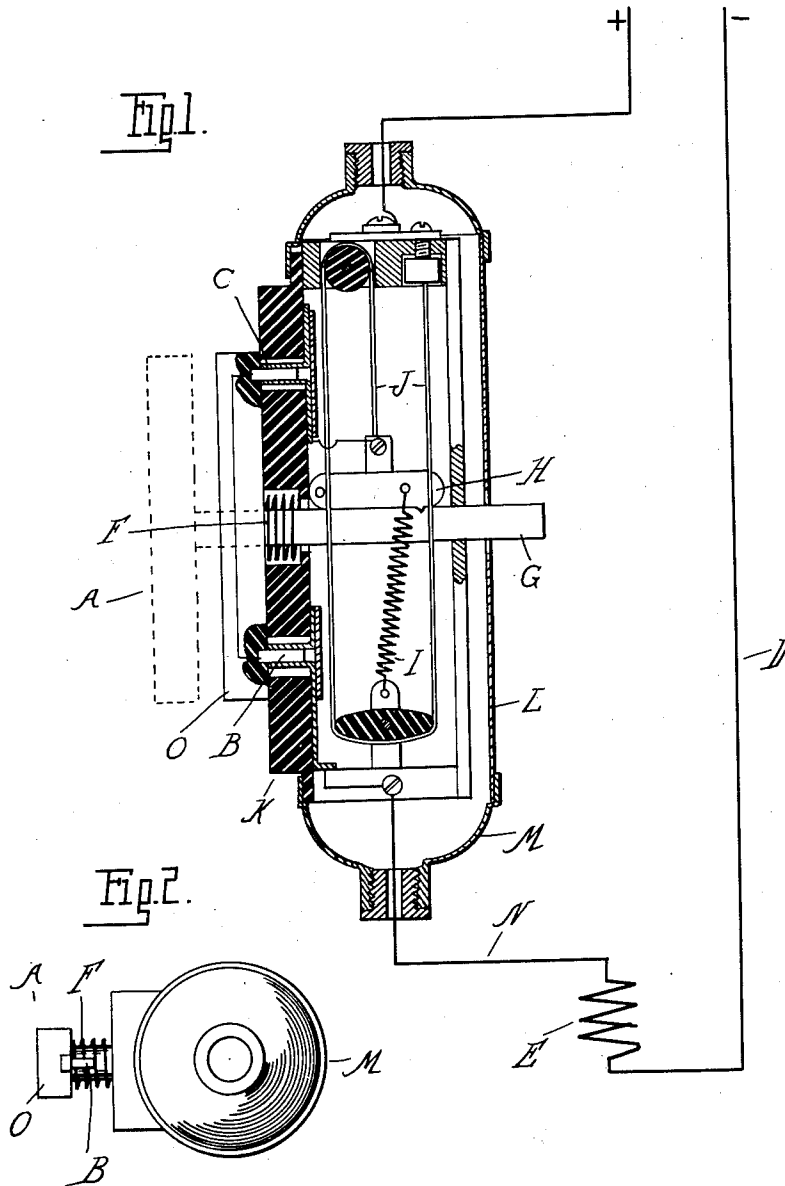


G. J. SCHNEIDER.
 AUTOMATIC CONTROLLING SWITCH FOR ELECTRIC CIRCUITS.
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1,046,499.

Patented Dec. 10, 1912.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE J. SCHNEIDER, OF DETROIT, MICHIGAN.

AUTOMATIC CONTROLLING-SWITCH FOR ELECTRIC CIRCUITS.

1,046,499.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE J. SCHNEIDER, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Automatic Controlling-Switches for Electric Circuits, of which the following is a specification, reference being had therein to the accompanying drawings.

It is the object of the invention to obtain a construction of automatic controlling switch for electric circuits which will operate upon a slight decrease in the volume of current passing through the circuit. Thus for use in connection with electric heaters and other work circuits of a like character where the increase in heat causes an increase in resistance, this will be operated automatically to cut out the circuit, thereby avoiding over heating.

In the drawings,—Figure 1 is a longitudinal section through the device, showing the electric circuits in diagram; and Fig. 2 is an end elevation.

As preferably constructed, A is an automatically opening switch having the contact plates B and cooperating contacts C for closing an electric circuit D, including an electric heater E or other work.

F is a spring for opening the switch which is sleeved upon a shank G.

H is a dog or latch member engaging the shank G to hold the same from movement in the closed position of the switch and I is a spring for operating the latch.

The work circuit D which is closed by the switch has included therein, a conductor J, one end of which is mechanically attached to the latch H, while the other end is anchored to a fixed point. The resistance of this conductor J is such that with the normal flow of current through the work circuit, a heating effect will be produced expanding and lengthening said conductor and releasing the latch member H from the tension thereof. Thus the spring I will hold the latch in engagement with the shank G and will lock the switch A in its closed position. On the other hand, a slight reduction in the current volume passing through the circuit will decrease the heating effect in the conductor J, and the resistance of the latter is so proportioned to its length and coefficient of expansion that such a reduction in

current will cause a contraction of the conductor J, thereby drawing upon the latch H and disengaging the same from the shank G.

It will be understood from the description above given that wherever there is an overheating effect in an electric heater controlled by such a switch, there will be a reduction in the current due to the increased resistance of the heater, and therefore, the switch will automatically operate. It is necessary however, in establishing the circuit, to hold the switch in closed position for a short interval of time so as to produce the initial heating effect necessary to the release of tension of the member J.

I preferably construct the switch so that it may be coupled into an electric circuit having a flexible conductor cord. Thus, as shown, the frame K on which the switch A is mounted is inclosed in a tubular housing L having caps M at the opposite ends thereof, with inlet and outlet flexible conductor connections N. The movable switch bar O projects out at the side of the casing in a position where it, together with the casing, may be grasped by the hand of the operator to close the switch, and by holding the parts in this position for an instant after the closing of the circuit, sufficient heat will be generated to release the tension on the latch.

What I claim as my invention is:

1. The combination with an electric circuit of a heating resistor in said circuit, a switch controlling said circuit, and thermostatic means operated by a decrease in current volume in said circuit for actuating said switch.

2. The combination with an electric circuit of a switch controlling said circuit, a heating resistor in said circuit and thermostatic means for actuating said switch operated by an overheating of said resistor sufficient to produce a decrease in current volume in said circuit.

3. The combination with an electric circuit of a heating resistor in said circuit, a switch for closing said circuit and thermostatically controlled means automatically operating upon a decrease in volume of current in said circuit for opening said switch.

4. The combination with an electric circuit of a heating resistor in said circuit, an electric switch controlling the circuit, a conductor included in said circuit expanded by the normal current in volume passing there-

through, and operatively connected with said switch, and mechanism for normally holding said switch closed, said switch being opened by the contraction of said conductor upon a decrease in current volume.

5 5. The combination with an electric circuit of a heating resistor in said circuit, a resistance conductor included in said circuit expanded by the heat of the normal current volume in said circuit, mechanism operated by the contraction of said conductor upon a decrease in current volume in the circuit, and a switch controlled by said mechanism.

15 6. The combination with a casing of an electric circuit, a switch without the casing controlling the circuit, a heating resistor in said circuit and means within the casing operated by an overheating of said resistor sufficient to produce a decrease in current volume in said circuit for actuating the switch.

20 7. The combination with a casing of an electric circuit, a switch projecting without the casing controlling said circuit, a heating resistor in said circuit and means within the casing for actuating said switch operated by an overheating of said resistor sufficient to produce a decrease in current volume in the circuit.

30 8. The combination with a casing of an electric circuit, a heating resistor in said circuit, a switch without the casing having a portion projecting therewithin, a latch positioned within the casing adapted to engage the projection of the switch and lock the same in one position of adjustment, and thermostatic means within the casing connected to said latch and normally tending to hold said latch out of locking engagement with said switch, said thermostatic means being heated sufficiently by the normal current volume in said circuit to permit the latch to engage said switch, whereby upon an overheating of said resistor sufficient to produce a decrease in current volume in the

circuit the latch will be operated to unlock the switch.

9. The combination with an electric circuit of a heating resistor in said circuit, a casing, a switch carried by said casing controlling said circuit, a latch pivoted within the casing adapted to engage and lock the switch in its closed position, a spring tending normally to maintain the latch in locked engagement with the switch, a thermostat included in said circuit and connected to said latch, said thermostat being normally of a length to hold the lock out of engagement with said switch and being expanded by the heat of the normal current volume in said circuit sufficient to permit the latch to have a locking engagement with the switch whereby upon a decrease of current volume in said circuit the latch will be released.

10. The combination with an electric circuit of a heating resistor in said circuit, a casing, a switch without the casing having a portion projecting therewithin, a spring tending normally to open said switch, a lock pivoted within the casing adapted to have a locking engagement with the switch in the closed position of the latter, a spring tending normally to hold said latch in locking engagement with the switch, a thermostat included in said circuit and connected to said latch normally of a length sufficient to hold said latch out of locking engagement with said switch and expanded by the heat of the normal current volume in said circuit to permit the latch to lock said switch closed, said thermostat being contracted to unlock the latch upon an overheating of said resistor sufficient to produce a decrease of current volume in said circuit.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE J. SCHNEIDER.

Witnesses:

W. J. BELKNAP,
JAMES P. BARRY.