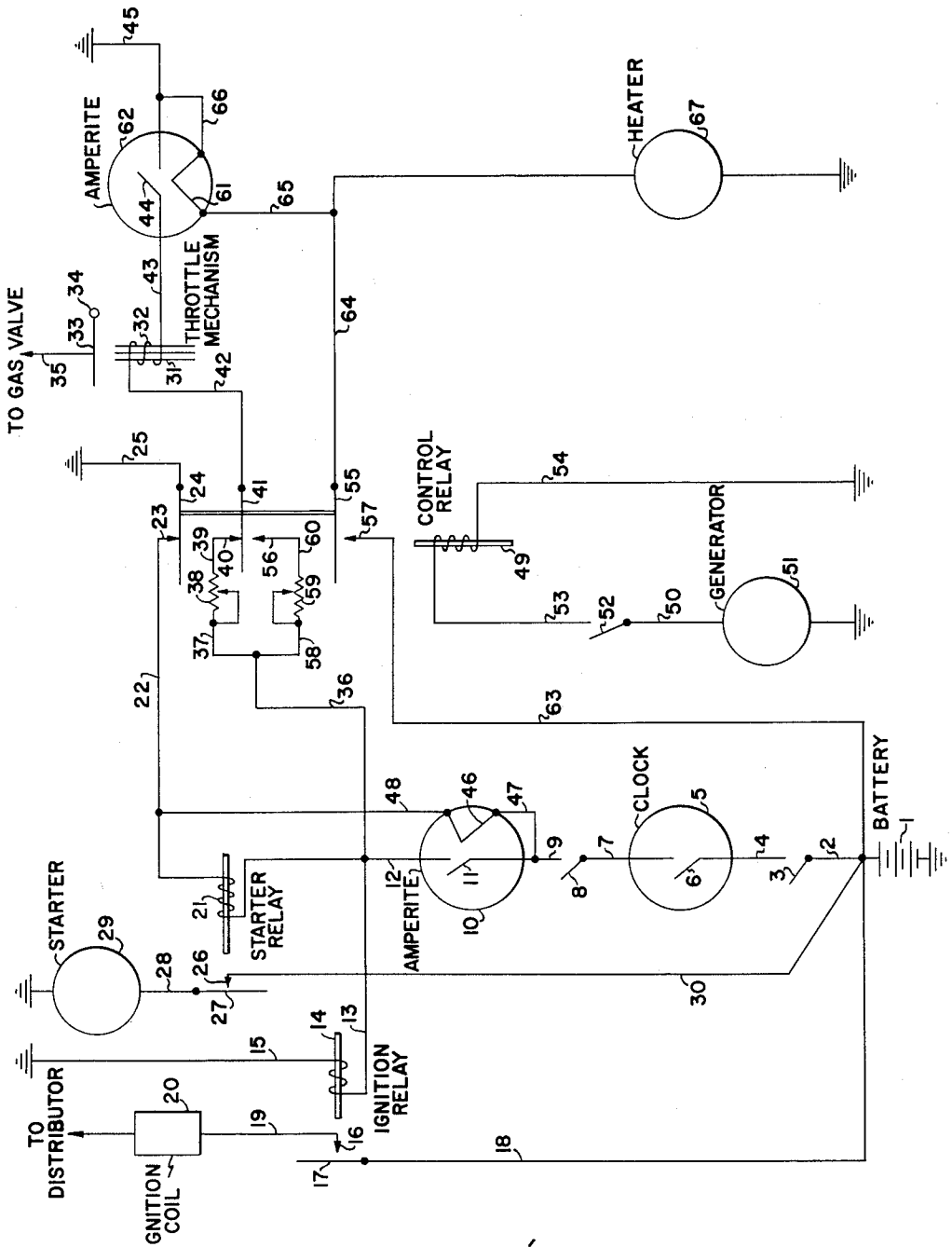
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CIRCUIT CLOCK CONTROL FOR STARTING MOTORS

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CIRCUIT CLOCK CONTROL FOR STARTING MOTORS

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2 Claims. (Cl. 290—37)

This invention is a device for automatically and effectively starting a motor vehicle, particularly an automobile.

An object of the invention is to provide a new, simple and effective device for automatically starting a motor vehicle at a predetermined time and energize the heater, thus enabling the operator to enter a warm car and find its engine warm.

Another object of the invention is to provide an automatic device for energizing the ignition circuit, the starter, the heater, and for controlling the throttle opening during the starting and warming up periods; for deenergizing the starter once the engine has started, and for idling the engine once it has warmed up; for restarting the engine if it stalls while warming up or while idling, and for deenergizing the automatic device itself if the engine fails to start after a reasonable time.

The accompanying drawing is a schematic circuit diagram of an arrangement which embodies my invention.

Referring to the drawing, 3 denotes a manually operated switch which for practical purposes can be included within the ignition switch located in the dashboard. Said switch 3 is provided to enable the operator to turn off the automatic device once he turns the ignition switch on. Therefore, said switch is normally on when the ignition switch is turned off.

Designated at 5 is an automatic clock similar to those used on automatic radios. Said clock 5 is provided to enable the operator to set it for a predetermined time, at which said predetermined time said clock closes an internal switch 6 which turns the automatic device on.

Designated at 8 is a safety switch provided to prevent the automatic device from starting the engine if the car is not left in neutral. Said switch is installed in the gearshift and is normally closed when the gearshift is left in neutral and open when the gearshift is left in gear. Moreover, said switch will prevent the car from being driven away without first turning on the ignition switch while the engine is under the control of the automatic device, since the act of moving the gearshift away from neutral will deenergize the automatic device, whereby the engine is shut off.

Designated at 10 and 62 are two Amperites. Said devices are commercially produced, thermally controlled switches designed to open or close a circuit after their heater elements have been energized for a certain length of time. As used with the automatic device, they are normally closed.

When clock 5 closes its internal switch 6, and assuming that the car had been left in neutral and the ignition switch turned off, ignition relay 14, starter relay 21, throttle mechanism 31, and heater element 46 of thermally controlled switch 10 are energized.

Ignition relay 14 becomes energized by a circuit comprising the ungrounded terminal of battery 1, wire 2, switch 3, wire 4, switch 6, wire 7, switch 8, wire 9, switch 11, wire 12, and a wire 13 connected to one terminal of ignition relay 14 and wire 15 connecting the other terminal of the ignition relay to ground.

The ignition relay is provided with a stationary contact 16 and a movable contact 17 which engages the stationary contact 16 when the ignition relay is energized. Contact 17 is connected by a wire 18 to the ungrounded terminal of battery 1; contact 16 is connected by a wire 19 to ignition coil 20.

Starter relay 21 is energized by a circuit comprising the ungrounded terminal of battery 1, wire 2, switch 3, wire 4, switch 6, wire 7, switch 8, wire 9, switch 11, and a wire 12 connected to one terminal of starter relay 21 and a wire 22, contact 23, contact 24, and wire 25 connecting the other terminal of the starter relay to ground.

The starter relay is provided with a stationary contact 26 and a movable contact 27 which engages stationary contact 26 when the starter relay becomes energized. Contact 27 is connected by a wire 28 to starter 29. Contact 26 is connected by a wire 30 to the unground terminal of battery 1. Starer 29 is normally grounded.

Throttle mechanism 31, which consists of a coil 32 wound about a magnetic core and a movable arm 33 which rotates about a point 34, said movable arm 33 being attached to a rod 35 which is in turn connected to the gasoline, or fuel, control valve, becomes energized by a circuit comprised of the ungrounded terminal of battery 1, wire 2, switch 3, wire 4, switch 6, wire 7, switch 8, wire 9, switch 11, wire 12, wire 36, wire 37, rheostat 38, wire 39, contact 40, contact 41, and a wire 42 connected to one terminal of coil 32 and wire 43, switch 44, and wire 45 connecting the other terminal of coil 32 to ground.

Movable arm 33 of the throttle mechanism deflects proportionately to the current existing in coil 32, said current being adjusted by varying the resistance in rheostat 38, thereby enabling the operator to set the throttle to the optimum position for efficiently starting the engine.

Heater element 46 of thermally actuated switch 10 becomes enerized by a circuit comprising the ungrounded terminal of battery 1, wire 2, switch 3, wire 4, switch 6, wire 7, switch 8, wire 9, and a wire 47 connected to one terminal of heater element 46 and wire 48, wire 22, contact 23, contact 24, and a wire 25 connecting the other terminal of heater element 46 to ground.

If the engine fails to start within a designed time after clock 5 closes its internal switch 6, the thermal action of device 10 opens switch 11, thereby deenergizing the automatic device. The designed time can be specified by the operator himself as thermally actuated switches are available commercially for several time lapses.

Once the engine starts, the generator begins to generate a current. Said current energizes control relay 49 by a circuit comprising wire 50, which connects to the armature winding of generator 51, switch 52, and a wire 53 connected to one terminal of control relay 49 and wire 54 connecting the other terminal of the control relay to ground. Generator 51 is normally connected to ground.

Switch 52 is a manually operated switch which for practical purposes can be included within the ignition switch in the dashboard. Said switch 52 is provided to enable the operator to disconnect the control relay from the generator when he turns the ignition switch on. It is normally on when the ignition switch is turned off.

Control relay 49 consists of movable contacts 24, 41, and 55 and stationary contacts 23, 40, 56, and 57. When the control relay is energized, the following actions happen simultaneously:

(1) Contact 24 disengages contact 23, whereby deenergizing heater element 46 of thermally actuated switch 10 and starter relay 21, which in turn deenergizes the starter by releasing contact 27 from 26.

(2) Contact 41 disengages contact 40 and engages

contact 56, whereby coil 32 of throttle mechanism 31 becomes energized by a circuit comprising the ungrounded terminal of battery 1, wire 2, switch 3, wire 4, switch 6, wire 7, switch 8, wire 9, switch 11, wire 12, wire 36, wire 58, rheostat 59, wire 60, contact 56, contact 41, and a wire 42 connected to one terminal of coil 32 and wire 43, switch 44, and wire 45 connecting the other terminal of coil 32 to ground.

Rheostat 59 is a device provided to enable the operator to adjust the current existing in coil 32 to give a throttle setting for engine warm up which is lower than that used for starting, but higher than that used for idling.

(3) Contact 55 engages contact 57, whereby heater element 61 of thermally actuated device 62 becomes energized by a circuit comprising the ungrounded terminal of battery 1, wire 63, contact 57, contact 55, wire 64, and a wire 65 connected to one terminal of heater element 61 and wire 66 and wire 45 connecting the other terminal of heater element 61 to ground. Heater 67 becomes energized by a circuit comprising the ungrounded terminal of battery 1, wire 63, contact 57, contact 55, and a wire 64 connected to the ungrounded terminal of heater 67 which is normally connected to ground.

When the designed time lapse has elapsed during which the engine has been running at the warm up speed, the thermal action of thermally actuated device 62 will open switch 44 of said thermally actuated device whereby deenergizing the throttle mechanism and changing the engine speed to idle. As heater element 61 remains energized, the engine will now idle until the operator arrives and turns on the ignition switch. The time lapse can be set by the operator as is done with thermally actuated device 10.

I claim:

1. An automatic engine starting device for starting an internal combustion engine which includes a starter motor, a generator, a fuel control valves, and a source of current and comprising; an adjustable clock switch which includes a pair of contacts, a starter relay which includes a relay winding and a pair of normally open relay contacts, a control relay which includes a relay winding and a pair of normally closed relay contacts, means connecting the said starter relay winding across the said current source through the said clock switch contacts and control relay contacts in series for energization of the said starter

relay upon closure of the said series connected contacts, circuit means connecting the said control relay winding across the said generator to open the said control relay contacts when the said generator produces a predetermined output upon starting of the engine, a throttle mechanism comprising a winding and a magnetic core movable upon energization of the said winding, means coupling the said control valve to the said magnetic core for actuation of the said valve upon energization of the said throttle mechanism winding, first and second rheostats, and means connecting the said throttle mechanism winding across the said current source through the said clock switch contacts, the last-mentioned means including means controlled by the said control relay for connecting the said throttle mechanism winding across the said current source through the said first rheostat when the control relay is energized and through the said second rheostat when the control relay is deenergized.

2. The invention as recited in claim 1 wherein the said engine starting device includes a thermally actuated switch having a pair of normally closed switch contacts in series circuit with the throttle control winding and a heater element connected across the said current source through a pair of normally open switch contacts controlled by the said control relay winding, the said thermally actuated switch contacts opening at a predetermined temperature in response to the heat from the heater element thereof to thereby deenergize the throttle mechanism.

References Cited in the file of this patent

UNITED STATES PATENTS

2,144,786	Baer et al.	Jan. 24, 1939
2,485,727	Gallina	Oct. 25, 1949
2,502,580	McMillan	Apr. 4, 1950
2,579,958	Perhats	Dec. 25, 1951
2,606,298	Merritt	Aug. 5, 1952
2,650,987	Doyle	Sept. 1, 1953
2,691,110	Lincoln	Oct. 5, 1954
2,698,391	Braden et al.	Dec. 28, 1954
2,707,463	Booth	May 3, 1955
2,748,759	Schiffer	June 5, 1956
2,817,022	Comer et al.	Dec. 17, 1957
2,836,732	Newlin	May 27, 1958