

H. W. YOUNG & A. S. PEARL.
 AUTOMOBILE SWITCH.
 APPLICATION FILED DEC. 8, 1911.

1,104,093.

Patented July 21, 1914.

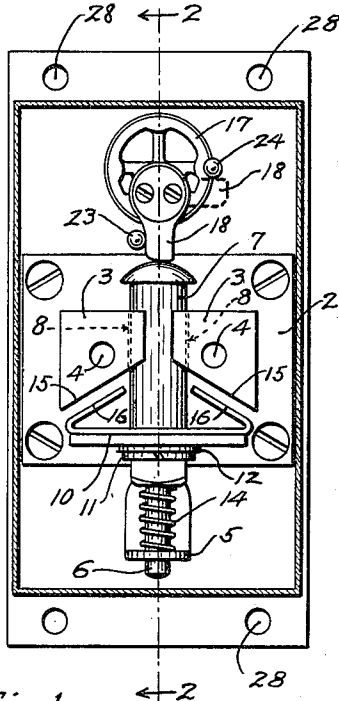


Fig. 1.

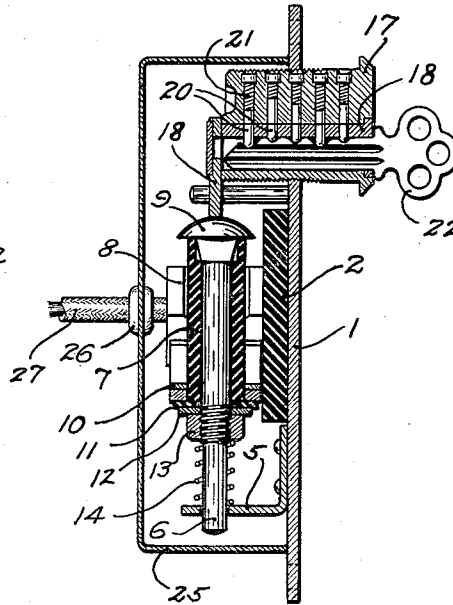


Fig. 2.

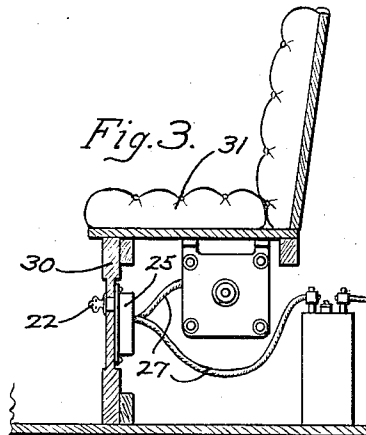


Fig. 3.

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UNITED STATES PATENT OFFICE.

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AUTOMOBILE-SWITCH.

1,104,093.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, HERBERT W. YOUNG, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, and ALLEN S. PEARL, a citizen of the United States, residing at Maywood, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Automobile-Switches, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The primary object of our invention is to produce an electric switch which cannot be tampered with so as to be operated maliciously or accidentally by an unauthorized person.

A further object of our invention is to produce a simple and novel electric switch construction which will permit a switch to be opened and closed by a suitable detachable key which can only be withdrawn when the switch is locked in its open position.

A further object of our invention is to provide a simple and compact electric switch for automobiles or the like, so mounted that an unauthorized person cannot operate the same without destroying some part of the automobile structure.

The various features of novelty whereby our invention is characterized will hereinafter be pointed out with particularity in the claim; but, for a full understanding of our invention and of its various objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a back view of a switch arranged in accordance with a preferred form of our invention, the box or casing being shown in section; Fig. 2 is a section on line 2-2 of Fig. 1; and Fig. 3 is a section through the body of an automobile adjacent to the seat, showing one method of mounting the switch in an electric automobile.

Referring to the drawing, 1 represents a plate, preferably of metal, on one side of which is mounted a slab 2 of insulating material. On the member 2 are mounted two separated blocks 3 of good conducting material. The members 3 serve as the stationary contacts of the switch and may also

conveniently form the switch terminals; each block being illustrated as provided with an opening 4 into which the end of a conductor may be inserted. On the plate is secured a bracket 5 which extends out from the plate at some distance beneath the contact pieces 3.

6 is a stem or rod lying between the contact pieces 3 and having its lower end extending freely through an opening in the bracket. The stem or rod is surrounded by a thick sleeve 7 of insulating material which is shaped to fit slidably in jaws 8 in the sides of the contact pieces which face each other. The contact pieces therefore serve as a bearing or support for one end of the rod or stem. The insulating sleeve may conveniently be held in place by providing the rod or stem with a head 9 on its upper end, the sleeve being locked between the head and suitable clamping devices on the rod or stem at the lower end of the sleeve. In the arrangement shown, there is mounted on the lower end of the insulating sleeve a movable switch arm or contact piece 10, this being engaged by a washer 11 of insulating material, followed by a metal washer 12 and a nut 13 screwed upon the rod or stem. When the several parts are assembled on the stem and the nut is tightened, the movable contact piece is held in operative relation to the stationary contact pieces and is insulated from the remainder of the switch structure except when it engages with the stationary contact pieces. A spring 14 surrounds the rod or stem and engages at one end with the nut 13 and at its other end with the top of the bracket 5, the parts being so designed that when free to do so the spring raises the movable switch member so as to bring the movable contact piece into engagement with the stationary contact pieces, thus closing the switch; the switch being opened by depressing the movable switch member against the tension of the spring. The insulating slab is preferably made long enough so that the movable contact piece does not drop below the lower end of the slab when the switch is opened and therefore, by placing the movable switch arm close to the front face of the slab, the switch arm is prevented from turning about a vertical axis. This makes it unnecessary to key the various parts together to prevent relative rotation and makes the construction simpler and cheaper.

The contact pieces may of course take any desired form, but we prefer to incline the bottom faces of the stationary contact pieces as indicated at 15 so that these faces diverge from each other, flaring outwardly and downwardly. The movable switch arm may be made of a rigid cross piece having yielding ends 16 extending upwardly and inwardly at approximately the same angles as those of the corresponding under faces of the stationary contact pieces. This arrangement permits the actual engaging portions of the movable switch member to yield sufficiently when the switch is closed to insure a good contact over a considerable area. Furthermore, by making the angles of the members 16 somewhat greater than the angles of the cooperating faces on the movable contact pieces, a sliding or wiping contact may be obtained, this serving to burnish the contact faces and keep them in good condition.

For the purpose of operating the switch we have secured in the supporting plate just above the insulating slab a lock barrel 17 preferably of the type in which there is a tumbler sleeve carrying a series of tumblers which make an accurately fitted key necessary. In the arrangement shown the barrel projects on opposite sides of the supporting plate, its inner end lying approximately above the axis of the movable rod or stem and its outer end lying far enough beyond the outer face of the plate to permit the plate to be secured on the back of a panel with the barrel projecting through the panel and having its outer end flush with the front of the panel. This particular arrangement, especially the extent to which the barrel projects beyond the front of the plate, is of course not essential as it will of course be understood that various other dispositions of the barrel may be made, depending upon the nature of the use to which the switch is to be put.

A tumbler sleeve 18 extends through the barrel and carries on its inner end a finger or cam 18 which lies directly above the head on a switch stem so that when the sleeve is turned in one direction the cam or finger will depress the movable switch member and open the switch; while upon turning the sleeve in the opposite direction the movable switch member will be left free to be lifted by the spring into engagement with the stationary contacts. In the positions of the parts illustrated, the tumbler sleeve is so situated that the tumblers 20 may rise into the passages 21 in the barrel, thus permitting the key 22 to be withdrawn. In this position the switch is open and, after the withdrawal of the key, the switch cannot again be closed until a proper key is inserted so as to lift the tumblers into the positions illustrated. When this is done the

sleeve may be turned so as to bring the finger or cam 18 into the position indicated in dotted lines in Fig. 1. This leaves the movable switch member free to rise and close the circuit. However, the key cannot now be withdrawn because the portions of the tumblers carried by the sleeve do not register with the passages in the barrel and therefore these tumbler members act as positive locks to prevent the withdrawal of the key. It is therefore necessary for the user to turn the key back so as to bring the parts into the positions indicated in full lines in Figs. 1 and 2 before the key can be withdrawn. Thus the user must always open the switch before the key can be withdrawn and, unless he forgets to withdraw the key, the switch is always left locked in an open position. It is preferable to provide stop pins 23 and 24 which limit the angular movement of the tumbler sleeve by engaging with the finger or cam 18 as the sleeve is turned. The first pin is so located that it engages with the cam or finger when a switch is opened and the tumbler sleeve is properly located to permit the withdrawal of the key; while the pin 24 is preferably located so as to insure that the cam or finger will be swung fully clear of the upper end of the switch stem before being arrested.

The switch and its operating mechanism may be housed by means of a suitable casing or cover 25 placed against the back of the supporting plate; the cover being provided with suitably insulated inlets 26 through which the electric conductors 27 may be passed.

In Fig. 3 we have illustrated one manner of mounting our improved switch on an electric automobile. The supporting plate 1 is made somewhat longer than the cover or casing 25 so as to provide flanges which may be perforated as indicated at 28 to receive screws or other fastening devices. The front of the supporting plate is laid against the rear face of the panel 30 supporting the front end of the automobile seat 31, the barrel extending through an opening in the panel so as to bring its front end flush with the outer surface of the panel. The switch device is then secured in place by means of screws or other fastening devices introduced through the holes 28 into the panel. It will thus be seen that the entire switch is concealed and housed within the space beneath the seat so that it cannot be reached by an unauthorized person who has not the proper key, without destroying the supporting panel or some other portion of the automobile structure. At the same time the switch is within easy reach of an operator on the seat, it being only necessary to reach down and insert the key into the exposed key hole.

While we have illustrated and described

with particularity only a single preferred form of our invention, we do not desire to be limited to the exact structural details thus illustrated and described, but intend to cover all forms and arrangements which fall within the terms employed in the definitions of our invention constituting the appended claim.

We claim:

10 In combination, a supporting plate, two separated stationary contact pieces mounted upon said plate and insulated from each other and from the plate, a bracket on said plate at one side of said contact pieces, a
15 movable switch stem slidably mounted in said bracket and extending between said contact pieces to the opposite side thereof,

an insulating sleeve on said stem, said contact pieces being shaped to form a guide for said sleeve, a movable switch piece carried by said stem, a spring between the stem and the bracket tending to force the stem in the direction to carry said movable switch piece into engagement with the stationary contact pieces, and an actuating member for said stem mounted on said plate in proximity to the free end thereof. 20 25

In testimony whereof, we sign this specification in the presence of two witnesses.

HERBERT W. YOUNG.

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Witnesses:

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