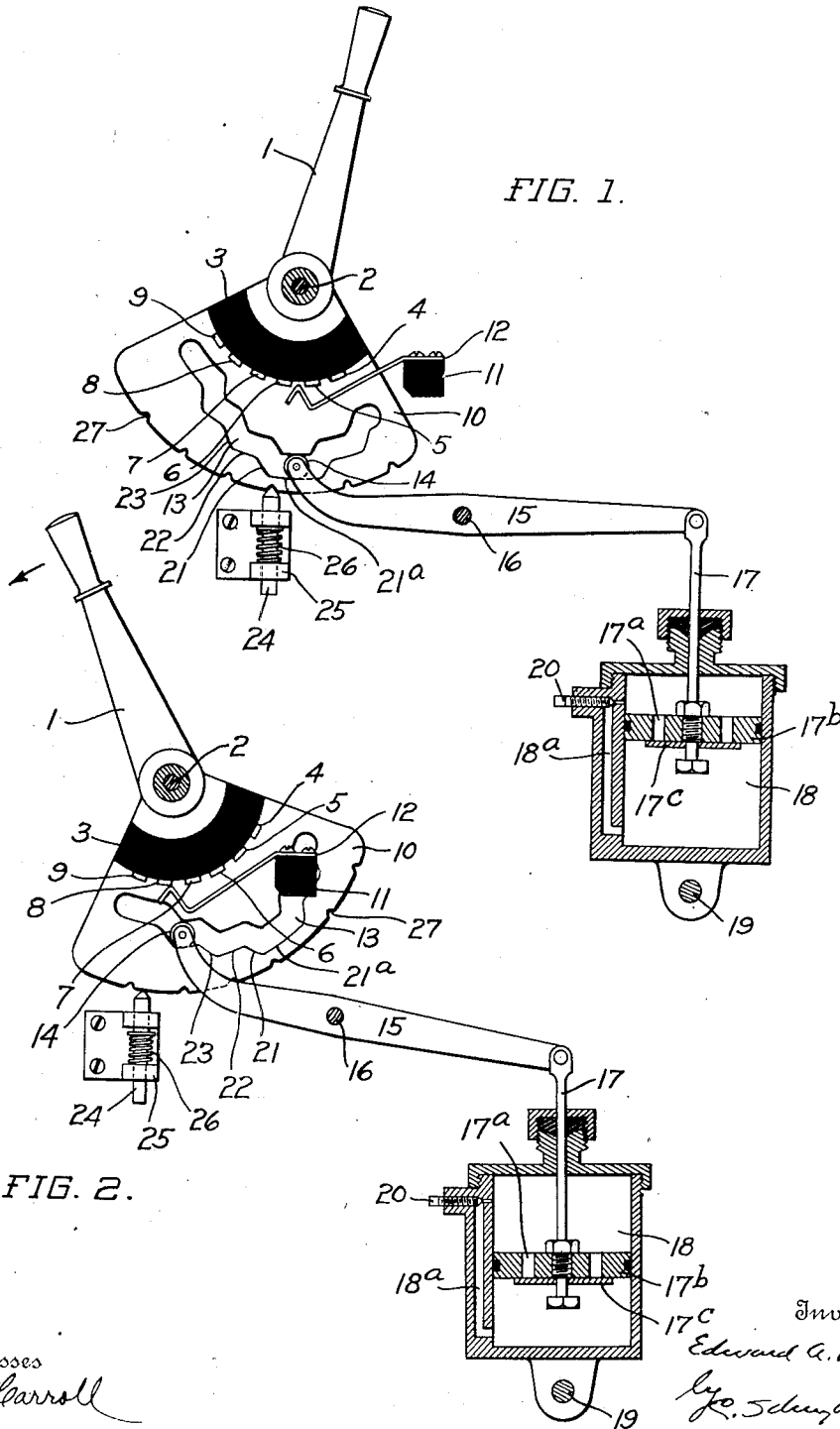


E. A. HALBLEIB.
CIRCUIT CONTROLLER RETARDING DEVICE.
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968,468.

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UNITED STATES PATENT OFFICE.

EDWARD A. HALBLEIB, OF ROCHESTER, NEW YORK.

CIRCUIT-CONTROLLER-RETARDING DEVICE.

968,468.

Specification of Letters Patent.

Patented Aug. 23, 1910.

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To all whom it may concern:

Be it known that I, EDWARD A. HALBLEIB, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Circuit-Controller-Retarding Devices, of which the following is a specification.

This invention relates to circuit controller retarding devices, and its object is to provide one that will check the movement of the controlling lever while the contacts are made, and yet permit the movement of the lever to be accelerated when the contacts are changed.

In the drawings:—Figure 1 is an elevation, partly in section, showing one form of the device, the parts being in a neutral position; and Fig. 2 is a similar view, showing the same parts in an operating position.

1 represents the hand lever which operates the controller, and said lever is pivoted at 2 on any suitable support. An insulated drum 3 which carries on its periphery a number of contact pieces 4, 5, 6, 7, 8 and 9, is fixed to the lever 1, and rotated by it around the pivot 2. The contacts may be suitably connected through resistances as in an ordinary rheostat or starting box. Adjacent to the drum 3 is a bar 11 (whose support is not shown), that carries suitable springs 12 (one only is shown), the latter being adapted to make contact with the strips 4, 5 &c.

At one side of the drum 3, and also fixed to move with the latter and with the lever 1, is a quadrant 10 that has in one face a slot or groove 13, in which a roller 14 lies that is carried by a lever 15, the latter being pivoted to a support at 16. The opposite end of the lever is connected with a plunger rod 17 of an oil dash pot 18, while the dash pot is hung or pivoted at 19 to a suitable support. The slot 13 has a series of rises and wells in its contour, which are so arranged that as the lever 1 is moved in the direction indicated, the roller 14 will encounter a rise just as the brush 12 strikes its contact strip on the drum 3, and as soon as the brush reaches the end of the contact, the roller enters upon the next dwell. The dwells in the cam slot are concentric with respect to the pivot 2, so that while the roller 14 lies in any of them, the lever 15, and accordingly the piston of the plunger, will not be operated by the movement of the lever

1. The purpose and effect of this construction is to retard the movement of the lever 1 while the contact pieces 4, 5 &c. are passing beneath the spring 12, but to permit it to be moved rapidly from one of said contact pieces to the one next in order, and so prevent an arc.

In explanation of the dash pot 18, it is sufficient to say that the downward movement of the plunger rod 17 can only occur at a predetermined rate, which is adjustably governed by the needle valve 20, in the passage 18^a from the lower to the upper part of the dash pot, the ports 17^a through the piston 17^b being closed during its downward stroke by the plate 17^c. Accordingly, when the roller 14 is in the lowest section 21^a of the slot 13, shown in Fig. 1, and the lever 1 is thrown forward, said roller encounters the rise 21 in the cam slot at the same instant that one of the brushes 12 makes contact with the strip 6. As the roller 14 moves through the neutral section 21^b of the slot, the lever 15 remains stationary, but as the roller ascends the rise 21, the lever 15 is caused to swing and force the plunger 17^b down through the dash pot, thus introducing the resistance of the dash pot to the movement of the lever 1 during the time that the brush is in contact with the contact piece 6. The rapid movement of the lever while the roller 14 passes through the "dwell" parts of the cam slot makes a quick break of contact between the brush 12 and the next strip. If the lever is rotated in the same direction as before after the roller has ascended the rise 21, it will pass through the dwell 22, and then up the cam face 23, thereby causing another downward movement of the plunger 17 and a consequent retardation of the lever until the next dwell is reached. It should also be noted that the operation of the lever 15 by the action of the cam faces on the roller 14 introduces some resistance to the movement of the lever, irrespective of the operation of the plunger, during the time that contact is made as aforesaid.

A centering device is provided which permits the lever 1 to be set and held when the brush 12 is on any desired contact. This device comprises a pin 24 that is supported in a bracket 25, and pressed upwardly by a spring 26. The upper end of the pin is tapered to engage any one of a series of notches 27 in the lower edge of the quadrant

10. The notches are so arranged that the pin will engage one of them only when the brush 12 is on a contact, or when the lever is in a neutral position.

5 In the drawings, three rises or retarding portions of the cam slot 13 are shown for the forward movement of the lever, and two for the reverse movement, but it is obvious that the number used will depend upon the number of contact strips on the drum, and
10 that the number of the latter may vary.

What I claim is:—

1. In a retarding device for circuit controllers, the combination with a plurality of
15 stationary contacts, of a part movable with respect to said stationary contacts, having separated contact surfaces adapted to engage said stationary contacts; a part movable against resistance; and operating connections between said resistingly-movable
20 part and said movable contact-carrying part, whereby the former is brought into operation during limited portions of the movement of the latter.

25 2. In a retarding device for circuit controllers, the combination with a plurality of stationary contacts, of a part movable with respect to said stationary contacts, having insulated contact surfaces adapted to engage
30 said stationary contacts; a part movable against resistance; means for adjusting the resistance of said last mentioned part; and operating connections between said resistingly-movable part and said movable contact-carrying part, whereby the former is
35 brought into operation during limited portions of the movement of the latter.

3. In a retarding device for circuit controllers, the combination with a plurality of
40 stationary contacts, of a part movable with respect to said stationary contacts, having insulated contact surfaces adapted to engage said stationary contacts and a series of cam faces connected by dwell surfaces; a lever
45 whose free end is adapted to engage and be operated by said cam faces; and a part movable against resistance operatively connected to said lever.

4. In a retarding device for circuit controllers, the combination with a plurality of
50 stationary contacts, of a rotary part, carrying contact surfaces adapted to engage said stationary contacts, and having also a series

of cam faces connected by dwell surfaces, the latter being concentric with respect to
55 the pivotal axis of the rotary part; a lever operated by the rotary part whose free end is adapted to engage said cam faces and dwell surfaces coincidently, respectively,
60 with predetermined relative positions of the movable and stationary contacts; and a part movable against resistance that is connected to said lever.

5. In a retarding device for circuit controllers, the combination with a plurality of
65 stationary contacts, of a rotary part, carrying contact surfaces adapted to engage said stationary contacts, and having also a slot with cam faces connected by dwell surfaces, the latter being concentric with respect to
70 the pivotal axis of the rotary part; a lever having at its free end a part that is adapted to move through said slot; and a part movable against resistance that is connected to said lever.

6. In a retarding device for circuit controllers, the combination with a plurality of
stationary contacts, of a part movable with respect to said stationary contacts, having
80 insulated contact surfaces adapted to engage said stationary contacts and a series of cam faces connected by dwell surfaces; a lever whose free end is adapted to engage and be operated by said cam faces; and a dash pot, comprising a cylinder adapted to contain
85 fluid, a perforated piston therein operatively connected with said lever, and means adapted to close the perforations in the piston during its movement in one direction.

7. In a retarding device for circuit controllers, the combination with a plurality of
stationary contacts, of a part movable with respect to said stationary contacts, having
90 insulated contact surfaces adapted to engage said stationary contacts and a series of cam faces connected by dwell surfaces; a lever whose free end is adapted to engage and be operated by said cam faces; a part movable
95 against resistance operatively connected to said lever; and means for retaining the movable, contact-carrying part in position when the contacts are made.

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