

No. 668,140.

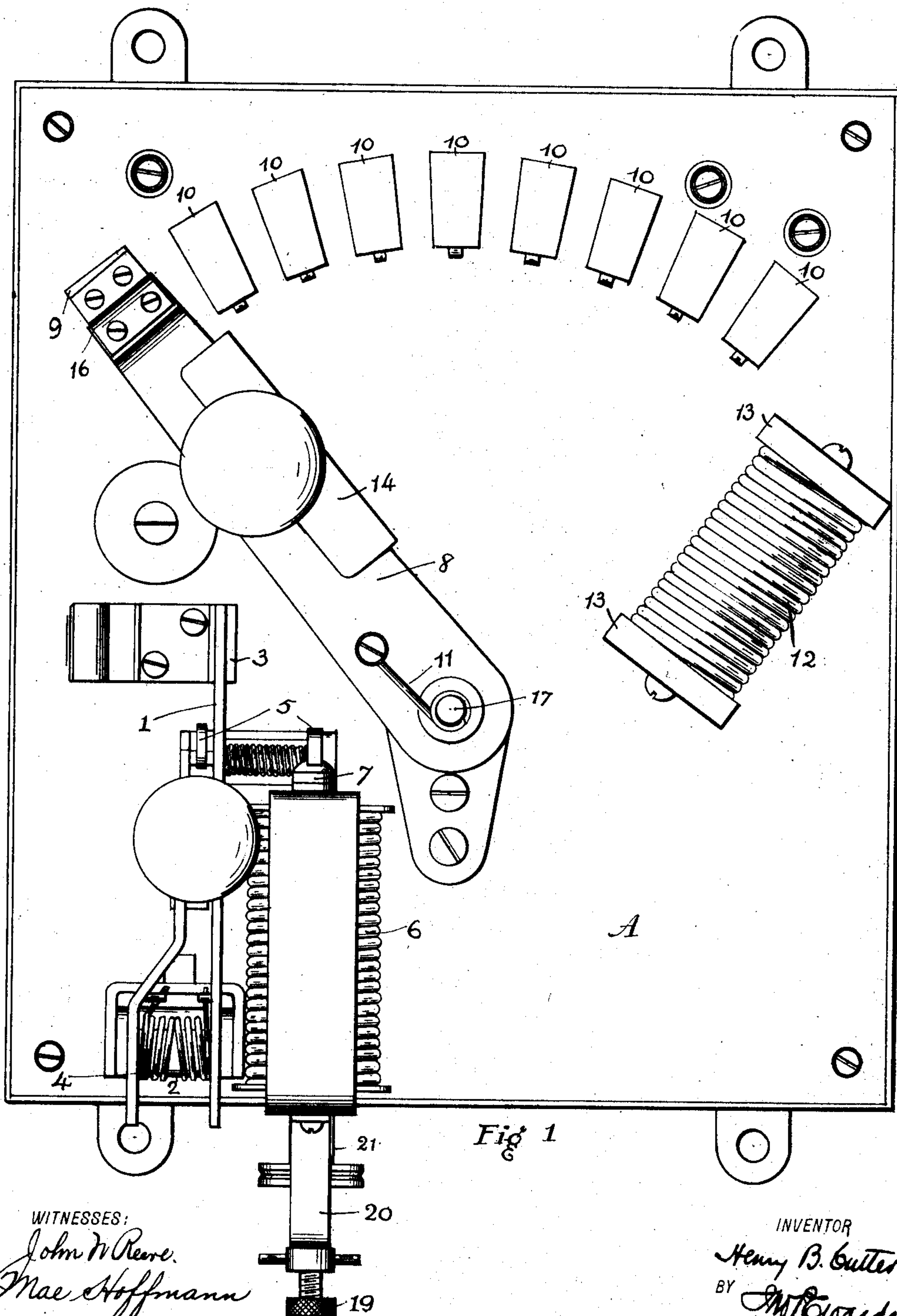
Patented Feb. 12, 1901.

H. B. CUTTER.
RHEOSTAT AND CIRCUIT BREAKER.

(Application filed Feb. 24, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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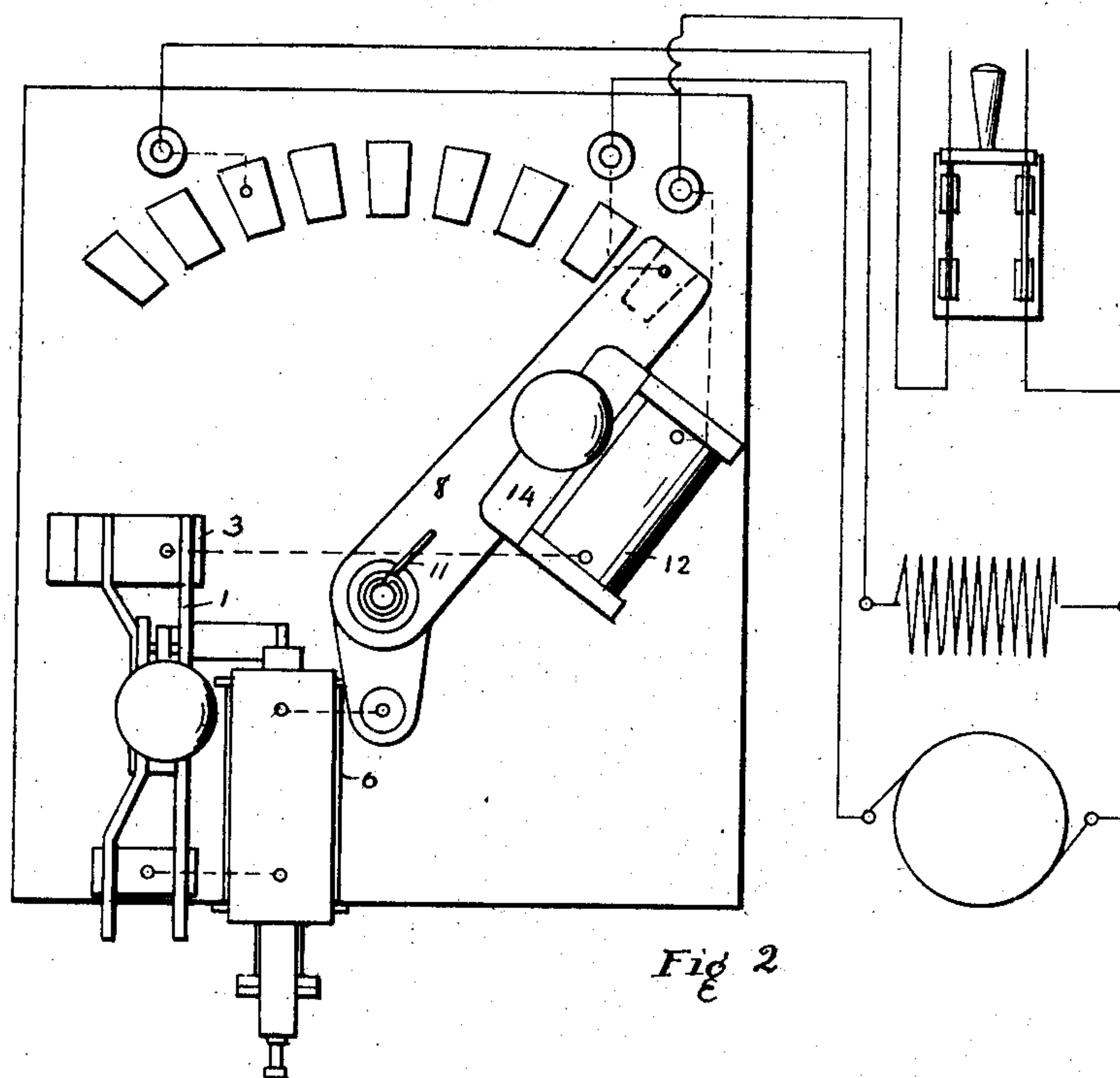


Fig 2

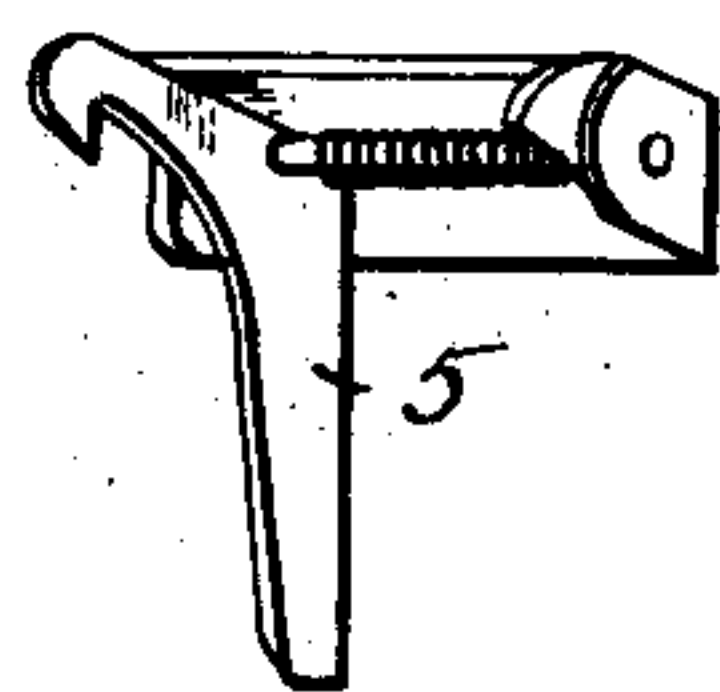


Fig 3

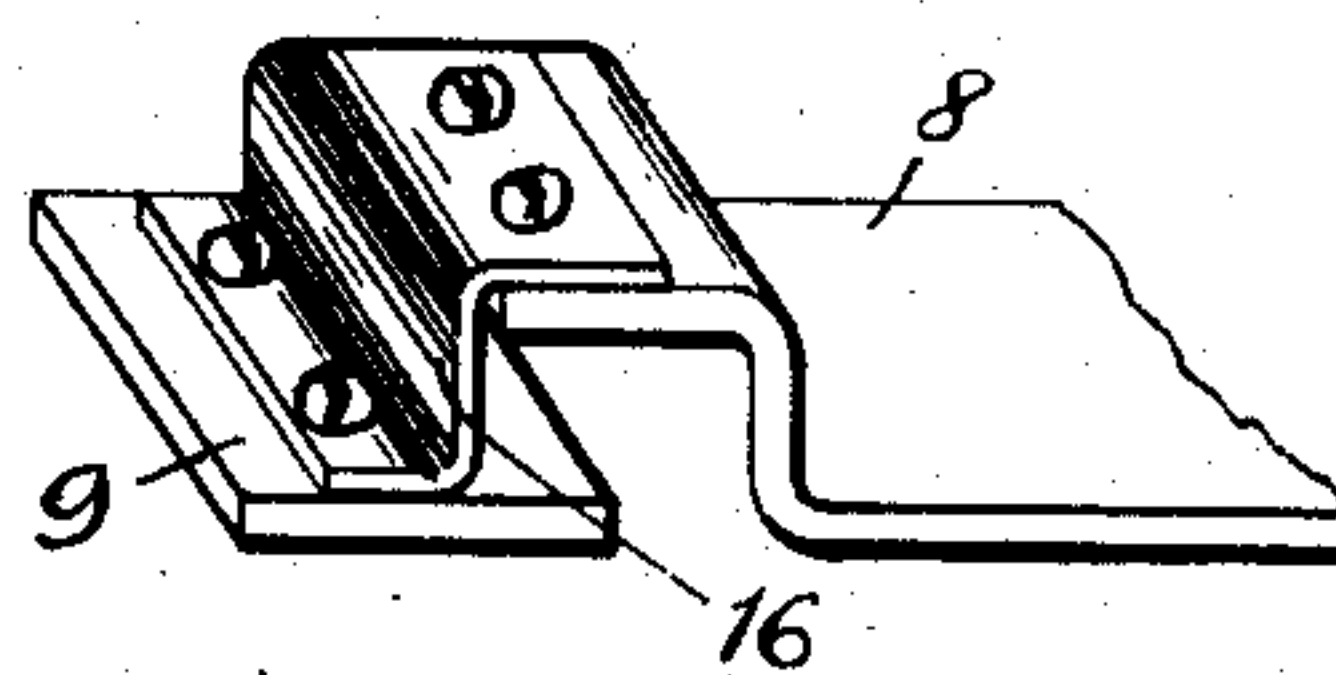


Fig 4

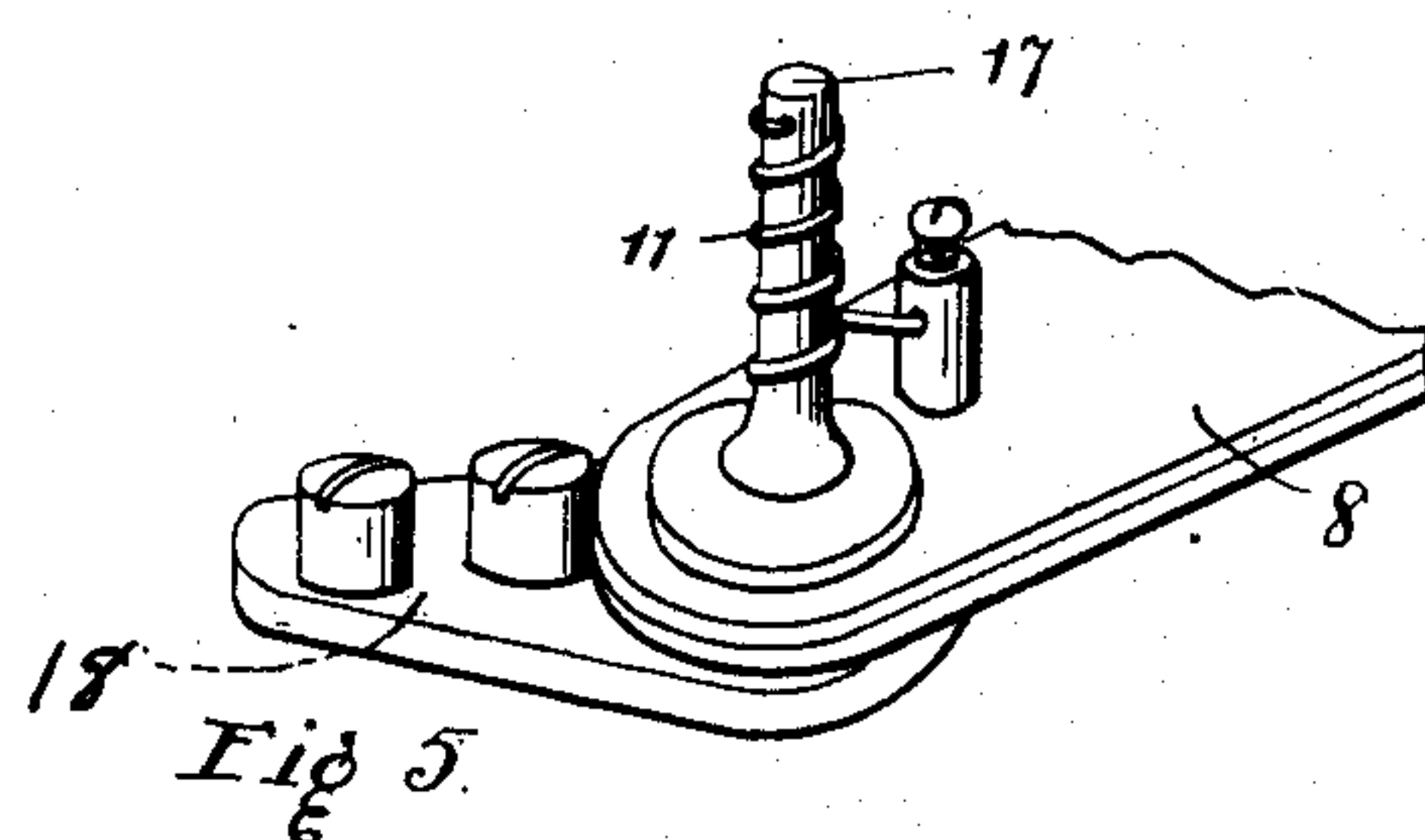


Fig 5

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UNITED STATES PATENT OFFICE.

HENRY B. CUTTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY
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RHEOSTAT AND CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 668,140, dated February 12, 1901.

Application filed February 24, 1899. Serial No. 706,631. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. CUTTER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Rheostat and Circuit-Breaker, of which the following is a specification.

My invention relates to automatic magnetic circuit-breakers in combination with resistance-controlling means.

My said invention comprises a novel combination of an automatic magnetic circuit-breaker, a spring-actuated resistance-controlling switch, and electromagnetic means for normally restraining said switch.

The object of my invention is to provide simple and efficient means for preventing injury to the translating device by abnormal flow either during the manipulation of the resistance-controlling switch or after the circuit is fully established, preventing the resistance from remaining cut out during the interruption of current, and thereby preventing any possibility of turning the current into the translating device, except through gradually-decreasing resistance.

My invention also includes certain improvements in details.

Referring to the drawings, Figure 1 is a plan view of my device. Fig. 2 is a diagrammatic view showing the paths of the current. Fig. 3 is a detail view in perspective showing the latch 5. Fig. 4 is a detail view of a part of the resistance-controlling switch; and Fig. 5 is a detail view of a portion of said switch-arm, the switch-supporting post, and post-supporting plate.

The various elements in my invention may be located upon a suitable base A, preferably of insulating material.

The automatic magnetic circuit-breaker consists of the switch 1, pivoted at 2 and adapted to engage with the contact 3. Coiled about the supporting-pivot is a spring 4, adapted to cause the separation of switch 1 from the contact 3. The latch 5 is adapted to engage said switch 1 normally to restrain its separation from contact 3. The solenoid 6 is adapted to actuate the movable core 21 to actuate the movable pin 7 to cause the

operation of latch 5 to release the switch 3. The knurled headed screw 19, carried by the stirrup 20, is adapted to adjust the position of the movable core 21 with respect to the amount of flow necessary to cause its actuation.

The resistance-controlling switch-arm 8 is pivotally mounted on post 17, so that its free end 9 is adapted to sweep the exposed contacts 10 of a resistance to close the circuit through said resistance, which is cut out step by step as the switch-arm is advanced. This switch-arm 8 is provided with a spring 11, coiled about post 17 and adapted to maintain said switch-arm in the initial or open-circuit- ed position, as shown in Fig. 1, when not restrained by the electromagnetic restraining means.

The electromagnetic restraining means consists of an electromagnet 12, so disposed and fixed that when energized its poles 13 are adapted to cooperate with the armature 14, carried upon resistance-controlling switch-arm 8 to hold said switch-arm in the position where all resistance is cut out.

In some cases it will be preferable to connect the coil of the circuit-breaker, the resistance-controlling switch, and the coil of the electromagnetic restraining means in the circuit, so that the deenergizing of the coil of the electromagnetic restraining means will be effected by the opening of the automatic magnetic circuit-breaker, in which case upon abnormal flow the automatic magnetic circuit-breaker will open and the electromagnetic restraining means will become inactive and release the resistance-controlling switch to return to its initial or open-circuited position, and it will therefore be impossible inadvertently to maintain the resistance cut out without first closing the automatic magnetic circuit-breaker. If after closing the automatic magnetic circuit-breaker it is attempted to cut out the resistance during the continuance of abnormal flow, the automatic magnetic circuit-breaker will again open the circuit. It will also be obvious that in case of interruption of current the electromagnetic restraining means will release the resistance-controlling switch and permit it to return to its ini-

tial or open-circuited position, and thus prevent injury to the translating device by the sudden reestablishment of the circuit.

By the means above described I dispense with the need for interlocking means for controlling the circuit-breaker or the need for having the switch of the circuit-breaker in any way dependent upon the movement of the controlling-switch.

While I have, for example, designated a specific arrangement for the electrical connection of the coil of the automatic magnetic circuit-breaker, the resistance-controlling switch, and the coil of the electromagnetic restraining means, I may obviously vary this arrangement without departing from the spirit of my invention, and therefore I do not wish to be limited to the exact arrangement above described.

In Fig. 4 is shown improved means for connecting a rigid contacting member 9 with the rigid pivoted member 8 of the resistance-controlling switch by the resilient piece of conducting material 16. By this means the rigid contacting member 9 is kept pressed firmly against the resistance-contacts. By reason of the form and disposition of the resilient piece 16 the contacting surface of member 9 is permitted to conform with the surface of the resistance contact or contacts 10, with which it may engage.

In Fig. 5 is shown in detail the supporting-post 17, upon which the resistance switch-arm 8 is pivoted and around which the spring 11 is coiled, and the supporting-plate 18, to which said post is secured. This supporting-plate

18 is adapted to be detachably secured to the front of the base A of the instrument, so that it may be readily removed therefrom without the necessity of removing the whole device or dismembering it of any of the other parts.

What I claim is—

1. The combination of a spring-actuated resistance-controlling switch, electromagnetic means for normally restraining the same, and an automatic magnetic circuit-breaker, the coil and switch of which carry the motor-actuating current.

2. The combination of a spring-actuated resistance-controlling switch, an automatic magnetic circuit-breaker, the coil and switch of which carry the motor-actuating current, and electromagnetic means, the circuit of which is controlled by the circuit-breaker, for normally restraining the resistance-controlling switch.

3. An automatic magnetic circuit-breaker consisting of separable cooperative contacts, means for causing their separation, means for normally restraining the separating means and electromagnetic means for actuating the restraining means, in combination with a spring-actuated resistance-controlling switch in series with the contacts of the circuit-breaker, but mechanically independent of the circuit-breaker, and electromagnetic means for normally restraining the resistance-controlling switch, substantially as described.

HENRY B. CUTTER.

Witnesses:

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