Nov. 7, 1944. W. F. JACKSON 2,361,945

SAFETY CONTROL FOR GASEOUS FUEL BURNERS

Filed May 14, 1941 3 Sheets-Sheet 1

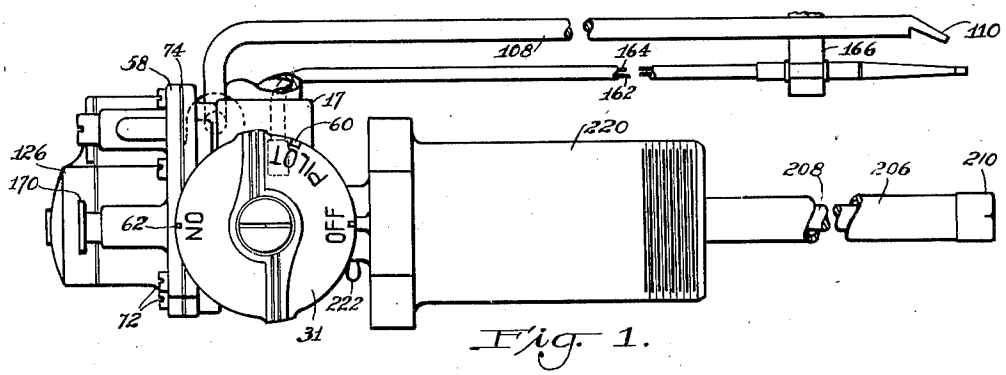

Fig. 1.

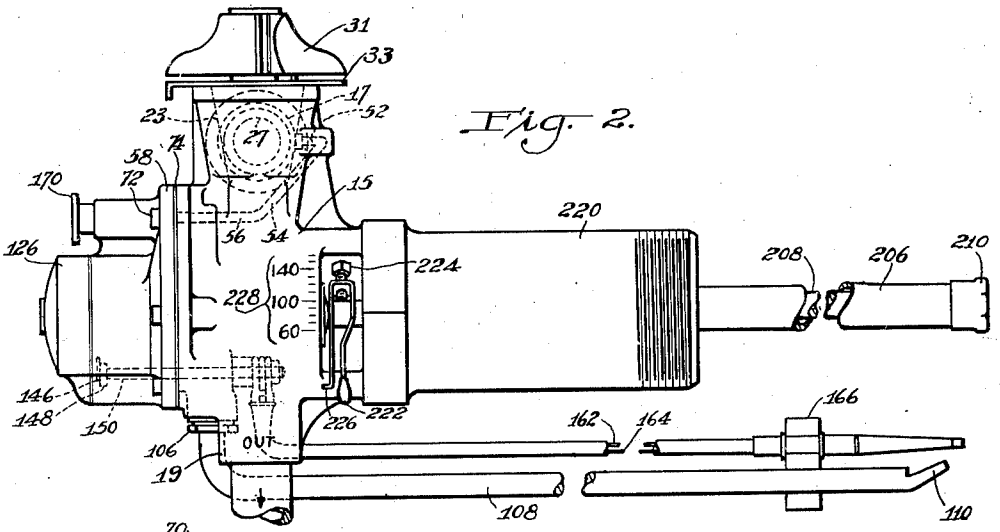

Fig. 2.

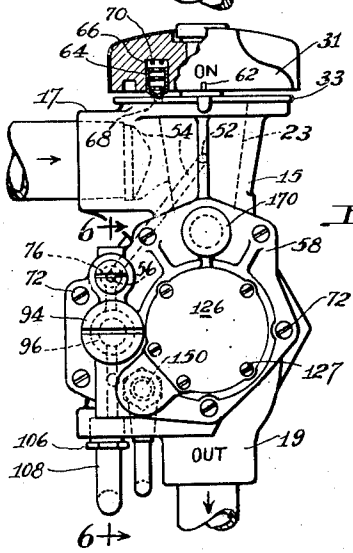

Fig. 3.

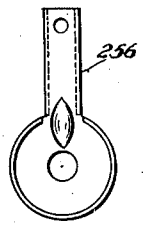

Fig. 10.

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SAFETY CONTROL FOR GASEOUS FUEL BURNERS

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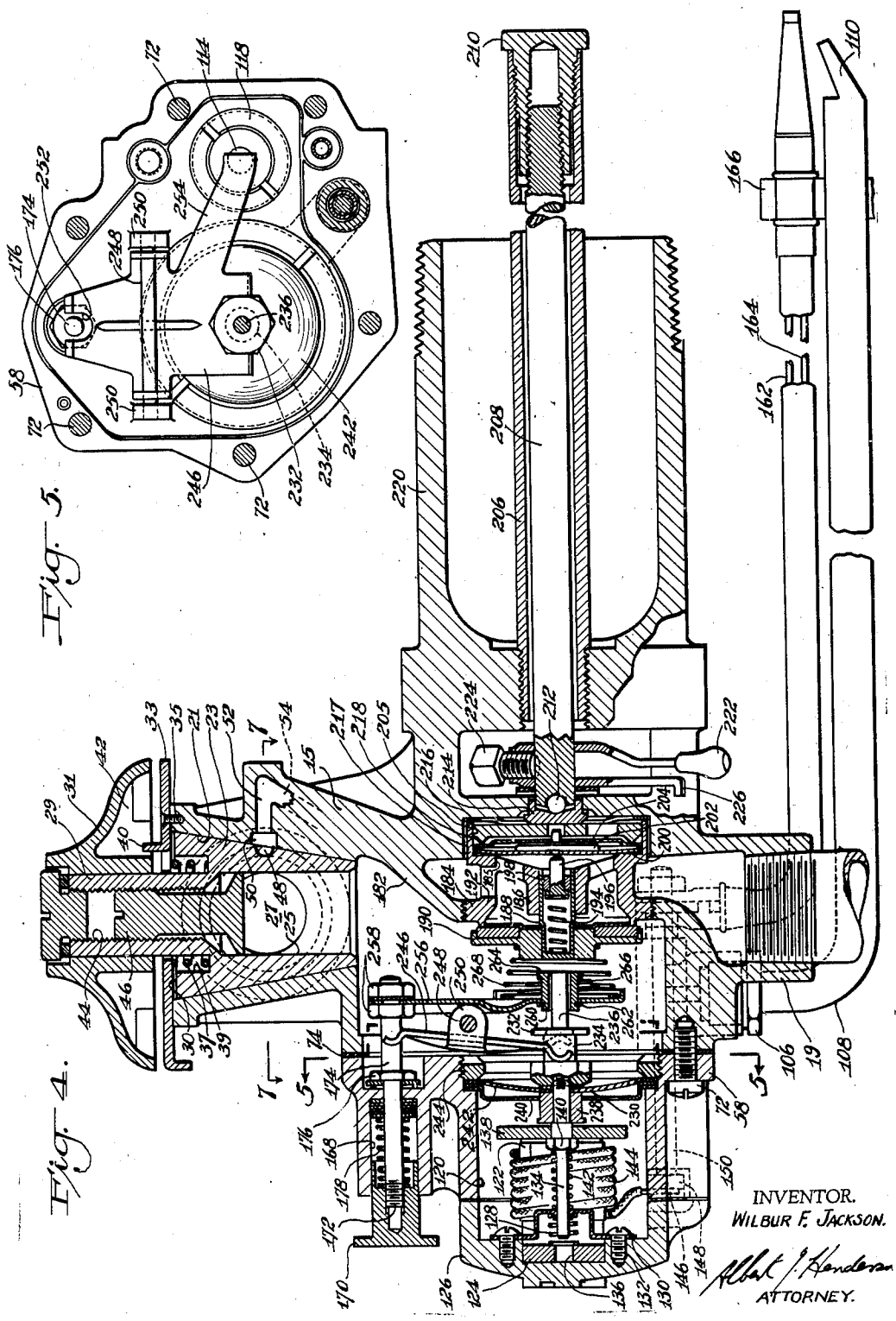

Fig. 5.

Fig. 4.

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SAFETY CONTROL FOR GASEOUS FUEL BURNERS

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Fig. 6.

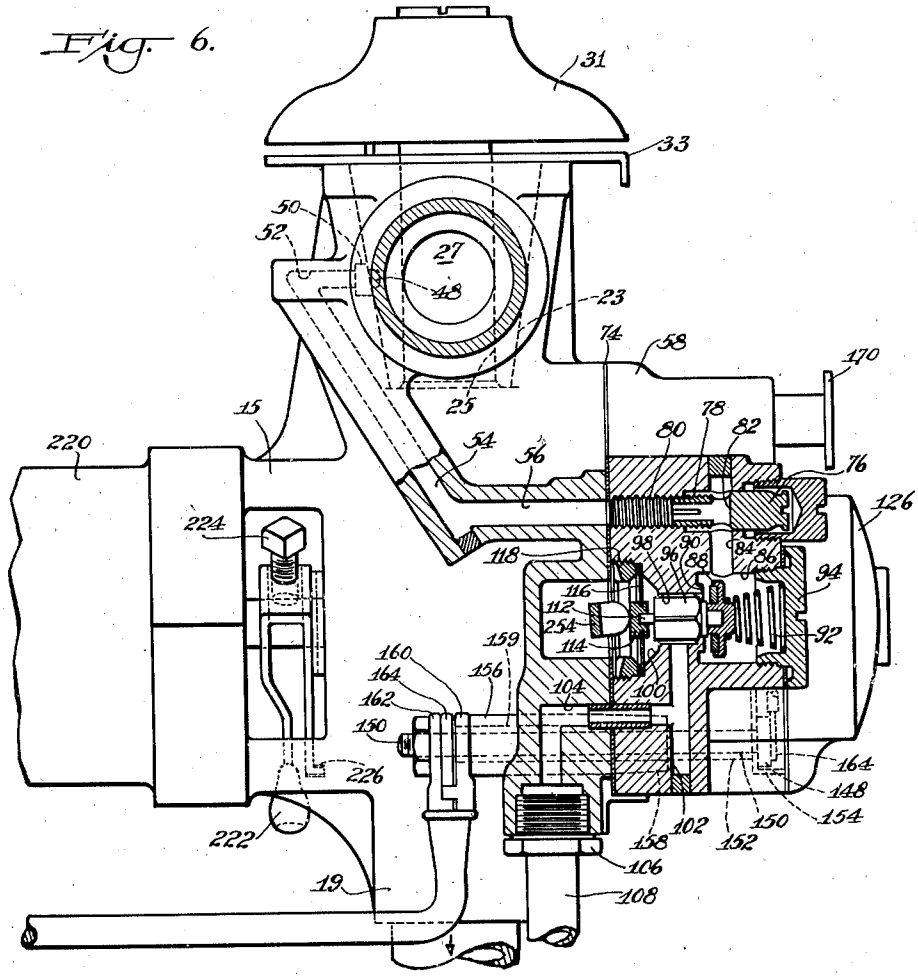


Fig. 7.

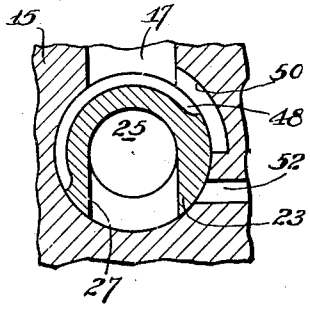


Fig. 8.

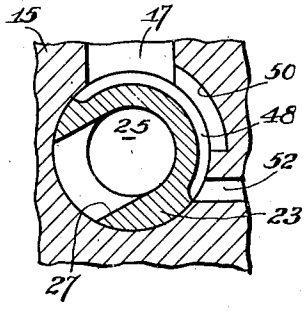
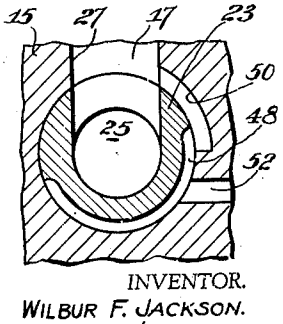


Fig. 9.



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Patented Nov. 7, 1944 2,361,945

UNITED STATES PATENT OFFICE

2,361,945

SAFETY CONTROL FOR GASEOUS FUEL BURNERS

Wilbur F. Jackson, Lynwood, Calif., assignor to Grayson Heat Control, Ltd., Lynwood, Calif., a corporation of California

Application May 14, 1941, Serial No. 393,398

8 Claims. (Cl. 236—21)

This invention relates to safety controls for gaseous fuel burners and more particularly to controls for domestic water heaters and the like.

Fuel controlling devices have been proposed to permit manual opening of the pilot burner fuel passage and automatic opening of the main burner line only after the pilot burner is lighted. In normal operation the fuel supply to the main burner is thermostatically regulated to maintain the water to be heated at a predetermined temperature. Should the flame of the pilot burner be extinguished for any reason, the fuel supply to both the main and pilot burners is shut off, and no fuel can flow through either burner until the device as been manually reset and the pilot burner relighted.

During the resetting operation it is highly important that the flow of fuel to the main burner be positively prevented. It will be apparent that if the valve or other control device is operated to permit fuel to be supplied otherwise than to the pilot burner when the resetting device is operated, such fuel may escape and collect unburned at the risk of a possible explosion when the pilot flame is lighted. Devices for this purpose have included interlock means between the main fuel valve and the resetting device to prevent movement of the latter except in certain positions of the former. Other devices utilize dual valves and are generally more complicated than is desirable.

It is an object of this invention automatically to prevent fuel from flowing to the main burner whenever the safety control is being reset until after the pilot burner is relighted.

Another object of the invention is to provide adequate safety means in the control device while reducing the number of parts required.

Another object of the invention is to ensure positive operation of the safety control when required.

Another object of the invention is to combine shut-off, safety and thermostatic regulating devices into a simple, compact and reliable structure, permitting economy in manufacture and facilitating installation and repair.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a plan view of the improved control;

Fig. 2 is a side elevation;

Fig. 3 is an end elevation;

Fig. 4 is a longitudinal sectional view;

Fig. 5 is a section taken on the line 5—5 of Fig. 4 looking in the direction indicated by the arrows;

Fig. 6 is an enlarged section taken on the line 6—6 of Fig. 3 looking in the direction indicated by the arrows;

Figs. 7, 8 and 9 are partial sections taken along the line 7—7 of Fig. 4 and showing different positions of the shut-off valve; and

Fig. 10 is a front elevation of a detail.

Referring more particularly to the drawings, the control comprises a casing 15 provided at one end with a laterally extending intake nipple 17 and, at the other end, with an outlet nipple 19 adapted to be connected by suitable piping with the main or heating burner of the water heater or other appliance (not shown).

The upper portion of the casing 15 is shaped to provide a tapered valve seat 21 within which a tapered plug cock 23 is seated. The plug cock 23 is provided with an axial bore 25 with which a port 27, extending through one wall of the cock 23, communicates. The port 27 affords communication between the inlet nipple 17 and the bore 25 in order that the fuel may flow into the body of the casing 15 when the cock is in the open position shown in Fig. 4.

The cock 23 is provided with a reduced stem 29 having a dial 31 mounted thereon against relative rotation and by means of which the cock 23 may be rotated in its seat 21. Movement of the cock 23 away from its seat is limited by a retainer plate 33 secured to the casing 15 by means of the screws 35 and overlying the shoulder 30 formed by the junction of the reduced stem 29 with the cock 23. A spring 37 is housed within a recess 39 at the junction of the stem 29 with the shoulder 30 and, by its engagement with the overlying portion of plate 33, serves to maintain the cock 23 resiliently in its seat 21.

Rotation of the cock in its seat is limited to substantially 180° between full-open and full-closed positions by the provision of an upstanding flange 40 on the plate 33 which enters an arcuate slot 42 formed in the underside of the dial 31. The stem 29 of the cock is provided with a threaded bore 44 for the reception of an adjustable plug 46 which extends into the bore 25 and serves to regulate the flow of fuel through the port 27.

The shut-off cock, which is constructed as described, is adapted for controlling fuel flow for both the main and pilot burners of the appliance. The pilot control includes an arcuate groove 48 formed in the seating surface of the cock 23 opposite the port 27. The seat 21 is provided with a similar but shorter arcuate groove 50 communi-

cating at one end with the inlet nipple 17. A passage 52 extends from the seat 21 adjacent the other end of the groove 50 and communicates with a passage 54 extending obliquely across the casing 15 and terminating in a horizontal passage 56.

By referring to Figs. 7, 8 and 9, the flow of fuel in various positions of the shut-off cock 23 may be ascertained. In Fig. 7 the cock is shown in closed position and there is no communication between the inlet nipple 17 and the port 27 or between the arcuate groove 48 and the passage 52. Upon being rotated from the closed position the cock first reaches the pilot position, designated by a notch 60 on the edge of the dial 31, marked "Pilot" (Fig. 1). This position is shown in Fig. 8 and the arcuate groove 48 is now in communication with the passage 52. The next position of the plug cock 23, upon further rotation, is the "on" position, suitably designated by the notch 62 in the edge of the dial 31, and marked "On." This position is shown in Fig. 9 and the port 27 in the cock communicates with the inlet nipple 17 while, at the same time, communication between the passage 52 and the inlet nipple 17 is afforded by the arcuate groove 48 extending across both the passage 52 and the groove 50 in the valve seat.

In order to facilitate positioning of the dial 31 in the "pilot" position a non-positive stop is provided which, as shown in Fig. 3, comprises a plunger 64 mounted within an aperture 66 formed in the underside of the dial 31 and yieldably urged into engagement with a depression 68 in the plate 33 by means of the spring 70. Thus, the "on" and "off" positions of the shut-off cock are located by the positive stop and the "pilot" position by both an audible click and increased resistance to rotation of the dial afforded by the device described.

An end casing 58 is secured to the main casing 15 by means of the screws 72, and a gas-tight joint is obtained by the provision of a gasket 74 between these members. As shown in Fig. 6, the end casing 58 is provided with an adjustable plug 76 having a hollow threaded end 78 reciprocable in a threaded passageway 80 communicating with the passage 56 in the main casing. The hollow end of the plug 76 communicates with an aperture 82 in the plug body which may be moved into and out of registry with a passage 84 formed in the end casing 58. As will be apparent, rotation of the threaded plug will increase or diminish the effective area of aperture 82 and adjust the amount of fuel that flows through the passage 84.

The passage 84 communicates with a chamber 86 within which a pilot control valve 88 is housed. The pilot control valve 88 may be of any suitable form and, in this instance, is shown as being of the poppet type adapted to be moved into and out of engagement with its seat 90 against the pressure of a coil spring 92 retained in the chamber 86 by the cap 94. The stem 96 of the pilot control valve 88 is suitably grooved to permit the passage of fuel therearound and is guided in an opening 98 formed in the end casing.

A sealing chamber 100 receives the projecting end of the valve stem 96 and intermediate this chamber and the valve seat 90 is an angular passage 102 communicating with a passage 104 formed in the main casing 15. The latter passage communicates through a suitable coupling connection 106 with a conduit 108 connected, as shown in Fig. 4, with a pilot burner 110. In order that leakage of gas from the pilot control valve chamber 86 into the main casing 15 may be prevented, the valve stem 96 is provided with a projection 112 which engages a cap 114 carried by a diaphragm 116 extending across the end of the sealing chamber 100 and secured in engagement therewith by means of the threaded collar 118. The cap 114 serves to reinforce the center portion of the diaphragm which receives the pressure of the operating parts.

As shown in Fig. 3, the pilot control valve assembly described is housed within part of the end casing 58 and is positioned to one side of the vertical axis of the main casing 15. That portion of the end casing 58 which is adjacent the vertical axis of the main casing 15 is provided with a chamber 120 (Fig. 4) within which a thermoelectric assembly is adapted to be housed. This assembly includes a horseshoe electromagnet 122 seated on its base 124 in an end cap 126 secured by screws 127 to the end casing 58 and forming a closure for the opening 120. In order to secure the magnet 122 yieldably in position and prevent distortion thereof, a coil spring 128 is held in position on the magnet base 124 by means of a magnet retainer 130 secured by means of the screws 132 to the end cap 126. A stem 134 extends between the legs of the magnet 122 and through the magnet retainer 130, there being an aperture 136 provided in the magnet base 124 to permit further extension of the stem during operation of the device. The stem carries an armature bar 138, abutting a flange 140 on the stem, and adapted to bridge the poles of the magnet 122 in the usual manner. An armature stem spring 142 extends between the nut 140 and the magnet retainer 130 and serves to urge the armature bar 138 away from the poles of the magnet 122. In order to prevent the spring 142 from unseating the magnet from the end cap 126, the spring 128 may be made considerably stronger than the spring 142.

The arms of the horseshoe electromagnet carry the coils 144 of a wire 146 which is connected by soldering or other suitable means to the head 148 of a terminal screw 150, the opposite end of the wire being secured to the magnet retainer 130. As shown in Fig. 6, the terminal screw 150 extends through the end cap 58 and emerges from the main housing 15 at a point behind the connection for the pilot burner conduit 108. The terminal screw 150 is insulated from the body of the casing by the sleeve 152 and the terminal insulator 154. A terminal sleeve 156 having a threaded end 158 is screwed into the end casing 58 around the insulating sleeve 152. A portion 159 of the insulating sleeve projects beyond the terminal sleeve and the terminal screw 150 projects still further. The projecting parts form terminals providing suitable electrical connection for the two elements, 160 and 162, of a thermocouple, these elements being separated at the terminals by means of the insulating washer 164.

The thermocouple may be supported by a bracket 166 in position to be heated by the pilot burner 110, thereby to establish an electric current to the coils 144 of sufficient strength to energize the magnet 122 and hold the armature bar 138 in contact with the pole faces thereof against the force of the spring 142, provided that the armature bar has been moved into contact with the magnet in a manner which will now be explained.

Formed in the end casing 58 immediately above the chamber 120 for the thermoelectric assembly and on substantially the same vertical axis, is a smaller chamber 168 within which a reset button 170 is slidably mounted. This reset button carries a reset stem 172 extending through an aperture in the bottom wall of the chamber 168 and having a projecting end 174 extending into the main casing 15 adjacent the tapered opening of the valve seat 21. The reset stem 172 is provided with a collar 176 between the stem and its projection 174. A coil spring 178 acts between the reset button 170 and one side of the end wall of the opening 168 to urge the button outwardly from the opening, this movement being limited by the engagement of the collar 176 with the opposite side of the end wall. Thus the spring will cause return of the button 170 to the position shown in Fig. 4 after it has been manually depressed and released.

This invention is particularly directed toward the provision of but a single valve for providing both thermostatic control of the main burner and safety control of the flow of fuel thereto should the pilot burner become extinguished. Accordingly, the body of the main casing 15 is of hollow form below the portion carrying the plug cock 23 and is provided with a web 182 within which an annular valve seat member 184 is removably mounted. The annular valve seat 184 carries a hollow boss 186, connected thereto by a perforated flange 185, and within which a hollow valve stem 188 is slidably mounted. A valve member 190 is secured on the valve stem 188 and cooperates with the valve seat 184 to control the flow of fuel through the ports 192 in the valve seat to the outlet nipple 19, with which these ports are aligned. It will be observed that the valve assembly is axially aligned with the thermoelectric assembly with which it is operatively associated.

The hollow valve stem 188 contains a spring 194 which serves to urge a plunger 196 into contact with a plug 198 closing the inner end of the hollow valve stem. A reduced end on the plunger 196 projects through the plug 198 and is adapted to engage and be operated by a clicker mechanism comprised of a pair of opposed fulcrum levers 200, fulcrum button 202 and clicker disc 204, all of which are housed within a recess 205 formed in the annular valve seat 184.

Thermostatic means for operating the valve 190 through the clicker disc mechanism is provided and consists of an element of the rod-and-tube type. A tube 206 of material having a high coefficient of expansion is securely mounted at its inner end on the casing 15. The rod 208 of the thermo-responsive unit, which is of material having a low coefficient of expansion, extends within the tube 206 and is threadedly connected at its outer end with a plug 210 anchored in the outer end of the tube 206. The inner end of the rod 208 is recessed for the reception of a ball 212 secured in position by means of a cap 214. The cap 214 engages a sealing disc 216, secured in a recess 217 in the casing 15 by the valve seat 184, and having its inner portion urged into engagement with a thrust member 218 by the cap member 214.

As is well known, the differential in the expansion of the rod and tube, under the influence of the heat of the water in which the device is mounted, causes the rod to actuate the thrust member 218 to operate the clicker disc 204 which, in turn, operates the fulcrum button 202 and the opposed fulcrum levers 200. The levers 200 strike the plunger 196 which actuates the valve member 190 to open position, it being noted that the spring 194 is not compressed at this time as will be apparent hereinafter. Suitable means for mounting the control in the water heater or other appliance are provided by the elongated boss 220 projecting from the casing around the rod and tube element. The temperature at which the valve 190 will be operated may be adjusted by means of a manually operated lever 222 attached to the rod 208 by means of the set screw 224. The lever carries a pointer 226 for cooperation with indicia 228 on the casing. Movement of the lever in a vertical direction will serve to rotate the rod 208 and screw this rod further in or out of the plug 210 to change the expansion differential.

Movement of the valve 190 toward and away from its seat by the thermostatic device is governed by the condition of the thermoelectric mechanism previously described. Such governing action is effected by the provision of valve operating mechanism for the thermoelectric assembly which will now be described. The armature stem 134 is provided beyond the armature bar 138 with an extension having a threaded end 230. Mounted on the end 230 is an abutment member 232 having an annular recess 234 intermediate its ends. The abutment member 232 is also provided with a reduced end 236 which extends toward the valve member 190 and is adapted to be spaced therefrom when the armature bar 138 is in the attracted position shown in Fig. 4.

The threaded extension 230 of the armature stetm also carries a collar 238 slidably mounted within a guide disc 240 which, together with a flexible sealing disc 242 carried on the stem, is securely retained in position across the end of the chamber 120 by means of the threaded collar 244. As will be apparent, the function of the sealing disc 242 is to prevent the entrance of fuel into the magnet chamber 120, while at the same time permitting free movement of the armature bar toward and away from attracted position with the poles of the magnet 122.

Extending between the projecting end 174 of the reset stem and the recess 234 in the abutment member 232 is a pivoted lever 246. As shown in Fig. 5, this lever is pivotally mounted at both ends on a pin 248 carried by spaced lugs 250 on the inner face of the end casing 58. The end of the lever adjacent the reset stem extension 174 is curved to slidably engage with the collar 176 thereof, there being a slot 252 formed in the lever to permit it to extend around the extension 174 for this purpose. The opposite end of the lever is also slotted to extend around the recessed portion 234 of the abutment 232 and is similarly curved for slidable engagement with the walls of the recess 234. The lever 246 is further provided on one side with a radially extending arm 254 which is adapted to engage at its outer end with the cap member 114.

The projecting end 174 of the reset stem extends beyond the lever 246 and carries an operating arm 256 of the form shown in Fig. 10 and secured rigidly in position between a pair of nuts 258. The operating arm 256 extends substantially parallel with the lever 246 through the hollow casing but is movable relatively thereto. The free end of the arm is perforated to accommodate a thimble 260 through which the extension 236 may loosely project. The thimble is not rigidly mounted on the arm 256 but slidable movement in the perforation is limited in one direction by a washer 262 projecting from one

end of the thimble and by an enlarged head 264 at the other end. The washer 262 is yieldably held against the arm 256 by means of an inner spring 266 extending between the collar 264 and the arm 256. Surrounding this inner spring is an outer or valve spring 268 which extends between the valve member 190 and the arm 256 and urges these members apart.

To operate the control from the "off" position of the dial, as shown in Fig. 7, the dial is first rotated to the "pilot" position. Until this position is reached no gas can pass the shut-off cock and both the pilot and the main burner valves are retained in closed position.

In the "pilot" position, as shown in Fig. 8, the fuel may flow from the inlet nipple 17 by way of the arcuate groove 48 to the pilot passage 52 and thence to the pilot control valve 88 which, as stated, is in the closed position. At this time the armature stem spring 142 is thrusting the armature stem 134, armature bar 138 and the abutment 232, together with their associated parts, toward the valve 190. The extension 236 from the abutment 232 is at this time engaged with the valve member, tending to hold it closed, and, as the armature stem spring 142 is stronger that the valve spring 194, the thermostatic control is unable to open the valve 190 when the parts are in this position.

The reset button 170 is then manually actuated to depress the stem 172. When the reset button 170 is actuated with the dial at the "pilot" position and the thermostatic valve 190 closed, the thimble 260 is moved by the operating arm 256 against the pressure of valve spring 268 until it engages the valve member 190. At this point, however, the collar 176 on the reset stem has not moved into engagement with the curved end of the lever 246. Further manual actuation of the reset button 170 causes the arm 256 to slide relative to the thimble 260 which is held stationary by the valve member compressing the spring 268. It should be noted that the arm 256 moves without any pivotal or tilting motion in a straight line towards and away from the valve member 190. Shortly after the arm 256 compresses the spring 268, the collar 176 on the reset stem engages the curved end of the lever 246. Further manual actuation of the reset button causes the lever 246 to rotate in a clockwise direction, as viewed in Fig. 4, pivoting upon the pin 248 and moving the armature bar 138 into engagement with the pole faces of the magnet 122. The clockwise movement of the lever 246 serves to withdraw the extension 236 attached to the armature stem 134 from contact with the valve 190 as the armature bar 138 reaches attracted position.

The pilot control valve 88 is moved off its seat by the engagement of the lateral arm 254 with the cap 114 during manual actuation of the reset button to move the lever 246. Hence, gas travelling through the passages 52, 54, 56 and 84 from the cock 23 is allowed to flow past the pilot control valve 88 and through the passages 102 and 104 to the pilot burner 110. The pilot burner may then be lighted and the flame size adjusted by operation of the adjusting screw 76. The flame from the pilot burner impinges upon the end of the thermocouple which is connected in series with the coil 144 of the electromagnet 122. In a short time the thermocouple generates sufficient current to energize the magnet and maintain the armature bar 138 in contact with the pole faces thereof against the thrust of the spring 142.

The reset button may now be released. Such movement causes the operating arm 256 to travel back along the thimble 260 until it engages the washer 262 when further relative movement is prevented. The arm 256 will, however, continue to move back to its normal position carrying the thimble 260 with it and leaving the original clearance between the thimble and the valve member 190. During this movement of the arm 256 and the thimble back to normal position it will be apparent that the lever 246 remains in pivoted position, being maintained by the recess 234 in such position regardless of the release of the reset button 170. Consequently, the lateral arm 254 continues to hold the pilot control valve 88 in open position while both the extension 236 and the thimble 260 are spaced from the valve 190, leaving it free to operate against the spring 268 in response to the thermostatic mechanism.

To cause gas to flow to the main burner the dial must be moved to the "on" position, as shown in Fig. 4 and Fig. 9. Gas is now permitted to flow from the inlet nipple 17 through the port 27 of the gas cock into the main body of the casing 15. In this position it will be observed that the groove 48 permits gas to flow to the pilot burner by connecting passage 52 with the inlet 17. The indicator lever 222 may be set to the desired temperature indicated on the casing and the control will then be in complete operation.

As previously described in part the rod 206 of the thermostatic means will actuate the valve 190 with a snap action through the clinker mechanism provided. The movement of the plunger 196 which effects opening of the valve moves the spring 194 bodily without compressing it due to this spring being strong enough to overcome the spring 268 and the force resulting from the gas pressure on top of the valve. The spring 194 is provided to permit the fulcrum levers to move under thermostatic operation when the valve is being held closed by the safety mechanism.

In the event that the pilot burner is extinguished, the thermocouple ceases to generate current causing deenergization of the electromagnet and movement of the armature bar 138 away from the pole faces. Such movement of the armature bar is caused by the spring 142 which urges the abutment 232 toward the valve member 190. If the thermostatic mechanism is operating at this time to hold the valve 190 in open position, movement of the extension 236 of abutment 232 will serve to close it. Such action is due to the spring 142 on the armature stem being stronger than the spring 194 in the valve stem and thus overcoming it to move the valve 190 to closed position.

During this movement of the abutment 232 toward the right, as viewed in Fig. 4, the lever 246 is rotated on its pivot 248 in a counter-clockwise direction. The laterally extending arm 254 moves away from the cap 114 and the spring 82 moves the pilot control valve to closed position. Thus, when the pilot burner is extinguished for any reason, the safety mechanism operates to close both the main control valve 190 and the pilot control valve 88, giving a complete shut-off.

The operating arm 256 and its associated parts function to prevent any gas, except the pilot gas, from flowing to any burner when the control is being set manually. Even though the reset button may be depressed when the dial is in

the "on" position no gas can flow to the main burner until the safety device is in operation.

It will be appreciated that the valve 190 is operated by the thermostatic mechanism under normal conditions, but this mode of operation is supplanted by that of the thermoelectric control whenever conditions demand. If the thermostatic control is holding the valve 190 off its seat and the safety mechanism comes into operation, the thermoelectric control overcomes the action of the thermostatic control, causing closure of both the main and pilot valves as described. Thus, the thermoelectric control is, in effect, a governor for the thermostatic control which normally operates the valve controlling fuel flow to the burner.

In controls where two or more valves are used in place of the single valve described and shown herein, the thermostatic valve is usually in constant operation but the safety valve is called upon to function only infrequently. It is apparent that unless abnormal conditions arise the safety valve has no occasion to operate. As this safety valve usually remains stationary for long periods of time it becomes incapable of functioning efficiently when called upon to do so. An infrequently operated valve is subject to gumming, due to the drying of lubricants, and also to dirt from the gas being deposited on the seating surfaces. Such condition of the safety valve would not be discovered until the resulting leakage became apparent. In the device described and shown herein, the single valve is in constant operation as a thermostatic valve and, when the thermoelectric safety device becomes operative, it acts upon this valve also. Closure of this valve by the safety control is readily accomplished due to the absence of dirt on the seating surfaces and the operative condition in which the valve has been maintained. It may be noted that the continual opening and closing of such a valve will tend to make it self-cleaning.

The embodiment of the invention herein shown and described is to be regarded as illustrative only, and it is to be understood that various modifications and changes may be made within the scope of the appended claims without departing from the spirit of this invention.

I claim:

1. In a safety control for gaseous fuel burners, the combination of a casing having a passage for supplying fuel to the burner, a valve in the passage for controlling the supply of fuel to the burner, said valve being movable between controlling positions, electromagnetic means having an armature movable between free and attracted positions coaxially with said valve, said armature being adapted to move said controlling valve to one controlling position when moving from one of said positions, a manually operable reset stem mounted in said casing for movement in a path substantially parallel with said armature and valve, a pivoted lever extending between said reset stem and armature for transmitting movements of one to the other for resetting said armature, and a separate holding member secured to said reset stem for operative engagement with said controlling valve for maintaining said valve in said one controlling position during the resetting operation.

2. In a safety control for gaseous fuel burners, the combination of a casing having a passage for supplying fuel to the burner, a valve in the passage for controlling the supply of fuel to the burner, said valve being adapted for axial movement between open and closed positions, electromagnetic means having an armature movable between free and attracted positions, an abutment on said armature coaxial with said valve and engageable therewith for movement to said closed position when said armature is in free position, and means telescopically mounted relatively to said abutment and adapted to be substituted therefor in engagement with said controlling valve for maintaining said closed position during movement of the armature to attracted position.

3. In a safety control for gaseous fuel burners, the combination of a casing having a passage for supplying fuel to the burner, a valve in the passage for controlling the supply of fuel to the burner, said valve being adapted for axial movement between open and closed positions, electromagnetic means having an armature movable between free and attracted positions, an abutment on said armature coaxial with said valve and engageable therewith for movement to said closed position when said armature is in free position, a manually operable reset stem mounted in said casing for axial movement substantially parallel with said abutment and valve, a pivoted lever extending between said reset stem and abutment for transmitting movements of the one to the other for resetting said armature to attracted position, a rigid member secured to said reset stem and extending in proximate relation to said abutment, and means carried by said rigid member for telescopic movement relative to said abutment to be substituted therefor in engagement with said controlling valve for maintaining said closed position during movement of the armature to attracted position.

4. In a combined temperature and safety control for gaseous fuel burners having main and pilot burners, the combination of a casing having passages for supplying fuel to the main and pilot burners, a main control valve intercepting the supply of fuel in said passage to the main burner, a pilot control valve intercepting the supply of fuel in said passage to the pilot burner, said valves being biased to closed position, a thermostat for operating said main control valve, thermoelectric means energizable by a flame at the pilot burner and having an armature movable with respect to said main control valve between released and attracted positions, means carried by said armature for operating said main control valve in opposition to said thermostat permitting operation of said main control valve by said thermostat to supply fuel to said main burner only when the armature is in attracted position, and manually actuable means for simultaneously moving said armature and opening said pilot control valve, and a holding member actuated by said manually actuable means to maintain said main control valve closed while said armature is moving to attracted position.

5. A combined temperature and safety control comprising a valve, thermostat means operable on one side of said valve for moving said valve to open position, electromagnetic means having an armature movable from attracted to released position to become operable on another side of said valve for moving said valve to closed position against the action of said thermostat means, manually operable means for resetting said armature to attracted position to permit operation of said valve by said thermostat means, and means operable on said valve in place of said armature and

independently thereof for holding said valve in closed position during the resetting operation.

6. A combined temperature and safety control comprising a valve, thermostat means operable on one side of said valve for moving said valve to open position, electromagnetic means coaxial with said thermostat means on the opposite side of said valve, an armature movable between attracted and released positions relative to said electromagnetic means, an abutment carried by said armature and engageable with said valve upon said movement to released position for moving said valve to closed position against the action of said thermostat means, manually operable means for resetting said armature to attracted position and moving said abutment away from said valve to permit operation thereof by said thermostat means, and means carried by said abutment and slidable relatively thereto by said manually operable means into engagement with said valve coaxially of said thermostat means, said slidable means being effective in place of said abutment for holding said valve in closed position during the resetting operation but freeing said valve for operation by said thermostat means upon discontinuance of said resetting operation.

7. A combined temperature and safety control comprising a valve, thermostat means operable on one side of said valve for moving said valve to open position, electromagnetic means having an armature movable from attracted to released position to become operable on another side of said valve for moving said valve to closed position against the action of said thermostat means, and manually operable means for resetting said armature to attracted position to permit operation of said valve by said thermostat and for holding said valve in closed position during the resetting operation, said means including a pivoted lever operatively engageable with said armature for resetting the same and an operating arm movable independently of said lever into operative engagement with said valve for holding the same closed during the resetting operation.

8. A combined temperature and safety control for fuel burners having main and pilot burners, comprising a main control valve biased to closed position, a pilot control valve biased to closed position, thermostat means for moving said main valve to open position against its bias, thermoelectric means responsive to operation of the pilot burner, an electromagnet adapted to be energized by said thermoelectric means when said pilot burner produces a flame, an armature device for said electromagnet operatively engageable with said main valve for moving said valve to closed position in opposition to said thermostat, means biasing said armature device toward operative engagement with said main valve, a manually operable reset stem reciprocable relative to said armature device, a pivoted lever having lost motion connection with said stem and engageable with said armature device for resetting it against its bias toward said electromagnet, means carried by said lever for moving said pilot valve to open position against its bias during the resetting operation, said armature being retained by said electromagnet upon energization thereof, and a holding member secured to said reset stem and operatively engageable with said main valve for maintaining said valve closed during the resetting operation, said lost motion connection permitting withdrawal of said holding means by operation of the reset stem without corresponding movement of said lever so that said pilot valve remains held open during energization of said electromagnet.

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