(No Model.)

H. P. DAVIS.

AUTOMATIC CIRCUIT BREAKER.

No. 532,537. Patented Jan. 15, 1895.

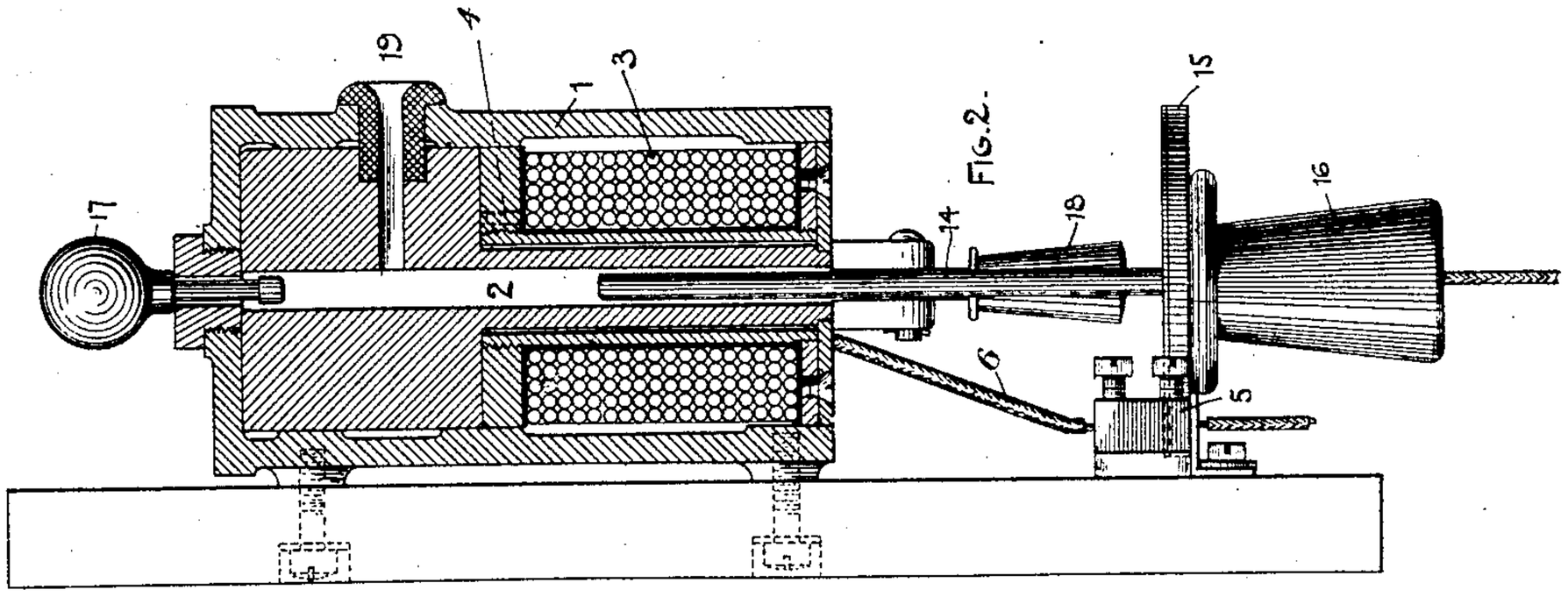

FIG. 2.

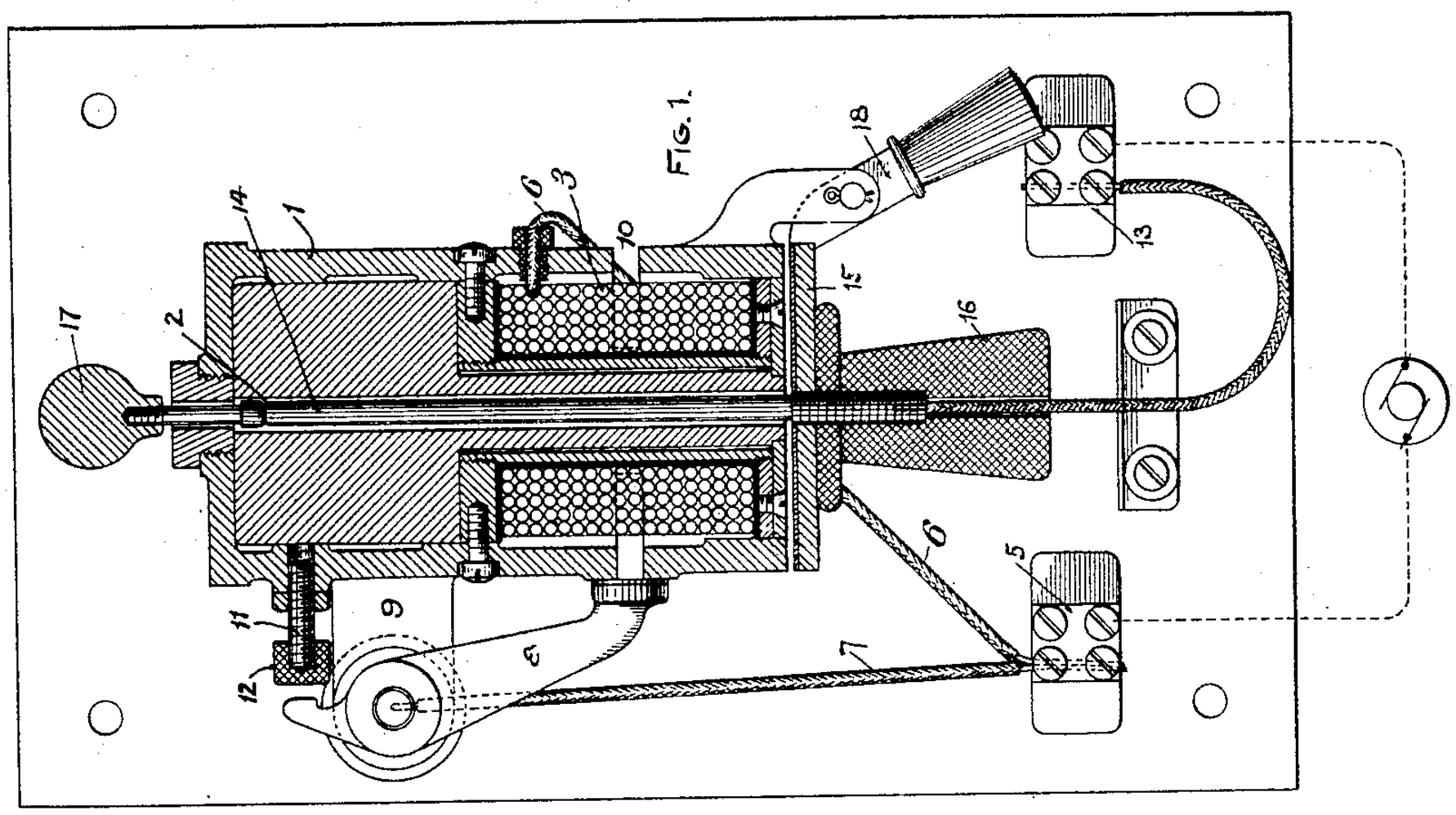

FIG. 1.

WITNESSES:
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ATTORNEYS.

UNITED STATES PATENT OFFICE.

HARRY P. DAVIS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF SAME PLACE.

AUTOMATIC CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 532,537, dated January 15, 1895.

Application filed February 28, 1894. Serial No. 501,756. (No model.)

To all whom it may concern:

Be it known that I, HARRY P. DAVIS, 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-Breakers, (Case No. 578,) of which the following is a specification.

My invention relates to devices for automatically interrupting electric circuits on the occurrence of excessive currents therein.

The object of my invention is to provide a device of this class which shall be easily adjustable, and at the same time perfectly reliable in its action, and which shall not permit maintenance of an arc at the point of rupture.

Another object of my invention is the attainment of portability, compactness and fireproof qualities in devices of this character.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical section of my device in a plane parallel to the suspending board, and Fig. 2 is a vertical section on a plane at right angles to the plane of section of Fig. 1.

My circuit breaker consists of a magnetic casing 1, within which is a restricted chamber 2, surrounded along a greater or less portion of its length by a solenoid, 3. One terminal is connected, as at 4, with the magnetic casing 1, and the other terminal is connected with one of the binding posts, as 5, by the insulated wire 6. Also connected electrically to the binding post 5 by the wire 7, is the pendant 8, loosely pivoted upon the insulating standard 9, or otherwise normally insulated from the casing 1.

The magnetic casing 1 is provided with a break 10, which causes leakage lines tending more or less to attract the magnetic pendant 8 into the position shown in Fig. 1. The upper end of the pendant 8 is adapted to impinge upon the stop 11, which is made adjustable as by screwing, as shown, and is provided with any well known means for insulating the pendant at this point from the casing. The rubber cap 12 is shown as an example of these means. The current normally enters by the binding post 13, and proceeds to the conducting stem 14, carried by the armature 15, which is preferably provided with an insulating handle 16. The upper end of the conducting stem is adapted to make contact with the movable weight or knob 17, which is in continual electric connection with the casing 1. As long, therefore, as the armature is held up to its place by the casing when magnetized by the solenoid 3, there will be an electric connection between the incoming binding post 13 and the casing 1, thence through the solenoid and wire 6 to outgoing binding post 5.

To set this device, the armature is raised into the position shown in Fig. 1, until the catch 18 is made to sustain the armature. The method of this support is plainly shown in the drawings. When current is now turned on, the armature is brought into its highest position, the movable nature of the contact piece 17 permitting considerable play. In this position the weight of the catch will bring it into the vertical position, and the armature will be ready to fall upon failure of current for any cause in the solenoid. The upper surface of the armature is preferably overlaid with non-magnetic material to prevent sticking to the iron when the solenoid is demagnetized.

The use of this device is two-fold. If by any accident a temporary break occurs in the current passing through the solenoid, the armature will instantly drop to the position shown in Fig. 2, and the local circuit in which the solenoid is located, being thus broken, any translating devices with which it may be in circuit are protected from sudden resumption of current, which might injure them. On the other hand, if, by short-circuits or otherwise, the current in the solenoid becomes excessive, the magnetization of the casing 1 becomes so high that sufficient leakage occurs at 10 to attract the pendant 8 into the position shown in Fig. 1. A short circuit around the solenoid is thus provided, from the casing through the pendant and wire 7 to the binding post 5. The casing is demagnetized, and the armature drops, breaking the circuit at the contact 17. If any arc occurs on this breakage, it creates sudden expansion of air in the chamber 2, which, finding vent through the opening 19, blows out the arc.

It will be seen that my device, by inclosing

the break, insures absence of fire risks, and that in every respect, a maximum of portability, compactness and convenience is obtained.

I do not limit myself to the specific details shown and described herein, as many obvious modifications might be made, without departing from the spirit of my invention.

What I claim is—

1. In an automatic circuit breaker, a movable contact piece and an armature for controlling the same; in combination with a magnetic body for actuating said armature and in the circuit to be broken, and a secondary shunting armature adapted to be brought into said circuit by contact with said body, substantially as described.

2. In an automatic circuit breaker, a movable contact piece and an armature for controlling the same; in combination with a solenoid and a magnetic casing surrounding the same in the circuit to be broken, and a secondary armature for shunting said solenoid, adapted to be brought into said circuit by contact with said casing, substantially as described.

3. In an automatic circuit-breaker, a solenoid and magnetic casing surrounding an inner chamber, said casing being pierced with a vent for said chamber; in combination with a contact stem passing through said chamber, and an armature carrying said stem, adapted to be normally held up by said solenoid, substantially as described.

4. In an automatic circuit breaker, a magnetic casing in the circuit to be broken, and a main armature governed thereby, said casing having a leakage break, in combination with a shunting armature placed near said break and adapted to be attracted into contact with said casing when the leakage across said break becomes excessive, substantially as described.

5. In an automatic circuit breaker, a magnetic casing in the circuit to be broken, and a pendent shunting armature hanging near to but insulated from said casing, in combination with an adjustable stop adapted to make contact with said pendent armature, substantially as described.

6. In an automatic circuit breaker, the magnetic sustainer, and the armature upheld thereby; in combination with a stop adapted to be swung under said armature, and to swing away therefrom when the armature is drawn fully into place by the magnet, substantially as described.

In testimony whereof I have hereunto subscribed my name this 26th day of February, A. D. 1894.

HARRY P. DAVIS.

Witnesses:
JAMES W. SMITH,
HUBERT C. TENER.