B. D. HORTON.

ELECTRICAL SWITCH AND INTERLOCKING CASING.

APPLICATION FILED JULY 17, 1918.

1,436,622. Patented Nov. 21, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

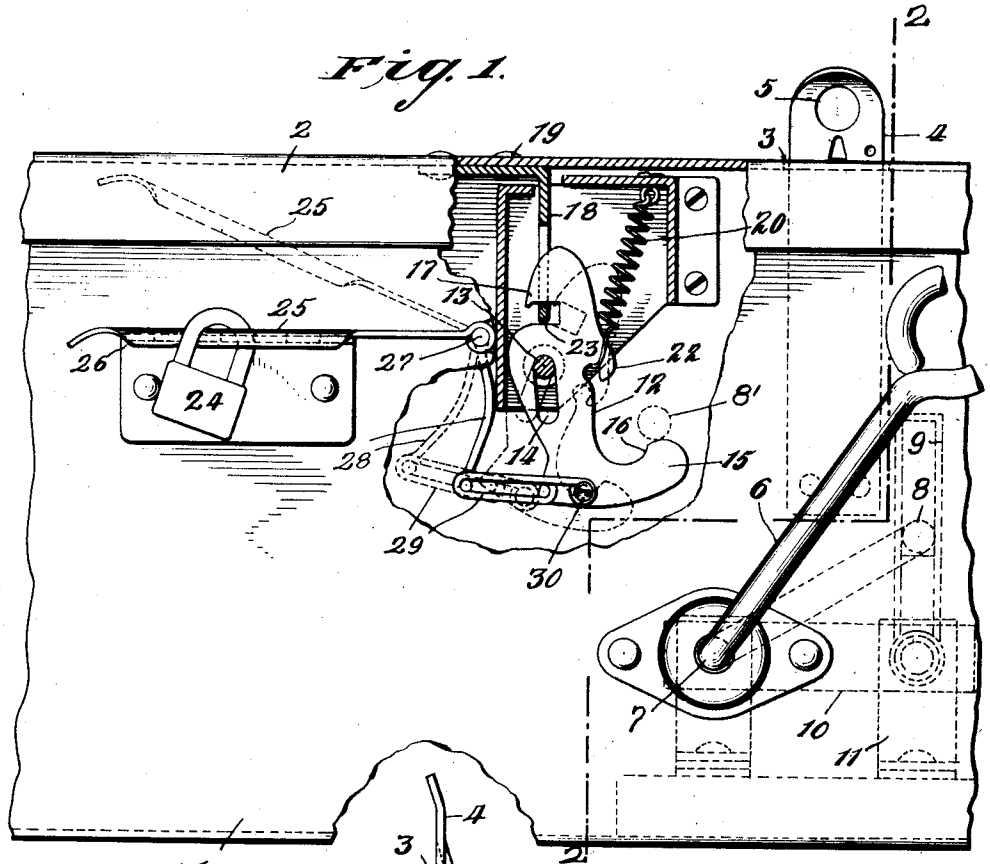
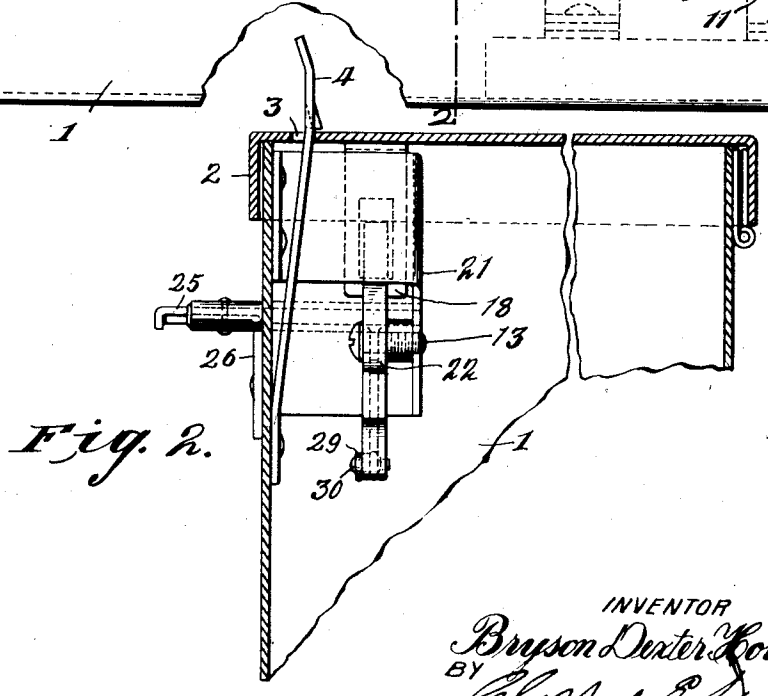


Fig. 2.



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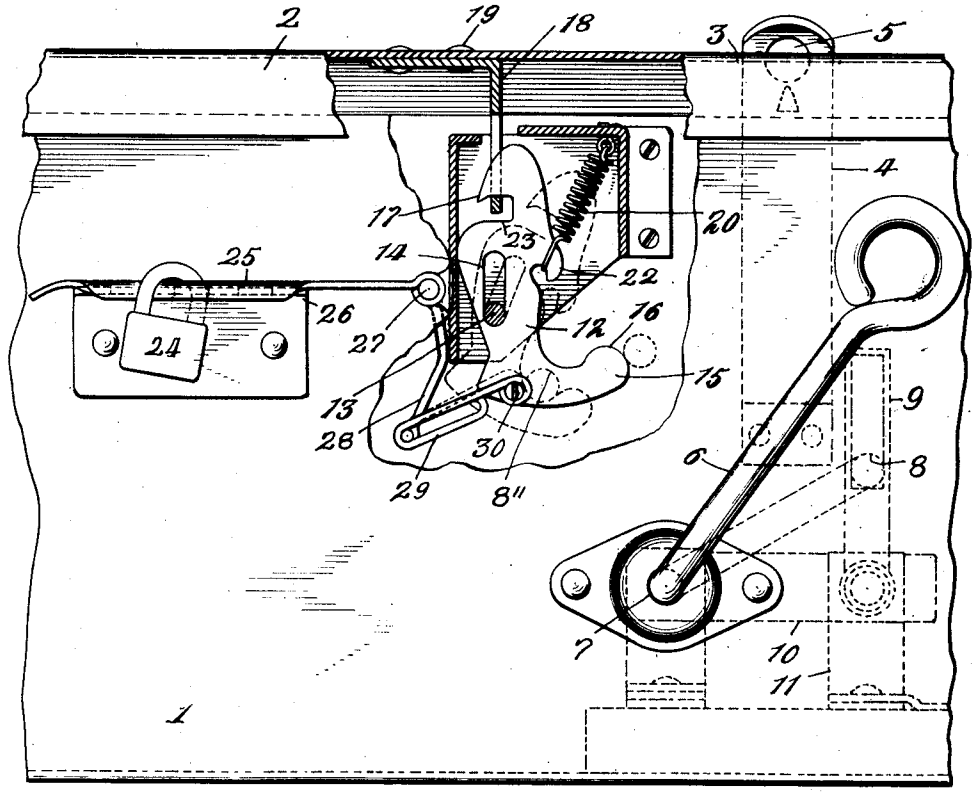


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ELECTRICAL SWITCH AND INTERLOCKING CASING.

Application filed July 17, 1918. Serial No. 245,274.

To all whom it may concern:

Be it known that I, BRYSON DEXTER HORTON, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrical Switches and Interlocking Casings, of which the following is a clear, full, and concise description thereof.

My invention relates to electrical switches of the enclosed type in which the switch may be of the quick break multibladed type and in which the casing is usually of metal suitably insulated from the electrical contacts of the switch.

One of the objects of this invention is to provide an enclosed electrical switch so arranged that normally the cover cannot be opened until the switch is opened.

It is a further object of this invention to so arrange the elements that the switch cannot be closed until the cover is closed in the normal operation of the device.

It is to be noted that if an enclosed switch was equipped solely with the device operating as noted above, it would be impossible for the inspector or test man to run a test or inspect the switch without first shutting off the customer's power. It is, therefore, a further object of this invention to remedy this defect by providing auxiliary means whereby it is possible for a suitably equipped authorized person to open the cover independently of the switch and to close the switch independently of the cover.

It is a further object of this invention to provide for locking the cover in closed position.

A further object of this invention is to generally simplify the construction of enclosed interlocking switches and covers, whereby a very rugged and substantially fool-proof structure results.

Referring now to the drawings in which one of the many possible forms which my invention may take is shown, it will be seen that

Fig. 1 represents a fragmentary side view partly in section showing the switch and cover in closed position, and in dotted lines the auxiliary device in operative position, thereby rendering the interlocking ineffective.

Fig. 2 is a sectional edge view of the interlocking device, such section being taken on the line 2—2 of Fig. 1; and

Fig. 3 is a view somewhat similar to Fig. 1, showing the cover in partly raised position as when it is attempted to raise the cover when the switch is closed and the interlocking mechanism in effective position.

Referring now to the drawings in detail it will be seen that the casing comprises a box 1 having a hinged apertured cover 2, such aperture being shown at 3 and cooperating with a spring hasp 4. This hasp 4 is provided with an opening 5 adapted to receive a pad lock or similar device whereby the cover may be locked in closed position. The switch mechanism is operated by means of an external handle 6 which is pivotally mounted at 7 in the casing 1. This operating member continues inside of the casing and has a horizontal operating portion 8, which is adapted through the medium of the link 9 to actuate the switch blades 10, and position them relatively to the stationary contacts 11. This operating member 8 is substantially U-shaped and is pivoted at the other side of the casing. The switch mechanism is of the general type shown in my co-pending application Serial No. 228,636, filed April 15, 1918, for electrical switches and interlocking casings. This electrical switch mechanism may include in addition to that shown, the conventional clip or plug fuses all mounted upon a single insulating base. This switch is shown diagrammatically and it may be of the multibladed quick break type. The interlocking mechanism comprises a bell crank lever 12 pivotally mounted on a pin 13 and so arranged that it may have limited sliding motion upon such pin through the medium of the elongated slot 14. This bell crank lever 12 has an arm 15 which extends at right angles to the main or body portion and ends in a hook-shaped member 16. At the upper portion this pivoted lever or latch member 12 has a second hook-shaped portion 17 which is adapted to engage in a depending recessed lug 18 rigidly fastened upon the cover 2, as by rivets, as shown at 19, for instance. This bell crank lever or latch member is normally held in the position shown in Fig. 1 by means of a spring 20 which is fastened at one end to a covering casing 21 which partially encloses this interlocking mechanism and at its other end engages a hook or finger 22 on the latch member 12. In the position shown in Fig.

1, it will be seen that this depending lug 18 bears at its lower portion against a shoulder 23 on this latch member and forces such latch member downwardly against the action of the spring 20, so that the pin 13 engages the upper portion of the slot 14. This allows the horizontal portion 8 of the switch operating member to pass freely over the hook portion 16, as shown in dotted lines in Fig. 1 at 8'. That is to say, when the cover is closed the switch may be opened to its full extent and then closed at will without being restrained in any manner by the latch member 12 through the medium of its hook portion 16.

Upon reference to Fig. 3, it will be seen that the cover 2 has been slightly moved upward and that it is restrained from further upward motion by the engagement of the hook 17 of the latch member 12 with the depending lug 18. From this it will be seen that under normal conditions the cover cannot be opened when the switch is closed. When, however, the switch is thrown to full open position, so that the operating member 8 occupies the position shown at 8'', the latch member 12 is rocked upon its pivot 13 and the hook 17 is then disengaged from the co-operating depending lug 18 and the cover may then be raised. While the cover is in raised position it is impossible to close the switch under normal conditions as the operating member 8 is retained by means of the hook portion 16. The above is the normal operation of the device.

When it is desired to inspect the switch while the switch is closed, a suitably equipped person, such as a test man or inspector, may insert a key in a pad lock or similar device, such as shown at 24, and remove the same, thereby permitting the arm 25 to be moved upwardly away from the co-operating member 26 which is rigidly mounted upon the casing 1 and to which the arm 25 is normally locked. This arm 25 rocks a pivot member 27 which carries on the interior of the casing an arm 28 which has mounted thereon a lost motion link device, shown at 29, which is connected at its other end to the latch member 12 through the medium of the pin 30. It will thus be seen that the interlocking of the switch and cover may be rendered ineffective through the operation of this arm 25, as for example, when it is desired to test the system or inspect the switch while the switch is closed. When the arm 25 has been raised, it through the medium of the members 27, 28 and 29 withdraws the latch member 18 from its normal position, as shown in full lines in Figs. 1 and 3 to its ineffective position, as shown in dotted lines in Fig. 1. This allows the switch and cover to be independently operated.

It will thus be seen that applicant has provided a very simple device which has a number of desirable functions, such as preventing the closing of the switch while its casing cover is opened under normal conditions, and preventing the opening of the casing cover while the switch is closed under normal conditions.

It is further so arranged that the cover and switch may be independently operated by a suitably equipped authorized person, as previously pointed out.

It is to be understood that the above detailed description and the drawings are to be interpreted in an illustrative sense only as the invention is to be limited only as defined by the following claims:—

I claim:—

1. In an enclosed switch having a casing provided with a cover, the combination of switch operating means with interlocking means co-operating with both cover and switch operating means, said interlocking means comprising a pivoted bell crank member, and external means for rendering said interlocking means temporarily ineffective.

2. In an enclosed switch having a casing provided with a cover, the combination with switch operating means, of interlocking means co-operating with both said switch operating means and cover, said interlocking means comprising a slotted pivotally mounted bell crank member, whereby normally the switch cannot be closed while the cover is open and the cover cannot be opened while the switch is closed, and means for rendering said interlocking means temporarily ineffective.

3. In an enclosed switch having a casing provided with a cover, the combination with switch operating means and interlocking means co-operating with both cover and switch operating means, said interlocking means comprising a slotted bell crank latching member, of external means for rendering the interlocking means temporarily ineffective.

4. In an enclosed switch having a casing provided with a cover, the combination with switch operating means and interlocking means co-operating with both cover and switch operating means, said interlocking means comprising a member having movement of both oscillation and translation, of external means for rendering the interlocking means temporarily ineffective.

5. In an enclosed switch having an operating mechanism, the combination of means for normally preventing access to said switch, comprising a bell crank member pivoted on the casing and independent of the switch operating mechanism, and means for rendering said first-mentioned means ineffective, whereby access may be had to said switch.

6. In an enclosed switch having a casing

provided with a cover, the combination of switch operating means with interlocking means co-operating with both said switch operating means and cover, whereby normally the switch cannot be closed when the cover is open, and the cover cannot be opened while the switch is closed, said interlocking means comprising a spring-pressed bell crank member and means externally operable comprising a pivoted lever and intermediate link mechanism for temporarily rendering said interlocking mechanism ineffective.

7. In an enclosed switch, the combination of switch operating means and interlocking means comprising a pivoted latch member for preventing access to said switch, of means for rendering said interlocking means temporarily ineffective, comprising an external pivotally mounted lever controlling said latch member and adapted to be locked in one position.

8. In an enclosed switch comprising a casing provided with a cover, the combination of switch operating means and interlocking means comprising a spring-pressed bell crank member having a latch adapted to engage the switch operating member and preventing closure of said switch while the cover is open, of external means for rendering said interlocking means temporarily ineffective.

9. In an enclosed switch comprising a casing provided with a cover having a depending lug, the combination of switch operating means with interlocking means comprising a bell crank spring-pressed member having a hook portion adapted to engage said depending lug, whereby normally the cover cannot be opened while the switch is closed, of means for rendering said interlocking means temporarily ineffective.

10. In an enclosed switch having a casing provided with a cover having a depending lug, the combination of switch operating means and interlocking means having two hook shaped portions, one adapted to engage said lug and the other adapted to engage said switch operating means, of external means adapted to render said interlocking means temporarily ineffective.

11. In an enclosed switch having a casing provided with a cover having a depending lug, the combination of switch operating means and interlocking means having two hook shaped portions, one adapted to engage said lug and the other adapted to engage said switch operating means, of external means adapted to render said interlocking means temporarily ineffective, said external means being adapted to be locked in one position.

12. In an enclosed switch having a casing provided with a cover having a depending lug, the combination of switch operating means, of interlocking means comprising a spring-pressed slotted bell crank member having two hook shaped portions, one adapted to engage said depending lug and the other adapted to engage said switch operating means, of means for rendering said interlocking means temporarily ineffective.

13. In an enclosed switch having a casing provided with a cover having a depending lug, the combination of switch operating means, of interlocking means comprising a spring-pressed slotted bell crank member having two hook shaped portions, one adapted to engage said depending lug and the other adapted to engage said switch operating means, of external means adapted to render said interlocking means temporarily ineffective and arranged to be locked in one position.

BRYSON DEXTER HORTON.