(No Model.)

# O. F. GREIM.

## ELECTRIC CIRCUIT CONTROLLER.

No. 384,440. Patented June 12, 1888.

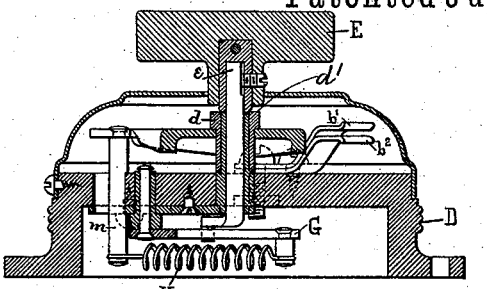


FIG. 1

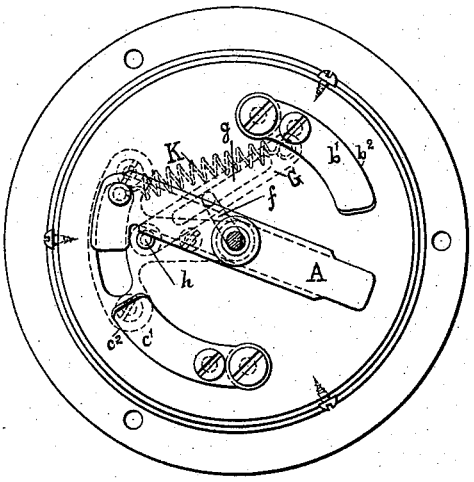


FIG. 2

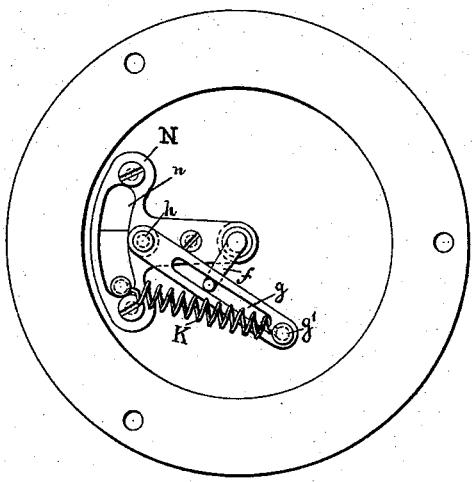


FIG. 3.

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# UNITED STATES PATENT OFFICE.

OTTO F. GREIM, OF NEWARK, NEW JERSEY.

## ELECTRIC-CIRCUIT CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 384,440, dated June 12, 1888.

Application filed December 31, 1887. Serial No. 259,451. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO F. GREIM, a citizen of the United States, residing in Newark, in the county of Essex, in the State of New Jersey, have invented certain new and useful Improvements in Electric-Circuit Controllers, of which the following is a specification.

The invention relates to the class of devices employed for completing and interrupting the connections of an electric circuit.

The object of the invention is to provide a circuit-controlling device which will, by a positive automatic movement of the contact-piece, either make or break the connections, as desired, with absolute certainty and quickly, thereby preventing the burning or oxidizing of the contact-points.

The invention consists in employing a contact-piece which is movable independently of the key, which serves to shift it from one to the other of its positions, and which will move quickly from one position to the other when the key is moved beyond a certain point. This movable contact-piece is placed between two pairs of contact springs or points. A tension-spring is strained between one end of the contact-piece and a movable lever, which is adapted to shift one end of the spring, so that it will pull the contact-piece in one direction or the opposite. The lever is operated by means of a key carrying a crank-arm which passes through a slot in the lever. The slot is of such length as to allow the key to be turned in either direction with the same result.

I do not claim, broadly, in an electric switch, the combination of a pivotal primary actuating device, a pivotal contact-bar, and a spring having its opposite extremities respectively connected to said two members eccentrically, said primary actuating device having a range of pivotal movement wherein the line of said two spring-connected points may pass, respectively, to opposite sides of the line of the pivotal axis of the contact-bar.

In the accompanying drawings, Figure 1 is a transverse section, Fig. 2, a plan view, partly in section, and Fig. 3, a reverse view, of the device.

Referring to the figures, A represents a suitable contact-piece. The respective ends of this piece are provided with contact plates or springs, as shown at $b'$ $b^2$ and $c'$ $c^2$. These may constitute the terminals of an electric circuit. The ends of the lever preferably pass between these springs, which may be more or less resilient for the purpose of insuring good electrical connections. The contact-piece is pivoted upon a hollow post or quill, *d*, extending from the base-plate D. Through this post there extends an arm, *e*, carrying a key, E. A bush, *d'*, may intervene between the arm *e* and quill *d*. The inner end of this arm is provided with a short crank, *f*, which extends into a slot, *g*, formed in a plate or lever, G. This plate is pivoted at one end to the under side of the base D, as shown at *h*. It is evident that by turning the key E in either direction the lever G will be turned alternately in opposite directions upon its pivot *h*.

At the free end of the lever G there is attached one end of a spring, K. The other end of this spring is secured to an arm or post, *m*, which is fixed to one end of the circuit-closing piece A. This post *m* passes through a curved slot, *n*, in the base-plate, and this slot is preferably faced by a metal plate, N, though this may not always be necessary. The length of the slot *n* is such as to allow the piece A to be brought into contact with the respective springs $b'$ $b^2$ and $c'$ $c^2$ on the one hand, and to be carried a sufficient distance therefrom to insure the complete interruption of the circuit-connections and all danger of sparking on the other hand.

It is evident that if the key E be turned sufficiently to carry the lever G a sufficient distance to bring the free end $g'$ into such position that the spring K will draw upon the opposite side of the pivot *h*, then the latter will be immediately drawn across to the opposite limit of its excursion, and this movement will be constant and uninterrupted the moment the spring has reached such a position. It is further evident that the key may be turned in either direction and still produce the same result, and that it cannot be left in such position as to allow the circuit to be partially or incompletely closed.

I claim as my invention—

1. The combination of a movable contact-piece, a coil-spring for moving the same in one direction or the opposite, according to the

direction of stress exerted thereby, a pivoted support for one end of the spring, and a crank-pin coupled with said support for moving the same, substantially as described.

2. A circuit-closing device consisting of a movable contact-piece, stationary contact-points, a coil-spring for actuating said contact-piece by throwing the same into and out of contact with said contact-points, a pivoted actuating-lever to which one end of the spring is connected for shifting the point of its support and its consequent direction of tension upon the contact-piece, a key for actuating the lever, and a connection between the key and the lever consisting of a crank-pin passing through a slot in the lever.

3. The combination of a movable contact-piece, contact-points for the same constituting the terminals of an electric circuit, a spring attached at one end to the contact-piece, a pivoted lever to the other end of which the remaining end of the spring is attached, said lever having a longitudinal slot and its point of support being intermediate between the ends of the spring, and a crank-pin passing through said slot, whereby the lever may be turned in either direction to carry the point of attachment of the spring upon one side or the other of the point of attachment of the lever.

4. In a circuit-controller, the combination of the movable piece A and its contact-points, the lever G, the spring K, attached at one end to the contact-piece and at the other end to the lever, the key E, and the crank *f*, moved thereby and engaging the lever G, substantially as described.

5. In a circuit-controlling device, the combination, with the base and the key pivoted thereon, of a movable contact-piece surrounding the axis of the key and movable independently thereof, a pivoted lever, a spring connecting the lever and the contact-piece, and a crank-pin operated by the key for moving said lever in one direction or the opposite, thereby changing the direction of pull exerted by the spring upon the contact-piece.

In testimony whereof I have hereunto subscribed my name this 30th day of December, A. D. 1887.

OTTO F. GREIM.

Witnesses:
DANL. W. EDGECOMB,
CHARLES A. TERRY.