

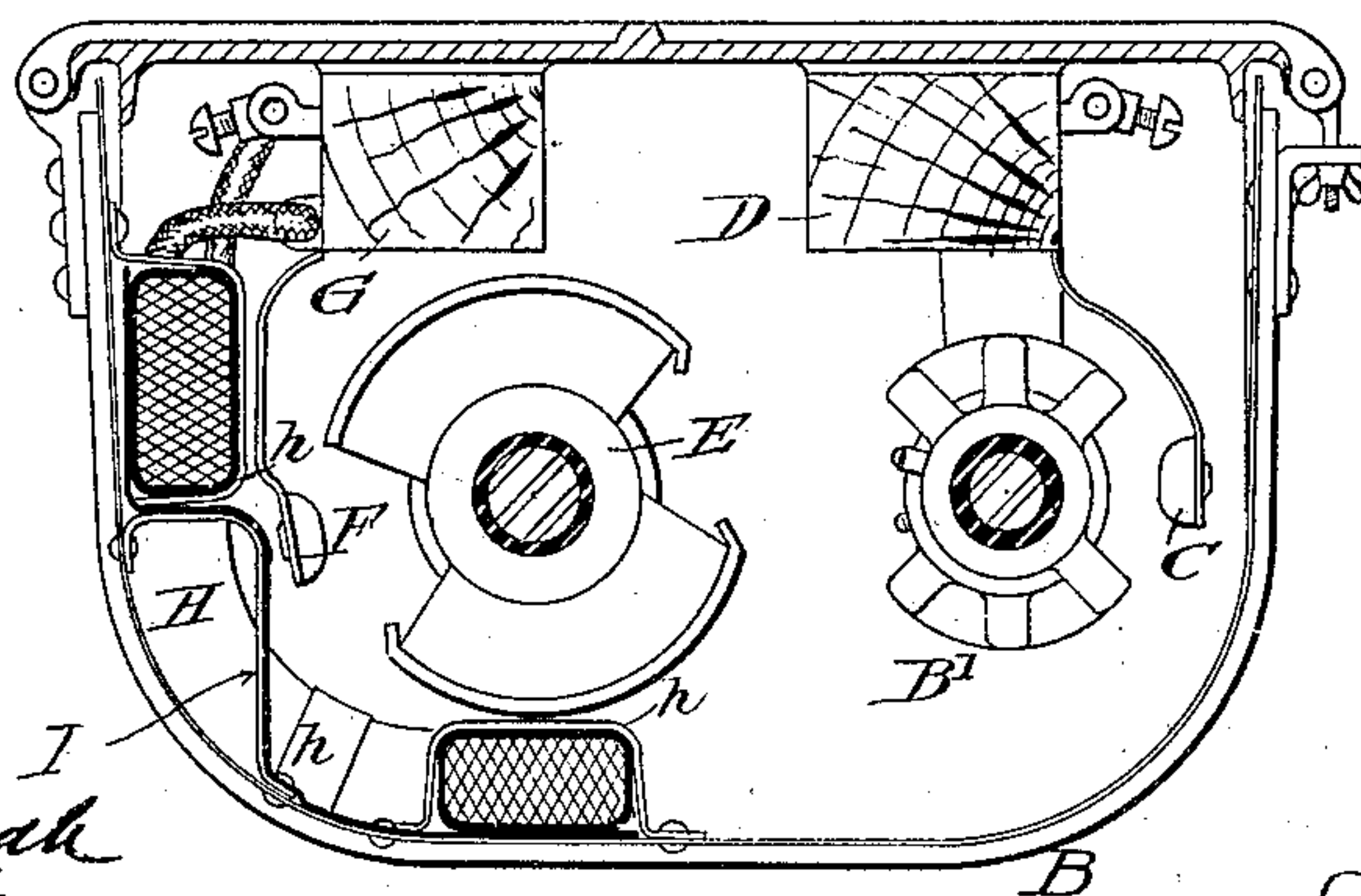
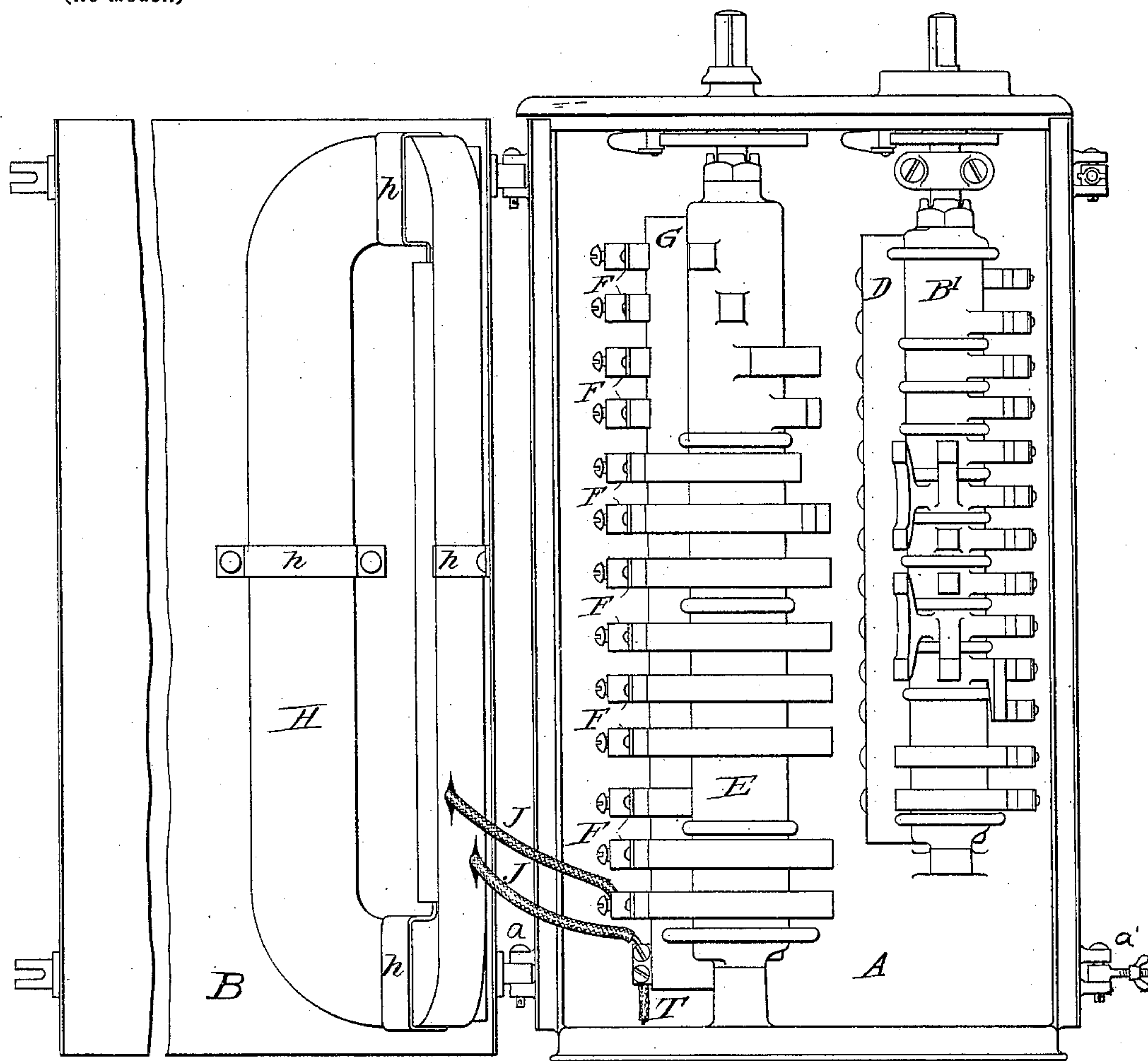
**No. 678,914.**

**Patented July 23, 1901.**

**E. W. STULL.**  
**CONTROLLER FOR ELECTRIC MOTORS.**

(Application filed Jan. 14, 1901.)

(No Model.)



WITNESSES :

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# UNITED STATES PATENT OFFICE.

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## CONTROLLER FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 678,914, dated July 23, 1901.

Application filed January 14, 1901. Serial No. 43,160. (No model.)

*To all whom it may concern:*

Be it known that I, EMMETT W. STULL, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Controllers for Electric Motors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has relation to certain new and useful improvements in controllers for electric motors, and more particularly to means of the character generally known as "magnetic blow-outs" for extinguishing arcs formed at the controller-contacts.

The object of my invention is to so arrange and dispose of the blow-out coil within the controller-casing as to secure a maximum efficiency in its action without obstructing access to the contact-fingers for purposes of adjustment, &c. I have found it very desirable in order to obtain the greatest efficiency from a magnet of given strength to make the coil embrace or surround a portion of the periphery of the contact-carrying drum in such a manner that the contact ends of the contact-carrying fingers shall be located at or near one of the poles in a space threaded by the greatest number of lines of force passing in a direction perpendicular to the direction of arcs which form between the fingers and the contacts. It is impossible, however, in many controllers to provide a magnet constructed and arranged in this manner without placing the coil in the way of access to the said fingers, which is a serious objection to the controller, and in such cases it becomes necessary to resort to a less efficient arrangement of the coil.

My present invention avoids this objection in a very simple manner by causing the blow-out coil to be attached to a movable or removable (preferably hinged) portion of the controller-casing, so that when the said portion is moved or removed to gain access to the interior the coil is moved bodily therewith entirely out of the way.

My invention also consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, to which reference is had, Figure 1 is a front elevation of a controller embodying my invention with the movable or door portion of the casing swung open, and Fig. 2 is a transverse horizontal section of the same with the said portion closed.

The controller-casing consists of a back portion A and a front portion B, which in the construction shown is connected to the back portion by hinges *a* at one of its vertical edges, its opposite edge being provided with detachable fastenings *a'*, which can be disengaged to permit the portion B to be swung open on said hinges to the position shown in Fig. 1.

B' designates the reversing-switch of the controller; C, one of the contact-fingers thereof; D, the finger-board to which said fingers are attached.

E is the drum of the regulating-switch, which is of the usual mechanical type and composed largely of magnetic material.

F designates the contact-fingers for engagement with the said drum, and G is the finger-board to which they are attached.

H designates the blow-out coil, which is a closed coil having its two limbs or branches in planes at right angles to each other. This coil is secured to the movable or door portion in vertical position by any suitable means, as by straps *h*. Between these two limbs or branches the part is provided with a reinforcement I, of magnetic material, extending practically the full height of the coil and forming a pole-piece adjacent to the series of contact-fingers F, as clearly shown in Fig. 2. The coil is connected in series with the motor-circuit by means of flexible leads J, having sufficient slack to permit the door to be opened in the manner described. One of these leads is connected with the trolley side of the circuit at T, and the other is connected to the lowermost contact-finger F.

It will be noted that the coil H practically surrounds a portion of the periphery of the drum E, since a straight line connecting the outer corner portions of its two limbs or branches will intersect the periphery of the drum chordwise; also, that a line connecting the centers of the two limbs or branches will



pass directly through the vertical plane of the contact-fingers F. It will be apparent, therefore, that these fingers are located in the densest part of the magnetic circuit, with the lines of force passing in such a direction that a very powerful blow-out effect will be exerted upon any arcs which may form between said fingers and the contacts of the drum. In case it is desired to obtain access to said fingers at any time for the purpose of adjusting or replacing them the very act of opening the controller-casing will move the blow-out coil bodily out of the way and leave said fingers and their connections to the finger-board perfectly exposed. The manner in which the coil is arranged increases but very little, if any, the size of the controller-casing.

It will be obvious that instead of hinging the portion B of the casing it may be made bodily removable; also, that other mechanical changes may be made in the parts without departing from the spirit and scope of my invention. Hence I do not wish to be limited to the precise construction, arrangement, and combination of parts which I have herein shown and described.

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

1. In a controller, the combination with a controller-casing having a movable portion, of a blow-out coil attached to and movable with said portion.

2. In a controller, the combination with a controller-casing having a movable or door portion, of a blow-out coil attached to and movable with said movable or door portion.

3. In a controller, the combination with a rotatable contact-carrying member, and a series of fixed contact-fingers for engagement therewith, of a casing in which said member

is journaled having a removable or door portion, and a blow-out coil attached to and removable with said portion and surrounding or embracing a portion of said drum.

4. In a controller, the combination with a rotatable contact-carrying member, and a series of fixed contact-fingers for engagement therewith, of a casing in which said member is journaled having a removable or door portion, a blow-out coil secured to and movable with said portion, and flexible conductors connecting said coil with fixed terminals of the controller.

5. In a controller, the combination with a casing having a removable or door portion, of a contact-carrying drum, a series of contact-fingers for engagement with the contacts of the said drum, and a blow-out coil attached to the said removable or door portion, and surrounding or embracing a portion of the periphery of the drum, said fingers having their contact ends situated between the two limbs of said coil.

6. In a controller, the combination with a casing having a removable or door portion, of a closed blow-out coil secured to said door with its two vertical legs or branches in planes at right angles to each other.

7. In a controller, the combination with a casing having a removable or door portion, of a blow-out coil secured to said portion and movable therewith, said portion also having thereon a pole-piece between the two legs of the coil.

In testimony whereof I have affixed my signature in presence of two witnesses.

EMMETT W. STULL.

Witnesses:

CORA G. COX,  
H. W. SMITH.