F. DARLINGTON.

CONTROLLER FOR ELECTRICAL APPARATUS.

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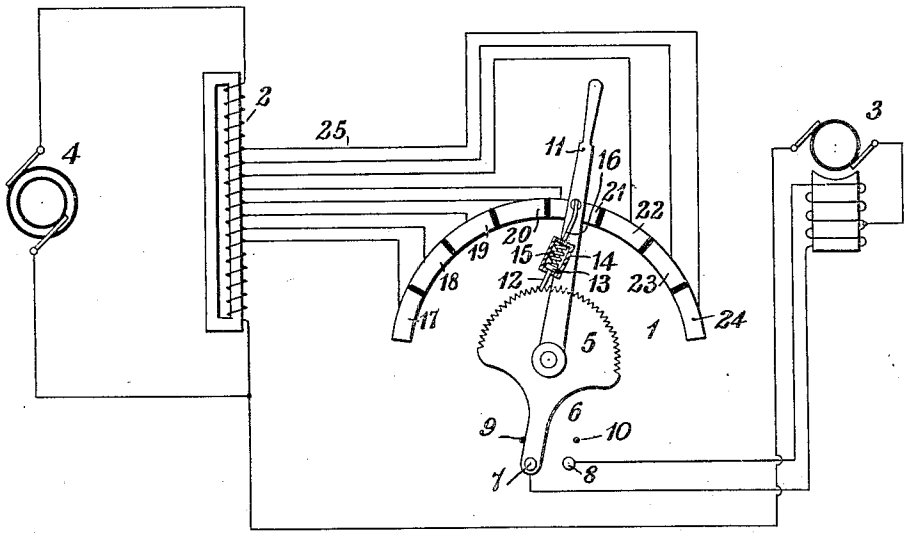
921,642. Patented May 11, 1909.



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CONTROLLER FOR ELECTRICAL APPARATUS.

No. 921,642. Specification of Letters Patent. Patented May 11, 1909.

Original application filed March 3, 1906, Serial No. 304,064. Divided and this application filed October 20, 1908. Serial No. 458,616.

To all whom it may concern:

Be it known that I, FREDERICK DARLINGTON, a citizen of the United States, and a resident of Great Barrington, in the county of Berkshire and State of Massachusetts, have invented a new and useful Improvement in Controllers for Electrical Apparatus, of which the following is a specification, this application being a division of my application Serial No. 304,064, filed March 3, 1906.

My invention relates to controlling devices for electrical apparatus, and it has for its object to provide a combination reversing and speed-regulating controller which shall be simple in construction and effective in operation.

The single figure of the accompanying drawing is a diagrammatic view of a system embodying my invention.

Referring now to the details illustrated in the drawing, a controller 1 is provided and employed in conjunction with a transformer 2 for varying the voltage supplied to a motor 3 and thereby varying the motor speed, and also for so reversing the circuit connections to the motor that the direction of its armature rotation shall be reversed.

The energy for operating the motor 3 is shown as furnished primarily by a single-phase alternating current generator 4, the voltage supplied by such generator being varied through the action of the controller 1, in combination with the auto-transformer 2.

The controller 1 comprises a ratchet segment 5, from one side of which projects a contact arm 6 to engage with the one or the other of two stationary contact terminals 7 and 8, stops 9 and 10 being provided to limit the movements of the arm 6.

An operating lever arm 11 is provided with a pawl 12, which is in position to engage the teeth of the ratchet segment 5, and is provided with a head or piston 13, mounted to operate in a cylinder 14. The head or piston 13 is pressed toward the ratchet segment by means of a coil-spring 15, and the cylinder 14 is resiliently connected to the arm 11 by means of a spring 16 that normally tends to maintain the pawl and cylinder parallel to the arm 11.

In order to explain the operation of the controller 1, it may be assumed that the lever arm 11 is moved from right to left and that the pawl 12 is thereby caused to engage a tooth of the ratchet segment 5 and move the lever arm 6 into engagement with contact terminal 8 and against the stop 10. As the motion of the lever arm 11 is continued toward the left, the pawl 12 is pressed into the cylinder 14, against the spring 15, until it passes the center line of the lever arm 11, whereupon it is again pressed outwardly and trails behind the lever arm without actuating or tending to actuate the ratchet segment 5.

If the lever arm 11 is moved from left to right from the position shown in the drawing, the pawl 12 trails behind over the teeth of the ratchet segment, but if the pawl occupies the position on the opposite side of the lever arm it will engage a tooth of the ratchet segment and cause the switch arm 6 to move into engagement with contact terminal 7 and against the corresponding stop 9, provided it is not already in that position. It will thus be understood that, upon reversing the direction of motion of the lever arm 11, the pawl 12 is caused to engage a tooth of the ratchet segment 5 and effect operation of the reversing switch.

The controller 1 also comprises a plurality of conducting segments 17, 18, 19, 20, 21, 22, 23 and 24, that are connected to suitable points in the winding of the transformer 2, by means of spaced leads 25, or to any other suitable source of variable voltages.

It will be understood, without further description, that, inasmuch as the lever arm 11 makes contact with the segments 17 to 24, movement of the said arm in one direction increases the voltage supplied to the motor 2 and movement of the said arm in the opposite direction decreases such voltage, in accordance with well known practice.

I claim as my invention:

1. The combination with a controller comprising a plurality of conducting segments, and a switch arm adapted to engage therewith, of a reversing switch, a ratchet for operating the same, and a pawl which is adapted to operate the reversing switch when the switch arm is moved in a given direction from any position and is automatically adjustable to effect operation of the ratchet only during a predetermined range of movement of said switch arm.

2. The combination with a controller com-

prising a plurality of conducting segments and a switch arm to engage therewith, of a reversing switch having a ratchet segment, and a yielding pawl to engage the ratchet segment for automatically connecting and disconnecting the switch arm and the movable member of the reversing switch with each direction of movement of the switch arm.

3. The combination with a lever and reversing switch having a ratchet segment, a yielding pawl carried by the lever and serving to actuate said segment and to automatically release it when the contact terminal reaches either of its circuit closing positions.

4. The combination with a lever and a reversing switch, of a single yielding clutch member carried by the movable member of the reversing switch, a coöperating clutch member carried by the lever, said yielding member being disconnected from the other clutch member when the movable member of the reversing switch reaches either of its circuit closing positions.

5. The combination with a controller comprising a plurality of conducting segments, and a switch arm to engage therewith, of a reversing switch and a clutch device between the switch arm and the movable member of the reversing switch that becomes active for any position of the switch arm and remains active only during a predetermined amount of movement of the switch arm in either direction.

6. The combination with a switch lever and a yielding spring pawl mounted thereon, of a reversing switch arm pivoted concentrically with said switch lever and having a ratchet segment, and stops to be engaged by said arm to effect release of the ratchet segment from the pawl.

In testimony whereof, I have hereunto subscribed my name this tenth day of October, 1908.

FREDERICK DARLINGTON.

Witnesses:
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L. R. La Pointe.