Aug. 14, 1951 F. L. LADE ET AL 2,563,944

SAFETY CONTROL FOR GAS STOVES

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FIG. 2.

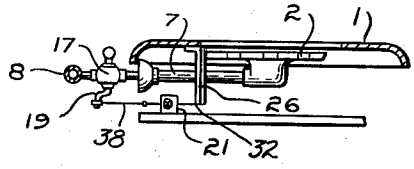
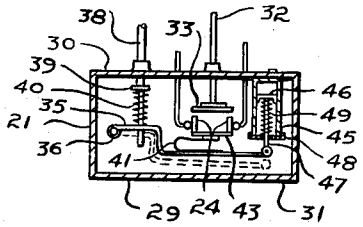


FIG. 3.



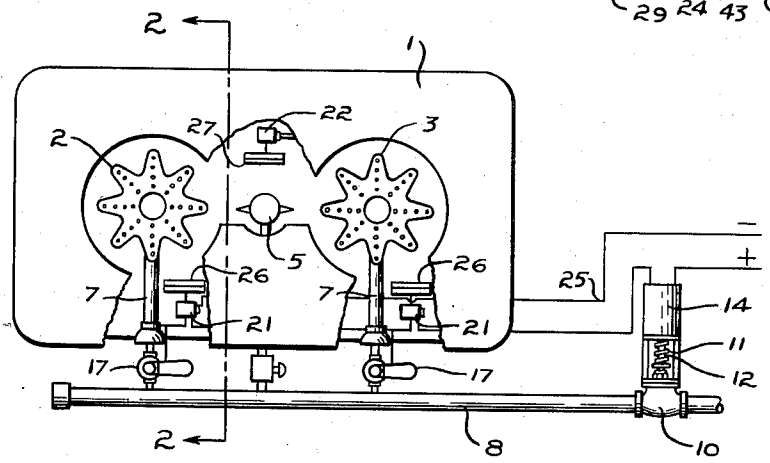


FIG. 1.

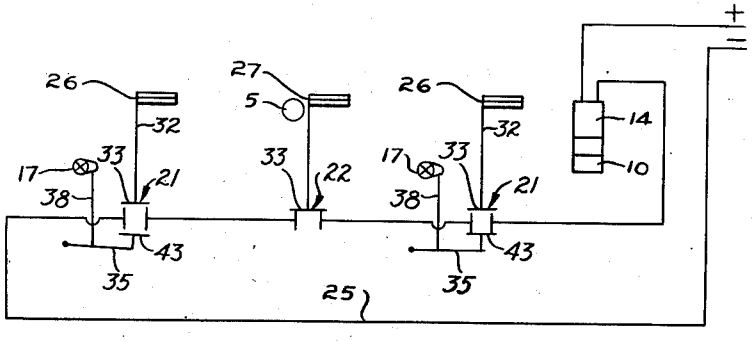


FIG. 4.

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SAFETY CONTROL FOR GAS STOVES

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2 Claims. (Cl. 158—117.1)

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Our invention relates to improvements in safety controls for gas stoves.

The object of the invention is to provide electrically operated means operable in response to failure of any gas burner or pilot light for such burner to shut off the main supply valve to the gas stove to which the device is fitted.

In gas stoves where pilot lights are provided, it has occurred that a liquid from a pan has been spilled or has boiled over the pan onto the burner immediately below and said liquid has plugged many of the gas burner jets within the range of the pilot, preventing said pilot from igniting the burner with the result that gas continues to flow from the orifices unaffected by the over flowing liquid and a dangerous explosion has followed, being set off by the pilot light or another lighted burner. With the device as now proposed, the gas is shut off almost immediately after the spilling had taken place and continued gas flow is prevented.

Referring to the drawings:

Figure 1 is a plan view of a gas plate showing the invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a detail sectional view of a switch included in the gas ring circuits.

Figure 4 is a diagrammatic view showing the electrical circuit.

In the drawings like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates generally a gas plate having two gas ring burners 2 and 3 mounted therebelow with a pilot light burner 5 mounted between said gas ring burners to light them.

The gas ring burners 2 and 3 and the pilot light burner 5 are supplied with gas through branch pipes 7 from a gas supply pipe 8. The gas supply pipe 8 is fitted with a main valve 10 by which the gas supply may be shut off from the gas ring burners and the pilot light burner. The valve 10 is closed by a spring 11 surrounding its stem 12 and is opened by a solenoid 14 connected to said stem, the solenoid being connected to a source of electrical supply. Each of the gas ring burners is normally controlled by manually operated valves 17, each of which is provided with a crank 19, see detail in Figure 2. A control switch 21 is provided adjacent each valve 17 and another control switch 22 is provided adjacent the pilot light 5. Each of the control switches 21 and 22 is fitted with contact posts 24, which are connected in series with the solenoid 14 in a suitable circuit 25. A thermostat 26 is mounted

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in appropriate proximity to each of the gas ring burners 2 and 3 to be expanded thereby and a thermostat 27 is provided adjacent the pilot light burner 5, which is also expanded thereby.

Each of the control switches 21 and 22 is mounted in a casing 29 having top and bottom walls 30 and 31 respectively, and slidably extending through the wall 30 is a rod 32 fitted at its inner end with an insulated contact 33 adapted to bridge the contact posts 24. The outer end of the rod 32 is attached to one of the thermostats 26 so that the heating of said thermostat will effect the closing movement of said contact 33. The control switches 21 are also provided with an arm 35 mounted as at 36, the inner portion of said arm being apertured to receive the end of a push rod 38 of one of the valves 17 which extends from the end of the crank 19 through the wall 30. Adjacent the end of the push rod 38 a collar 39 is provided and between said collar and the arm 35 is a coil spring 40 which is adapted to move said arm when the complementary valve 17 is moved to open position. Intermediate the length of said arm 35 is a light leaf spring 41 which carries an insulated contact 43, for the purpose of bridging the contact posts 24 and to keep said contacts bridged until the arm 35 has moved downwards a predetermined distance as indicated in dotted line in Figure 3.

Disposed within the casing 29 is a dash pot 45, or other suitable action delaying device, the dash pot being provided with a piston 46, piston rod 47 and cylinder head 48. A light coil spring 49 is fitted upon the piston rod 47 which abuts the cylinder head 48 and the piston 46 for the purpose of returning the piston to rest position and for exerting a lifting strain on the arm 35 to move it upwardly, as the push rod is moved upwardly by turning the valve 17 to closed position. It will be obvious that when a valve 17 is closed as shown in Figure 1, the contact 43 is also bridging its contact posts 24.

In use, when neither gas ring burners nor pilot burners are in use none of the thermostats 26 and 27 are heated and consequently all the switch contacts 33 are out of contact with their contact posts 24 and the main gas supply valve 10 will be closed under the influence of the spring 11. Also, assuming that the gas valves 17 to the gas ring burners 2 and 3 are closed, the dash pot spring 49 of each control switch 21 will compress the leaf springs 41 and cause the contact 43 to bridge the contact posts 24, thus leaving the circuit 25 closed except at the control switch 22, which is connected with the

thermostat 27 of the pilot light burner 5. On applying heat to the thermostat 27, said thermostat will expand to depress the contact 33 of the switch 22 to bridge the contact posts 24, thus completing the closing of the circuit 25 which will cause the solenoid 14 to be energized and open the valve 10 admitting gas to the pilot light burner 5, so that it may be lighted to ignite the gas ring burners 2 and 3. To light either of said gas ring burners 2 or 3 its valve 17 is turned to open position, allowing gas to flow thereto and become ignited. After a predetermined interval, the adjacent thermostat 26 is expanded and the contact 33 connected therewith will bridge its contact posts 24 and by the time this contact is closed the dash pot 45 will allow the arm 35 to swing in a downward direction and disconnect the contact 43 from said contact posts. So long as the aforesaid burner is functioning properly, the circuit 25 will remain closed, but if the ring burner should be put out, such as from a pan boiling over and spilling onto it the thermostat 26 will contract, removing its associated contact 33 from the contact posts, breaking the circuit 25 and allowing the main valve 10 to close down. Obviously with the gas being shut off at said valve the pilot light 5 will go out too and its thermostat 27 will contract, causing a further break through the switch 22 in the circuit, thus eliminating all hazard of explosion or fire from the stove.

While the invention has been described as being applied to a gas stove having a pilot light burner, it will function equally well on any gas ring burner or gas fire, in which case a switch 21 would be used for each gas burner and a solenoid controlled main valve would be used on the gas supply pipe.

What we claim as our invention is:

1. In a safety device for a gas stove having ring burners, manually operated valves therefor and a pilot burner, each ring burner and pilot burner having a thermostat adjacent thereto, said device comprising a self-closing valve for supplying gas to the burners and the pilot burner and an electric circuit including a solenoid to open the self-closing valve, a switch operated by the pilot burner thermostat which when heated closes, and a second switch normally closed and operated to open position after a time delay incidental to the opening of the manually operated valve, and a third switch operated by said ring burner thermostat in response to the heat thereof, to closed position prior to opening of said second switch to thereby maintain said circuit closed.

2. In a safety device for a gas stove having ring burners, manually operated valves therefor and a pilot burner, each ring burner and pilot burner having a thermostat adjacent thereto, said device comprising a self-closing valve for supplying gas to the burners and the pilot burner and an electric circuit including a solenoid to open the self-closing valve, a switch operated by the pilot burner thermostat which when heated closes, and a second switch normally closed and operated to open position after a time delay incidental to the opening of the manually operated valve, and a third switch operated by said ring burner thermostat in response to the heat thereof, to closed position prior to opening of said second switch to thereby maintain said circuit closed and means for retarding the opening of the circuit through said second switch until the manually operated valve is opened a predetermined distance.

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