Aug. 4, 1936. E. D. JONES ET AL 2,049,958

BURNER CONTROL APPARATUS

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Fig. 1

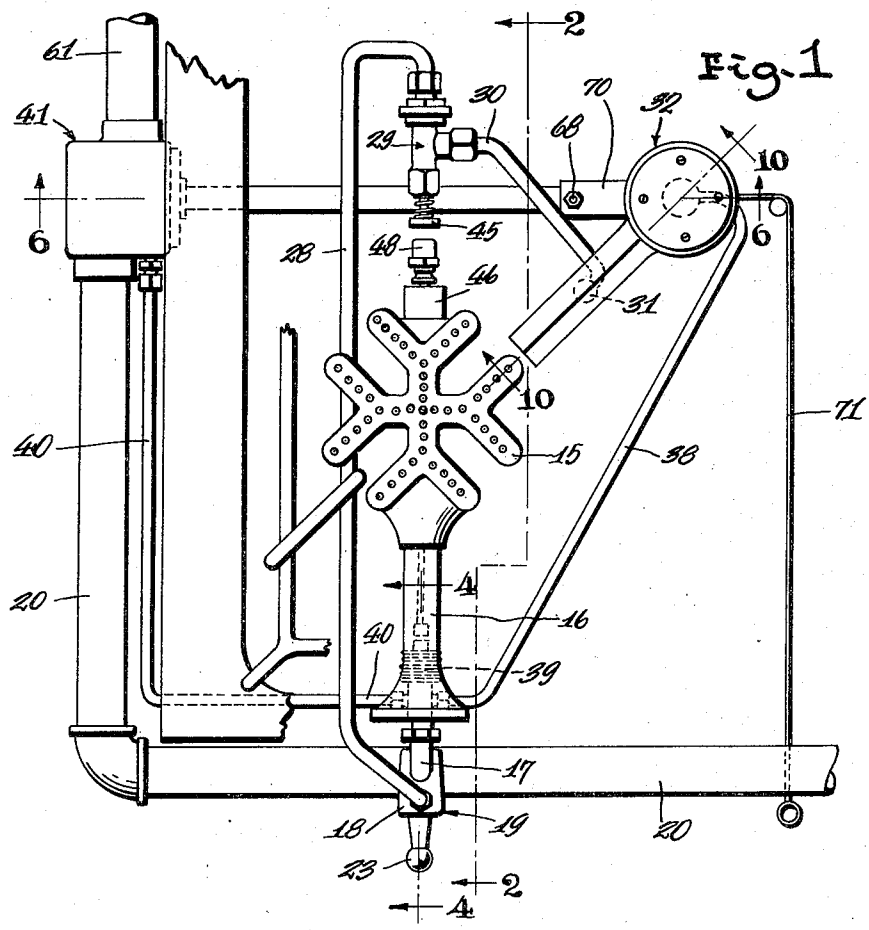
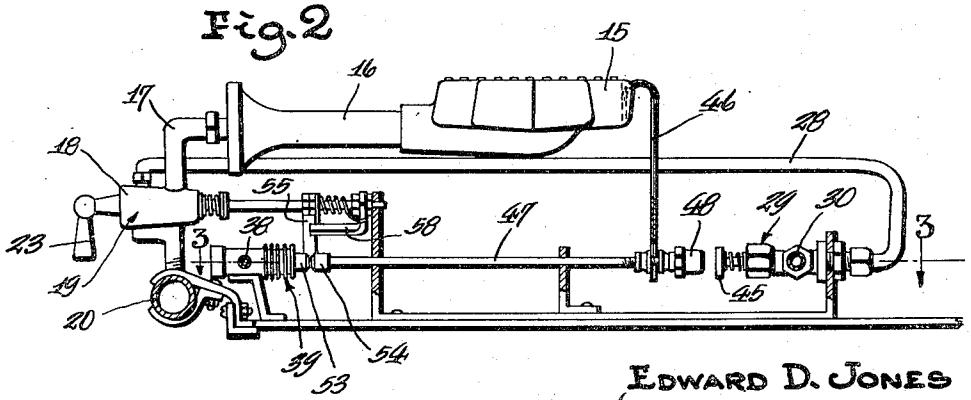


Fig. 2



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BURNER CONTROL APPARATUS

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Fig. 3

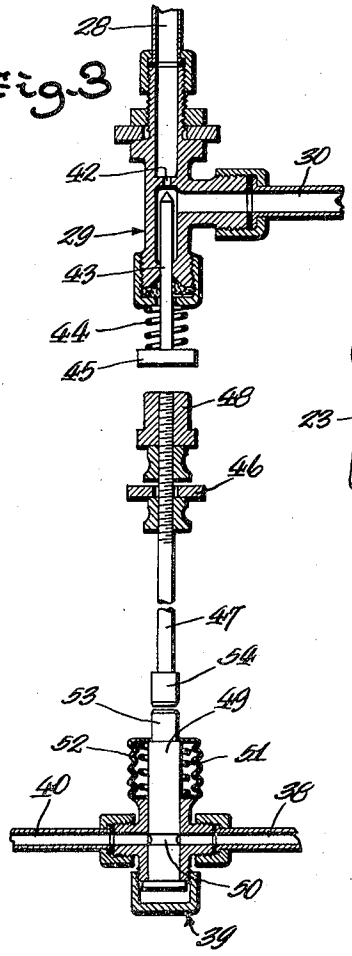


Fig. 4

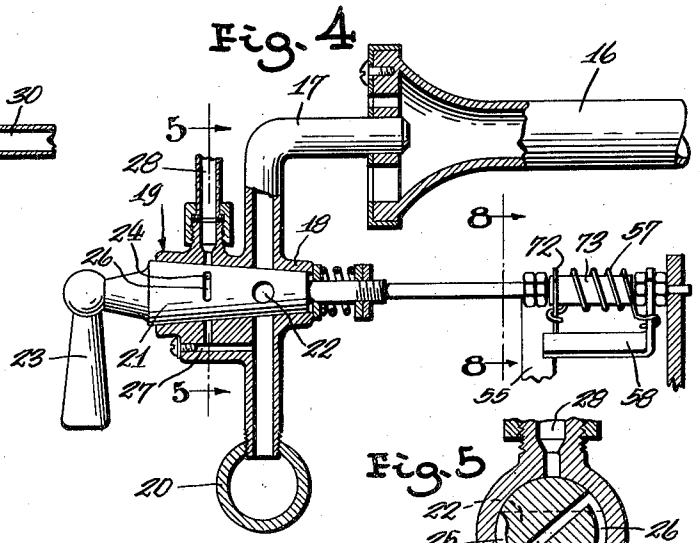


Fig. 5

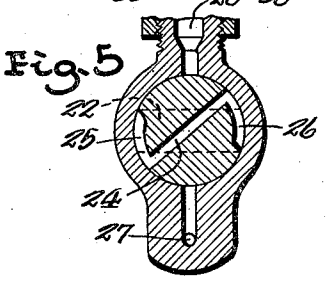
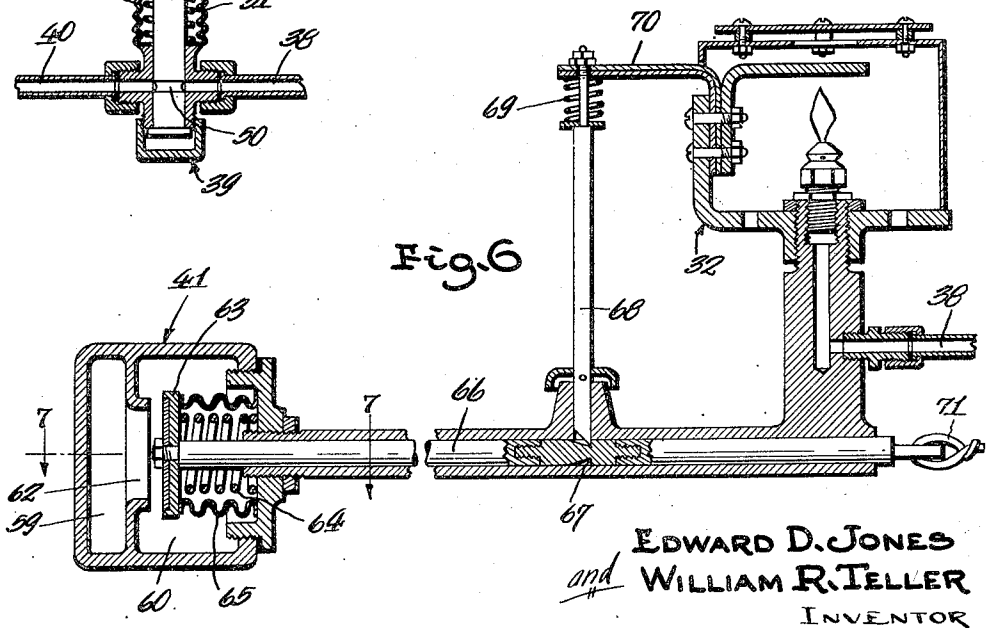


Fig. 6



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BURNER CONTROL APPARATUS

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Fig. 8

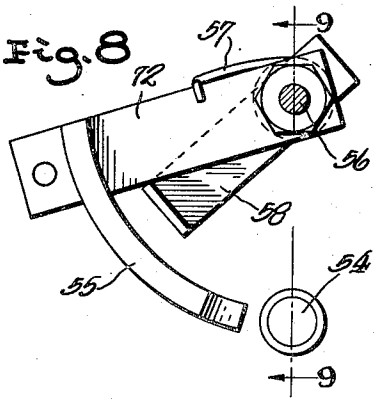


Fig. 9

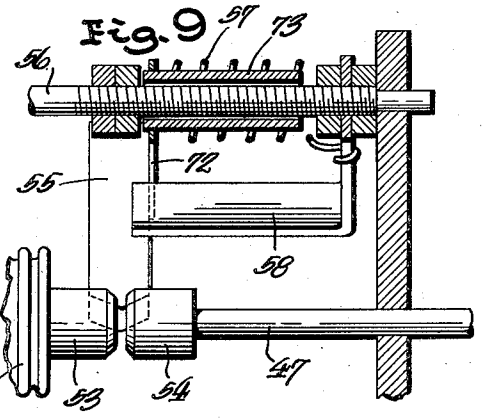


Fig. 7

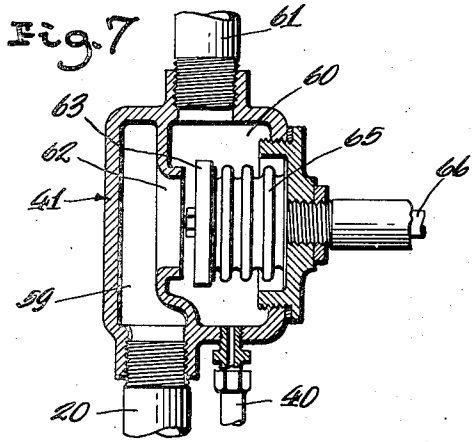
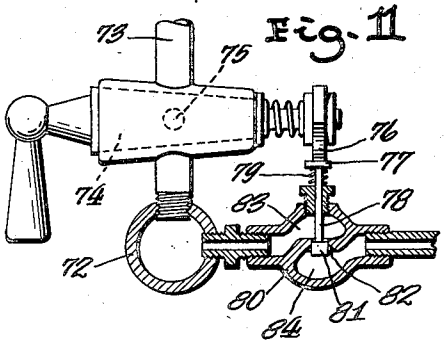


Fig. 11



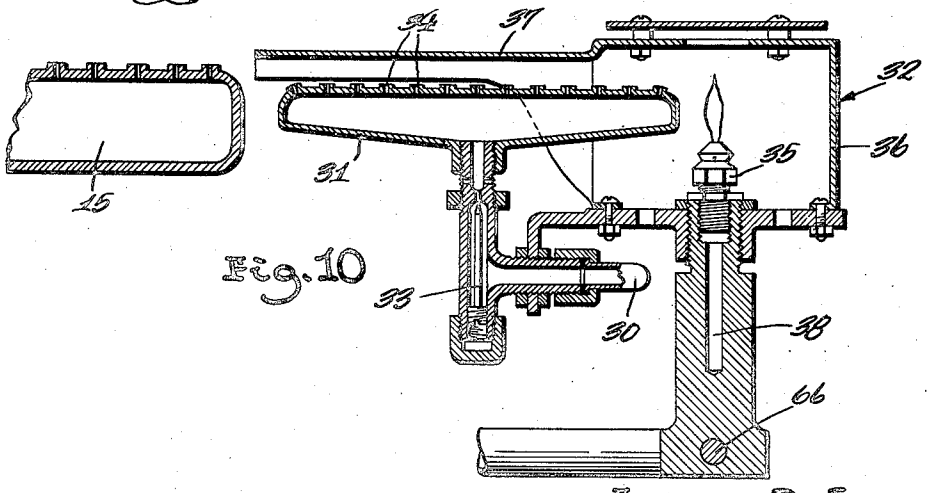


Fig. 10

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UNITED STATES PATENT OFFICE

2,049,958

BURNER CONTROL APPARATUS

Edward D. Jones and William R. Teller, Cleveland, Ohio, assignors to American Gas Association, Incorporated, New York, N. Y., a corporation of New York

Application October 5, 1933, Serial No. 692,293

16 Claims. (Cl. 158—117.1)

This invention relates to burner control mechanism, and has for an object the provision of main burner means, and igniting means for igniting said burner means, and control mechanism for controlling the operation of said burner and igniting means, whereby upon extinguishment of said burner means the same is re-ignited by said igniting means, and should said burner means fail to ignite, said control mechanism operates to cut off the supply of fuel to said burner means and to said igniting means.

Another object of the invention is to provide mechanism wherein said igniting means controls the supply of fuel to said burner means, together with additional means responsive to the condition at said burner means for controlling said igniting means.

Other and further objects of the invention will become apparent from the specification and drawings forming a part hereof.

In the drawings accompanying this specification and forming a part of this application, we have shown, for purposes of illustration, certain forms which our invention may assume.

In these drawings:

Figure 1 is a fragmentary top plan view of an embodiment of the invention,

Figure 2 is a vertical sectional view of said embodiment corresponding substantially to the line 2—2 of Figure 1,

Figure 3 is an enlarged horizontal sectional view corresponding substantially to the line 3—3 of Figure 2, translocated to better accommodate the view to the sheet,

Figure 4 is an enlarged fragmentary vertical sectional view corresponding substantially to line 4—4 of Figure 1,

Figure 5 is an enlarged fragmentary vertical sectional view corresponding substantially to the line 5—5 of Figure 4,

Figure 6 is an enlarged fragmentary vertical sectional view corresponding substantially to the line 6—6 of Figure 1,

Figure 7 is an enlarged fragmentary horizontal sectional view corresponding substantially to the line 7—7 of Figure 6,

Figure 8 is an enlarged vertical sectional view corresponding substantially to the line 8—8 of Figure 4, and showing parts in elevation,

Figure 9 is an enlarged fragmentary vertical sectional view corresponding substantially to the line 9—9 of Figure 8,

Figure 10 is an enlarged fragmentary vertical sectional view corresponding substantially to the line 10—10 of Figure 1, while

Figure 11 is a fragmentary vertical sectional view of a different embodiment of the invention, and showing parts thereof in elevation.

The embodiment of the invention illustrated in Figures 1 to 10 inclusive comprises a burner 15 supplied with gaseous fuel through the usual type of mixing tube 16, connecting with a nozzle 17 leading to the valve casing 18 of a valve cock 19 tapped into the manifold 20, and the valve casing 18 is provided with a tapered rotatably mounted plug valve 21 having a transverse bore 22 adapted to be brought in registration with the conduit leading to the nozzle 17 and with the conduit tapped into the manifold 20 through rotation of the plug valve 21 by manipulation of the handle 23.

The plug valve 21 (Figures 4 and 5), at a point longitudinally spaced from the bore 22 is provided with a transversely extending bore 24 disposed at an angle to the bore 22, the outer ends of which communicate with channels 25 and 26, the channel 25 being adapted to communicate with the manifold gas supply through a duct 27 formed in the casing 18, and the channel 26 being adapted to communicate with a conduit 28 leading to a valve mechanism 29 and from the valve mechanism 29 through a conduit 30 with an intermediary igniting device 31 positioned to extend between the burner 15 and a pilot burner 32, the amount of gas admitted to the igniting device 31 being controlled by a needle valve 33, and the gas which enters the igniting device 31 flows outwardly through the apertured nipples 34.

The pilot burner 32 is provided with a burner tip 35 disposed adjacent to one end of the igniting device 31, substantially enclosed within a housing 36 and the housing 36 is provided with an extension 37 which overhangs the igniting device 31 in spaced relation with respect thereto.

The pilot burner tip 35 is supplied with fuel through a conduit 38 leading to a valve mechanism 39, and through a second conduit 40 to the inlet side of a main valve mechanism 41.

Means are provided for automatically controlling the operation of the fuel supply to the igniting device 31 (Figures 1, 2, and 3) after the cock 19 has been opened to supply gas thereto. The continuance of a supply of fuel to the igniting device after a supply is once established depends upon operation of the valve mechanism 29, this mechanism including a partition provided with a valve opening 42 which establishes communication between the conduits 28 and 30 and which is controlled by a valve 43 reciprocably mounted and normally urged to open position

by means of a spring 44 which may be interposed between the valve head 45 and adjacent portion of the valve mechanism 29.

The valve 43 is adapted to be actuated through the medium of a bimetallic thermostatic element 46 having one end fixed to the burner structure 15 and the opposite end in operative engagement with a reciprocable rod 47 having a head 48 disposed in line with the valve head 45, the thermostatic element 46, when the burner 15 is not burning, being constructed to occupy the position as shown in Figure 2, and in this position holding the head 48 on the rod 47 in spaced relation with respect to the valve head 45. When the burner 15 is burning, the thermostatic element 46 moves the head 48 of the rod 47 toward the right as viewed in Figure 2, into engagement with the valve head 45, compressing the spring and closing the valve 43 and thus cutting off gas to the igniting device 31.

The valve mechanism 39 is for the purpose of controlling the supply of fuel to the pilot burner 32 and it comprises (Figures 1, 2, 3, 8, 9, and 10) a reciprocably mounted valve 49 having an annular groove 50, which when in registration with the openings to the conduits 38 and 40, maintains a supply of fuel to the pilot burner, and the valve 49 is normally held in registering position by means of a spring 51 enclosed by a flexible sealing envelope 52, and the valve 49 has an extension 53 projecting outwardly and disposed in line with a head 54 on the rod 47, and the thermostatic element 46 while the burner is not burning, as viewed in Figure 2, holds the rod so that the head 54 thereof is positioned closely adjacent to the extension 53, but slightly spaced therefrom. Adapted to cooperate with the extension 53 and head 54 is a transversely swinging arm 55 carried by a spring strip 72 fixed to a sleeve 73 loosely surrounding a shaft 56 forming a reduced extension of the plug valve 21, and the arm 55 is also longitudinally movable with respect to the shaft 56, the latter movement being provided by reason of the spring strip 72 and loosely mounted sleeve 73, so that the pointed end of the arm 55 will tend to center itself in the gap between the heads 53 and 54, and the arm 55 will be in position to fall between the heads when the gap is of a sufficient size. The arm 55 is urged toward the extension 53 and head 54 by a torsion spring 57 having one end bearing upon the spring strip 72 and its opposite end fixed to an angular member 58 rotatable with the shaft 56 and positioned to move in a path which will bring the same into engagement with the arm 55 during certain phases of operation of the mechanism. When the burner 15 is burning, the thermostatic element 46 pulls the rod 47 to the right as viewed in Figure 2, causing the extension 53 and the head 54 on the rod to separate, and immediately this occurs, the arm 55 moves into the gap thus provided, and when the thermostatic element 46 resumes the position shown in Figure 2, the valve 49 will be moved to place the groove 50 out of communication with the openings to the conduits 38 and 40.

The valve mechanism 41 (Figures 1, 6, and 7) is provided with a partition dividing the valve casing into an outlet chamber 59 communicating with the manifold 20 and with an inlet chamber 60 communicating with the main gas line 61 and these chambers communicate through a valve opening 62. Mounted in the inlet chamber 60 is a valve 63 normally urged to closed position by a spring 64 incased by a flexible sealing envelope 65, and the valve 63 carries a rod 66 provided with a hardened insert having a reduced portion providing an annular shoulder 67 with which cooperates a latch member 68 normally urged into engagement by a spring 69 and connected to a second thermostatic element 70 subject to the influence of the pilot burner 32, operating when the pilot flame is extinguished to retract the latch 68 and permit the main valve 63 to close under the influence of the spring 64. The latch may be reset by manipulation of a flexible cable 71 connected to the rod 66 and terminating in a finger piece in line with the burner cock 19.

Referring to the embodiment shown in Figure 11, a cock is interposed between the manifold 72 and the conduit 73 leading to the mixing tube for the burner (not shown) and the rotatable valve 74 is provided with a bore 75 to establish communication with the burner, the plug however not having channels 25 and 26 and bore 27 as described more particularly in connection with Figures 4 and 5. The valve 74 has a fixed axially disposed extension provided with a cam 76 adapted to engage the head 77 of a valve stem 78 normally urged toward the cam by a spring 79, and the stem extends into a valve casing 80 and carries a valve 81 engageable with a valve seat 82 formed in a partition dividing the valve casing 80 into an inlet chamber 83 communicating with the manifold 72 and an outlet chamber 84 communicating with an igniting device similar to the igniting device heretofore described. The cam 76 is so contoured as to begin to open the valve 81 to establish flow of gas to the igniting device in advance of the establishment of gas flow through the bore 75 to the burner, and to maintain gas flow to the igniting device after the valve has been turned to establish communication through the bore 75 in the valve 74. This construction of course could be used in the system already described in place of that illustrated specifically in Figures 4 and 5.

In operation, and assuming the thermostatic element 46 to be in the position illustrated in Figure 2, and the thermostatic element 70 to be in the position illustrated in Figure 6, and the pilot burner 32 burning, gas flows from the main valve 41 through the manifold 20 toward the cock 19, with the cock 19 closed, and upon initial rotation thereof, and before communication is established through the bore 22, gas flows through the channels 25 and 26 (Figures 4 and 5) or through the valve 81 (Figure 11) into the igniting device conduit 28, and the valves 33 and 43 being open, gas enters the igniting device 31, and is ignited by the pilot burner 32; additional turning movement of the cock 19 then brings the bore 22 in the plug valve 21 in position to feed gas to the mixing tube 16 and thence to the burner 15, and the gas emerging from the burner 15 is ignited by the igniting device 31.

When the gas entering the burner 15 has been ignited, the thermostatic element 46 moves to the right as viewed in Figure 2 and carries with it the rod 47, and eventually brings the head 48 upon the rod into engagement with the valve head 45 to close the valve 43 and cut off supply of gas to the igniting device. This movement of the rod 47 causes separation of the extension 53 and the head 54 on the rod 47, and as soon as the separation between these parts has become great enough, the arm 55, under the influence of the spring 57 moves into the gap thus formed, and the movement of the thermostatic element

46 is enough so that the gap formed is somewhat greater in degree than is necessary to admit the arm 55, so that should the burner for any reason go out after once being ignited, the thermostatic element 46, upon cooling, will begin to move the rod 47 in a reversed direction, but before the rod has moved sufficiently to cause the head 54 to engage the arm 55, the head 48 on the rod will have moved sufficiently to cause the valve 43 to re-open, re-establishing a gas flow to the igniting device, and this gas being ignited from the pilot will re-ignite the burner. If, however, for some reason a flame cannot be established at the burner 15, the thermostatic element 46 will move the rod 47 sufficiently to bring the head 54 into engagement with the arm 55, and move the arm with respect to the shaft 56 against the extension 53 and close the valve 49. This will cut off supply of fuel to the pilot burner 32, and cause cooling of the thermostatic element 70, which retracts the latch member 68, permitting the valve 63 to close under the influence of the spring 64 and cut off supply of fuel to the manifold 20, and the pilot fuel supply already having been cut off there is no escape of gas from the apparatus, even though the cock 19 still be open. Closing of the cock 19 through movement of the angular member 58 moves the arm 55 from between the extension 53 and head 54, permitting the valve 49 to re-open, and re-establish a supply of gas to the pilot burner 32 which then may be relit. Re-establishment of gas flow to the manifold is effected by a slight pull on the flexible cable 71 to re-engage the latch 68 with the shoulder 67; subsequent operation of the apparatus then takes place as already described.

From the foregoing it will be obvious that we have accomplished at least the principal object of our invention, but at the same time it also will be obvious that the disclosure herein is illustrative only, and our invention is not limited thereto.

We claim:

1. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner for igniting fuel supplied to said main burner, and having a fuel supply conduit; movable valve means for controlling flow of fuel through said main burner conduit; a thermostatic element juxtaposed with reference to said main burner and actuated by the change of thermal condition thereof; a valve member for controlling the flow of fuel through said pilot burner conduit; means for actuating said valve member, said means being connected to said thermostatic element, and initially extending to a position adjacent said valve member when said main burner is not burning, and movable by said thermostatic element to a position spaced with reference to said valve member to form a gap therewith, when said main burner is burning; and an element normally urged to enter said gap, and operable when entered, to shift said valve member when said actuating means reassume their initial position.

2. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner having a fuel supply conduit; an igniting device, extending between said main burner and said pilot burner, and having a fuel supply conduit, said igniting device being adapted to ignite fuel at said main burner by transmitting the flame from said pilot burner; and thermostatically controlled valve mechanism, affected by changes in thermal condition at said main burner, for interrupting the supply of fuel to said igniting device when a flame has been established at said main burner, said mechanism having means automatically operable to re-establish flow of fuel to said igniting device when the flame is extinguished at said main burner.

3. Apparaus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner having a fuel supply conduit; an igniting device, extending between said main burner and said pilot burner, and having a fuel supply conduit, said igniting device being adapted to ignite fuel at said main burner by transmitting the flame from said pilot burner; valve means for controlling flow of fuel through said main burner conduit; valve mechanism for controlling flow of fuel through said igniting device conduit, said valve means being constructed and arranged to supply fuel through said valve mechanism to said igniting device in advance of supplying fuel to said main burner; and thermostatically controlled valve mechanism, affected by changes in thermal condition at said main burner, for interrupting the supply of fuel to said igniting device when a flame has been established at said main burner, said mechanism having means automatically operable to re-establish flow of fuel to said igniting device when the flame is extinguished at said main burner.

4. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner for igniting fuel supplied to said main burner, and having a fuel supply conduit; valve means for controlling flow of fuel through said main burner conduit; a valve member for controlling flow of fuel through said pilot burner conduit; a thermostatic element juxtaposed with reference to said main burner, and affected by the changes in thermal condition thereof; actuating means connected to said thermostatic element, and adapted to be actuated thereby, said actuating means initially extending to a position adjacent said valve member when said main burner is not burning, and movable to a position spaced with reference to said valve member to form a gap therewith when said main burner is burning; an element normally biased to enter said gap, and when entered, being in position to shift said valve member when said actuating means resume their initial position to cut off supply of fuel to said pilot burner; and thermostatically operated valve means, responsive to the change in thermal condition at said pilot burner when the latter is extinguished, to close off flow of fuel to said main burner.

5. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner for igniting fuel supplied to said main burner, and having a fuel supply conduit; valve means for controlling flow of fuel through said main burner conduit; a valve member for controlling flow of fuel through said pilot burner conduit; a thermostatic element juxtaposed with reference to said main burner, and affected by the change in thermal condition thereof; actuating means connected to said thermostatic element, and adapted to be actuated thereby, said actuating means initially extending to a position adjacent said valve member when said main burner is not burning, and movable to a position spaced with reference to said valve member to form a gap therewith when said main burner is burning; an element normally biased to enter said gap, and when entered being in position to shift said valve member when said

actuating means resume their initial position to cut off supply of fuel to said pilot burner; connecting means operatively connected to said valve mechanism for biasing said element when said valve mechanism is turned to fuel-flow position; and a thermal device, independent of said valve mechanism, responsive to the change of thermal condition at said pilot burner when the latter is extinguished, to interrupt the flow of fuel to said main burner.

6. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner, having a fuel supply conduit; an igniting device extending between said main burner and said pilot burner, and adapted to transmit the flame from said pilot burner to said main burner, said igniting device having a fuel supply conduit; valve means for controlling flow of fuel through said main burner conduit; a valve member for controlling flow of fuel through said pilot burner conduit; valve mechanism for controlling fuel to said igniting device; said valve means and said valve mechanism being correlated to establish flow of fuel first to said igniting device; a thermostatic element juxtaposed with reference to said main burner, and affected by the changes in thermal condition thereof; actuating means connected to said thermostatic element, and adapted to be actuated thereby, said actuating means initially extending to a position adjacent said valve member when said main burner is not burning, and movable to a position spaced with reference to said valve member to form a gap therewith when said main burner is burning; an element normally biased to enter said gap, and when entered, being in position to shift said valve member when said actuating means resume their initial position to thereby cut off the supply of fuel to said pilot burner; and thermostatically operated valve means, responsive to the change in thermal condition at said pilot burner when the latter is extinguished to close off flow of fuel to said main burner.

7. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner, having a fuel supply conduit; an igniting device extending between said main burner and said pilot burner, and adapted to transmit the flame from said pilot burner to said main burner, said igniting device having a fuel supply conduit; valve means for controlling flow of fuel through said main burner conduit; a valve member for controlling flow of fuel through said pilot burner conduit; valve mechanism for controlling fuel to said igniting device, and normally urged to open position; said valve means and said valve mechanism being correlated to establish flow of fuel first to said igniting device; a thermostatic element juxtaposed with reference to said main burner, and affected by the changes in thermal condition thereof; actuating means connected to said thermostatic element, and adapted to be actuated thereby, said actuating means initially extending to a position adjacent said valve member when said main burner is not burning, and movable to a position spaced with reference to said valve member to form a gap therewith when said main burner is burning, and operable when so moved to actuate said valve mechanism to closed position; an element normally biased to enter said gap, and when entered, being in position to shift said valve member when said actuating means resume their initial position to thereby cut off the supply of fuel to said pilot burner; and thermostatically operated valve means, responsive to the change in thermal condition at said pilot burner when the latter is extinguished to close off flow of fuel to said main burner.

8. Apparatus of the character described, comprising: a main burner, having a fuel supply conduit; a pilot burner, having a fuel supply conduit; an igniting device extending between said main burner and said pilot burner, and adapted to transmit the flame from said pilot burner to said main burner, said igniting device having a fuel supply conduit; valve means for controlling flow of fuel through said main burner conduit; a valve member for controlling flow of fuel through said pilot conduit burner; valve mechanism for controlling fuel to said igniting device, and normally urged to open position; said valve means and said valve mechanism being correlated to establish flow of fuel first to said igniting device; a thermostatic element juxtaposed with reference to said main burner, and affected by the changes in thermal condition thereof; actuating means connected to said thermostatic element, and adapted to be actuated thereby, said actuating means initially extending to a position adjacent said valve member when said main burner is not burning, and movable to a position spaced with reference to said valve member to form a gap therewith when said main burner is burning, and operable when so moved to actuate said valve mechanism to closed position; and an element normally biased to enter said gap, and when entered, being in position to shift said valve member when said actuating means resume their initial position to thereby cut off the supply of fuel to said pilot burner.

9. An apparatus of the character described, comprising: a conduit leading to a source of fuel supply; a main valve controlling the passage of fuel through said conduit; a main burner adapted to get its supply of fuel through said conduit when said main valve is open, and to be cut off when said main valve is closed; manually operable means for opening and closing said main valve; a pilot burner; means controlled by the thermal condition at said pilot burner, said means, in one position, being operable to hold said main valve open, and in another position being operable to effect closing of said main valve; and automatically acting means responsive to the thermal condition at said main burner, for controlling the operation of said pilot burner controlled means; said automatically acting means being set for automatic operation through manipulation of said manually operable means when the latter are moved to open said main valve.

10. An apparatus of the character described, comprising: a conduit leading to a source of fuel supply; a main valve controlling the passage of fuel through said conduit; a main burner adapted to get its supply of fuel through said conduit when said main valve is open, and to be cut off when said main valve is closed; a pilot burner; pilot burner controlled means, controlled by the presence of a flame at said pilot burner, to hold said main valve open, and in the absence of a flame at said pilot burner, being operable to effect closing of said main valve; and automatically acting means, responsive to the presence or absence of a flame at said main burner, for controlling the operation of said pilot burner controlled means; said automatically acting means having means for producing a lag in operation

to provide for relighting said main burner before said pilot burner controlled means is actuated.

11. An apparatus of the character described, comprising: a conduit leading to a source of fuel supply; a main valve controlling the passage of fuel through said conduit; a main burner adapted to get its supply of fuel through said conduit when said main valve is open, and to be cut off when said main valve is closed; manually operable means for opening and closing said main valve; a pilot burner; means controlled by the thermal condition at said pilot burner, said means, in one position, being operable to hold said main valve open, and in another position being operable to effect closing of said main valve; automatically acting means responsive to the thermal condition at said main burner, for controlling the operation of said pilot burner controlled means; said automatically acting means being set for automatic operation through manipulation of said manually operable means when the latter are moved to open said main valve; an igniting device, adapted to transmit flame from said pilot burner to said main burner; and valve means operable by manipulation of said manually operable means when the latter are moved in an opening direction to supply fuel to said igniting device in advance of fuel supply to said main burner.

12. An apparatus of the character described, comprising: a conduit leading to a source of fuel supply; a main valve controlling the passage of fuel through said conduit; a main burner connected to get its supply of fuel through said conduit when said main valve is open, and to be cut off when said main valve is closed; a pilot burner; pilot burner controlled means, controlled by the presence of a flame at said pilot burner, constructed and arranged to hold said main valve open and in the absence of a flame at said pilot burner to effect closing of said main valve; control means, responsive to the presence or absence of a flame at said main burner, and to existence or non-existence of fuel supply to said main burner, for controlling the operation of said pilot burner and hence of said pilot controlled means, constructed and arranged to cut off said pilot burner upon said main burner remaining extinguished while fuel is being supplied thereto; intermediary igniting means between said pilot burner and said main burner, and having a fuel supply; and valve means, actuated by said control means, constructed and arranged to cut off the supply of fuel to said intermediary igniting means when said main burner remains ignited.

13. Apparatus of the character described, comprising: main burner means having a fuel supply conduit; control means for admitting and cutting off fuel to said main burner means; normally open valve means for controlling flow of fuel through said control means to said main burner means; pilot burner means having a fuel conduit for supplying fuel thereto independently of said normally open valve means; a second normally open valve means for controlling flow of fuel through said second fuel conduit; thermostatically controlled actuating means affected by thermal changes at said main burner means, when the latter is being supplied with fuel, said actuating means initially extending to a position adjacent said second valve means when said main burner means is not burning, and movable to a position spaced with reference to said second valve means to form a gap when said main burner means is burning; means constructed and arranged to enter said gap when said control means is in on position, said means being cooperable with said actuating means to shift said second valve means when said actuating means assumes its initial position while said means remains in said gap, thereby to cut off supply of fuel to said pilot burner means; and thermostatically controlled means affected by the thermal condition at said pilot burner means for closing said normally open valve means when fuel to said pilot burner means is cut off.

14. Apparatus of the character described, comprising: main burner means; a source of fuel supply for said main burner means, including a main valve for cutting off fuel from said source; means for igniting said main burner means when the same is being supplied with fuel, including pilot burner means; a fuel supply for said pilot burner means, independent of the fuel supply through said main valve; thermally responsive means, subject to a reduced heat condition at said main burner means, while said main burner means is connected to receive fuel for cutting off fuel to said pilot burner means; and thermally responsive means subject to a reduced heat condition at said pilot burner means for cutting off said main valve, and thus interrupting fuel supply to said main burner means.

15. Apparatus of the character described, comprising: a main burner; a source of fuel supply for said main burner, including a normally open main valve operable when closed to cut off fuel to said main burner; means for igniting said main burner, including pilot burner means; a source of fuel supply for said pilot burner means independent of any supply through said main valve; control means, quiescent when said main burner is burning, and operable when said main burner is connected to receive fuel, and is not burning, to cut off the independent supply of fuel to said pilot burner means and thereby to intentionally extinguish the same, said control means being constructed and arranged to provide a time interval while said main burner is being supplied with fuel, but not burning, before cutting off the supply of fuel to said pilot burner means, to afford opportunity for establishing a flame at said main burner; and actuating means, responsive to the thermal condition at said pilot burner means, operable when said pilot burner is extinguished, to close said main valve and cut off supply of fuel to said main burner.

16. Apparatus of the character described, comprising: a main burner; fuel control means for said main burner; a source of fuel supply for said main burner, including a normally open main valve operable when closed to cut off the supply of fuel through said control means to said main burner; pilot burner means; a fuel supply line for said pilot burner means to supply fuel independent of that which passes through said normally open valve means; control mechanism, quiescent when said main burner is burning, and operable when said main burner is connected to receive fuel and is not burning, to cut off the supply of fuel to said pilot burner means and thereby to intentionally extinguish the same; said control mechanism including a valve in the supply line for said pilot burner means, and actuating means responsive to the thermal condition at said main burner, movable away from said valve when said main burner is burning and toward said valve when said main burner is not burning, said mechanism including means interposable between said actuating means and said valve, and cooperable

therewith to effect closing of said valve when said actuating means move toward said valve, said control mechanism being constructed and arranged to provide a time interval while said main burner is being supplied with fuel, but not burning, before cutting off the supply of fuel to said pilot burner means, to afford opportunity for establishing a flame at said main burner; and actuating means responsive to the thermal condition at said pilot burner means, operable when said pilot burner means is extinguished, to close said main valve and cut off supply of fuel to said main burner.

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