F. D. HALLOCK.

REGULATING RHEOSTAT FOR ELECTRIC MOTORS.

APPLICATION FILED JAN. 3, 1910.

959,005. Patented May 24, 1910.

2 SHEETS—SHEET 1.

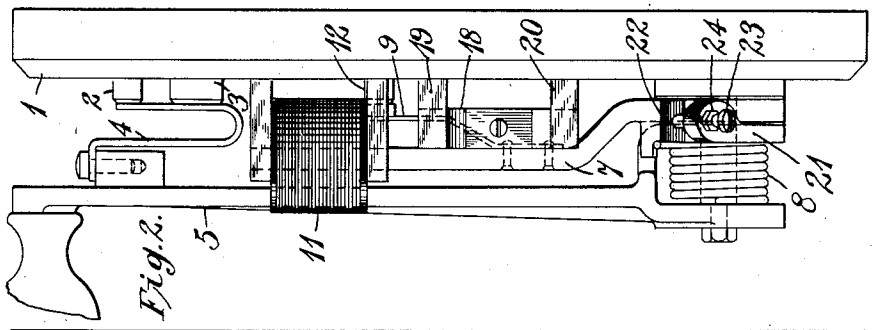

Fig. 2.

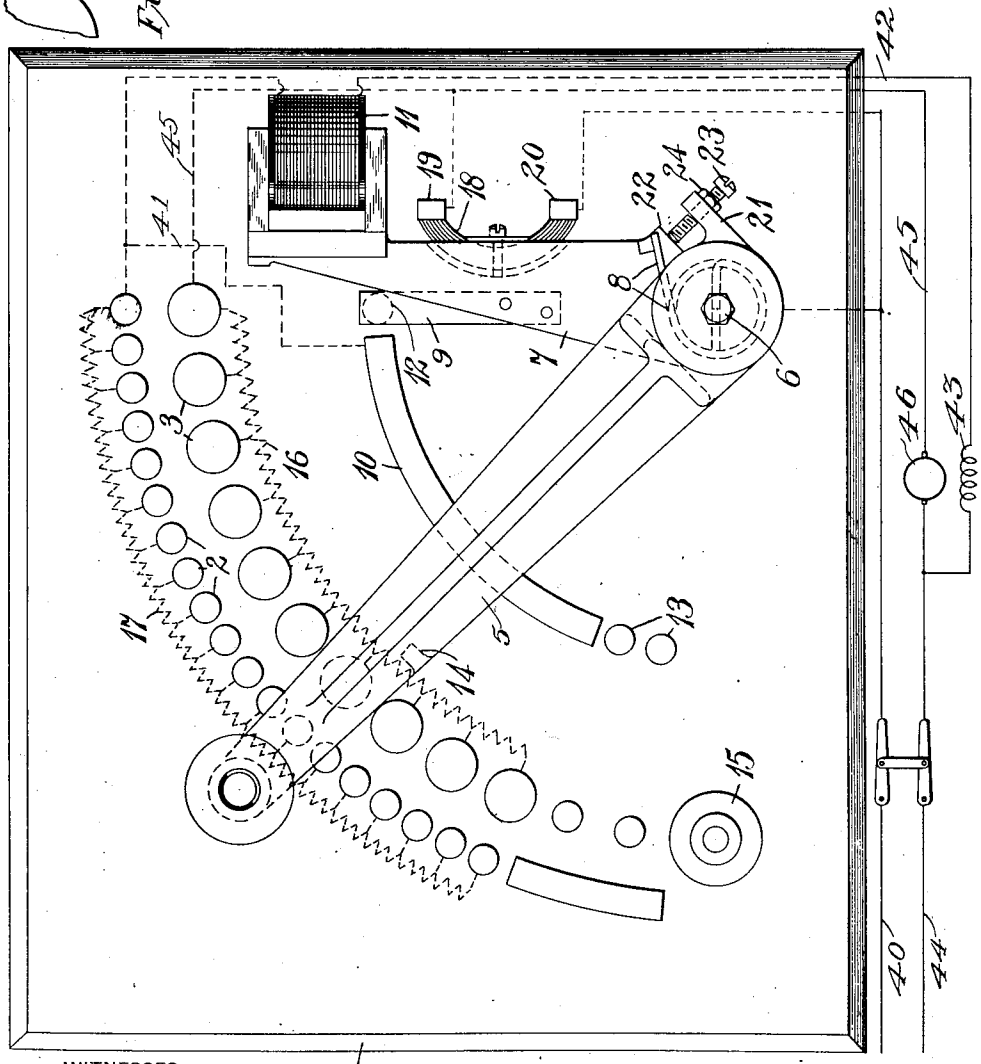

Fig. 1.

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Fig. 3.

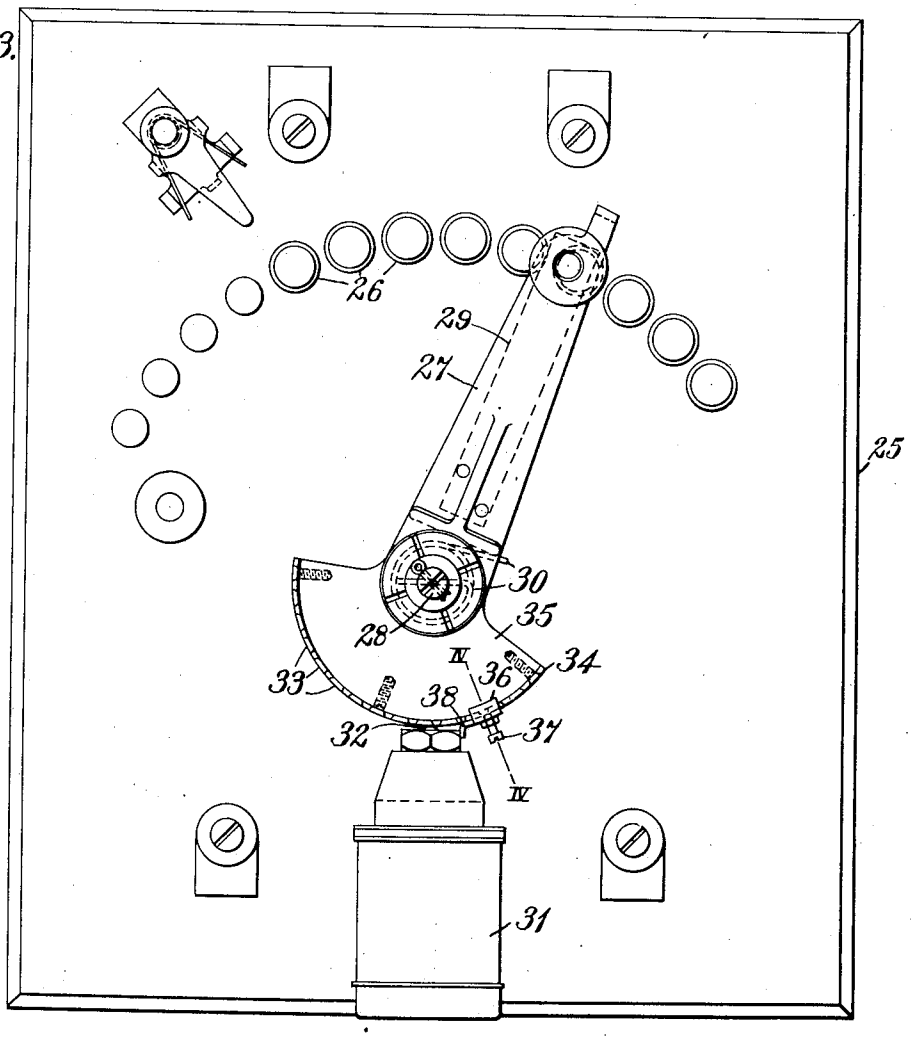
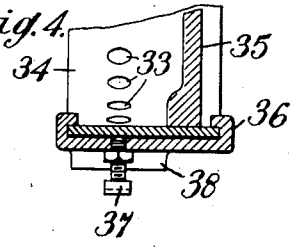


Fig. 4.



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REGULATING-RHEOSTAT FOR ELECTRIC MOTORS.

959,005. Specification of Letters Patent. Patented May 24, 1910.

Application filed January 3, 1910. Serial No. 536,054.

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 Regulating-Rheostats for Electric Motors, of which the following is a specification.

My invention relates to rheostatic controllers for electric motors and it has special reference to rheostats of the face plate type.

The object of my invention is to provide adjustable means for limiting the operation of the device to a predetermined position in order that the motor governed thereby may be brought up to the same operating speed each time it is started.

When electric motors are used for driving machines which should always operate at the same speed, the motor regulating controller must either be carefully adjusted each time the motor is started or means must be provided for limiting the movement of the rheostat to such a position that the desired motor speed will be attained.

According to my present invention I provide simple adjustable means for securing the aforesaid objective result without interfering with the normal operation of the device.

Figure 1 of the accompanying drawings is a partially diagrammatic plan view and Fig. 2 is an end elevation of the rheostatic controller embodying my invention and Fig. 3 is a view, corresponding to Fig. 1, of a modified form of controller which also embodies my invention. Fig. 4 is a sectional view on the line IV—IV of Fig. 3 which illustrates one form of my invention in detail.

Referring to Figs. 1 and 2 of the drawings, the structure here shown is similar to that illustrated and described in my copending application Serial No. 442,225, filed July 6, 1908, and comprises a slab or face plate 1, of insulating material, on which a series of field resistance contact members 2 and armature resistance contact members 3 are mounted in substantially concentric arcs and are engaged by a contact finger 4 carried by the contact-bearing arm 5, which is pivotally mounted on a shaft or stud 6 projecting outwardly from the face plate at the center of curvature of the arcs. A second arm 7 is pivotally mounted on the same axis and is retracted to the off position of the controller by a spring 8. The arm 7 is provided with a contact finger 9 which engages a contact ring-segment 10, except in its extreme positions, in one of which it is held by an electro-magnet 11, when it engages a contact member 12, and in the other of which it rests upon guide blocks 13. The arm 5 is provided with a projection 14 which is adapted to engage the outer end of the arm 7 when the controller is adjusted in opposition to the spring 8.

The operation of and the circuit connections for the device are as follows: Assuming that the controller occupies its off position and that the arms 5 and 7 engage the stop 15; if the arm 5 is rotated in a clockwise direction, the arm 7 will be carried with it in opposition to the spring 8 and the armature resistance 16, which is connected to the contact members 3, will be gradually cut out until the arm 7 engages the poles of the electro-magnet 11 and is held in its extreme position. While the finger 9 is in engagement with the contact member 10, the field resistance 17, which is connected to the contact members 2, is short-circuited so that the motor is started under full field. At this point the circuit connections may be traced as follows: From line conductor 40 through arm 7, finger 9, contact member 10, conductor 41, electro-magnet 11, conductor 42, and motor field winding 43 to opposite line conductor 44; and from conductor 40 through arm 5, finger 4, one of the contacts 3, and a portion of armature resistance 16, conductor 45 and motor armature 46 to line conductor 44. As soon as the extreme position of the arm 7 is reached, the short circuit is interrupted and the field resistance may be gradually inserted by backwardly adjusting the arm 5, the armature resistance being then short-circuited by the engagement of the bridging contact member 18 with stationary contact members 19 and 20 as shown in Fig. 1.

The inner end of the arm 5 is provided with a lateral projection 21 having an adjustable set screw 23 threaded through it and the arm 7 is provided with a corresponding projection 22 which is engaged by the set screw 23. The adjustment of the set screw determines the maximum independent adjustment of the arm 5 and, consequently, by properly fixing the position of the set

screw 23, the maximum motor-operating speed may be definitely determined, so that, no matter how many times the motor is started, it may always be brought to the same operating speed. In order to prevent the set screw from being accidentally adjusted, it is provided with a lock nut 24.

Referring to Figs. 3 and 4 of the drawings, the structure here shown is substantially like that shown and described in my co-pending application, Serial No. 437,324, filed June 8, 1908, and comprises a face plate 25 on which a series of armature-resistance contacts 26 are disposed substantially in the arc of a circle, a contact bearing arm 27, which is pivotally mounted on a stud 28 and provided with a contact finger 29, which is adapted to sweep over the contacts 26. The arm 27 is retracted to the off position of the controller by means of a spring 30, but it may be left in any intermediate position, since the electro-magnet 31 is adapted to force a ball 32 into engagement with a series of counter-sunk holes 33 in a segment 34 that is mounted on a fan shaped projection 35 of the arm.

The rheostat is therefore evidently adapted for regulating the speed of the motor, as well as for motor starting purposes, and, in order that a pre-determined motor-operating speed may be attained without difficulty each time that the motor is started, I provide an adjustable rider 36 which is mounted on a segment 34 and is provided with a set screw 37 by which it may be locked in any desired position. The rider is provided with a projection 38 which engages a portion of the stationary magnet 31 and prevents a further clockwise rotation of the arm.

I do not wish to be limited to the structures shown and described since it is evident that modifications may be effected within the spirit and scope of my invention.

I claim as my invention:

1. A rheostatic controller for electric motors comprising field and armature contact members, a pair of contact-bearing arms and adjustable means for restricting the independent adjustment of one of the arms relative to the other.

2. A rheostatic controller for electric motors comprising field and armature contact members, a pair of contact-bearing arms and adjustable means for restricting the independent adjustment of one of the arms relative to the other to insure any desired maximum motor speed.

3. The combination with a movable member, and two resistances adapted to be controlled thereby, of a second movable member, means governed thereby to render the first member effective to control but one of said resistances at one time, and adjustable means for limiting the independent movement of the first member.

4. The combination with a movable member, and two resistances adapted to be controlled thereby, of a second movable member which is effective to adjust only one of the resistances during movement of the second member from its initial to its extreme position and for thereafter rendering the first member effective to control only the other resistance, and adjustable means for restricting the independent movement of the first member.

5. The combination with a dynamo-electric machine having field and armature circuits, and a resistance for each of said circuits, of a movable member for controlling both of said resistances, a second movable member, means governed by the second member to render the resistance-governing member effective to control only the armature resistance during movement thereof in one direction and only the field resistance during movement thereof in the opposite direction, and adjustable means for limiting the maximum field-resistance variation.

In testimony whereof, I have hereunto subscribed my name this 24th day of Dec., 1909.

FLETCHER D. HALLOCK.

Witnesses:

ALBERT VAN ZANDT,

B. B. HINES.