L. S. CHAPMAN.

MOTOR CONTROLLING DEVICE.

APPLICATION FILED MAY 22, 1908.

958,365. Patented May 17, 1910.

Fig. 1.

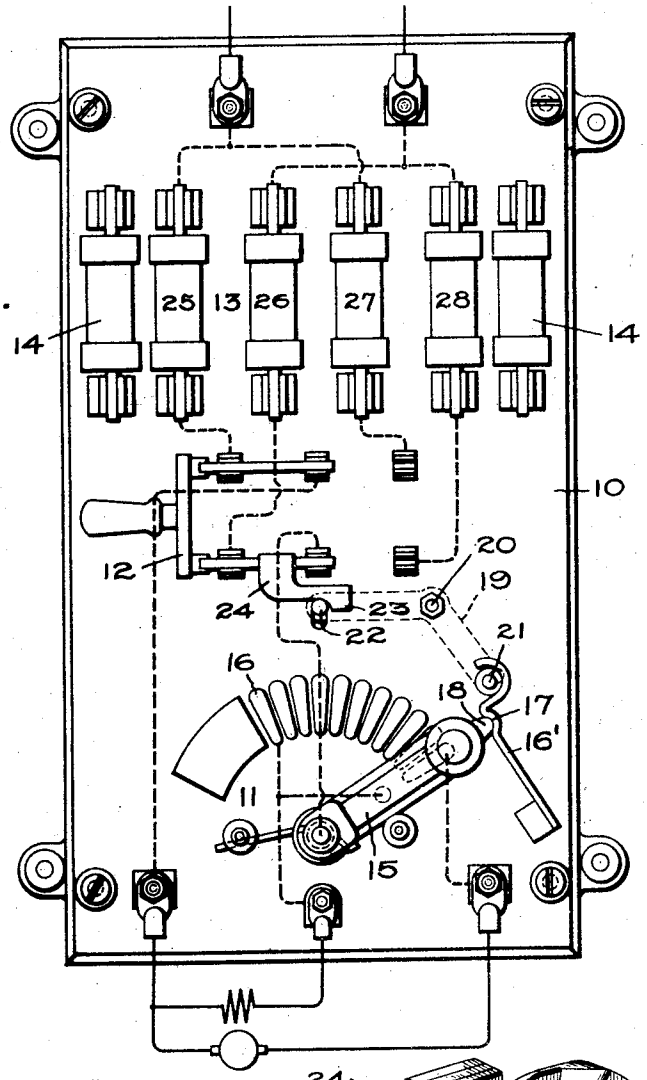
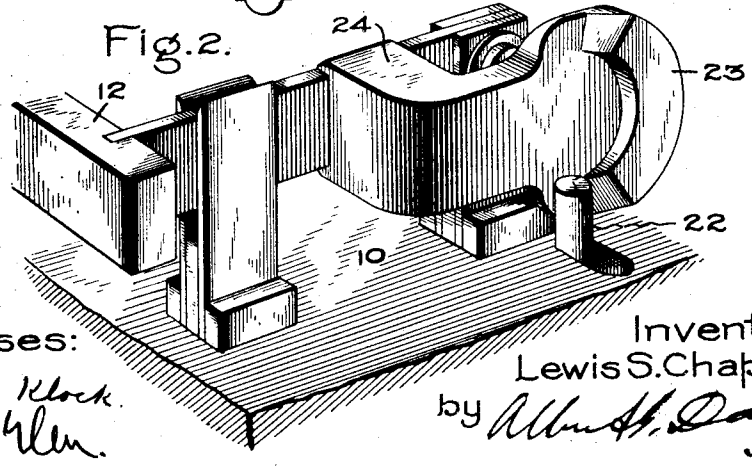


Fig. 2.



Witnesses:

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Att'y.

UNITED STATES PATENT OFFICE.

LEWIS S. CHAPMAN, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

MOTOR-CONTROLLING DEVICE.

958,365. Specification of Letters Patent. **Patented May 17, 1910.**

Application filed May 22, 1908. Serial No. 434,309.

To all whom it may concern:

Be it known that I, LEWIS S. CHAPMAN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Motor-Controlling Devices, of which the following is a specification.

This invention relates to devices for controlling electric motor circuits and has for its object the provision of a device of this character which will protect the motor against accident due to careless handling or other causes in a reliable, safe and efficient manner.

My invention relates more specifically to protective devices for starting rheostats. In the use of motor starters in which the controlling arm is spring-pressed to the off-position it sometimes occurs that the controlling arm is not released immediately when the line switch is opened. This sometimes occurs in the case of a double-throw switch used for reversing, and in this case trouble may result because of the fact that no protective resistance is in series with the armature. For certain uses it has been found that the no-voltage magnet is not altogether satisfactory or desirable for holding the arm in running position, and for this reason I have arranged the arm to be held in running position by means of a spring-pressed latch or a detent. I have also so interlocked this latch with the double-throw line switch that the latch will release the controlling arm and allow it to return to starting position when the line switch is open.

In the accompanying drawing in which I have shown my invention embodied in concrete form for purposes of illustration, Figure 1 is a plan view of the device showing the arrangement of circuits, and Fig. 2 is a detail of the switch and cam mechanism for releasing the detent.

Referring to the drawing, 10 is the ordinary base or panel board of the rheostat made of some insulating material, such as slate or soapstone having mounted thereon a starting rheostat 11, a double-pole, double-throw switch 12, and a series of protective fuses 13. The two end fuses 14 are spare fuses, and the remaining fuses are arranged in pairs, two of which will be in circuit when the switch is in one position and the other two in the circuit when the switch is in the opposite position. The object of this arrangement is to make it possible to quickly supply new fuses in case the fuses are blown out. The switch 12 operates as a line switch and in order to assure the return of the controlling arm to the off position when the switch is opened I arrange an interlocking mechanism between the switch and the rheostat. This rheostat comprises the usual spring-pressed controlling arm 15 coöperating with a series of contact segments 16.

Instead of the usual no-voltage magnet for holding the arm in running position I provide a spring detent 16′ having a recess 17 adapted to receive a finger 18 upon the end of the controlling arm so that when the arm is brought to running position it will be automatically latched there by entering the recess. This spring detent is actuated to release the arm by means of a bell-crank lever 19 pivoted at 20 on the under side of the slate base. A pin or stud is mounted on each end of the lever and projects through the base. One of these pins 21 engages the detent 16′ while the other 22 is engaged by a cam 23 on a bracket 24 mounted upon one of the blades of the switch 12. The arrangement is such that when the switch is opened and the blade is raised, the cam 23 engages the pin 22 forcing it in a direction away from the switch. This movement causes the pin 21 to engage the detent 16′ and release the arm 15 which immediately returns to the off position. The parts will remain in this position until the switch is closed in either one position or the other so that there will always be a protective resistance in series with the motor when the switch is closed. When the switch 12 is in the position shown in the drawing, two fuses 25 and 26 are in circuit. If one or both of these fuses should be blown out and it is desired to quickly replace them the switches will be thrown to the opposite position. As soon as the switch 12 is opened the switch 15 will return to the off position. When the opposite position of this switch is reached the fuses 27 and 28 will be in circuit. The rheostat may then be turned to start up the motor and the arm locked in running position in the usual way. While I have described my invention in connection with concrete mechanism and arrangement of elements for producing a definite result,

it should be understood that I do not limit my invention thereto except in so far as it is limited by the scope of the claims annexed hereto.

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

1. In combination with a starting rheostat having a controlling arm biased to starting position, a latching device for holding said arm in running position, a double throw switch, and mechanism for mechanically moving the latch to release the arm upon the opening of said switch from either position.

2. The combination with a starting rheostat having a controlling arm biased to starting position, of a spring detent for automatically latching said arm in running position, a double-throw switch, and a cam operated by the switch to actuate the detent and release the arm when the switch is moved from either position.

3. The combination with a starting rheostat having a controlling arm biased to starting position, of a latching device for holding said arm in running position, a double-throw switch, a plurality of protective fuses one for each position of said switch, and means operated by the opening of said switch from either position for releasing said arm.

In witness whereof, I have hereunto set my hand this 21st day of May, 1908.

LEWIS S. CHAPMAN.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.