(No Model.)

W. T. PEEL.

REGULATOR FOR DYNAMOS OR MOTORS.

No. 426,570. Patented Apr. 29, 1890.

Fig. 1.

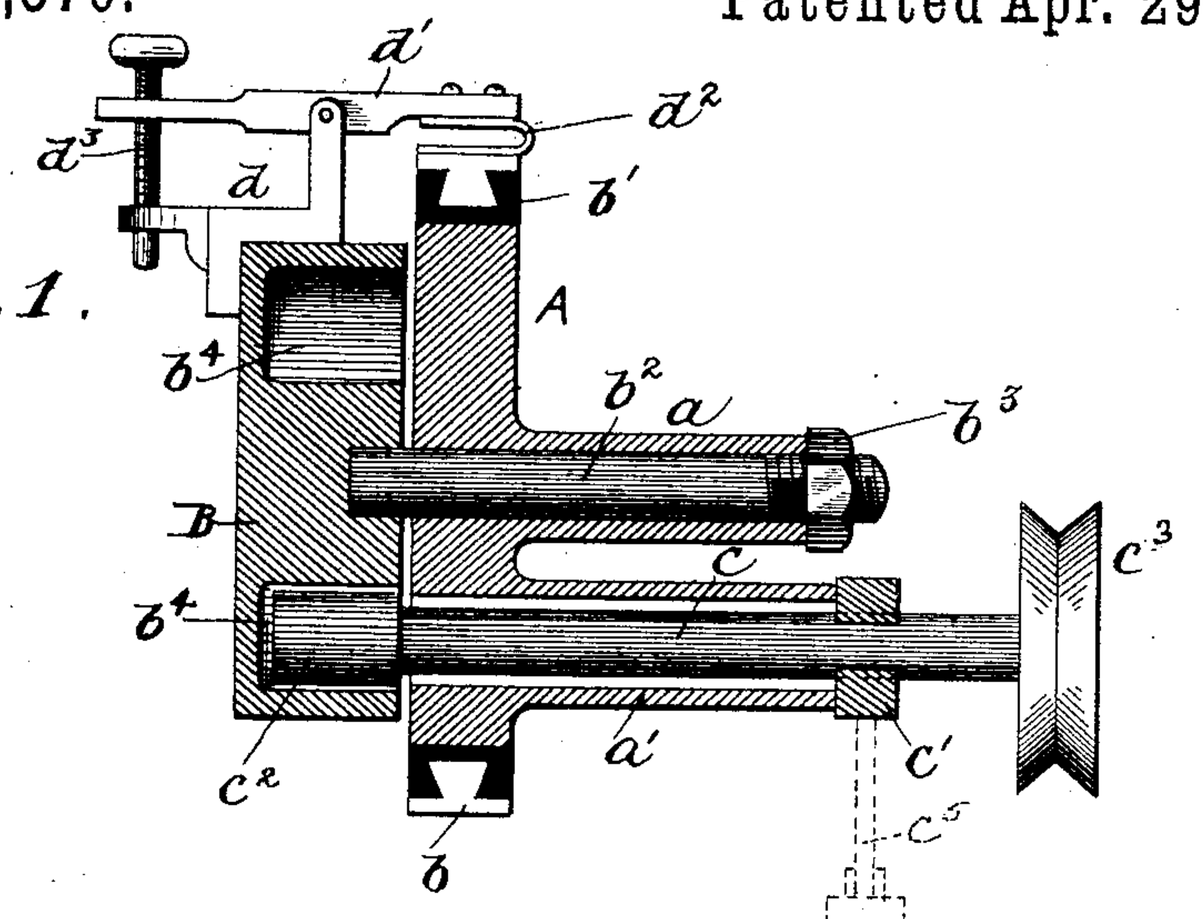
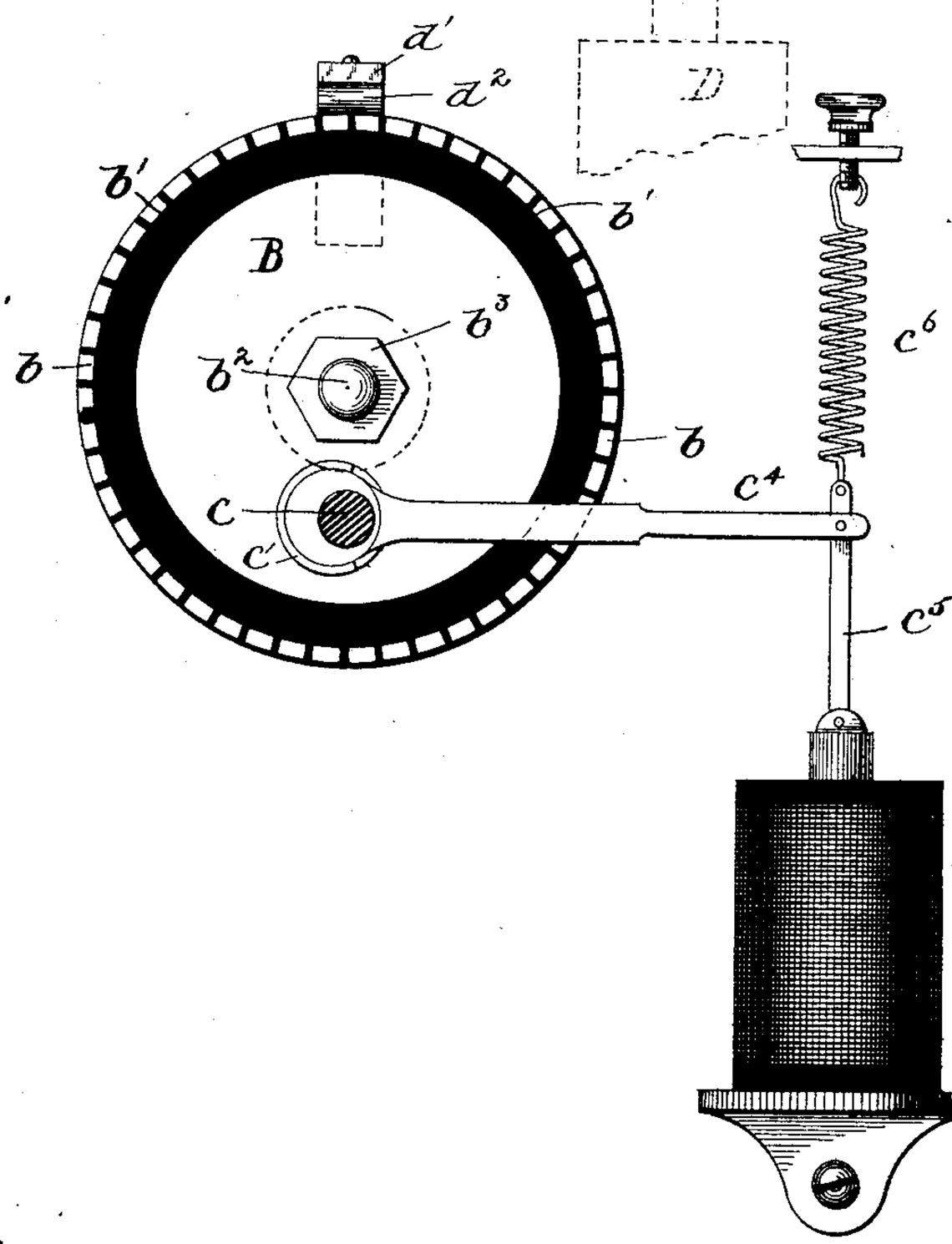


Fig. 2.



WITNESSES:

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WILLIAM T. PEEL, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO JACOB R. STEINER, OF SAME PLACE.

REGULATOR FOR DYNAMOS AND MOTORS.

SPECIFICATION forming part of Letters Patent No. 426,570, dated April 29, 1890.

Application filed July 12, 1889. Serial No. 317,264. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. PEEL, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Regulators for Dynamo-Electric Machines and Motors, of which the following is a specification.

My invention relates to the regulation of dynamo-electric machines and motors, and the device which I have invented belongs to that particular class of regulators in which a number of coils upon the field-magnets of the machines are cut in or out automatically to increase or decrease the intensity of the field of force, or a resistance thrown into circuit to accomplish the same thing.

The invention consists of the combination, with a series of immovable contact-points representing the terminals of the sections on the field-magnets or a series of resistances, of a contact-brush mounted in a peculiar manner and adapted to be moved over the surfaces of the contacts by means of certain novel devices, which will now be described with reference to the accompanying drawings, in which—

Figure 1 represents a sectional view of the regulating mechanism, parts being shown in elevation; and Fig. 2 represents an end or side elevation of the device.

Referring to the drawings by letter, A represents a circular base-plate supported in a stationary position by a bracket or any other suitable means. At the center this base-plate is provided with an opening and hub a, and in a location off the center it is provided with a second opening and hub a'. Upon the periphery of the base-piece, I secure in any suitable manner a series of contact strips or pieces b, representing and connected with the terminals of a series of resistances of the usual construction or of the field-magnet coils. These pieces are all insulated from each other by being embedded in a ring b' of insulating material. The pieces, however, may be secured in any other desired manner around the periphery, so long as they are properly insulated from each other and from the base-piece.

B represents a disk or wheel mounted upon the end of shaft b^2, which has its bearing in the hub a. This disk stands concentrically against the face of the base-plate A. It is held in this normal position by a nut b^3, threaded onto the outer end of the shaft b^2. The disk is provided with an annular concentric groove b^4, which opens toward the base-plate A. The position of this groove is such that in the rotation of the disk it will always be presented to the opening a' in the base-plate. The shaft c is mounted in the hub a'. It is somewhat smaller than the opening in the hub, so that it may have a limited free lateral movement therein. The shaft occupies an eccentric position with reference to the hub, the eccentricity being secured by the box c', located at the outer end of the hub, as will readily be understood. Upon the inner end of this shaft is mounted a friction-roller c^2, which projects into the annular groove b^4 of the disk B. The roller is made somewhat smaller than the width of groove b^4, in order that it may move laterally therein and into contact with either the inner or the outer wall of said groove. The shaft is adapted to be driven at a uniform speed by any suitable motor, which may be geared to the pulley c^3.

On the outside of the disk B a bracket d is secured, preferably to the periphery of the disk. This bracket has pivoted to it a lever d', carrying at one end a contact-brush d^2, which is adapted to bear upon the contacts b. The pressure of the brush upon the contacts may be regulated by means of the screw d^3, passing through the outer end of the lever d' and through a threaded hole in bracket d.

The eccentric c' has attached to it an arm c^4, which in turn is connected with the core of a solenoid magnet D through link c^5. There is also connected with the arm c^4 a spring c^6, which is arranged to counteract the "pull" of magnet D.

The operation of the regulator is as follows: Let us suppose that magnet D is in the main circuit of the machine to be regulated and that the contact-pieces b are connected with a variable resistance in the main circuit or with the terminals of the coils upon the field-magnets of the machine. As the main circuit increases in strength, the magnet D pulls arm c^4 downward and through the eccentric

forces roller c^2 against the outer wall of the groove b^4 in disk B, thus causing the disk to partake of a rotary motion communicated from the constantly-rotating shaft *c*. The disk then will be rotated and the brush d^2 carried around into contact successively with the different pieces *b* until resistance is thrown into the main circuit, or sections of the field-magnets cut out sufficient to lower the working-current, at which time the magnet D releases the arm c^4 and spring c^6 forces roller c^2 out of contact with the outer wall of groove b^4 and the disk B stops. When the current becomes abnormally low, spring c^6 overcomes magnet D and forces roller c^2 against the inner wall of groove b^4, and causes the rotation of disk B in the contrary direction to what it was formerly rotated. This causes the reverse movement of brush d^2, and either the resistances are gradually thrown out of the main circuit or else the sections of the field-magnets are thrown into the circuit.

It will thus be seen that I have devised a very sensitive and simple-acting regulator. The movement of the brush d^2 will depend entirely upon the pressure of roller c^2 against one or the other of the walls of the groove b^4, and also upon the strength of such pressure. The slightest change in the strength of the main current will make a corresponding change in the pressure of the roller upon the disk B.

Having thus described my invention, I claim—

1. In a regulator for dynamos or motors, a rotatable disk provided with two concentric friction-surfaces and carrying a switch-arm adapted to move over a series of contacts, a constantly-rotating friction-roller mounted and adapted to vibrate between said two friction-surfaces, a movable bearing for said friction-roller, and an electro-magnet or solenoid adapted to move said bearing, whereby the roller is caused to move back and forth into and out of contact with said friction-surfaces, substantially as described.

2. A regulator for a dynamo-electric machine or motor, consisting of a disk carrying a switch-arm, a series of contacts over which said switch-arm moves, the disk provided with an annular groove, a continuously-rotating friction-pulley located in said groove, and mechanism controlled by the main circuit for throwing said friction-pulley into contact with one or the other of the walls of said groove, for the purpose described.

3. A regulator for a dynamo-electric machine or motor, consisting of a disk carrying a switch-arm, a series of contacts over which said switch-arm moves, the disk provided with an annular groove, a continuously-rotating friction-pulley located in said groove, the shaft of said pulley being eccentrically mounted, and mechanism controlled by the main current for throwing said eccentric to move the friction-roller into contact with one or the other of the walls of the groove, for the purpose described.

4. The combination, with the circular base-piece A, having attached around its periphery a series of contacts, a rotatable disk concentrically mounted therewith and carrying a contact-arm adapted to impinge upon said series of contacts, the disk being provided with an annular groove, a continuously-rotating friction-roller extending into said groove, and its shaft mounted eccentrically, as described, in said base-piece A, and mechanism controlled by the main current for throwing said eccentric to bring the roller into contact with one or the other of the walls of said groove, for the purpose described.

In witness whereof I have signed my name in the presence of two subscribing witnesses.

WILLIAM T. PEEL.

Witnesses:
JNO. V. I. DODD,
JOHN H. BOWMAN.