

[54] **TIMER CONTROLLED VEHICLE HEATER**

[72] Inventor: **Emery J. Sammut**, 50 Decorah Lane, Campbell, Calif. 95008

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[51] Int. Cl. **F23n 5/00**

[58] Field of Search 126/110 R, 110 B, 126/116 R, 116 B, 431/67, 73, 86

[56] **References Cited**

UNITED STATES PATENTS

2,654,422 10/1953 Aubert 126/116 A X

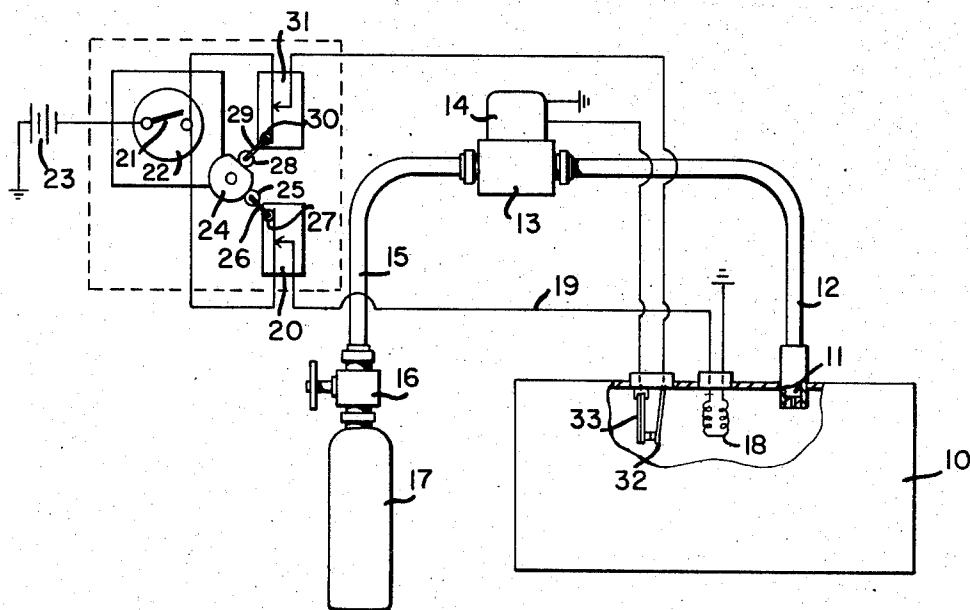
3,078,838 2/1963 Broecker 431/67 X

Primary Examiner—Charles J. Myhre
Attorney—Allen and Chromy

[57] **ABSTRACT**

Apparatus employing a container of compressed fuel such as propane for warming an automobile prior to the occupant's use thereof, particularly on extremely cold days. This device employs a timer that is set to actuate the energization of a glow plug and air valve which allows the fuel to enter the heat exchanger in which the fuel is burned. The timer controls the device so that the glow plug and air valve are turned off after a predetermined time of operation. The timer may also be set to keep the heating cycle on until the occupant of the vehicle turns it off.

3 Claims, 2 Drawing Figures



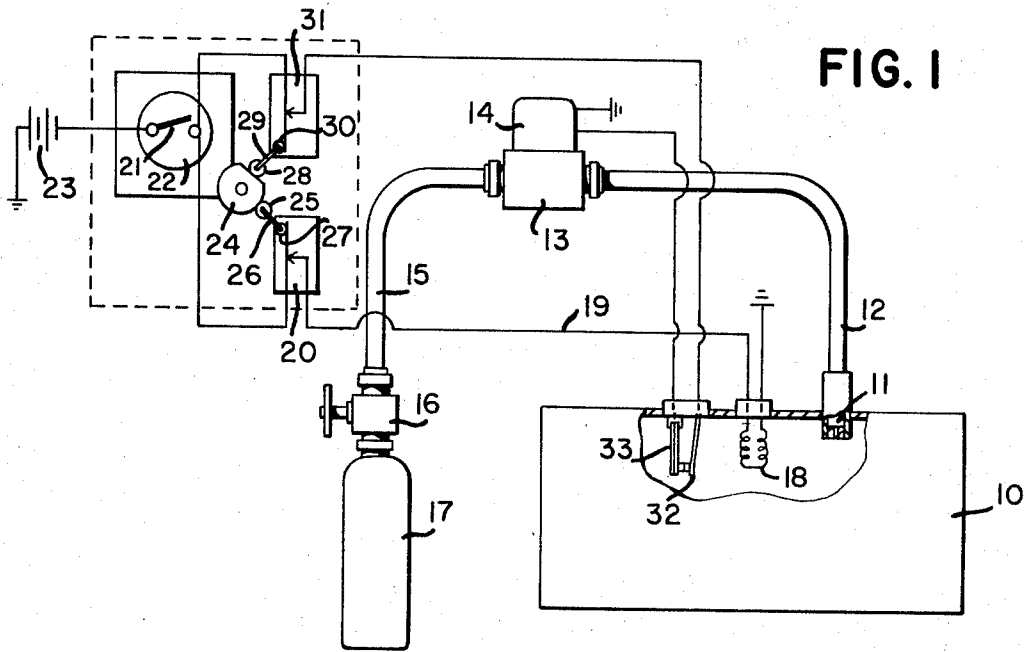


FIG. 1

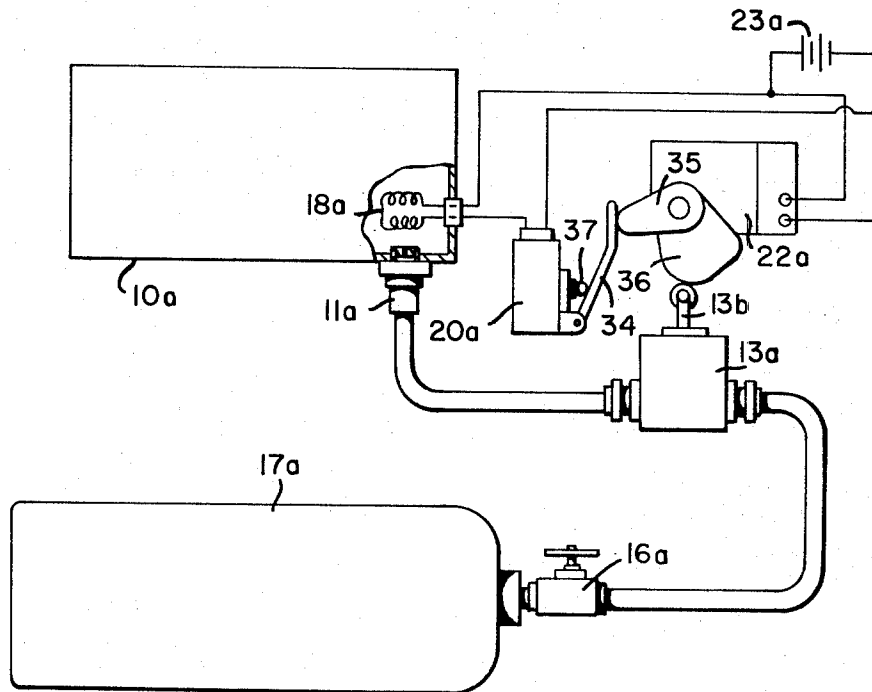


FIG. 2

INVENTOR.
EMERY J. SAMMUT

BY *Allen and Gromy*
ATTORNEYS

TIMER CONTROLLED VEHICLE HEATER

DESCRIPTION OF THE INVENTION

This invention relates to an automatic car heater which is provided with a timer.

An object of this invention is to provide an improved car heater which is equipped with a timer for controlling the feeding of compressed gas to a heat exchanger in which the gas is ignited by a glow plug that is also controlled by the timer.

Another object of this invention is to provide an improved automatic car heater that is equipped with a timer which controls an electric circuit to turn the heater on at a predetermined time before the occupant enters the vehicle, said heater being provided with a supply of compressed gas which is fed into the heat exchanger by a solenoid controlled valve, said gas being ignited in the heat exchanger by a glow plug, both said valve and said glow plug being controlled by the timer.

Still another object of this invention is to provide an improved automatic car heater that is controlled by a timer, said timer being equipped to control the admission of gas fuel into a heat exchanger at a predetermined time, said gas being ignited in the heat exchanger by a glow plug the energization of which is also controlled by the timer.

Other and further objects of this invention will be apparent to those skilled in the art to which it relates from the following specification, claims and drawing.

In accordance with this invention there is provided an automatic car heater which is provided with a timer that is preset to initiate the operation of the heating mechanism approximately 15 minutes, for example, before the occupant enters the vehicle. The timer operates two cams, one of which controls the electric circuit to the glow plug that is provided in the heat exchanger for igniting the gas supplied thereto. The fuel for the heat exchanger is in the form of compressed gas such as propane that is confined in a small tank connected to the heat exchanger by a suitable tube. The tube is provided with a valve that is also controlled by the timer for controlling the feeding of gas to the heat exchanger in which it is ignited by the glow plug after the plug is heated to its operating temperature. Thereafter the switch controlling the current supplied to the glow plug is turned off by the other of the two cams operated by the timer. After a predetermined time when the vehicle is warm the timer turns the heater off.

Further features and details of this invention will be set forth in the following specification, claims and drawing, in which, briefly:

FIG. 1 is a view showing one embodiment of this invention; and

FIG. 2 is a view showing another embodiment of this invention.

Referring to the drawing in detail, reference numeral 10 designates the chamber of a heat exchanger of conventional construction which is provided with a nozzle 11 at which propane or other gas is ignited and burned inside of the heat exchange chamber. The gas is supplied to the nozzle 11 through the pipe 12 that is connected to a valve 13 which is opened when the solenoid 14 is energized. The solenoid controlled valve 13 is connected by the pipe 15 and manually operated valve

16 to the fuel tank 17 that contains liquefied petroleum gas or other combustible gas under pressure.

The gas supplied through the nozzle 11 is ignited when the electrode 18 is heated by electric current.

The electrode 18 which is a type of glow plug is connected by the electrical conductor 19 to the switch 20 and to the switch 21 which is controlled by the timer 22. The switch 21 is connected to the vehicle battery 23. The timer 22 is of conventional construction and employs a clock mechanism that may be set so that it closes the switch 21 at a predetermined selected time. The timer also drives a cam device 24 which is provided with two cam surfaces one of which is engaged by the roller 25 of the lever 26. The lever 26 is supported by the housing of switch 20 and is provided with a cam 27 that engages the blade of the switch and closes this switch when the roller 25 is actuated by the cam 24. When the timer switch 21 and the cam operated switch 20 are both closed the electrode 18 is heated to red heat by current from the vehicle battery 23. Thus, the cam 24 controls the switch 20 through which electric current is supplied to the electrode or glow plug 18 of the heat exchanger.

The other cam surface of the cam device 24 actuates the roller 28 that is provided to the lever 29 which is supported by the housing of the switch 31. When the roller 28 of lever 29 is actuated by the cam surface the switch 31 is closed by the cam 30 which is carried by the lever 29. One side of switch 31 is connected to the switch 21 of the timer 22 and the other side is connected to the switch 32 that is supported inside of the heat exchanger 10. The switch 32 is provided with a bimetal member 33 which is heated by the glow plug 18 and the contacts of this switch are closed after the electrode or glow plug 18 is heated for a predetermined time.

The solenoid 14 is supplied by electric current through the switch 32, switch 31 and timer switch 21 from the vehicle battery 23. When the solenoid 14 is energized by the current from the battery 23 it opens the valve 13 and gas is supplied from the container 17 to the burner nozzle 11. As the gas is burned in the heat exchanger 10 the temperature therein increases and air may be circulated therethrough by a suitable motor driven fan (not shown).

In FIG. 2 there is shown another embodiment of this invention and the parts of this modified embodiment that correspond to parts shown in FIG. 1 are designated by the same reference numerals with the suffix *a* added thereto. The heat exchanger 10a is provided with a nozzle 11a that is supplied with gas, such as propane gas, from the container 17a of liquefied petroleum gas through the manually operated valve 16a and through the cam operated valve 13a. The valve 13a is provided with a control member 13b which is provided with a roller that engages the cam 36. Cams 35 and 36 are operated by the timer 22a which is driven by a suitable motor (not shown) that is energized by electric current supplied by the battery 23a provided to the vehicle.

The electrode 18a is also energized by electric current supplied from the vehicle battery 23a and the electric current to this electrode is controlled by the switch 20a. The switch 20a is provided with a control lever 34 which is pivotally supported by the switch housing. When the lever 34 is actuated by the cam 35 it exerts

pressure on the switch button 37 and switch 20a is closed. Electric current is then supplied to the electrode 18a which is heated. After a predetermined time interval electrode 18a is brought up to red heat and cam 36 is brought into engagement with the roller of member 13b by the timer so that the valve 13a is opened. Gas is admitted into the heat exchanger 10a through the nozzle 11a and ignited by the heated electrode 18a. The valve 13a is kept open as long as the cam 36 engages the roller of member 13b and this time interval is determined by the timer 22a which drives the cam 36. A conventional electric motor driven fan (not shown) may be provided to move the air through heat exchanger 10a during the time interval in which the heat exchanger is heated and this fan may be connected to the vehicle battery 23a by a switch that is also controlled by the cam 36.

While I have shown and described a preferred form of the invention, it will be understood that the invention is capable of variation and modification from the form shown so that the scope thereof should be limited only by the proper scope of the claims appended hereto.

What I claim is:

1. In a timer controlled vehicle heater for heating the inside of the vehicle prior to the occupant entering said

vehicle, the combination comprising a supply of compressed fuel, a heat exchanger, a tube connecting said supply of compressed fuel to said heat exchanger, a valve in said tube controlling the flow of fuel therethrough, a glow plug in said heat exchanger, a timer controlling a cam device having two cam surfaces, an electric switch connected to said glow plug controlled by one of said cam surfaces, a source of current supply connected to said glow plug when said electric switch is closed by said one cam surface, and means controlled by the other of said cam surfaces for controlling said valve connected in said fuel line.

2. In a timer controlled vehicle heater for heating the inside of the vehicle prior to the occupant entering said vehicle, the combination as set forth in claim 1, further characterized in that said valve controlling means comprises a solenoid, a second electric switch controlled by said other cam surface connecting said solenoid to said source of current supply.

3. In a timer controlled vehicle heater for heating the inside of the vehicle prior to the occupant entering said vehicle, the combination as set forth in claim 1, further characterized in that said valve controlling means comprises a member slidably engaging said other cam surface.

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