No. 829,794. PATENTED AUG. 28, 1906.

H. LEMP.

CONTROLLER.

APPLICATION FILED DEC. 18, 1905.

Fig. 1

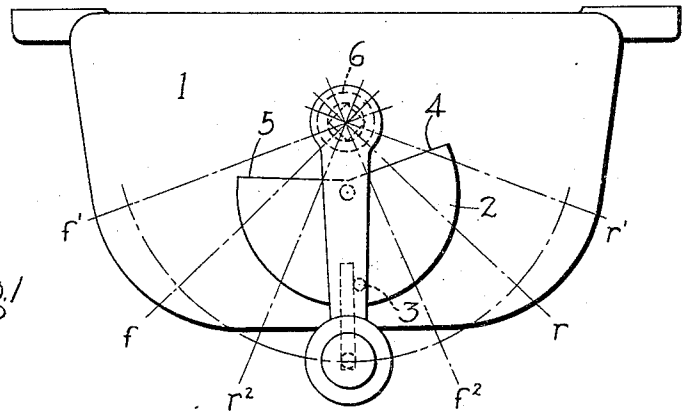


Fig. 2

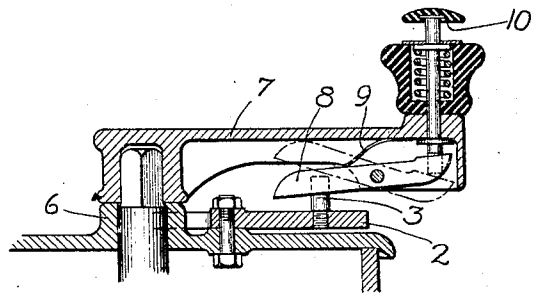
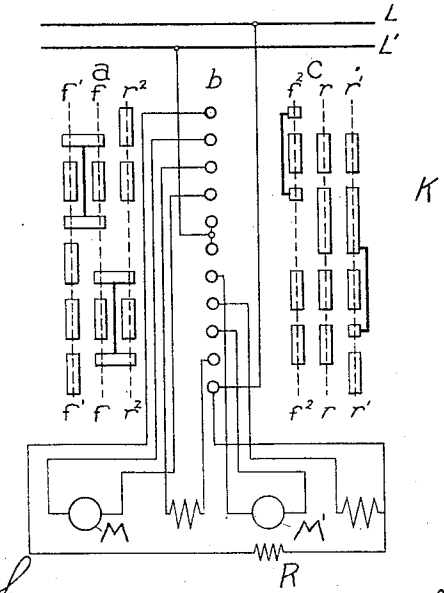


Fig. 3



Witnesses:

Lloyd C. Bush

Helen Orford

Inventor:

Hermann Lemp,

By Albert G. Davis

Atty.

UNITED STATES PATENT OFFICE.

HERMANN LEMP, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

CONTROLLER.

No. 829,794. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed December 18, 1905. Serial No. 292,314.

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Controllers, of which the following is a specification.

In reversing controllers which are provided with separate braking-points for connecting the motors as braking-generators after they have been running in forward and reverse directions, respectively, it is difficult to stop the controller-handle at the proper braking-points, for unless particular care is exercised the controller may pass the desired braking position and connect the motor or motors for reverse operation. It is highly desirable that the controller may be stopped into the desired braking position and maintained there without making it necessary for the operator to watch the controller-handle; and the present invention has for its object a construction and arrangement of parts for automatically bringing the controller-handle to rest in the forward braking position when the motor has been running in a forward direction and in the reverse braking position when the motor has been running in the reverse direction without requiring the operator to note the extent to which he is moving the handle.

The present invention will be more fully understood, and further objects and advantages will appear from the following description thereof, taken in connection with the accompanying drawings, which illustrate a preferred embodiment.

In said drawings, Figure 1 is a plan view of a controller arranged in accordance with the present invention. Fig. 2 is a cross-section through the upper portion of the controller and its operating-handle; and Fig. 3 shows, diagrammatically, the developed controller-cylinder and the motors, together with the connections between the controller-contacts and the motors and source of current-supply.

Referring to Fig. 3, M and M′ represent two motors, L and L′ the current-supplying mains, and K a controller. The controller is illustrated as consisting of a series of fixed contacts or fingers *b* and two sets of movable contacts *a* and *c* adapted to coöperate with the fixed contacts. The type of controller, as well as the number of its operative positions, may, of course, be varied, since the present invention is not confined to any particular form of controller or motor-control system. In the construction shown two braking positions, two forward, and two reverse running positions, together with an "off" position, are provided. The forward running positions are those in which the contacts *a* engage with the contacts *b* along lines *f f f′ f′*, respectively, while the braking position to which the controller is moved when it is desired to cause the motors to act as braking-generators after they have been running in the forward direction is that in which the contacts *c* engage with the stationary contacts along line f^2 f^2. Similarly *r r* and *r′ r′* indicate the reverse running positions of the controller, and r^2 r^2 the reverse braking position. Thus it will be noticed that when the motors have been running and it is desired to brake, the controller is moved backward to and beyond the off position in order to reach the proper braking position.

It is believed to be unnecessary to trace the various circuits, since it is evident from the drawings that in the two forward running positions the motors are connected first in series and then in parallel across the line, while in the forward braking position the relative connections of the motor fields and armatures are reversed and the two motors are short-circuited through a braking resistance R, and similarly in the reverse running positions the motors are first connected in series and then in parallel across the line for operation in the reverse direction, while in the reverse braking position the relative connections of the armatures and fields are changed and the motors are short-circuited through the braking resistance.

The present invention contemplates movable stop mechanism so constructed and arranged that the operator need simply turn the handle of the controller backward from any running position in order to bring it into and stop it in the desired braking position, while it remains within the operator's power to move the controller-handle freely from a forward running position to a reverse running position, if he desires to do so. To this end I have pivoted on the controller-casing 1 a segmental disk 2, provided with a pin or stop 3, projecting from its upper surface. The disk may be oscillated about its pivot until one of

the shoulders 4 or 5 engages with a portion 6 of the controller-casing, and the parts are so dimensioned that this movement of the disk permits the stop 3 to oscillate between extreme limits which correspond to the braking positions of the controller. On the controller-handle 7 there is arranged a pivoted stop or dog 8, normally held in the plane of the pin by means of a spring 9. Thus it will be seen that if the con' oller-handle is in either of the positions f or f' and is turned backward the dog 8 will engage the pin 3 and will oscillate the disk into one of its extreme positions, whereupon the disk will come to a stop and prevent further movement of the controller-handle, being now in position f^2, which is the desired braking position. If, on the other hand, the controller-handle is in position r' or r and is turned backward, the dog in the controller-handle strikes the pin on the opposite side and oscillates the disk until it is brought to rest in its other extreme position, the controller-handle being now brought to rest in position r^2, which is the reverse braking position.

In order that the controller-handle may be moved from the off position into one of the running positions without being stopped in the braking position, there is provided a push-button 10 in the grip of the controller-handle, the stem of this push-button engaging with one end of the dog 8. Consequently when the push-button is depressed the dog 8 is lifted out of the plane of the stop or pin 3 and the controller-handle may be moved freely without interference on the part of the stop. It is of course evident that the movable stop need not be mounted on a segmental disk, as shown, or that the stop 3 be movable, since in some of its aspects the present invention contemplates any arrangement of coöperating stops upon the controller-handle and on the fixed support wherein either of the stops is movable relative to its support between the desired limits.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a controller, a movable contact member having running positions and forward and reverse braking positions, and a movable stop adapted to engage with said contact member and bring it to rest in one braking position or the other depending upon the direction from which said member is moved relative to the stop.

2. In a controller, a movable member having running positions and forward and reverse braking positions, a stop movable within limits corresponding to said braking positions, and a projection on said contact member adapted to engage with said stop and carry it to one extreme position or the other depending upon the direction from which said projection is moved into engagement with the stop.

3. In a controller, a rotary contact member having an "off" position and forward and reverse running positions on opposite sides of the "off" position, together with forward and reverse braking positions respectively on the reverse and forward running sides of the controller, a stop movable within limits corresponding to said braking positions, a dog associated with said contact member and adapted to be engaged by said stop, and means for holding said dog out of engagement with the stop during the rotation of said cylinder.

4. In a controller, a rotary contact member having an "off" position and forward and reverse running positions on opposite sides of the "off" position, together with forward and reverse braking positions respectively on the reverse and running sides of the controller, a stop movable within limits corresponding to said braking positions, an operating-handle for said contact member, a dog carried by said handle and arranged normally in the plane of said stop, and a push-button in said handle for lifting said dog out of the plane of the stop.

5. In a controller, a movable contact member having an "off" position, a reverse braking position and forward running positions on one side of the "off" position, together with forward braking and reverse running positions on the opposite side of the "off" position, a stop movable within limits corresponding to said braking positions, and a projection on said movable contact member adapted to engage said stop and bring said contact member to rest either in the forward braking position when said member is moved past the "off" position from the forward running positions or in the reverse braking position when said member is moved past the "off" position from the reverse running positions.

6. In a controller, a casing, a movable contact member supported by said casing and having two operative positions, stops on said contact member and on said casing, one of said stops being movable within limits corresponding to the said operative positions of the contact member, and means for causing said stops to engage to bring said contact member to rest in either of said operative positions.

7. In a controller, a rotary contact member having an "off" position and forward and reverse running positions on opposite sides of the "off" position, together with forward and reverse braking positions respectively on the reverse and forward running sides of the controller, stops supported respectively on a fixed support and upon said contact member, one of said stops being movable upon its support between limits corresponding to said braking positions, and means for causing said stops to engage to

bring said contact member to rest in either braking position.

8. In combination, a motor or group of motors, a source of current-supply, a controller having contacts constructed and connected to connect said motor or group of motors to said source of supply for rotation in either direction in the running positions of the controller and to connect said motor or group of motors as braking-generators in the braking positions of the controller, stops supported respectively upon the movable member of said controller and upon a fixed support, one of said stops being movable on its support between limits corresponding to the braking positions of the controller, and means for causing said stops to engage to bring said movable contact member to rest in either of said braking positions.

In witness whereof I have hereunto set my hand this 13th day of December, 1905.

HERMANN LEMP.

Witnesses:
JOHN A. McMANUS, Jr.,
HENRY O. WESTENDARP.