Oct. 7, 1930. D. M. PEARSON 1,777,732

MEANS FOR IGNITING AND CONTROLLING LOW GRAVITY FUEL BURNERS

Filed April 3, 1929

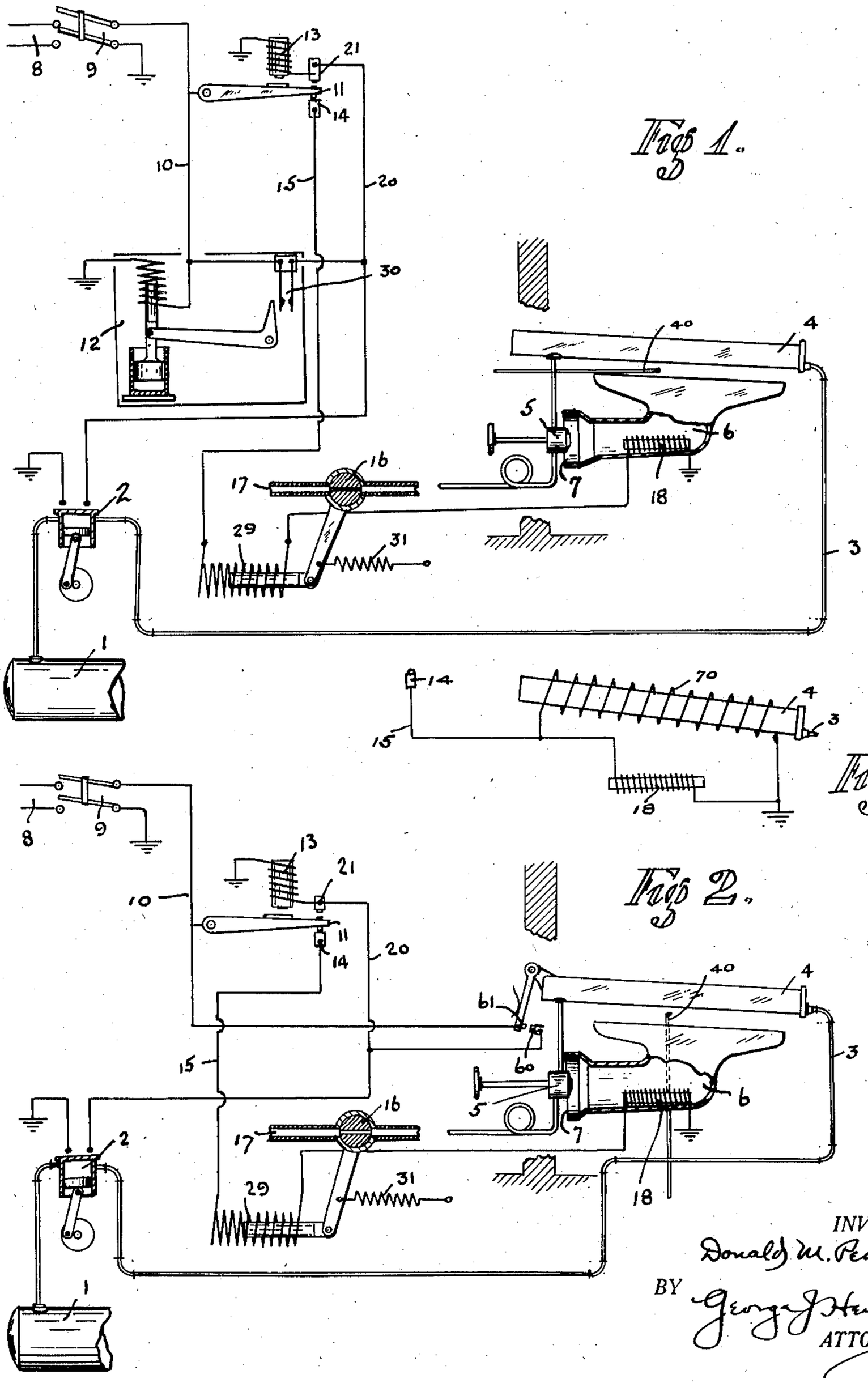

Fig 1.

Fig 3.

Fig 2.

INVENTOR.
Donald M. Pearson
BY George J. Henry
ATTORNEY.

Patented Oct. 7, 1930 1,777,732

UNITED STATES PATENT OFFICE

DONALD M. PEARSON, OF OAKLAND, CALIFORNIA

MEANS FOR IGNITING AND CONTROLLING LOW-GRAVITY-FUEL BURNERS

Application filed April 3, 1929. Serial No. 352,092.

My invention has for its object an electrically controlled heating system wherein vaporized fuel, ordinarily difficult of vaporization and ignition at room temperatures, is employed.

By my invention such fuel is first heated and then in its vaporized state is readily ignited. I therefore provide a preheating means whereby the passages into which the cold fuel is to be introduced and through which it passes, are first brought to a temperature corresponding with that at which fuel will be properly preheated.

When such temperature is reached, this preheating step is discontinued and the full fuel flame being immediately established under the increased preheating temperature condition, is thereafter maintained continuously.

By reference to the accompanying drawing, my invention will be made clear.

Fig. 1 is a diagram of the electrical circuit and operating elements showing one form of my invention as applied to fuel burners.

Fig. 2 is a mdification of Fig. 1 wherein a thermostat control is substituted for the time delay switch.

Fig. 3 illustrates an alternate form of electrically heating the fuel supply.

A conventional liquid fuel supply is indicated by the numeral 1 from which oil is abstracted by a conventional electrically operated pump 2, through the delivery pipe 3, to the chamber 4 within which the oil is vaporized and from which it issues through the tip 5 into the burner base 6, and is there mixed with air drawn in through the inlet 7 and burns under the chamber 4.

At 8 is a conventional source of electric energy controlled through the switch 9; one circuit leg from the switch is grounded and the other leg shown at 10, energizes the movable contact 11 and initiates movement of the time delay switch 12.

The movable contact 11 is actuated through the relay coil 13 to break the circuit between contacts 11 and 14 when energized after the time delay switch 12 closes its contacts at 30.

When the contacts 11 and 14 are closed the first action is that the circuit branch 15 is energized and the conventional electrically operated gas valve at 16 opens fully as by the solenoid 29 overcoming the coil spring 31 to supply gas from the inlet 17 furnishing instantly a large gas flame to the burner 6.

When the circuit branch 15 and the solenoid 29 are de-energized, the valve 16 closes under the action of spring 31.

I prefer, especially where temperatures are very low, as under winter or freezing conditions, to furnish in circuit with the branch 15, an electric heating element 18 which heats the lower portion of the burner base and throat through which the air and gas is introduced, thus preventing condensation and facilitating the ready ignition of the fuel vapor, when it is introduced.

The time delay switch 12 starts functioning as soon as the switch 9 is closed and the gas flame now being fully turned on, the chamber 4 becomes heated and likewise the walls of the burner base 6.

After a predetermined time interval, the time delay switch 12 closes its contacts at 30 and the circuit leg 20 is energized, thus causing the relay coil 13 to raise the movable contact 11 against the contact 21. This breaks the circuit with branch 15 which now becomes dead and the gas valve 16 now closes under the action of the spring 31.

Thereafter, during the full operation of the burner, the relay 13 holds contacts 11 and 21 in engagement as long as the throw switch at 9 remains closed.

This closing of contacts 11 and 21 starts the pump 2, which now supplies fuel to the heated chamber 4, where it is vaporized, and it then issues from the tip 5 as a continually burning fuel spray.

When it is desired to shut off the burner flame, the switch 9 is opened, de-energizing the relay 13 when contacts 11 and 21 are broken and the pump 2 stops and contacts 11 and 14 are re-established, ready for another cycle of operation.

Referring particularly to Fig. 2 the closing of switch 9 opens the gas valve 16 as before, supplying a large gas flame until the chamber 4 is heated to vaporize the fuel and this

temperature increase closes contacts 60 and 61.

In other words when the burner is started and the gas flame is first turned on through the action of the valve 16 at which time the contacts 60 and 61 are separated, the pump 2 is therefore not yet in operation.

Shortly thereafter, the chamber 4 being heated, the contacts close under the thermostat action. The closing of these contacts energizes the relay 13 causing the contacts 11 and 21 to close, the gas valve 16 closes off the supply of gas and the pump starts into operation.

It is of course desirable to maintain a pilot light or other conventional ignition means as an electric spark, not shown but well known, to ignite the gas when the gas valve 16 is first turned on and while I have shown an electrically controlled gas valve and gas supply to preheat the chamber 4, an electric heating means for the chamber 4 may be substituted therefor in circuit with the contacts 11, 14, functioning the same way as does the gas flame to initially heat the chamber and I wish to be understood as claiming all such.

Such an electric heating means is illustrated diagrammatically in Fig. 3, wherein the chamber 4 is provided with a heating coil 70, connected through conductor 15 with the contact 14 and thence to ground and wherein the coil 18, if employed, is likewise connected and parallel with the coil 7.

I claim:

1. Means for igniting and controlling the fuel supply to a double burner, which consists of a gas supply and a gas valve and connections therefrom to and including a burner tip, a vaporizing chamber and means adapted to introduce liquid fuel into said chamber, a vapor connection from said chamber to said burner tip, an electric circuit and devices adapted to open said gas valve to preheat said chamber, automatic means operating to close said valve when said chamber has arrived at a predetermined temperature and to actuate said means to introduce liquid fuel into said chamber where it is vaporized and passes through said connection and said tip, and a heating element in front of said tip and in circuit with said valve whereby the passage walls through which the gas passes on leaving the tip are simultaneously preheated.

2. Means for igniting and controlling the fuel supply to a double burner, which consists of a gas supply and a gas valve and connections therefrom to and including a burner tip, a vaporizing chamber and means adapted to introduce liquid fuel into said chamber, a vapor connection from said chamber to said burner tip, an electric circuit and devices adapted to open said gas valve to preheat said chamber, a thermostat within said vaporizing chamber, contacts actuated by said thermostat and a relay excited by the closing of said contacts whereby the circuit and devices operate to close said valve when said chamber has arrived at a predetermined temperature and to actuate said means to introduce liquid fuel into said chamber where it is vaporized and passes through said connection and said tip.

3. Means for igniting and controlling the fuel supply to a double burner, which consists of a gas supply and a gas valve and connections therefrom to and including a burner tip, a vaporizing chamber and means adapted to introduce liquid fuel into said chamber, a vapor connection from said chamber to said burner tip, an electric circuit and devices adapted to open said gas valve to preheat said chamber, a thermostat within said vaporizing chamber, contacts actuated by said thermostat and a relay excited by the closing of said contacts whereby the circuit and devices operate to close said valve when said chamber has arrived at a predetermined temperature and to actuate said means to introduce liquid fuel into said chamber where it is vaporized and passes through said connection and said tip, and an electric heating element in the path of said gas issuing from said tip in said circuit and adapted to be energized during said gas flow.

DONALD M. PEARSON.