No. 729,323. PATENTED MAY 26, 1903.

H. GARRETT.

CIRCUIT BREAKER FOR STORAGE BATTERIES.

APPLICATION FILED AUG. 5, 1902.

NO MODEL.

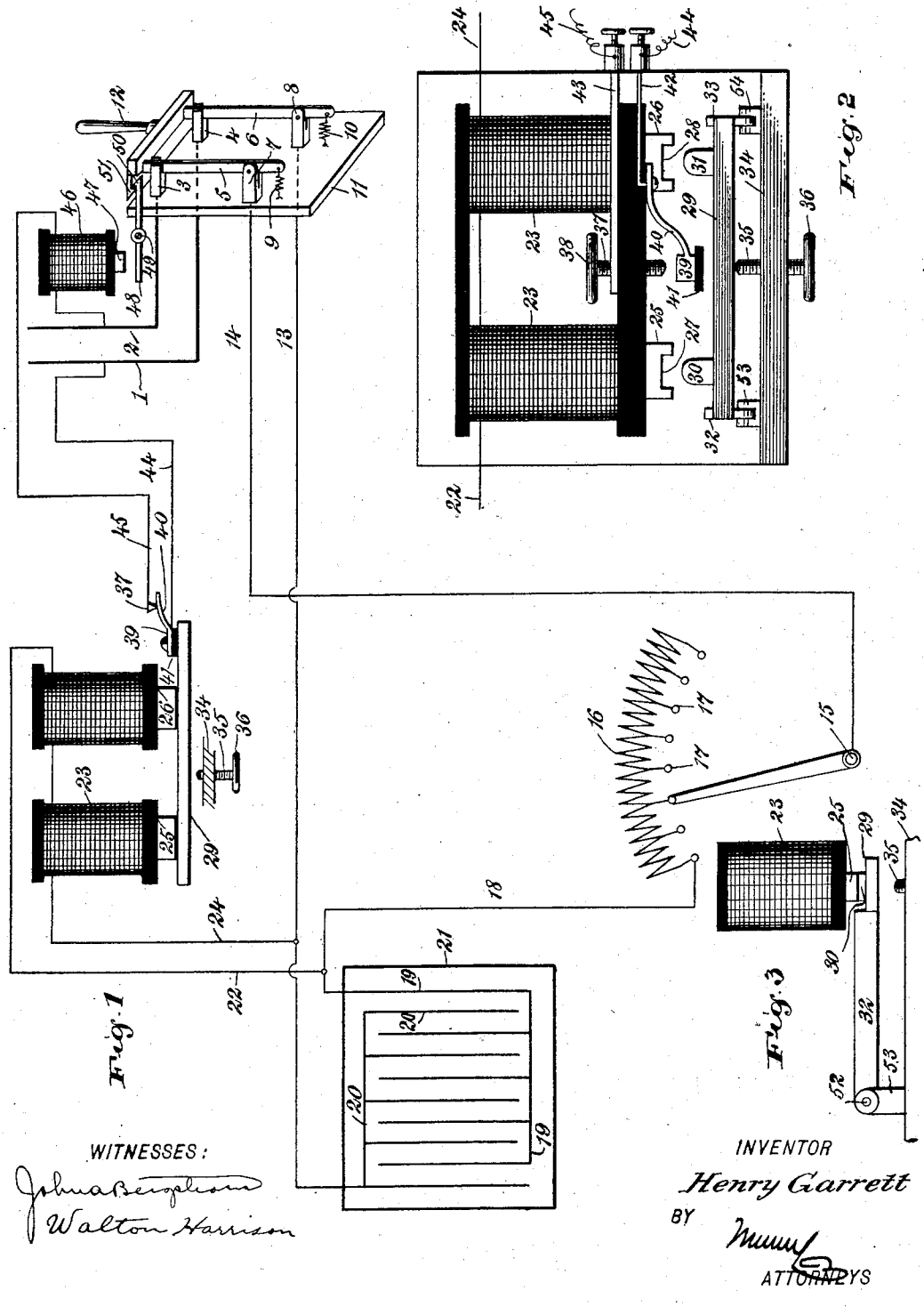


Fig. 1

Fig. 2

Fig. 3

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No. 729,323. Patented May 26, 1903.

UNITED STATES PATENT OFFICE.

HENRY GARRETT, OF DALLAS, TEXAS.

CIRCUIT-BREAKER FOR STORAGE BATTERIES.

SPECIFICATION forming part of Letters Patent No. 729,323, dated May 26, 1903.

Application filed August 5, 1902. Serial No. 118,483. (No model.)

To all whom it may concern:

Be it known that I, HENRY GARRETT, a citizen of the United States, and a resident of Dallas, in the county of Dallas and State of Texas, have invented a new and Improved Circuit-Breaker for Storage Batteries, of which the following is a full, clear, and exact description.

My invention relates to an improved circuit-breaker for storage batteries—that is to say, an appliance whereby the circuit is automatically broken when the storage battery has become fully charged.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a diagram showing my device complete. Fig. 2 is an elevation showing a relay forming part of my invention, and Fig. 3 is a side elevation of the armature and its connections and the magnet shown at the left in Fig. 1 and also in Fig. 2.

The feed-wires or mains 1 2 are connected with the bifurcated contacts 3 4, which are engaged by the knife-contacts 5 6, the contacts being pivoted upon bifurcated posts 7 8 and secured to springs 9 10, all of these last-mentioned parts being mounted upon a board 11. A handle 12 is used for operating the knife-contacts 5 6, the several contacts and this handle together constituting a very efficient form of switch. From the post 7 a wire 14 runs to the arm 15 of the rheostat 16, which is provided with contacts 17. From the rheostat a wire 18 runs to one of the battery-plates 19, thus constituting a terminal for the battery. The other battery-plate 20 is connected, by means of a wire 13, with the post 8. The battery-cell or containing vessel is indicated at 21. To the wires 13 and 18 are connected shunt-wires 22 24 for the purpose of energizing the magnet 23. This magnet is provided with cores 25 26, having apertures 27 28, as indicated in Fig. 2, and an armature 29 is provided with studs 30 31 for engaging these apertures. The armature 29 is mounted upon the arms 32 33, pivoted at 52 upon the posts 53 54, so as to swing radially, thereby being free to move with a minimum of friction. The armature 29 is adjustable by means of a screw 35, operating in a base-bar 34 and provided with a handle 36. A somewhat similar screw 37, provided with a handle 38, is mounted between the poles of the magnet, as shown in Fig. 2. A contact-head 39, mounted upon a leaf-spring 40, is provided with insulation 41 and is engaged by the screw 37 when the armature 29 is drawn into contact with the insulation 41. The electrodes 42 43 are thus electrically connected together each time the magnet 23 is energized. Wires 44 45 are connected with the electrodes mentioned and are also connected in shunt with the main circuit. For this purpose the wire 44 is joined directly to the feed-wire 1, while the wire 45 runs to the magnet 46 and thence to the feed-wire 2.

The magnet 46 is provided with a core 47, adjacent to which is an armature 48, mounted to rock upon the pivot 49 and provided with a latch or hook 50, which engages the member 51, forming a movable part of the switch. When the magnet 46 attracts the armature 48, the hook 50 is disengaged from the member 51, whereupon the springs 9 10 cause the switch to open, the handle 12 inclining radially to the right. The main circuit is thus left open. The magnets 23 and 46 should be of high resistance, so as to avoid wasting the current.

The operation of my device is as follows: The current being turned on through the mains or feed-wires 1 2, the rheostat is properly adjusted and the storage battery is charged. At the beginning of the charging process there is comparatively little difference between the potential of wires 13 and 18, for the reason that the battery is absorbing the current nearly as fast as the same is supplied. When, however, the battery is partially charged, the potential between the wires 13 and 18 begins to increase, for the reason that the battery begins to exert back pressure. The shunt-wires 22 24 therefore begin to energize the magnet 23, causing the same to exert more or less stress upon the armature 29. When the battery is completely charged, the voltage passing through the wires 22 24 is sufficient to cause the mag-

net 23 to draw the armature 29 toward it, thus forcing the studs 30 31 into the apertures 27 28 and causing the head 39 to make contact with the screw 37, thus closing the local circuit through the magnet 46—that is to say, the current flows from one of the mains through the wire 44, contact 39, screw 37, wire 45, and magnet 46 to the other main. The magnet 46 being thus energized attracts the armature 48, thereby releasing the switch, as above explained, and opening the main circuit between the feed-wires 1 2, thus stopping the charging of the storage battery.

The screws 35 and 38 are used for rendering the armature 29 more or less sensitive to voltage, rendering it possible to have the current cut off at any predetermined voltage. The relay is now shown fully in Fig. 1, for the reason that this figure is merely intended as a diagram.

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

1. A circuit-breaker for storage batteries, comprising feed-wires of opposite sign to be connected with the battery-terminals, switch mechanism for connecting and disconnecting said feed-wires, electrically-operated mechanism connected by a normally open shunt-circuit with said switch mechanism for controlling the same, and electrical relay mechanism connected with said mains of opposite sign and energized thereby, said relay mechanism having a contact connected with said shunt-circuit for energizing the same.

2. A circuit-breaker for storage batteries, comprising feed-wires of opposite sign to be connected with the battery-terminals, switch mechanism for connecting and disconnecting said feed-wires, and relay mechanism for controlling said switch mechanism, said relay mechanism being provided with main and local terminals connected in parallel with said feed-wires.

3. A circuit-breaker for storage batteries, comprising feed-wires of opposite sign to be connected with battery-terminals, switch mechanism for connecting and disconnecting said feed-wires, electrically-operated mechanism connected by a normally open circuit with said switch mechanism for actuating the same, electrical relay mechanism connected with said mains of opposite sign and energized thereby, said relay mechanism having a contact connected with said normally open circuit for energizing the same, and mechanism controllable at will for governing the sensitiveness of said electrical relay mechanism.

4. A circuit-breaker for storage batteries, comprising feed-wires of opposite sign to be connected with the storage-battery terminals, switch mechanism for connecting and disconnecting said feed-wires, relay mechanism for controlling said switch mechanism, said relay mechanism being provided with main and local terminals, said main and local terminals being connected in shunt with said feed-wires, and a rheostat for controlling differences in the current in the main circuit of said relay mechanism.

5. A circuit-breaker for storage batteries, comprising feed-wires of opposite sign to be connected with battery-terminals, switch mechanism for connecting and disconnecting said feed-wires, electrically-operated mechanism connected by a normally open circuit with said switch mechanism for actuating the same, electrical relay mechanism connected with said mains of opposite sign and energized thereby, said relay mechanism having a contact connected with said shunt-circuit for energizing the same, and a manually-operated rheostat connected with said battery and coacting therewith for governing the sensitiveness of said electrical relay mechanism.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY GARRETT.

Witnesses:
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