H. V. S. TAYLOR.

ELECTRICAL SWITCH.

APPLICATION FILED SEPT. 13, 1916.

1,368,370. Patented Feb. 15, 1921.

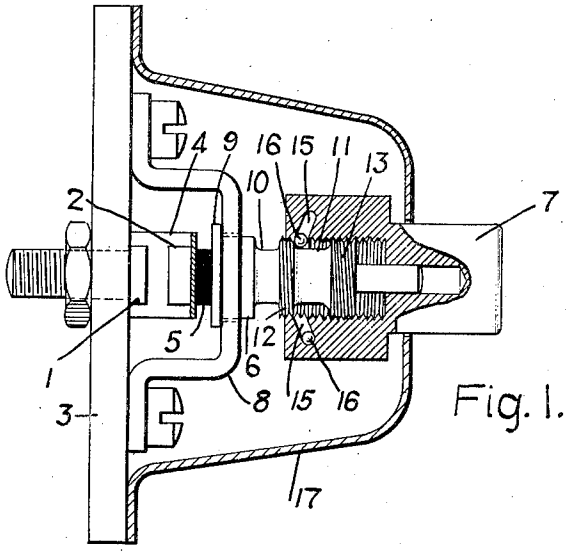


Fig. 1.

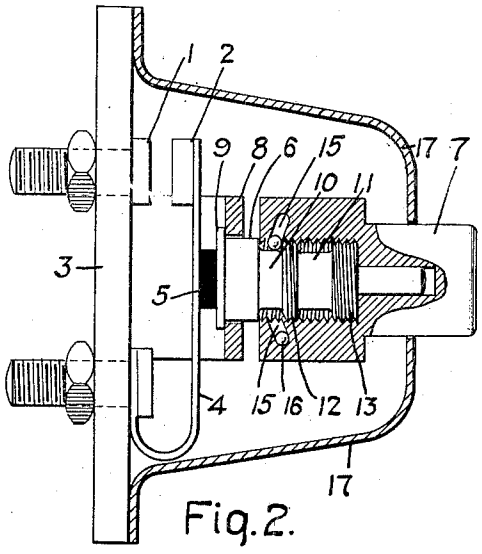


Fig. 2.

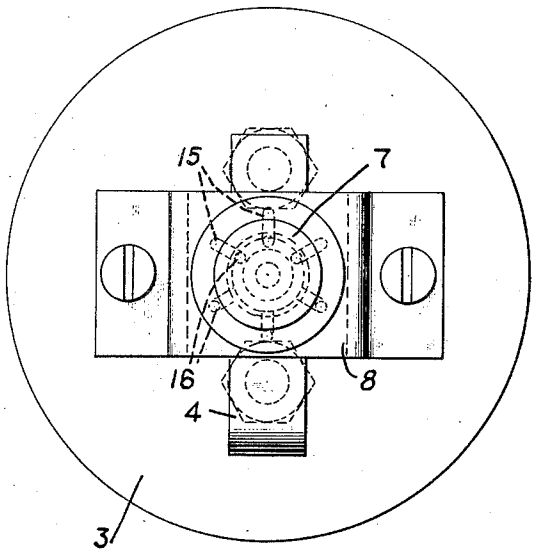


Fig. 3.

WITNESSES:

C. J. Ridge.

J. R. Langley.

INVENTOR

Horace V. S. Taylor.

BY

Wesley G. Carr

ATTORNEY

UNITED STATES PATENT OFFICE.

HORACE V. S. TAYLOR, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

ELECTRICAL SWITCH.

1,368,370. Specification of Letters Patent. Patented Feb. 15, 1921.

Application filed September 13, 1916. Serial No. 119,891.

To all whom it may concern:

Be it known that I, HORACE V. S. TAYLOR a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electrical Switches, of which the following is a specification.

My invention relates to electrical switches, and particularly to such switches as are employed in connection with the electrical circuits of automobies.

My invention has for its object to provide a switch of the above-indicated character embodying means for preventing its operation by unauthorized persons.

It is well known that when automobiles or other motor vehicles are parked or are unattended, it frequently occurs that the push buttons for controlling the electrical circuits of the various accessories of the vehicles are operated by children or other unauthorized persons. When an automobile is equipped with the usual electric horn, its operation under such circumstances causes not only an objectionable amount of noise, but the energy of the battery is wasted and may be entirely exhausted.

Push button switches of the non-tamperable type have been provided heretofore, but they usually comprise detachable keys which must always be carried by the drivers or they embody combination locks which are difficult to manipulate at night. Other switches have been provided with adjusting means for rendering them inoperative but they are of such nature that their methods of operation may be readily discovered.

According to the present invention, I provide a push button switch for controlling an electrical circuit which is so arranged that it may be rendered inoperative by a simple turning movement of the operating button. The switch may be rendered operative only by a rapid turning movement in the opposite direction.

In the accompanying drawings, Figure 1 is a view, partially in elevation and partially in section, of a switch constructed in accordance with my invention, the actuating means being shown in operative position. Fig. 2 is a view, similar to Fig. 1, but taken at right angles thereto, the actuating means being shown in inoperative position. Fig. 3 is a plan view of the mechanism of Fig. 2, the cover being removed.

A switch, comprising a stationary contact member 1 and a movable contact member 2, is supported by a base member 3 of fiber or other suitable insulating material. The movable contact member 2 is carried by a spring 4. The engagement of the contact members is effected by an insulating block 5 that engages an intermediate portion of the spring 4, a longitudinally movable rod 6 has a push button 7.

The rod 6 projects through a circular opening in a guide member 8 of substantially U-shape. The rod 6 is provided with a flange portion 9 of larger diameter than the opening in the member 7 to limit the outward movement of the rod and its connected parts. The rod 6 is provided, also, with grooved portions 10 and 11 and screw-threaded portions 12 and 13.

The push botton 7 is provided with a bore having screw threads which coact with the screw-threaded portions 12 and 13 to adjust the relative positions of the rod 6 and the push button. The push button 7 is provided with a plurality of radially-extending holes or slots 15 which are inclined to the axis of the push button. Each of the slots 15 contains a ball 16 of steel or other material which is loosely mounted therein to coact with the groove 10 or the groove 11, according to the relative positions of the push button 7 and the rod 6.

It will be obvious that, in any angular position of the push button, the balls 16 in the upper half of the push button will normally occupy positions at the lower or inner ends of the slots 15 to engage the rod 6, while the balls 16 in the lower half of the push button will occupy their respective positions at the outer ends of the slots 15. When the push button 7 and the rod 6 occupy their respective relative positions illustrated in Fig. 1, the actuation of the push button effects the engagement of the contact members 1 and 2, as will be readily understood.

In case it is desired to render the switch inoperative, the push button is rotated in a clockwise direction, as viewed from the right, Figs. 1 and 2, until the push button has advanced relatively to the rod 6, to its position shown in Fig. 2. The pressure of

the spring 4 against the end portion 9 of the rod 6 through the insulating blocks causes a certain amount of friction which enables the operator to rotate the push button 7 as described above. Because of the inclination of the slots 15 to the axis of the push button, the balls 16 that are in engagement with the side of the groove 11 readily recede into their respective slots to permit the longitudinal movement of the push button relatively to the rod 6.

When the various parts occupy their respective illustrated positions (Fig. 2), actuation of the push button 7 cannot effect the engagement of contact members 1 and 2. The distance between the inner end of the push button 7 and the guide member 8 is less than that separating the contact members 1 and 2 in the open position of the switch. The guide member 8 accordingly operates as a stop to so limit the inward movement of the push button 7 that the contact members 1 and 2 are not in engagement, and the switch is therefore rendered inoperative.

In order to again render the switch operative, it is necessary to return the push button 7 to its outer position with respect to the rod 6. This operation cannot be accomplished by an ordinary rotation of the push button. The balls 16 now engage the sides of the slots 15 and the side of the groove 10 in such manner as to constitute a locking device to prevent relative movement of the coacting members.

If, however, the push button 7 be rotated in a counter-clockwise direction with a sufficiently rapid movement, the balls 16 that are in engagement with the grooves 10 are actuated outwardly in the slots by centrifugal force. The rotation of the push button to return it to the position shown in Fig. 1 is then unopposed.

The push button 7 may be rotated in a counter-clockwise direction to move outwardly beyond the position illustrated in Fig. 1, if it is so desired. It is not necessary that the balls 16 engage the inner side of the groove 11, since the balls serve no useful purpose while the push button is in its operative position.

Should an unauthorized person attempt to rotate the push button in a counter-clockwise direction out of operative connection to the rod 6, the balls 16 engage the outer side of the groove 11 to limit the outward movement of the push button in the manner described above in connection with the groove 10. The cover member 17 of the switch constitutes, also, means for preventing excessive rotation of the push button in a counter-clockwise direction.

The arrangement shown and described provides a means whereby a switch may be rendered operative or inoperative, at the will of the operator. It is not necessary to employ a key or to manipulate a combination for rendering it operative. Inasmuch as the mechanism may be operated to some extent, even when the parts are arranged in their inoperative positions, it is unlikely that an unauthorized person would realize that the switch was ineffective to close the circuit controlled by it. Under such circumstances, it is probable that a person not familiar with the mechanism would ascribe its failure to operate to a derangement of the parts at some other portion of the automobile.

I claim as my invention:

1. In a switch, the combination with cooperating contact members, of an actuating member for one of said contact members having an operative position and an inoperative position, and means for preventing the adjustment of said actuating member from one of said positions to the other except by a rapid movement.

2. In a switch, the combination with cooperating contact members, of an actuating member for one of said contact members having an operative position and an inoperative position, and means for preventing the adjustment of said actuating member from its inoperative position to its operative position except by a rapid movement.

3. In a switch, the combination with cooperating contact members, of an actuating member for one of said contact members having an operative position and an inoperative position, and centrifugal means for preventing the adjustment of said actuating member from one of said positions to the other except by a rapid movement.

4. In a switch, the combination with a stationary and a movable contact member, and a pair of relatively movable members for controlling the operation of said movable contact member, of means for preventing relative movement of said pair of members in one direction except when executed rapidly, said means permitting relative movement freely in the opposite direction.

5. In a switch, the combination with cooperating contact members and a pair of relative movable members for actuating one of said contact members, of means for readily permitting relative movements of said relatively movable members in one direction and for preventing relative movements in the other direction except under predetermined speed conditions.

6. In a switch, the combination with a member having recessed portions, of a coacting member having openings and elements in said openings for coacting with said recessed portions to prevent relative movement of the two members in one direction, except when executed rapidly, and to permit relative movement freely in the op-

posite direction, a stationary contact member and a movable contact member coöperating with said stationary contact member, said movable contact member being controlled by the member having recessed portions and the member associated with it.

7. In a switch, the combination with a member having grooved portions, a coacting member having a screw-threaded connection to the other member and provided with recesses, of elements loosely mounted in said recesses for coacting with said grooved portions to prevent relative movement of the two members in one direction, except when executed rapidly, and to permit relative movement freely in the other direction, a stationary contact member and a movable contact member coöperating with said stationary member, said movable contact member being controlled by the member having a grooved portion, and the member associated with it.

8. In a switch, the combination with a movable contact member and a member operatively connected thereto having a plurality of grooved portions, of an actuating member having a screw-threaded connection to the grooved member and provided with an inclined recess, and a ball in said recess for coacting with said grooved portions.

In testimony whereof, I have hereunto subscribed my name this 26th day of August, 1916.

HORACE V. S. TAYLOR.