A. K. SUTHERLAND.

INCLOSED SWITCH.

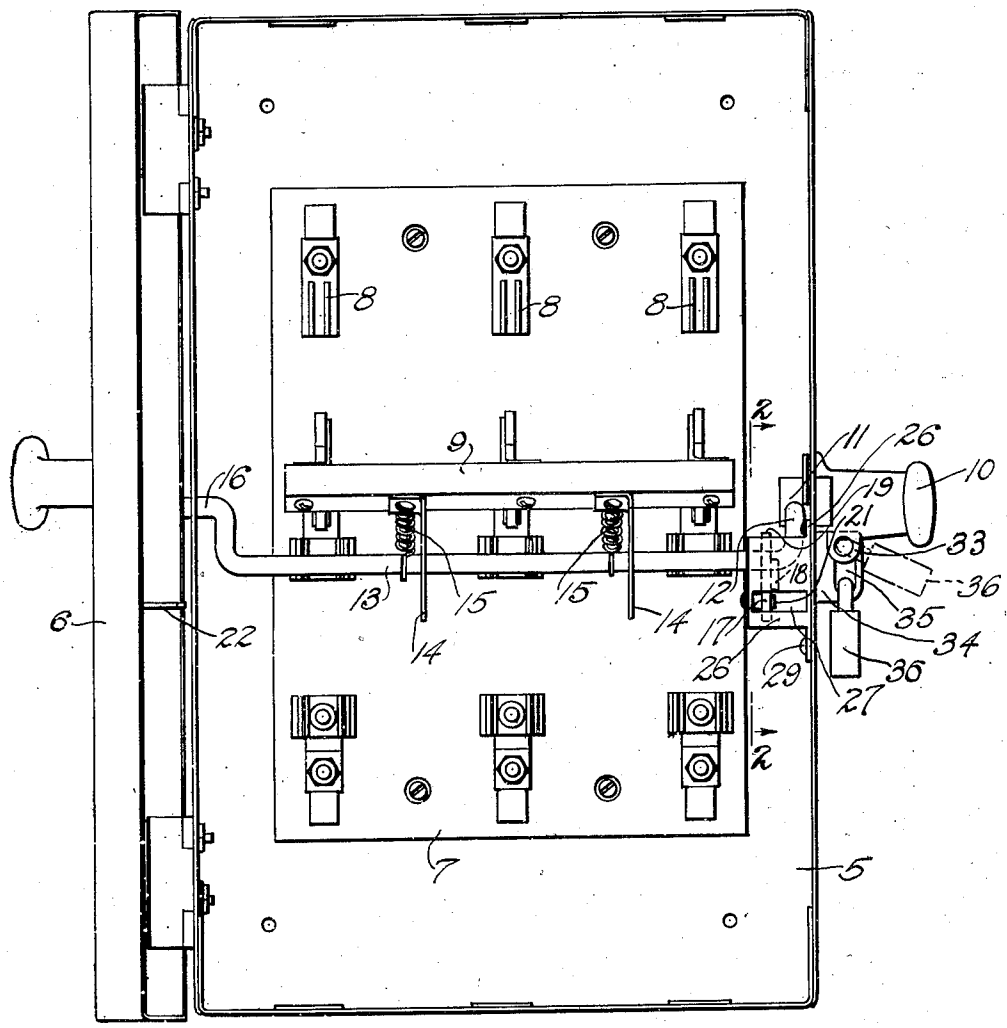
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1,288,739.

Patented Dec. 24, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



INVENTOR

ALEXANDER K. SUTHERLAND

BY

Mulhee Taylor & J.

ATTORNEY S.

A. K. SUTHERLAND.

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2 SHEETS—SHEET 2.

Fig. 2.

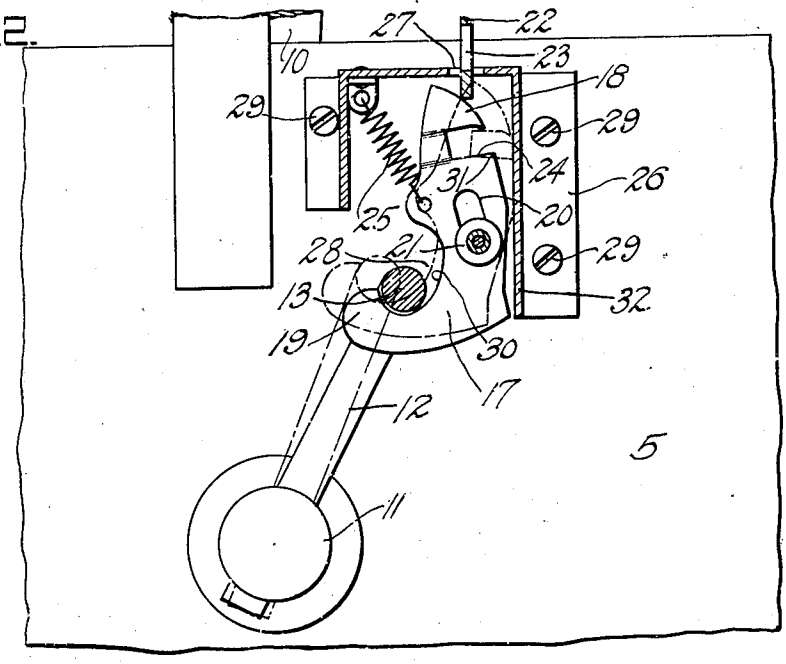
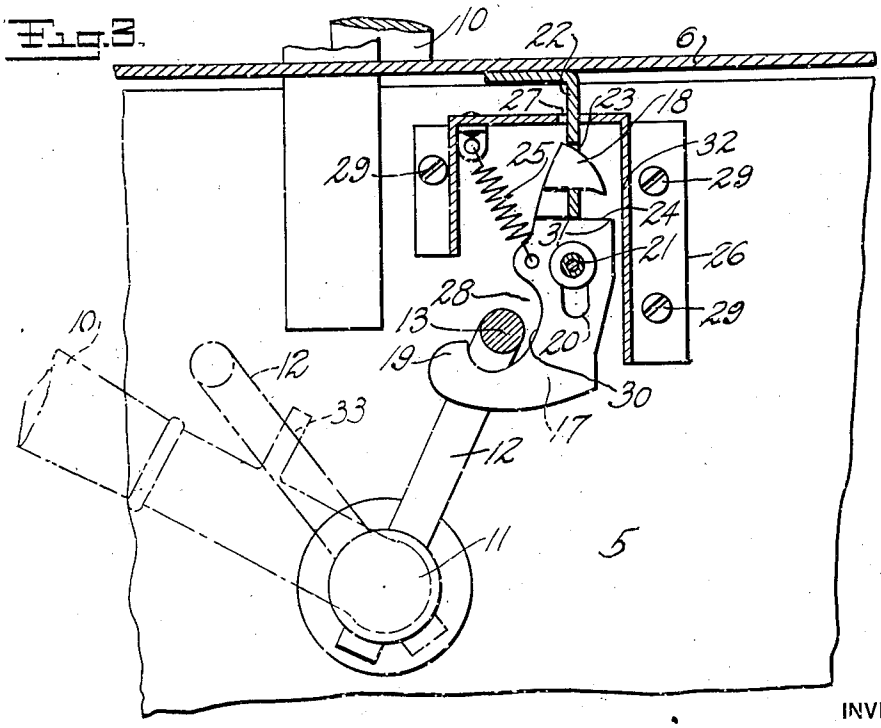


Fig. 3.



INVENTOR

ALEXANDER K. SUTHERLAND

BY

Mitchell & Allegan

ATTORNEYS

UNITED STATES PATENT OFFICE.

ALEXANDER K. SUTHERLAND, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, OF PLAINVILLE, CONNECTICUT, A CORPORATION OF CONNECTICUT.

INCLOSED SWITCH.

1,288,739. Specification of Letters Patent. Patented Dec. 24, 1918.

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To all whom it may concern:

Be it known that I, ALEXANDER K. SUTHERLAND, a subject of the King of Great Britain, residing at New Britain, Connecticut, have invented a new and useful Inclosed Switch, of which the following is a specification.

This invention relates to inclosed or so-called "safety" switches and the general objects of the invention are to improve and simplify switches of this character.

A special object of the invention is to combine in a single relatively simple mechanism, means for locking the cover of the switch casing and also means for locking the switch in the open circuit position, the latter lock being released by the closing of the cover.

Another object is to provide an improved form of outside lock for the switch operating handle.

Briefly stated, the invention resides in the combination with a switch casing having a hinged cover and a switch mounted in said casing, of a latch for securing the cover in closed position and a locking element carried by said latch for holding the switch in the open circuit position, said latch being displaced by the closing of the cover to release said locking element from holding engagement with the switch operating member. The lock for the switch operating handle comprises a bracket on the outside of the casing for receiving a padlock, said bracket being slotted so that when the padlock is not in use it may be moved along in the slot to a point where it will not interfere with the free operation of the switch operating handle.

In the accompanying drawing I have illustrated the invention embodied in a practical commercial form but I would have it understood that changes and modifications may be made without departure from the true spirit and scope of the invention.

In said drawings:—

Figure 1, is a front view showing the cover of the switch casing thrown back, the switch proper being in the open circuit position.

Fig. 2, is a detail sectional view showing the compound lock for the switch and the cover, this view being taken substantially on the plane of the line 2—2 of Fig. 1 and showing how the switch is locked in open circuit position when the cover is open.

Fig. 3, is a similar view showing how when the cover is closed and locked the switch is automatically released.

The box or casing 5 is shown as of typical construction being made of sheet metal and having a hinged cover 6. The switch also is of a typical construction embodying a switch base 7 secured to the bottom of the box and supporting the relatively stationary and movable switch elements 8 and 9 respectively.

The switch is operated by a handle 10 having a hub 11 journaled in the side of the box, the connection from this handle to the movable switch element being made by means of an arm 12 engaged in the hub at the inside of the box and having a laterally extending portion 13 connected with the cross bar of the movable switch element by means of the brackets 14 and the quick-break springs 15. The pivot of the handle is substantially coincident with the pivotal mounting of the movable switch element. The far end of the switch operating arm 12 and lateral extension 13 may be provided with a cranked portion 16 journaled in the opposite side wall of the box as indicated. It will be clear from this that as the switch handle is rocked, the pivoted switch element will be operated to open or close the circuit as the case may be.

The compound lock for the cover and switch comprises a locking member 17 having a sliding pivotal mounting in the casing and provided with a latch hook 18 at its upper end for locking engagement with the cover and a hook element 19 on its lower end for holding engagement with the lateral projection 13 of the switch operating arm 12. The sliding pivotal mounting for the locking member is here provided by longitudinally slotting the locking member as at 20 so as to slide and rock on the pivot stud 21. The cover is provided with a keeper for engagement with the latch portion of the locking member, said keeper being shown as a lug or bracket 22 dependent from the cover and provided with a slot 23 in the lower portion thereof for receiving the latch hook 18.

A special feature of the keeper is that it acts as a detent to depress the locking member when the cover is closed to thereby shift the switch holding hook 19 out of holding engagement with the switch operating arm. This feature is illustrated most clearly in Fig. 3 wherein it will be seen that the lower

end of the keeper engages an abutment shoulder 24 on the locking member below the latch hook 18 and thereby forces the locking member downwardly to free the hook 19 from the part 13.

The locking member is yieldingly supported by means of a spring 25 connected therewith at such a point as to both lift said member and also tilt it forwardly in a direction to carry the latch hook 18 into the path of the keeper on the cover.

The locking member may be supported and housed within a box 26 which may be made of sheet metal, said box having a slot 27 in the top thereof to receive the keeper. The pivot 21 for the locking member is shown mounted on the side wall of said box and the supporting spring 25 is shown wholly inclosed within the box. The lower side of the box is shown cut away at 28 to receive the rocking switch operating element 13. This box for the locking member is made of sheet metal and the locking member itself may in fact, be made of a single piece of relatively heavy sheet metal. The construction therefore is very simple and enables the assemblage of the parts under the most convenient circumstances, the box with the locking member properly mounted therein being subsequently mounted in place in the switch casing as by securing it by screws or rivets 29 to the inner wall of the switch casing.

From Fig. 3 it will be clear that when the cover of the switch casing is closed, the switch lock is depressed out of holding engagement with the switch operating member and the switch therefore in this closed condition of the casing may be freely operated. When it is desired to open the switch casing, it is simply necessary to throw the switch handle in a switch opening direction to bring the switch arm 13 into engagement with the locking member at the point 30 in rear of the hook 19, whereupon, the locking member will be fulcrumed upon its pivot to free the latch hook 18 from engagement in the keeper slot 23. The cover may then be opened free of any control of the locking member. As the cover is raised, the locking member is lifted by the spring 25 to bring the hook 19 into holding engagement with the switch arm 13 so that when the cover is open the switch is automatically locked in the open circuit position. The locking member is prevented from turning on its pivot in such a way as to release the switch by reason of its engagement at 31 with an abutment wall 32, which latter may be the adjacent inside wall of the box 26. This abutment wall also serves as a sliding abutment limiting the rocking movement imparted to the locking member by the spring 25.

The locked condition of the switch in the open position of the cover is shown in Fig. 2. As the cover is closed, the keeper slides over the nose of the latch and becomes interlocked therewith and also depresses the latch so as to free the switch lock from the switch operating member. The switch is then again free to be operated as desired so long as the casing remains closed.

In order that one authorized to do so may operate the switch and close the circuit when the cover is open, the box inclosing the locking member may be left open at the bottom to expose the lower end of said locking member so that one familiar with the construction can operate said locking member to release the same from the switch operating arm. The switch therefore while locked against tampering by unauthorized persons, may nevertheless, if necessity requires, be operated by one authorized to do so, when the switch casing is open.

It is usually desirable to provide in addition to the automatic lock, means by which the switch can be locked in an open circuit position when the switch casing is closed. For this purpose I provide the switch handle with an extension or lug 33 perforated to register with an aperture for the hasp of a padlock provided in the bracket 34 secured on the outer wall of the casing. The aperture in this bracket is in the nature of a slot 35, it being extended rearwardly beyond the lug 33 sufficiently to receive the hasp of the padlock 36 when the handle is in the upright open circuit position. The padlock therefore while secured on the bracket in position for use when needed, nevertheless, when not in use does not interfere with the free movement of the switch handle. When it is desired to lock the switch handle in the open circuit position, it is merely necessary to unlock the padlock and slip the hasp through the apertured handle lug, the hasp now engaging the forward end of the bracket slot to prevent movement of the handle in a circuit closing direction.

From the foregoing it will be apparent that the switch of my invention is extremely simple in construction and further that it is positive and certain in operation. Another advantage is that the mechanism can be made quite cheaply and from stock material. Also the possibility of the mechanism getting out of order is reduced to a minimum inasmuch as the locking mechanism for both the cover and the switch is embodied in a single rugged member.

I claim:—

1. In an inclosed switch, a casing having a hinged cover, a switch in the casing having a movable switch element, a switch operating member operatively connected with said movable switch element, a locking member having a sliding pivotal mounting in the casing and provided with a hook at one end for engagement with the switch operating

member and a latch at its opposite end for engagement with a keeper on the cover, a keeper on the cover for engagement by said latch and arranged to slide the locking member on its pivotal support to thereby displace the hook from holding engagement with the switch operating member.

2. In an inclosed switch, a casing having a hinged cover, a locking member having a sliding pivotal mounting in the casing and provided with a cover latch on its upper end and a switch locking hook on its lower end, a spring for yieldingly supporting said locking member, a switch in the casing having a movable switch element, a switch operating member operatively connected with said movable switch element and arranged to be engaged by the hook on the locking member, and a keeper on the cover for engagement with the latch and arranged to slidingly displace the locking member to thereby free the hook from holding engagement with the switch operating member.

3. In an inclosed switch, a casing having a hinged cover, a switch in the casing having a movable switch element, a switch operating member connected with said movable switch element, a pivot stud carried by the casing, a slotted locking member having a sliding and rocking bearing on said pivot stud and provided with a hook for the switch operating member at one end and a latch for the cover at its opposite end, a spring for yieldingly supporting the locking member on the pivot stud, and a dependent lug on the cover adapted to force the locking member slidingly upon the pivot stud to free the hook from engagement with the switch operating member, said lug having a keeper slot therein to receive the latch on the locking member.

4. In an inclosed switch, a casing having a hinged cover, a switch in said casing having a movable switch element, a switch operating member connected with said movable switch element, a locking member slidably supported in the casing and having a hook for holding engagement with the switch operating member and a latch for securing the cover in closed position, a keeper on the cover for engagement with said latch and arranged to depress the locking member to free the hook from holding engagement with the switch operating member, means for guiding the locking member in its sliding movement, and means for yieldingly sustaining the locking member in position to be engaged by the keeper on the cover.

5. In an inclosed switch, a casing having a hinged cover, a switch in said casing having a movable switch element, an operating member connected with the movable switch element, a pivot stud carried by the casing, a slotted locking member pivotally engaged on said stud, said locking member having a hook for holding engagement with the switch operating member and a latch for securing the cover, a keeper on the cover for engagement with the latch and arranged to slidingly displace the locking member, an abutment surface adjacent the locking member, and a spring for yieldingly sustaining the locking member and holding the same rocked into sliding engagement with said abutment member.

6. In an inclosed switch, a casing having a hinged cover, a switch in said casing having a movable switch element, an operating member connected with the movable switch element, a keeper on the cover, a box secured to the inner wall of the casing, a pivot stud carried by said box, a slotted locking member slidingly engaged on said pivot stud and having a sliding engagement with one of the inner walls of the box, said locking member having a hook for holding engagement with the switch operating member, and a latch for engagement with the keeper, and a spring yieldingly supporting the locking member and holding the same rocked into sliding engagement with the wall of the box.

7. In an inclosed switch, a casing having a movable cover, a dependent member on the cover, a switch in the casing having a movable switch element, a switch operating member operatively connected with said movable switch element, a locking member having a sliding pivotal mounting in the casing and provided with means at one end for holding engagement with the switch operating member and means at its opposite end for interlocking engagement with said dependent member on the cover, said dependent member being positioned to slide the locking member on its pivotal support upon closure of the cover and to thereby displace the same from holding engagement with the switch operating member.

8. In an inclosed switch, a casing having a movable cover, a switch in the casing having a movable switch element, a switch operating member operatively connected with said movable switch element, a slidingly supported locking member in the casing having means to adapt it in one position to lock the switch operating member, said sliding member being positioned to be depressed upon the closing of the cover to unlock the same from the switch operating member and means operative through the locking slide and cover for securing the cover closed when the locking slide is unlocked from the switch operating member.

ALEXANDER K. SUTHERLAND.