March 18, 1969 F. J. SEME 3,433,114

SLIDE CONTROL ARRANGEMENT

Filed Sept. 15, 1966

FIG. 1

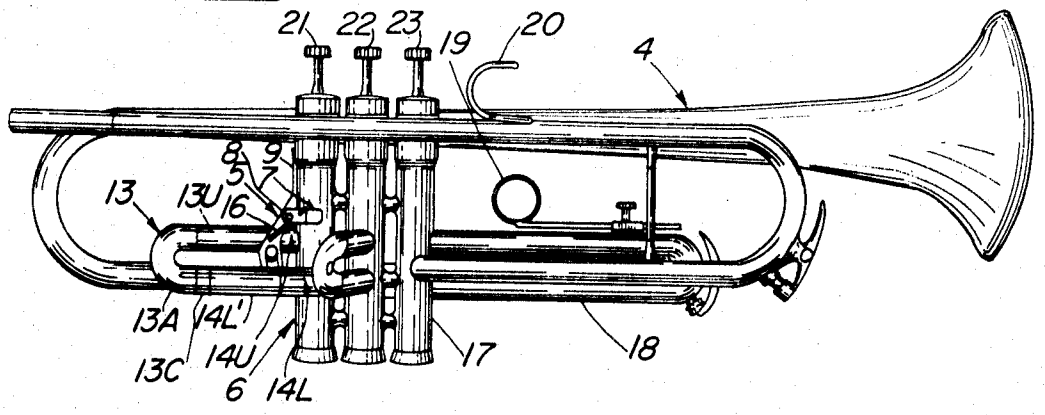



FIG. 2

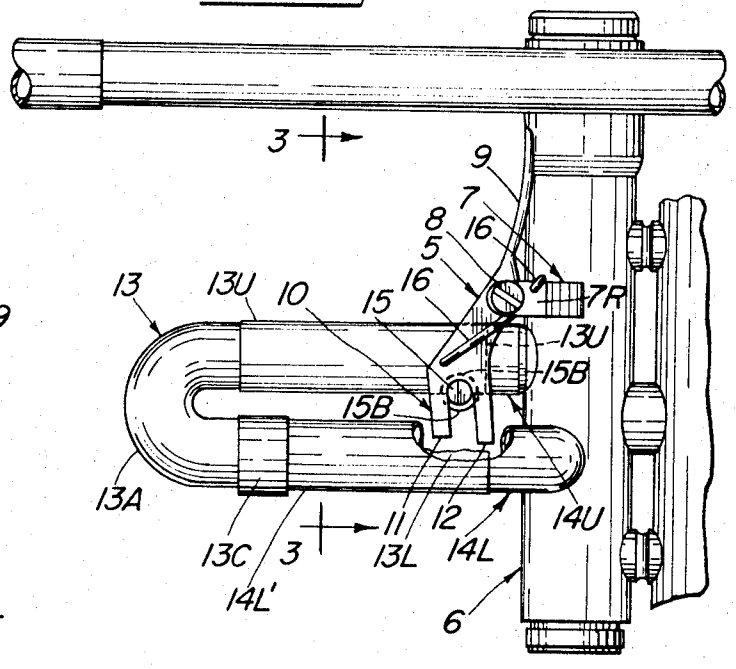
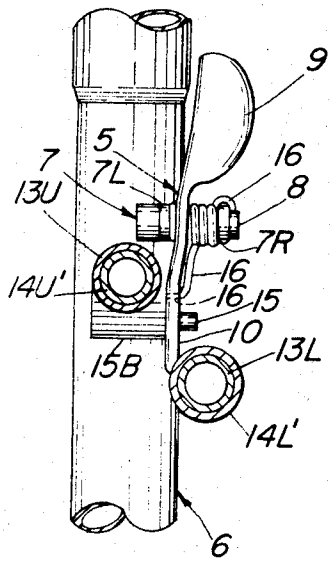



FIG. 3

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United States Patent Office 3,433,114
Patented Mar. 18, 1969



3,433,114

# SLIDE CONTROL ARRANGEMENT

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Filed Sept. 15, 1966, Ser. No. 579,740
U.S. Cl. 84—394 5 Claims
Int. Cl. G10d 9/04

## ABSTRACT OF THE DISCLOSURE

To control the positioning of a tuning slide of a trumpet or similar musical instrument, a pivoted member with one end adapted for actuation by the instrumentalist and the other end formed as a yoke to engage a pin on the tuning slide is provided. The yoke is formed in such a manner that rotation of the pivoted member to an extreme position permits the instrumentalist to disengage the tuning slide from the instrument.

This invention relates generally to a slide control arrangement for a musical instrument and more particularly to a unique arrangement for controlling the positioning and removal of a tuning slide for a trumpet, cornet, or other like wind instrument.

Slide adjusting mechanisms heretofore known to the art have not been entirely satisfactory for various reasons. One of the disadvantages of some of the prior art mechanisms is that the position of the mechanism on the instrument does not readily allow the musician to grip the instrument consistently with handling techniques commonly practiced by musicians while playing the instrument. On the other hand, other prior art slide adjusting mechanisms that attempt to minimize this problem nonetheless require the musician to change his grip before the musician is able to actuate the mechanism. Yet other mechanisms heretofore known to the art are actuated with the right hand (for right-hand instruments, and vice-versa for left-hand instruments), which makes simultaneous actuation of the slide adjusting mechanism and the valves of the instrument extremely difficult, if not impossible. This awkward positioning of the prior art mechanisms also has the disadvantage of causing the mouthpiece of the instrument to shift when the musician shifts his grip on the instrument or when the musician actuates the slide mechanism, thereby raising the possibility of causing the musician to play distorted or slurred notes.

Moreover, an important operational characteristic of instruments of the type in question resides in the frequent necessity for the musician to remove accumulated moisture from the tuning slide of the instrument several times during a long performance. Preferably, the musician should be able to remove accumulated moisture in as short a period of time as a rest pause in a musical score. However, slide adjusting mechanisms heretofore known to the art have been predicated upon attachment of the mechanism to the slide by relatively cumbersome and not readily detachable devices, such as machine screw and bolt assemblies. These methods of attaching the adjusting mechanism to the tuning slide makes it impossible for the musician to quickly and easily detach the slide for cleaning purposes. Often, special tools are necessary, which means that it is impossible for the musician to clean out moisture during a performance. As a result of the accumulated moisture, the musical quality of the instrument is decreased.

The present invention obviates these deficiencies of the prior art by a unique and inexpensive approach to slide tuning mechanisms that facilitates use thereof consistently with common handling techniques of the instrument and that nonetheless provides for an extremely rapid removal



and replacement of the tuning mechanism for effecting moisture removal during play.

A preferred embodiment of the present invention can be best explained in the context of a standard trumpet or cornet. Generally, a standard trumpet or cornet consists of a series of hollow tubes of varying length with a set of valves which can be actuated to change the direction of the flow of air through any or all of these hollow tubes.

More specifically, the trumpet or cornet has a hollow mouthpipe into which the mouthpiece is inserted. The mouthpipe curves and enters the third valve housing of the instrument, which includes three valves with associated valve housings. The valves are actuated by depressing valve keys that are situated on valve shafts extending through the respective tops of the valve housings. Extending from each valve housing of the instrument are hollow generally U-shaped tubes or slides of varying lengths, the bifurcated ends of which are attached to the valve housing. Attached to and extending from the first valve housing is the outlet pipe which terminates at the bell of the instrument. The bell is a generally conical expansion of the outlet pipe which serves to amplify and direct the emitted tones of the instrument.

When the musician presses his closed lips against the mouthpiece of the instrument and then forces air between his lips, the musician's lips will vibrate. This vibration of the musician's lips produces a musical note as a result of a well known physical principle around which all wind instruments are designed. When vibrating air is passed through a tube, only the vibrations with wavelengths that are an integer factor of the length of the tube are emitted from the other end. A trumpet or cornet is really a tube which can be varied in length by actuating the valves. By actuating the valves, the vibrating air is directed through either the first, second, or third valve slides, or any combinations of these slides to vary the effective tube length of the instrument to produce the musical note desired. A cornet or trumpet is designed so that by properly actuating the valves, the length of the interior tube of the instrument can be varied proportionately so that a musical scale of notes can be achieved. The present invention provides an improved means for changing the effective length of the first valve slide so that the proportional length of internal tubing of the instrument and therefore the key of the instrument may be selectively changed.

Generally, the preferred embodiment of the present invention comprises a trigger mechanism mounted intermediate its ends by suitable means (such as a screw connection) on a supporting member attached to the first valve of a trumpet or a cornet so that the trigger mechanism may be pivoted relative to the first valve. The trigger mechanism is provided with a digital pressing surface at one end and with an open bifurcated cam yoke at the other end. The cam yoke is generally U-shaped and has two legs of unequal length which fit over and mate with a suitable follower (such as a protruding pin) attached to the tuning slide. The tuning slide is conventionally mounted for sliding movement into and out of receiving guide tubes attached to the first valve. In order to adjust the slide to change the key of the musical instrument, pressure may be applied to the pressing surface so as to cause the trigger mechanism to rotate angularly. This angular motion causes one leg of the open yoke to press against the follower causing the slide to move laterally on the guide tubes away from the first valve. A spring bias means attached directly to the trigger mechanism biases the mechanism to a rest position and therefore serves to cause the trigger mechanism to return the slide to its original position when pressure is removed from the trigger mechanism pressing surface.

The primary object of the present invention is to provide a simple slide control arrangement that may be

easily actuated to adjust the position of a tuning slide of a musical instrument while the instrument is being played.

An equally important object of the present invention is to provide such a slide control arrangement that is designed so as to permit the tuning slide of a musical instrument to be detached and replaced quickly enough so that accumulated moisture may be removed from the slide during such short intervals of time as a rest pause in a musical score.

Another object of the present invention is to provide a unique slide control arrangement that can be actuated without varying the musician's grip and without requiring the musician to grip the instrument in any other way than that which is commonly practiced by musicians.

Yet another object of the present invention is to provide a slide control arrangement that can be actuated by either one of the musician's hands, as desired.

A still further object of the present invention is to provide a slide control arrangement that can be actuated without causing the mouthpiece of the instrument to slip or shift position relative to the musician's lips.

These and other objects, advantages, and features of the present invention will hereinafter appear, and, for purposes of illustration, but not of limitation, an exemplary embodiment of the present invention is shown in the accompanying drawing, in which:

FIGURE 1 is a partially fragmentary side elevational view of a musical instrument equipped with a preferred embodiment of the present invention;

FIGURE 2 is an enlarged view of a portion of the musicial instrument illustrated in FIGURE 1, partially broken away to fully show the structural details of the preferred embodiment; and

FIGURE 3 is a partially sectional view taken along the line 3—3 in FIGURE 2.

With reference to the drawing, FIGURES 1, 2, and 3 show a preferred embodiment of the present invention on a trumpet **4** with a trigger mechanism **5** attached to a first valve **6** of trumpet **4** by a supporting member **7** and a screw **8** received therein to provide a pivot axis for trigger mechanism **5**. Supporting member **7** takes the form of a yoke-like extension of first valve **6** comprising extending arms **7R** and **7L** (FIGURES 2 and 3) through which screw **8** is threadably received.

Trigger mechanism **5** comprises an upper end formed into a digital pressing surface **9** comprising a generally flattened spatula actuator and a lower end formed into an open ended bifurcated yoke **10** comprising a generally U-shaped member having legs **11** and **12** extending from an interconnecting base, with leg **11** being shorter than leg **12** for reasons that will hereinafter appear.

A conventional hollow tuning slide **13** is slidingly mated with conventional guide tubes **14U** and **14L** that are attached to first valve **6**. Tuning slide **13** is a generally U-shaped hollow tube comprising a lower male leg **13L**, an enlarged diameter stop collar portion **13C**, an arcuate interconnecting portion **13A**, and an enlarged diameter upper female sleeve **13U**. Guide tubes **14U** and **14L** are generally parallel hollow tubes that extend from first valve **6** and that are pneumatically connected therewith. Tube **14U** is provided with a reduced diameter male leg **14U'** over which female sleeve **13U** matingly slides, and tube **14L** is provided with an enlarged diameter female sleeve **14L'** within which male leg **13L** matingly slides, as best shown in FIGURE 3.

A follower pin **15** is positioned in a socket cylinder **15B** that is mounted on the underside of upper leg **13U** of tuning slide **13** such that pin **15** extends between legs **11** and **12** of yoke **10**. A coil spring **16** is also provided in trigger mechanism **5** and is coiled around screw **8** with one end thereof locked on supporting member **7** and the other end thereof locked on the base of yoke **10** such that spring **16** tends to resist clockwise angular rotation of trigger mechanism **5** and biases slide **13** to the normal fully retracted or extreme right hand position (as viewed in FIGURES 1 and 2).

In use, the musician grips the trumpet **4** in a conventional manner with the left hand thumb placed behind first valve **6** in position for rapid shifting to press against digital pressing surface **9**. The fingers of the left hand are wrapped around the third valve **17**, the first two fingers above a conventional third valve tuning slide **18** shown in FIGURE 1 and the third and fourth fingers below third valve tuning slide **18**. If the musician prefers, he may extend his ring finger straight along third valve tuning slide **18**, and he may hook his middle finger through a conventional finger hook **19** to keep the instrument from slipping out of his grasp. The little finger of the right hand of the musician is hooked in a conventional open finger hook **20**, leaving the first three fingers of the right hand in a position to depress conventional valve keys **21**, **22**, and **23** of the trumpet in a well known manner. With the musician's hands in this position, which is the position commonly practiced by musicians playing a trumpet, the thumb of the left hand is in position to press against pressing surface **9** of trigger mechanism **5**, if desired. Of course, the other thumb of the right hand may also be utilized, but the ability to utilize the normally dormant left thumb is especially significant since tuning slide adjustments may thereby be effected without disturbing the right hand grip during normal play. The thumb pressure against pressing surface **9** rotates trigger mechanism **5** clockwise around screw **8** causing relatively longer leg **12** of yoke **10** to cam press against follower pin **15** and thereby sliding first valve slide **13** horizontally on guide tubes **14U** and **14L** away from first valve **6** toward any desired degree of a fully extended or extreme left hand position (as viewed in FIGURES 1 and 2).

When the pressure is removed from pressing surface **9**, trigger mechanism **5** is rotated by the bias of spring **16**, causing relatively shorter leg **11** of yoke **10** to cam press against follower pin **15** and thereby sliding tuning slide **13** back to its normal starting position. To quickly and easily disengage slide **13** from trigger mechanism **5** so that slide **13** can be removed from guide tubes **14U** and **14L** for rapid removal of accumulated moisture (as by shaking disengaged slide **13**) and subsequent rapid replacement or re-engagement of slide **13**, sufficient pressure can be exerted against pressing surface **9** to rotate trigger mechanism **5** about screw **8** until the reverse side of pressing surface **9** is impeded by the stationary abutment of supporing member **7**. With trigger mechanism **5** rotated to this extreme clockwise position (as viewed in FIGURES 1 and 2), follower pin **15** can be readily removed from between legs **11** and **12** of yoke **10** because leg **11** is short enough to allow follower pin **15** to clear the bottom edge of leg **11** when slide **13** is manually grasped and slid completely out of engagement with guide tubes **14U** and **14L**. After the accumulated moisture is removed from the slide **13** (as by appropriate shaking), slide **13** can be easily re-engaged with guide tubes **14U** and **14L**. With trigger mechanism **5** held in the same fully rotated position as when slide **13** was fully extracted for removal, slide **13** can be guided back into engagement with guide tubes **14U** and **14L** until follower pin **15** is again positioned between legs **11** and **12** of yoke **10**. By removing the pressure against pressing surface **9**, the bias of spring **16** will cause rotation of trigger mechanism **5** such that leg **11** of yoke **10** presses against follower pin **15** to bring slide **13** back to its normal fully retracted position.

What is claimed is:

**1.** A slide control arrangement for selectively positioning a tuning slide engaged on guide tubes of a wind musical instrument comprising:

trigger means mounted intermediate oppositely disposed first and second ends thereof for pivotal movement on the musical instrument adjacent to the guide tubes thereof;

digital pressing surface means located at the first end of the trigger means;

cam means located at the second end of the trigger means and comprising a bifurcated open ended yoke having a pair of spaced extending legs;

follower means comprising a pin affixed to the tuning slide and normally disposed between the legs of the yoke for engagement with the cam means to produce sliding movement of the tuning slide in response to movement of the cam means, the cam means being adapted for selective disengagement from the follower means; and

spring bias means interconnecting the trigger means and the musical instrument to normally retain the trigger means and therefor the tuning slide as well in a fully retracted position and away from a fully extracted position adjacent the musical instrument,

whereby the tuning slide can be selectively located in relation to the guide tubes between its fully retracted and fully extracted positions by angular rotation of the trigger means induced by digital pressure applied ot the digital pressing surface means, and the tuning slide can be readily disengaged from the trigger means by digital rotation of the trigger means until the pin can be removed from between the legs of the yoke so as to facilitate disengagement of the tuning slide from the guide tubes.

2. A slide control arrangement, as claimed in claim 1, wherein the legs of the yoke are of unequal length, the relatively shorter leg being disposed closer to the fully extracted position of the tuning slide and the relatively longer leg being disposed closer to the fully retracted position of the tuning slide.

3. A slide control arrangement for selectively positioning a tuning slide engaged on guide tubes of a wind musical instrument comprising:

a trigger member mounted intermediate oppositely disposed first and second ends thereof for pivotal movement on the musical instrument adjacent to the guide tubes thereof;

a digital pressing surface located at the first end of the trigger means and comprising a flattened spatula portion of the trigger member extending from the intermediate pivotal point thereof;

a follower pin connected to the tuning slide;

a cam member located at the second end of the trigger member and comprising a bifurcated open ended yoke having a pair of spaced extending legs, the cam member being normally adapted to engage the follower pin for sliding movement thereof and therefore of the tuning slide as well in response to movement of the cam member but adapted for selective disengagement from the follower pin; and

a biasing spring interconnecting the trigger member and the musical instrument to normally retain the trigger member and therefore the tuning slide as well in a fully retracted position and away from a fully extracted position adjacent the musical instrument,

whereby the tuning slide can be selectively located in relation to the guide tubes between its fully retracted and fully extended positions and, when located in its fully extracted position, can be completely removed from and replaced into engagement with the guide tubes upon disengagement of the cam member and the follower pin, the selective locating of the tuning slide being controlled by angular rotation of the trigger member induced by digital pressure applied to the digital pressing surface thereof.

4. A slide control arrangement, as claimed in claim 3, wherein the legs of the yoke are of unequal length, the relatively shorter leg being disposed closer to the fully extracted position of the tuning slide and the relatively longer leg being disposed closer to the fully retracted position of the tuning slide.

5. A slide control arrangement, as claimed in claim 3, wherein the biasing spring comprises a spring member coiled about the pivot axis of the trigger member and having a first end thereof in locking engagement with the trigger member and a second end thereof in locking engagement with the musical instrument.

**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 1,662,076 | 3/1928 | Newman. | |
| 3,161,103 | 12/1964 | Pascucci et al. | 84—394 |


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U.S. Cl. X.R.

235—156, 159, 160, 164