

March 27, 1945.

C. WANTZ

2,372,537

COMBINED THERMOELECTRIC SAFETY SHUTOFF DEVICE AND COCK

Filed Jan. 29, 1942

2 Sheets-Sheet 1.

Fig. 1.

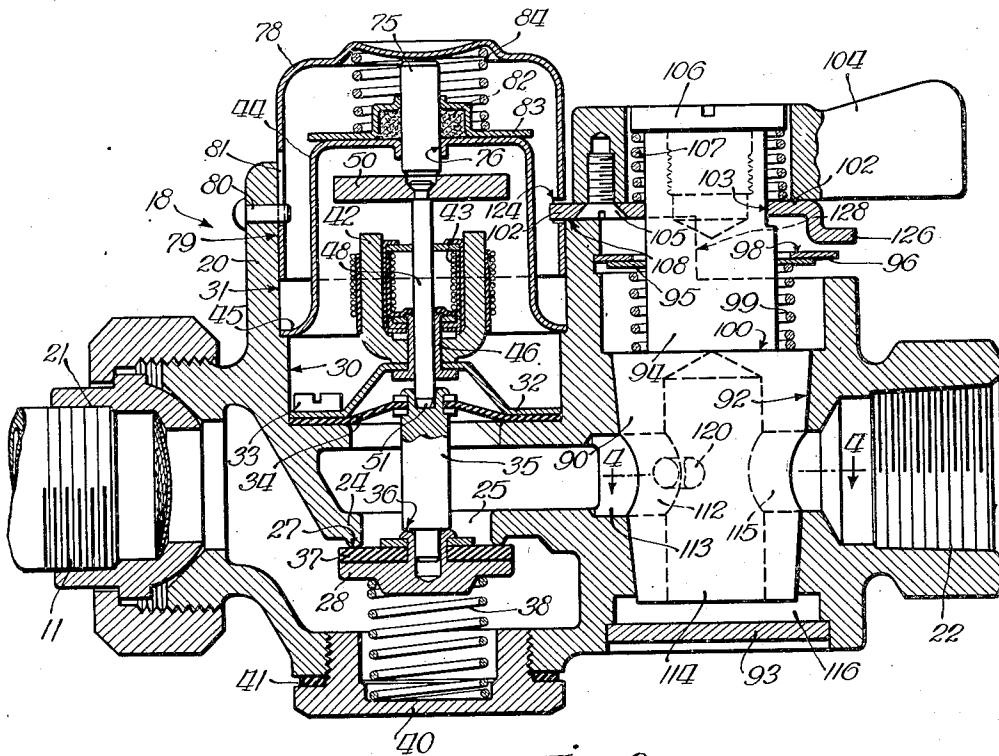
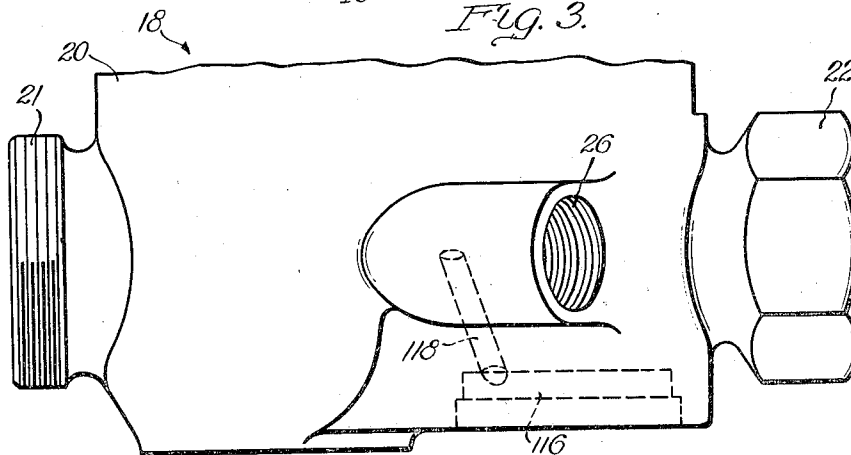


Fig. 3.



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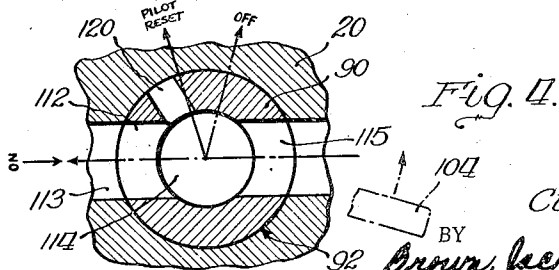
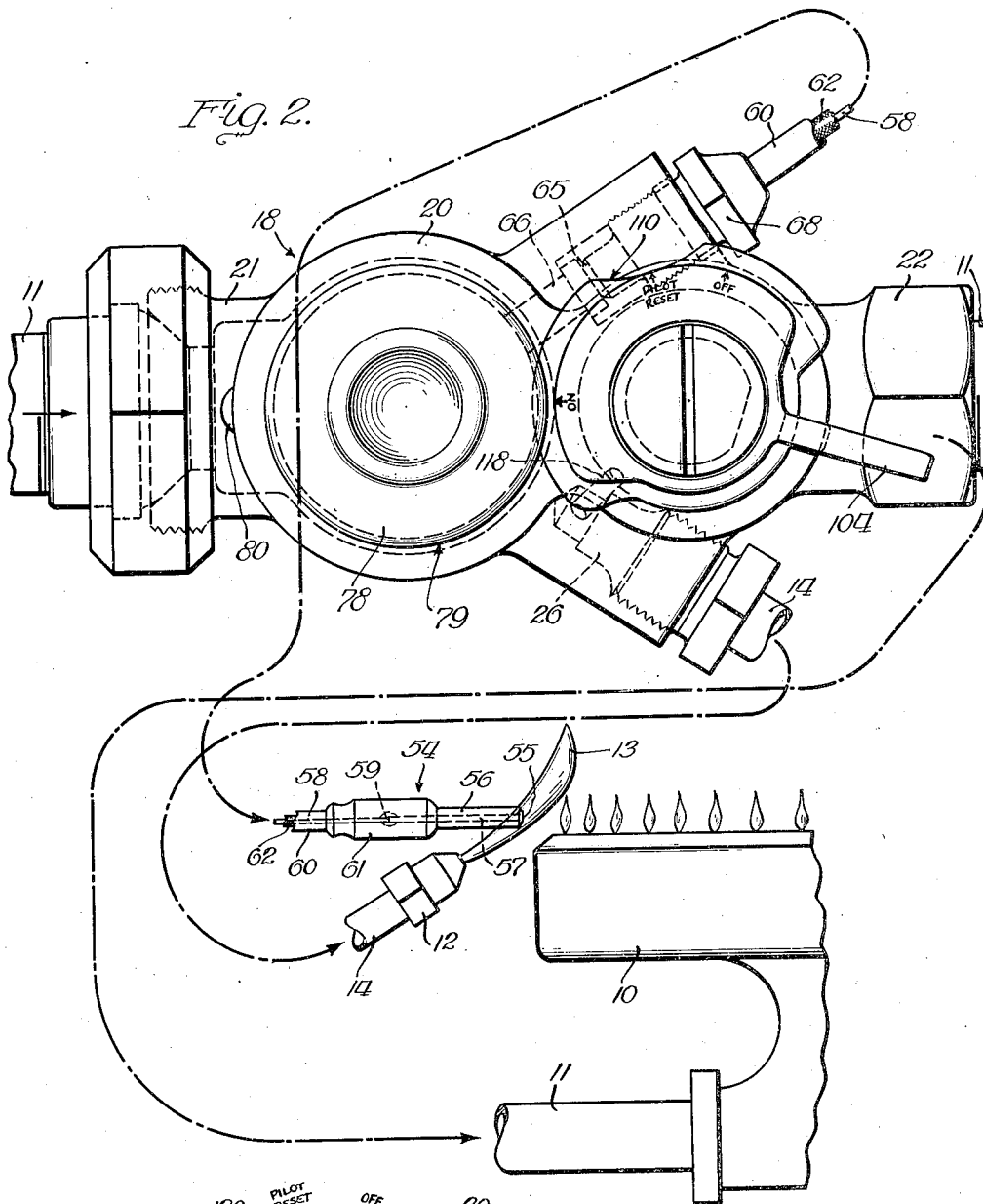
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,372,537

COMBINED THERMOELECTRIC SAFETY
SHUTOFF DEVICE AND COCK

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15 Claims. (Cl. 158—117.1)

This invention relates to burner control apparatus and, more particularly, to an improved form of combined thermoelectric safety shutoff device and cock.

While the invention has utility in connection with hot water heaters, it is not limited to use in connection with the burners for such heaters, but may be used with any other burner or combination of burners as suitable or desired, as, for example, with the burner of a room or space heater, floor furnace, or with an oven burner, top burner, or any other burner.

The particular device selected for illustration employs a thermoelectric safety shutoff valve which is adapted for movement to open and closed positions with movement of the armature to attracted and retracted positions. It is to be understood, however, that the invention is not limited to this particular embodiment, but may be employed in all similar forms of devices—by way of example, in devices in which the movement of the armature controls a switch connected in circuit with a solenoid or other electroresponsive valve which is operable to open and close the fuel supply line leading to the burner.

Due to the minute character of the electromotive force that can be generated by the heat of a pilot light or other flames or source of heat on a thermoelectric generator, and the inability of this minute electromotive force to actuate the safety shutoff means to open or operating position, thermoelectric safety shutoff and control devices of the type to which this invention particularly appertains usually require reset or cocking means for resetting or cocking the armature to attracted position and the valve or other safety shutoff means to open or operating position.

Unless means is provided for assuring that the supply of fuel to the main burner is shut off during the resetting operation and until the pilot is lighted and has heated the thermoelectric generator sufficiently to hold the safety shutoff valve in open position, fuel would pass to the main burner and escape and collect unburned. This unburned fuel would present the danger of asphyxiation and possible explosion when a flame is applied to light the pilot burner.

One of the main objects of the present invention is to provide improved means which will permit resetting the armature to the position in which it is adapted to be held by the electromagnet and the valve or other controlling member controlled thereby to open or operating position only when the shutoff cock is in position shutting off the main supply of fuel for the main burner,

and which means is operable to prevent resetting the safety shutoff device when the shutoff cock is in "on" position.

Another and more specific object of the invention is to provide in a device of the class described a shutoff cock having not only "on" and "off" positions, but also a "pilot" position for the supply of fuel to the pilot burner with the supply of fuel to the main burner shutoff, and means for preventing resetting the device except when the shutoff valve is in "pilot" position for supplying fuel to the pilot burner with the fuel supply to the main burner shut off.

Another and more specific object of the invention is to provide an improved form of device of the class described in which there is no requirement for separate flow interrupter valve means for shutting off communication with the fuel supply pipe leading to the main burner during the resetting operation.

In its more specific aspects, the means for permitting resetting of the safety shutoff device only when the cock is in position shutting off the main supply of fuel for the main burner and for preventing resetting of the safety shutoff device when the cock is in "on" position is in the form of stop means mounted to turn with the cock and lying in the path of movement of the reset means to prevent the resetting operation when the cock is open and clear of the reset means to permit the resetting operation when the cock is in position shutting off the main supply of fuel for the main burner.

In the illustrated embodiment of the invention the stop means mounted to turn with the cock also prevents the resetting operation when the cock is in "off" position shutting off the supply of fuel from both the main burner and the pilot burner, but this may be varied within the broader aspects of the invention.

Also, in the more limited aspects of the invention, the cock or turn-valve for permitting or arresting the flow of fuel to the main burner has a handle for turning the same to its different positions, and the stop means for preventing the resetting operation when the cock is in "on" position and permitting the resetting operation when the cock is in position shutting off the main supply of fuel for the main burner constitutes the means through which turning movement of the handle is imparted to the cock.

Another object of the invention is to provide a combined thermoelectric safety shutoff device, cock and reset stop of relatively simple and inexpensive construction, and which may be in-

stalled and operated conveniently and effectively; also a device of this character composed of relatively few parts and adapted for convenient and expeditious manufacture and assembly.

Another object of the invention is to provide, in a device of the class described, improvements toward the end of enclosing and sealing the electromagnet and armature, and an improved form of reset member for resetting the armature to attracted position and the safety shutoff valve or controlling member to open or operating position, the reset stop cooperating directly with this reset member to prevent the resetting operation when the cock is in "on" position and being turned to position clear of the reset member to permit the resetting operation when the cock is in position shutting off the main supply of fuel for the main burner.

Another and more specific object of the invention is to provide an improved form of device in which the resetting operation is permitted only when the shutoff cock is in pilot position for shutting off the main supply of fuel for the main burner and for setting up a pilot supply of fuel for the pilot burner.

Further features and advantages of the invention will be apparent from the following detailed description, taken in connection with the accompanying drawings in which:

Figure 1 is a sectional view through a combined thermoelectric safety shutoff device and cock embodying the present invention;

Figure 2 is a top plan view;

Figure 3 is a fragmentary side view of the valve body of the device shown in Figure 1; and

Figure 4 is a fragmentary section taken on the line 4-4 of Figure 1.

Referring to the drawings, the burner shown fragmentarily at 10 is any suitable or preferred main burner—by way of example, for a water heater, or for a room or space heater, or an oven burner, or it may be one of the main top burners of a gas range, or any other main burner.

A pipe indicated fragmentarily at 11 supplies gaseous or other suitable fuel to the burner 10, and disposed in juxtaposition to the burner 10 is a pilot burner 12 which maintains a pilot light 13 for igniting the main burner. The pilot burner 12 is supplied with fuel by a tube 14 connected to the body of the combined safety shutoff device and cock, as will be hereinafter described, or in any other suitable manner.

The safety shutoff device and cock, designated in its entirety at 18, comprises a valve body 20 having an inlet 21 and an outlet 22 which are connected in communication with contiguous sections of the fuel supply pipe 11, the pipe section connected to the inlet 21 being adapted for delivering fuel from a suitable source of fuel supply, and the pipe section connected to the outlet 22 being adapted to deliver the fuel to the burner 10.

The valve body 20 has a wall or partition 24 provided with a valve opening 25 through which the inlet 21 is adapted to be placed in communication with the main outlet 22 for supplying fuel for the main burner 10, and with the pilot outlet 26 for supplying fuel to the pilot burner as will presently appear. The wall or partition 24 is provided at the inlet end of the valve opening 25 with an annular valve seat 27 for the safety shutoff valve disc 28. The pilot supply tube 14 leads from the pilot outlet 26 to the pilot burner 12 for supplying fuel thereto.

The valve body 20 has a bore 30 counterbored

at 31. A magnet support 32 is clamped in place at 33 in the inner end of the bore 30, and a flexible diaphragm 34 is clamped in place marginally between the magnet support 32 and the shoulder to which the support 32 is secured. The diaphragm 34 carries, at the center thereof, a safety shutoff valve stem 35 which has endwise abutting engagement at 36 with the valve 28 to open the same and hold the same open, as will hereinafter appear. The shutoff valve 28, which has a yielding valve facing 37 adapted to engage the valve seat 27 when the safety shutoff valve is closed, is urged toward closed position engaging the valve seat 27 by a coiled spring 38. The spring 38 is interposed between the valve 28 and a cap nut 40 threaded into the valve body. A sealing gasket or washer is preferably provided at 41.

The electromagnet, which comprises a magnet frame 42, shown of generally U-shaped form, and an energizing coil 43, is enclosed within the valve body 20 outwardly of the diaphragm 34 by a magnet housing 44. The magnet housing 44 is shown of generally cup-shaped form with its open inner end belled out at 45 to fit within the counterbore 31 in position seating upon the shoulder at the outer end of the bore 30. The magnet frame 42 is attached by a sleeve member 46 to the center of the raised bottom portion of the magnet support 32. An armature stem 48 passes slidably through the sleeve 46, and has an armature 50 mounted on its outer end preferably for relative movement on the stem 48 so that the armature may accommodate itself to the pole faces of the magnet frame when in attracted position. The inner end of the armature stem 48 has endwise abutting engagement at 51 with the adjacent end of the valve stem 35.

The armature 50 is disposed in the armature and electromagnet housing 44 and is adapted to be held in attracted position against the pole ends of the magnet frame 42 as long as the electromagnet is thermoelectrically energized by the heat of the pilot or other flame on the thermoelectric generator. The armature 50 is shown of disc-like form.

A thermoelectric generator, shown in the form of a thermocouple 54, is placed in position so that the hot junction 55 thereof will be heated by the pilot flame 13 as long as the pilot flame is burning. The thermocouple and leads therefor may be similar to the thermocouple and leads more fully disclosed in Oscar J. Leins Patent No. 2,126,564, granted August 9, 1938, or the thermocouple and leads may be of any other suitable or preferred form.

For the purpose of the present description suffice it to state that the particular thermocouple selected for illustration comprises an outer tubular metallic thermocouple element 56 and an inner metallic thermocouple element 57 of different thermoelectric characteristics. The inner thermocouple element 57 is joined at one end to the outer end of the outer thermocouple element 56 to form the thermojunction 55 which is placed in position to be heated by the pilot flame 13. An inner lead conductor 58 is joined to the inner thermocouple element 57 to form an internal thermojunction 59 and an outer tubular lead conductor 60 surrounds the inner lead conductor and is connected to the outer thermocouple element, for instance, through a sleeve 61 to form a third thermojunction. The inner lead conductor 58 is insulated from the outer lead conduc-

tor 60, for instance, by a wrapping of insulation 62 on the inner lead conductor.

A quick detachable or removable connection is preferably provided between the electromagnet of the safety shutoff and control device and the ends of the leads 58 and 60 opposite the ends which are connected to the thermocouple elements. This removable lead connection may be of the form disclosed in the copending application of Richard K. Ergholdt above identified, and is illustrated in general of that form, it being understood that this connection may be of any other suitable or preferred form. Suffice it for purposes of this description to state that the inner lead 58 has a connector cone 65 which seats in the correspondingly recessed outer end of the terminal tip 66 and is clamped in contact therewith by a connector sleeve 68. The adjacent end of the outer tubular lead conductor 60 is connected in circuit with one side of the coil 43 through the connector sleeve 68. The other end of the coil 43 is connected to the terminal tip 66, and through this tip 66 and the connector cone 65 with the inner lead conductor 58, the parts being suitably insulated.

The heat of the pilot light upon the thermocouple is sufficient to hold the armature 50 in attracted position and the safety shutoff valve member 28 in open position when the armature is engaged with the pole ends of the magnet frame 42, but this thermoelectric current is not capable of moving the armature to attracted position and the valve member 28 to open position. In order, therefore, to provide for opening the valve member 28 and for setting the armature to attracted position upon initial operation of the device and to reset the device after the same closes to shut off the fuel supply to the main burner 10 and to the pilot burner 12 when the pilot light is extinguished, reset means is provided. This reset means comprises a reset stem 75 coaxial with the shutoff valve 28 and extending outwardly for reciprocatory movement through an opening 76 in the outer end of the housing 44.

The reset button 78 is shown of generally cup-shaped form, having its annular wall mounted for sliding or rectilinear movement at 79 in the valve body 20 with the open end of the cup-shaped button presented inwardly. The reset button or member 78 may be restrained against turning movement by a pin 80 fixed in the valve body 20 and engaging in a longitudinal slot 81 in the wall of the reset member 78. Packing 82 of felt or other suitable or preferred material is preferably interposed between the outer end of the housing 44 and a reset spring seating member 83. The reset spring is in the form of a coiled spring 84 interposed between the spring seating member 83 and the outer end wall of the reset member 78, the spring being held centered, if desired, as shown, or in any other suitable manner. The spring 84 returns the reset member 78 yieldingly to its outwardly projected position and yieldingly retains the reset member in this position.

The cock or turn-valve 90 is shown in the form of a truncated conical plug with its conical surface seated in a corresponding conical bore 92 in the valve body 20 laterally of the safety shutoff valve member 28 and the reset means therefor, and with its axis parallel to the axis of the safety shutoff valve and reset stem. The lower end of the bore 92 is closed by a suitable closure and sealing member 93 having pressed fit or other

suitable fluid-tight attachment to the valve body.

The stem-like part 94 of the plug 90 extends through an opening in an abutment member 95 which abuts a member 96 disposed within an arcuate slot in the valve body and stopped against outward movement by abutment with the arcuate shoulder 98. A coiled spring 99 is interposed between the stop or abutment member 95 and annular shoulder 100 or plug 90 to maintain the conical surface of the plug 90 resiliently and, at the same time, tightly seated in the bore 92.

A stop plate 102 is fixed on the plug 90 to turn the same therewith, for example by splaying the plug at 103 and forming the opening in the plate 102 of corresponding contour. For the purpose of rotating the plug 90, its outer end has a handle 104 fixed, for example, by screws 105 to the stop plate 102. Threaded into the outer end of the plug 90 is a screw 106 and interposed between the head of this screw and the stop plate 102 is a coiled spring 107 which holds the plate 102 resiliently seated against the shoulder 108.

The stop plate 102 has an inwardly rounded peripheral notch or indentation 110 which, when the shutoff cock 90 is positioned in "pilot" position for the supply of fuel to the pilot burner, frees the reset member 78 so that it may be pressed inwardly to reset the safety shutoff valve 28 to open position and the armature 50 to attracted position.

The valve plug 90 has a port 112 for registration with a passage 113 to place the inlet side of the device in communication with the hollow interior 114 of the valve plug, and the plug has a diametrically opposite port 115 for simultaneously placing the hollow interior 114 of the plug in communication with the outlet 22 for the supply of fuel for the main burner. The lower end of the hollow interior 114 of the valve plug 90, as the device is viewed in Figure 1, communicates with a chamber 116 from which a passage 118 leads to the pilot outlet 26. When the valve plug 90 is positioned as shown in Figures 1, 2, and 4, the ports 112 and 115 are in register with the passage 113 and outlet 22 for the supply of fuel for the main burner and for the pilot burner. The valve plug 90 has a third and relatively restricted port 120 which, when moved into register with the passage 113 by turning the cock 90 to "pilot" position, sets up a pilot supply of fuel for the pilot burner through the hollow interior 114 of the plug 90, chamber 116, passage 118, pilot outlet 26, and pilot supply tube 14. When the device is in "pilot" position, the port 115 is out of register with the outlet 22 so that the valve plug 90 not only provides for supplying fuel to the pilot burner, but shuts off the supply of fuel to the main burner at this time.

When the cock 90 is in open or "on" position for the supply of fuel for the main burner and for the pilot burner, the lock plate 102 is turned to position to engage inwardly in a notch 124 in the wall of the reset member 78, and, by preventing inward movement of the reset member, prevents resetting the device as long as the cock or plug is in open or "on" position. The particular form of stop plate 102 shown in Figure 2 also prevents resetting the device when the cock 90 is in "off" position shutting off the supply of fuel to both the main burner and the pilot burner, thus preventing the resetting operation except when the cock 90 is in "pilot" position. This, of course, may be varied—for example, to the ex-

tent of permitting the resetting operation when the cock 90 is in full "off" position, as well as when in "pilot" position. There would be no purpose, however, in permitting the resetting operation with the cock 90 in full "off" position, and there would be a disadvantage, namely, the person manipulating the device could not tell that the cock is in pilot position merely by the ability to manipulate the reset member 78 as is possible when the reset member cannot be manipulated except when the cock 90 is in pilot position.

The stop plate 102 may have a lug 126 offset inwardly and adapted for cooperation with shoulder means 128 on the valve body 20, as shown partially in Figure 1, to limit the turning movement of the plug to full "off" position in one direction and to full open or "on" position in the opposite direction.

The handle 104 may have "on," "pilot reset," and "off" markings thereon as shown in Figure 2, or other suitable markings for cooperation with a fixed index or point of reference to indicate when the cock 90 is in "on" position for the supply of fuel for both the main burner and the pilot burners; also when the cock is in pilot position for the supply of fuel only for the pilot burner and when the cock is in "off" position shutting off the supply of fuel for both the main burner and the pilot burner.

The operation of the device is as follows:

When the pilot light is burning, the heat thereof on the thermojunction 55 produces a thermoelectric current in the coil 43. The magnet frame 42 and armature 50 are preferably formed of an alloy of relatively low magnetic reluctance and, as a result, the minute or relatively weak electromotive force produces a magnetic field of sufficient strength so that when the armature 50 is placed in attracted position by pushing the reset button 78 inwardly, the magnetic attraction holds the armature in attracted position against the magnet frame with a force greater than the force exerted by the spring 38, thereby holding the shutoff valve 28 in open position as long as the pilot flame is burning.

If the pilot flame is extinguished, the holding action of the electromagnet ceases to be sufficient to hold the armature 50 in attracted position and the shutoff valve 28 in open position, and the spring 38 moves the valve 28 to closed position to shut off the supply of fuel both for the main burner 10 and for the pilot burner 12. The armature 50 moves to retracted position with the movement of the valve 28 to closed position.

When it is desired to reset the device the cock 90 is turned to "pilot" position by grasping and manipulating the handle 104. This removes the obstructing part of the stop plate 102 from position in the notch 124, so that the reset button may be pressed inwardly to move the armature to attracted position and the shutoff valve to open position. The pilot position of the turn-valve or cock 90 provides only a pilot supply of fuel, and the port 115 in the plug 90 being out of register with the outlet 22, the flow of fuel to the main burner is prevented during the resetting operation. As soon as the shutoff valve 28 is opened in the resetting operation, the pilot supply of fuel passes through the relatively restricted port 120 and out through the hollow interior of the plug 90, chamber 116, pilot outlet 26, and tube 14 to the pilot burner.

If the pilot burner is lighted and sets up a

thermoelectric current to hold the armature in attracted position and the shutoff valve in open position, the shutoff valve will remain open, and when the reset button 78 is released the spring 84 returns the reset button to its outwardly projected position as shown in Figure 1. The plug or cock 90 may then be rotated to place the ports or openings 112, 115 in register with the passage 113 and outlet 22 for the supply of fuel to both the main burner and the pilot burner. If the pilot burner is not lighted to produce the thermoelectric current for holding the shutoff valve 28 open, this valve will move to closed position upon release of the reset button 78.

In order to turn on or shut off the supply of fuel to the main burner with the pilot light burning and the armature held in attracted position and the shutoff valve 28 held in open position, the handle 104 is grasped and turned to rotate the valve plug 90. With the ports 112 and 115 in complete register with the passage 113 and outlet 22, the device is completely open for maximum supply of fuel for the main burner and for the supply of fuel to the pilot burner. By rotating the plug 90 until the main port 112 and restricted pilot port 120 are out of register with the passage 113, the supply of fuel through the outlet 22 and to the interior of the plug, and thereby the supply of fuel for both the main burner and the pilot burner, is completely shut off. Intermediate supplies of fuel through the outlet 22, and thereby for the main burner, may be provided by intermediate amounts of registration of the ports 112, 115 with passage 113 and outlet 22, respectively.

The embodiment of the invention shown in the drawings is for illustrative purposes, and it is to be expressly understood that said drawings and the accompanying specification are not to be construed as a definition of the limits or scope of the invention, reference being had to the appended claims for that purpose.

I claim:

1. In a burner control device having an outlet for supplying fuel for a main burner and a pilot outlet for supplying fuel for a pilot burner, a shutoff valve having an "on" position for the supply of fuel to the main burner and to the pilot burner, a "pilot" position shutting off the supply of fuel to the main burner and permitting the supply of fuel to the pilot burner, and an "off" position shutting off the supply of fuel to both the main burner and the pilot burner, thermoelectric safety shutoff means, means for operating said first mentioned shutoff valve, reset means for resetting said thermoelectric safety shutoff means independently of the operating means for said first mentioned shutoff valve when said valve is in pilot position, and means for preventing the resetting operation of said reset means when said first-mentioned shutoff valve is in "on" position.

2. In a burner control device having an outlet for supplying fuel for a main burner and a pilot outlet for supplying fuel for a pilot burner, a shutoff valve having an "on" position for the supply of fuel to the main burner and to the pilot burner, a "pilot" position shutting off the supply of fuel to the main burner and permitting the supply of fuel to the pilot burner, and an "off" position shutting off the supply of fuel to both the main burner and the pilot burner, thermoelectric safety shutoff means, means for operating said first mentioned shutoff valve, reset means for resetting said thermoelectric safety shutoff means independently of the operating means for said

first mentioned shutoff valve when said valve is in pilot position, and means for preventing the resetting operation of said reset means when said first-mentioned shutoff valve is in "on" position and also when said first mentioned shutoff valve is in "off" position.

3. In a burner control device having an outlet for supplying fuel for a main burner and a pilot outlet for supplying fuel for a pilot burner, a shutoff valve having an "on" position for the supply of fuel to the main burner and to the pilot burner, a "pilot" position shutting off the supply of fuel to the main burner and permitting the supply of fuel to the pilot burner, and an "off" position shutting off the supply of fuel to both the main burner and the pilot burner, thermoelectric safety shutoff means, means for operating said first mentioned shutoff valve, reset means for resetting said thermoelectric safety shutoff means independently of the operating means for said first mentioned shutoff valve when said valve is in pilot position, and means for preventing the resetting operation of said reset means when said first mentioned shutoff valve is in "on" position, said last means comprising stop means operable with said first mentioned shutoff valve and positioned to prevent movement of said reset means when said first mentioned shutoff valve is in "on" position and clear of said reset means to permit movement of said reset means when said first mentioned shutoff valve is in "pilot" position.

4. In a burner control device having an outlet for supplying fuel for a main burner and a pilot outlet for supplying fuel for a pilot burner, a shutoff valve having an "on" position for the supply of fuel to the main burner and to the pilot burner, a "pilot" position shutting off the supply of fuel to the main burner and permitting the supply of fuel to the pilot burner, and an "off" position shutting off the supply of fuel to both the main burner and the pilot burner, thermoelectric safety shutoff means, means for operating said first mentioned shutoff valve, reset means for resetting said thermoelectric safety shutoff means independently of the operating means for said first mentioned shutoff valve when said valve is in pilot position, and means for preventing the resetting operation of said reset means when said first-mentioned shutoff valve is in "on" position, said last means comprising stop means operable with said first mentioned shutoff valve and positioned to prevent movement of said reset means when said first mentioned shutoff valve is in "on" and "off" positions and clear of said reset means to permit movement of said reset means when said first mentioned shutoff valve is in "pilot" position.

5. In a burner control device having an outlet for supplying fuel for a main burner and a pilot outlet for supplying fuel for a pilot burner, thermoelectric safety shutoff means, a shutoff valve mounted for turning movement and having an "on" position for the supply of fuel to the main burner and to the pilot burner, a "pilot" position shutting off the supply of fuel to the main burner and permitting the supply of fuel to the pilot burner, and an "off" position shutting off the supply of fuel to both the main burner and the pilot burner, reset means having rectilinear movement for resetting said thermoelectric safety shutoff means, and a stop member mounted to turn with said shutoff valve, said stop member being movable into position preventing rectilinear movement of said reset means when said shutoff

valve is turned to position for supplying fuel for the main burner and when said shutoff valve is turned to "off" position, said stop member being movable to position clear of said reset means to permit rectilinear resetting movement thereof when said shutoff valve is turned to "pilot" position.

6. In a device of the class described, a valve body having a generally conical bore, a hollow generally conical plug seated in said bore, said valve body having an inlet passage opening into said bore and an outlet passage leading from said bore, a pair of ports one opening through the wall of said plug into the interior of the plug and the other opening through the wall of the plug from the interior thereof, said ports being adapted to be moved into register with said inlet and outlet passages by turning the plug, said plug having a third pilot supply port adapted to register with said inlet passage when said first mentioned ports are out of register with said inlet and outlet passages, a pilot supply passage for supplying fuel for a pilot burner from the hollow interior of said plug when said pilot supply port is in register with said inlet passage, a thermoelectric safety shutoff valve mounted in said valve body in series with said valve plug, reset means for resetting said thermoelectric safety shutoff valve, and stop means mounted to turn with said valve plug and cooperable with said reset means to prevent the resetting operation of said reset means except when said plug is in position with said pilot supply port in register with said inlet passage.

7. In a device of the class described, a valve body having a generally conical bore, a hollow generally conical plug seated in said bore, said valve body having an inlet passage opening into said bore and an outlet passage leading from said bore, a pair of ports one opening through the wall of said plug into the interior of the plug and the other opening through the wall of the plug from the interior thereof, said ports being adapted to be moved into register with said inlet and outlet passages by turning the plug, said plug having a third pilot supply port adapted to register with said inlet passage when said first mentioned ports are out of register with said inlet and outlet passages, a pilot supply passage for supplying fuel for a pilot burner from the hollow interior of said plug when said pilot supply port is in register with said inlet passage, a thermoelectric safety shutoff valve mounted in said valve body in series with said valve plug, reset means for resetting said thermoelectric safety shutoff valve, stop means mounted to turn with said valve plug and cooperable with said reset means to prevent the resetting operation of said reset means except when said plug is in position with said pilot supply port in register with said inlet passage, and stop means on said valve body for cooperation with said last mentioned stop means to limit turning movement of said plug.

8. In a device of the class described, in combination, a valve body, a thermoelectric safety shutoff valve mounted in said valve body, an electromagnet mounted in said valve body and comprising a magnet frame and an armature operable when attracted to said magnet frame to hold said thermoelectric safety shutoff valve in open position and, when retracted, permitting movement of said thermoelectric safety shutoff valve to closed position, a housing for said electromagnet, a generally cup-shaped reset member operable over said electromagnet housing and having

rectilinear sliding movement in said valve body for resetting said armature to attracted position and said thermoelectric safety shutoff valve to open position, a spring interposed between said electromagnet housing and said cup-shaped reset member for returning said reset member to its outwardly projected position, a shutoff valve mounted for turning movement in said valve body, and a stop member mounted to turn with said last mentioned valve and having position obstructing rectilinear resetting movement of said reset member when said last mentioned valve is in a predetermined position.

9. In safety control means of the character described, a valve body having an outlet for supplying fuel to a main burner and an outlet for supplying fuel to a pilot burner associated with the main burner, thermoelectric safety shutoff means to be energized by heat derived from the pilot burner, reset means for resetting said shutoff means, a valve controlling flow of fuel to said main burner outlet and to said pilot outlet movable to a first position establishing flow of fuel to both of said outlets and to a second position cutting off flow of fuel to said main burner outlet while establishing flow of fuel to said pilot burner outlet, and stop means carried by said valve for movement therewith and cooperating with said resetting means effective for preventing the resetting operation except when said valve is in its said second position.

10. In safety control means of the character described, a valve body having an outlet for supplying fuel to a main burner and an outlet for supplying fuel to a pilot burner associated with the main burner, thermoelectric safety shutoff means to be energized by heat derived from the pilot burner, reset means for resetting said shutoff means, a valve controlling flow of fuel to said main burner outlet and to said pilot outlet movable to a first position establishing flow of fuel to both of said outlets and to a second position cutting off flow of fuel to said main burner outlet and to a third position cutting off flow of fuel to both of said outlets, and stop means carried by said valve for movement therewith and cooperating with said resetting means effective for preventing the resetting operation in said first and third positions of said valve while enabling the resetting operation in said second position of said valve.

11. In safety control means of the character described, a valve body having an outlet for supplying fuel to a main burner and an outlet for supplying fuel to a pilot burner associated with the main burner, thermoelectric safety shutoff means to be energized by heat derived from the pilot burner, reset means for resetting said shutoff means, a valve controlling flow of fuel to said main burner outlet and to said pilot outlet, said valve being mounted for turning movement to a first position establishing flow of fuel to both of said outlets and to a second position cutting off flow of fuel to said main burner outlet while establishing flow of fuel to said pilot burner outlet, and a stop member fixed to said valve for turning therewith and cooperating with said resetting means effective for preventing the resetting operation except when said valve is in its said second position.

12. In safety control means of the character described, a valve body having an outlet for supplying fuel to a main burner and an outlet for supplying fuel to a pilot burner associated with the main burner, thermoelectric safety shutoff

means to be energized by heat derived from the pilot burner, reset means for resetting said shutoff means, a valve controlling flow of fuel to said main burner outlet and to said pilot outlet, said valve being mounted for turning movement to a first position establishing flow of fuel to both of said outlets and to a second position cutting off flow of fuel to said main burner outlet while establishing flow of fuel to said pilot burner and to a third position cutting off flow of fuel to both of said outlets, and a stop member fixed to said valve for turning therewith and cooperating with said resetting means effective for preventing the resetting operation in said first and third positions of said valve while enabling the resetting operation in said second position of said valve.

13. In a burner control device having an outlet for supplying fuel for a main burner and an outlet for supplying fuel for a pilot burner associated with the main burner, a valve body, a thermoelectric safety shutoff valve mounted in said body yieldingly urged in closing direction, a stem for said valve, an electromagnet mounted in said valve body having an armature provided with a stem having abutting engagement with the valve stem and operable when attracted to said electromagnet to hold said valve in open position and, when released from said electromagnet, permitting closing of said valve, a housing for said electromagnet, a generally cup-shaped reset member operable over said housing yieldingly urged outward thereof and having rectilinear sliding movement inward of said valve body for resetting said armature to attracted position and said valve to open position, a second valve mounted in said valve body for turning movement into a first position for supplying fuel for both the main burner outlet and said pilot burner outlet and a second position for supplying fuel for the pilot burner outlet only, and stop means carried by said second valve effective in cooperation with said reset member for preventing the resetting operation when said second valve is in its said first position while permitting the resetting operation when said second valve is in its said second position.

14. In a burner control device having an outlet for supplying fuel to a main burner and an outlet for supplying fuel to a pilot burner associated with the main burner, thermoelectric safety shutoff means to be energized by heat derived from the pilot burner, reset means for resetting said shutoff means, a valve mounted for turning movement on an axis offset laterally from the axis of said thermoelectric safety shutoff means into a first position for supplying fuel for both of said outlets and a second position for supplying fuel for said pilot burner outlet only, and means carried by said valve and cooperating with said resetting means effective for holding said resetting means against resetting operation when said valve is in its said first position and releasing said resetting means for resetting operation when said valve is in its said second position.

15. In a burner control device having an outlet for supplying fuel to a main burner and an outlet for supplying fuel to a pilot burner associated with the main burner, a thermoelectric safety shutoff valve, a turn-valve mounted for turning movement on an axis offset laterally from the axis of said thermoelectric safety shutoff valve into a first position for supplying fuel for both of said outlets and a second position for supplying fuel for said pilot burner outlet

only, reset means mounted on the control device in position externally of and offset laterally relative to said turn-valve for resetting said thermoelectric safety shutoff valve to open position, means responsive to the heat of the pilot flame for holding said thermoelectric safety shutoff valve in open position, and means carried by

5 said turn-valve and cooperating with said reset means for holding said reset means against resetting operation when said turn-valve is in its said first position and releasing said reset means for resetting operation when said turn-valve is in its second position.

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