

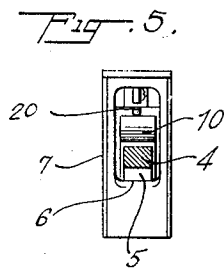
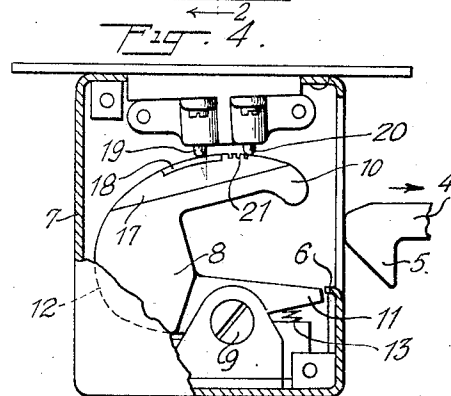
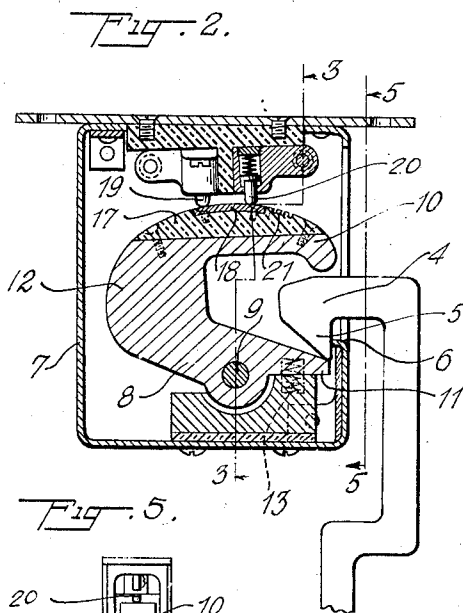
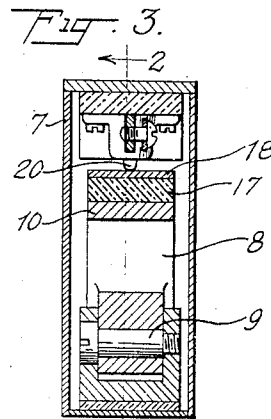
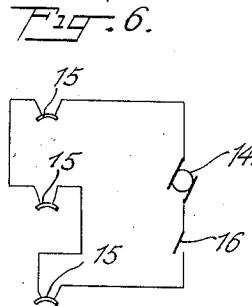
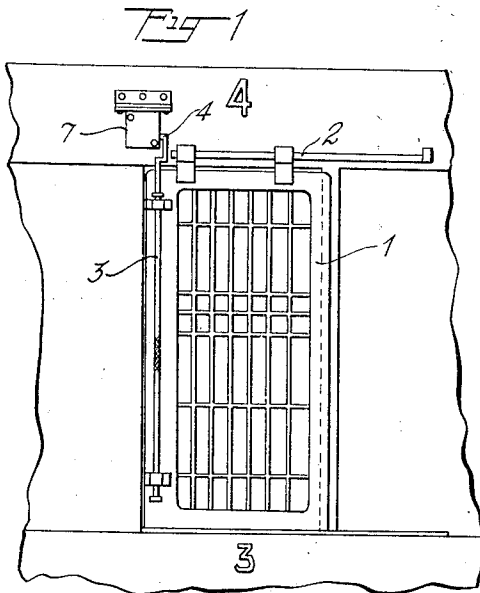
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1,649,475

COMBINED DOOR LATCH AND SWITCH MECHANISM

Filed Dec. 26, 1922



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UNITED STATES PATENT OFFICE.

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COMBINED DOOR LATCH AND SWITCH MECHANISM.

Application filed December 26, 1922. Serial No. 608,816.

My invention relates to a combined door latch and switch mechanism, and my object is to improve the construction of such a device. It is particularly adapted for use with elevator doors or gates or in other situations where a gate controls an electric circuit.

In the preferred embodiment of my invention shown in the drawings, Fig. 1 is a side elevation with the device in place;

Fig. 2 is a section on the line 2—2 of Fig. 3;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a side elevation with the gates partly in section;

Fig. 5 is an end view with the latch in section on the line 5—5 of Fig. 2;

Fig. 6 is a diagram illustrative of an electric circuit with which such switch is particularly adaptable for use.

In the running of elevators operated by an electric motor, it is often desirable that the hoisting motor should not be startable until all the gates at the floor landings have been closed and latched. Various constructions have been suggested for actuating the switches in such a circuit, but all are defective for various reasons.

My object is to improve the construction and provide one which is not open to the objections inherent in those which have heretofore been in use.

In the drawings, 1 is a gate closing a floor landing of an elevator shaft and which may be hung and slidable on the rod or guide 2 in any suitable manner. 3 is a latch bar which may be moved slightly upward by the elevator operator in order to unlatch the gate. The latch bar carries a latch 4 having a portion 5 which is adapted to engage behind an abutment 6 in order to hold the gate locked, as shown in Fig. 2. This abutment may well be formed as a part of the case 7. Beyond the abutment is a movable head 8 preferably pivoted as shown at 9. This head is provided with a mouth or opening which is adapted to receive the latch and is arranged to be shifted into one position when the latch moves into its locking position behind the abutment, and into another position as the latch is withdrawn, and which, by such movement, is arranged to open and close

the circuit. This mouth portion is formed by an upper jaw portion 10 and a lower jaw portion 11, the distance between which is just sufficient to allow the latch to enter. Assuming that the parts are in the position shown in Fig. 2, when the latch is raised its upper portion will strike the jaw 10 and move the head to the position shown in Fig. 4 when the latch has been raised enough to clear the abutment. It will be retained in this position by the overweighted portion 12 or by a spring 13. The gate may then be opened. As the gate closes, the latch enters the head and, as the latch bar and latch move downward behind the abutment to the position shown in Fig. 2, the weight of the latch bar overcomes the counterweight or spring and automatically moves the head from the position shown in Fig. 4 to that shown in Fig. 2. The head is therefore positively moved in both directions by the latch, retained by it in one position and automatically retained in its other position after having been released by the latch.

This shiftable head may be utilized to close various circuits and in a variety of ways. In the preferred embodiment shown, I have illustrated it as included within a circuit (see Fig. 6) from the hoisting motor 14 through a series of such switches indicated by 15, one at each floor gate. 16 may indicate diagrammatically another switch operated by the car operator to completely close the circuit.

Specifically the construction illustrated also comprises an insulated portion 17 carrying an embedded curved metallic plate 18, which, in the position indicated in Fig. 2, serves to bridge two spring-pressed terminals 19 and 20 in the electric circuit.

It will be observed that as soon as the gate is unlatched, the head is moved to a position to open the circuit. It is positively moved to this position by the latch assisted, if necessary, by the counterweight or the spring 13, but these latter are not necessary as the latch engages the upper jaw to move the head.

21 are slots breaking the surface of the insulation in order to break the continuity of any metal deposited which might occur on the insulated portion because of the rubbing of the terminal 20. Such slots would

therefore prevent any leakage of current from one terminal to the other in the position indicated in Fig. 4.

It will be observed that in the embodiment shown, the latch itself does not form the connection between the terminals, and consequently even though the latch may not be accurately positioned with relation to the switch, the switch will always close properly because it is actuated merely by the weight of the latch, and that the circuit will always be opened at the proper time. Even though the gate may swing slightly on the axis of the guide rail 2, it will have no effect on the electric circuit. Other advantages not necessary to be described will be evident from the foregoing description.

I am aware that my invention may be embodied in forms other than that illustrated, and I therefore do not desire to be limited to the particular construction above described.

What I claim is—

1. In an electric switch, the combination with a latch and an abutment to retain the same, of a movable head beyond the abutment having an insulating portion provided with a contact surface, a conducting plate mounted on said insulating portion and having a contact surface forming a continuation of the contact surface of said insulating portion, two circuit terminals yieldingly engaging the contact surfaces of said insulating portion and conducting plate, said head having a mouth adapted to receive a latch and to be shifted thereby into position with both the circuit terminals in engagement with the conducting plate to connect electrically said terminals when the latch is behind the abutment, and said head being movable by the latch to locate one of the conductors in engagement with the insulating portion and thereby interrupt the circuit as the latch is withdrawn from the abutment.

2. In an electric switch, the combination with a latch and an abutment to retain the same, a movable pivoted head beyond the abutment arranged to be actuated by the latch and having an insulating portion provided with a curved contact surface, a conducting plate mounted on said insulating portion and provided with a contact surface forming a continuation of the contact surface of said insulating portion, two circuit terminals yieldingly engaging the contact surfaces of said insulating portion and said conducting plate, said head being arranged to be moved pivotally by said latch into one position with both the circuit terminals in engagement with the conducting plate to connect electrically said terminals when the latch is behind the abutment and into another position with at least one of the terminals in engagement with said insulating

portion when the latch is withdrawn from the abutment.

3. In an electric switch, the combination with a latch and an abutment to retain the same, of a movable head beyond the abutment, said head having an insulating portion formed with a contact surface, a conducting plate mounted on the insulating portion of said head and having a contact surface forming a continuation of the contact surface of said insulating portion and one or more slots extending transversely of the head and interrupting said contact surface, a pair of circuit terminals yieldingly engaging the contact surfaces of said insulating portion and said conducting plate, and means on the head engaged by the latch for causing the head to be moved into position with both said circuit terminals in engagement with said conducting plate when the latch is in locked position behind the abutment and to cause at least one of said terminals to slide relatively to the head onto the contact surface of said insulating portion and across the slots as the latch is withdrawn from behind the abutment.

4. In an electric switch, the combination with a latch and an abutment to retain the same, of a movable head having an insulating portion formed with a contact surface and conducting means having a contact surface forming substantially a continuation of the contact surface of said insulating portion, two circuit terminals arranged yieldingly to engage the contact surfaces of said insulating portion and said conducting means and across which the contact surfaces are moved by the movement of said head, and means for moving the head across said terminals from the latch to cause both terminals to engage the conducting means when the latch is in locked position behind the abutment and to cause at least one of said terminals to engage the insulating portion when the latch is withdrawn from behind the abutment.

5. In an electric switch, the combination with a latch and an abutment to retain the same, of a member separate from said latch, said member comprising a movable head having an insulating portion and also a contact and conducting surface, two circuit terminals arranged yieldingly to engage the contact surface of said movable head and against which the contact surface is moved by the movement of said head, and means for moving the head against said terminals to cause both terminals to engage the conducting means when the latch is in locked position behind the abutment and to withdraw said contact surface from said terminals when the latch is withdrawn from behind the abutment.

6. In a combined lock and switch, a keeper, a circuit terminal disposed on one side of said keeper, an operating member pivotally

mounted and carrying a contact piece insulated from the operating member, said operating member having a bifurcated formation on one side of its pivot and adapted
5 to engage the said circuit terminal, the operating member being balanced so that the contact supporting portion thereof is in its inoperative position tilted downwardly relatively to said pivot, and the bifurcated portion is maintained in a tilted position with
10 the upper member of the bifurcated portion tilted in a direction away from said keeper, locking means associated with said keeper comprising a longitudinally movable bar having thereon a hook-shaped latch, the bifurcated portion of the operating member
15 being in its inoperative position disposed so that said hook-shaped latch can pass the said tilted upper member of the bifurcated portion while the lower member of said bifurcated portion is rocked about its pivot by
20 the said latch in passing into latching position behind said keeper whereby electrical connection is established between said circuit terminal and said contact piece.
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Signed at Hoboken, N. J., this 22nd day of December, 1922.

ARTHUR W. JONES.