G. N. BLANCHARD.

IGNITING AND CONTROLLING DEVICE FOR HYDROCARBON GENERATORS AND BURNERS.

APPLICATION FILED DEC. 4, 1920.

1,394,807. Patented Oct. 25, 1921.

Fig. 1

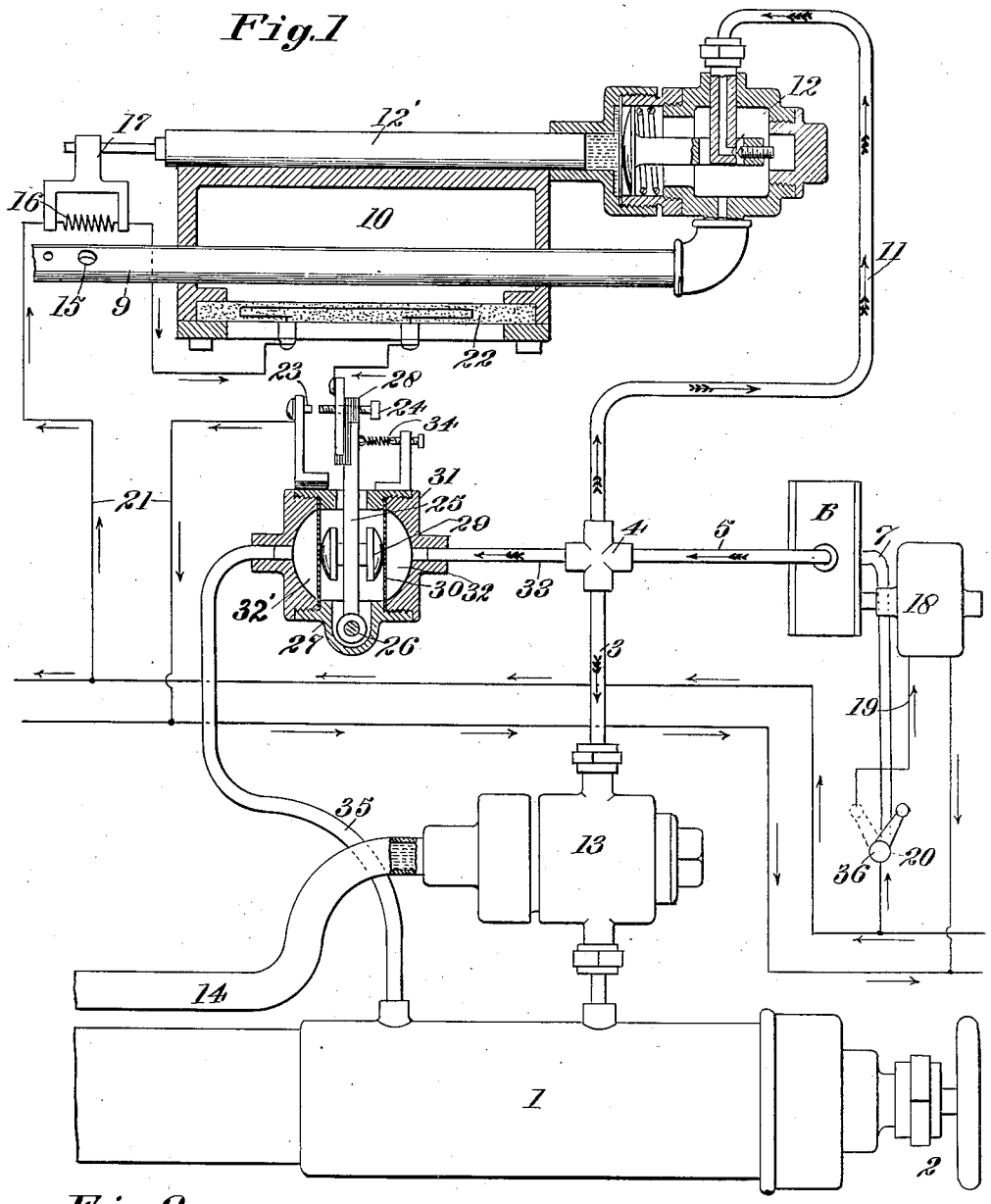
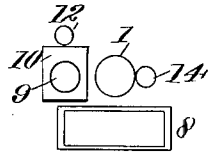


Fig. 2.



Inventor:
George N. Blanchard
By Eckert Totten,
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE N. BLANCHARD, OF SAN FRANCISCO, CALIFORNIA.

IGNITING AND CONTROLLING DEVICE FOR HYDROCARBON GENERATORS AND BURNERS.

1,394,807. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed December 4, 1920. Serial No. 428,276.

To all whom it may concern:

Be it known that I, GEORGE N. BLANCHARD, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Igniting and Controlling Devices for Hydrocarbon Generators and Burners, of which the following is a specification.

This invention relates to hydrocarbon fuel burners and more particularly to a controlling means therefor whereby one at a distant point from the burner may by the closing of the switch either manually or by automatic mechanism cause the automatic igniting of the generator and burner on the same attaining a sufficient temperature to convert into gas the liquid hydrocarbon fuel fed thereto. By my present apparatus hydrocarbon fuel burners are made adaptable for universal use and controllable from a distant point enabling their adaptation for housing or dwelling heating without requiring the operator to go to the cellar, basement or fire-room each time it is desired to start or extinguish the apparatus, which is the custom with fuel burners of this general character now in use.

The invention consists broadly in providing a generator in connection with a burner, and to associate therewith a pilot burner for initially heating the generator, the two being supplied with hydrocarbon fuel from a main line in which is interposed automatic mechanism such as valves for selectively controlling the supply of fuel to the generator and pilot burner. I prefer to associate with the pilot burner a heater for generating the fuel supplied to the same into gas, and also associate therewith an igniter for igniting the gas issuing therefrom, and to position the pilot burner relative to the generator, so that the flame therefrom will initially heat the generator. With the installation I incorporate a suitable mechanism for automatically rendering the heater and igniter inoperative at such time as fuel is admitted into the generator, as at this time the generator is heated to a sufficient temperature to no longer require the pilot burner.

The present invention relates to that class of device illustrated in my pending application for Letters Patent Serial Nos. 355,361, 375,440 and 390,397, filed respectively January 31st, 1920, April 21st, 1920, and June 21st, 1920; and the application of Blanchard and Colmar, Serial Number 418,033 filed October 19th, 1920, certain of which applications are hereinafter specifically referred to.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Referring to the drawings:—

Figure 1 is a diagrammatic illustration of the preferred embodiment of my invention with the burner eliminated.

Fig. 2 is a view in detail of the relative position of the burner generator and pilot burner in one form of installation.

Referring to the drawings wherein like characters of reference designate corresponding parts in the several views:—1 indicates a suitable generator for liquid hydrocarbon fuels controlled by the well known needle valve by operation of the handle 2, and this construction being well known in the art a detailed description thereof is not thought necessary.

Fuel for vaporization, preferably liquid hydrocarbon fuel is supplied to the generator 1 through the feed pipe 3 extending from a connection 4 with which communicates a main feed pipe 5 extending from a pump or other pressure mechanism 6 to which fuel is fed or delivered from any suitable source by a pipe 7. The generator 1 is positioned over a suitable burner 8, as illustrated in the copending application Serial Number 418,033, and the temperature thereof, after the initial starting is maintained by a pilot flame from said burner 8. Disposed preferably at one side of the generator 1, and extending longitudinally thereof is a suitable pilot burner 9 for initially heating the generator 1, and the same at its rear end extends through a suitable heating chamber 10. Liquid hydrocarbon fuel is supplied to the pilot burner 9 through a pipe 11 extending from the con-

nection 4, and interposed in side line between the rear end of the pilot burner 9 and the discharge end of the member 11 is a suitable thermostatic valve 12 described in detail in my application Serial No. 355,361 and the operating thermostat 12′ of which extends over or in suitable coöperative relation with the heater 10. Interposed between the generator 1 and the end of the pipe 3 is the thermostatic valve 13 of the same construction as valve 12, and the thermostatic tube 14 thereof is disposed in coöperative relation with the generator 1 to be controlled by the heat therefrom. It will be apparent that on the heating of the member 10, the valve 12 will be opened to permit the passage of hydrocarbon fuel from the line 11 into the pilot burner 9, *i. e.*, when the heater 10 attains a determinable temperature; and it will also be apparent that the valve 13 will open at such time as the temperature of the generator 1 arrives at a predetermined degree sufficient to operate a controlling thermostat 14, and it will also be observed that if for any reason, after the apparatus has started, the same should become accidentally extinguished, the cooling of the generator 1 will, through the thermostat 14, cause a closing of the valve 13, and thus prevent the flooding of the burner. The pilot burner 9 is provided with a gas discharge port 15, and in close proximity thereto is positioned an igniting means 16 illustrated in the form of a coil in an electric circuit which is supported by a suitable arm and bracket 17. The pump 6 is operated by a suitable motor 18 supplied with current through the main circuit 19, and within one line of which is a controlling switch 20 adapted for either manual or automatic operation. From the main circuit 19 extends an auxiliary circuit 21 within which is the igniting coil 16, and within said circuit is also positioned a heating element such as the resistance unit 22 associated with the heater 10, the same being conventionally illustrated, and it is to be understood that I am not limited to such exact disclosure. In the auxiliary circuit 21 is a suitable make and break or switch structure, the same consisting of a stationary contact 23, and a movable and adjustable contact 24, the contact 24 being carried by a switch lever 25 fulcrumed as at 26 in a casing or support 27. The contact 24 is insulated by material 28 from the lever 25, and said lever within the casing is provided at opposite sides with the bearing members 29, one of which contacts with a diaphragm or other operating mechanism 30 positioned within the casing as illustrated in Fig. 1 of the drawings. The casing 27, which is of annular formation, is closed at its opposite sides by suitable caps or other members 31 between the inner surface of which and the outer surface of the respective diaphragms 30 are formed the pressure chambers 32 and 32′. Hydrocarbon fuel under the pressure of the pump 6 is on the starting of the pump delivered into the chamber 32 by a pipe 33 extending from the connection 4, and the same distends the diaphragm 30, moving the lever 25, to place the movable contact 24 into engagement with the stationary contact 23 and thus close the auxiliary circuit 21, this action being against the tension of the spring 34.

The closing of the auxiliary circuit 21 will render operative the heater 10 and the igniter 16, and when the heater 10 reaches a sufficient temperature to cause the operation of the thermostat 12′, the valve 12 will be opened to admit fuel from the line into the pilot burner 9, and in passing therethrough will be generated into gas by the temperature of the heater 10, and the gas will be initially ignited by the igniter 16.

This operation will permit the pilot burner 9 to direct a flame on to the main generator 1 for initially heating the same, and on the temperature of the main generator obtaining a degree sufficient to vaporize fuel to be admitted thereto, the heat radiated therefrom operates the thermostat 14 opening the valve 13, admitting hydrocarbon fuel from the pipe 3 into the generator 1. From the pressure chamber 32′ extends a pipe 35 which connects with the interior of the generator 1 at a point between the tip of the generator and the controlling valve 13, and on the opening of the controlling valve 13, pressure is admitted through the pipe 35 from the generator 1 into the chamber 32′ to actuate the diaphragm within said chamber, and to cause a movement of the lever 25 to break the connection between the contacts 23 and 24, and thus break the auxiliary circuit 21 without affecting the main circuit 19, which has been previously closed by the operation of the switch 20.

It will be observed that the pressure within the chamber 32′ has the assistance of the tension of the spring 34 in breaking the contact between the members 23 and 24.

While I have illustrated a motor for supplying fuel under pressure by a pump 6 to the fuel feed line, it will be apparent that if the main fuel container is positioned at a sufficient elevation above the burner 8, the required fuel pressure may be obtained and maintained without the pump 6.

It will be observed that in connection with the switch 20, there is provided a valve 36 in the line 7, and the valve is adapted to be shut off or moved to closed position on the movement of the switch to break the circuit 19.

In operation, the handle 2 controlling the needle valve for the generator is adjusted to permit the desired flame to issue from the generator tube.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:—

1. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith and through which fuel is supplied thereto, a motor, a pump operated thereby for forcing fuel through said line under pressure, a main circuit for operating said motor and including a main switch, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the temperature of the generator, a pilot burner associated with the generator for initially heating the same and connected with said fuel feed line, a thermostatic valve for controlling the fuel feed to the pilot burner, a secondary circuit connected with said main circuit, an electric heater associated with the pilot burner and its thermostatic valve, an electric igniter associated with said pilot burner, said heater and igniter being connected in series in said secondary circuit, a switch in said secondary circuit, and means connected with said switch and operated by the fuel feed pressure for opening and closing the switch.

2. In combination with a generator for hydrocarbon burners, a pressure fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a thermostatic valve for controlling the admission of fuel from the line to the generator in accordance with the temperature of the generator, a pilot burner associated with the generator for initially heating the same and connected with said fuel feed line, a thermostatic valve for controlling the fuel feed to the pilot burner, an electric heater associated with the pilot burner, an electric igniter associated with the pilot burner, and pressure actuated means for controlling the operation of said pilot heater and igniter.

3. In combination with a generator for hydrocarbon burners, a pressure fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a thermostatic valve for controlling the admission of fuel from the line to the generator in accordance with the temperature of the generator, a pilot burner associated with the generator for initially heating the same and connected with said fuel feed line, a thermostatic valve for controlling the fuel feed to the pilot burner, an electric circuit, an electric heater therein and associated with the pilot burner, an electric igniter within said circuit and associated with the pilot burner, a main controlling switch within said circuit, and a pressure operated switch within said circuit for controlling the operation of said heater and igniter.

4. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the generator temperature, a pilot burner associated with the generator, for initially heating the same and connected with said fuel feed line, an automatic valve for controlling the fuel feed to the pilot burner, an electric heater associated with the pilot burner for generating the fuel admitted thereinto into gas, an electric igniter associated with said pilot burner for igniting the gas issuing therefrom, a circuit within which said heater and igniter are connected in series and including a switch, and means for operating said switch.

5. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the generator temperature, a pilot burner associated with the generator, for initially heating the same and connected with said fuel feed line, an automatic valve for controlling the fuel feed to the pilot burner, an electric heater associated with the pilot burner for generating the fuel admitted thereinto into gas, an electric igniter associated with said pilot burner for igniting the gas issuing therefrom, a circuit within which said heater and igniter are connected in series and including a switch, and means for opening said switch on the admission of fuel under pressure into said generator.

6. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the generator temperature, a pilot burner associated with the generator, for initially heating the same and connected with said fuel feed line, an automatic valve for controlling the fuel feed to the pilot burner, an electric heater associated with the pilot burner for generating the fuel admitted thereinto into gas, an electric igniter associated with said pilot burner for igniting the gas issuing therefrom, a circuit within which said heater and igniter are connected in series and including a switch, a casing, fuel feed connection between one side thereof and said fuel feed line, a fuel feed connection between the other side thereof and said generator, a movable member within said casing and operated by the fluid pressure admitted thereto and mounting the movable member of said switch.

7. In combination with a generator for hydrocarbon burners, a pilot burner associated with the generator for initially heating the same, a fuel feed line connected with said generator and pilot burner for supplying fuel thereto, an electric circuit, an electric heater and an electric igniter within said circuit and associated with said pilot burner, one for generating gas from the

hydrocarbon fuel supplied thereto and the other for igniting gas as it discharges therefrom, and an automatically operated switch within said circuit for controlling the operation of said igniter and heater.

8. In combination with a generator for hydrocarbon burners, a pilot burner associated therewith for initially heating the same, a fuel feed line connected with said generator and pilot burner for supplying fuel thereto, thermostatic valves adapted for operation in accordance with the temperature of said respective generator and pilot burner for admitting fuel respectively thereto, means associated with the pilot burner for converting the hydrocarbon fuel supplied thereto into gas, and an electric igniter associated with the pilot burner for automatically igniting the gas discharging therefrom.

9. In combination with a generator for hydrocarbon burners, a pilot burner associated with the generator for initially heating the same, a fuel feed line connected with the generator and pilot burner for supplying fuel thereto, automatic valves within said fuel line for selectively controlling the feed of fuel to the generator and pilot burner, a heater associated with the pilot burner for generating the fuel supplied thereto into gas, an igniter associated with the pilot burner for igniting the gas issuing therefrom, and means for automatically rendering operative and inoperative said heater and igniter.

10. In combination with a generator for hydrocarbon burners, a pilot burner associated with the generator for initially heating the same, a fuel feed line connected with the generator and pilot burner for supplying fuel thereto, automatic valves within said fuel line for selectively controlling the feed of fuel to the generator and pilot burner, a heater associated with the pilot burner for generating the fuel supplied thereto into gas, an igniter associated with the pilot burner for igniting the gas issuing therefrom, and means for automatically rendering said heater and igniter operative and for rendering same inoperative on the admission of fuel into the generator.

11. In combination with a generator for hydrocarbon burners, a pilot burner associated with the generator for initially heating the same, a fuel feed line connected with the generator and pilot burner for supplying fuel thereto under pressure, automatic valves within said fuel line for selectively controlling the feed of fuel to the generator and pilot burner, a heater associated with the pilot burner for generating the fuel supplied thereto into gas, an igniter associated with the pilot burner for igniting the gas issuing therefrom, and means for automatically rendering said heater and igniter operative on the supplying of fuel under pressure through said line and for rendering inoperative said heater and igniter on the opening of the automatic valve associated with said generator.

12. In combination with a generator for hydrocarbon burners, a pressure fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a thermostatic valve for controlling the admission of fuel from the line to the generator in accordance with the temperature of the generator, an electric heater, an electric igniter, and pressure actuated means for controlling the operation of said heater and igniter.

13. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the generator temperature, an electric heater, an electric igniter, a circuit within which said heater and igniter are connected and including a switch, and means for opening said switch on the admission of fuel under pressure into said generator.

14. In combination with a generator for hydrocarbon burners, a fuel feed line connected with said generator for supplying fuel thereto, an electric circuit, an electric heater and an electric igniter within said circuit, one for initially generating gas from the hydrocarbon fuel supplied by said fuel feed line and the other for igniting said generated gas, and an automatically operated switch within said circuit for controlling the operation of said igniter and heater.

15. In combination with a generator for hydrocarbon burners, a fuel feed line connected with the generator for supplying fuel thereto under pressure, an automatic valve within said fuel line for controlling the feed of fuel to the generator, a heater, an igniter, and means for automatically rendering said heater and igniter operative on the supplying of fuel under pressure through said line and for rendering inoperative said heater and igniter on the opening of the automatic valve associated with said generator.

16. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the temperature of the generator, electrically controlled means for initially heating the generator and an igniter for the generator.

17. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the temperature of the generator, an electri-

cally controlled heater for initially heating said generator, and means operable by a variation of pressure in said fuel feed line for controlling the operation of said heater.

18. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a thermostatic valve for controlling the admission of fuel from the line to the generator dependent on the temperature of the generator, means for initially heating said generator and an electrically controlled igniter coöperating with the generator and operated by the variation of pressure in said fuel feed line for igniting the gas issuing from said generator on said generator attaining a predetermined temperature.

19. In combination with a generator for hydrocarbon burners, a fuel feed line connected therewith, means for forcing fuel therethrough under pressure, a valve for controlling the admission of fuel from the line to the generator, an electric circuit, an electric heating unit and an electric igniting unit within said circuit for controlling the initial heating and igniting of the generator, and a pressure actuated contact member in said circuit operated by a variation of pressure in said generator for breaking said circuit on the opening of said valve controlling the feeding of fuel to the generator.

In testimony whereof I have signed my name to this specification.

GEORGE N. BLANCHARD.