

W. H. DURFEE.
CIRCUIT CONTROLLER.
APPLICATION FILED APR. 22, 1911.

1,034,000.

Patented July 30, 1912.

Fig. 1.

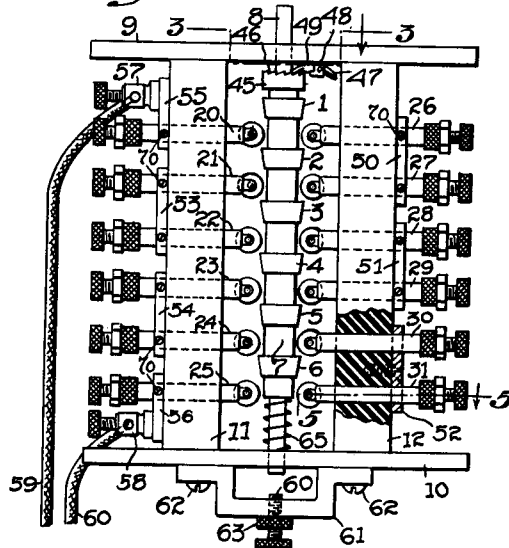


Fig. 2.

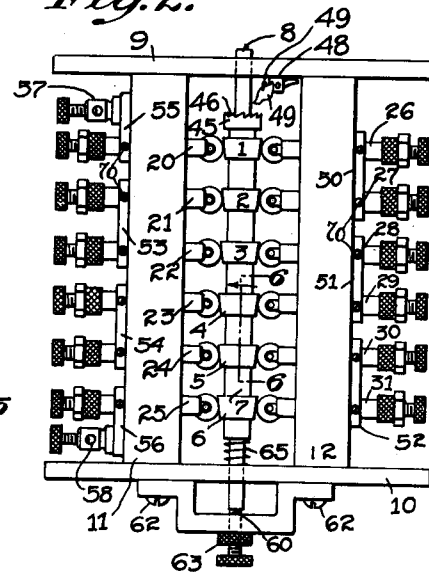


Fig. 3.

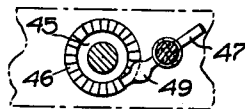


Fig. 5.

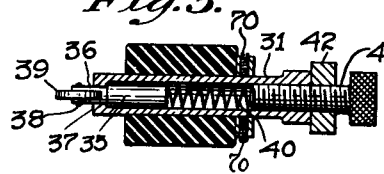


Fig. 4.



Fig. 6.

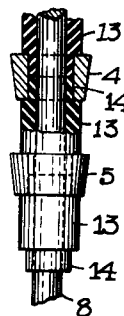
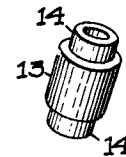


Fig. 7.



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CIRCUIT-CONTROLLER.

1,034,000.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER H. DUFFEE, a citizen of the United States, residing in Providence, county of Providence, and State of Rhode Island, have invented an Improvement in Circuit-Controllers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a multiple break circuit controller of that class in which a plurality of movable contact members are mounted on a carrier, which is movable with relation to a plurality of stationary contact members, some of which are electrically connected together to establish a series relation of said stationary and movable members in the closed condition of the circuit controller.

The present invention has for its object to improve the efficiency, reliability and life of circuit controllers of the class referred to. To this end, the carrier for the movable contact members is provided with a core of rigid material, preferably a steel rod, upon which the movable members are mounted and insulated therefrom and from each other, as will be described. Provision is made for obtaining a superior electrical connection between the movable and stationary contact members as will be described. Provision is also made for insuring the operativeness of the contact members as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of a multiple break circuit controller embodying this invention. Fig. 2, a like view with the movable contact members in their closed position. Fig. 3, a sectional detail on the line 3-3, Fig. 1. Fig. 4, a detail of the pawl to be referred to. Fig. 5, a section on an enlarged scale, taken on the line 5-5, Fig. 1. Fig. 6, a detail in elevation and section, the latter being taken on the line 6-6, Fig. 2, and Fig. 7, a detail to be referred to.

In the present instance, the invention is shown as embodied in a circuit controller having six movable contact members, which cooperate with six pairs of stationary contact members. The movable contact members 1, 2, 3, 4, 5, 6, are mounted upon a sleeve or cylinder 7 of insulating material, preferably made in sections as herein shown

and fitted on a steel rod 8, which is supported and guided by the top and bottom metal bars 9, 10, secured to interposed bars or pieces 11, 12, of insulating material. The movable contact members are preferably made of silver and in the form of rings having beveled or conical outer surfaces.

The sections of the insulating sleeve or cylinder 7 are preferably made as shown in Fig. 7, except the lowermost section, and each consists of a tubular body portion 13 of substantial thickness and having reduced portions 14, which project from the opposite ends of the body portion 13, and are made of a length substantially equal to one half the length of the movable contact members, so that, when the movable contact members and the sectional insulating sleeve are fitted together as represented in Fig. 6, each metal ring is confined between the body portions of adjacent sections, and said rings are electrically separated from one another and from the metal rod 8 by insulation of substantial thickness, without unduly enlarging the diameter or size of the movable contact member and its carrier.

The insulating side bar 11 supports six stationary contact members numbered 20, 21, 22, 23, 24, 25, which cooperate with stationary contact members 26, 27, 28, 29, 30, 31, supported by the insulating side bar 12. The stationary contact members are arranged in pairs on opposite sides of the movable contact members, and in order to obtain a superior electrical connection between said contact members, each of the stationary contact members is preferably made as shown in Fig. 5, and consists of a metal tube provided within it with a plunger 35, having a reduced end portion 36 extended through a hole in the head 37 of said tube, and carrying the shaft 38 of a contact wheel or roller 39, preferably of silver. The plunger 35 is engaged by a spring 40 within the metal tube, whose tension or pressure is regulated by an adjusting screw 41, which is in threaded engagement with the interior of the metal tube and has cooperating with it a lock nut 42, which serves to lock the screw 41 and thereby maintain the contact wheel 39 under the proper spring pressure, after the latter has been once adjusted, thereby preventing defective contact by the screw 41 being moved by jars, vibration or accident, or working of the circuit controller. To still further insure good elec-

trical contact between the movable and stationary contact members, provision is made for presenting a fresh or new surface of the movable member for engagement with the stationary members after each operation of the circuit controller. This result may be accomplished as herein shown, by providing the carrier for the movable contact members with a disk or wheel 45 fitted upon the reduced end of the uppermost section of the insulating sleeve 7, and having on its upper surface ratchet teeth 46, with which coöperates a pawl 47, pivoted at 48 to the top bar 9 and having its front end provided with a weight 49, herein shown as an enlargement of the pawl. On the downward movement of the carrier for the movable contact members, the ratchet wheel is moved away from the pawl and the latter assumes a more vertical position as represented in Fig. 2, and its front end is brought into position to engage a different tooth of the ratchet wheel, so that, when the said carrier is moved upward, the pawl will be engaged by the ratchet wheel and be carried up with it, and in this upward movement of the pawl, the latter will effect a limited rotary movement of the carrier for the movable contact members, which movement is sufficient to bring a new portion of the movable members into position to engage the contact wheels 39 on the next downward movement of the said carrier. In this manner, a superior electrical contact is obtained, and the life of the circuit controller is prolonged.

The stationary contact members are connected together so as to obtain a series relation of the same when the circuit controller is closed, and for this purpose, the members 26, 27, are connected by a plate 50; the members 28, 29 by a plate 51; the members 30, 31, by a plate 52, the members 21, 22 by a plate 53, and the members 23, 24 by a plate 54. The members 20, 25 are respectively connected by plates 55, 56, with binding posts 57, 58, to which the circuit wires 59, 60 are secured.

The downward movement of the carrier for the movable members may be limited by a set screw 60 extended through a yoke 61 fastened by screws 62 to the bottom bar 10, and said screw may be secured in its adjusted position by the lock-nut 63.

The carrier for the movable contact members may be moved in one direction to close the circuit controller, by pressure applied to the upper end of the core or rod 8, and may be moved in the opposite direction to open said circuit controller by a spring 65 encircling the lower end of the metal rod 8 between the insulating sleeve 7 and the bottom bar 10.

The sleeve 7 of insulating material and the core or rod 8 constitute a carrier for the movable contact members, and by making

the core 8 as a steel rod, warping or distortion of the said carrier is avoided, and consequently liability of the movable members getting out of alinement is prevented, which insures reliable operation of the circuit controller.

Each stationary contact member is capable of being moved longitudinally to initially adjust the same with relation to the movable contact member, and may be secured in this adjusted position by screws 70 in the metal plate through which the tube of the stationary member is passed. In the present instance, the upward movement of the movable member is limited by the pawl striking the top bar 9.

Claims:

1. In a circuit controller of the character described, in combination, a framework comprising top and bottom metal bars and interposed side bars of insulating material separated from each other, a plurality of sets of stationary contact members carried by said insulating side bars, means for electrically connecting together some of said contact members in series relation, contact rollers carried by said stationary contact members, a plurality of movable contact members interposed between said stationary contact members and coöperating with said rollers, a sleeve of insulating material composed of sections having reduced end portions upon which said movable contact members are mounted, a steel rod guided by said top and bottom bars and upon which said sleeve is mounted, a spring to move said rod and sleeve in one direction to open the circuit controller, a ratchet wheel carried by said rod, and a pawl coöperating with said ratchet wheel to effect rotary movement of said rod and sleeve when said rod and sleeve are moved by said spring, substantially as described.

2. In a circuit controller of the character described, in combination, a plurality of movable contact members, a carrier for said members comprising a sleeve of insulating material composed of sections connected together by said movable contact members and a metal core upon which said sleeve is mounted, and contact members coöperating with said movable contact members.

3. In a circuit controller of the character described, in combination, a plurality of movable contact members, a carrier therefor rotatable and bodily movable in the direction of its length, contacts coöperating with said members, a ratchet wheel on said carrier, and a pawl coöperating with said ratchet wheel and rendered effective by the bodily movement of the carrier in one direction to engage a new tooth of the ratchet wheel and effect rotation of said carrier when the latter is moved bodily in the opposite direction, substantially as described.

4. In a circuit controller of the character described, in combination, a plurality of movable contact members, a carrier therefor capable of being moved bodily in the direction of its length and of being rotated, contact members coöperating with the contact members on said carrier, and means rendered effective by bodily movement of said carrier in one direction for automatically effecting rotary movement of said carrier when the carrier is moved bodily in the opposite direction, substantially as described.

5. In a circuit controller of the character described, in combination, a plurality of contact members comprising metal rings, a sleeve of insulating material composed of sections having reduced end portions extended into said metal rings, a core of rigid material upon which said sleeve is mounted, and contact members coöperating with said rings, substantially as described.

6. In a circuit controller of the character described, in combination, a plurality of contact members comprising metal rings, a sleeve of insulating material composed of sections having reduced end portions extended into said metal rings, a core of rigid material upon which said sleeve is mounted, and contact members coöperating with said rings and provided with rollers to engage said rings, substantially as described.

7. In a circuit controller of the character

described, in combination, a plurality of movable contact members, a carrier therefor capable of being moved bodily in the direction of its length and of being rotated, contact members coöperating with the contact members on said carrier, and means rendered effective by bodily movement of said carrier in one direction for effecting rotary movement of said carrier, when the latter is moved in the opposite direction, substantially as described.

8. In a circuit controller of the character described, in combination, a rigid core bodily movable in the direction of its length, a sleeve of insulating material mounted on said core and a contact member mounted on said sleeve, means rendered effective by bodily movement of the said core and sleeve in one direction for automatically effecting rotary movement of said contact member when said core and sleeve are moved in the opposite direction, and a contact member coöperating with the contact member on said sleeve, substantially as described.

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

WALTER H. DURFEE.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.