

May 4, 1937.

H. J. HAMMERLY

2,079,286

SAFETY SWITCH

Filed Sept. 28, 1935

2 Sheets-Sheet 1

Fig. 1.

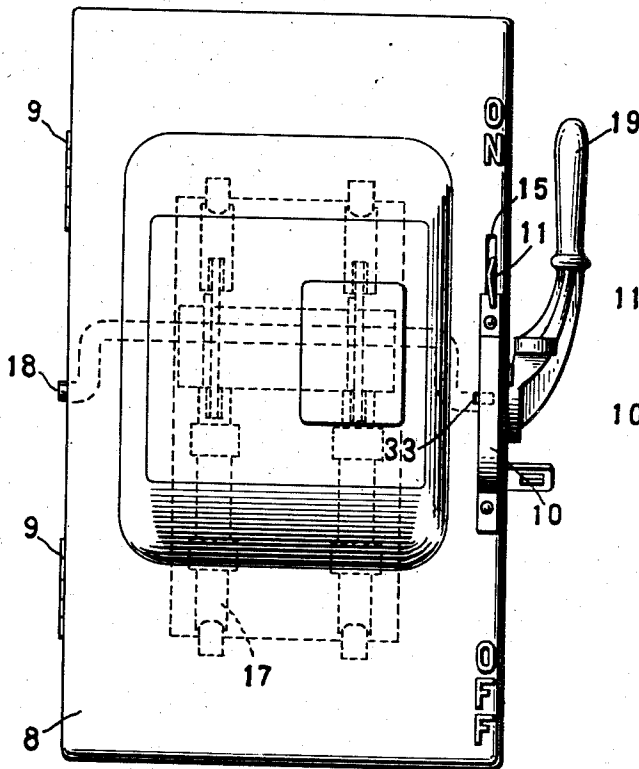


Fig. 2.

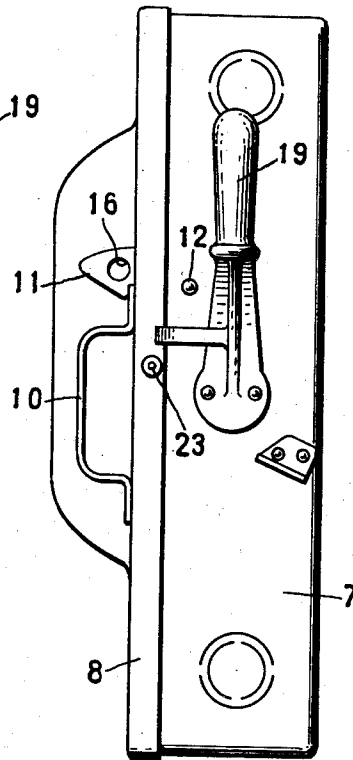


Fig. 3.

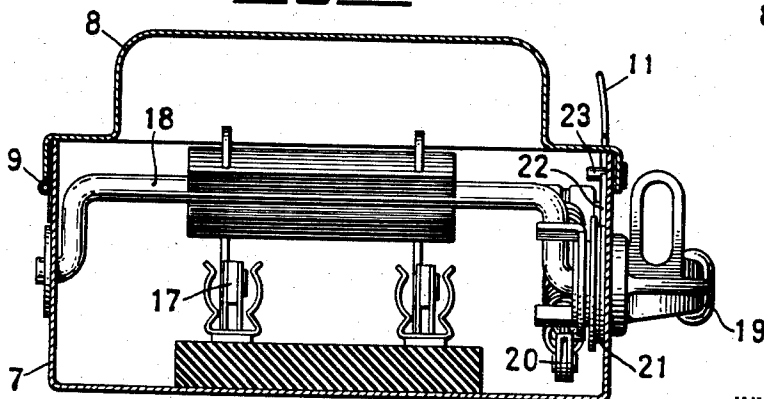
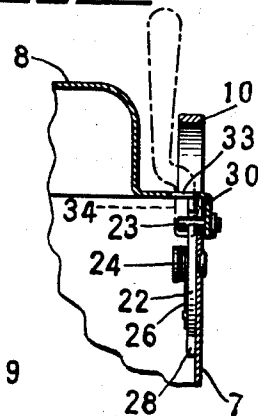


Fig. 4.



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Fig. 5.

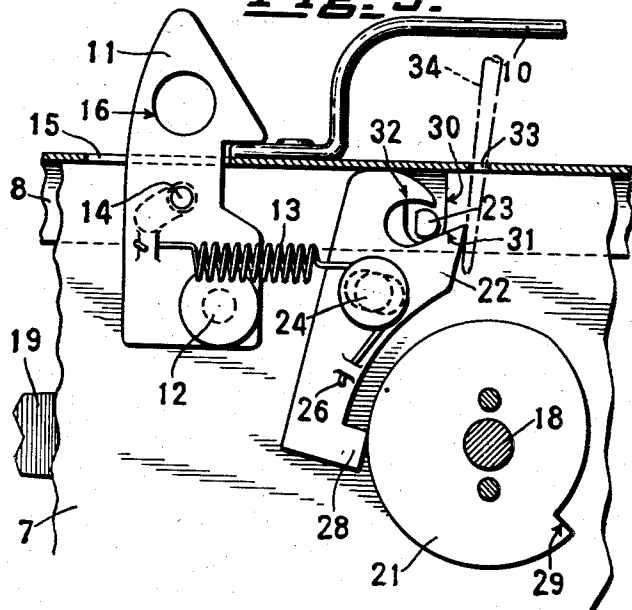


Fig. 7.

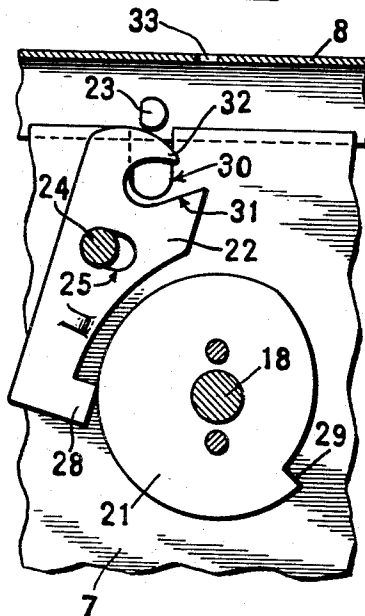


Fig. 6.

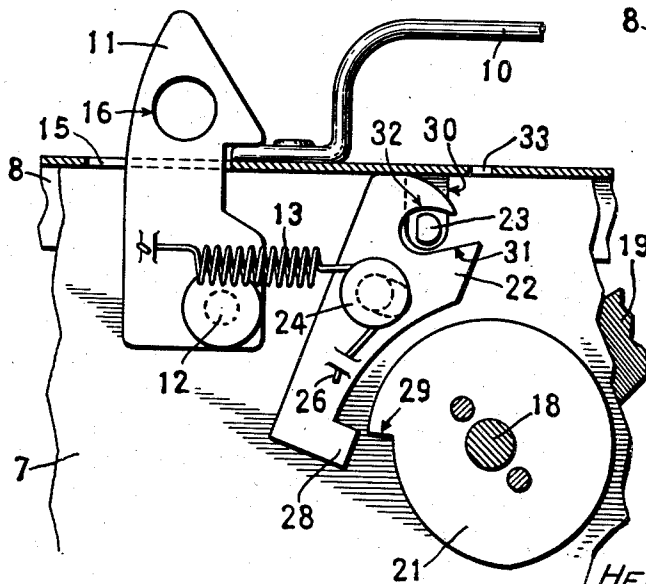
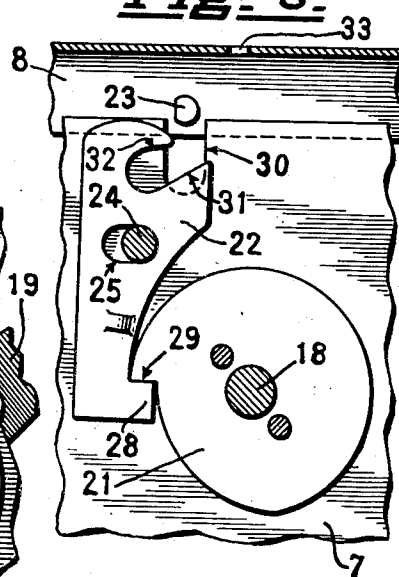


Fig. 8.



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UNITED STATES PATENT OFFICE

2,079,286

SAFETY SWITCH

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Application September 28, 1935, Serial No. 42,598

1 Claim. (Cl. 200—50)

My invention relates to what are called enclosed switches embodying some form of circuit making and breaking device mounted within a box but operable by movement of an external handle. The box, of course, has a cover which can be opened to allow access to the switch proper and to the circuit protecting relays or fuses when employed.

The main object is to provide a construction in which the cover is normally locked closed when the switch is in the closed circuit or "on" position and in which the switch is normally locked in the open circuit or "off" position when the cover is open and yet in which the cover may be opened when the circuit is "on" and the switch may be closed when the cover is open.

A special object is to provide a simple form of construction of the character mentioned.

Another object is to provide a safety switch, the cover of which can be closed in the ordinary way with the circuit open or closed.

Another object is to provide a switch of the character described which does not require complicated lock and key mechanisms.

Another object is to provide a construction in which the cover is latched closed against accidental opening when the circuit is open and yet in which the latch can be readily released and the cover readily opened by one hand when desired.

In the form shown herein I have provided an interlock member which coacts with the cover and with the switch actuator in a manner such as shown in the Knudson Patent 1,310,163. The interlock, however, is specially mounted so as to permit its retraction to release the cover and a partially concealed slot permits the introduction of an ordinary screw driver blade to retract the interlock.

A hinged latch independent of the interlock secures the cover against accidental opening and a single spring produces the necessary bias of the latch and of the interlock. The same spring maintains a bias on the interlock toward the cover holding position and toward the switch holding position.

The invention is shown as applied to a quick make and break switch of the knife blade type but is not limited to these features.

Fig. 1 is a front view of an enclosed switch embodying my invention, the parts of the switch being in the "on" position and the cover closed, latched and locked.

Fig. 2 is a side view of the same.

Fig. 3 is a transverse sectional view of the same on a somewhat larger scale.

Fig. 4 is a fragmentary sectional view showing the means of access to the interlocking release.

Fig. 5 is a detail internal side view showing the interlocking parts in the closed circuit locked position with the cover closed and an instrument inserted through the cover and starting to release the interlock.

Fig. 6 is another similar view with the parts in the open circuit position and the cover closed, the interlock being held by the cover in a retracted position.

Fig. 7 is another similar view with the parts in the closed circuit position and the cover partly open.

Fig. 8 is a similar view of the interlocking parts showing the switch in the locked, open circuit position and the cover partly open.

The box or receptacle body 7 has a cover 8 hinged at 9 and provided with a handle or hand grip 10 to facilitate opening. A latch 11 is hinged at 12 and biased by a spring 13 toward the latching position. A pin 14 in a slot in the latch limits its movement. The cover has a slot 15 for the tip of the latch and an opening 16 facilitates the attachment of a seal, padlock or other device (not shown).

Any suitable form of circuit making and breaking device 17 or switch per se may be employed. A crank shaft 18 is suitably actuated by an external handle 19 and quick break and make or snap action 20 may be employed if desired. The handle may be of any suitable type and mounted in one wall of the box in any suitable manner.

The handle and attached parts constitute the switch actuating means. A locking plate or cam 21 is formed as a part of or secured to the handle and rotates back and forth as the handle is turned from the "on" to the "off" position and return. The interlock 22 is in the form of a floating lever and coacts with the plate 21 and the projecting pin 23 carried by or forming a part of the cover. The pin 24 serves as a pivot for the interlock but the interlock has a slot 25 which also permits it to move bodily to release the cover pin 23. The spring 13 has an extension 26 which serves to bias the interlock so that its inner hook 28 at one end tends to move toward the plate 21 and the other end tends to move away from the pin 23.

The plate 21 has a shoulder 29 to coact with the hook 28 when the switch is open and the cover is open as in Fig. 8.

The side wall of the box has a slot 30 to receive the pin 23. The interlock 22 has an inclined

shoulder 31 engaged by the pin 23 when the cover is closed.

5 The hook 32 on the outer end of the interlock engages the pin 23 normally to hold the cover closed when the switch is closed. The upper end of the hook 32 is rounded off or inclined so that when the cover is being closed and the pin 23 engages the upper end of the hook, the hook will be moved toward the left (see Fig. 7) if it happens
10 to stand in the way, and the shoulder 31 extends beyond the tip of the hook.

As the pin 23 engages the inclined shoulder 31 it forces the outer end of the interlock toward the right (see Fig. 6) and causes the hook 31 to over-
15 stand the pin 23 and hold the cover closed and at the same time disengage the hook 28 from the shoulder 29 of the plate 21 thus releasing the handle so as to permit closing the circuit.

When the circuit is closed and the parts as
20 shown in Fig. 5, the interlock holds the cover closed. The interlock however may be readily retracted from the pin 23 by simply inserting the blade 34 of a screw driver or similar tool through the slot 33 and prying the outer end of the interlock away from the pin 23, the inner end of the
25 interlock acting as a fulcrum for the lever.

It also will be seen that even when the interlock 22 is retracted from the pin 23, the cover is still held by the latch 11 which must be retracted
30 at the same time that the interlock 22 is pried away from the pin 23 in order to permit the cover to be opened while the circuit is closed. The slot 33 is preferably at least partially concealed be-

neath the handle 10 so as to be less likely to be seen by an unauthorized person.

When the circuit is open and the parts in the position shown in Fig. 6, it should be understood that although the pin 23 of the cover appears to
5 be held by the hook 32 of the interlock, nevertheless the cover is held only by the latch 11 as the spring 26 will tilt the interlock away from the pin 23 as soon as the pressure of the cover is removed from the upper end of the interlock.
10

It will thus be seen that the usual unskilled actuator is safe-guarded against accidental contact with live parts but that an inspector may open the box while the circuit is "on" and may also close it and that the cover can be closed whether
15 the circuit is "on" or "off."

I claim:

An enclosed switch having a box with a cover hinged thereto and including switch mechanism and manually operable actuating means for said
20 switch mechanism, a handle carried by the edge of the cover opposite the hinged edge adapted to be grasped by one hand to open the cover, and interlocking means within the box coacting between the box, the cover and the actuating means
25 for holding the cover closed when the switch is closed, said cover having an opening adjacent one edge to permit a removable instrument to be inserted to retract the interlock from the cover and permit opening of the cover while the switch is
30 still closed, said opening being at least partially concealed by the handle.

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