H. HAUDENSCHILD.

CONTROL MECHANISM.

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1,006,749.

Patented Oct. 24, 1911.

Fig. 1.

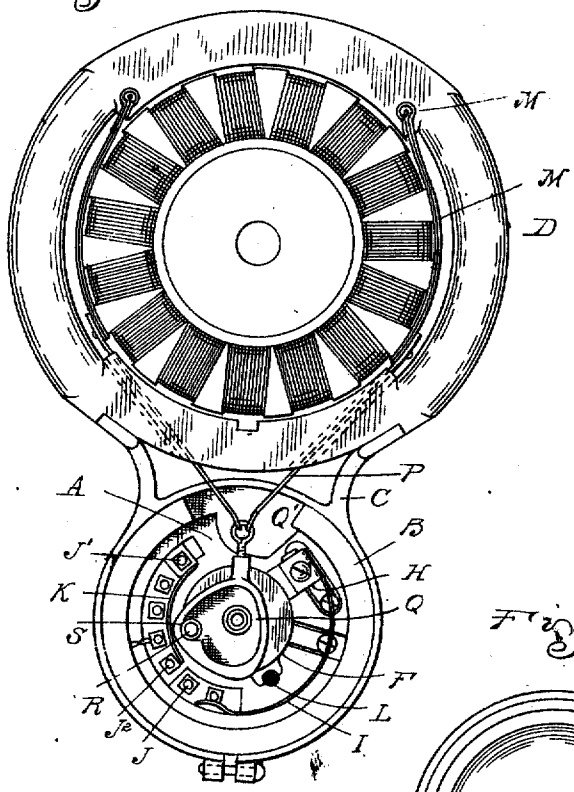


Fig. 2.

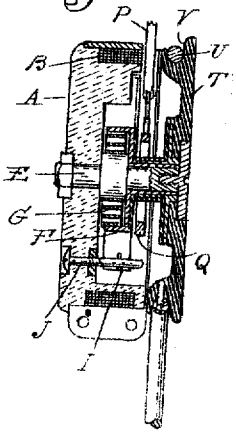
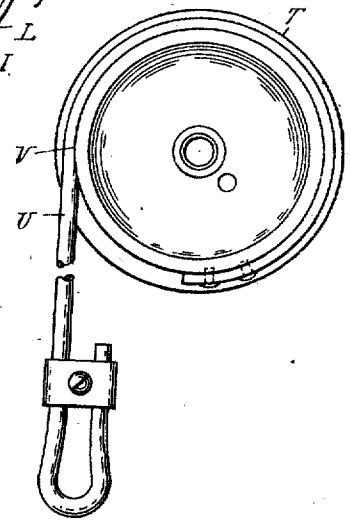


Fig. 3.



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UNITED STATES PATENT OFFICE.

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CONTROL MECHANISM.

1,006,749. Specification of Letters Patent. Patented Oct. 24, 1911.

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To all whom it may concern:

Be it known that I, HARRY HAUDENSCHILD, a citizen of the United States of America, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Control Mechanisms, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to controlling mechanism for electric motors, and more particularly to the means by which said motor may be run at variable speeds and instantaneously stopped when desired.

The invention consists in the peculiar construction of a rheostat and the controlling switch therefor; further in the combination therewith of a brake mechanism for overcoming the inertia of the motor, and further in the peculiar construction, arrangement and combination of parts as hereinafter set forth.

In the drawings—Figure 1 is a front elevation of the controlling mechanism in connection with the motor to which it is applied; Fig. 2 is a longitudinal section. Fig. 3 is an elevation of the rotary cap.

The invention is particularly designed for use in connection with small electric motors such, for instance, as sewing machine motors where but a limited space is available, and it is therefore an object to condense the mechanism by arranging the parts as compactly as possible.

It is a further object to produce a control in which the circuit closure, the rheostatic switch and the mechanical brake mechanism are all operated in proper sequence by the single actuating connection.

Still further it is an object to render the stopping of the motor automatic upon the release of the control.

These objects are all attained by a construction as follows:

A is a hollow drum or spool member preferably formed of insulating material and B are resistance conductors mounted about said drum in a peripheral groove therein. The member A is suitably mounted preferably in an annular frame member C which may be attached directly to or formed integral with the frame of the motor D. E is a post arranged concentrically within the hollow member A and having revolubly mounted thereon the member F. This member is preferably in the form of a hollow drum or barrel, within which is arranged a coil spring G, one end thereof being secured to the post E and the opposite end to the member F.

H is a traveling contact arm projecting from the member F and I is a spring contact carried by this arm. This contact member I is adapted to successively engage with a series of contact pins J, which are arranged in a segmental path within the hollow member A, and said member I preferably engages the outer faces of said pins. K is a contact spring connected to one of said contact pins J′ and extending into proximity with another pin of the series J^2.

L is an insulated arm or projection on the member F which during the rotation thereof will bear against the spring contact K and move the same into connection with the contact pin J^2.

With the arrangement above described, the member F is normally held by the tension of the spring G in a position where the motor circuit is open, but upon the rotation of said member the contact I will successively engage the contact pins J first closing the electric circuit with all of the resistance windings B therein and then successively cutting out portions of the resistance. During this movement the insulated contact member L will also be rotated and at a certain point in the operation will press against the spring K thereby effecting a coupling between the contact pins J′ and J^2, this occurring when the contact member I is in connection with the pins of the series midway between the pins J′ and J^2. As a result portions of the resistance windings B will be connected into the motor circuit in parallel thereby lowering the resistance, while distributing the heating effect in the windings. Thus the speed of rotation of the motor may be controlled by varying the position of the rotary member F.

To effect a quick stopping of the motor and the mechanism driven thereby a mechanical brake is necessary. This brake is preferably applied directly to the periphery or pole face of the rotor, and as shown is arranged between the rotor and stator and in the space intermediate the poles of the stator. In detail M are brake shoes preferably formed of resilient material and arranged upon opposite sides of the rotor.

One end of each shoe is anchored in the stator preferably by forming dove-tail slots in the laminæ of the stator pole and by forming heads M′ on the ends of the shoes M for interlocking with said slots. This construction permits of inserting the brake shoes laterally into engagement with the stator, and of quickly removing and replacing them when necessary. The resiliency of the brake shoes M will hold them out of contact with the periphery of the rotor, excepting where drawn into contact by application of the braking force. This application of the brakes is effected through the medium of connections P attached to the free ends of the brake shoes M and extending therefrom through an aperture in the hollow member A and supporting frame C therefor into the space within the member A. Q is a stirrup connected to the members P and preferably provided with a take-up adjustment formed by a screw eye Q′ having a threaded shank engaging a threaded socket in the stirrup. R is a crank pin projecting from the member F and engaging a bearing S in the stirrup Q.

With the above described construction in the normal position in which the member F is held by the tension of the spring G the crank pin R, through its engagement with the bearing S and the stirrup Q, will draw downward upon the members P and hold the brake shoes M in frictional contact with the periphery of the rotor so as to prevent rotation of the latter. As soon, however, as the member F is rotated against the tension of the spring G, and in the direction for closing the motor circuit, the pin R will be withdrawn from its bearing, permitting the tension of the brake shoes M to move them out of contact with the rotor so that the latter is free to revolve. In the reverse operation, the tension of the spring G will move the member F to open the motor circuit, and at the same time the pin R is drawn downward to again bear against the stirrup Q and draw the shoe M into contact with the rotor. During this movement, the pin R is constantly gaining leverage as it approaches the dead center, and consequently the power applied to the brakes is greatest at the completion of the movement. An adjustment may be effected at any time by disengaging the stirrup Q from the pin R and rotating it one way or the other whereby it is longitudinally adjusted upon the threaded shank of the screw eye Q′.

For operating the member F a pulley T is preferably secured thereto and this pulley is employed to form a closure for the recess within the hollow member A. The member T is also preferably formed of insulating material so that the switch mechanism is inclosed in a complete insulating housing. The actuating connection for the pulley T is preferably a flexible belt or band U, which engages a peripheral groove V in said pulley and may be attached to suitable actuating connection, such as the treadle of a sewing machine.

What I claim as my invention is:

1. A rheostat comprising a hollow body, a resistance conductor wound about said body and a controlling switch within said body for cutting in or out resistance.

2. A rheostat comprising a hollow body, a resistance conductor wound about said body, and a rotary switch within said body for cutting in or out resistance.

3. A rheostat comprising a hollow body, a resistance conductor wound upon said body, a rotary switch within said hollow body controlling said resistance, and a rotary member forming a cover for said switch and the actuating member therefor.

4. A rheostat comprising a hollow spool, a resistance conductor wound about the periphery of said spool, a switch within said spool, having a movable contact member revoluble about the axis of the spool and an actuating member for said revoluble contact member forming a closure for the space within the spool.

5. A rheostat comprising a spool, a resistance conductor wound about said spool, a rotary member within said spool, a traveling contact carried by said rotary member, coöperating stationary contacts within the spool, and a spring surrounding the axis of said rotary member and actuating the same in one direction.

6. A rheostat comprising a spool, a resistance conductor wound about the periphery of said spool, a rotary member within the spool, a movable electric contact carried by said rotary member, coöperating stationary contacts within the spool, a coil spring surrounding the axis of said rotary member and actuating the same in one direction, a peripherally grooved closure for the space within the spool forming an actuating member for said rotary member, and a band secured within the peripheral groove of said actuating member for operating the same against the tension of the spring.

7. A rheostat comprising a spool of insulating material, a resistance conductor wound peripherally thereabout, a rotary member within said spool, a series of stationary contact pins within said spool, a traveling contact carried by said rotary member and adapted to successively engage with said stationary contact pins.

8. A rheostat comprising a hollow spool, a resistance conductor wound about the periphery of said spool, a segmental series of contacts within said hollow spool connected with sections of said resistance, a rotary contact member for successively engaging the contacts of said segmental series and

means operated by the rotation of said movable contact member for coupling separated contacts of said series.

9. A rheostat comprising a hollow spool, resistance windings mounted upon said spool, a segmental series of contacts within said spool connected with said resistance, a rotary arm, a segmental contact carrier by said arm and successively engaging said segmental contacts, a coupling contact extending from one of said segmental contacts into proximity with another contact of the series but normally separated therefrom, and a bearing on said rotary arm for operating said coupling contact.

10. A rheostat comprising a hollow spool, resistance windings mounted upon said spool, a segmental series of contacts within said spool, a post within said spool concentric with said segmental contacts, a member revolubly mounted upon said post, a contact member secured to said revoluble member, and movable in a path outside said segmental series of contacts in progressive contact therewith, a segmental contact extending on the inside of said segmental series of contacts from one member thereof extending into proximity with another member, and an insulated member upon said revoluble member for pressing said inner segmental contact member to effect a coupling between said segmental contacts.

11. The combination with an electric motor, of a controlling switch therefor, a housing for said switch and a rotary closure for said housing forming an actuating means for the switch.

12. The combination with an electric motor, of a controlling mechanism therefor, a housing for said controlling mechanism, and a rotary closure for said housing forming an actuating member for said mechanism.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY HAUDENSCHILD.

Witnesses:

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