Nov. 24, 1942. L. ROSTOKER 2,302,717

RESETTABLE CIRCUIT BREAKER

Filed May 27, 1940

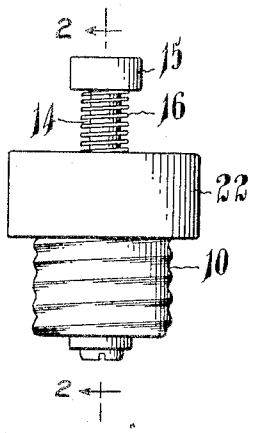


Fig. 1.

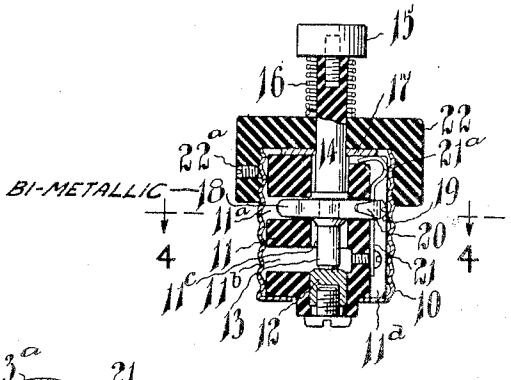


Fig. 2.

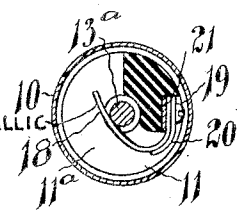


Fig. 4.

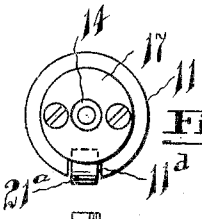


Fig. 6.

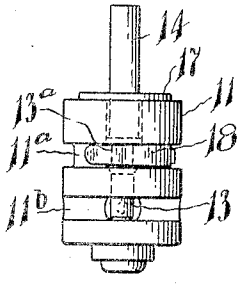


Fig. 7.

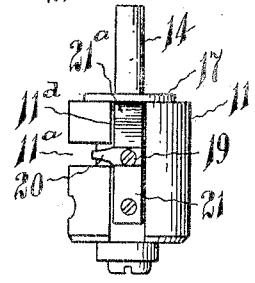


Fig. 5.

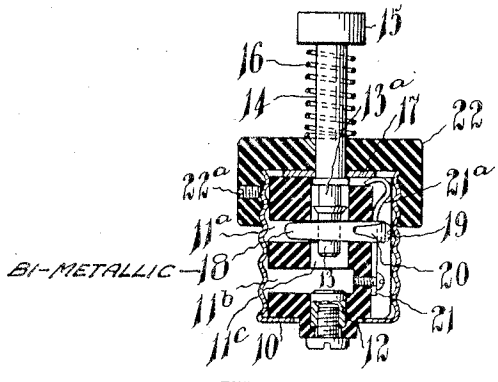


Fig. 3.

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RESETTABLE CIRCUIT BREAKER

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Application May 27, 1940, Serial No. 337,382

5 Claims. (Cl. 200—116)

This invention relates to resettable circuit breakers, and the object of the invention is to devise a circuit breaker which will operate quickly and effciently without fusing the thermal operating element or other contacts, thus increasing the effective life of the device.

The invention is hereinafter described and illustrated, by way of example, in the following drawing in which

Figure 1 is a side elevation of the circuit breaker;

Figure 2 a longitudinal section on the line 2—2 in Figure 1;

Figure 3 a similar view to Fig. 2 with the circuit breaker in unset position;

Figure 4 a transverse section on the line 3—3 in Figure 2;

Figure 5 a side elevation of one side of the core with the shell and cap removed;

Figure 6 a plan view of the core with the shell and cap removed; and

Figure 7 a side elevation of the opposite side of the core with the shell and cap removed.

In the drawing corresponding numerals in the different figures refer to corresponding parts.

The circuit breaker is in the form of a plug provided with the usual threaded brass shell 10 adapted to screw into a socket (not shown) provided with circuit terminals. The shell 10 forms a contact member which is adapted to engage one of the circuit terminals in a socket. A core 11 of insulating material fits into the shell 10 and is provided at its bottom with a base or end contact 12 which is adapted to engage the other circuit terminal in the socket. The core 11 is provided with two slots 11^a and 11^b which extend into the core past the center line thereof. The inner end of the base contact member 12 extends through the insulated core to a point adjacent the underside of the lower slot 11^b.

Extending axially of the core 11 is a hole 11^c in which is slidably mounted a conducting rod 13. The rod 13 has connected to its upper end a plunger 14 of hard rubber or similar insulating material which in turn has secured to the upper end thereof a knob 15 of insulating material. A cap 22 of insulating material screws over the shell 10 and is secured thereto by means of a grub screw 22^a. The insulating plunger 14 extends above the end of the core 11 and through the cap 22 and a compression spring 16 surrounds the member 14 and engages the knob 15 and the upper end of the cap 22 tending to force the knob away from the core, and hence to move the conducting rod 13 outwardly. An annular plate 17 is secured to the top of the core 11 around the central hole 11^c. The diameter of the hole in the plate 17 is somewhat less than the diameter of the hole 11^c, so that the plate will engage the upper end of the rod 13 when the rod 13 is urged outwardly by the spring 16, thus limiting its outward movement.

Below the upper end of the conducting rod 13 is a reduced portion 13^a which when the circuit breaker is set registers with the slot 11^a in the core and is engaged by a bi-metallic conducting strip 18.

The bi-metallic strip is secured to the core 11 by means of a screw 19 in the vertical groove 11^d. The screw 19 clamps the end of the bi-metallic strip between a leaf spring support 20 and a conducting strip 21 which lies in the bottom of the groove 11^d and which has an outwardly curved spring end part 21^a which engages the shell 10 forming a contact therewith.

In ordinary operation the bi-metallic strip 18 in combination with the reduced portion 13^a of the conducting rod 13 forms a latch in which the catch member is the bi-metallic strip and the keeper is the shoulder formed by the reduced portion 13^a. When the bi-metallic strip 18 is contacting with the conducting member 13 said conducting member is retained in contact with the base contact member 12 as shown in Figure 2. The electrical current travels through the shell, the conducting member 21, the bi-metallic strip 18 and the conducting rod 13 to the base contact member 12. If there is an overload the bi-metallic strip 18 will become heated and will straighten out until it disengages from the shoulder formed by the reduced portion 13^a. Thereupon the conducting rod 13 will be moved upwardly by the pressure of the spring 16 to the position indicated in Figure 3, so that the circuit will be broken because of the fact that the conducting rod 13 is out of contact with the base contact member 12. It will be understood that the breaking of this contact will take place immediately that the bi-metallic strip 18 becomes disengaged from the conducting rod 13. There will be very little arcing, but what arcing does take place will take place at the point of contact between the conducting member 13 and the contact member 12, rather than between the conducting member 13 and the bi-metallic strip 18. The slot 11^b forms an arc chamber which is separated by the insulating core from the point at which the bi-metallic strip 18 engages the conducting member 13. To re-set the circuit breaker it is only necessary to press down the knob 15 until the end of the conducting

member 13 engages the base contact member 12 and the bi-metallic strip 18 snaps into the reduced portion 16a, thus retaining the circuit breaker in operative position as shown in Figure 2.

What I claim as my invention is:

1. In a resettable circuit breaker, a contact member adapted to engage a circuit terminal, a second contact member adapted to enage another circuit terminal, a spring pressed conducting member insulated from the second contact member and normally not contacting the first mentioned contact member, but manually movable into contact therewith, a second conducting member connected to the second contact member and normally in electrical contact with and engaging the spring pressed conducting member to retain it in contact with the first mentioned contact member, whereby an electrical circuit may be completed between the two contact members, said second conducting member being thermally operated by overload to disengage itself from and break contact with the spring pressed conducting member to permit the latter to spring out of contact with the said first mentioned contact member thus causing a double break in the circuit.

2. In a resettable circuit breaker, a contact member adapted to engage a circuit terminal, a second contact member adapted to engage another circuit terminal, a conducting member insulated from the second contact member but adapted to contact the first mentioned contact member, spring means tending to move the conducting member out of contact, manually operable means for moving the conducting member into contact, and latch means for retaining the conducting member in contact against the spring pressure, said latch means comprising a shoulder on the conducting member and a bi-metallic conducting strip connecting the conducting member and the second contact and normally engaging and in electrical contact with the shoulder on the conducting member to retain it in contact with the first mentioned contact, said bi-metallic strip being adapted to move out of engagement with the shoulder and out of electrical contact with the conducting member when an overload passes therethrough to permit the conducting member to spring out of contact with the first mentioned contact member thus causing a double break in the circuit.

3. In a resettable circuit breaker, a shell contact member, a base contact member, an insulating core member within the shell, a conducting rod slidably mounted in the core and adapted to contact the base contact member, a spring pressing the conducting rod out of contact with the base contact, and a bi-metallic conducting strip mounted on the core and electrically connected to the shell and normally engaging and in electrical contact with the conducting rod to retain it in contact with the base contact member, said bi-metallic strip being adapted to move out of engagement and contact with the rod when an overload passes therethrough to permit the rod to spring out of contact with the base contact member, thus causing a double break in the circuit.

4. In a resettable circuit breaker, a shell contact member, a base contact member, an insulating core member within the shell having two transverse slots therein, a conducting rod slidably mounted in the core and adapted to contact the base member, a spring pressing the conducting rod out of contact with the base contact, one of the slots in the core being located opposite the point of contact of the base contact member with the conducting rod to provide an arc chamber, and a bi-metallic conducting strip mounted in the other transverse slot in the core and electrically connected to the shell and normally engaging and in electrical contact with the conducting rod to retain it in contact with the base contact member, said bi-metallic strip being adapted to move out of engagement and contact with the rod when an overload passes therethrough to permit the rod to spring out of contact with the base contact member, thus causing a double break in the circuit.

5. In a resettable circuit breaker, a shell contact member, a base contact member, an insulating core member within the shell, a conducting rod slidably mounted in the core and adapted to contact the base contact member, an insulating plunger secured to the conducting rod and extending above the core, an insulating knob at the end of the plunger, an insulating cap on the core surrounding the shank of the plunger, a spring surrounding the rod and engaging the knob and the top of the cap and pressing the conducting rod out of contact with the base contact, and a bi-metallic conducting strip mounted on the core and electrically connected to the shell and normally engaging and in electrical contact with the conducting rod to retain it in contact with the base contact member, said bi-metallic strip being adapted to move out of engagement and contact with the rod when an overload passes therethrough to permit the rod to spring out of contact with the base contact member, thus causing a double break in the circuit.

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