April 18, 1944. W. A. RAY 2,346,704

IGNITING SYSTEM

Filed Nov. 6, 1940

Fig. 1

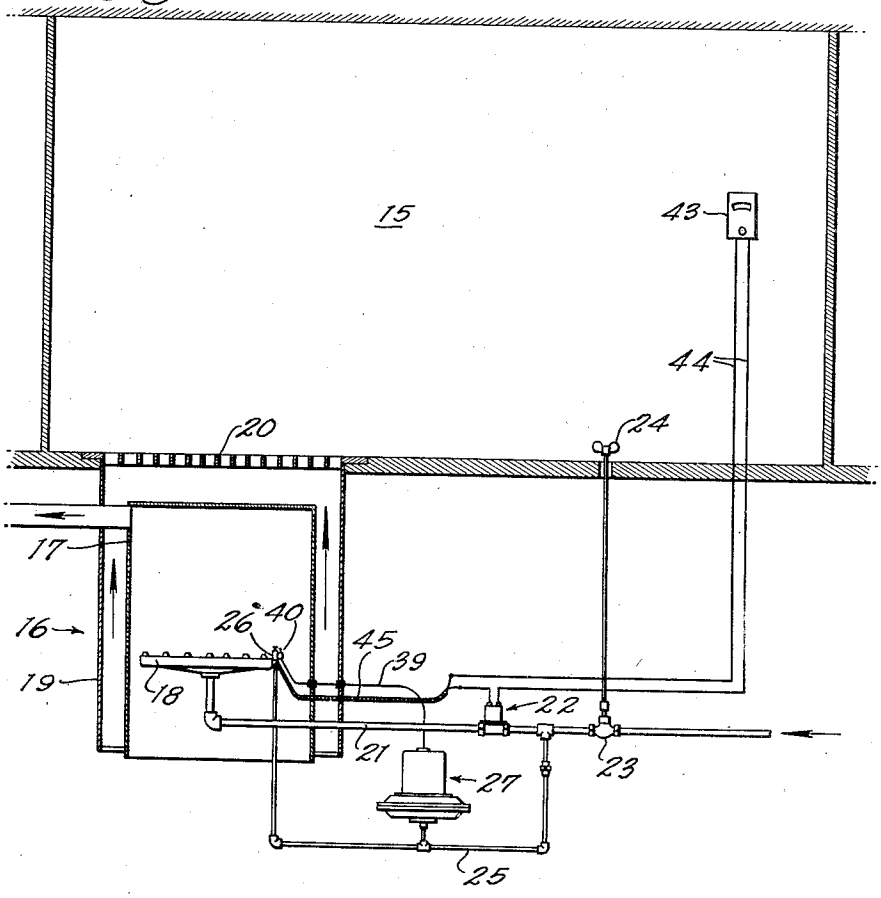
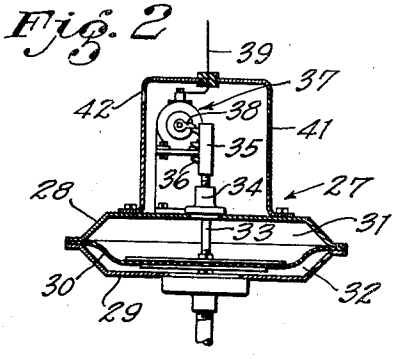


Fig. 2



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2,346,704

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2,346,704

IGNITING SYSTEM

William A. Ray, Glendale, Calif.

Application November 6, 1940, Serial No. 364,524

1 Claim. (Cl. 158—117.1)

My present invention relates to igniting systems for fluid burners and has for a main object the provision of mechanically operated electromagnetic means for igniting the fuel at a gas burner, which means is under the control of a valve by means of which fuel is supplied to the burner.

Another object is the provision, in a system of the character described, of a motor, operated by the pressure of the fuel passed by the burner control valve, for operating a magneto to produce an igniting spark at the burner.

Other objects and advantages of my invention will be found in the description, the drawing, and the appended claim.

For complete understanding of the invention, reference may be had to the following detailed description and accompanying drawing, wherein:

Figure 1 is a diagrammatic view of a burner control system embodying my invention; and

Figure 2 is an enlarged sectional view of the fluid pressure operated magneto shown in Fig. 1.

In the drawing, the number 15 indicates a space or room for which is provided a floor furnace generally indicated at 16 and comprising an inner stove portion 17, containing a main burner 18, and an outer enclosure 19 wherein air is heated and passed to the room through a grill 20. Gas is supplied to the main burner through a conduit 21 wherein are connected an electrically operated valve 22 and a gas cock 23, manually operable within the room by an extension handle 24. Connected to the conduit 21 between the valves 22 and 23 is a pipe 25 which terminates adjacent the main burner in a combination pilot burner and thermoelectric device 26 which performs the dual function of providing a flame for igniting the main burner, and also of providing a source of electric energy for the operation of the valve 22 while the igniting flame is burning. Such a device is the subject of the copending application of William R. Ray, Serial No. 225,075, filed August 15, 1938, now Patent No. 2,236,609, dated April 1, 1941.

Connected to the pipe 25, in parallel with the pilot burner, is a fluid pressure operated magneto 27, the motor portion of which comprises a pair of dished members 28 and 29 joined at their margins, with a flexible diaphragm 30 therebetween, to form an upper and a lower chamber, 31 and 32 respectively. Connected to the diaphragm is a stem 33 which extends through a guide 34, secured in an opening in the top wall of the member 28, and is provided with a head 35 having a plurality of ratchet teeth 36. Mounted on the member 28 is a magneto 37 which is provided with a movable operating finger 38 so positioned as to be engaged by the ratchet teeth in the movement of the stem 33.

The magneto 37 may be of any suitable well known type wherein means, such as a permanent magnet, is movable to effect a change in the flux passing through a high inductance coil. When gas pressure is applied to the lower chamber of the motor, by opening valve 23, the diaphragm is forced upward, moving the ratchet head so that its uppermost tooth lifts the finger 38 to a position where it is disengaged from the ratchet tooth and falls rapidly under the influence of a force biasing the finger to a horizontal position, which force is provided by a spring in the magneto. In the continued upward movement of the ratchet head, the magneto finger is similarly affected by the other teeth. Each downward movement of the magneto finger effects a change in the magneto flux which is sufficiently rapid to induce a spark-producing surge which is applied, by means of a cable 39, to an igniting electrode 40 insulatingly mounted adjacent the pilot burner 26, the high voltage return being through the ground of the magneto and the fuel pipe. A housing 41 for the magneto is vented at 42, the air in the upper motor chamber 31 passing through the guide 34 and this vent in the upward movement of the motor. When the valve 23 is closed, the gas compressed in the lower motor chamber 32 escapes through the pilot burner and the motor moves downward by gravity, the magneto finger being downwardly deflectable to permit passage of the teeth on the ratchet head.

A room thermostat 43 is connected, by wires 44 and cable 45, to the valve 22 and the thermoelectric device 26. To initiate operation of the heating system shown in Fig. 1, the valve 23 is opened by means of the handle 24, gas then flowing to the pilot burner 26 and to the fluid pressure operated magneto 27, with the result that a flame is produced at the pilot burner which heats the thermoelectric means incorporated therein. After the thermoelectric device has been heated for a few seconds, current is generated thereby in an amount sufficient to operate valve 22 to open position, so that, if the thermostat 43 calls for heat, fuel is supplied to the main burner, where it is ignited by the pilot

burner flame. Valve 22 is preferably of the sensitive pressure-operated pilot-valve-controlled type, such as is disclosed and claimed in my copending application, Serial No. 222,673, filed August 2, 1938, now Patent No. 2,294,693, dated September 1, 1942.

The heating system continues in automatic operation under the control of the thermostat as long as the manual control valve 23 is open. If this valve is closed, as at night, upon its reopening in the morning, operation of the system is again initiated as hereinabove described. If the pilot burner flame is accidentally extinguished, it may be relighted by closing valve 23 (and keeping it closed long enough to permit venting of the magneto motor chamber) and then reopening it.

While I have herein shown and described a specific embodiment of my invention, I wish it to be understood that modifications may be made without departing from the spirit of the invention, and that I intend therefore to be limited only by the scope of the appended claim.

I claim as my invention:

In a gas-burner control system: a main burner, a gas-supply conduit, a normally-closed electrically operated valve in said conduit and controlling gas supply to said main burner, a pilot burner for the main burner and connected by a pipe to said conduit ahead of said electrically operated valve, a thermoelectric generating device arranged to be heated by the flame of said pilot burner, a thermostat responsive to the heat produced by the main burner for controlling the energization of the electrically operated valve by said generating device, a motor operated by the pressure of the gas in said pilot-burner pipe, a magneto operated by said motor and effective to produce a gas-igniting spark at the pilot burner, and a main valve controlling passage of gas through said conduit both to the electrically operated valve and to the pilot-burner pipe; all whereby, when said main valve is opened gas is supplied only to the pilot burner, the gas is ignited, and the thermoelectric generating device is heated so that the electrically operated valve can then operate in accordance with the demand of the thermostat.

WILLIAM A. RAY.