

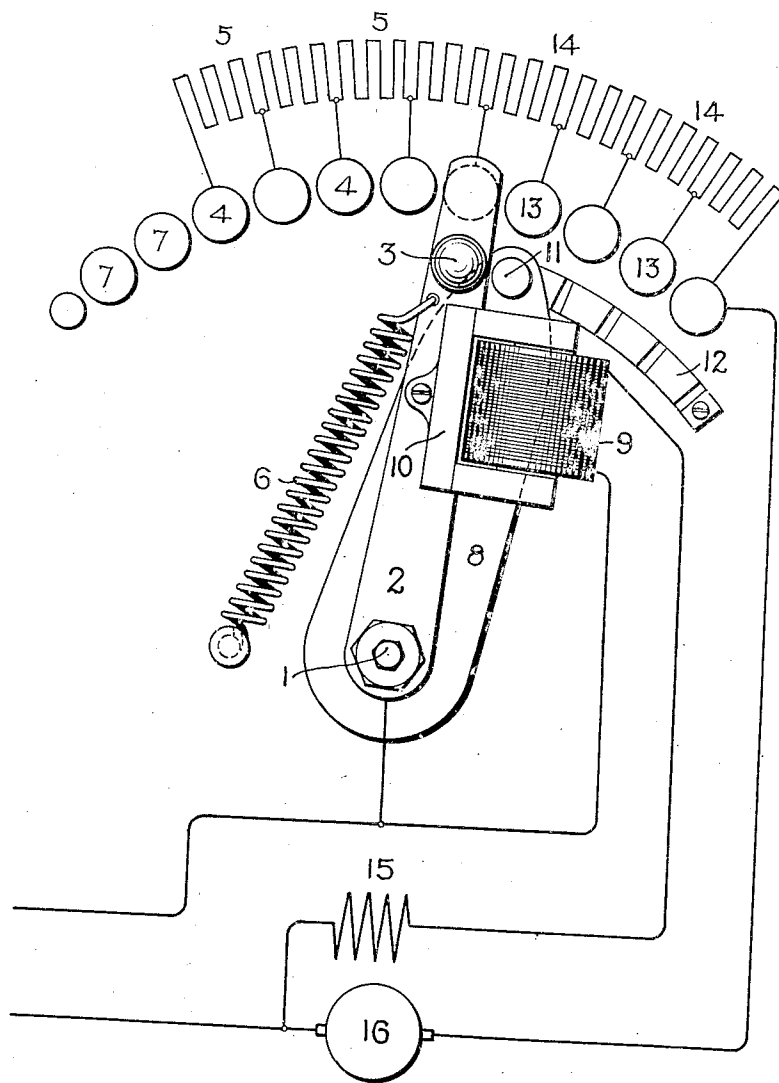
No. 815,908.

PATENTED MAR. 20, 1906.

W. J. DAY.

RHEOSTAT FOR STARTING AND CONTROLLING ELECTRIC MOTORS.

APPLICATION FILED SEPT. 14, 1904.



Witnesses.

*Jonathan C. Briggs*  
*Allen Orford*

Inventor:  
Winterton J. Day  
by *Albert H. Davis*  
Att'y.

# UNITED STATES PATENT OFFICE.

WINTERTON J. DAY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## RHEOSTAT FOR STARTING AND CONTROLLING ELECTRIC MOTORS.

No. 815,908.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed September 14, 1904. Serial No. 224,364.

*To all whom it may concern:*

Be it known that I, WINTERTON J. DAY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Rheostats for Starting and Controlling Electric Motors, of which the following is a specification.

This invention relates to devices whereby the current supplied to an electric motor can be increased gradually at starting in accordance with the acceleration of the motor when it is coming up to speed and afterward regulated to vary the running speed.

The object is to provide a starting and controlling rheostat with a no-voltage release-coil which is effective at any of the controlling positions of the rheostat switch-lever.

The invention consists of the combination with the rheostat-lever of a movable arm pivoted on the same stud as the lever and carrying the no-voltage release-coil. The keeper of the release-magnet is carried by the switch-lever. The arm is movable to any position of speed control and is held by a catch cooperating with a notched quadrant. The switch-lever is first moved over the starting-contacts until the keeper meets and is held by the release-magnet, after which both lever and arm can be moved as one to any position along the controlling-contacts. If voltage fails, the switch-lever will be released, and a spring thereupon returns it to zero, while the arm carrying the no-voltage release-coil remains in the position of speed control at which the rheostat had been set.

The accompanying drawing is a diagrammatic representation of a rheostat embodying my invention.

Pivoted on the stud 1 is a switch-lever 2, having a handle 3, by which it can be moved over a set of contacts 4, connected with the coils 5 of the starting resistance. A spring 6 urges it toward the zero position, where it can rest on the dead contacts 7. Pivoted on the stud 1 is also an arm 8, on which is mounted the retaining or no-voltage release-magnet 9, whose keeper 10 is pivotally attached to the lever 2. The arm is provided with a catch 11, which engages with notches in a stationary quadrant 12, concentric with

an additional set of contacts 13, which are connected with the coils 14 of the controlling or running resistance. The contacts 13 are in line with the contacts 4, the entire row being concentric with the pivot-stud 1. The notches correspond in number with the contacts 13. The circuit connections with the motor are as usual, the no-voltage release-magnet being in series with the shunt field-coil 15 of the motor and the resistances in series with the armature 16.

The operation is as follows: Starting from its extreme left-hand position, in which the armature is open-circuited, the switch-lever is moved over to the contacts 4, cutting out resistance from the armature-circuit until the keeper 10 abuts against the pole-pieces of the magnet 9 and is held thereby. From this point the movement of the lever can be continued to the right, cutting out the controlling resistance-coils from the armature-circuit and speeding up the motor. The arm and its magnet are carried with the lever, and when the proper control-point is reached both the arm and the lever can be retained there by engaging the catch with the corresponding notch in the quadrant. The arm and lever can be shifted back and forth along the quadrant to meet the changing conditions of service. Should the voltage fail, the magnet is deenergized and releases the switch-lever, which is instantly thrown to the zero position by the spring, leaving the arm at the former running position. When the line-voltage is restored, the switch-lever can be returned to the same running position as before by moving it until the keeper strikes the magnet pole-pieces.

It is evident that this invention can be applied to rheostats which control the field as well as the armature of the motors, requiring merely the usual changes in the arrangement of contacts and motor connections.

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

1. The combination with a rheostat switch-lever, of a no-voltage release-magnet, and means for adjusting said magnet to several points in the path of said lever.

2. The combination with a rheostat switch-lever, of starting and controlling resistances,

a no-voltage release-magnet, and means for shifting said magnet to various points along the controlling resistances.

3. The combination with a rheostat of a pivoted arm, a no-voltage release-magnet thereon, and a switch-lever movable thereto to vary the resistance.

4. The combination with a rheostat of a pivoted arm, a no-voltage release-magnet mounted thereon, and a switch-lever pivoted concentrically with said arm and movable toward said magnet to vary the resistance.

5. The combination with a motor starting and controlling rheostat of a pivoted arm, a no-voltage release-magnet mounted thereon, and a switch-lever movable to said magnet in one direction for starting, said lever and arm being movable together in the same direction for controlling.

6. The combination with a rheostat switch-lever, of starting and controlling resistances connected with contacts arranged concentric with the point of said lever, an arm pivoted concentric with said contacts, a no-voltage

release-magnet mounted on said arm, and means for retaining said arm at any one of the controlling-contacts.

7. The combination with a rheostat switch-lever, of starting and controlling resistances over which said lever is movable, an arm movable past the controlling resistances, a no-voltage release-magnet on said arm, a keeper therefor on the lever, and a spring to return the lever to zero.

8. The combination with a spring-retained rheostat switch-lever, of starting and controlling resistances over which said lever is movable, an arm movable past the controlling resistances, a catch on the arm, a notched quadrant cooperating therewith, a no-voltage release-magnet on said arm, and a keeper therefor on the lever.

In witness whereof I have hereunto set my hand this 9th day of September, 1904.

WINTERTON J. DAY.

Witnesses

G. C. HOLLISTER,  
HELEN ORFORD.