(No Model.)

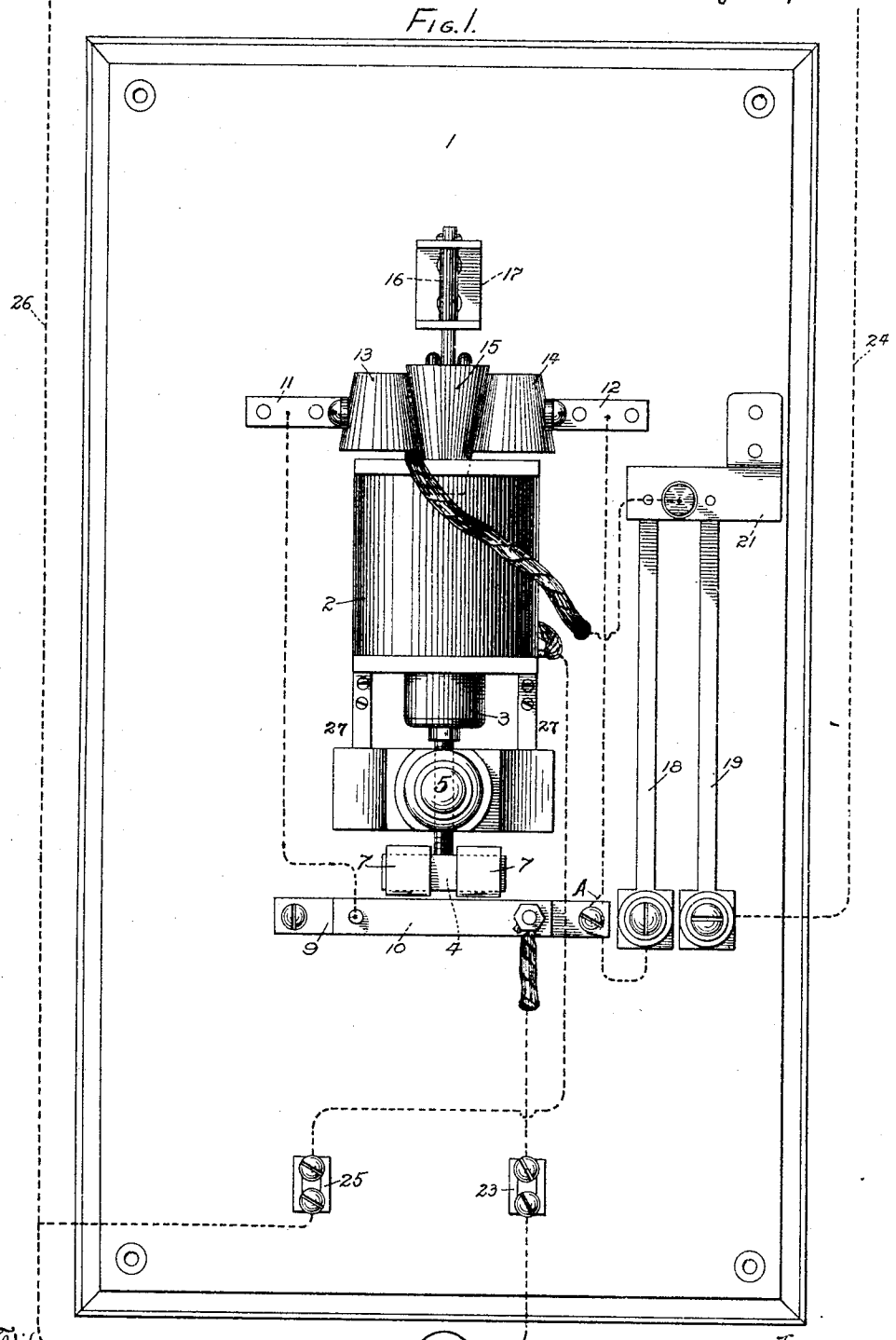
2 Sheets—Sheet 1.

A. WURTS.

AUTOMATIC CIRCUIT INTERRUPTER.

No. 501,201. Patented July 11, 1893.

Fig. 1.



Witnesses
R. D. Mershon
W. L. Tener

Inventor
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By his Attorney
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(No Model.) 2 Sheets—Sheet 2.

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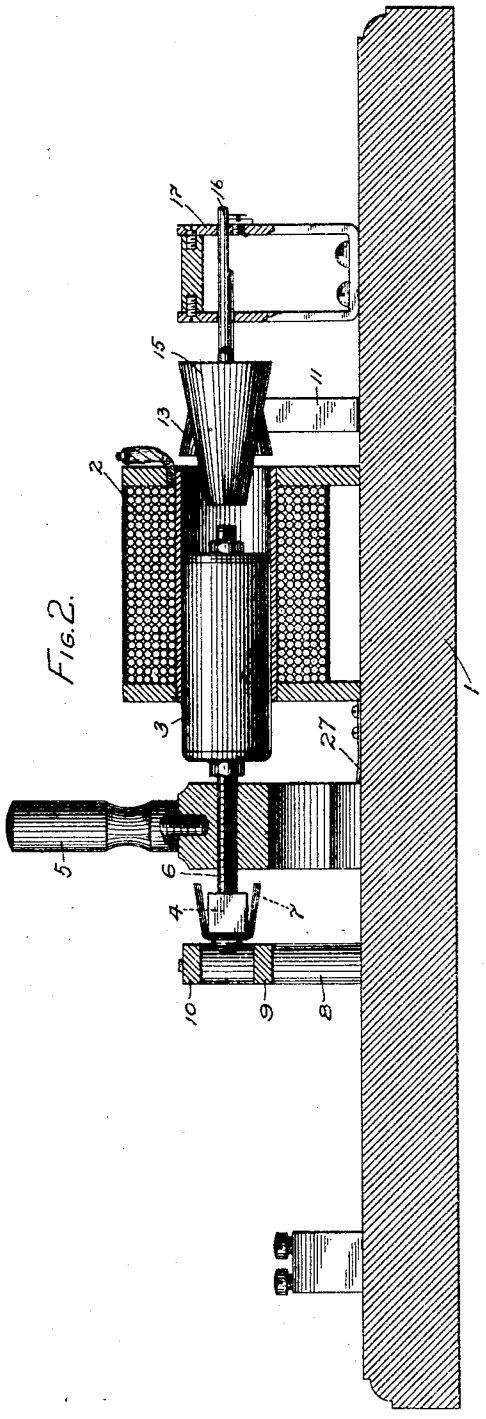

FIG. 2.

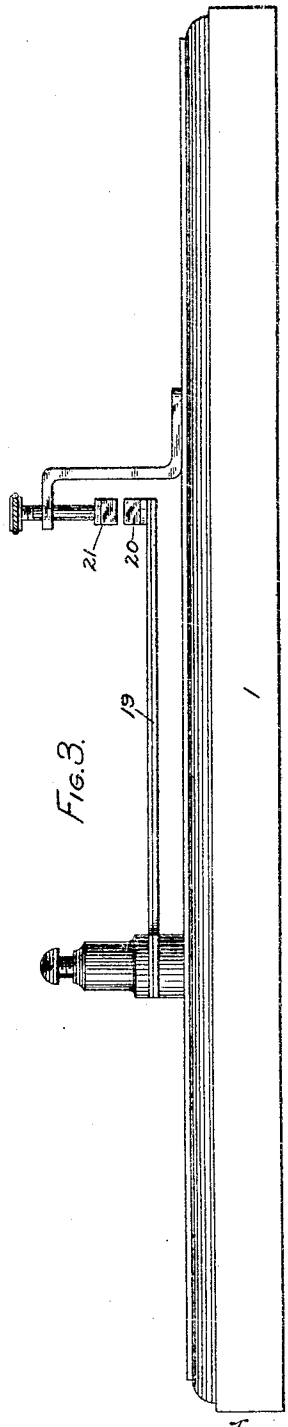

FIG. 3.

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UNITED STATES PATENT OFFICE.

ALEXANDER WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF SAME PLACE.

AUTOMATIC CIRCUIT-INTERRUPTER.

SPECIFICATION forming part of Letters Patent No. 501,201, dated July 11, 1893.

Application filed October 5, 1892. Serial No. 447,975. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER WURTS, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Automatic Circuit-Interrupters, (Case No. 514,) of which the following is a specification.

My invention relates to means whereby any circuit may be automatically interrupted on the occurrence of an abnormal current therein.

The object of my invention is to provide an apparatus of this nature wherein the occurrence of arcs may be avoided at points of interrupting the circuit and wherein the operation of breaking the circuit shall be complete and rapid. To this end I have devised means exemplified in the accompanying drawings wherein—

Figure 1 is an elevation of my device, showing also the connections in diagram. Fig. 2 is a longitudinal section of the same, and Fig. 3 is a detail of a thermostatic circuit-closer.

To the base 1, is attached a solenoid 2, having a core 3, to the end of which is fastened a metallic bridge-piece 4, preferably of copper for good conduction. The handle 5, which may be of any shape, is used for adjusting the position of the core. The screw 6 is preferably employed for varying the position of the handle upon the core stem. The bridge-piece 4 is preferably compound, having one or more spring pieces of good conducting material 7 upon a central core, shown as screwed to the end of the stem 6.

Upon standards 8 fixed in any way to the base are fastened the metal contact pieces 9 and 10, insulated from each other. The bridge-piece 4 is adapted to fit tightly between said contact pieces.

By means of the standards 11 and 12 the cones 13 and 14 are fixed to the base, these cones being composed of non-arcing metal. A movable cone 15, supported upon a spindle 16, sliding in a frame 17, is adapted to move into and out of contact with said fixed cones by sliding up and down. This movement is imparted by the top of the core 3 coming in contact with said cone. It will be observed from Fig. 1 that contact at the cones is preserved even after the bridge-piece has been withdrawn from between the parts 9 and 10. Further movement, however, breaks contact with said cones.

Preferably fixed to the base 1, beside the solenoid, is a thermostatic circuit-closer composed of the two compound bars 18 and 19 joined by contact pieces 20 at their free ends. These bars are ordinary thermostatic bars adapted to bend upward when heated by an excessive current, so that the contact 20 touches the contact 21.

Fig. 1 illustrates my invention as applied to the main circuit extending from a generator 22; but it is to be distinctly understood that my device may be used in any other circuit wherein an abnormal current may possibly occur. My device should have a solid core when employed with direct current circuits and said core should be laminated when used with alternating currents.

In case of use with a main circuit the connections are as follows: One brush of the source of current is connected to the piece 10 preferably through a binding post 23 employed for convenience. The contact 9 is connected with the fixed end of the bar 18 and with the standard 12 by wire A, while the fixed end of the bar 19 is connected with the outgoing wire 24. The solenoid coils form part of a circuit from contact-piece 21 to binding-post 25, which leads to the incoming wire 26. The contact 10 is also connected with the standard 11.

As normally used, the bridge-piece 4 is down and the parts 9 and 10 are in electric connection. The current coming in at 10 finds its way to the thermostat by the two paths offered by the bridge-piece and cones, whence it goes out to line. If this current becomes excessive, however, the thermostat bends up until contact is made at 20, 21, when a short-circuit is presented through the solenoid. The resulting rush of current through the solenoid pulls the bridge-piece away from the contacts 9, 10, thus breaking the circuit at this point. No arc is, however formed with this break, as the current finds a temporary path through the cones. This is immediately broken, however, by further movement of the solenoid core, and the circuit is fully interrupted. No arc occurs at this latter break as the cones are made of non-arcing metal. When

the circuit through the solenoid is thus interrupted, the core cannot fall back, as it is held up by the friction of the springs 27 under the handle 5. The handle 5, as shown in Fig. 2, is attached to the stem of the solenoid core; and is preferably arched between said stem and the base, the two sides thereof bearing on the flat springs 27 as shown in plan in Fig. 1. The handle is provided to enable one to move the solenoid core up and down at will, and so manually make or break contact at 9, 10, if desired. The springs 27 merely act to insure proper friction between the handle and base, so that the core will not fall back of its own weight after the solenoid has raised it. Of course these parts are not absolutely essential to my invention.

What I claim is—

1. The combination of a switch composed of fixed and movable parts with a circuit interrupter composed of non-arcing metal in shunt on said switch and adapted to be operated by the movement of said movable part, substantially as described.

2. In an automatic circuit-interrupter, the contact pieces, the bridge-piece for electrically connecting the same, the solenoid, the core adapted to be moved thereby and adapted to move said bridge-piece, a circuit interrupter composed of non-arcing metal in shunt with said contact pieces and adapted to be operated by impact with said core after removal of said bridge-piece, and means operated by an abnormal current through said contact-pieces whereby a short-circuit is established through said solenoid.

3. In an automatic circuit interrupter, contact pieces, and a circuit-interrupter composed of non-arcing metal normally electrically connecting said pieces, a thermostatic bar in circuit with said contact pieces and joined at one end by a movable contact-piece, a solenoid, a core movable thereby, a bridge-piece moved by said core and adapted to bridge said contact pieces and a contact piece permanently in electric connection with one end of said solenoid, substantially as described.

4. In an automatic circuit interrupter, the contact pieces 9 and 10, the non-arcing cone 13, electrically connected with the piece 10, the non-arcing cone 14 connected with the piece 9, the thermostatic bars connecting said piece 9 with one leg of the main circuit and joined at their movable ends by the contact piece 20, and the movable non-arcing cone normally resting in contact with the cones 13 and 14; in combination with a solenoid connected with the second leg of the circuit, a core movable therein, a bridge-piece for connecting the contacts 9 and 10 adapted to be moved by said core, a handle for adjusting said core, springs normally pressing on said handle for retaining the same in a given position, and a contact-piece 21 in the path of the contact piece 20 and electrically connected with said solenoid, substantially as described.

In testimony whereof I have hereunto subscribed my name this 3d day of October, A. D. 1892.

ALEXANDER WURTS.

Witnesses:
JAMES WM. SMITH,
HAROLD S. MACKAYE.