

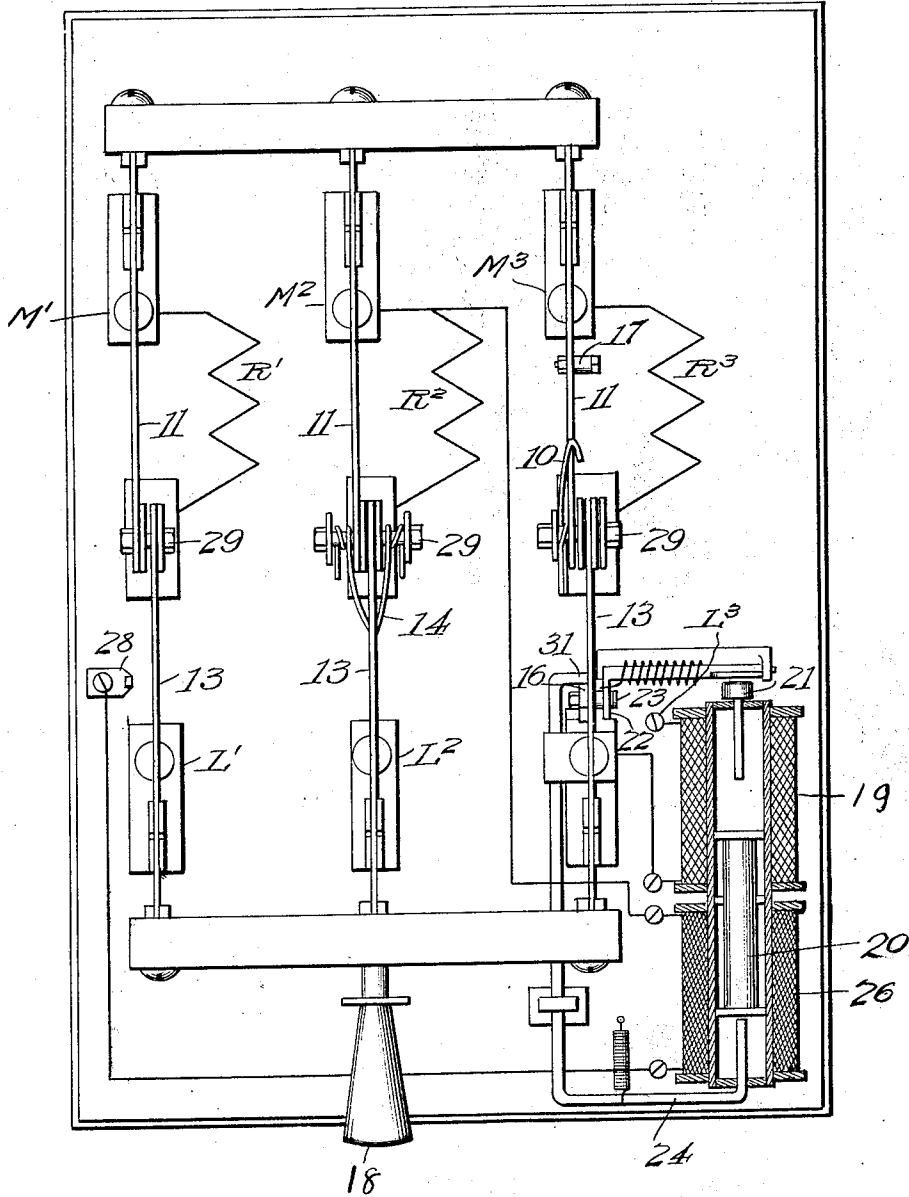
W. S. EVANS.
MOTOR STARTER SWITCH.
APPLICATION FILED DEC. 30, 1910.

1,009,229.

Patented Nov. 21, 1911.

3 SHEETS-SHEET 1.

Fig. 1.



WITNESSES
J. L. Mochan
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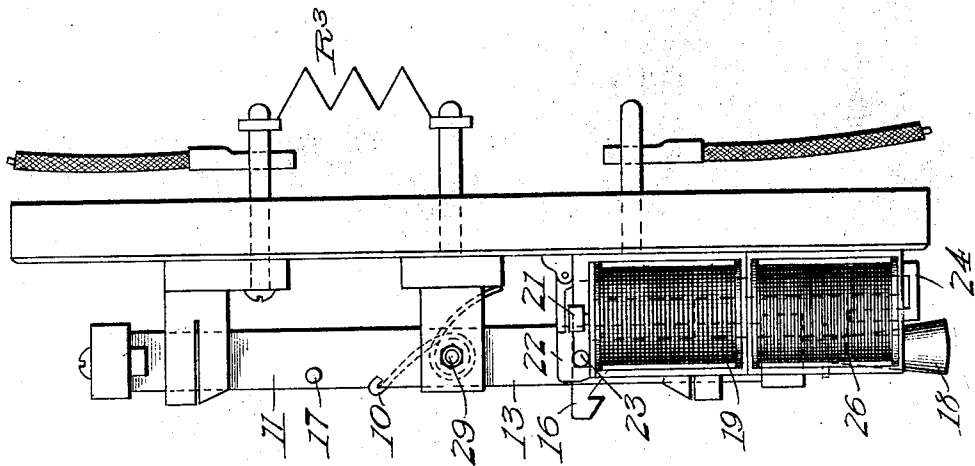
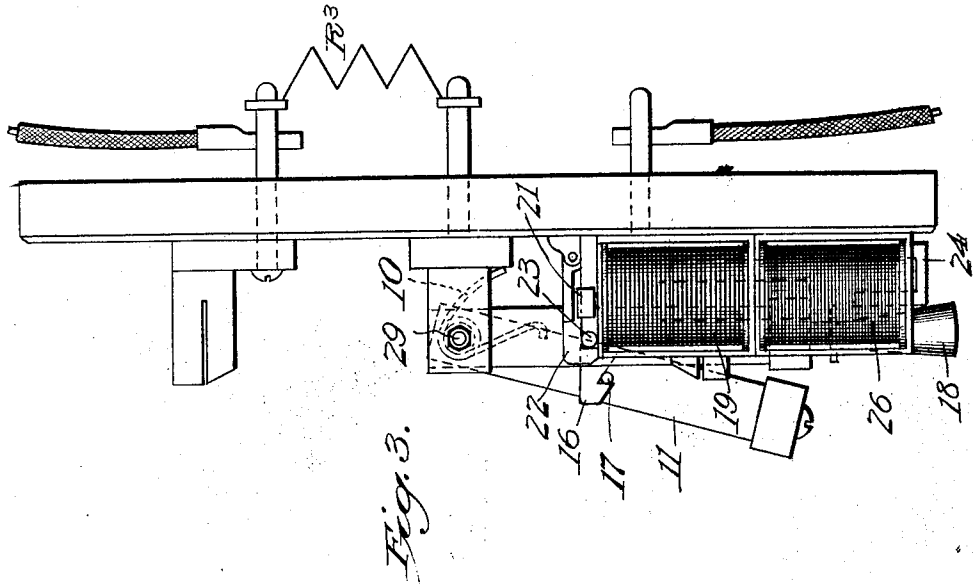
INVENTOR
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3 SHEETS-SHEET 2.



WITNESSES

T. H. Kockman
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INVENTOR

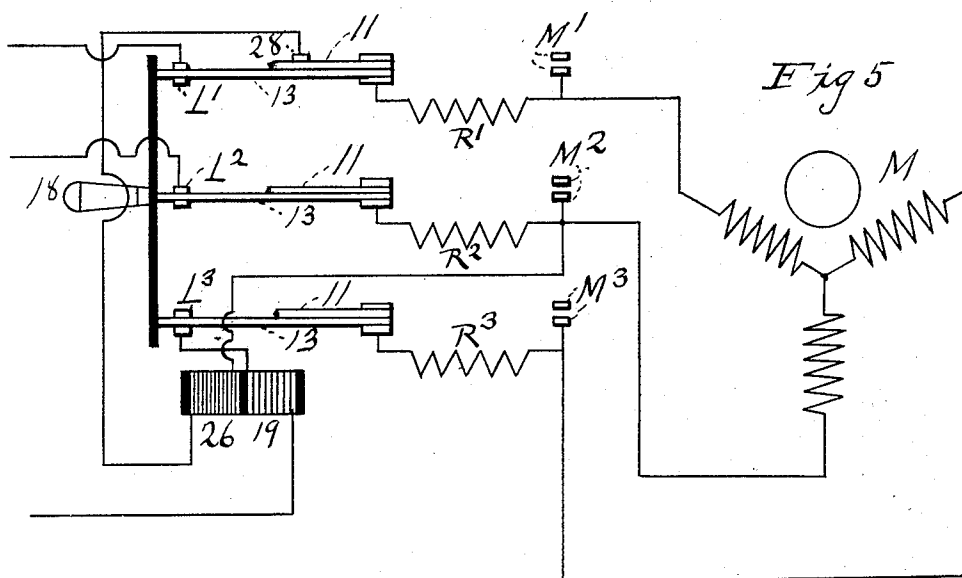
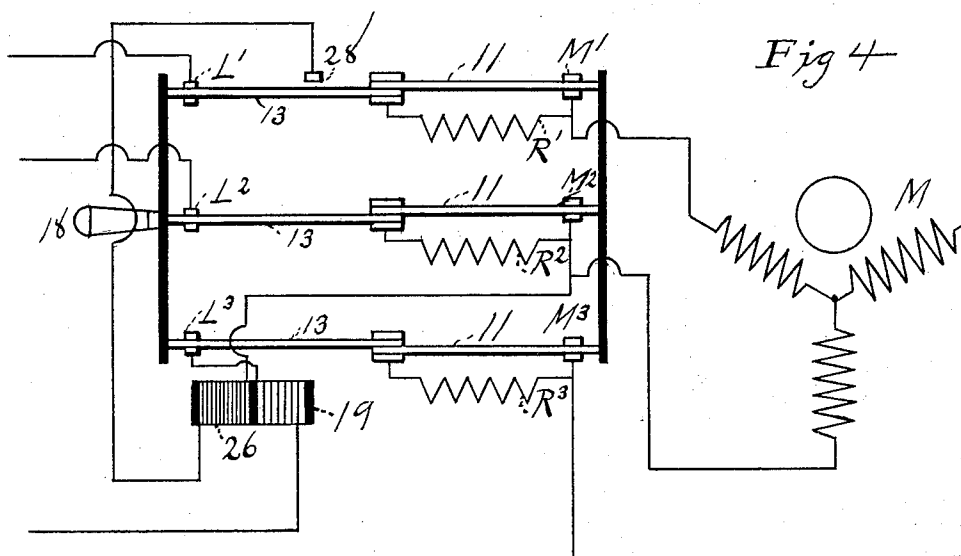
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3 SHEETS-SHEET 3.



WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM S. EVANS, OF NEWARK, NEW JERSEY.

MOTOR-STARTER SWITCH.

1,009,229.

Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed December 30, 1910. Serial No. 600,148.

To all whom it may concern:

Be it known that I, WILLIAM S. EVANS, a citizen of the United States of America, and resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Motor-Starter Switches, of which the following is a specification.

My invention relates to that class of device in which starting resistances are automatically short circuited, when the motor has reached normal speed, combined with means for effecting a quick overload release.

Figure 1 is an elevation of the device when in operation. Fig. 2 is a side view of Fig. 1. Fig. 3 is an elevation of a detail. Fig. 4 is a diagram of the circuits through the controller in one of its positions, the motor, and the magnets 19 and 20. The electric connections are the same as those that occur in the device as shown in Fig. 1. Fig. 5 is a diagram of the circuits through the controller in its other position, the motor, and the magnets 19 and 20. The circuits and connections are as they exist when the controller is in the position seen in Fig. 3. To prevent confusion, parts of the blades 11 are broken off, to more clearly exhibit the circuits. One blade is seen in contact with the terminal 28, which always lies in the path of the said blade. The Y type of induction motor is indicated.

The organization consists of starting resistances R^1 , R^2 , R^3 , in circuit with the line whose terminals are respectively L^1 , L^2 , L^3 , and with a motor whose terminals are M^1 , M^2 , M^3 ; a three pole doubly acting switch, whose blades are 11; a spring 10 for holding said switch closed while short circuiting said resistances, a pawl 16, engaged with a pin 17 on the switch for holding said switch open against the force of said spring; a shunt coil 26; a core 20 for said coil, for releasing said pawl and switch for short circuiting said resistances, and for cutting out said shunt coil at the contact 28, which is in the path of the left hand blade 11, and which is one terminal of the coil 26; a second three pole doubly acting switch whose blades are 13; a spring 14 for opening said second switch; a second pawl 22 engaging the pin 23 on the second switch, for holding the second switch closed; a series coil 19; a core 20 and pin 21 for releasing said second pawl, and opening the second switch at an overload of current; pivot studs 29 com-

mon to both switches; said pin 17 on the first switch being in the path of the pawl 16 pivoted on the second switch, by which the two switches are joined together when the second switch is released from its closed condition.

Below the core 20, and in its path, is a rod 24, which extends upward and is provided with a hook 31 reaching over one end of the pawl 16 for tilting the latter and releasing the pin 17 on the right hand blade 11. The pawl 16 is pivoted to the right hand blade 13 so that when the blades 13 are swung open, the pawl 16 will engage with the pin 17 on one of the blades 11.

To operate the invention, pull the handle 18 whose blades are 13 until they engage the terminals L^1 , L^2 , L^3 ; the current is now free to pass through the blades 13, and the resistances R^1 , R^2 , R^3 , and the series coil 19, which pulls the cord 20 up, which strikes against the pin 21, which trips the pawl 22 on the stud 23, but the hand prevents the blades 13 from rising. As the motor speeds up and drops in current and increases in voltage, the coil 19 loses its strength, and the coil 26 becomes stronger, pulling the core 20 down, striking the bar 24, thereby releasing the pawl 16 when the motor has attained a certain speed, and releasing the switch whose blades are 11, for short circuiting the resistances R^1 , R^2 , and R^3 to obtain full speed. The motor is thus put across the line, so that the hand can be removed from the handle 18. The coil 19 then acts as a circuit breaker for on an overload, the core 20 trips the pawl 22, again, causing the blades 13 to cut out the lines at the terminals L^1 , L^2 , L^3 . The stud 23 serves also as a pivot for the pawl 16.

31 is a pivot for the pawl 22, which is fastened to the base of the switch. One terminal of the coil 26 is at 28, while the other is at the resistance R^2 .

I claim as my invention:—

1. In a three phase induction motor starter, the combination of a starting resistance in circuit with said motor, a shunt coil, means released by said coil for short circuiting said resistance at starting speed or half speed, and for simultaneously cutting out said shunt coil, a series coil, and means released by said series coil for cutting out said motor on an overload.

2. In a three phase induction motor starter, the combination of a starting resistance in circuit with said motor; a three

pole doubly acting switch; a spring for closing said switch; a pawl holding said switch open against the force of said spring; a shunt coil; a core therefor, for releasing
5 said pawl and switch for short circuiting said resistance and for cutting out said shunt coil, at starting speed or half speed of said motor; a second three pole doubly acting
10 switch, a spring for opening said switch, a second pawl for holding said second switch closed; a series coil, a core therefor for releasing said pawl and opening said second switch during an overload, studs upon which both switches are swung, and means by which both switches are held together in their normal condition.

WILLIAM S. EVANS.

Witnesses:

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ARTHUR M. CONDIT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
