G. B. WURSTER.

AUTOMATIC CIRCUIT BREAKER.

APPLICATION FILED SEPT. 17, 1917.

1,270,356. Patented June 25, 1918.

Fig. 1.

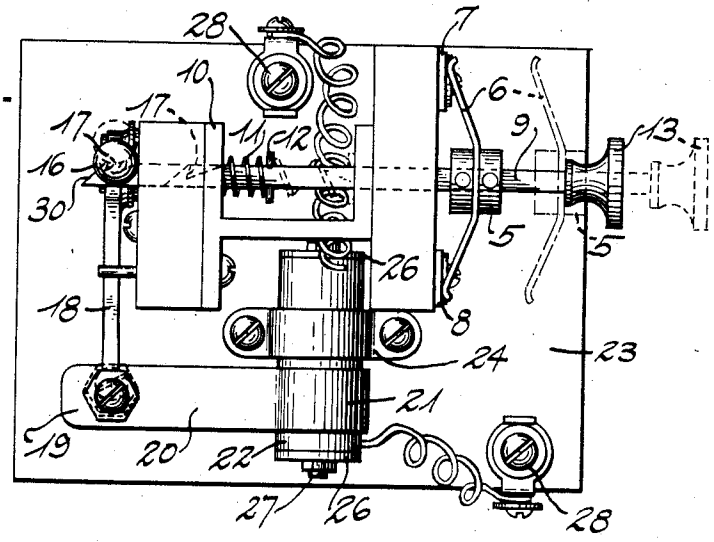


Fig. 2.

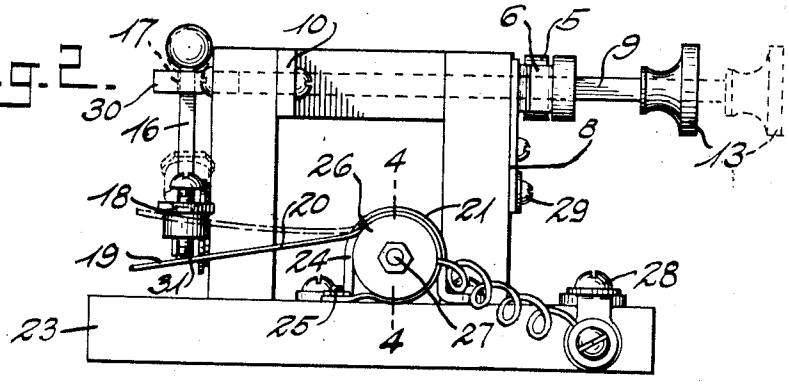


Fig. 3.

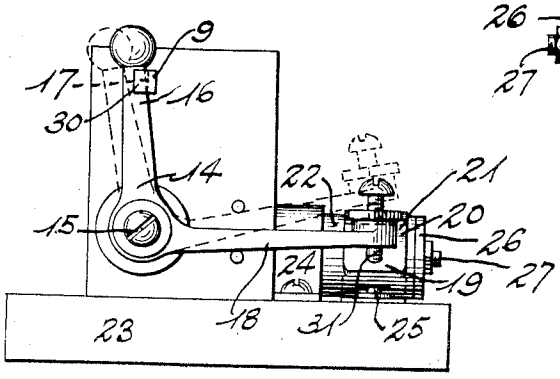
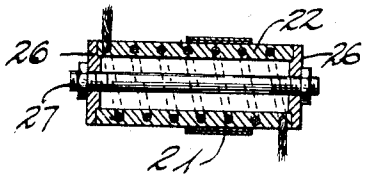


Fig. 4.



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AUTOMATIC CIRCUIT-BREAKER.

1,270,356. Specification of Letters Patent. Patented June 25, 1918.

Application filed September 17, 1917. Serial No. 191,698.

To all whom it may concern:

Be it known that I, GEORGE B. WURSTER, a citizen of the United States of America, residing at Tuckahoe, New York, have invented a new and useful Automatic Circuit-Breaker, of which the following is a specification.

This invention relates particularly to protective devices for automatic fire alarm circuits, special objects of the invention being to provide a simple, compact and inexpensive piece of apparatus which will quickly and positively interrupt the circuit under certain overload conditions. Briefly stated, the invention consists of a spring operated circuit-closing member which is held in the circuit-closed position by means of a latch and which latch is operated to release the circuit-closing member by means of a thermostatic element which is coiled in close engagement with a heating coil connected in the circuit to be protected.

Other features of the invention and details of construction will be made apparent as the specification proceeds.

The accompanying drawing illustrates the invention embodied in a practical and preferred form, but I would have it understood that changes and modifications may be made without departure from the true spirit and scope of the invention.

In said drawing:—

Figure 1 is a top plan view of the invention with the circuit-closing member shown in full lines in the circuit-closed position and in dotted lines in the open-circuit position.

Fig. 2 is a side view, and

Fig. 3 is an end view of the device.

Fig. 4 is a sectional view of the heating coil and thermostatic member, taken substantially on the plane of the line 4—4 of Fig. 2.

The circuit-closing member is designated by the numeral 5, said member consisting of a contact piece shown arranged to bridge the two relatively stationary contacts 7 and 8 and carried by a plunger 9, slidably guided in the spaced arms of a bracket 10. A spring 11 encircling the contact carrying rod 9 and interposed between the bracket and an abutment 12 on the rod exerts its tension to shift the rod in a direction to open the circuit. The circuit-opening movement of the rod may be limited by the abutment 12 thereon, coming into engagement with the other arm of the supporting bracket 10, as indicated in dotted lines in Fig. 1. A handle 13 may be provided on the outer end of the rod for restoring it to the closed-circuit position.

14 designates the latch member which serves to hold the circuit closer in the closed circuit position, said latch being in the form of an elbow lever, pivoted at 15 and having an upstanding arm 16 engageable in a notch 17 in the end portion of the contact carrying rod and a second arm 18 projecting laterally into position to be engaged by the outstanding arm 19 of a composite thermostatic bar which is shown at 21 coiled about and in close engagement with a heating coil element 22.

The parts described may all be mounted on a suitably designed base 23. In the illustration, the heating coil element is shown secured on the face of said base by an enveloping strip 24 and the thermostatic element is shown secured in place by a screw 25 holding the end of the coiled portion of the element fast to the face of the base, said coiled portion being shaped so as to closely embrace the heating coil and thereby receive the heat directly therefrom. The heating coil may be closed at opposite ends as by means of end caps 26 secured together by a through screw rod 27. This closing of the hollow coil prevents air currents circulating through the coil and carrying off the heat and the entrapped air acts as a heat insulating medium, causing the heat to be transmitted directly outwardly to the thermostatic element which is in contact therewith.

The heating coil is shown provided with suitable terminals 28, secured on the base and the main circuit contacts 7 and 8 also have suitable terminals 29.

In normal use, the circuit closer is held in the circuit-closed position by the latch element. In case of an excessive flow of current or other unusual conditions of the like character in the circuit which is protected, the heating coil heats up and immediately transmits this heat to the surrounding thermostatic bar, causing this bar to expand and to lift the laterally outstanding arm 19 thereof, substantially as indicated in dotted lines in Fig. 2. This arm 19 as it rises, lifts the trip arm 19 of the latch, thereby causing the upstanding arm 16 thereof to be freed from holding engagement with the contact

carrying rod. As soon as this occurs, the spring 11 asserts itself and shifts the rod over so as to quickly open the circuit. The circuit may be restored again just as soon as the thermostat has coiled sufficiently to allow the latch to drop back into its holding position. The end of the contact carrying rod may be pointed or inclined as indicated at 30 so that the switch may be restored by simply pushing in on the handle 13, the cam surface 30 forcing the arm 16 of the latch out of its path and permitting the latch arm to drop into engagement with the notch in the end of the rod.

The device may be timed to operate as desired by means of a set screw 31 mounted in the end of the trip arm 18 and adjustable to produce a quicker or a slower releasing of the latch.

From the foregoing, it will be seen that the invention provides a protective device for electrical circuits which will operate quickly and with certainty at all times, which is simple in its construction and therefore not liable to get out of order and which is small and compact.

I claim:

1. An automatic circuit breaker comprising, a relatively stationary contact, a movable contact for engagement therewith, a carrier for said movable contact having a beveled portion and a locking shoulder in rear thereof, a spring acting to separate the movable contact from the stationary contact, a latch member displaceable by the beveled portion of the contact carrier to engage the locking shoulder, a heating coil and a thermostatic bar closely engaged about said heating coil and disposed in position to engage and operate the latch member aforesaid.

2. An automatic circuit breaker comprising, a base, a spring operated circuit closing member movably supported on said base, a latch mounted on the base for holding said member in the circuit-closed position, a heating coil mounted on the base and a composite thermostatic bar having a coiled portion closely engaged about the heating coil and a laterally extending arm for operating the latch aforesaid.

3. An automatic circuit breaker comprising a relatively stationary contact, a sliding plunger, a contact carried by said plunger for engagement with the relatively stationary contact, a spring acting on the plunger to separate the contact carried thereby from the relatively stationary contact, a pivoted elbow lever having an upstanding arm and a laterally projecting arm, the plunger having a notch therein to receive the upstanding arm of the elbow lever in the closed circuit position of the plunger, a heating coil disposed at one side of the laterally extending arm of the elbow lever and a composite thermostatic bar anchored at one end and having a portion coiled about the heating coil and projecting laterally into position for engagement with the laterally extending arm of the elbow lever.

4. An automatic circuit breaker comprising a base, spaced contacts on said base, a bracket mounted on the base, a plunger slidably guided in said bracket, a contact on said plunger for connecting the contacts on the base, said plunger having an operating handle at its outer end and having a beveled inner end with a locking notch in rear thereof, a latch pivoted on the base having an arm adapted to be displaced by the beveled inner end of the plunger and to engage in the holding notch in rear of such beveled end, said latch also having a laterally projecting trip arm, a spring for shifting the plunger in the direction of separating the contacts, a heating coil mounted on the base and a composite thermostatic bar coiled about said heating coil and anchored at one end to the base and having a laterally projecting arm at its opposite end disposed in position to engage the trip arm of the latch.

GEORGE B. WURSTER.