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PUSH-BUTTON SLIDER SWITCH HAVING PUSHROD RETAINING MEANS AND EXTERNALLY OPERABLE PUSHROD RETURN MEANS

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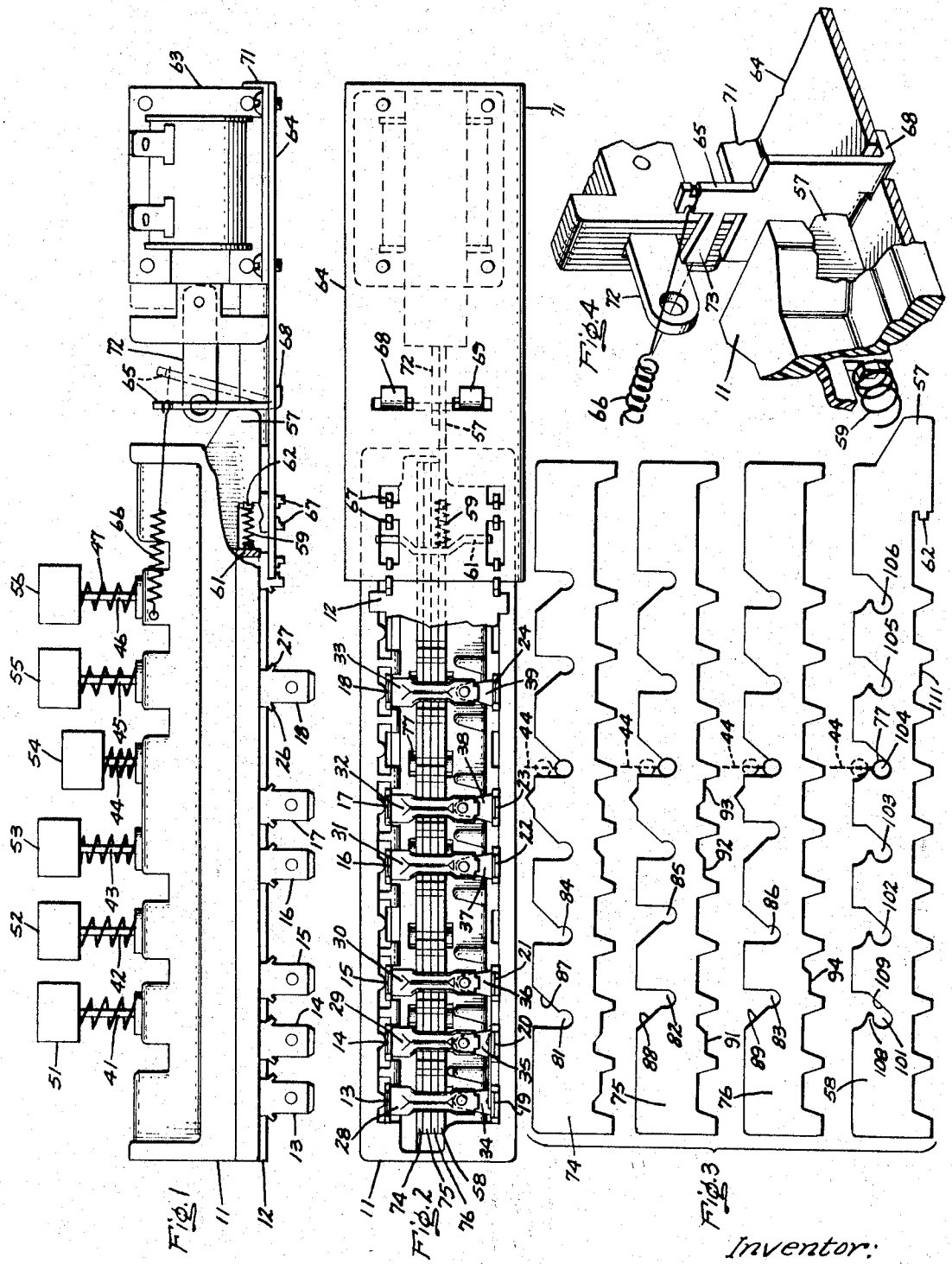


Fig. 1

Fig. 2

Fig. 3

Fig. 4

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PUSH-BUTTON SLIDER SWITCH HAVING PUSH-ROD RETAINING MEANS AND EXTERNALLY OPERABLE PUSHROD RETURN MEANS

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This invention is generally related to push-button switches, and more particularly to a multiple push-button switch having a plurality of manually actuated pushrod members which vary the positions of a series of reciprocating sliders to control the operation of various circuits coupled through the switch.

In recent years push-button slider switches have been widely utilized in many varied applications such as home laundry appliances, room air conditioners, electric ranges, window fans, etc., to control various circuitry therein. In these applications, switches of this type have proven to be economical, reliable, and relatively maintenance-free. These features of reliability and low maintenance, although desirable for all types of switches, are particularly essential for switches utilized in automatic vending equipment, since such equipment is usually coin operated and unattended. A need, therefore, has arisen for a reliable push-button switch having increased versatility of operation for utilization in conjunction with various electro-mechanical circuitry, of a type often found in automatic vending equipment for dispensing such articles as cigarettes, beverages, and candies. The present invention provides an improved push-button slider switch having this desired versatility.

An object of the present invention is to provide an improved push-button slider switch having cooperating means for retaining a manually actuated pushrod in a depressed position to prevent manual actuation of additional pushrods until the initially depressed pushrod is reset.

Another object of the present invention is the provision of an improved push-button slider switch having a novel and efficient pushrod resetting or return means which may be externally actuated by an electro-mechanical device, such as an electrical solenoid.

A further object of the present invention is to provide an improved push-button slider switch having a novel means of coupling an electro-mechanical device thereto for externally actuating a pushrod resetting or return means.

In carrying out my invention in one form thereof, I apply it to a multiple push-button slider switch having a plurality of movable sliders. The switch includes a base having a plurality of pushrods mounted thereto for selectively controlling the relative positions of the plurality of cooperating movable sliders. Depression of any one of the plurality of pushrods produces a corresponding specific relative movement between certain of the movable sliders. This movement of the sliders causes certain of a plurality of movable contacts which are mounted on the base to become opened or closed with respect to mating fixed contacts which are also mounted on the base. By my invention, one of the plurality of movable sliders is a special slider which includes a plurality of novel retaining recesses, one of which corresponds with each of the plurality of depressible pushrods. This special retaining slider is spring biased so that, upon depression of any single pushrod, the corresponding retaining recess engages the depressed pushrod causing it to be retained in a depressed position. The other movable sliders which operate the movable contacts of the switch have actuating recesses so arranged that only one pushrod may be fully depressed at any one time. Therefore, by retaining the first fully depressed pushrod in its depressed position, the special

retaining slider cooperates with the other movable sliders to prevent any of the other pushrods from being depressed until the retained pushrod is released. The special retaining slider has a projection on one end which is adapted to extend through an opening in the switch base. This projection may be acted upon by an external force, such as that supplied by an electro-mechanical solenoid. When a sufficient external force is applied to this projection to overcome the spring bias internally applied to the special retaining slider, the slider moves longitudinally in response to this external force. This movement of the special slider causes the one pushrod which is being retained in its depressed position to be released from, and returned by, the associated special slider retaining recess to its outermost, or non-depressed, position. This special slider may include one or more contact-operating cam surfaces in its lower portion such that its movement will control or signal external circuitry and/or electro-mechanical slider actuating means. This special slider enables an improved push-button slider switch to be provided in which the pushrod attached to the first push-button to become fully depressed will be retained in that depressed position, thereby preventing or "locking out" the depression of any other push-button, until an external force is applied to the special slider causing it to release and return the retained pushrod. Such an improved push-button switch is especially useful in automatic vending equipment. In such equipment after initial selection of an article to be vended has been made by depressing a corresponding psuh-button, it becomes necessary to "lock out" any additional selection until the first article has been vended, at which time the depressed push-button must be returned to its original nondepressed position to enable the next selection to be made. The special slider arrangement of the present invention provides means for obtaining this desired action in an improved push-button switch, effectively and at a minimum cost. In addition, there is provided by my invention a novel mounting means on my improved switch for enabling an electro-mechanical actuating device to be positioned with respect to the special slider in such manner that it may control the application of a force to this slider without being positively connected to it. This manner of coupling the electro-mechanical device to the special slider is desirable in order to provide greater freedom of movement for the movable element of the electro-mechanical device without the danger of damaging the special slider which would otherwise exist if the special slider were positively connected to the movable element of the electro-mechanical device, Thus, this novel mounting means protects my special slider thereby increasing the reliability of my improved switch, and also permits greater freedom of movement (or increased tolerance for the limits of travel) of the electro-mechanical device.

Further aspects of my invention will become apparent hereinafter, and the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which I regard as my invention. The invention, however, as to organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description when taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a front elevational view of a multiple push-button switch embodying one form of the present invention and illustrating an electro-mechanical device coupled thereto;

FIGURE 2 is a bottom view of the switch, mounting means, and electro-mechanical device of FIGURE 1, with the cover partially broken away;

FIGURE 3 is a layout view showing the various configurations of a plurality of movable sliders including a

special slider of this invention suitable for use in the switch of FIGURE 1; and

FIGURE 4 is a partially exploded, fragmentary perspective view showing one embodiment of the mounting means of the present invention for coupling an electro-mechanical device to the switch.

Referring in detail to the drawings and in particular to FIGURES 1 and 2, there is shown a multiple push-button slider switch in which my invention has been advantageously employed. The switch includes a housing comprised of a relatively hollow base **11** and a thin cover **12**, both being of a suitable electrical insulating material. Base **11** and cover **12** cooperate to provide a suitable enclosure and supporting structure for the operating elements of the switch. Base **11** contains two oppositely disposed rows of terminals which extend through slots in cover **12**. In FIGURES 1 and 2, terminals **13–18** comprise one of these rows and terminals **19–24** comprise the other row. Each of these terminals is provided with a pair of projecting fingers **26** and **27** (see terminal **18**, for example) which are lapped over, in a manner now well known in the art, to secure the cover **12** to the base **11** after assembly of the operating elements within the hollow base **11**. Terminals **13–18** are connected to, and support, movable contacts **28–33**, respectively. Movable contacts **28–33** are formed from a metallic, electrically conducting material and prestressed in such manner that they are, in the absence of movable sliders, spring biased against fixed contacts **34–39** which are, in turn, connected to and supported by terminals **19–24**. Pushrods **41–46** extend downwardly through openings in the top wall of base **11** to engage, when depressed, the actuating recesses of the movable sliders, causing the sliders to move longitudinally and selectively open and close the various movable contacts. These pushrods are spring biased to an uppermost position by a spring such as spring **47** on pushrod **46** except when a particular depressed pushrod (such as pushrod **44** in FIGURE 1) is being retained in a depressed position by the special slider of this invention. Pushrods **41–46** have push-buttons **51–56** attached to their outer ends to provide a relatively large surface area for ease of manual actuation of the pushrods.

In the cutaway portion of FIGURE 1, projection **57** of the special retaining slider **58** of this invention is shown extending through base **11**. Special slider **58** is spring biased by a compression spring **59** which is positoned between a support **61** and a spring retaining lip **62** formed in the lower portion of special slider **58** at the rear of projection **57**. Spring **59** biases special slider **58** to the right in FIGURE 1, thereby causing projection **57** to be internally biased outward from base **11**.

FIGURES 1, 2, and 4 show a novel mounting means for attaching an electro-mechanical device such as a solenoid **63** to the switch, and for enabling such device to control the force applied to projection **57** without positively connecting projection **57** to solenoid **63**. This mounting means is comprised of a mounting plate **64**, a movable motion transmitting arm **65**, and a biasing spring **66** which must have a biasing force greater than that of special slider biasing spring **59**, as will become better understood during the discussion of operation. Mounting plate **64** may be atached to base **11** by any suitable means, such as the installation of "dummy" terminals in base **11** which have projections suitable for passing through apertures in mounting plate **64** and being deformed into engagement therewith (see, for example, dummy terminal **67** in FIGURES 1 and 2), or by suitable screw or rivet means, etc. Mounting plate **64** has a pair of apertures for receiving angled legs **68** and **69** of motion transmitting arm **65**, which is biased in contact with projection **57** of special slider **58** by spring **66**. Mounting plate **64** has an edge **71** rolled over at approximately a 90 degree angle for increasing its rigidity. Solenoid **63** may be attached to mounting plate **64** by any suitable means such as self-tapping screws, rivets, etc. The movable armature **72** of solenoid **63** may be coupled to motion transmitting arm **65** by any suitable means, such as shown in FIGURE 4 by passing a projection **73** of arm **65** through an aperture in armature **72**.

Referring now to FIGURE 3, various configurations of a plurality of movable sliders which may be stamped from relatively thin insulating material for use in the switch of FIGURES 1 and 2 are shown. Slider **58** at the bottom is a special slider embodying the teachings of the present invention. However, it is to be understood at this point that the other three movable sliders **74**, **75**, and **76** are of a well-known standard type and that this invention relates to the construction, utilization, and mode of operation of special slider **58** and to the novel mounting means for coupling slider **58** to an external electro-mechanical device. Looking at FIGURE 1, it will be seen that push-button **54** and associated pushrod **44** are shown in a depressed position. This depression of pushrod **44** is carried over into FIGURE 3 where sliders **74**, **75**, **76**, and **58** are depicted in relative vertical position and alignment with respect to one another as they would appear after pushrod **44** has been manually actuated to a completely depressed position and is being retained in that position by special slider **58**. As may be seen with regard to pushrod **44** in FIGURE 3, each of pushrods **41–46** has a cylindrically configured actuating portion **77** formed at its inner or lower end for cooperating with and acting upon a corresponding actuating recess in each of the movable elongated actuating sliders **74**, **75**, and **76** to cause longitudinal movement of one or more of these sliders, thereby controlling the relative positions of movable contacts **28–33**. Looking more closely at movable actuating sliders **74**, **75** and **76**, it will be seen that each of these sliders has a respective actuating recess for cooperating with, and being longitudinally moved by, its corresponding pushrod. For example, actuating recesses **81**, **82**, and **83** cooperate with pushrod **41**, while actuating recesses **84**, **85**, and **86** cooperate with pushrod **42**, etc. It will be noted that each of these actuating recesses has an inclined working surface set at approximately a 45 degree angle with the longitudinal axis of the slider. For example, actuating recesses **81**, **82**, and **83** have inclined working surfaces **87**, **88**, and **89**. These inclined working surfaces produce longitudinal movement of their respective sliders when acted upon by the manual depression of a respective cooperating pushrod.

It will be assumed for purposes of explanation, that all pushrods **41–46** are initially in their uppermost or nondepressed positions and that actuating sliders **74**, **75**, and **76** are positioned such that the vertical alignment of their respective actuating recesses is as shown in FIGURE 3. Now, if pushrod **41** is depressed (ignoring for the present any effect which the depression of pushrod **41** may have upon special slider **58**), slider **74** will remain in approximately the same position shown in FIGURE 3, since the pushrod would proceed to the bottom of actuating recess **81** without contacting inclined working surface **87**. However, sliders **75** and **76** will be moved to the left as pushrod **41** contacts and acts upon inclined working surfaces **88** and **89**. This movement of sliders **75** and **76** causes their contact operating cam surfaces **91–94** to respectively open or close the various movable contacts cooperating therewith. It will be noted with respect to the actuating recesses in sliders **74**, **75**, and **76** which are associated or grouped with any particular pushrod, that at least one of the working surfaces in each group is oppositely inclined with respect to the others in that group, i.e., at least one of the inclined working surfaces in each group is approximately perpendicular with respect to the others of that group. For example, in the group of inclined working surfaces **87**, **88**, and **89**, surface **87** is inclined in one direction and surfaces **88** and **89** are inclined in a direction approximately perpendicular to that of surface **87**. In addition, it may be observed from FIGURE 3 that the actuating recesses of sliders **74**, **75**, and **76** are spaced such that

only one group of actuating recesses may be vertically aligned at any one time. For example, if the group comprised of recesses **81**, **82**, and **83** which cooperate with pushrod **41** are placed in vertical alignment, as they would be by fully depressing pushrod **41**, then no other group of recesses (such as recesses **84**, **85**, and **86** which cooperate with pushrod **42**) may be placed in vertical alignment until the depressed pushrod **41** is returned to its uppermost or nondepressed position. Thus it may be seen that by having inclined working surfaces perpendicular to one another within each group of actuating recesses, and by spacing these recesses on each actuating slider such that only one group thereof may be vertically aligned at any one time, then fully depressing and retaining a single pushrod will cause the oppositely inclined working surfaces within each group, except that group cooperating with the depressed pushrod, to produce a scissors action, criss-crossing one another, thereby "locking out" or preventing the depression of any other pushrod until the retained pushrod is released. Special slider **58** of this invention cooperates with standard actuating sliders **74**, **75**, and **76** to provide this "lockout" feature by retaining the initially depressed pushrod in a fully depressed position, causing sliders **74**, **75**, and **76** to remain locked in position due to the presence of the retained pushrod in the bottom of each of their cooperating actuating recesses.

Next, consideration will be given to a more detailed description of special slider **58**, shown at the bottom of FIGURE 3, which embodies the teachings of the present invention. It will be seen that special slider **58** includes a plurality of identical novel retaining recesses **101–106** in its upper portion, one for each of the plurality of pushrods. Each of these retaining recesses includes a retaining lip and an inclined work or return surface. For example, see retaining lip **108** and inclined surface **109** of retaining recess **101**. It is to be understood that if it should be desirable for a particular application that one or more of the pushrods should not be retained when depressed, i.e., for example, to provide a momentary return action thereto, one or more of the corresponding retaining recesses **101–106** could have its retaining lip removed or the particular retaining recess could be replaced by a mere vertical clearance slot. In either case, a pushrod depressed into such an adapted recess would not be retained and would be free to return to its nondepressed position upon removal of the manual actuating force applied to its associated push-button. As shown in FIGURE 3, slider **58** has a single contact operating cam surface **111** on its lower portion for operating a corresponding movable contact, in this instance movable contact **33**, for controlling the energization of solenoid **63**. However, it is to be understood that additional cam surfaces of this type may be added to slider **58** for signal or control purposes, or such cam surfaces may be completely eliminated from this special slider without varying from the scope and teachings of this invention. As previously mentioned, special slider **58** includes a projection **57** adapted to extend through a suitable opening in the right end of base **11** as depicted in FIGURES 1, 2, and 4. Special slider **58** also includes a spring retaining lip **62** for positioning compression spring **59** in a proper biasing position.

The operation of my improved multiple push-button slider switch embodying the teachings of the present invention will now be discussed, relative to its utilization in a particular application, such as an automatic coin-operated vending machine. However, it is to be understood that my invention may find utility in many varied applications, and it is not to be limited to vending equipment. Initially, it will be assumed that all pushrods **41–46** are in their outermost or nondepressed positions, as would be the case in an automatic vending machine prior to making a selection. Also, it will be assumed that the energization circuit of solenoid **63** is coupled through terminals **18** and **24**, so that solenoid **63** will be energized and pull its movable armature **72** to the right in FIGURE 1 when movable contact **33** is closed upon fixed contact **39**, but only after it has been established by circuitry external to the switch and the invention that the proper money for an article has been deposited by the customer. When movable contact **33** is cammed open by cam surface **111** of special slider **58**, solenoid **63** will be in a deenergized condition with movable armature **72** biased to its extreme left or outer position by bias spring **66** which is of sufficient strength to overcome the reverse bias effect internally placed on special slider **58** by spring **59**. Therefore, it may be seen that when solenoid **63** is not energized, spring **66** will hold motion transmitting arm **65** against projection **57** of special slider **58** with a force sufficient to overcome the reverse bias of spring **59**. Thus spring **66** will maintain slider **58** to the left, so that as a pushrod, such as pushrod **41** for example, is depressed, it will contact working and return surface **109** of actuating recess **101** and will not apply a downward force to the upper portion of retaining lip **108**, thereby reducing wear and eliminating any danger of breakage of retaining lip **108** by the downward thrust of pushrod **41**. It will also be assumed that the other contact sets are coupled to appropriate external circuitry for selecting a specific article to be vended.

It will be assumed that a customer has deposited the proper money in the vending equipment utilizing this improved switch and that circuitry external to the invention has established the proper equipment operating potentials in response to the deposit, so that the machine is now ready for the customer to select the article to be vended by depression of the corresponding push-button. Prior to selection by depression of a push-button, solenoid **63** will be deenergized and spring **66** will have special slider **58** biased to the left by application of its force to projection **57** via movable motion transmitting arm **65**. When special slider **58** is biased to the left, its cam surface **111** holds movable contact **33** in an open position preventing energization of solenoid **63** until a pushrod is depressed.

When the customer selects the article to be vended by depression of a push-button, here it will be assumed to be push-button **51**, the corresponding pushrod **41** immediately contacts and applies a force to working surfaces **87**, **88**, and **89** of standard sliders **74**, **75**, and **76**, causing these sliders to move longitudinally thereby opening or closing the various movable contacts **28–32** by means of their cammed surfaces such as surfaces **91–94**. Operation of these contacts causes circuitry external to the invention to select the article corresponding to push-button **51** and to place it in a "vend" position within the machine. As the pushrod **41** travels downward, it contacts working and return surface **109** of retaining recess **101** in special slider **58** and applies a force to surface **109** which causes slider **58** to move to the right. As slider **58** moves to the right, cam surface **111** releases movable contact **33** allowing it to close upon fixed contact **39**, thereby energizing solenoid **63** and signaling external vending machine circuitry to release the article being held in the "vend" position. When solenoid **63** becomes energized, it immediately "pulls in" its armature **72** overcoming the bias of spring **66** and causing movable motion transmitting arm **65** to move to the right as shown in broken lines in FIGURE 1. This removes the force previously applied to projection **57** by arm **65**, and allows spring **59** to hold special slider **58** to the right causing retaining lip **108** of retaining recess **101** to retain pushrod **41** in a depressed position. As previously described, the retention of pushrod **41** in a depressed position by special slider **58** of this invention prevents longitudinal movement of standard actuating sliders **74**, **75**, and **76** and the criss-crossed arrangement of their actuating recesses thereby locks out all other pushrods, preventing depression of more than one pushrod at a time. After the desired article has been released or vended by external vending machine circuitry,

that external circuitry removes the potential applied to solenoid **63**, causing it to become deenergized. At this time, bias spring **66** pulls armature **72** and motion transmitting arm **65** to the left position in FIGURE 1 causing arm **65** to apply a force to projection **57** of special slider **58** which is sufficient to overcome the biasing force of spring **59**. This force applied to projection **57** causes special slider **58** to be moved to the left, allowing retaining lip **108** of retaining recesses **101** to release depressed pushrod **41** and returning recess **109**, in conjunction with the vertical biasing spring on pushrod **41** (corresponding to spring **47** on pushrod **46**), to return pushrod **41** to its uppermost or nondepressed position. This completes the cycle, and the machine now awaits the next customer.

Thus it will now be understood that this new and improved push-button switch of my invention such as herein illustrated provides a simple and efficient means for retaining a manually actuated pushrod in a depressed position to prevent actuation of additional pushrods until the initially depressed pushrod is reset. My invention also provides a novel and efficient pushrod return means which may be actuated by external means. In addition, it has been shown that my invention provides a novel mounting means for coupling an external actuating device to my special slider to enable such device to control the force applied to that slider without being positively connected thereto, permitting greater freedom of movement to the external actuating device and reducing wear and stress to my special slider.

While in accordance with the patent statutes, I have described what at present is considered to be the preferred embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from my invention, and I, therefore, intend in the following claims to cover all such equivalent variations as fall within the true spirit and scope of this invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An improved push-button slider switch comprising a housing having a base of electrical insulating material, a first contact means including at least one movable contact disposed on said housing, at least one elongated actuating slider carried by said housing for reciprocating movement between first and second positions for actuating said movable contact, pushrod means mounted to said housing for reciprocating movement between an outer position and a depressed position in relation to said housing, actuating recess means on said contact actuating slider to receive said pushrod means for moving said actuating slider from said first position to said second position in response to depression of said pushrod means, an elongated retaining slider carried by said housing for retaining said pushrod means in a depressed position, a second contact means including at least one movable contact disposed on said housing, said retaining slider having a contact actuating means for actuating said second contact means, and means operatively connected to said retaining slider for applying a longitudinal force thereto in response to actuation of said second contact means thereby moving said retaining slider longitudinally in said housing and releasing said pushrod means from said depressed position.

2. An improved push-button slider switch as set forth in claim **1** wherein said elongated retaining slider has retaining recess means thereon for receiving and retaining said pushrod means in a depressed position and has a projection on one end thereof which is adapted to extend through an opening in said housing for being acted upon by said means for applying a longitudinal force thereto thereby causing said retaining slider to release said pushrod means.

3. The push-button switch of claim **1** wherein said means for applying said longitudinal force to said elongated retaining slider in response to actuation of said second contact means includes an electromechanical device mounted upon said switch housing, a motion transmitting arm movably mounted upon said switch housing and connected to said electromechanical device and spring biasing means connected to said motion transmitting arm for biasing said arm against said retaining slider thereby to move said retaining slider longitudinally in said housing and release said pushrod means.

4. An improved multiple push-button slider switch comprising a housing having a base of electrical insulating material, a plurality of contact means disposed on said housing, each of said plurality of contact means including a movable contact and a fixed contact, a plurality of elongated contact actuating sliders carried by said housing for reciprocating movement between first and second positions and including means for operating said movable contacts, a plurality of pushrod means mounted to said housing for reciprocating movement between an outer position and a depressed position in relation to said housing, a plurality of actuating recess means on each of said plurality of actuating sliders, said plurality of actuating recess means on each of said actuating sliders corresponding in number and relative location to said plurality of pushrod means and being adapted to receive said pushrod means for moving said plurality of actuating sliders from said first position to said second position in response to depression of any one of said plurality of pushrod means, an elongated retaining slider carried by said housing for retaining any one of said plurality of pushrod means in a depressed position thereby cooperating with said plurality of actuating sliders to lock out or prevent depression of any other of said plurality of pushrod means until the retained pushrod means is released, said retaining slider including contact actuating means for operating one of said contact means upon longitudinal movement, and mounting means attached to one end of said housing for mounting an external electro-mechanical device to said switch, said mounting means including means for transmitting an external force to said retaining slider without positively connecting said external device to said retaining slider, and said electromechanical device being operative in response to actuation of said one contact means by said contact actuating means of said retaining slider.

5. An improved multiple push-button slider switch as set forth in claim **4** wherein said elongated retaining slider has a plurality of retaining recess means thereon for receiving and retaining any one of said plurality of pushrod means in a depressed position and has a projection on one end thereof which extends through an opening in said housing for cooperation with said means for transmitting an external force.

6. The multiple push-button slider switch of claim **4** wherein said mounting means includes a mounting plate attached to one end of said housing for mounting an external electromechanical device to said switch, a motion transmitting arm movably mounted upon said mounting plate and positively connected to said electromechanical device, and spring biasing means attached to said motion transmitting arm for biasing said arm into contact with said retaining slider.

7. An improved multiple push-button slider switch comprising a housing having a base of electrical insulating material, a plurality of contact means disposed on said housing, each of said plurality of contact means including a movable contact and a fixed contact, a plurality of elongated contact actuating sliders carried by said housing for reciprocating movement between first and second positions and including means for operating said movable contacts, a plurality of pushrod means mounted to said housing for reciprocating movement between an outer position and a depressed position in relation to said housing, a plurality of actuating recess means on each of said plurality of actuating sliders, said plurality of actuating recess means on each of said actuating sliders corresponding in number and relative location to said

plurality of pushrod means and being adapted to receive said pushrod means for moving said plurality of actuating sliders from said first position to said second position in response to depression of any one of said plurality of pushrod means, an elongated retaining slider carried by said housing having a plurality of retaining recess means thereon for receiving and retaining any of said plurality of pushrod means in a depressed position, said retaining slider also having a projection on one end thereof which extends through an opening in said housing, means for constantly spring biasing said retaining slider outwardly from said housing, and means mounted externally of said housing and operatively connected to said projection for selectively overcoming the spring bias of said biasing means and moving said retaining slider in order to spring bias cause said retaining slider to release any previously retained pushrod means.

8. An improved multiple push-button slider switch comprising a housing having a base of electrical insulating material, a plurality of contact means disposed on said housing, each of said plurality of contact means including a movable contact and a fixed contact, a plurality of elongated contact actuating sliders carried by said housing for reciprocating movement between first and second positions for operating said movable contacts, a plurality of pushrod means mounted to said housing for reciprocating movement between an outer position and a depressed position in relation to said housing, a plurality of actuating sliders, said plurality of actuating recess means on each of said actuating sliders corresponding in number and relative location to said plurality of pushrod means and being adapted to receive said pushrod means for moving said plurality of actuating sliders from said first position to said second position in response to depression of any one of said plurality of pushrod means, an elongated retaining slider carried by said housing for

retaining any one of said plurality of pushrod means in a depressed position thereby cooperating with said plurality of actuating sliders to lock out or prevent depression of any other of said plurality of pushrod means until the retained pushrod means is released, said retaining slider being adapted to release said pushrod means upon the application of an external force thereto, and mounting means attached to one end of said housing for mounting an external electromechanical device to said switch, said mounting means including means for transmitting an external force to said retaining slider without positively connecting said external device to said retaining slider, said elongated retaining slider having a plurality of recess means thereon for receiving and retaining any one of said plurality of pushrod means in a depressed position, and having a projection on one end thereof which extends through an opening in said housing for cooperation with said means for transmitting an external force, said mounting means including a mounting plate attached to one end of said housing for mounting said external electromechanical device to said switch, a motion transmitting arm movably mounted upon said mounting plate and positively connected to said electromechanical device, and spring biasing means attached to said motion transmitting arm for biasing said arm in abutment with said projection on said retaining slider.

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