

UNITED STATES PATENT OFFICE

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MOTOR-CONTROL APPARATUS.

No. 857,797.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE W. EUKER, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Motor-Control Apparatus, of which the following is a specification.

The present invention relates to apparatus for controlling the operation of electric motors, and particularly in situations where, as for example in the operation of printing presses, it is desirable that the operator shall have complete control over the motor in order to start or stop the same or run it at any speed and still be entirely free to watch the operation of the press when making the necessary preliminary adjustments.

The object of the present invention is to provide a simple and inexpensive apparatus whereby an operator may start and stop a motor quickly and cause it to run at any desired speed within certain limits without having his attention distracted from the work which is being done.

To the above end, I have associated with a starting rheostat having a spring returned arm and an electro-magnetically-actuated catch for holding the arm in any operative position when current is flowing through the motor, a handle for operating the movable arm of the rheostat from any desired point on or adjacent to the machine which is driven by the motor, said handle being provided with a push button for short-circuiting the electromagnet which actuates the catch.

The present invention will be more fully understood from the following detailed description thereof taken in connection with the accompanying drawing.

In said drawing, Figure 1 illustrates a motor mounted upon a suitable base and a starting rheostat located in the base and having connected thereto a handle in accordance with the present invention; Fig. 2 illustrates diagrammatically the starting rheostat, the motor, and the connections between the same and a source of current supply.

Reference being had to the drawing, 1 represents a motor mounted upon a suitable base 2. Within the base is arranged a starting rheostat 3. The arrangement shown is one particularly adapted for use in driving small printing presses, it being of course understood that the base may be omitted and that

the starting rheostat may be situated at some other point, these being mere matters of convenience or taste. The rheostat illustrated is of a common type, having a spring returned arm and a no-voltage release coil. The principal parts are mounted upon a slab or insulating material 4 and consist of a series of fixed contacts 5, an arm 7 pivoted at 8 and the no-voltage release magnet 12. The contacts 5 are connected to the several sections of a resistance 6. A spring 9 tends normally to maintain the arm 7 in the position shown. One terminal of the motor 1, is connected to the arm 7 and the other terminal is connected to line 11. One of the fixed contacts 5, namely 5^a, is connected to line 11. It will be seen that when the switch 10 is closed and arm 7 is moved into engagement with the first of the series of fixed contacts 5, namely contact 5^a, the motor is connected across the lines 11 and 12 through all of the resistance and, as the rheostat arm is moved toward the left, this resistance is cut out section by section. The lower end of the arm 7 is provided with a toothed sector 11, which is adapted to co-operate with a tooth or pawl 12 carried on the end of a pivoted lever 13. The lever 13 forms an armature for electro-magnet 14 which, as illustrated, is connected across the line in shunt to the motor. It is evident, therefore, that as soon as the current flows through the motor the electro-magnet 14 is energized and attracts the armature 12 and causes tooth 12 to engage with the sector 11, thus locking the arm against the tension of a spring in any position to which the arm may have been moved. When the electro-magnet is de-energized, a spring 15 withdraws the tooth 12 from engagement with the sector 11, thereby permitting the spring 9 to return the arm 7 to its open-circuiting position.

The present invention consists in securing to the rheostat arm an operating member 16, which may take any form, although a rope or cable is preferably employed since it is flexible and may be led in a tortuous path, if necessary, to the point desired. On the end of the cable 16 is placed a handle 17 which may be grasped by the operator. A pair of leads 18 and 19 connect the terminals of electro-magnet 14 to a pair of separated contacts 20 and 21 within the handle 17. The contacts 20 and 21 are adapted to be bridged by a member 22 carried on the inner end of a

spring-pressed push button 23. It will be seen that if, at any time while the motor is in operation, the push button 23 is pressed, electromagnet 14 will be short-circuited and the rheostat arm will be released and returned to its "off" position through the action of the spring 9. The operation of the apparatus and the functions thereof will now be evident.

15 The operator, when desiring to start the motor, pulls the handle 17 so as to bring the rheostat arm to the position corresponding to the speed required. This speed may, of course, be that determined by any one of the operative positions of the rheostat arm. The operator may then release the handle, the rheostat arm will be locked in the position which it has assumed, and the motor will continue to operate at a definite speed.

20 When it is desired to stop the motor, the operator simply presses the push button 23, thus short-circuiting electromagnet 14 and causing the rheostat arm to be returned to its "off" position. If, on the other hand, a higher speed is required, a further pull on the handle 17 will bring the rheostat arm into the running position which provides for the higher speed. In this way the motor may be started and stopped with certainty and may be made to run at any speed without necessitating the withdrawal of the operator's attention from his work. Furthermore, the return of the rheostat arm to its "off" position before the motor circuit is broken insures that the motor when started is always protected by full resistance.

Although I have described in detail a preferred form of the present invention and a starting rheostat well adapted for use in carrying it out, I do not desire to limit the pres-

ent invention to the particular details shown and described except to the extent indicated in the accompanying claims, since the structural details may assume various forms.

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

1. In combination, a motor-starting rheostat having a movable contact member tending normally to assume its "off" position, electro-magnetic locking means for holding said contact member in a running position, a handle for operating said contact member, and a switch carried by said handle for controlling said electro-magnetic locking means.

2. In combination, a motor-starting rheostat having a spring returned arm, a catch for locking said arm in a running position, an electromagnet for moving said catch into operative relation with said arm, a handle for operating said arm, a switch in said handle, and electrical connections between the members of said switch and the terminals of said electromagnet.

3. In combination, a motor-starting rheostat having a movable contact member tending normally to assume its "off" position, electro-magnetically-actuated means for locking said contact member in a running position, a flexible operating member connected to said arm, a switch carried by said flexible member, and electrical connections extending from said switch to said electro-magnetically-actuated means.

In witness whereof, I have hereunto set my hand this 29th day of August, 1905.

GEORGE W. EUKER.

Witnesses:

FORBES THOMPSON CULLEN,
FREDERICK MURRAY PLATT.