This invention relates to the art of musical wind instruments, and more specifically to a new trigger mechanism for the same.

As is known to those skilled in the art, a trumpet is provided with three finger-operated valves. In addition, it is provided with a main tuning slide, and with tuning slides for the various finger-operated valves. In particular, this invention is concerned with the tuning slide for the first valve. This slide is frequently extended during play in order to flatten the notes produced by the first valve. Heretofore, it has been conventional practice to use a trigger mechanism operated by the thumb for extending this slide. Such operation by the thumb has imposed a very substantial tipping force on the instrument, tending to tip it away from the player's mouth.

Accordingly, it is an object of this invention to provide a superior trigger mechanism for the tuning slide for the first valve of a trumpet or the like.

It is another object of this invention to provide a trigger mechanism for the first valve slide of a trumpet or the like which does not tend to displace the trumpet in any manner.

Still another object of this invention is to provide a trigger mechanism for the tuning slide of the first valve of a trumpet or the like which is operable by any of two or three fingers of the hand that holds the instrument.

Other and further objects of the present invention will be apparent from the following description when taken in connection with the accompanying drawings wherein:

FIG. 1 is a side view of a trumpet incorporating the present invention;

FIG. 2 is a horizontal sectional view on an enlarged scale taken along the line 2--2 in FIG. 1;

FIG. 3 is an enlarged side view of a fragment of the trumpet;

FIG. 4 is a horizontal sectional view on an enlarged scale taken substantially along the line 4--4 in FIG. 3 showing the first valve tuning slide in its normal retracted position;

FIG. 5 is a view similar to FIG. 4 showing the slide in extended position;

FIG. 6 is a vertical sectional view on an enlarged scale taken substantially along the line 6--6 in FIG. 1;

FIG. 7 is a vertical detail view partially in section as taken substantially along the line 7--7 in FIG. 2 and on an enlarged scale,

FIG. 8 is an enlarged detail view partially in section taken substantially along the line 8--8 in FIG. 7.

Referring now in greater particularity to the figures, and first to FIG. 1, there will be seen a trumpet identified generally by the numeral 10. The trumpet shown is a standard B♭ trumpet, although it will be understood that the invention hereinafter to be described is equally applicable to trumpets in other keys, to cornets, and to other wind instruments in which a slide must be moved somewhat from time to time during playing for tuning. The trumpet is mainly of conventional construction, including the mouthpiece 12, leader pipe 14, and main tuning slide 16. The main leader pipe extends to the body 18 of the instrument, wherein the first, second and third valves, respectively identified by numerals 20, 22 and 24 are provided. The instrument, as is usual, is terminated by a bell 26. There is a tuning slide 28 for the third valve 24 which is controlled by a ring 30 connected to a shank 32 respectively held by a set screw in a fitting 34 on the top of the slide 28. Conveniently, the second finger of the left hand extends through the ring 36, as shown in FIGS. 2 and 3.

The second valve 22 is provided with a tuning slide 36 having a pair of protuberances or horns 38 engageable by the fingers for adjustment. Normally, this slide does not have to be operated during playing, but remains in a preset position.

Finally, the first valve 20 is provided with a tuning slide 40. The tuning slide itself is of conventional construction, including upper and lower outer tubes 42 and 44. Upper and lower inner tubes 46 are slidably received in the outer tubes 42 and 44, and are interconnected by a bight 48. The bight 48 is of somewhat larger outside diameter than the inner tube 46, although the internal diameter is constant. Thus, the outside diameter of the bight is substantially identical with the outside diameter of the tubes 42 and 44.

It is to be noted that the instrument departs from conventional construction. A trigger mechanism identified generally by the numeral 59 is provided. The post 52 is curved and is affixed to the side of the first valve in vertically spaced relation. These posts extend outward toward the second valve tuning slide 36, but curve slightly away therefrom, as best seen in FIG. 2. A pin 68 (FIG. 7) extends between these posts and pivotally receives a generally T-shaped lever 54. The shape of the lever is best seen in FIGS. 2, 4 and 5. The cross member 59 of the T-shaped lever is pivoted at one end between the posts 52 and extends between the upper and lower outer tubes 42 and 44, and has pivotally connected at the outer end thereof a connecting rod 56. The connecting rod is pivotally connected to the cross member 58 of the T-shaped lever 54 by means of a clevis 69 and bearing screw 62. The connecting rod is provided at the opposite end thereof with another clevis 64, and this is connected by means of a bearing screw 66 to a post 69 extending from the post 52 in the line of the bight 48 of the tuning slide 40.

The stem or shank 70 of the T-shaped lever 54 is connected to the cross member 58 relatively toward the end thereof which is pivotally mounted between the posts 52. The stem 70 initially is substantially perpendicular to the cross member 58, but curves away from the valves 20, 22, extending between the posts 52. Thereafter, the stem 70 is bifurcated. At this point, the shank 70 is provided with upper and lower branches 72 and 74, respectively lying above and below the adjacent portion of body tubing 76. The branches and their extremities extend parallel to the shank 70, and both are provided with cork or the like pads 78 for engagement with the third valve 24 upon manipulation of the lever 59. The upper branch 72 is provided with a plateau 80 having a roller 82 thereon, and the lower branch is provided with a plateau 84 having a roller 86 thereon.

Reference now should be had particularly to FIGS. 6 and 7 wherein the mounting of the lever 54 is shown. The end of the cross member of the lever is apertured to receive the pin 88 extending between the posts 52, the cross member 58 being centrally disposed thereon. The lever is held in the central position by the helical portions 90 of a biasing spring 92 having an interconnecting central bight portion 94 straddling the cross member 58 of the lever and lying on the opposite side thereof from the stem 70. Arms 96 extend from the outer ends of the helical portions 90, and are provided with hook-like ends 98 engaging the sides of the posts 52. The spring force is such as to try to bring the bight 48 and the hooks 98 together, whereby the lever is biased in a clockwise direction as seen from above. This causes the lever to pull on the connecting rod 56, whereby to hold the tuning
slide 49 in fully closed or retracted position. The plateaus 80 and 84 are spaced outwardly away from the valves and the body of the instrument, as in FIG. 4.

The normal method of holding the instrument is in the left hand, with the palm on the left side of the valves, and the thumb extending around the front of the first valve, as shown in FIG. 3. The first finger wraps around the third valve, and the second finger is received in the ring 39, with the third and fourth fingers also wrapped around the third valve below the horizontal tubular portions of the body. As readily will be seen in FIGS. 2 and 3, this brings the index finger into proximity with the plateaus 80, and the third finger into proximity with the plateaus 84, whereby either or both of these fingers may be pressed against the respective plateaus to depress them toward the third valve 24, thereby pivoting the lever in a counter-clockwise direction, and pushing on the connecting rod 56 to extend the tuning slide 48. Upon release of such finger pressure, the spring 92 returns the lever, and hence the slide to its initial rest position. The third valve tuning slide 26 is manipulated by the second finger of the left hand, as will be evident.

Although the great majority of trumpet players hold the trumpet in the left hand, in the manner just described, there are a few who for one reason or another hold the trumpet in the right hand. As will be appreciated, the trigger mechanism comprising the lever 53, etc., could with little or no modification be placed on the left side of the instrument to be operated by the right hand of a trumpet player holding the instrument in his right hand. As will be recognized, when an instrument is held in the left hand, the valves are operated by the right hand. It has been found in practice that the natural squeezing motion with the index finger and the third and fourth fingers depresses the plateaus and operates the trigger mechanism with no tendency whatsoever to displace the trumpet. This will readily be understood when it is considered that such a squeezing force is normally used to hold the trumpet anyway. Hence, the mechanism works much more simply and with less or no conscious effort on the part of the trumpet player, while retaining substantially one hundred percent reliability.

Although a specific example of the invention has been shown and described for illustrative purposes, it will be understood that various changes may occur to those skilled in the art and will be understood as forming a part of the present invention insofar as they fall within the spirit and scope of the appended claims.

We claim:

1. In a musical wind instrument of the type having a body with substantially vertical finger-operated valves and a longitudinally movable tuning slide, said instrument also having a mouthpiece and a bell, a trigger mechanism for said slide comprising a lever having a portion adapted for engagement by a finger, means pivotally mounting said lever from said body along the right side thereof as viewed from said mouthpiece to said bell with said finger engaging portion positioned for engagement by a finger of the left hand other than the thumb with the left hand in substantially normal instrument holding position or by the palm of the right hand with the right-hand fingers in valve operating position, connecting means extending between substantially the other end of the cross member of said lever and slide and operative upon manual pivoting of said lever transversely of said valves to extend said slide longitudinally, and spring means acting from said body on said lever and slide resiliently to hold said slide in retracted position and said lever finger engaging portion away from said body.

2. In a musical wind instrument of the type having a body with substantially vertical finger-operated valves and a longitudinally movable tuning slide, said instrument also having a mouthpiece and a bell, a trigger mechanism for said slide comprising a substantially T-shaped lever having a cross member and having a stem with a portion thereof adapted for engagement by a finger, means pivotally mounting said lever adjacent one end of said cross mem-
5 to the rear in the direction of said mouthpiece, and spring means acting from said body on said lever and slide resiliently to hold said slide in retracted position and said lever finger engaging portion away from said body.

7. A trumpet or the like as set forth in claim 6 including a second valve and a second tuning slide slidable cooperative with a pair of tubes extending from said second valve, said trigger mechanism lever extending between the last two mentioned tubes.

8. A trumpet or the like as set forth in claim 7 and further including a third valve with a horizontal section of tubing extending therefrom in a direction away from the first valve slide, said trigger mechanism lever being bifurcated at one end and providing two finger engaging portions lying respectively above and below said tubing.

9. A trumpet or the like as set forth in claim 8 wherein the lever is substantially T-shaped having a stem and a cross member, said cross member being pivoted adjacent one end thereof from said body with the stem extending through the second valve tuning slide and the cross member extending between the tubes of the first valve tuning slide, the connecting means between the lever and the first valve tuning slide being connected to the lever cross member on the side thereof opposite the pivotal mounting thereof.

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