

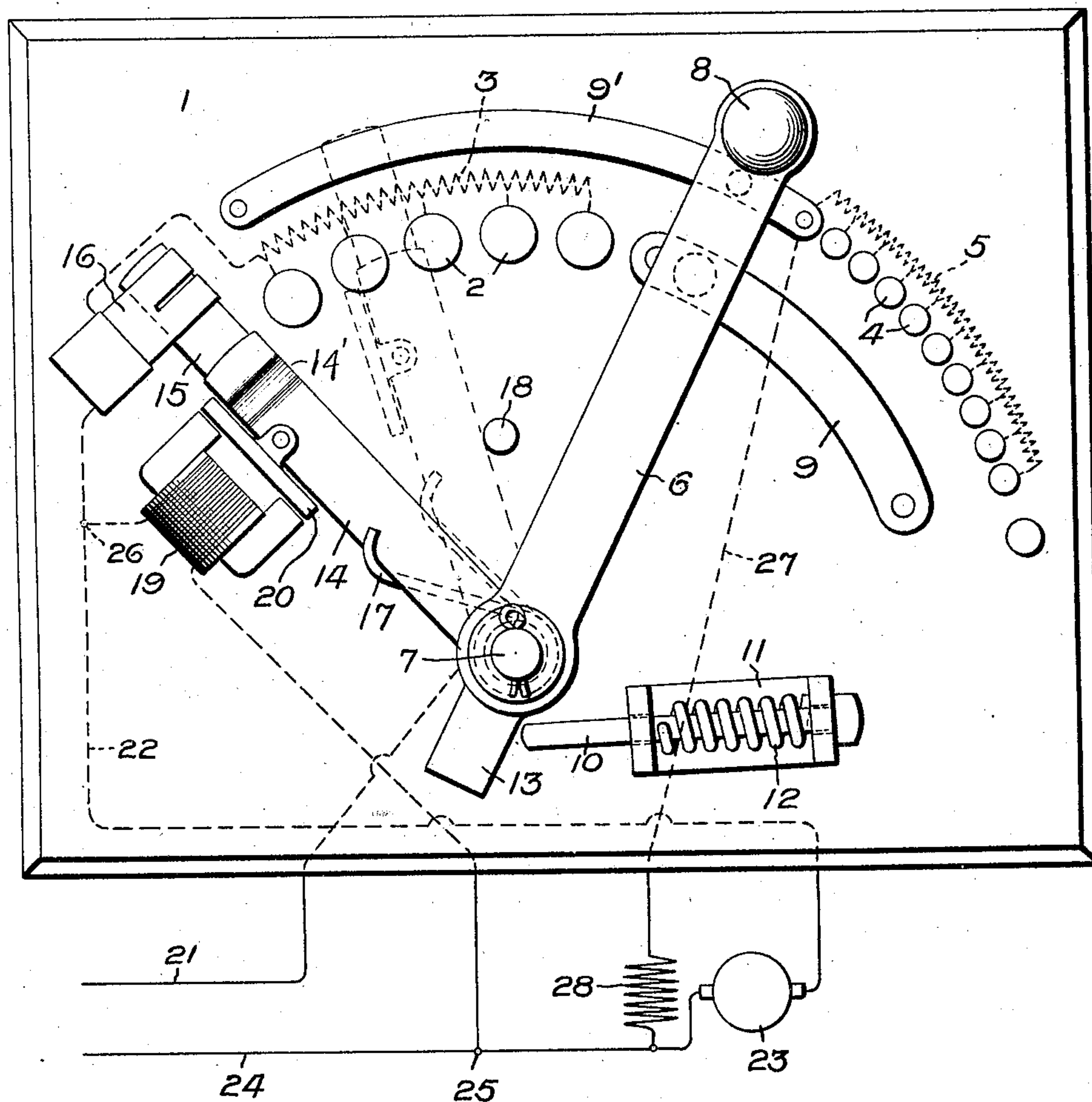
No. 819,626.

PATENTED MAY 1, 1906.

P. H. ZIMMER.

MOTOR STARTING AND REGULATING RHEOSTAT.

APPLICATION FILED JUNE 28, 1905.



Witnesses:

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UNITED STATES PATENT OFFICE.

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MOTOR STARTING AND REGULATING RHEOSTAT.

No. 819,626.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed June 28, 1905. Serial No. 267,368.

To all whom it may concern:

Be it known that I, PAUL H. ZIMMER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Motor Starting and Regulating Rheostats, of which the following is a specification.

This invention relates to devices for controlling motor-circuits, and has for its object the provision of a device of this character in which the starting and regulating of the motor may be accomplished in a simple and efficient manner.

In carrying out my invention I provide, in connection with a starting-rheostat, a series of resistances for regulating the speed of the motor and a single controlling-arm to accomplish both the starting and the regulation. In order to accomplish this result in a simple manner, I provide means whereby when the running conditions of the motor have been established the arm is automatically returned to starting position, it being then left free to be moved over the studs of the regulating resistance to control the motor speed.

My invention further consists in the details of construction and in the arrangement and combination of elements hereinafter set forth, and particularly pointed out in the claims annexed to and forming a part of this application.

In the single figure of drawing I have represented a plan view of a rheostat embodying my improvements.

Referring to the drawing, 1 is an insulating-base of slate or soapstone provided with the studs 2, forming terminals of the starting resistances 3, arranged in the arc of a circle in the usual manner. I also provide a series of studs 4, forming the terminals of a regulating resistance 5, these studs also being arranged in the arc of a circle, preferably of a larger diameter. A controlling-arm 6, pivoted at 7 and provided with an operating-handle 8, is adapted to be moved so that its free end engages the studs 4 and 2. Contact-rings 9 and 9' form continuations, respectively, of the starting-studs 2 and the regulating-studs 5, the studs themselves being separated, as shown, so as to leave space for the arm 6 between them. The arm 6 is biased to the starting position by means of a spring-pressed plunger 10, mounted to recip-

rocate in a bracket 11, the spring 12 forcing the end of the plunger out, so as to engage extension 13 of the arm 6. The arm when moved to the left of the central position will upon being released return to that position; but it is free to be moved to the right over the regulating-studs and to remain in any desired position upon the studs. A switch-arm 14, preferably pivoted at 7, is arranged so that its free end 15 engages a clip 16. A spring 17 normally forces the switch-arm into contact with the stop 18. In order to maintain the switch-arm in contact with the clip, I provide an electromagnet 19, preferably connected across the line, although I do not limit my invention to the particular location of this magnet. The switch-arm 14 is provided with a pivoted armature 20, and the magnet 19 by attracting this armature holds the switch in closed position.

The operation of my device is as follows: Before starting the motor the arm 6 is in the central position, as shown in the drawing, while the arm 14 is in contact with the stud 18, as shown in dotted lines. To start the motor, the arm 6 is moved to the left, cutting out starting resistance 3 and at the same time carrying with it switch-arm 14 by engaging the lug 14' thereon. When arm 6 reaches the last stud, so as to short-circuit the starting resistance, the switch-arm 14 engages the clip 16, forming a shunt-circuit around the arm 6. The magnet 19, now being energized, maintains the switch-arm 14 in this position. The operator now releases the handle 8, and the starting-arm returns to central position. The direction of the current will then be as follows: from lead 21 to pivot 7, thence through switch-arm 14, clip 16, conductor 22, to armature 23, and back to the other side of the line at 24. The magnet 19 is connected to the line 24 at 25 and with conductor 22 at 26. The current through the field passes from pivot 7 through arm 6 to contact-ring 9', thence through conductor 27 and field 28 to line 24. By moving the arm 6 to the right, so as to engage the studs 5, resistance may be cut into the field to weaken it, and thus speed up the motor, the arm being free to remain in frictional contact with the studs at any position. Upon failure of voltage magnet 19 releases the arm 14 and breaks the circuit. The motor cannot then be started without repeating the opera-

tion above described—i. e., arm 6 must first be brought into position when the field has its greatest strength, and all of the starting resistance must be in series with the motor.

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

1. In a rheostat, the combination with armature and field resistances and a controlling member therefor, of means whereby said member is returned to the starting position of said armature resistance after running conditions have been established, and means in connection with said member for varying said field resistance.

15 2. In a rheostat, the combination with armature and field resistances, of a controlling-arm therefor having a bias to the starting position of said armature resistance, means for closing a shunt-circuit around said arm when the latter is moved to running position, and means in connection with said arm for varying said field resistance.

3. In a rheostat, the combination with armature and field resistances, of a controlling-arm therefor having a bias to the starting position of said armature resistance, electrically-controlled means for closing a shunt-circuit around said arm when the latter is moved to running position, and means in connection with said arm for varying said field resistance.

4. In a rheostat, the combination with armature and field resistances, of a controlling-arm therefor having a bias to the starting po-

sition of said armature resistance, a switch adapted to be closed to short-circuit said arm by the movement of the latter to running position, and means in connection with said arm for varying said field resistance.

5. In a rheostat, the combination with armature and field resistances, of a controlling-arm therefor, a switch biased to open position and adapted to be closed to short-circuit said arm by the movement of the latter to running position, electrically - controlled means for maintaining the closed position of said switch, and means in connection with said arm for varying said field resistance.

6. In a rheostat, the combination of a plurality of armature and field resistances and studs therefor, of a controlling-arm normally at a position between said studs and biased to the starting position of said armature resistance, a switch biased to open position and adapted to be closed to short-circuit said arm by the movement of the latter in one direction to running position, and electrically-controlled means for maintaining the closed position of said switch, said arm being free to be moved in the opposite direction to vary said field resistance.

In witness whereof I have hereunto set my hand this 27th day of June, 1905.

PAUL H. ZIMMER.

Witnesses:

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HELEN ORFORD.