

C. A. CLARK.
PUSH BUTTON SWITCH.
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1,063,854.

Patented June 3, 1913.

Fig. 1.

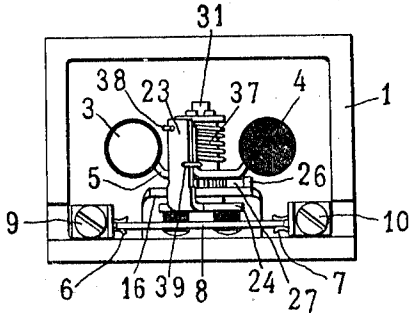


Fig. 2.

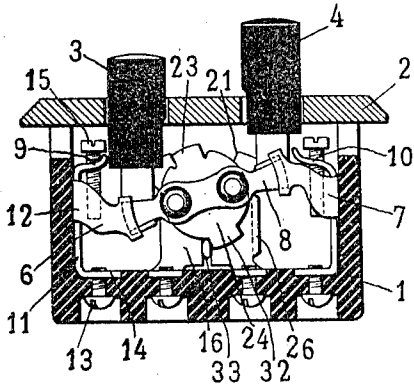


Fig. 3.

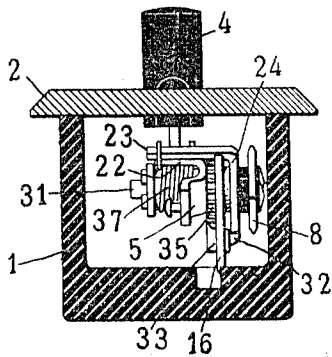
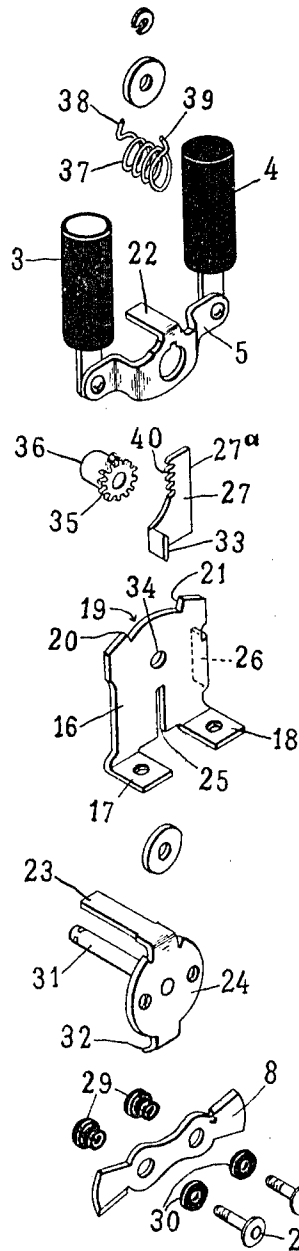


Fig. 4.



WITNESSES

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PUSH-BUTTON SWITCH.

1,063,854.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES A. CLARK, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Push-Button Switches, of which the following is a full, clear, and exact description, whereby any one skilled in the art may make and use the same.

The invention relates to electric switches and particularly to the type known as "push button switches."

It relates particularly to a mechanism for securing a quick make and break between the stationary and movable contacts of the switch.

The object of the invention is to provide a very simple and compact structure in which the operating parts will operate with certainty and precision.

A further object is to secure a quick make and break connection of the switch bar and stationary contacts by direct and positive action of the switch actuator.

A further object is to provide such a direct connection of the actuating bar and locking mechanism as will be controlled by a single tension spring arranged between the actuating bar and movable contact bar.

Referring to the drawings: Figure 1 is a plan view of the switch mechanism mounted in a receptacle with the cover removed. Fig. 2 is a sectional view through the receptacle showing the parts in vertical position. Fig. 3 is a cross-sectional view through the receptacle of Fig. 1, illustrating the parts in end view. Fig. 4 illustrates the various parts of the switch mechanism unassembled and in perspective view.

Referring to the drawings the numeral 1 denotes a receptacle of insulating material provided with the ordinary cover 2 through which project the push buttons 3, 4 of an actuator bar 5. These parts are all formed substantially the same as those of any well known type of push button switch. The receptacle is provided with stationary contacts 6, 7, which cooperate with a switch bar 8, through which the circuit is made or broken. The circuit wires are connected with binding posts 9, 10. These binding posts have a main supporting member 11, and secured thereto are flexible spring contact jaws 12. They are held in place by a set screw 13 engaging the foot 14 of

the standard. A binding screw 15 passes through the upper end of the standard which is bent at substantially right angles to the main post section and extends down between the spring arms 12.

Operatively arranged in the receptacle and suitably secured therein is a supporting frame member 16 having foot portions 17, 18, by which it may be securely fastened within the receptacle and provided at its upper surface with a cutaway portion 19 providing shoulders 20, 21, between which is the tongue-member 22 of the actuator bar 5 and the tongue-member 23 of the carrier 24, which bears the contact bar 8. A slot 25 is formed vertically in the supporting plate 16 and in conjunction with an in-turned lug 26 forms a supporting guide for a stop and releasing member 27. The contact plate 8 is secured to the carrier 24 by screws or rivets 28 and is thoroughly insulated therefrom by bushings and washers 29, 30. The carrier has a stud or shaft 31 which is concentric with the tongue members 22, 23 and is also provided with a stop member 32 adapted to be engaged by and disengaged from the stop member 33 of the stop and releasing member 27. The carrier 24, with its switch blade 8 is mounted on one side of the supporting plate 16 with a stud or shaft 31, projecting through a perforation 34, so that the stop member 32 is swung along one face of the supporting plate 16, and according to the position of the parts rests at one side or the other of the slotted opening 25. The actuator 5 has secured to it a pinion 35 which has a sleeve 36 forming an extended bearing for the actuator as well as a spring barrel about which is wound the tension spring 37. This spring has its opposite ends 38, 39, up-turned to engage the two tongues 22, 23, on their opposite sides. The stud or shaft 31 passes through the center of the bushing 36 upon which the latter as well as the actuator plate 5 have their bearing. The stop plate 27 has one edge 27^a straight and rests against the guide 26, while the stud 33 projects through the slot 25 to hold or release the lug 32 during the operation of the parts. The plate 27 is also provided with a rack 40, which engages the pinion 35.

With the parts assembled as shown in Figs. 1 and 2, the operation is as follows: The stop 32 of the plate 24 is held against rotation by the lug 33 of the plate 27. If now, the button 4 is depressed, the actuator

will rotate the pinion 35 and depress the stop plate 27 through its rack connection. During this movement, the tongue 22 will move away from the tongue 23 and through the spring 37 considerable tension will be placed upon the carrier 24 and its switch blade. At or near the lower limit of depression of the button 4, the stop-lug 33 will pass below the stop 32 releasing the same. Thereupon the carrier 24 will be rapidly rotated until its tongue 23 abuts against the shoulder 21. This movement will instantly break the connection between the contact bar 8 and stationary contacts 6 and 7. When it is desired to restore the connections at the contacts 6 and 7 the button 3 is depressed, and the parts restored to the position indicated in Fig. 2. This rocks the actuator bar and, through the pinion 35 secured thereto, lifts the stop plate 27. The lug 33 of this plate is however in contact with the opposite face of the stop 32 from that engaged thereby when the parts are in the position shown in Fig. 2, and the plate 24 is forcibly held, with the contact plate 8 in position to maintain open the circuit, until the tongue 22 of the actuator bar has moved sufficiently far away from the tongue 33 to put the spring 37 under tension. When the button 3 arrives at or near to the lower limit of depression the stop lug 33 will have passed beyond the stop 32 and behind the plate 24, releasing the same and permitting the parts to be carried to the position shown in Fig. 2 by the spring. It will be seen, by reference to Figs. 3 and 4 that the stop lug 32 is curved inward or toward the plate 16 so that the carrier plate 24 and the supporting plate 16 are spaced apart sufficiently to permit the projecting end of the stop lug 33 to move between these plates, while above the inturned edge of the stop lug 32. As the plate 5 is mounted on the opposite side of the supporting plate 16 from the carrier plate 24 and has its tongue 22 under-lying but concentrically arranged with reference to the tongue 23, a depression of the button being pressed, carries the tongue 22 far enough to slightly over-tension the spring 37. As soon as the pressure upon the button is released, the stop lug 33 will move slightly and engage the opposite face of the lug 32 from that which it just previously engaged.

From the above, it is apparent that the stop 33 always holds the switch parts in locked position with the tongues 22, 23, resting against one or the other of the shoulders 20, 21. Therefore, there is no liability of the switch bar being jarred out of the position which it is intended to occupy. Furthermore, the direct connection of pinion and rack for operating the stop gives a positive movement controlled by the rotation

of the actuator bar 5 and as the latter is controlled by the depression of the button, the movements and operation of the parts is precise and definite and but one spring-member is required in the device.

In devices so far as known, some form of spring connection is utilized for controlling the stop and locking member. In the device herein shown, the single spring which gives the tension between the actuator and contact bar always positions the actuator and consequently positions the stop plate and its stop 33. As the throw of the tongues 22 and 23 is locked by the stops 20 and 21, there is a definite locked position of the parts at each end of the throw and the instant the pressure upon the push button is removed.

Obviously, the exact details of the construction might be varied to a great extent without departing from the spirit or intent of the invention which is characterized by a positive locking and releasing member directly actuated from the actuator bar and controlled as to its position by the position of said bar and the action of the tension spring.

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

1. A push button switch embodying a supporting plate with a slot and a lug constituting a guide for a stop and releasing member appurtenant thereto, an oscillatory carrier for the movable contacts, a reciprocatory stop and releasing member geared with and positively operated from the push buttons, and arranged to bear against the aforesaid lug and also having a projecting part that enters the aforesaid slot, whereby it is guided in its movements, and a tension device acting upon the said oscillatory carrier.

2. A two button snap switch embodying an actuator bar with which the push buttons are connected, a pinion rotated thereby, an oscillatory carrier for the movable contacts, a reciprocatory stop and releasing member controlling the movements of the said carrier, formed with a rack with which the said pinion engages and by which it is moved, and a tension device acting upon the said oscillatory carrier.

3. A two button snap switch embodying a reciprocating plate bearing a stop and having a toothed rack upon one edge and a pinion in mesh therewith, said rack and pinion being connected with the actuator bar of the switch.

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Witnesses:

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