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Fig. 26 is a perspective view of the elongated, flexible body of the device. It shows the internal structure, including the proximal tube (27) at the top, the main body (26), and the distal tube (31) at the bottom. The body is flexible and has a wavy shape. It also shows the connection points for the proximal and distal tubes, labeled 28 and 32.

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ORGAN STOP KEY

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The invention relates to stop keys for organs.

An object of the invention is to provide a simple, durable and inexpensive stop key including an adjustably mounted resilient conducting member engageable with portions of a movably mounted stop-controlling member and having cam portions by which the movable stop-controlling member is urged to, and retained in, either of alternative positions, constituting the "off" and "on" positions of the stop key.

Another object of the invention is to provide a stop key including a pivotally mounted member having a U-shaped metal extension formed thereon to support a contact member and to facilitate the attachment of actuating means.

A further object is to provide a stop key including simple but effective means for permitting the removal and replacement of a stop key lever on a supporting rod.

A further object is to provide retaining means for the movable member of the stop key of such character as to avoid the loss of parts when the movable member is dismounted from its supporting rod.

A further object of the invention is to perfect details of construction generally.

The invention further consists in the several features hereinafter set forth and more particularly defined by the annexed claims.

In the accompanying drawings, Fig. 1 is a transverse sectional elevation through an organ console including stop keys embodying the invention, parts being broken away and parts being shown in section;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1 and showing the stop keys in plan, and including a schematic wiring diagram for one of the stop keys;

Fig. 3 is a perspective detail view of a retaining member for one of the stop keys;

Fig. 4 is a perspective detail view of a positioning and contact member for the stop key; and

Fig. 5 is a detail side elevation of one of the stop key levers.

In these drawings, the numeral 10 designates one of the front rails of an organ con-

sole through which is formed a horizontally-extending slot 11 sloping forwardly and downwardly and receiving therethrough the forward portions of a plurality of stop key levers or tablets 12, the walls of the slot being lined with felt bumper strips 13 engageable by the levers to limit the movement of the levers to their alternative positions. The levers or tablets may be formed of any suitable plastic, such as celluloid.

A horizontally-disposed bar 14 is detachably secured by screws 14' to the rear face of the front rail 10 and has driven therein a plurality of spaced upstanding pins 15 which have aligned apertures 16 at their upper ends receiving therethrough a horizontally-disposed rod 17 arranged in parallel relation to the rail 10 behind the slot 11. Each stop key lever 12 has a downwardly opening notch 18 at an intermediate portion to receive therein the rod 17 on which the stop key levers are thereby saddled and pivotally mounted, and the pins 15, which are placed between adjacent stop key levers, serve to dispose the levers in their predetermined spaced relation. In order to retain each stop key lever in place on the supporting rod 17, an inverted U-shaped yoke 19, formed of resilient wire, straddles an intermediate portion of the stop key lever above the rod 17 and is provided with eyed ends 20 through which the rod passes, the downwardly bowed upper portions 21 of the wire yoke being sprung into a transverse groove 22 at the upper portion of the stop key lever. The rearwardly-extending portions of the stop key lever beyond the rod 17 are relatively short and of reduced width and are straddled by the terminal portions of a U-shaped sheet metal member 23 having the end portions of its legs secured to the lever by rivets 24. A metal pin 25 is secured transversely of the U-shaped sheet metal member 23 to project beyond the sides thereof and is engaged within the member 23 by an upstanding forwardly-urged leaf spring 26 having its lower portions secured to the lower parts of the bar 14. The upper portions of the leaf spring 26 are provided with a forwardly projecting V-shaped kink 27 presenting sloping cam surfaces on either side of its apex

which are alternatively engageable with the pin 25 on the stop key lever. The lower portions of the leaf spring 26 are provided with vertically-spaced slots 28 receiving there-
 5 through attaching screws 29, the lower screw 29 extending into a vertical wall 30 of the bar 14 to clamp the spring 26 thereagainst and the upper screw extending into an up-
 10 wardly and forwardly sloping wall 30' of the bar 14 in order to facilitate the adjustment of spring tension. A bent portion 31 is integrally-formed at the lower end of the spring 26 and includes a terminal hook 32 adapted to project into a longitudinal groove
 15 33 formed in the lower edge of the bar 14. A conductor wire 34 extends longitudinally below the bar 14 and is soldered to the hook portions 32 of the several leaf springs 26. This conductor wire may be permanently secured
 20 in place, since the bent portion 31 of each spring permits the spring to be vertically adjusted, the adjustment of the spring being made in order to insure the proper travel of the stop key lever within the slot 11.

25 A spring contact wire 35 extends upwardly from the bar 14 through which it passes and includes an angular upper portion 36 which is engageable with the pin 25 on the stop key lever to form a circuit-closer, the lower end
 30 of the wire 35 being connected to one conductor of a cable 37 secured in place in any suitable manner, as by means of a supporting strip 38. When the stop key lever 12 is in its upper full line position of Fig. 1, the
 35 spring wire 35 is out of contact with the subjacent pin 25 and the stop key is then in its "off" position. A movement of the stop key lever to the dotted line position of Fig. 1 lifts the contact pin 25 into engagement with
 40 the spring wire 35, the stop key being then in its "on" position. In either of the "off" or "on" positions of the stop key, the pin 25 engages the corresponding sloping wall of the kink 27 formed on the leaf spring 26,
 45 so that the lever is spring-urged to its extreme positions, and as soon as the pin passes over the apex of the kink 27, the resulting cam action forces the lever to its extreme position.

50 The conductor 34 and cable conductors 37 are connected in the usual stop-controlling circuits of the organ.

In order to provide for the automatic or pre-selected operation of the stop keys, each
 55 lever 12 may be connected behind the console to any of the usual actuating means, which in the present instance is shown to be inflatable bellows 39 and 40 mounted on a supporting frame 41 and connected by cords 42 with the
 60 inner end of the sheet metal extension 23 of the stop key lever, an opening 43 being formed at the end of the extension member to receive the cords.

65 In the schematic wiring diagram shown in Fig. 2, the lever-retaining spring 26 of one

of the stop keys is connected by the conductor 34 to one terminal of a battery 45 or other suitable source of current, the other terminal of the battery being connected by a con-
 70 ductor 46 to one terminal of an electro-magnet 47 of a gang switch 48 which is a type commonly used in organ building. The other terminal of the electro-magnet 47 is connected by a conductor 49 to the spring contact
 75 wire 35 of the stop key. The gang switch 48 includes a plurality of circuit-closer elements, only one of which is shown, and this is connected by a conductor 50 to one terminal of a battery 51 or other suitable source of current, the other terminal of the battery being con-
 80 nected by a conductor 52 to the circuit-closer of one of the keys 53 of a manual or pedal key board. Another terminal of the key circuit-closer is connected by a conductor 54 to one terminal of an electro-magnet 55 of a
 85 stop action 56 including a pipe 57, and the other terminal of the electro-magnet is connected by a conductor 58 with another terminal of the gang switch 48.

When the stop key is in the full line po-
 90 sition of Fig. 1, the circuit-closer formed thereby is in "off" position, in consequence of which the electro-magnet 47 of the gang switch 48 is not energized. Under such con-
 95 ditions the gang switch 48 is open, thereby preventing the speaking of the pipe 57 by the depression of the key 53. When the stop key is moved to its closed position, the gang switch is also closed and the stop is then
 100 placed in operative position under the control of the key 53.

When it becomes necessary to remove a stop key from the console to facilitate repairs or to permit the substitution of an active stop
 105 key for a previously mounted blank stop key, it is only necessary, after disconnecting the cord 42, to urge the spring yoke 19 forwardly from the notch 22 in the stop key lever, whereupon the lever can be withdrawn
 110 by a rearward and upward movement. After a new stop key is inserted, the spring yoke 19 is snapped back into its proper position to retain the lever on the supporting rod 17. The spring yoke 19, by reason of its pivoted
 115 attachment on the rod 17, remains in accessible position during the lever replacement operation and it will not become lost or misplaced.

The stop keys are completely assembled on the supporting bar 14 with their positioning
 120 members 26, retaining members 19, bellows 39, 40 and cable 37, prior to the attachment of the bar to the front rail 10, thereby greatly facilitating assembling operations and per-
 125 mitting all the necessary adjustments to be made before the stop keys are mounted in the console. In mounting the stop key assembly in place, it is only necessary to intro-
 130 duce the stop key levers through the slot 11 and then secure the bar 14 in place to the rear

face of the console rail 10 by means of the screws 14'. By eliminating the usual spring connection between the console rail and the stop key, the effect of the warping of this rail on the adjustment of the stop key is obviated. The effort required to operate the stop key is also substantially decreased, thereby rendering it possible to use smaller bellows as well as to greatly reduce the operating air pressure.

While the devices of this invention find their greatest usefulness as stop keys, they are also readily adaptable to perform other controlling functions in organs, pianos and other musical instruments.

What I claim as new and desire to secure by Letters Patent is:

1. In a stop key, the combination of a stop-controlling member movable to alternative positions, and a resiliently mounted member having cam portions engageable with said stop-controlling member for urging said stop-controlling member to its alternative positions.

2. In a stop key, the combination of a stop-controlling member movable to alternative positions and having a conducting portion, a resiliently mounted conducting member having cam portions engageable with the conducting portions of said stop-controlling member for conducting current thereto and for urging said stop-controlling member to its alternative positions, and circuit-closer means operated by said stop-controlling member.

3. In a stop key, the combination of a stop-controlling member movable to alternative positions, a resiliently mounted member having cam portions engageable with said stop-controlling member for urging said stop-controlling member to its alternative positions, means for adjustably supporting said resiliently mounted member to displace said cam portions with respect to said stop-controlling member, and means for adjusting the pressure of said resiliently mounted member on said stop-controlling member independently of said first-named adjustment.

4. In a stop key, the combination of a stop-controlling member, a support on which said member is rockably mounted, and a resilient member having a pair of cam surfaces alternatively engageable with portions of said stop-controlling member for urging said stop-controlling member in opposite directions to its alternative positions.

5. In a stop key, the combination of a stop-controlling member, a support on which said member is rockably mounted, a contact member carried transversely on said rockably mounted member, and a resiliently mounted positioning member and a contactor both engageable with said contact member.

6. In a stop key, the combination of a support, a stop-controlling member rockably

mounted on said support, a U-shaped member secured to said rockably mounted member and extending rearwardly therefrom beyond said support, a conducting pin carried transversely of said U-shaped member, a resiliently mounted member having a pair of cam surfaces alternatively engageable with said pin and urging said rockably mounted member to its alternative positions, and a contactor engageable with said pin in one of the alternative positions of said rockably mounted member.

7. In a stop key, the combination of a support, a stop-controlling member rockably mounted on said support, and a leaf spring having a bent portion presenting a pair of cam surfaces alternatively engageable with portions of said rockably mounted member for urging said member to alternative positions.

8. In a stop key, the combination of a supporting member, a stop-controlling member having a recess receiving said supporting member and said stop-controlling member being rockably mounted on said supporting member, and a yoke member having portions carried on said supporting member and other portions engageable with said rockably mounted member for retaining said rockably mounted member on said supporting member.

9. In a stop key, the combination of a supporting member, a stop-controlling member having a notch receiving said supporting member and said stop-controlling member being rockably mounted on said supporting member, and a spring wire yoke member having terminal portions carried on said supporting member and intermediate portions releasably engageable with said rockably mounted member for retaining said rockably mounted member on said supporting member and for permitting the removal of said rockably mounted member from said supporting member.

10. In a stop key, the combination of a supporting member, a stop-controlling member having a notch receiving said supporting member and said stop-controlling member being rockably mounted on said supporting member, means for releasably retaining said rockably mounted member on said supporting member, and means for preventing the loss of said retaining means upon the removal of said rockably mounted member from said supporting member.

11. In a stop key, the combination of a supporting member, a stop-controlling member having a notch receiving said supporting member and said stop-controlling member being rockably mounted on said supporting member, means for releasably retaining said rockably mounted member on said supporting member, and means distinct from said retain-

ing means for urging said rockably mounted member to alternative positions.

12. In a stop key, the combination of a support, a stop-controlling member rockably mounted on said support for movement to alternative positions, a U-shaped member secured to said rockably mounted member and extending rearwardly therefrom beyond said support, said U-shaped member including a rearwardly-disposed transverse portion having an aperture therein to receive an actuating means, a member carried transversely by said U-shaped member, and a resiliently-mounted member having end portions engageable with said transverse member for urging said rockably-mounted member to its alternative positions.

13. In a stop key, the combination of a stop-controlling member movable to alternative positions, a support, a leaf spring secured at intermediate portions to said support and having cam portions engageable with said stop-controlling member for urging said stop-controlling member to its alternative positions and for conducting current thereto, securing means for longitudinally-adjusting said leaf spring with respect to said support, and said leaf spring having a resilient bent terminal portion adapted to receive a fixed conductor thereon in spaced relation to said securing means, whereby the longitudinal-adjustment of said leaf spring may be effected without disturbing said fixed conductor.

14. The combination of a console wall, a console rail having an aperture therethrough, a horizontally-disposed bar secured to the inner face of said console rail and including a rear wall, a supporting rod secured transversely above said bar rearwardly of said aperture, a stop key lever including an arm projecting forwardly through said aperture and pivotally mounted at intermediate portions on said rod for movement to alternative positions, a conducting pin secured transversely of said lever behind said rod, circuit closer means including said pin, an upstanding leaf spring having its lower portions secured to the rear wall of said bar and having its upper portions provided with a forwardly projecting protuberance presenting a pair of cam surfaces alternatively engageable with said pin for conducting current to said pin and for urging said stop key lever to its alternative positions.

15. In an organ control, the combination of a support, a lever rockably mounted on said support and having a recess receiving said support therein, and a yoke member having portions carried on said support and other portions detachably engageable with said lever for retaining said lever on said support.

16. In an organ control, the combination of a support, a lever rockably mounted on said

support, a resiliently mounted member having cam portions engageable with said lever for urging said lever to at least one position, means for adjustably displacing said cam portions with respect to said lever, and means for adjusting the pressure of said resiliently mounted member on said lever independently of said first-named adjustment.

17. In an organ control, the combination of a support, a lever rockably mounted on said support, a contact member carried on said lever, and a resiliently mounted positioning member and a contactor both engageable with said contact member.

18. In an organ control, the combination of a support, a lever rockably mounted on said support, and a leaf spring having a bent portion presenting a cam surface engageable with portions of said lever for urging said lever to at least one of different positions.

19. In an organ control, the combination of a supporting member, a lever member rockably mounted on said supporting member and having a notch receiving said supporting member therein, and means operatively connected to said supporting member and said lever member for releasably retaining said lever member on said supporting member, said means being detachably engageable with one of said members and permanently engageable with the other of said members, whereby to avoid the loss of said retaining means when said lever member is dismounted from said supporting member.

20. In an organ control, the combination of a supporting member, a lever member rockably mounted on said supporting member and having a notch receiving said supporting member therein, means operatively connected to said supporting member and said lever member for releasably retaining said lever member on said supporting member, said means being detachably engageable with one of said members and permanently engageable with the other of said members, and means distinct from said retaining means for urging said lever member to at least one of a plurality of positions.

In testimony whereof I affix my signature.

EDMOND VERLINDEN.