

No. 661,771.

Patented Nov. 13, 1900.

B. P. RUCKER.
ELECTRIC CIRCUIT BREAKER.

(Application filed June 25, 1900.)

(No Model.)

2 Sheets—Sheet 1

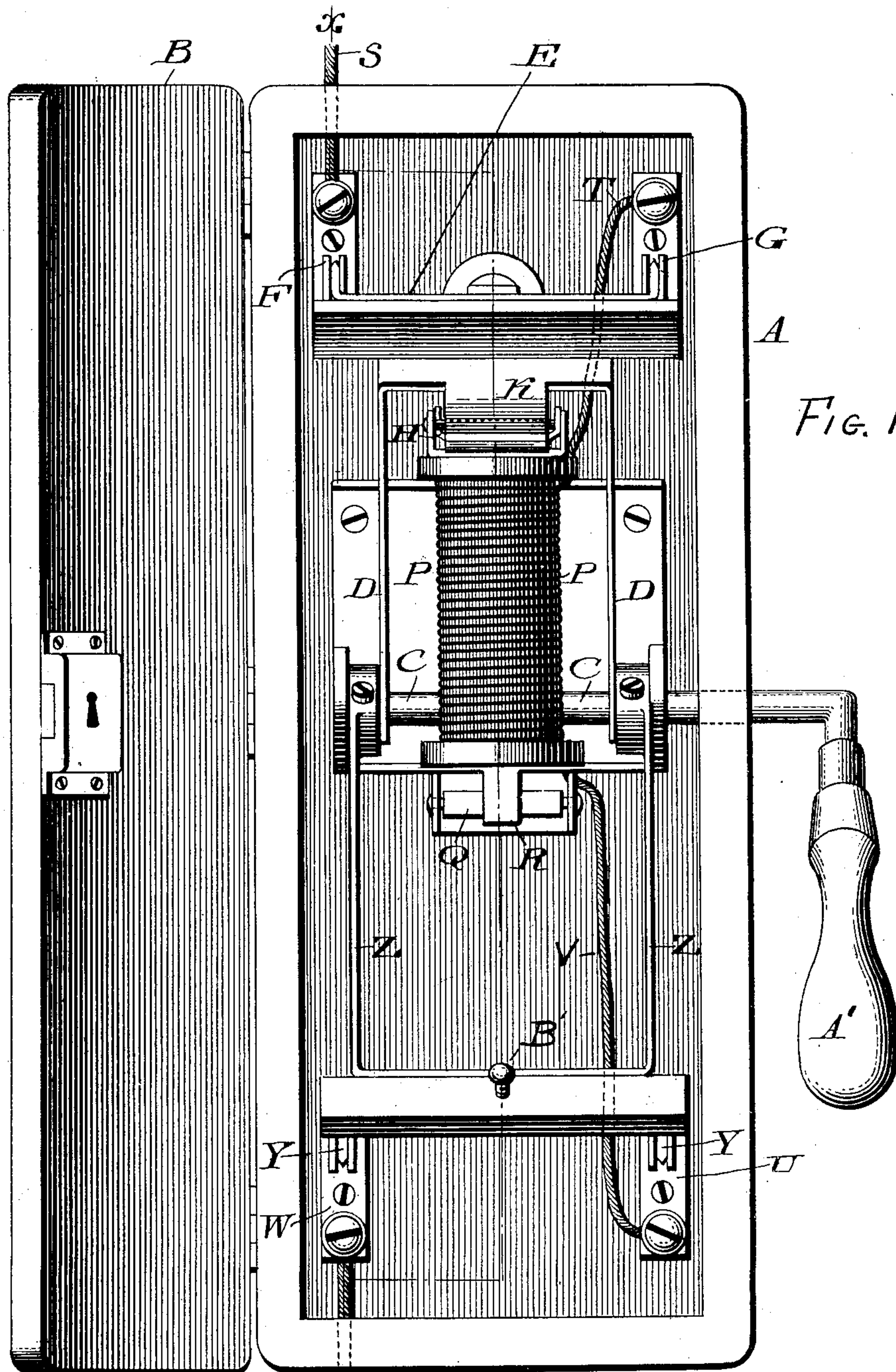


FIG. 1.

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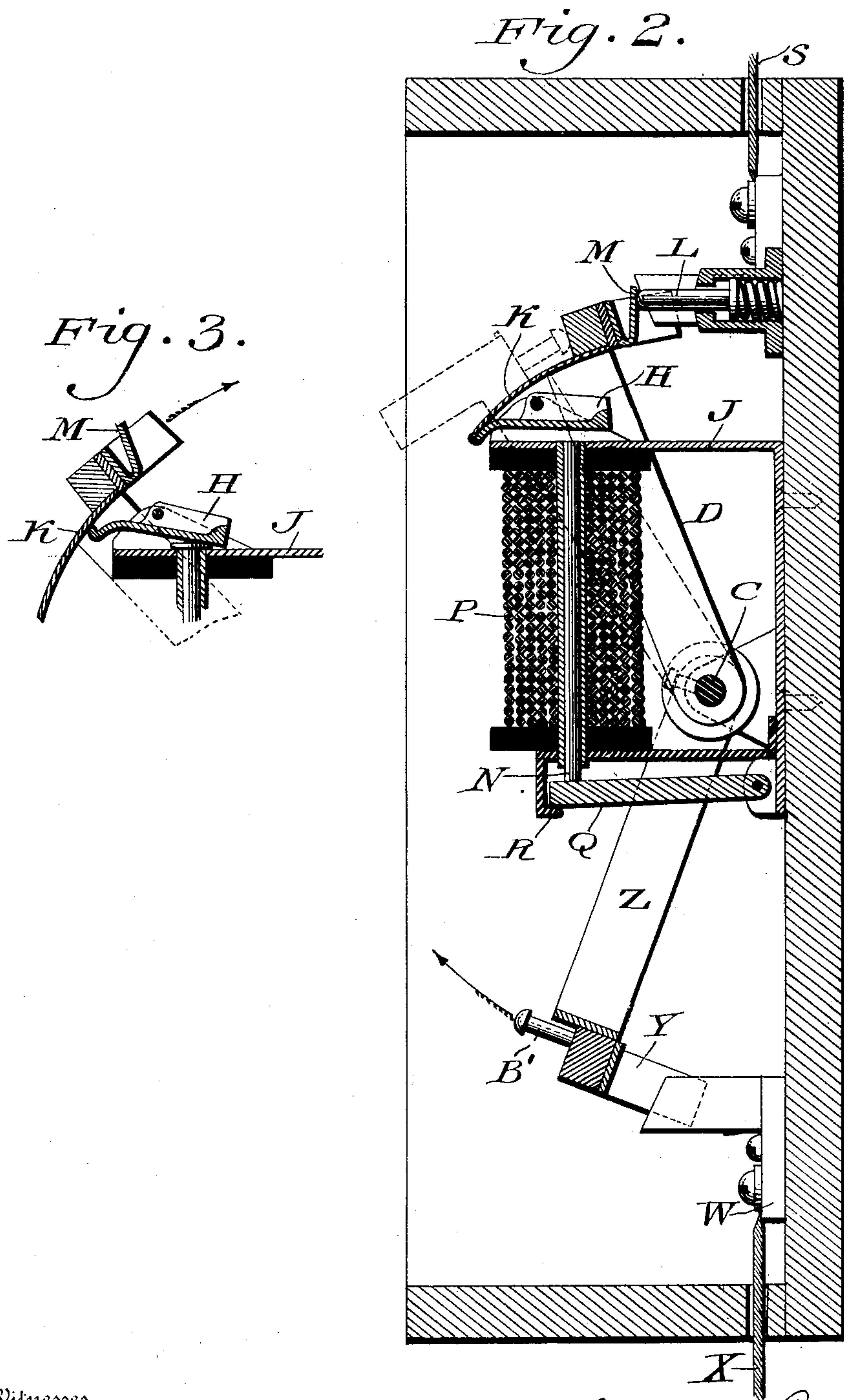
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

BENJAMIN PARKS RUCKER, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC-CIRCUIT BREAKER.

SPECIFICATION forming part of Letters Patent No. 661,771, dated November 13, 1900.

Application filed June 25, 1900. Serial No. 21,425. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN PARKS RUCKER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Electric-Circuit Breakers, which improvement is fully set forth in the following specification and accompanying drawings.

10 This invention consists of an improvement in a circuit-breaker of that class wherein the switch-arm is automatically released to break the circuit by reason of an abnormal current.

15 The invention further consists of novel details of construction, all as will be hereinafter fully set forth, and particularly pointed out in the claims.

Figure 1 represents a front elevation of a circuit-breaker constructed in accordance with my invention. Fig. 2 represents a vertical section taken on line *x x*, Fig. 1, the front portion of the box being cut off. Fig. 3 represents a fragmentary detail view of a portion of the end of the switch-carrying arm and adjacent parts.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a box within which the circuit-breaker is situated, the same being closed by a door B. The forward portion of the box A in Fig. 2 is cut off; but it is understood that it is deep enough to allow the switch-carrying arms to swing on their pivot when the door is closed. Freely mounted upon a suitable shaft C within the box is a switch-carrying arm D, which carries the switch-contact blade E, that is adapted to complete a circuit between the contacts F and G. Said switch-carrying arm is held in the position shown in full lines in Figs. 1 and 3 by means of a catch H, mounted upon an arm J within the box A and which is situated to engage a projection K upon the switch-carrying arm. The said catch holds the switch-carrying arm in the position illustrated against the action of a spring throwing or tension device L, which consists of a spring-actuated pin engaging the finger M of the switch-carrying arm. The catch H is pivotally mounted and is situated in the path of the pin N, that extends through the core P of the magnet and which is actuated by the

pivoted armature Q, situated below the magnet and normally resting upon a stop R to support the pin N. The circuit-wire S extends through an opening in the box and is connected with the binding-post of the contact F. From the binding-post of the contact G a conductor T leads to the coil of the magnet P, and the other end of this coil is connected with the binding-post of the contact U by a conductor V. Adjacent the contact U is another contact W, from which extends the circuit-wire X. The contacts U and W are connected by a switch-contact blade Y of an auxiliary switch-carrying arm Z, that is conveniently mounted upon and rotatable with said shaft C, upon which switch-carrying arm D rotates freely. The shaft C is provided exterior to the box with the handle A'. The said switch-carrying arm is provided with a pin or abutment B', situated to engage the switch-carrying arm D, as shown in dotted lines in Fig. 2.

The operation is as follows: In Figs. 1 and 2 the parts are shown in full lines in the position they occupy when the circuit is in working condition. It is understood, however, that as soon as an abnormal current passes through the magnet P the arm Q is raised to cause the pin N to tilt to catch H and release the switch-carrying arm D. The tension device L thereupon throws the arm D upon its axis, withdrawing the switch-contact blade from the contacts F and G and breaking the circuit. The switch-carrying arm D falls downwardly and rests against the abutment or pin B'. The object of the auxiliary switch-carrying arm is to disrupt the circuit when the switch-carrying arm D is returned to its upper position to connect the contacts F and G. It is seen, therefore, that to return the switch-carrying arm D to its upper position the shaft C is turned by the handle, and the abutment B' being in contact with the arm D will raise the same to the position shown in dotted lines in Fig. 2 and connect the contacts F and G. In doing this, however, and before the contacts F and G are connected the connection between the contacts U and W is broken by the withdrawal of the switch-contact blade Y of said auxiliary switch-carrying arm Z. When the arm D is secured by the catch H, the handle A' is returned to its

normal position, the contacts U and W being again connected, as shown in Figs. 1 and 2.

In Fig. 3 a portion of the magnet, the catch H, and the outer end of the switch-carrying arm are shown to illustrate the manner in which the projection K of the switch-carrying arm rides over the end of the catch when it is returned to its working position.

It will be noticed that all parts of the switch are inclosed within the box A and that it cannot be interfered with unless the lid is open. Thus the automatic action of the switch under the desired condition is insured, for instance, against fastening or tying any of the parts and otherwise. It is not necessary, however, to remove the lid of the box to reset the switch-arms, as this is accomplished by the lever A', that projects from the box.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a circuit-breaker, a switch adapted to be automatically operated by an abnormal current to break the circuit at one point, and a switch adapted to break the circuit at another point and by means of which said automatically-operated switch is operated to make the circuit.

2. In a circuit-breaker, a plurality of switches adapted to break the circuit at different points, one of said switches being adapted to be automatically operated by an abnormal current to break the circuit, and adapted to be operated by said other switch to make the circuit, said other switch being adapted to break the circuit when actuated to operate the automatically-operated switch.

3. A circuit-breaker having a switch adapted to be automatically operated by an abnormal current to break the circuit at one point, and a manually-operated switch adapted to break the circuit at another point and to operate said automatically-operated switch to make the circuit.

4. A circuit-breaker, having a plurality of contact-carrying arms adapted to break the circuit at different points, one of said contact-carrying arms being automatically operated by an abnormal current to break the circuit,

the other contact-carrying arm being situated in the path of said automatically-operated contact-carrying arm, and means for moving said other contact-carrying arm whereby the automatically-operated contact-carrying arm can be moved by said other contact-carrying arm to make the circuit at one point and said other contact-carrying arm then returned to its normal position to make the circuit at the other point.

5. In a circuit-breaker, an automatically-operated contact-carrying arm, an auxiliary contact-carrying arm situated in the path of the same, and means for moving said auxiliary contact-carrying arm to move said contact-carrying arm to its operative position.

6. In a circuit-breaker, a spring-actuated contact-carrying arm, a catch for holding the same in operative position, an armature adapted to operate said catch and itself adapted to be operated by an electromagnet in the circuit controlled by the circuit-breaker, an auxiliary contact-carrying arm situated in the path of said contact-carrying arm, and means for moving said auxiliary contact-carrying arm to move said contact-carrying arm to its operative position.

7. In a circuit-breaker, an automatically-operated contact-carrying arm freely mounted upon a shaft, an auxiliary contact-carrying arm rotatable with said shaft and situated in the path of said contact-carrying arm, and means for moving said shaft to cause the auxiliary contact-carrying arm to move the contact-carrying arm to its operative position.

8. In a circuit-breaker, a switch adapted to be automatically operated by an abnormal current to break the circuit at one point, a switch adapted to break the circuit at another point and by means of which said automatically-operated switch is operated to make the circuit, a casing inclosing said switches, and a lever for operating said switch that operates the automatically-operated switch, said lever projecting exterior to said casing.

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Witnesses:

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