

F. D. HALLOCK.
 CONTROLLER.
 APPLICATION FILED SEPT. 8, 1908.

958,803.

Patented May 24, 1910.

Fig. 1.

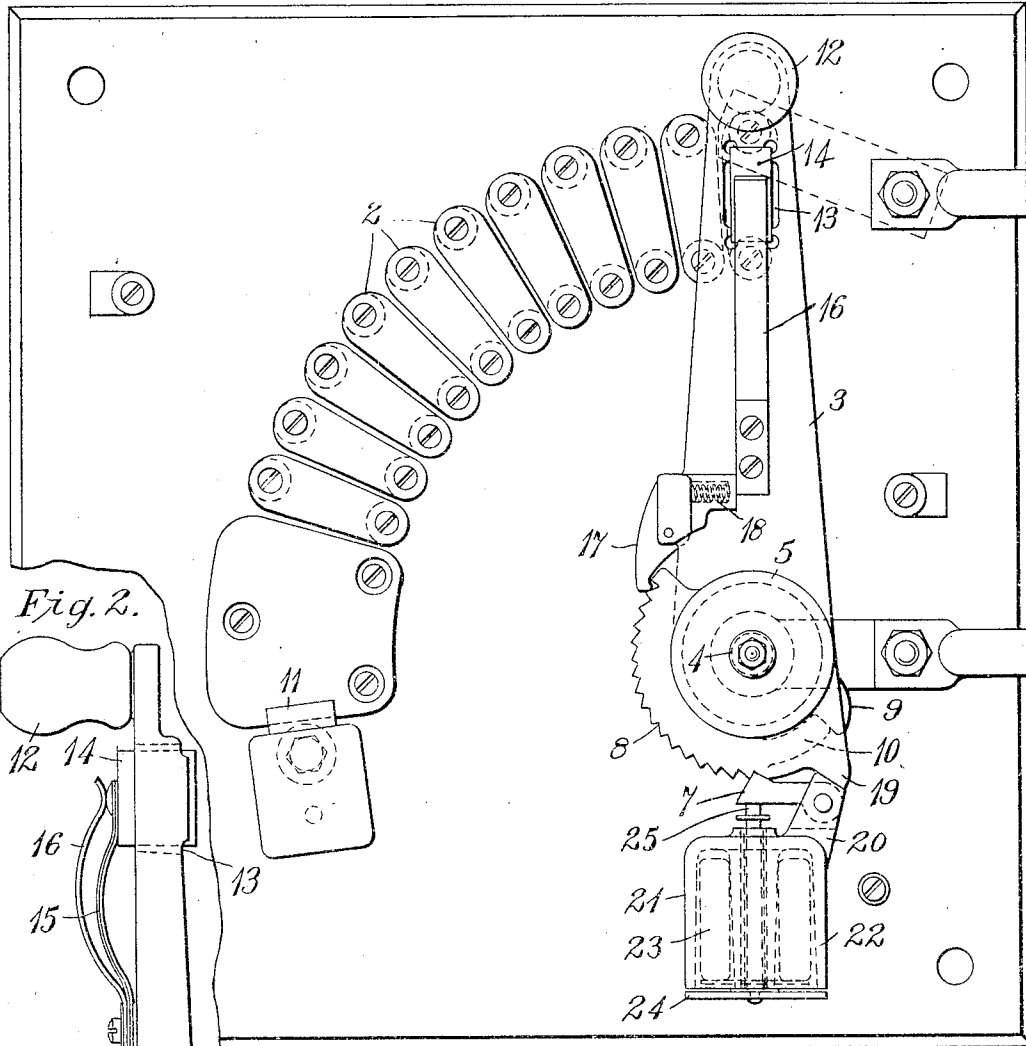


Fig. 2.

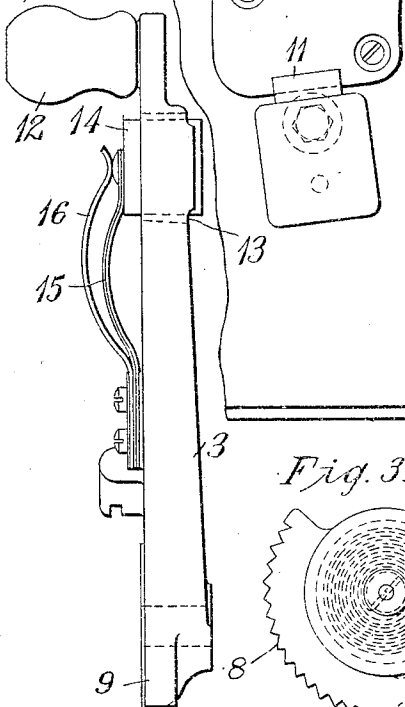


Fig. 3.

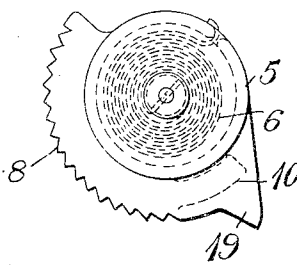
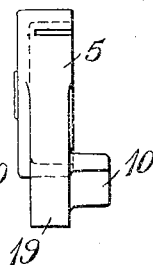


Fig. 4.



WITNESSES:

Fred H. Miller
R. J. Carbow

INVENTOR

Fletcher D. Hallock
 BY
Harley C. Carr
 ATTORNEY

UNITED STATES PATENT OFFICE.

FLETCHER D. HALLOCK, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, OF EAST PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CONTROLLER.

958,803.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed September 8, 1908. Serial No. 452,087.

To all whom it may concern:

Be it known that I, FLETCHER D. HALLOCK, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Controllers, of which the following is a specification.

My invention relates to electric circuit controllers and it has for its object to provide a simple and efficient device of this character that shall be specially adapted for controlling the armature circuit resistance of electric motors.

According to my present invention, I provide a controller of the face-plate type having a plurality of stationary contact terminals arranged substantially in the arc of a circle, a rotatable arm having a contact terminal which is adapted to engage the stationary terminals, a spring for retracting the arm to its "off" position, and electro-responsive means for locking the spring, except under predetermined conditions, and acting independently of the position of the arm.

Figure 1 of the accompanying drawings is a plan view of a controller constructed in accordance with my invention, and Figs. 2, 3 and 4 are detail views of certain of the parts shown in Fig. 1.

Referring to the drawings, the device here illustrated comprises an insulating slab or face-plate 1, a plurality of stationary contact terminals 2 secured thereto and arranged substantially in the arc of a circle, an arm 3 that is rotatably mounted upon a stationary shaft or stud 4, a member 5 that is also rotatably mounted on the stud 4 and comprises a cylindrical body portion and a flange having a set of peripheral teeth or notches 8, a stop shoulder 19 and a lug 10. The arm 3 is provided with a projection 9 to be engaged by the lug 10 of the member 5 under certain conditions of operation which will be hereinafter set forth. The outer end of the arm 3 is provided with a knob or handle 12 and with a hole 13 in which a brush or contact block 14 is disposed, an electrical connection being established between the arm and the block by means of a conducting strip 15. The block 14 is preferably constructed of carbon or similar mate-

rial and is forced into engagement with the stationary contact terminals by means of a spring 16. Under certain conditions, as hereinafter explained, the arm 3 may be moved independently of the member 5 and its positions are then accentuated by means of a pawl 17 which is pivotally secured to it and is forced into engagement with the notches 8 by a spring 18. The cylindrical portion of the member 5 is fitted upon the stud 4 after the arm 3 is in position and contains a spiral spring 6, one end of which is fastened to said member and the other end of which is fastened to the stud. Rotative movement of the member 5 is limited in one direction by a stationary projection 20, with which the shoulder 19 engages. A pawl 7 is pivotally mounted upon the projection 20 and is forced into engagement with the notches 8, under predetermined conditions, by means of an electro-magnet 21 which comprises a stationary core member or frame 22, a winding 23, a movable core member or armature 24 and a rod 25.

The operation of the device is as follows: Assuming that the electro-magnet is deenergized and that the arm 3 occupies its "off" position in engagement with stop 11; if the said arm is moved in a clockwise direction to effect successive engagement of the brush 14 with the stationary contact terminals, the member 5 will be correspondingly actuated, by reason of the engagement of the lug 10 by the projection 9 and the spiral spring 6 will thus be put under tension. The arrangement of parts is such that when the shoulder 19 of the member 5 engages the stationary projection 20, the brush 14 engages the last of the series of stationary contact terminals 2 and the pawl 7 engages one of the end notches 8, which correspond in number and relative positions to the stationary contact terminals, while the pawl 17 engages the notch at the opposite end of the set. The electromagnet winding 23 is energized by the current in the circuit and is completed and interrupted when the brush moves into and out of engagement with the stationary contact terminals and, consequently, the arm 3 and the member 5 will be held in the positions to which they may be moved since the rod 25 of the armature 24

serves to hold the pawl 7 in engagement with one of the notches 8. When the parts are in the positions illustrated in Fig. 1 of the drawings, the arm 3 may be moved in a counter-clockwise direction independently of the member 5, its various positions being accentuated by the pawl 17. The various contact terminals 2 and the corresponding notches 8 may represent motor-operating or running points, any one of which may be occupied for an indefinite time by the arm 3. If the motor circuit is interrupted, the magnet winding 23 will be deenergized, the pawl 7 will drop out of engagement with the notch which it may occupy when such interruption occurs and the arm 3 and the member 5 will both be returned to their initial positions by the action of the spring 6. If the arm 3 is moved from its "off" position in a clockwise direction to any intermediate position, the pawl 7 will obviously engage a corresponding intermediate notch 8, the notches being so formed that the said pawl will prevent a counter-clockwise movement of the member 5 when the magnet is energized, but will always permit a clockwise movement, irrespective of the condition of the magnet.

I claim as my invention:

1. In a controller, the combination with a plurality of stationary contact terminals, a movable arm having a contact terminal which is adapted to successively engage the stationary terminals and a notched member operatively connected to said arm, of a retracting spring for said member, means for locking said member to permit movement of the arm independently thereof in one direction and means adapted to engage the notches of said member for accentuating positions in the independent adjustment of the arm.

2. In a controller, the combination with a plurality of stationary contact terminals arranged substantially in the arc of a circle, a movable arm having a contact terminal to successively engage the stationary terminals and a notched member operatively connected to said movable arm, of a retracting spring for said member electro-responsive means for locking said member to permit independent movement of said arm in one direction and means carried by the arm for accentuating positions in the independent adjustment of the arm.

3. In a controller, the combination with a plurality of stationary contact terminals disposed substantially in the arc of a circle, of a movable arm having a contact terminal to successively engage the stationary terminals and a notched member rotatably mounted on the same axis and operatively connected to the arm, of a spiral spring for retracting the member and the arm, electro-responsive

means for locking the member in predetermined positions to permit independent movement of the arm in one direction, and means carried by the arm and engaging the notches of said member for accentuating a plurality of positions in the independent movement of the arm.

4. In a controller, the combination with an insulating slab or plate, a plurality of contact terminals secured thereto, a movable contact-bearing arm adapted to sweep over said contact terminals, a notched member rotatably mounted upon the axis of the arm and operatively connected thereto when moved in one direction, of a spiral spring coiled about the axis of the member for retracting it to a predetermined position, a pawl adapted to engage any one of the notches in said member, an electro-magnet for holding said pawl in operative position in order to permit independent movement of said arm in one direction and a pawl for accentuating the positions of engagement between the movable and stationary contact terminals when the arm is moved independently of the member.

5. In a controller, the combination with an insulating plate or slab, a plurality of stationary contact terminals secured thereto and arranged substantially in the arc of a circle, a stationary shaft perpendicular to the face of the plate, a movable contact-bearing arm mounted on said shaft and adapted to sweep over the stationary contact members, and a notched member rotatably mounted on the stationary shaft and connected thereto by a spiral retracting spring, said arm being operatively connected to said member, of a pawl adapted to engage the notches in said member and electro-responsive means for forcing the pawl into engagement with one of the notches to permit independent movement of the arm in one direction, and a second pawl secured to the arm and adapted to engage the notches to accentuate the positions of the arm when it is moved independently of the member.

6. In a controller, the combination with stationary contact terminals, a movable contact-bearing arm having a projection, and a notched member rotatably mounted on the axis of the arm and having a lug to engage the projection of the arm, of retracting means for the member, electro-responsive means for locking the said member to permit independent movement of the arm in one direction, and a pawl carried by the arm and engaging the notches in said member for accentuating the positions of independent arm movement.

7. In a controller for electric circuits, the combination with a plurality of stationary contact members, a movable contact member associated therewith and a notched member

adapted to throw the movable contact member to the off position of the controller, of means for locking the notched member to permit independent movement of the arm in
5 one direction and means adapted to engage the notches in said member for accentuating the positions of independent arm movement.

In testimony whereof, I have hereunto subscribed my name this 31st day of August, 1908.

FLETCHER D. HALLOCK.

Witnesses:

H. R. HEIM,
BIRNEY HINES.