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E. J. GULICK

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WIND MUSICAL INSTRUMENT

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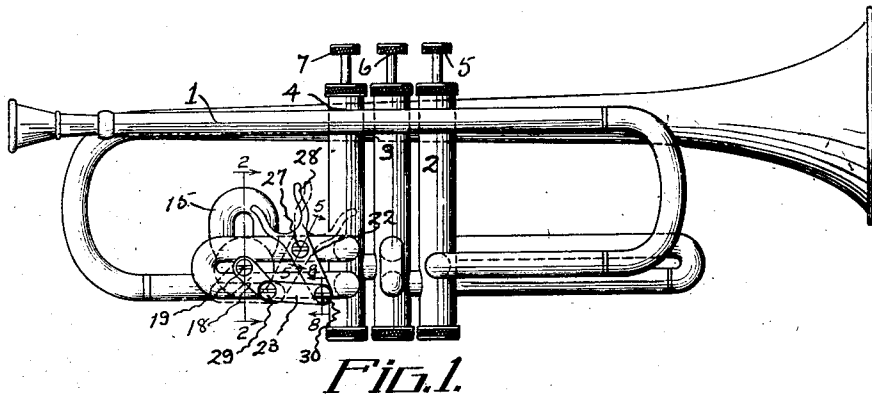


Fig. 1.

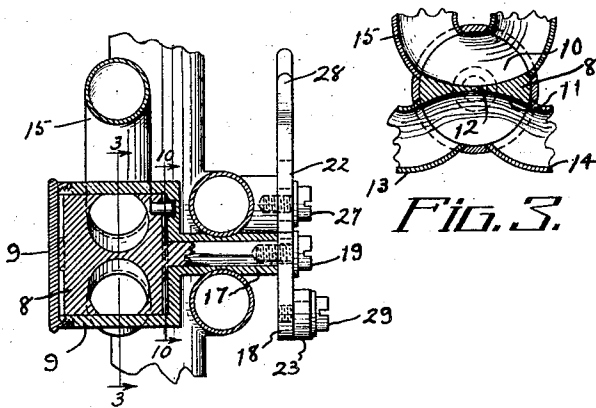


Fig. 2.

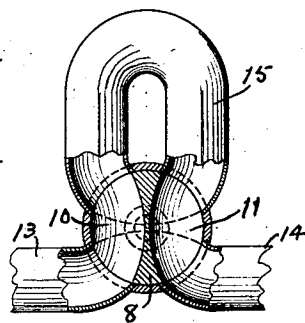


Fig. 4.

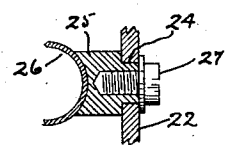


Fig. 5.

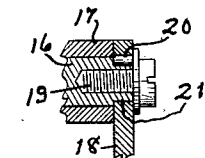


Fig. 6.

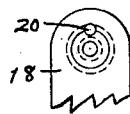


Fig. 7.

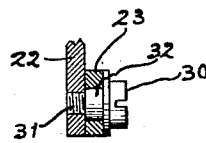


Fig. 8.

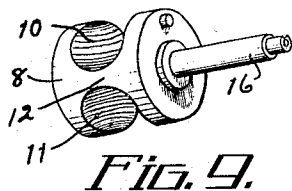


Fig. 9.

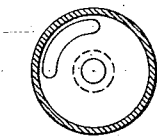


Fig. 10.

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# UNITED STATES PATENT OFFICE

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## WIND MUSICAL INSTRUMENT

Application filed July 19, 1928. Serial No. 293,895.

This invention relates to valved wind musical instruments, and particularly to key changing devices for horns.

In some valved wind musical instruments it is usual to incorporate therein a key-changing valve of some character, but the mechanism for actuating such a valve has been so designed or so located in the instrument as to require the use of both hands of the player to hold the instrument and to actuate the key-changing valve.

The particular object of my invention is to provide simple mechanism advantageously located in the instrument for one hand actuation of a key-changing valve in a horn, or like musical instrument.

Another object of the invention is to provide simple mechanism for the actuation of a rocking key-changing valve for horns, or the like, the valve actuation being effected by the thumb of the player's hand which supports the instrument.

Other objects of the invention are mentioned and described herein.

The preferred embodiment of my invention is illustrated in the accompanying drawing, wherein,

Figure 1 illustrates a side elevation of a horn to which my invention is applied;

Figure 2 is a section taken on line 2—2 of Fig. 1;

Figure 3 is a section taken on line 3—3 of Fig. 2 showing the normal position of the key-changing rocking valve;

Fig. 4 is a similar view showing the valve rotated to produce A tone;

Fig. 5 is a section taken on line 5—5 of Fig. 1;

Fig. 6 is a section taken on line 2—2 for a limited distance to illustrate the connection between the valve stem and its actuating arm;

Fig. 7 illustrates a fragment of one end of the valve arm;

Fig. 8 is a section taken on line 8—8 of Fig. 1;

Fig. 9 is a perspective view of the key-changing valve and stem; and

Fig. 10 is a section taken on line 10—10 of Fig. 2.

Similar numerals of reference indicate like

parts throughout the several views on the drawing.

Referring to the details of the drawing the numeral 1 indicates a common type of horn which is provided with the usual piston valve casings 2, 3 and 4 and within which the usual reciprocatory piston valves are positioned—not shown—and adapted for actuation by the usual finger tips 5, 6 and 7.

The numeral 8 indicates a rockable key-changing valve mounted for movement within the valve casing 9 which is suitable mounted in the instrument, said valve being provided with the usual ports 10 and 11 which are separated by the partition 12. The valve casing 9 has the tubes 13 and 14 connected on opposite sides thereof and the U shaped by-pass tube 15 also, all of which tubes are subject to the control of the valve 8, as is well known in the art.

In Figures 2 and 3 the normal B' position of the valve 8 is illustrated, and to change the key to A the valve is rocked to the position shown in Fig. 4, thereby placing the by-pass 15 in communication with the tubes 13 and 14.

The valve 8 is provided with an axial cylindrical stem 16 which is journaled in the reduced tubular extension 17 of the valve casing 9 and the actuating arm 18 is rigidly connected with the end of the stem 16 by a headed screw 19 and a pin 20, the reduced portion 21 of the valve stem penetrating an aperture in the end of arm 18. In this structure the screw 19 is threaded in to the end of the stem 16 and a washer mounted under the screw head prevents axial displacement of the arm 18 from the stem end, rotation of the arm 18 on portion 21 of the valve stem being prevented by the locking pin 20. Oscillation of the arm 18 may be effected by the lever 22 and the link 23 which connects said lever with said arm when the former is oscillated to effect rocking movement of the valve 8.

The lever 22 is pivotally mounted intermediate its extremities on the reduced cylindrical end 24 of a bearing block 25 rigidly secured to the instrument tube 26, said lever being retained on the element 24 by a headed screw 27 which is threaded into the block 25.

The upper end of the lever 22 is provided with a forked portion 28, as a handle, to receive the player's thumb, whereby said lever may be readily rocked in either direction by the thumb of the player's right hand which supports the instrument.

The link 23 connects the arm 18 with the lower end of the lever 22 by pivot elements 29 and 30, respectively, both pivot elements being alike in construction, one being illustrated in Fig. 8 and comprising a headed screw element 30 with the threaded portion 31 screwed into the lower end of lever 22, said screw element including also the cylindrical bearing portion 32 upon which one end of the link 23 is carried.

Obviously, the position of the lever 22 is important to enable ready access thereto by the thumb of the player's hand which grasps the valve casing 2, 3 and 4, and said lever is therefore positioned adjacent the casing 4 and between the latter and the mouthpiece of the instrument.

I claim:

1. In a wind musical instrument of the character described provided with a rockable key-changing valve and a plurality of piston valve casings, means for rocking said key-changing valve, said means including a forked oscillatory lever mounted adjacent one of said piston valve casings, and link and lever devices positioned between said valve casings and the instrument mouthpiece operatively connecting said lever with said rockable valve for rocking the latter upon oscillation of said lever.

2. In a wind musical instrument of the character described, the combination of a rockable key-changing valve provided with a stem, an arm rigidly connected with said valve stem, a forked oscillatory lever, and a link connecting said lever and arm, the fork of said lever being adapted to be engaged by the thumb of the instrument player for oscillating said lever and thereby rocking said valve.

3. In a wind musical instrument of the character described, the combination with a rockable key-changing valve, the valve casing therefor, and the by-pass tube connected with said casing, of means for rocking said valve, said means including a tubular reduced valve casing extension, a valve stem connected with said valve and rockably arranged within said valve casing extension, and manually operable means for rocking said valve stem, said means comprising a tiltable lever, an arm rigidly connected with the end of said valve stem, and a link connecting said lever and arm.

4. In a wind musical instrument of the character described, the combination of a valve casing, a by-pass tube connected therewith, a rockable key-changing valve mounted within said valve casing, a reduced tubu-

lar valve casing extension, a valve stem connected with said valve and rockably arranged within said casing extension, and means for rocking said valve, said means including an arm rigidly connected with the outer end of said valve stem, a manually operable lever, and a link connecting said lever with said valve stem arm.

5. In a wind musical instrument of the character described, the combination of a valve casing, a by-pass tube connected therewith, a rockable key-changing valve mounted within said valve casing, a reduced tubular valve casing extension arranged axially of said casing, a valve stem connected with said valve and rockably arranged within said casing extension, and means for rocking said valve, said means including a lever bearing block rigidly mounted in the instrument and provided with a cylindrical bearing section, a manually operable lever pivotally mounted upon said bearing section of said block intermediate the extremities of said lever, an arm rigidly connected with said valve stem, and a link connecting said arm with said lever.

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