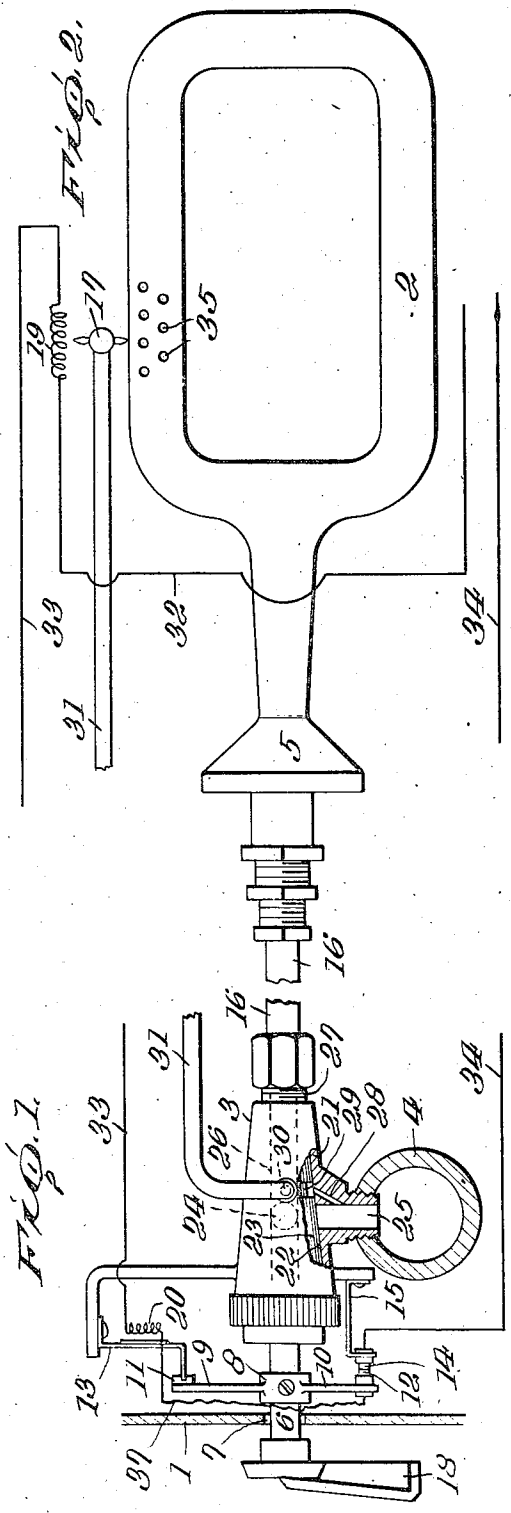
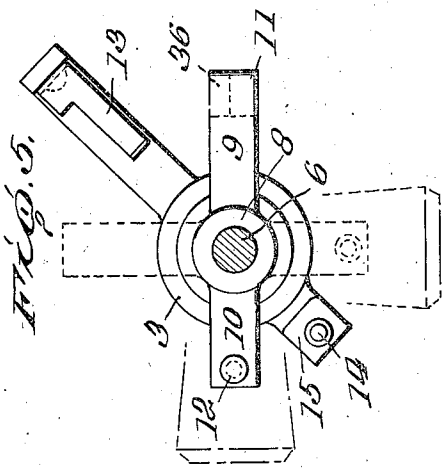
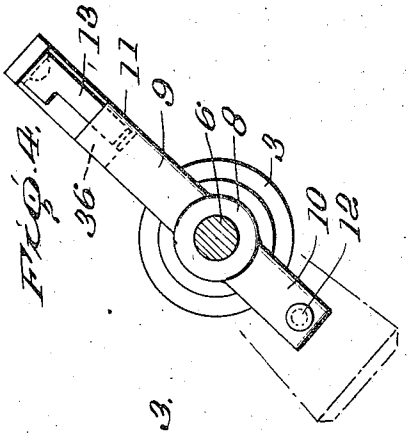
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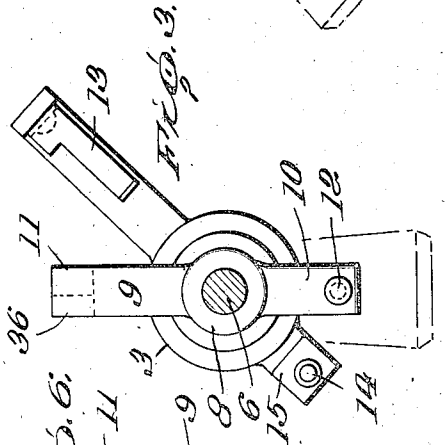
IGNITION DEVICES OR SYSTEMS FOR GAS AND LIQUID FUEL BURNERS

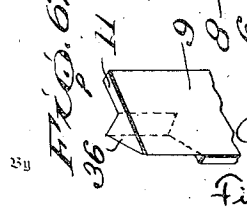
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IGNITION DEVICE OR SYSTEM FOR GAS AND LIQUID FUEL BURNERS

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7 Claims. (Cl. 175—115)

This invention relates to ignition devices or systems for gas and liquid fuel burners.

Heretofore it has been the practice to provide a pilot burner adjacent the main burner for lighting the latter. This pilot burner heats an operating element which in turn actuates a gas valve controlling the main gas supply to the burner. This gas valve, preferably located adjacent the main burner, is in addition to the main shut off valve or gas cock.

One of the objects of this invention is to provide an electric ignition system in which the auxiliary gas valve now in use will be eliminated.

Another object of the invention is to provide electrically operated latch means for preventing actuation of the main shut off valve or gas cock to the position in which gas is supplied to the main burner, until a sufficient time interval has elapsed to provide for electric ignition of the pilot burner.

Still another object of the invention is to provide means whereby the gas valve can be returned to off or closed position from full flow position when flow of current to the electrically operated latch is shut off and the latch is in position to prevent actuation of the valve to full flow position.

Other objects and advantages of the invention will be apparent as the ensuing description is considered in connection with the accompanying drawing, in which:

Figure 1 is a side view of the gas cock or valve, and associated parts partly broken away;

Figure 2 is a plan view of the main burner, parts being broken away;

Figure 3 is an end view of the valve shown in closed position with the electric circuit open;

Figure 4 is a view similar to Figure 3 showing the valve by-pass open and the circuit closed;

Figure 5 is an end view of the valve showing the position assumed by the latch and electrical contacts when the valve is in full open position, with the pilot lit and the circuit open; and

Figure 6 is an end view of the latch arm.

Referring more particularly to the drawing, 1 denotes the front plate or panel of a gas stove or range. For purposes of illustration the range is shown as having an oven burner 2, but it will be understood that the present invention is equally adaptable for use with top burners.

A gas cock 3, suitably mounted upon a gas supply pipe or manifold 4, connects at its inner discharge end with the air and gas mixing chamber 5, of the burner 2, through the medium of a conduit or pipe 16, and at its other end is provided with an operating stem 6 which projects freely through an aperture 7 formed in the panel 1. A latch member 8 secured on the stem 6 of the valve 3 is formed with oppositely extending arms 9 and 10, the end of the arm 9 being provided with a beveled latch member 11 while the arm 10 carries an electrical contact member 12. These members 11 and 12 are adapted to cooperate with a bi-metallic stop member or strip 13 and an electrical contact member 14, the latter two of which members being carried by a bracket 15 in turn suitably supported upon the valve 3. The electrical contacts 12 and 14 are suitably insulated from the arm 10 and bracket 15 respectively.

Positioned adjacent certain of the gas ports 35, of the burner 2, is a pilot 17 which receives a reduced supply of gas from the valve 3 when the gas cock handle 18 is appropriately manipulated, in a manner presently described. Two coils 19 and 20, arranged in series and positioned in proximity to the pilot 17 and bi-metal strip 13 respectively, are provided, the former for igniting the pilot and/or main burner and the latter for heating the strip 13, when the electric circuit is completed through the closing of contact points 12 and 14.

The hollow valve casing 21 has an interior tapered bore 22 which rotatably receives a tapered valve plug 23, having therein a transverse full flow passageway 24, adapted for registry with an inlet bore or passageway 25, formed as a part of the housing and a communicating longitudinal passageway 26 which is at all times in communication with the outlet passageway 27. The communicating passageways 24 and 26 of the valve plug just referred to are the main passageways and are utilized when either a full flow or a reduced flow of a fuel is desired at the main burner. The casing is also formed with an inwardly and upwardly extending by-pass 28 leading from the casing inlet passageway 25 and opening into the casing bore 22 at a point inwardly spaced from the inlet passageway. An annular groove 29 formed in and extending almost completely around the plug is adapted to be brought into registry with the outlet end of the by-pass 28 for supplying a small quantity of gas to the pilot 17. Thus the groove 29 is also adapted to place the by-pass in communication with a small transverse outlet opening or passage 30 extending through the casing wall in the same vertical plane with but spaced from the outlet end of the by-pass 28 approximately 45°. A small gas pipe 31 connected at one end to the small outlet port 30 and

at its other end to the pilot 17, supplies gas to the latter when the groove 29, by-pass 28 and port 30 are in communication with each other.

When the burner is not in use, both coils 19 and 20 are cold and the bi-metal strip 13 assumes a position in the path of travel of the latch member 11, carried by the arm 9, thus making it impossible to open the gas valve 3 sufficiently to supply gas to the main burner. However, movement of the valve plug in a clockwise direction from off or Figure 3 position, through a small predetermined arc, to Figure 4 or by-pass flow position is possible, before the latch member 11 engages the bi-metallic stop member. In this latter position the inlet passage 24 in the plug is still out of communication with casing inlet passage 25, but by-pass 30 is in communication with the passage 25 and permits a small flow of gas to the pilot. At the same time, the contacts 12 and 14 are closed and current is supplied to the coils 19 and 20 through line wire 32 leading to one end of coil 19 and thence through coil 19 and line wire 33 leading to coil 20 mounted on stop member 13. Current then passes through coil 20, loose wire 37 to and through electrical contacts 12 and 14, and thence out through wire 34, to a source of power (not shown) to complete the circuit, the coils being in series. As both coils become hot, the ignition coil 19 lights the pilot 17, thus permitting the latter to ignite the main burner 2 when gas is supplied to the latter, while the heater coil 20 heats the bi-metallic strip causing it to move out of the path of and clear the latch member 11.

The gas valve can now be moved in a clockwise direction to full open or Figure 5 position for supplying gas to the main burner which is ignited at the ports 35. In moving the valve to full open position the contacts 12 and 14 are separated thus breaking the flow of current to both coils and permitting the bi-metallic strip 13 to cool off and resume its normal position in the path of movement of the latch member 11. However, when rotating the handle 18 in an anti-clockwise direction to close the gas valve, the beveled face 36 of the latch part 11 rides over the offset free end of the bi-metallic strip and consequently the latch does not interfere with the closing of the valve. During the turning of the valve in a counter-clockwise direction to off position, a full flow of fuel to the pilot 17, through the groove 29 is assured until the main burner is completely shut off.

To assure positive ignition of pilot 17 by coil 19 before releasing latch mechanism, resistances of coils 19 and 20 can be arranged so that coil 19 attains a temperature for ignition before coil 20 supplies enough heat to release the latch mechanism.

Under certain conditions the coil 19 could be used for lighting the main burner and in that event the pilot could be dispensed with.

Having thus described my invention, what I claim is:

1. An apparatus of the kind described comprising in combination with a main burner, a pilot adjacent the burner for lighting the same, a valve having an inlet passage communicating with a source of fuel supply, a plug rotatably positioned in said valve, said plug having a main burner passage communicating with said valve inlet passage and said main burner and a passage communicating with said pilot to open and close passsage of fuel from said source of supply to said main burner and pilot, a bi-metallic latch for temporarily preventing further movement of the valve after the valve has been rotated to position to supply fuel through one of said passages to the pilot, an ignition circuit including in series an ignition coil and a heating coil, said ignition coil adapted to ignite the pilot and said heater coil adapted to heat the latch and move the same to an inoperative position when the circuit is closed, and contact members associated with the valve, said contact members being closed for closing said circuit upon movement of the valve to position to supply fuel through one of the passages to the pilot, and said contact members being opened to break the circuit when the valve is moved to position to permit of a full flow of fuel through said main burner passage to said main burner whereby said bi-metallic latch will cool and return to operative valve latching position.

2. An apparatus of the kind described comprising in combination with a main burner, a pilot adjacent the burner for lighting the same, a valve having an inlet passage communicating with a source of supply, a plug rotatably positioned in said valve, said plug having a main burner passage communicating with said valve inlet passage and said main burner and a passage communicating with said pilot to open and close passage of fuel from said source of supply to said main burner and pilot, a bi-metallic latch for temporarily preventing further movement of the valve after the valve has been rotated to position to supply fuel through one of said passages to the pilot, an ignition circuit including in series an ignition coil and a heating coil, said ignition coil adapted to ignite the pilot and said heater coil adapted to heat the latch and move the same to an inoperative position when the circuit is closed, and contact members associated with the valve, said contact members being closed for closing the said circuit upon movement of the valve to position to supply fuel through one of the passages to the pilot, and said contact members being opened to break the circuit when the valve is moved to position to permit of a full flow of fuel through said main burner passage to said main burner whereby said bi-metallic latch will cool and return to operative valve latching position, said latch mechanism being such that movement of the valve from full flow burner position to closed position is not interfered with.

3. Apparatus of the kind indicated comprising in combination with a main gas burner, a pilot adjacent the burner for lighting the same, a source of fuel supply, a valve casing having an inlet passage communicating with said source of supply, a rotatable valve plug in said casing, a large gas conduit and a small gas conduit leading from said valve casing to said burner and said pilot respectively, said plug having a main burner passage communicating with said valve inlet passage and said large gas conduit and a passage communicating with said small gas conduit adapted to open and close passage of fuel from said source of supply to said main burner and pilot, a latch to prevent said valve plug being moved into a full on position to supply gas through said large conduit to the main burner, said latch including a latch member rotatable with the valve plug and a bi-metallic stop member mounted on the casing in the path of rotation of said latch member, an ignition circuit including in series an ignition coil and a heating coil for igniting said pilot and for heating said bi-metallic stop member and causing

the same to move out of the path of rotation of said latch member when the circuit is closed and thus permitting the valve plug to be moved to full flow position with the main burner passage communicating with the large gas conduit, and contact members associated with the valve for closing the said circuit when the valve is moved to position to supply gas through the small conduit to said pilot, said contact members being opened to break said circuit when the valve is moved to position to permit of a full flow of gas through the large conduit to said main burner whereby said bi-metallic stop cools and moves into a position in the path of rotation of said latch members.

4. Apparatus of the kind indicated comprising in combination with a main gas burner, a pilot adjacent said burner for lighting the same, a source of fuel supply, a valve casing having an inlet passage communicating with said source of supply, a rotatable valve plug in said casing, conduits leading from said valve casing to said burner and pilot respectively, said plug having a main burner passage communicating with said valve inlet passage and one of said conduits and a passage communicating with the other of said conduits adapted to open and close passage of fuel from said source of supply to said main burner and pilot, a latch to prevent said valve being moved into a full on position to supply gas through one of the conduits to the main burner, said latch including a latch member mounted upon and rotatable with the valve plug and a bi-metallic stop member arranged in the path of rotation of said latch member, an ignition circuit including in series an ignition coil and a heating coil for igniting said pilot and for heating said bi-metallic stop member and causing the same to move out of the path of rotation of said latch member when the circuit is closed and thus permitting the valve to be moved to full flow position with the main burner passage communicating with one of the conduits, and a contact member carried by the latch and a contact member carried by the casing, said contact members adapted for closing the said circuit when the valve is moved to position to supply gas through one of the conduits to said pilot, and said contact members being opened to break said circuit when the valve is moved to position to permit of a full flow of gas through one of the conduits to said main burner whereby said bi-metallic stop cools and moves into position in the path of rotation of said latch member.

5. An apparatus of the kind described comprising in combination with a main burner, a pilot adjacent the burner for lighting the same, a source of fuel supply, a valve casing having an inlet passage communicating with said source of supply, a rotatable valve plug in said casing, conduits leading from said valve casing to said burner and pilot respectively, said plug having a main burner passage communicating with said inlet passage and one of said conduits and a passage communicating with the other of said conduits adapted to open and close passage of fuel from said source of supply to said main burner and pilot, latch means adapted to prevent further movement of the valve to a position to supply a full flow of gas to the main burner when the valve reaches the position for supplying fuel through one of the conduits to the pilot, an electrical circuit, means in said circuit for igniting the pilot and separate means in said circuit adapted to cause said latch to move to an inoperative position when the circuit is closed and to permit return of said latch to operative position when the circuit is open, and contact members associated with the valve for closing the said circuit upon movement of the valve to position to supply fuel through one of the conduits to the pilot, and said contact members being opened to break the circuit when the valve is moved to position to permit a full flow of fuel through one of the conduits to said main burner.

6. An apparatus of the kind described comprising in combination with a main burner, a pilot adjacent the burner for lighting the same, a source of fuel supply, a valve casing having an inlet passage communicating with said fuel supply, a rotary valve plug in said casing, conduits leading from said valve casing to said burner and pilot respectively, said plug having a main burner passage communicating with said inlet passage and one of said conduits and a passage communicating with the other of said conduits adapted to open and close passage of fuel from said source of supply to said main burner and pilot, a bi-metallic latch for temporarily preventing further movement of the valve after the valve has been rotated to position to supply fuel through one of the conduits to the pilot, an ignition circuit for igniting the pilot and including means for heating the latch to move the same to an inoperative position when the circuit is closed, and contact members associated with the valve for closing the said circuit upon movement of the valve to position to supply fuel through one of the conduits to the pilot, said contact members being opened to break the circuit when the valve is moved to position to permit of a full flow of fuel through one of the conduits to said main burner whereby said bi-metallic latch will cool and return to operative valve latching position.

7. An apparatus of the kind described comprising in combination with a main burner, a pilot adjacent the burner for lighting the same, a source of fuel supply, a valve casing having an inlet passage communicating with said fuel supply, a rotary valve plug in said casing, a large gas conduit and a small gas conduit leading from said valve casing to said burner and pilot respectively, said plug having a main burner passage communicating with said valve inlet passage and said large gas conduit and a passage communicating with said small gas conduit adapted to open and close passage of fuel from said source of supply to said main burner, and pilot, a latch normally operative for temporarily preventing further movement of the valve after the valve has been rotated to position to supply fuel through the small conduit to the pilot, an ignition circuit for igniting the pilot and including means for causing the latch to move to an inoperative position when the circuit is closed and said means is energized, and contact members associated with the valve for closing the said circuit upon movement of the valve to position to supply fuel through the small conduit to the pilot, said contact members being opened to break the circuit when the valve is moved to position to permit of a full flow of fuel through said large conduit to said main burner whereby said latch will return to operative valve latching position.

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