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Patented Dec. 9, 1902.

J. I. AYER.

REVERSING SWITCH CONTROLLER FOR ELECTRIC MOTORS.

(Application filed Feb. 17, 1902.)

(No Model.)

Fig. 1.

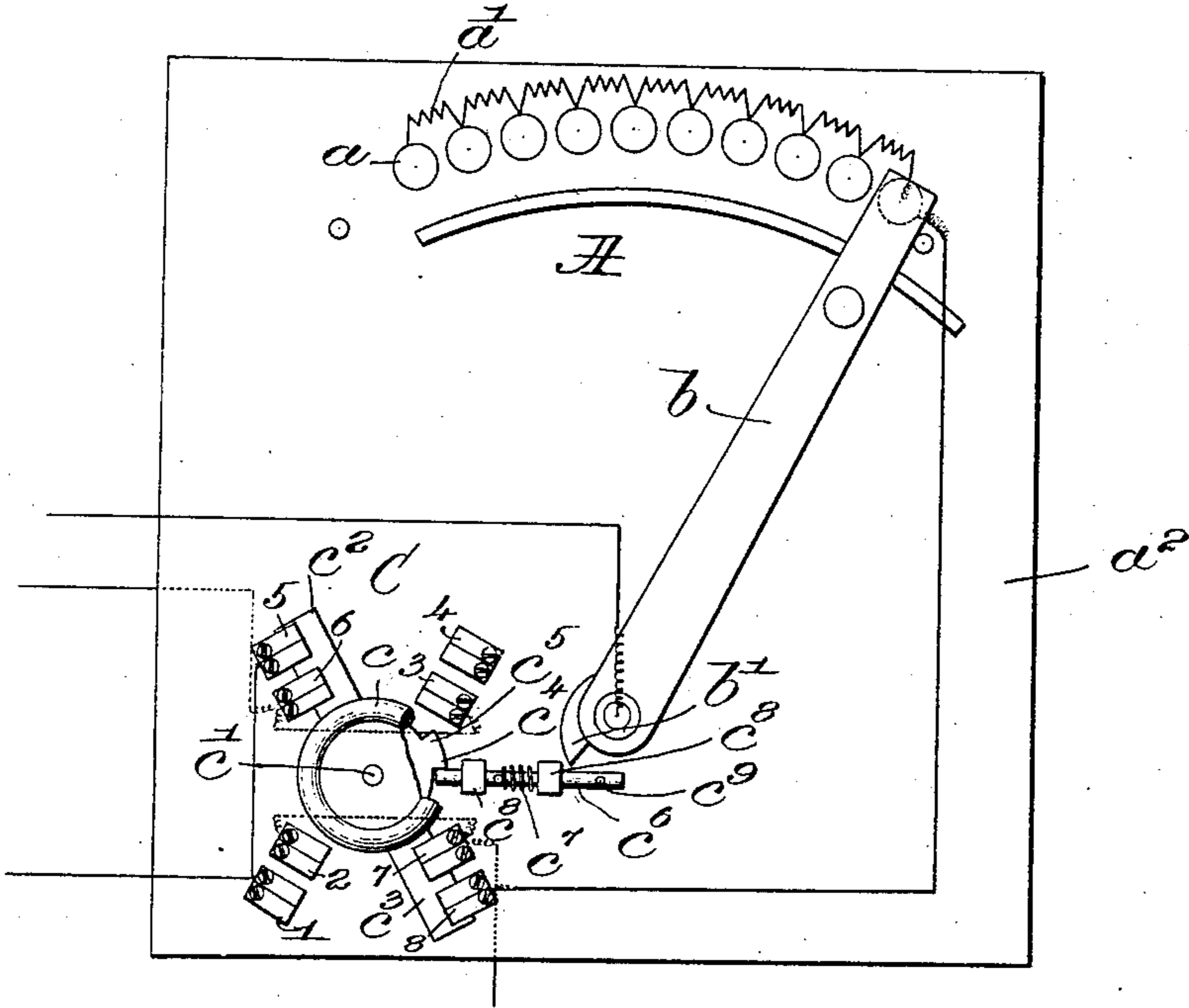
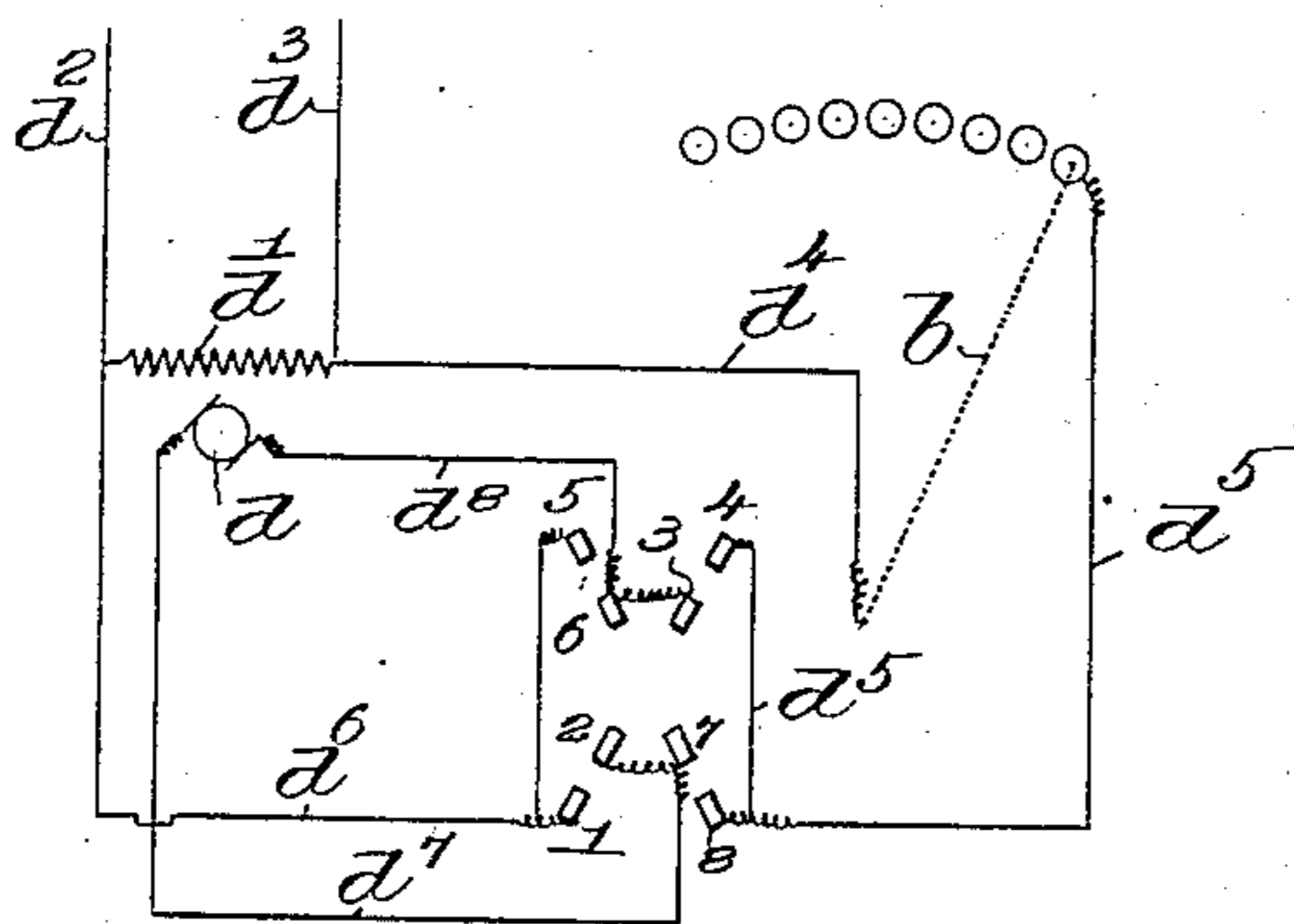


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES I. AYER, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO SIMPLEX ELECTRIC HEATING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

REVERSING-SWITCH CONTROLLER FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 715,235, dated December 9, 1902.

Application filed February 17, 1902. Serial No. 94,352. (No model.)

To all whom it may concern:

Be it known that I, JAMES I. AYER, a citizen of the United States, residing at Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Reversing-Switch Controllers for Electric Motors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention is a controller for a motor-reversing switch in connection with a starting and controlling rheostat, and has for its object the provision of means for preventing the possibility of reversing the current in the motor while the motor is still going.

As usually practiced it is the custom in order to reverse a motor with an independent reversing-switch first to shift the starting and controlling lever of the motor back to its neutral position for stopping the motor, and then when the motor is stopped the operator shifts the reversing-lever so as to change the direction of the current, and having done this he again starts the motor by shifting the starting and controlling lever of the rheostat to proper position, according to the work and operation required of the motor, and it sometimes happens that disastrous accidents are occasioned because the operator forgets to stop the motor before he reverses the current, and accordingly my present invention resides in providing means for automatically rendering this mistake impossible and insuring that whenever the motor-current is reversed the starting and controlling mechanism of the motor will first be moved to stopping position.

The constructional details and further advantages of my invention will be more apparent from the following description, reference being had to the drawings, in which a preferred embodiment of my invention is shown.

In the drawings, Figure 1 is a front elevation of sufficient details of a usual starting and controlling motor mechanism with my invention applied thereto to make the latter fully understood. Fig. 2 is a diagrammatic view thereof, showing more fully the wirings.

As shown in the drawings, the starting and

controlling mechanism A comprises resistance-contacts a , connected by usual resistances a' , mounted on a suitable rheostat base or plate a^2 , over which moves a starting and controlling lever b , and in convenient relation thereto is mounted any form of reversing-switch C.

The reversing-switch herein shown is a rotary switch having a knob or hand-lever c , centrally pivoted at c' and provided with opposite arms or contact-makers $c^2 c^3$ for cooperating with opposite sets of contacts 1 to 8.

The motor, comprising an armature d and field d' , connected to line-wires $d^2 d^3$, is connected to the foregoing mechanism in any suitable manner, being herein shown as having a wire d^4 leading to the contact-lever b , which serves as one conductor for the rheostat, the other being a wire d^5 , connected to the contacts 8 and 4. A wire d^6 connects on the opposite side to the contacts 1 and 5, and from the armature a wire d^7 connects with the contacts 2 and 7, and a wire d^8 connects to the contacts 3 and 6.

As already intimated, my invention in its broader aspects resides in providing means for preventing the operation of the reversing-switch C while the motor-starting mechanism is in its full-line position, Fig. 1, and this invention is capable of a wide variety of embodiments. I have deemed it sufficient for making the invention clear to show herein one simple form of mechanism for accomplishing this purpose.

I prefer to provide mechanical means (as distinguished from electrical) for positively locking and unlocking the reversing-switch, although, as stated, I intend this patent to cover all such means, and accordingly, as herein shown, the switch-lever c is provided with two stops $c^4 c^5$, adapted to be engaged by a bolt or locking device c^6 , normally held by a spring c^7 in engagement with one or the other of the stops $c^4 c^5$, according to the position to which the switch-lever is rotated. Said locking device is herein shown as mounted to reciprocate longitudinally in eyes or lugs c^8 , projecting from the base a , and is provided at its outer end with a pin c^9 , cooperating

ing with a retractor b' , actuated by and preferably integral with the starting-lever b of the mechanism A.

From the foregoing description it will be seen that as long as the starting-lever b is in any other position excepting its left-hand or stopping position the bolt c^6 (which in practice is concealed from view and interference) positively locks the reversing-switch lever c against any movement, so that it is impossible for the operator or any intermeddler to tamper in any way with the reversing-switch while the motor is running. When, however, it is desired to reverse the motor, the operator in order to be able to move the reversing-switch must first shift the lever b over to the left, thereby engaging the releasing device or lug b' with the locking device and automatically unlocking the reversing-switch, so that thereafter the latter may be turned from its previous position to its other position. For example, when in contact for running the motor in the circuit established by the contacts 5 to 8 the unlocking of the lever will permit the switch-lever c to be rotated to the right, so as to break the previous circuit and establish an opposite circuit through the contacts 1 to 4, as is clearly evident viewing Fig. 2. On the other hand, if the motor is running in the circuit including contacts 1 to 4 the locking device will then be in engagement against the shoulder c^5 , so that when the lever b is moved to its stopping position the bolt c^6 (or whatever form of locking device is employed) will be released to permit the reversing-switch to be thrown into circuit with the contacts 5 to 8.

As already explained, I do not intend to limit my invention to the form in which I have

illustrated it, excepting as otherwise specified in certain of the claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A device of the kind described, comprising starting and stopping mechanism for a motor, and a reversing-switch for said motor, a spring-actuated locking device for engaging said switch and holding it against movement, and a retractor actuated by the operation of said mechanism to move said locking device into and out of locking engagement with said switch.

2. A device of the kind described, comprising starting and stopping mechanism for a motor, and a reversing-switch for said motor, a locking-lug on the switch, a bolt for cooperating therewith to lock the switch, and means actuated by said first-mentioned mechanism for moving said bolt into and out of operative engagement with said lug.

3. A device of the kind described, comprising starting and stopping mechanism, including a lever, for a motor, and a reversing-switch for said motor, a locking-bolt for holding said switch against movement, and a retractor projecting from said lever in position to engage and release said bolt from locking position when the lever is thrown to stopping position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAS. I. AYER.

Witnesses:

DORA A. PROCTOR,
ELIZABETH M. CONLIN.