socket portion and rotatably adjustable therein.

3. In a musical instrument of the wood wind type comprising a stack, a bow connected to the stack, and a mouthpipe, the provision of a vent in said bow independently of said mouthpipe, said vent having a fixed position in said bow in relation to said stack and an adjustable connection between said mouthpipe and bow whereby said mouthpipe can be adjusted in relation to said bow and stack, said adjustable connection comprising a socket portion at one end of said bow, and an end portion at one end of said mouthpipe received in said socket portion and rotatably adjustable therein, means for clamping said end portion of the bow in adjusted position, a tampion for said vent, and means carried by said stack for operating said tampion.

4. In a musical instrument of the wood wind type having a stack, a bow connected at one end to said stack and having a portion disposed in laterally spaced relation thereto, a mouthpipe connected to the end of said laterally spaced portion of said bow, said bow having a vent provided therein in fixed relation to said stack, a tampion for controlling said vent and a rod pivotally mounted on said stack for actuating said tampion.

5. In a musical instrument of the wood wind type having a stack, a bow connected at one end to said stack and having a portion disposed in laterally spaced relation thereto, a mouthpipe connected to the end of said laterally spaced portion of said bow, said bow having a vent provided therein in fixed relation to said stack, a tampion for controlling said vent and a rod pivotally mounted on said stack for actuating said tampion, the vent in the bow and the means for actuating said tampion being independent of the mouthpipe whereby the latter can be adjusted in relation to the stack of the instrument.

6. A musical instrument of the wood wind type comprising a stack, bows connected to said stack, a mouthpipe connected to one of said bows, a vent in each of said bows, said vents being in relatively fixed relation, tampions for controlling said vents, means for actuating said tampions carried by the stack, the vents in said bows, the tampions therefor, and the means for actuating said tampions being independent of said mouthpipe whereby the latter can be adjusted in relation to the stack of the instrument.

7. A musical instrument of the wood wind type provided with a stack, a bow connected to said stack and having a portion spaced laterally of said stack, a vent in said bow, a rod pivotally mounted on said stack and having an arm secured thereto and projecting laterally therefrom, said arm carrying a tampion for said vent, an upper bow, a second vent in the upper bow, a rod pivotally mounted on said stack and provided with an arm carrying a tampion for said second vent, a yoke mechanism for operating said tampions comprising an arm fixed to each of said rods, a bar extending between said yoke and arms and having reduced end portions loosely mounted in the ends of said yoke arms, and a lever pivotally connected to said bar intermediate the ends thereof, whereby said first mentioned rod is actuated to operate said first mentioned tampion.

8. A musical instrument of the wood wind type provided with a stack, a bow connected to said stack and having a portion spaced laterally of said stack, a vent in said bow, a rod pivotally mounted on said stack and having an arm secured thereto and projecting laterally therefrom, said arm carrying a tampion for said vent, an upper bow, a second vent in the upper bow, a rod pivotally mounted on said stack and provided with an arm carrying a tampion for said second vent, a yoke mechanism for operating said tampions comprising an arm fixed to each of said rods, a bar extending between said yoke arms and having reduced end portions loosely mounted in the ends of said yoke arms, and a lever pivotally connected to said bar intermediate the ends thereof, whereby said first mentioned rod is actuated to operate said first mentioned tampion, a mouthpipe connected to said first bow, the vents in said bows, the tampions therefor, and the mechanism for actuating said tampions being independent of said mouthpipe whereby the latter can be adjusted in relation to the stack of the instrument.

9. A musical instrument of the wood wind type provided with a stack, a bow connected to said stack and having a portion spaced laterally of

said stack, a vent in said bow, a rod pivotally mounted on said stack and having an arm secured thereto and projecting laterally therefrom, said arm carrying a tampion for said vent, an upper bow connected to the stack, a second vent in the upper bow, a rod pivotally mounted on said stack and provided with an arm carrying a tampion for said second vent, a yoke mechanism for operating said tampions comprising an arm fixed to each of said rods, a bar extending between said yoke arms and having reduced end portions loosely mounted in the ends of said yoke arms, a lever pivotally connected to said bar intermediate the ends thereof, whereby said first mentioned rod is actuated to operate said first mentioned tampion, a key operated rod mounted on said stack and provided with an arm terminating in a free end adjacent to first mentioned rod, an operating arm on said first mentioned rod normally positioned in spaced relation to the free end of said arm on the key actuated rod and movable by said lever into position for engagement by said last mentioned arm whereby the turning of said first mentioned rod is effective to operate said bar and the arm connected thereto and to said second mentioned rod for operating said second tampion.

10. A musical instrument of the wood wind type provided with a stack, a bow connected to said stack and having a portion spaced laterally of said stack, a vent in said bow, a rod pivotally mounted on said stack and having an arm secured thereto and projecting laterally therefrom, said arm carrying a tampion for said vent, an upper bow connected to the stack, a second vent in the upper bow, a rod pivotally mounted on said stack and provided with an arm carrying a tampion for second vent, a yoke mechanism for operating said tampions comprising an arm fixed to each of said rods, a bar extending between said yoke arms and having reduced end portions loosely mounted in the ends of said yoke arms, a lever extending longitudinally of said stack and pivotally mounted thereon, said lever having one of its ends pivotally connected to said bar intermediate the ends of the latter and a spring for moving said lever in a direction to effect closing movement of said first tampion.

11. A musical instrument of the wood wind type comprising a stack, an upper bow connected to the stack, an octave vent in the upper bow, a rod pivotally mounted on said stack and having an arm fixed thereto, said arm carrying a tampion for said vent, a bow connected to said upper bow and having a portion disposed laterally of and in spaced relation to said stack, an octave vent provided in said last mentioned bow, a rod pivotally mounted on said stack and having an arm fixed thereto, said arm carrying a tampion for said second mentioned vent, and means mounted on said stack and connected to said rods for operating said tampions.

12. A musical instrument of the wood wind type comprising a stack, an upper bow connected to said stack, an octave vent in said bow, a rod pivotally mounted on said stack and having an arm fixed thereto, said arm carrying a tampion for said vent, a bow connected to said upper bow and having a portion disposed laterally of and in spaced relation to said stack, an octave vent provided in said last mentioned bow, a rod pivotally mounted on said stack and having an arm fixed thereto, said arm carrying a tampion for said second mentioned vent, and means on said stack and connected to said rods, effective to first open said second tampion while the first tampion remains closed, and then to open said first tampion and to simultaneously close said second tampion.

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