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M. E. GREENWAY ET AL

AUTOMATIC CIRCUIT BREAKER

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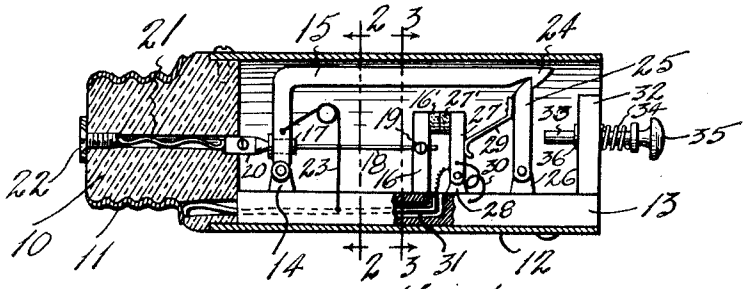


Fig. 1.

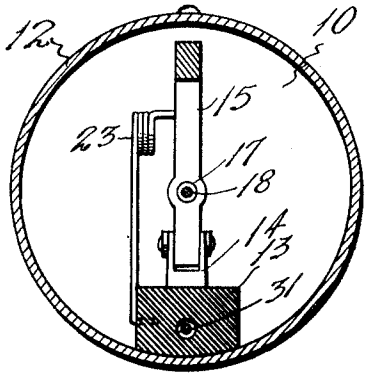


Fig. 2.

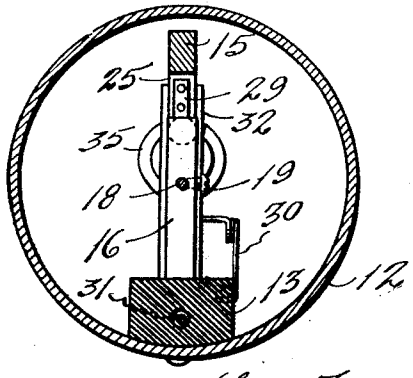


Fig. 3.

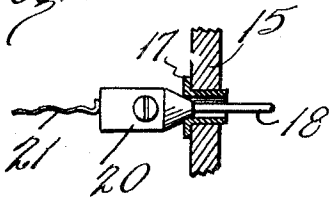


Fig. 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC CIRCUIT BREAKER.

Application filed May 8, 1925. Serial No. 28,770.

This invention relates to new and useful improvements in automatic circuit breakers.

The object of the invention is to provide an improvement in the fuses usually employed in house wiring and other places, where the plug-type is used.

A particular object is to provide a fuse device or circuit breaker which may be restored to service, after breaking or opening the circuit, by simply depressing a button.

A further object is to provide a circuit breaker of the thermostatic type which may be screwed into a fuse plug socket and used in place of the ordinary fuse plug, without changing the receptacle or circuit.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Fig. 1 is a longitudinal sectional view of a circuit breaker constructed in accordance with my invention,

Fig. 2 is an enlarged cross-sectional view taken on the line 2—2 of Fig. 1,

Fig. 3 is an enlarged cross-sectional view taken on the line 3—3 of Fig. 1, and

Fig. 4 is a detail of the thermostat connection.

In the drawings the numeral 10 designates a screw threaded plug of porcelain or other suitable electrical insulating material. The threaded portion of the plug is surrounded by a metal jacket 11. The outer end or head of the plug is shouldered to fit in the inner end of a cylindrical case 12 which is suitably fastened into the plug.

A base or mounting member 13 of insulating material, is suitably fastened in the case. A bracket 14 is fastened on the base near the plug and the lower end of a bell-crank latch lever 15 is hinged therein. An upright contact post 16 is mounted at the central portion of the base. In the vertical leg of the lever is inserted an insulating bushing 17. A thermostat in the form of a wire 18 passes through the bushing. This wire may be of any suitable material such as German silver.

One end of the wire is fastened in the post 16 by a screw 19 while the other end, which passes through the bushing, is fastened in clamp 20 having a reduced end engaging in the bushing. By adjusting the clamp the wire is drawn taut when the lever 15 is set. A current conducting wire 21 passes through the plug 10 and is secured to clamp 20 and to a cap screw 22 at the inner end of the plug and by which contact is made in the socket (not shown). The clamp 20 is movable in the channel of plug 10 sufficiently to permit expansion of the thermostat 18, and the wire 21 is yieldable to permit such movement.

A wire spring 23 of the expanding type has one of its legs attached to the base 13 and the other to the vertical leg of the lever 15. Normally the wire 18 is set to resist the spring and hold the forwardly extending arm of the lever in a substantially horizontal position. When the wire is elongated by overheating, the spring will swing the lever upwardly. At its forward end the lever has a latchhook 24. An upright latch dog 25 pivoted on a bracket 26 has its upper end engaging the hook 24.

A swinging vertical contact arm 27 is hinged on a bracket 28 carried by the base 13. This arm has a suitable contact 27′ which engages the contact 16′ of the post 16. The dog 25 has a spring finger 29 attached thereto and insulated therefrom, and engaging the arm 27 to hold the contacts together. A wire spring 30 has one arm fastened to the arm 27 and the other arm secured to the base 13. This spring acts in opposition to the finger and tends to swing the arm 27 away from the post 16. So long as the hook 24 is caught over the end of the dog the circuit is closed by the engagement of the contacts. A circuit conducting wire 31 leads from the arm 27 through the base 13 and plug 10 to the jacket 11.

A post 32 is fastened to the end of the base at the front or outer end of the case 12 and supports a resetting plunger 33 having its inner end near the dog 25. On the outer end of the plunger is a button 35. A coiled spring 34 surrounds the plunger between the button and the post. A collar 36 on the plunger engages the inner side of the

post to limit the outward displacement of said plunger.

In using the circuit breaker the plug 10 is screwed into the usual socket or receptacle (not shown) just as is done with the ordinary fuse plug. The wire 18 is sufficiently taut to resist the tension of the spring 23, thus holding the latch hook 24 down upon the end of the dog 25. The contacts 16' and 27' are held in engagement by the finger 29. The circuit connection is made from the jacket 11 over wire 31, arm 27, contacts 27' and 16', post 16, wire 18, clamp 20 and wire 21 to screw 22. So long as normal or safe circuit conditions exist the parts will remain as described. However should the circuit become overloaded or shorted, the thermostatic wire 18 will permit the spring 23 to raise the lever 15 and release the hook 24 from the dog 25; whereby the spring 30 will be free to swing the arm 27 and remove the contact 27' from the contact 16', thereby breaking the circuit.

When the arm 27 is swung the finger 29 will be displaced causing the dog 25 to fall against the end of the plunger 33. When proper circuit conditions have been restored it is simply necessary to press inward on the button 35 to reset the parts. When the plunger is depressed the dog 25 is swung to engage its upper end under the hook 24 and the finger 29 swings the arm 27 to engage the contacts and thus close the circuit.

While we have illustrated and described our invention as including a screw plug for insertion in a socket, it is to be understood that the base 13 may be supported in any suitable manner in an electric circuit requiring such a fuse and the invention is not to be limited to the screw plug.

Various changes in the size and shape of the different parts, as well as modifications and alterations may be made within the scope of the appended claims.

What we claim, is:

1. In an automatic circuit breaker, a base, a yielding angular latch lever mounted on the base and having an elongated hooked end, means for tensioning said lever in one direction, a dog pivoted upon the base and engaging the hooked end of said lever, a fixed contact parallel to the pivoted end of the lever, a movable contact engaging the fixed contact adapted to be released from said dog, tension means for shifting the movable contact and dog to break circuit, and a thermostatic member extending from the fixed contact to said lever for normally holding the latch lever in restraint.

2. In an automatic circuit breaker, a casing, an insulating base extending longitudinally thereof, a latch lever pivotally mounted at one end of said base, a dog pivoted at the opposite end of the base to be retained by said lever, means for tensioning said lever to release said dog, fixed and movable contacts upon said base intermediate the dog and lever pivots, a thermostatic member extending from the fixed contact to said lever, and means for automatically shifting the movable contact and dog when released to break circuit.

3. In an automatic circuit breaker, a base, a latch lever mounted thereon and having a retaining end, means for tensioning said lever in one direction, a dog pivoted upon the base and engaging the retaining end of the lever, a fixed contact intermediate the ends of the lever, a thermostatic member extending from the fixed contact to said lever for normally holding it in restrained position, a pivoted movable contact tensioned away from the fixed contact, and means upon said dog for engaging the movable contact and retaining it in closed circuit position.

4. In an automatic circuit breaker, a base, a latch lever pivoted on the base, a spring for actuating said lever, a dog pivoted on the base and engaged by said lever, a contact, a movable contact member engaging said contact, a spring for separating said contact and movable contact member, a connection between the dog and the contact member normally restraining the last named spring, a bushing carried by the lever, a thermostatic wire having one end fixed and the other end passing through the bushing, and a clamp engaging the bushing and secured to the wire.

5. In an automatic circuit breaker, the combination of a screw threaded plug, a pair of contacts one of which is movable and carried by the plug, a spring actuated latch insulated from the contacts, a member retained by the latch for holding the contacts in engagement, and a thermostat normally holding the latch against action by its spring.

6. In an automatic circuit breaker, the combination of a screw threaded plug, a pair of contacts carried by the plug, one of said contacts being tensioned for movement away from the other, a dog having a connection for holding the movable contact in engagement, a latch lever for engaging the dog, a thermostatic wire normally holding the lever in engagement with the dog, a spring for swinging the lever to free the dog when said lever is released by said wire, and a case carried by the plug and enclosing said parts.

7. In an automatic circuit breaker, the combination of a screw threaded plug, a pair of contacts carried by the plug, one of said contacts being tensioned for movement away from the other, a dog having a connection for holding the movable contact in engagement, a latch lever for engaging the dog, a thermostatic wire normally holding

the lever in engagement with the dog, a spring for swinging the lever to free the dog when said lever is released by said wire, a case carried by the plug and enclosing said parts, a resetting plunger mounted upon the end of the case in alinement with said dog, and a spring for normally retracting the plunger from the dog to permit its free operation.

In testimony whereof we affix our signatures.

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