Jan. 5, 1926. 1,568,042

H. M. BROADWELL

INCLOSED SWITCH

Filed Feb. 27, 1923

Fig. 1.

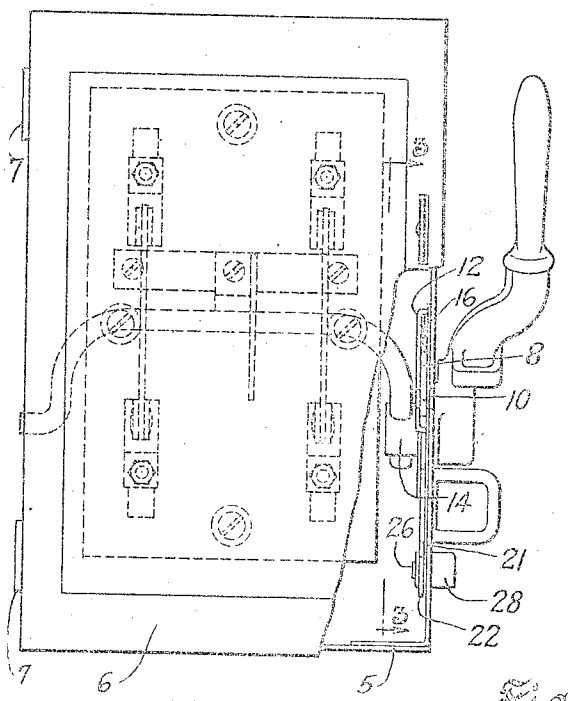


Fig. 2.

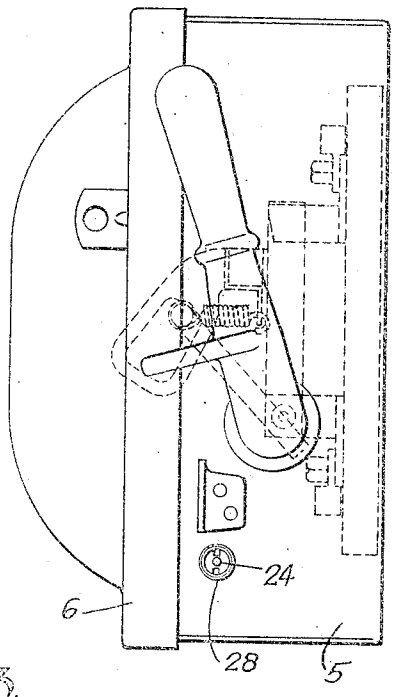


Fig. 5.

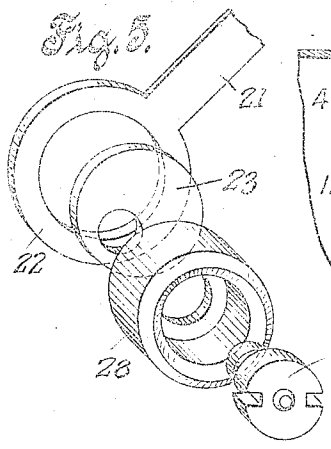
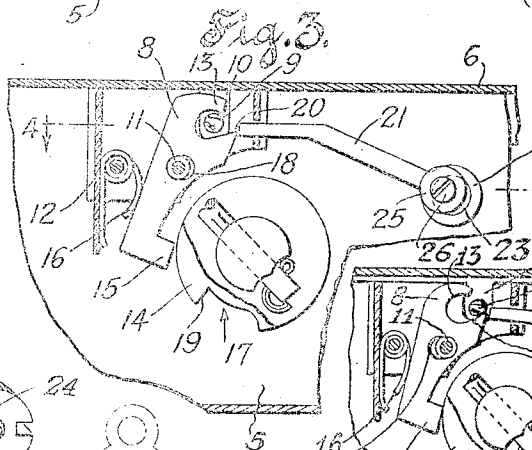


Fig. 3.



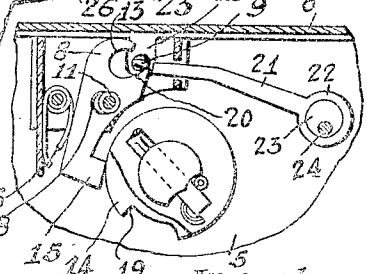


Fig. 4.

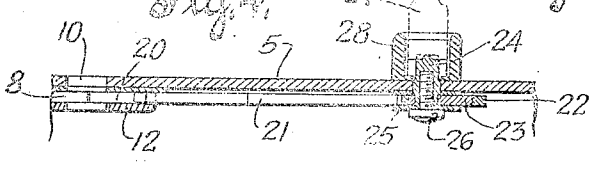
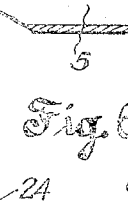


Fig. 6.



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UNITED STATES PATENT OFFICE.

HARRY M. BROADWELL, OF PLAINVILLE, CONNECTICUT, ASSIGNOR TO THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, OF PLAINVILLE, CONNECTICUT, A CORPORATION OF CONNECTICUT.

INCLOSED SWITCH.

Application filed February 27, 1923. Serial No. 621,503.

To all whom it may concern:

Be it known that I, HARRY M. BROADWELL, a citizen of the United States of America, and residing at Plainville, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Inclosed Switches; of which the following is a specification.

My invention relates to constructions of the type of the Knudsen Patent #1,310,163, in which the cover is ordinarily locked when the circuit is closed.

The main object of my invention is to provide a simple and inexpensive construction by means of which the cover may be readily released without opening the circuit.

Another object is to provide an attachment for this purpose which can be readily installed in the box body independently of the cover.

Another object is to provide a construction of this character which can be readily installed in a construction of the character of the Knudsen invention with only a slight modification of the latch mechanism.

The invention may be carried out in a very simple manner by providing an externally accessible key-operated release member for retracting the movable part of the latch inside the box.

Figure 1 is a front view of a switch embodying improvements of my invention, part of a cover being broken away to show the interior construction.

Figure 2 is a side view of the same. In both these views a conventional switch is indicated in dotted outline.

Figure 3 is an enlarged interior view, parts being shown in section on the plane of the line 3—3 of Figure 1.

Figure 4 is a sectional view on the plane of the line 4—4 of Figure 3.

Figure 5 is an exploded view of the latch retracting parts.

Fig. 6 shows the relative positions of the interlocking parts when the key has been operated to release the cover while the switch is closed.

The box may be of any suitable form having a body portion 5 and a cover 6 which is ordinarily hinged along one edge as indicated for instance at 7.

The latch mechanism consists of members 8 and 9 carried respectively by the body and cover of the box. The member 9 is in the form of a pin, and the edge of the body of the box is slotted at 10 to permit this pin to project inside the body of the box. The member 8 is loosely pivoted at 11 in a housing 12 in the box. When the switch is in the closed circuit position the hook 13 of the latch member 8 extends over the pin 9 and thus prevents the cover from being opened. The hub 14 of the operating handle when the parts are in the closed circuit position forms an abutment for the finger 15 of the latch 8 and the spring 16 presses this finger toward the hub. When the operating hub is rotated clockwise, as viewed in Figure 3, to open the switch, the recess 17 is brought in line with the finger 15 so that the spring 16 can tilt the latch 8 around its hinge or pivot 11 and release the hook 13 from the pin 9 and permit the cover to be opened. The latch 8 is slotted at 18 to permit it to be swung contra-clockwise to release the pin 9 even when the switch is closed.

When the cover has been opened with the switch open, the shoulder 19 engages the finger 15 and prevents the closing of the switch while the cover is open. When the cover is being closed the pin 9 strikes against the inclined shoulder 20 of the latch 8 and retracts the finger from the shoulder 19 so as to permit the switch to be closed.

To retract the latch 8 and permit the cover to be opened when the switch is closed, I provide a thrust member 21 which is mounted inside the box. One end is guided in the housing 12 and is adapted to engage the latch and swing it so as to disengage the hook 13 from the path of the pin 9. The other end of the member 21 is in the form of a ring or strap 22 in which is mounted an eccentric 23. This eccentric 23 is mounted on the inner end of a key stud 24 and may be held in place by a washer 25 and screw 26 or by riveting. This stud 24 has a bearing in one wall of the body 5 of the box and its outer end is recessed to accommodate some suitable form of key 27.

A loosely mounted freely rotatable guide or guard 28 may also be held in place by the stud 24 and serve not only to prevent the op-

eration of the device by other than proper key means but also to assist in positioning the key.

It will be obvious from the foregoing that the rotation of the stud 24 and eccentric 23 will move the thrust rod 21 back and forth and that the movement of the rod 21 to the left as viewed in Figure 3 will unlock the cover even when the switch is still closed. When it is desired to open the cover while the switch is in the closed circuit position, the key 27 is inserted within the guard 28 into the stud 24 and turned so as to rotate the eccentric 23 and move the thrust rod 21 toward the left, as viewed in Fig. 3. This tilts the latch 8 about the tip of the finger 15 and the inclined shoulder 20 of the latch 8 moves toward the left and presses the pin 9 upward slightly just as the hook 13 passes by the pin 9. This releases the cover from the latch and raises it slightly. As the cover is again closed the pin 9 engages the inclined shoulder 20 so as to tilt the latch toward the right and cause it to force the thrust rod toward the right, thus returning it to its normal position where the friction of the parts holds them in the position shown in Fig. 3. If, while the cover is opened, the switch is opened, the shoulder 19 will, of course, pass by the finger 15 of the latch 8 and the spring 16 will press the finger beneath the shoulder 19, thus holding the switch in the open circuit position. With the parts constructed and proportioned as shown in the drawing, the operation of the key 27 and thrust rod 21 has no effect on the latch 8 when the switch is in the open circuit position, since at that time the hook finger 15 is interlocked with the shoulder 19 on the switch operating member, and in this position the hook 13 of the latch 8 is not in the path of movement of the pin 9.

By this form of construction it will be seen that the cover and pin 9 of the Knudsen device have not been materially modified and that the cover has no unusual movable or projecting part or hole. Similarly the latch and box are not modified except by the addition of the thrust bar 21 and the supports for its opposite ends, and the key guide.

I claim:

1. In an electric switch, a box body, a cover therefor, a pivoted latch, a pin coacting with said latch for interlocking engagement therewith, a thrust member for moving said latch out of engagement with said pin, an eccentric for operating said thrust member, said pin operating by the closing movement of the cover to retract said thrust member.

2. An electric switch comprising a box body and cover, a movable switch member, a latch for holding the cover closed when the switch is closed and preventing movement of the switch when the cover is open, a key operated member carried by the box for retracting said latch and releasing said cover when the switch is closed, said cover and latch automatically resetting said key operated member as the cover is closed.

3. In an inclosed switch, a box having a hinged cover, a switch within the box, a switch operating member having an external handle, a pivoted latch having a limited sliding movement approximately parallel to the top of the box for interlocking the cover with the box when the switch is closed, a thrust rod within the box for sliding said latch to release said cover, and a member mounted in a wall of the box and actuated by a key from the outside of the box for operating said thrust rod and latch.

4. In an electric switch, a box body and cover, a switch within said box, an operating member and interlocking latch members for preventing the opening of the cover when the switch is closed, a key operated eccentric member and a co-operating thrust bar carried by the body of the box for disengaging said latch members, said latch member operating by the closing movement of the cover to retract said thrust bar.

5. In an inclosed switch, a box, a cover therefor, a switch operating member, a latch supported in said box and co-acting with said member, a pin rigidly carried by said cover for engagement with said latch, a key actuated member for disengaging said latch, and an external loosely mounted rotatable protecting guard for said key actuated member.

6. In an inclosed switch, a box, a cover therefor, a latch mounted in said box, a pin carried by the cover for engaging said latch and a key operated eccentric means mounted in one of the members of the box to disengage said latch and a guard to prevent the direct manual operation of said key operated means.

7. In an inclosed switch, a box and a cover, a switch operating member, a latch member supported in said box and co-acting with said member, a retracting member mounted in said box for engaging said latch, and a key operated hub mounted in a wall of said box and having an eccentric for operating said retracting member independently of the said switch operating member.

8. In an inclosed switch, a box, a cover for said box, a switch in said box, said box and cover members being provided with an internal interlocking means to prevent the opening of the cover when the switch is closed and an externally accessible key-operated eccentric means for disengaging the said interlocking means when the switch is in the closed position, said interlocking means operating by the closing of the cover to reset said eccentric means.

9. In an inclosed switch, a box, a cover

for said box, a switch in said box, said box and cover members being provided with an internal interlocking means to prevent the opening of the cover when the switch is closed and an externally accessible key-operated eccentric means for disengaging the said interlocking means when the switch is in the closed position, the key operated means being provided with an external, freely rotatable guard member.

10. In an inclosed switch, a box, a cover for said box, a switch in said box, an internal latching means supported by said box members to prevent the opening of the cover when the switch is closed, and an externally accessible key operated means for disengaging the said latching means to permit the opening of the cover when the switch is in the closed position, the said key operated means including an external, freely rotatable guard member.

11. In an inclosed switch, a box, a cover for said box, a switch in said box, an internal latching means supported by said box members to prevent the opening of the cover when the switch is closed, and an externally accessible key operated means for disengaging the said latching means to permit the opening of the cover when the switch is in the closed position, the said key operated means including a thrust rod for engaging the said latching means and an eccentric member for operating the thrust rod, said latching means being automatically reset by the closing of the cover.

12. In an inclosed switch, a box, a switch in the box, a cover for the box, internal latching means carried by the box members to prevent the opening of the cover when the switch is closed and an externally accessible key operated eccentric means for rendering the latching means temporarily ineffective and including a freely rotatable guard for the externally accessible operating means.

13. In an inclosed switch, a box having a hinged cover, a movable switch member within the box, an operating member therefor, a latch for holding said cover closed when the switch is closed, a key actuated means for moving said latch to free said cover when the switch is closed, said moving means being automatically reset when the cover is closed.

14. An inclosed switch comprising a box body, a movable switch member therein, a cover for said body, an operating member for said switch member, a latch cooperating between said cover and said operating member, key actuated means for retracting said latch, said key actuated means being automatically reset by the closing of the cover.

HARRY M. BROADWELL.