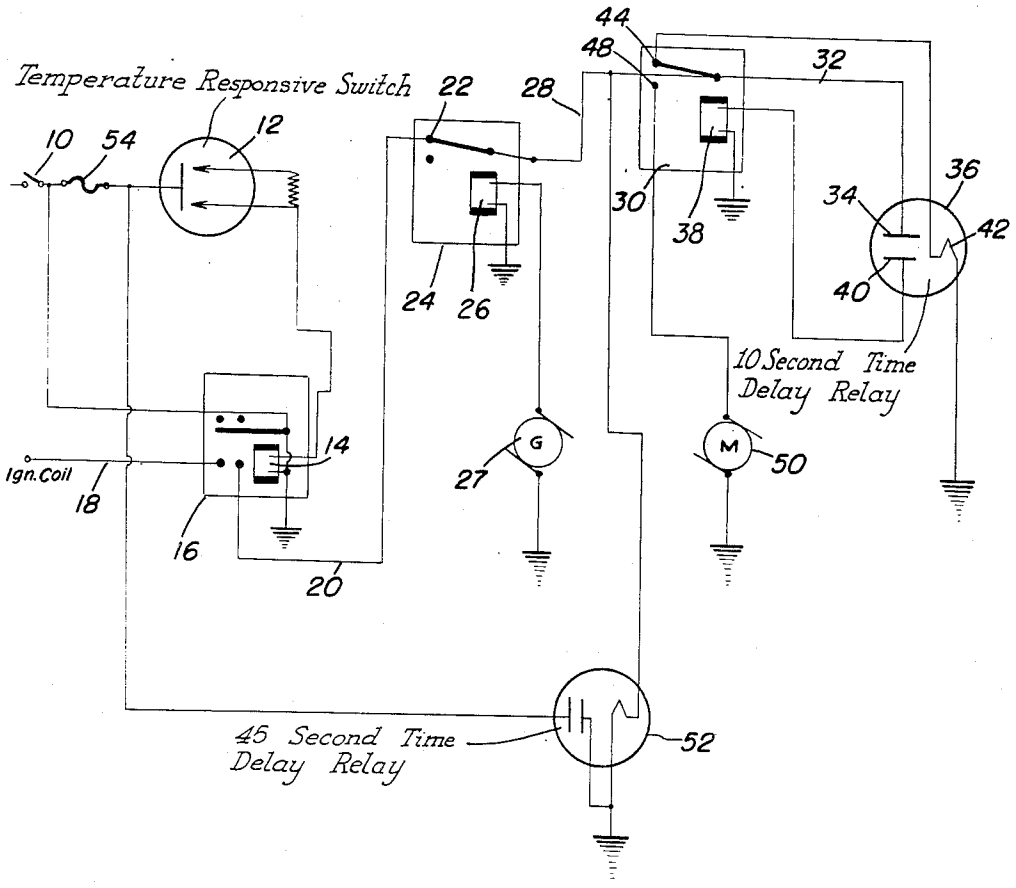
June 14, 1955 W. G. CHARLES 2,710,926

STARTER CIRCUIT

Filed Feb. 9, 1953



William G. Charles
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office 2,710,926
Patented June 14, 1955

2,710,926

STARTER CIRCUIT

William G. Charles, Chicago, Ill., assignor of twenty-five per cent to Emil F. Autunovich, and ten per cent to John J. Rumzis, both of Chicago, Ill.

Application February 9, 1953, Serial No. 335,973

2 Claims. (Cl. 290—37)

This invention relates to an actuating circuit for internal combustion engines which employ electrical systems for starting and stopping and more particularly to a device especially adapted to start an internal combustion engine of an automotive vehicle located in climates where the vehicle is subjected to severe cold weather conditions, when the temperature falls below a certain preset level.

The primary object of this invention is to provide means for causing an internal combustion engine to start and stop in order to maintain the engine at a certain predetermined temperature. Means are further provided to start and stop the engine so that the internal heat provided by the operating engine will maintain the engine above a predetermined temperature level.

It is to be understood that various other applications of this device may be considered to be within the scope of this invention and this starter circuit is equally applicable to heating and refrigerating systems which employ electrical circuits for starting and stopping.

Still further objects of this invention reside in the provision of an electrical circuit for starting and stopping an internal combustion engine in response to a certain preset temperature level, the electrical circuit being simple in construction by including a minimum number of parts, capable of being arranged in a very compact manner, and which is relatively inexpensive to install.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this starter circuit, a wiring diagram being shown in the figure of the accompanying drawing, by way of example only.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral **10** generally designates an actuation switch for the device. This switch **10** is connected in series with a power source such as the 6-volt D. C. battery commonly used in automotive vehicles. A temperature responsive switch **12** such as a thermostat is connected in series with the switch **10** and in series with the solenoid **14** of a double-pole double-throw D. C. relay **16**. Hence, with the switch **10** closed and with the temperature at the predetermined temperature level, current will pass through to conductor **18** which is connected to the ignition coil of the internal combustion engine. Further, current will pass through the conductor **20** which is connected to one contact **22** of a single-pole double-throw 6-volt D. C. relay **24**.

The D. C. relay **24** has its solenoid actuating mechanism **26** connected in series with the generator **27** driven by the internal combustion engine. The relay **24** is normally urged to a position where the contact **22** is engaged. Current will pass through the relay and through conductor **28** to another single-pole double-throw relay **30**. The conductor **28** is further connected through the conductor **32** to one contact **34** of a ten second time delay relay **36**. The solenoid actuating mechanism **38** of the

relay **30** is electrically connected to the other contact **40** of the time delay relay **36**. The heater **42** of the relay **36** is connected to one contact **44** of the relay **30**. Another contact **48** of the relay **30** is connected to the starter motor **50** of the internal combustion engine. The relay **30** is normally urged to a circuit closed position through the contact **44** to the heater **42** of the time delay relay **36**. Current is applied across the contacts **34** and **40** which are closed when the heater **42** has been actuated. When these contacts are closed the solenoid **38** is actuated to close a circuit through contact **48** so as to activate the starter motor **50**. When the internal combustion engine starts, the generator **27** will start delivering current so as to activate the solenoid **26** thus breaking the circuit to starter motor **50**.

There is connected in parallel with the relay **30** a forty-five second time delay relay **52**. If the starter **50** does not succeed in starting the internal combustion engine the time delay relay **52** will short circuit the system blowing fuse **54** which is connected in series with the source of power. If the internal combustion engine does start it will remain in operation until the thermostat **12** is actuated to break the circuit to the ignition coil to stop the engine.

Since from the foregoing, the construction and advantages of this starter circuit are readily apparent, further description is believed to be unnecessary.

However, since numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the precise embodiment shown and described, but all suitable modifications and equivalents may be readily resorted to as desired.

What is claimed as new is as follows:

1. A starter circuit for operating an internal combustion engine to maintain a preset temperature level, said internal combustion engine being provided with an ignition circuit and a starting motor for starting the internal combustion engine, said starter circuit comprising a temperature responsive switch interconnecting said ignition circuit of said internal combustion engine with a first time delay relay, said first time delay relay interconnecting said ignition circuit and said starting motor of said internal combustion engine with a source of electrical power, a fuse between said source of power and said temperature responsive switch, a short circuiting time delay relay interconnected between said starting motor and said source of electrical power, and means to stop said starting motor after said internal combustion engine has started.

2. A starter circuit for operating an internal combustion engine to maintain a preset temperature level, said internal combustion engine being provided with a generator, an ignition circuit and a starting motor for starting the internal combustion engine, said starter circuit comprising a temperature responsive switch interconnecting said ignition circuit with a first relay, a second relay interconnecting said first relay with a third relay, said second relay normally being in a circuit closed position and being controlled to a circuit open position by current generated by said generator after said internal combustion engine has been started, a first time delay relay interconnecting said third relay with said starting motor and said ignition circuit and said starting motor with a source of electrical power, a fuse between said source of power and said temperature responsive switch, a short circuiting time delay relay interconnected between said starting motor and said source of electrical power, and means to stop said starting motor after said internal combustion engine has started.

(References on following page)

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 23,340	Lincoln	Feb. 13, 1951
1,287,266	Eberly	Dec. 10, 1918
1,386,844	Cowen	Aug. 9, 1921
1,932,064	Conant et al.	Oct. 24, 1933
1,992,568	Connor	Feb. 26, 1935
2,144,786	Baer et al.	Jan. 24, 1939

2,197,726	Johnson	Apr. 16, 1940
2,606,298	Merritt	Aug. 5, 1952

FOREIGN PATENTS

475,130	Great Britain	Nov. 15, 1937

OTHER REFERENCES

Cramer 65,705 (abstract), published Jan. 31, 1950.