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2,627,564

UNITED STATES PATENT OFFICE

2,627,564

ELECTRIC CIRCUIT BREAKER

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2 Claims. (Cl. 200—116)

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My invention relates particularly to relatively small so-called "air" circuit breakers.

One object is to provide a circuit breaker of the manually actuated and automatic type which is compact, efficient and reliable.

It is well known to those familiar with the use and testing of small air circuit breakers that excessive currents frequently encountered have a destructive effect on parts of the breaker. The contacts and contact carrying parts frequently have a certain amount of metal melted away, which is either ejected through the arc chute or condensed on the interior of the case where it adversely affects the insulating properties of the case. These properties are usually still further deteriorated by a deposit formed as a result of the burning of the housing material in the vicinity of the arc. In addition, small particles of metals which have been thrown off the metallic parts exposed to the arc are impinged on other parts of the breaker, with the possibility that they might interfere with the operation of the breaker. In many cases the effect of the damage to the parts is to increase the time necessary for the breaker to trip or even prevent it from tripping, with the result that the breaker would not give the protection for which it was designed and if continued in service might permit extensive damage to wiring or equipment.

In any case the effect of interrupting such excessive currents is to increase the possibility of subsequent breakdown within the breaker and a consequent danger to personnel.

One object of the invention, therefore, is to prevent reclosing of the circuit through a damage breaker.

Another object is to provide for mechanism by which the circuit can be opened forcibly by hand operation in case the movable contact or its carrier fails to snap open.

Another object is to protect the mechanism from damage due to arcing.

Another object is to provide a breaker which is durable and yet which will give an indication of its condition in case it deteriorates.

Fig. 1 is a side view showing the inside of the housing with the switch mechanism in the manually opened circuit or Off position in full lines and showing in dotted lines the position of the parts when the circuit is closed.

Fig. 2 is a similar view but partially broken away showing in full lines the mechanism in the position when the circuit has been broken automatically and in dotted lines the closed circuit position.

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Fig. 3 is a cross-sectional view taken on the plane of the line 3—3 of Fig. 1.

Fig. 4 is a cross-sectional view taken on the plane of the line 4—4 of Fig. 1.

Fig. 4a is a view of a fragment of a detail of the actuating mechanism.

The switch parts are enclosed in an insulating housing having two molded parts 8, 8 held together by screws or rivets 9, 9, 9'. One circuit terminal 10, usually the line terminal, is held in place in grooves 10' in the housing and has a stationary switch contact 11. The other circuit terminal 12 is similarly mounted and anchored by a screw 12'. The inner U-shaped end 13 of the terminal 12 supports a thermostatic bimetal strip 14 which is connected by a flexible conductor 15 to the switch contact member 16. The latter is pivoted at 17 in a tripping frame member 18 which is pivoted at 19 in the housing.

As shown in Fig. 1, the end of the strip 14 is secured to the inside of the looped end 13. This is accomplished by assembling the terminal conductor and the strip with the strip inside the loop and inserting a securing tool through the cutaway portion of the terminal conductor.

The actuating lever 20 is pivoted at 21 in the walls of the housing and has a frame 22 with lugs 22' which overlap the edges of the tripping frame to enable the lever to reset the tripping frame after an automatic release. A spring 23 is under tension between the anchor 24 of the actuating lever and a point 25 intermediate the ends of the switch member 16.

In the open circuit position, the switch member 16 presses against the shoulder 18' of the housing and the tripping lever presses against shoulder 18' when released as in Fig. 2.

The field piece 26 of a magnet is mounted on the bimetal strip 14 and has an armature 27 which is pivoted at 28 in the housing walls. This armature has a latch member 27' with which the tip of the tripping frame 18 engages in the normal ready position (Fig. 1).

The spring 29 presses the armature clockwise toward the tripping member and the armature in turn presses against the bimetal strip at 30. An insulating strip 31 serves as an abutment for spring 29 and is interposed between the spring and the joint in the housing adjacent the connector rivet 9'. Calibration is effected by adjustment of the screw 32.

Manual operation of the switch by the lever 20 is effected by moving the lever from one side to the other when the spring 23 provides the snap action of switch member 16 in the usual manner.

metal strip and a calibrating screw threaded through the first-named arm of said L-shaped terminal member below its cutaway portion and extending into the space in said U-shaped portion and contacting said bimetal strip at its point of securement to the arm of the L-shaped terminal.

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THERMOSTATIC SWITCH

Filed Oct. 11, 1949 2 SHEETS—SHEET 1

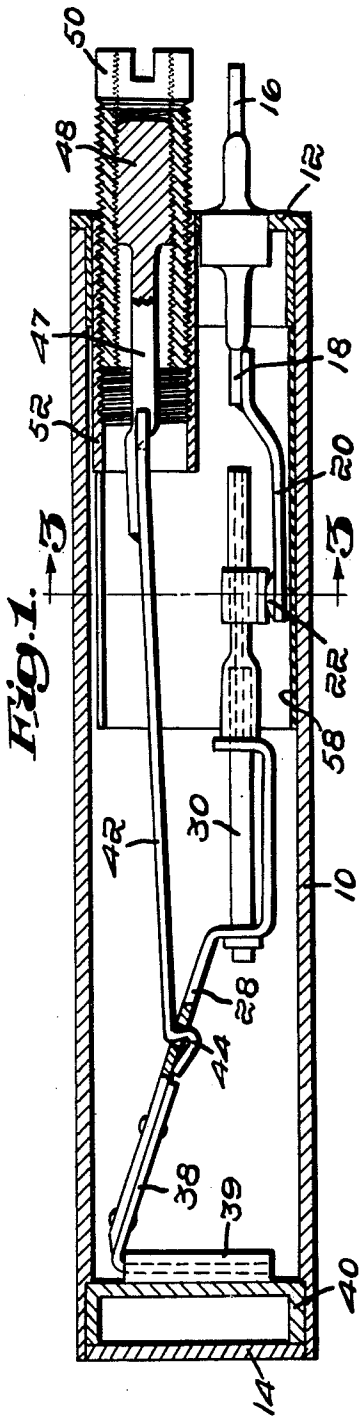


Fig. 1.

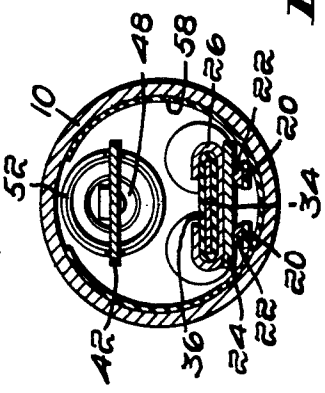


Fig. 3.

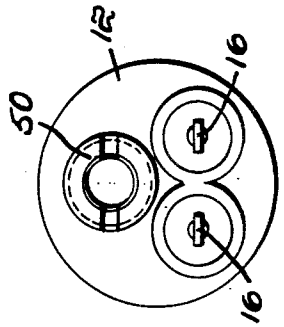


Fig. 2.

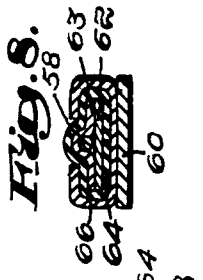


Fig. 8.



Fig. 4.



Fig. 6.

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