

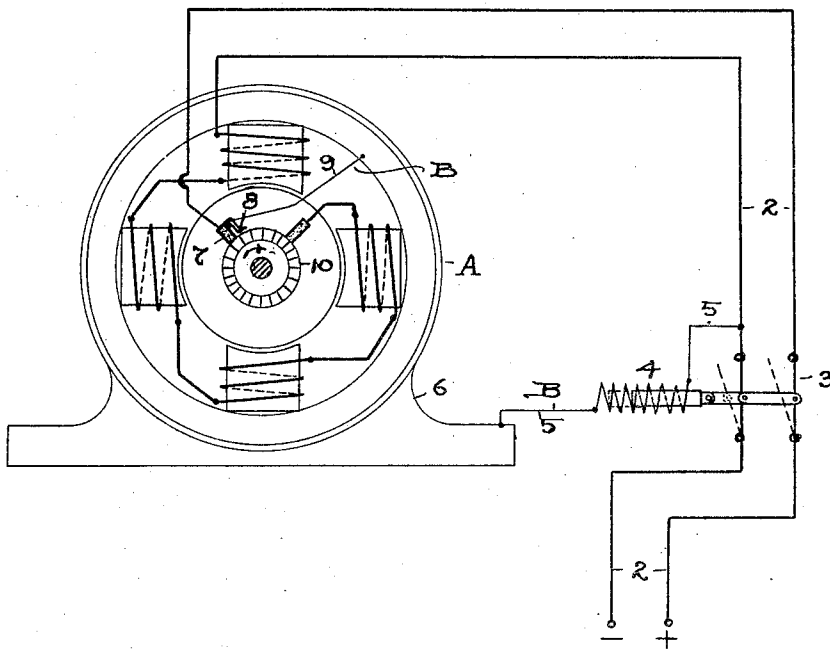
Dec. 20, 1927.

1,652,999

S. C. BENSON

ELECTRIC MOTOR

Original Filed Oct. 25, 1921



Inventor

S. C. BENSON

By *Fisher, Moore & Wilson*

Attorney

UNITED STATES PATENT OFFICE.

SAMUEL C. BENSON, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-FOURTH TO J. J. ROBY, OF CLEVELAND, OHIO, AND ONE-FOURTH TO R. W. MOORE AND ONE-FOURTH TO L. S. MOSCHUP, BOTH OF ADENA, OHIO.

ELECTRIC MOTOR.

Original application filed October 25, 1921, Serial No. 510,322. Divided and this application filed August 21, 1926. Serial No. 130,601.

The present invention relates to an improvement in electric motors, and more particularly to an improvement in safety circuits and devices for electric motors, such for example as shown in my Letters Patent of the United States No. 1,602,743, which eventuated from my application, Serial Number 510,322, filed October 25, 1921, of which this application is a division. In general, the object of the present improvement is to provide means for automatically cutting off the source of electric supply for the motor and to stop the motor, whenever objectionable sparking occurs at the commutator and particularly when the armature coil opens and injury to the motor is imminent.

In the accompanying drawing the single figure is a diagrammatic view of a series wound motor embodying my improved safety circuit and device. As shown, a series wound motor A is connected in a main circuit 2 representing the source of electric supply. This main circuit is adapted to be opened automatically by a magnetic switch 3, comprising a solenoid 4 in a shunt circuit B. A double pole switch may be used and shunt circuit B may include a connection 5 leading from the negative wire of the main circuit, to the solenoid coil 4 and from this coil to frame 6 of motor A. The positive wire of main circuit 2 may be connected to one commutator brush 7 upon or in association with which I provide a spark intercepting element 8 having a shunt connection 9 with frame 6.

Spark intercepting element 8 may be mounted in an insulated position upon or at one side of brush 7 closely adjacent to but apart from the commutator 10 of the motor. Thus, if a break or opening of an armature loop or coil occurs a spark will be produced intermittently at brush 7 as the armature revolves. The spark is initiated at the brush and one or more of the segments of commutator 10, and the rotative movement of the armature and the close position of intercepting element 8 permits the current to jump to said element where sparking occurs, thereby shunting the current for an instant through element 8 to line 9 and frame 6 of the motor and thence over connection 5 to the solenoid coil and to the negative side of main circuit 2; in that way energizing and opening magnetic switch 3 and opening the main circuit for motor A. Accordingly the device as described serves an important protective purpose for the motor, and in addition compels the operator to adjust the brushes properly to prevent sparking and wear on the commutator.

As shown only a single brush is provided with a spark intercepting element connected in shunt with the main line through switch 3, but in a multipolar machine a plural number of such intercepting elements may be used or electrically connected together to operate the switch. Conductor 9, frame 6 and connection 5 exemplify one way of shunting the current, but obviously, a single connection or conductor might be employed if it is not desirable to shunt through frame 6 of the motor.

What I claim, is:

1. An electric motor having a main circuit, a magnetic switch controlling said circuit, and a spark intercepting device associated with the commutator of said motor and connected in open shunt circuit with said magnetic switch, said open shunt circuit adapted to energize said switch when closed temporarily by current flowing there-through as a result of sparking at the commutator upon the occurrence of an opening or break in the armature winding.
2. An electric motor and a main circuit therefor embodying a magnetic switch, and a normally open shunt circuit for said motor having an auxiliary brush opposite the commutator of the motor adapted to shunt the current and energize said magnetic switch when an armature coil is opened and sparking occurs between the commutator and said brush.

In testimony whereof I affix my signature.

SAMUEL C. BENSON.