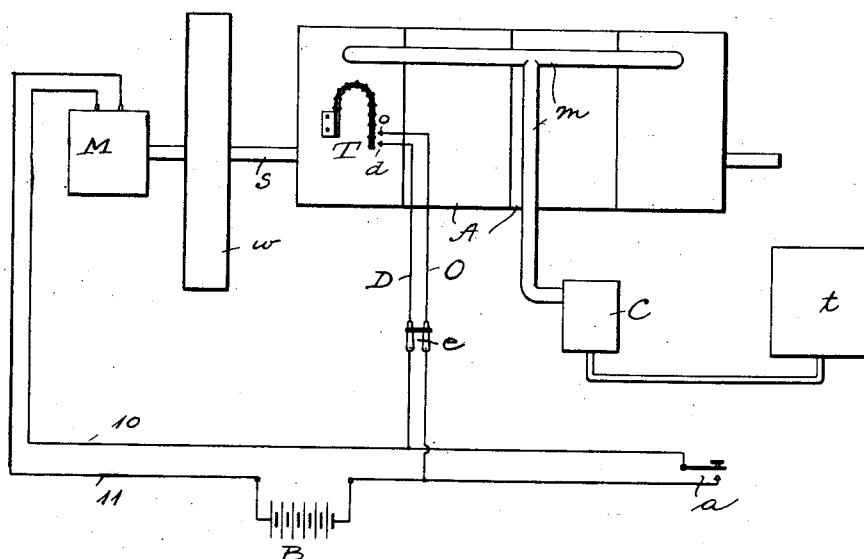
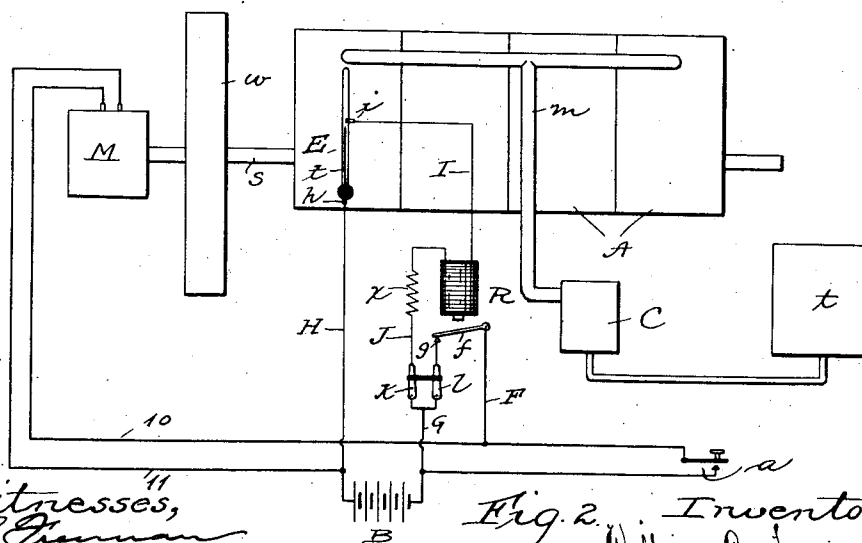


W. A. LURIE.
 AUTOMATIC CIRCUIT CONTROLLING MECHANISM FOR ELECTRICAL SELF STARTERS
 FOR AUTOMOBILES.
 APPLICATION FILED MAR. 12, 1913.

1,081,683.

Patented Dec. 16, 1913.

Fig. 1.



Witnesses,
J. P. Hannan
Julius M. Kahn.

Fig. 2. Inventor,
 William A. Lurie
 By *George D. Davis* Atty.

UNITED STATES PATENT OFFICE.

WILLIAM A. LURIE, OF CHICAGO, ILLINOIS.

AUTOMATIC CIRCUIT-CONTROLLING MECHANISM FOR ELECTRICAL SELF-STARTERS
FOR AUTOMOBILES.

1,081,683.

Specification of Letters Patent.

Patented Dec. 16, 1913.

Application filed March 12, 1913. Serial No. 753,707.

To all whom it may concern:

Be it known that I, WILLIAM A. LURIE, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Automatic Circuit-Controlling Mechanism for Electrical Self-Starters for Automobiles, of which the following is a specification.

My invention relates to automatic circuit controlling mechanism for electrical self starters for automobiles.

Engine starters in the form of electrical motors are coming into general use but up to the present time the motor starting circuit depended for its control upon the operation by hand or by foot of switch mechanism by the driver of the automobile.

When the engine and fuel supply mechanisms become chilled below a certain temperature it becomes difficult for the gasoline or other fuel to be properly vaporized and when it is attempted to start the engine, considerable difficulty is experienced. If the temperature becomes too cold, the cooling water will freeze and the various mechanisms, lubricating oils, etc., become so chilled that starting, even with a self starter, becomes an uncertainty and a great annoyance.

The main object of my invention is to provide thermostatically controlled switch mechanism for automatically connecting the starting motor for operation when the temperature falls below a predetermined point, and for disconnecting the motor when the temperature has again risen sufficiently. By such means, as soon as the temperature falls to a point below which starting would be difficult, the starting motor will operate and the engine run, and then as soon as the temperature has been raised and the mechanism heated up, the motor will stop. After the engine runs a few minutes sufficient heat will be generated to withstand the cold for a considerable time. With such arrangement, the driver may leave his car in the cold for any length of time without injury thereto and when he is ready to proceed he will experience no difficulty in starting.

Referring to the accompanying sheet of drawing, Figure 1 is a diagrammatical representation of an engine outfit with one embodiment of my invention applied thereto,

and Fig. 2 is a similar view showing a modified arrangement.

The cylinders A are shown connected by manifold *m* with the carbureter C which receives fuel supply from tank *t*. The engine shaft *s* carries the fly wheel *w*, and connected with the shaft is the starting motor M. A battery B provides current for the motor and the motor circuit 10, 11 is controlled by switch *a* actuated either by hand or by foot.

The arrangement thus far described is now extensively used, but control of the motor requires the presence of the driver. In accordance with my invention I provide means for automatically controlling the motor operation independently of the driver and the switch *a*. In the arrangement shown in Fig. 1 a thermostat device T of any well known construction is applied near the engine and fuel supply to cooperate with the terminals *o* and *d* of circuit branch O, D which forms a shunt about switch *a*. Experience has been that starting becomes difficult when the temperature falls below about 40° Fahrenheit and the thermostat device is therefore adjusted to expand sufficiently to close contacts *o* and *d* when this temperature is reached and to disconnect the contacts when the temperature has again risen to say about 50° F. Closure of the contacts will close circuit O, D and the motor circuit independently of the switch *a*, and the motor will operate to start the engine. When the engine becomes heated after a few minutes' running the thermostat device will open the circuit and the motor will stop. It is therefore impossible for the engine and mechanisms to become too cold, and ready starting in the usual way is always assured. In order that the automatic controlling mechanism may be disconnected from circuit when the automobile is running, a switch *e* is included in conductors O, D, as shown.

In the modified arrangement shown in Fig. 2, a thermometer E is applied near the operating mechanisms and controls a relay R whose armature *f* and contact *g* are the terminals of the shunt circuit F, G. The bulb contact *h* of the thermometer is connected by conductor H with one side of the battery and the contact *i*, at about the temperature division 40°, is connected by conductor I with one terminal of relay R,

whose other terminal is connected by conductor J with conductor G and the other side of the battery. Switch sections *k* and *l* are included in the relay circuit and the shunt circuit respectively so that the automatic control may be disconnected. The motor can then be started in the ordinary way by the driver by means of switch *a*. When the driver leaves the car, he closes switch *k*, *l*, and while the temperature remains over 40°, the relay circuit is closed and armature *f* is drawn away from contact *g* and the shunt circuit F, G is open. This relay circuit is as follows: battery B, conductor H, bulb contact *h*, the thermometer fluid *t*, contact *i*, conductor I, relay R, conductor J, and conductor G. As soon, however, as the temperature falls and the thermometer fluid falls below the 40° point, this relay circuit is broken and the armature falls against its contact to close the shunt circuit F, G, the motor being then in circuit with this shunt branch and the battery and the engine is operated until the temperature has been sufficiently raised. In order to save current a resistance *x* may be included in the relay circuit.

I thus provide a very simple attachment for automobile electric starting systems which will automatically control the running of the engine to keep itself and the surrounding mechanism above a temperature which would interfere with proper and efficient operation.

I do not desire to be limited to the exact construction and arrangement shown as changes and modifications are no doubt possible which will come within the scope of the invention, and

I claim as follows:

1. In combination, an explosive engine, a starting motor therefor, a current supply circuit for the motor and a battery therefor, a switch for controlling said circuit, and

thermostat mechanism responsive to the temperature at said engine to automatically control said circuit independently of said switch.

2. In combination, an explosive engine, a starting motor therefor, a current supply circuit for the motor and a battery, a main switch for controlling said circuit, a shunt circuit around said switch, and a thermostat switch responsive to the temperature at said engine for controlling said shunt circuit.

3. In combination, an explosive engine, a starting motor therefor, main mechanism for controlling the operation of said motor, and auxiliary mechanism controlled by the temperature of the engine for controlling said motor independently of said main mechanism.

4. In combination, an explosive engine, a starting motor therefor, a supply circuit for the motor including a source of current, and a thermostat device for controlling said circuit.

5. In combination, an explosive engine, a starting motor therefor, a supply circuit for the motor including a source of current, and a thermostat switch placed near the engine for automatically controlling the opening and closing of said circuit.

6. In combination, an explosive engine, a starting motor therefor, a supply circuit for the motor including a source of current, a thermostat switch placed near the engine, a circuit controlled by said switch and a relay included in said circuit, and a switch for said supply circuit controlled by said relay.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 28th day of February, A. D. 1913, at Chicago, Illinois.

WILLIAM A. LURIE.

Witnesses:

GEO. S. PINES,
SAML. A. SWITZER.