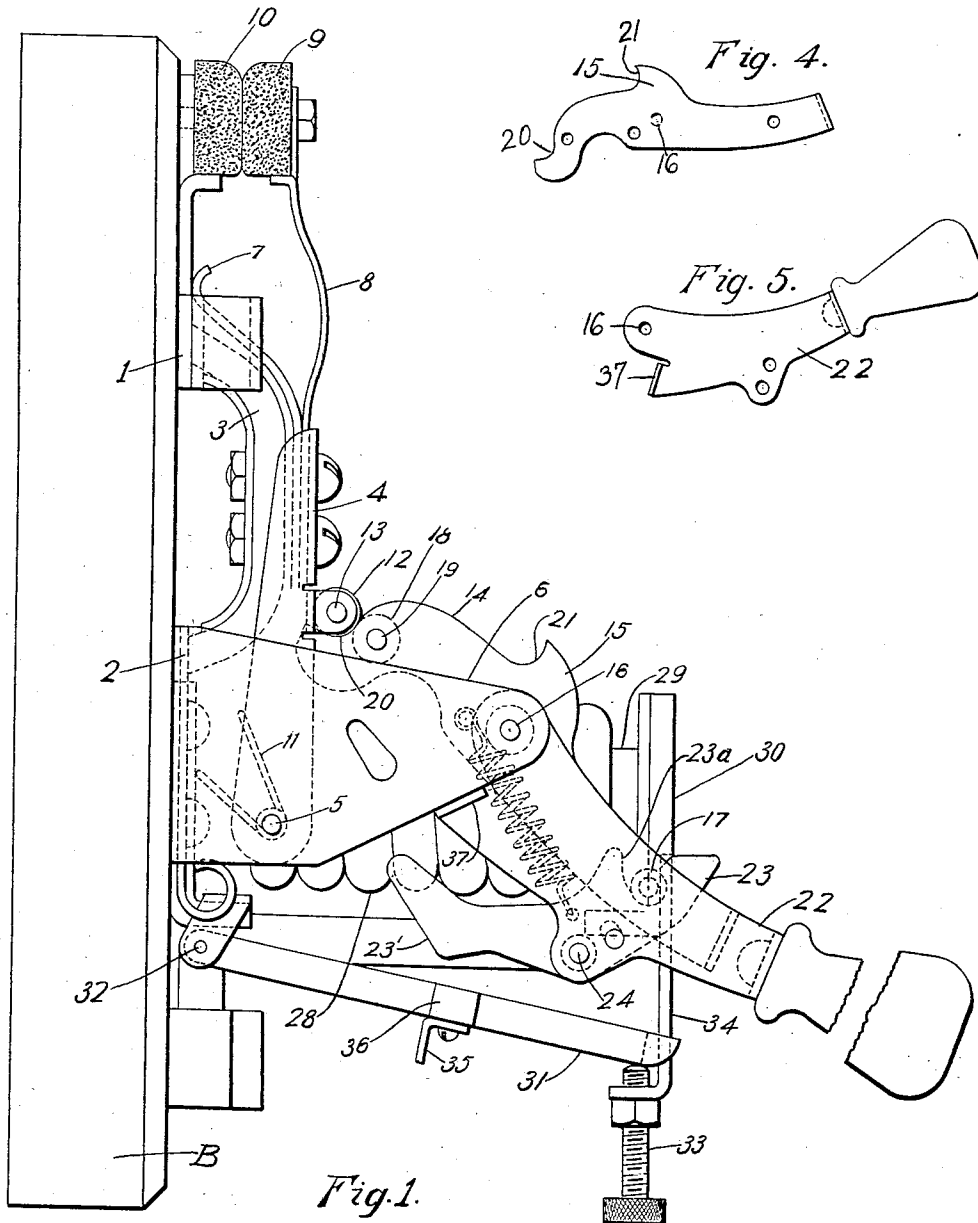


W. M. SCOTT.
ELECTRICAL SWITCH.
APPLICATION FILED MAR. 12, 1906.

1,064,096.

Patented June 10, 1913.

2 SHEETS—SHEET 1.



Witnesses
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Delores Benning

Inventor
William M. Scott
by Cornelia S. Ebert
his Attorney

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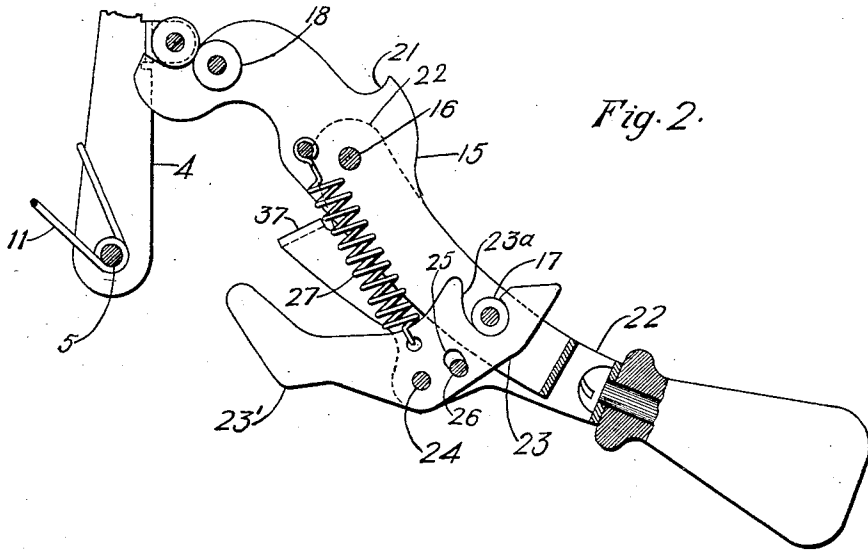


Fig. 2.

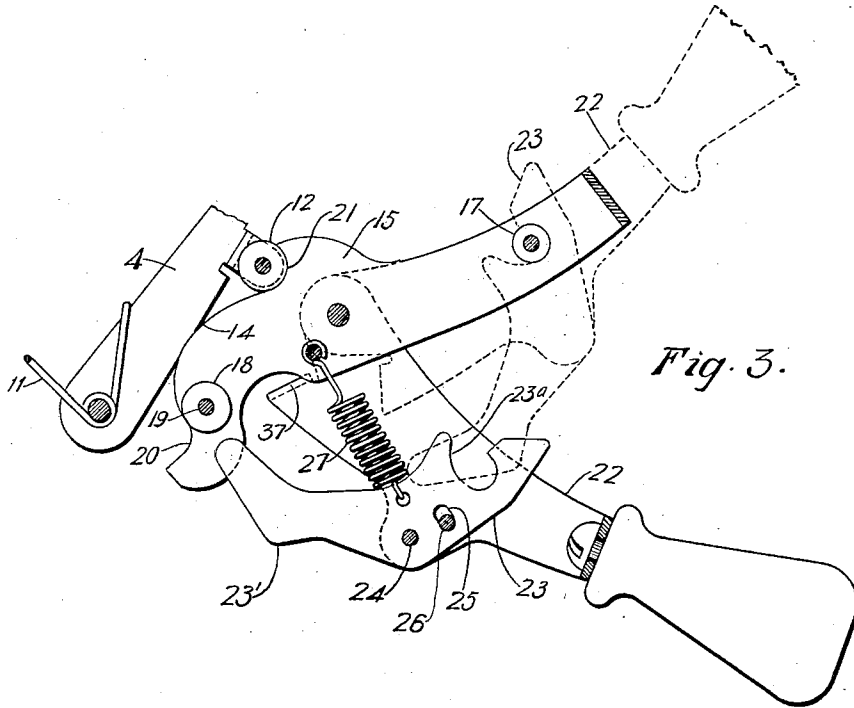


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM M. SCOTT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE CUTLER ELECTRICAL AND MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

ELECTRICAL SWITCH.

1,064,096.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed March 12, 1906. Serial No. 305,590.

To all whom it may concern:

Be it known that I, WILLIAM M. SCOTT, a citizen of the United States, residing in the county and city of Philadelphia and State of Pennsylvania, have invented a new and useful Electrical Switch, of which the following is a specification.

My invention relates to electrical switches, and more particularly to automatic electrical switches such as automatic magnetic circuit breakers.

My invention resides in an automatic electrical switch which is adapted to control a circuit upon occurrence of predetermined electrical conditions, and which has its handle or operating lever disengageable from the switch mechanism so as to prevent the operator from reestablishing a circuit, or otherwise moving the switch to normal position during the existence or continuance of an abnormal or predetermined electrical condition.

More particularly my invention resides in a cam mechanism for operating the movable switch member; the operator's handle being latched to the cam member and disengageable therefrom. The movable switch member is not positively connected with this operating means, but is independent therefrom.

For an illustration of one of the forms my invention may take, reference is to be had to the accompanying drawings in which:

Figure 1. is a side elevational view of a circuit breaker embodying my invention.

Fig. 2. is a side elevation showing the operating mechanism in circuit closing position. Fig. 3. is a view similar to Fig. 2 with the parts shown in open circuit position. Fig. 4. is a side view of the cam member.

Fig. 5. is a side view of the actuator.

Referring to the drawings, B is a base or switchboard of a suitable insulating material, such as marble, to the face of which are secured contact terminals, 1 and 2 adapted to be bridged by the laminated bridging member 3 secured to and supported on arm 4 pivoted at 5 to the housing or bracket 6 secured upon said base B. A metallic shunt contact 7 is movable with the member 3, and adapted to engage the terminal 1. At the upper end of the resilient member 8 is carried the movable shunt contact piece 9, of carbon, coöperating with the fixed shunt carbon 10 which is secured above and in electrical communication with the

terminal. A spring 11 is coiled about the pivot 5 and engages the arm 4 and tends to throw it to open circuit position. A roller 12 is pivoted at 13 on an extension of arm 4, said roller 12 being adapted to roll upon and engage and be engaged by the cam surface 14 on the cam member 15 pivoted at 16 in the bracket or housing 6. The cam member 15 extends outwardly beyond the pivot 16 and carries at its outer end the roller 17. A second roller 18 is pivoted at 19 the roller 18 being adapted to be engaged by the roller 12 when the parts are in circuit closing position or nearly full circuit closing position. When in circuit closing position, the roller 12 rests in a depression 20 at the inner end of the cam member 15, and when in open circuit position the roller 12 rests against the shoulder 21 of the member 15. The actuator or operator's handle or lever 22 is pivoted at 16 concentrically with the cam member 15 but independently thereof. A latch 23 is pivoted on the actuator 22 at 24, a slot 25 and pin 26 serving to allow motion of the latch 23 upon its pivot 24 and to limit the extent of motion. Spiral spring 27 is connected at its one end to the latch 23 and at its other end to the cam member 15. A coil or winding 28 extends out horizontally from the switchboard B and surrounds the core 29 of the electromagnet having the pole piece 30 and armature 31 pivoted at 32. An adjusting screw 33 is held in the bracket 34 and serves to determine the distance between armature 31 and pole piece 30. The angle member 35 is fastened to the under side of the armature 31 and carries a fiber member 36 which extends under the tail 23' of the latch 23.

The operation of the switch is as follows: With the parts in their circuit closing position, as shown in Fig. 1, when the current through the coil or winding 28 reaches or exceeds a predetermined value, the armature 31 is attracted upwardly by the pole piece 30, causing fiber member 36 to engage the under side of the tail 23' of the latch 23, thus causing said latch to be moved in opposition to spring 27, in a clockwise direction about its pivot 24, thus causing it to disengage the roller 17 of the cam member 15. This upward blow by the armature upon latch 23 is communicated through the curved surface 23^a of the latch 23 to the roller 17, so that in addition to releasing the roller 17

that roller is given a blow or impetus so as to start the cam member 15 to rotate in a counter clockwise direction about its pivot 16. When thus unlocked, spring 27 rotates the cam member 15. This movement of the cam member 15 allows the roller 12 of the movable contact member to ride out of the depression 20 and past roller 18. The spring 27 contracts and causes the cam member 15 to continue its rotation about its pivot 16, the arm 4 being forced away from the base B by spring 11. This movement continues until the parts assume the position shown in Fig. 3, in which case the arm 4 has carried the laminated member 3 and the shunt contacts 7 and 9 away from their complementary fixed contacts, the final rupture taking place at the carbons 9 and 10 as well understood in this art. During the opening movement, the actuator or handle 22 has remained in its lowermost position, which is limited by the stop or shoulder 37 which engages the under side of the housing 6. To again close the circuit, the operator raises the handle 22 to position shown in dotted lines in Fig. 3, in which case the latch 23 reengages the roller 17 thus locking the actuator 22 and the cam member 15 together. When this locking has taken place, the operator depresses the handle or actuator 22 and thus causes the cam surface 14 to force the roller 12, and therefore the arm 4 and member 3 toward circuit closing position, the roller riding up along the surface 14 to and past the roller 18 and then into the depression 20. Now that this position has been reached, the operating handle 22 is again in its lowermost position as shown in Fig. 2, and the stop 37 has engaged the under side of housing 6. The roller 12 resting in the depression 20 and latch 23 engaging roller 17 lock the parts in circuit closing position.

If it is attempted to close the circuit during the existence or the continuance of an electrical condition to which the armature 31 responds, upon first closure of the circuit the abnormal or predetermined current will again flow through the winding 28 and the armature 31 will accordingly disengage the latch 23 from the roller 17, and the parts will fly to open circuit position while the operator continues to grasp the member 22. So it is that upon attempted closure of the circuit breaker during the existence or continuance of certain conditions of the circuit, the operating handle is disengaged from the switch mechanism.

What I claim is:

1. In an electrical switch, a movable contact member, a cam member, a roller on said

contact member engaging the cam surface, a depression at one end of said cam surface, a roller on said cam member approximate said depression, and means for actuating said cam member, whereby said roller on said contact member will travel along said cam surface over said roller on said cam member and into said depression.

2. In an electrical switch, a movable contact member, a cam member for actuating the same, an actuator, a latch pivoted to said actuator for locking the same to said cam member, and a spring connected to said cam member and through said latch to said actuator.

3. In an electrical switch, a movable contact member, a cam member having a depression approximate one end of the cam surface, a roller on said contact member engaging said cam surface, a roller on said cam member approximate said depression, an actuator, means for locking said cam member and actuator together whereby said actuator operates said cam member to cause said roller on said contact member to travel over said roller on said cam member and into said depression.

4. In an electrical switch, a movable contact member, a pivoted cam member for operating said contact member and having a depression approximate one end of the cam surface, a member movable with said contact member engaging said cam surface and in said depression, an actuator pivoted concentrically with said cam member, a latch connecting said actuator and said cam member, and a spring connecting said cam member and said actuator, said latch and said means engaging in said depression serving to lock said movable contact member in normal position.

5. In an electrical switch, a movable contact member, a cam member, an actuator, said cam member and actuator being concentrically pivoted and movable with respect to each other, and a latch for connecting said cam member and actuator, said contact member when in normal position engaged by said cam member at a point of the cam surface such that said cam member latched to said actuator restrains said contact member in normal position.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

WILLIAM M. SCOTT.

Witnesses:

C. V. HEENAN,
N. F. WHELAN.