June 3, 1952 A. L. MILLER 2,599,063

SAFETY CONTROL VALVE FOR GAS BURNERS

Filed March 6, 1948 3 Sheets-Sheet 1

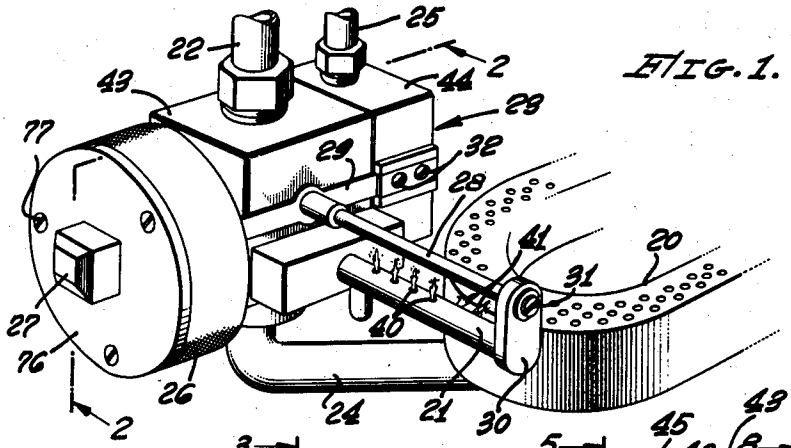


FIG. 1.

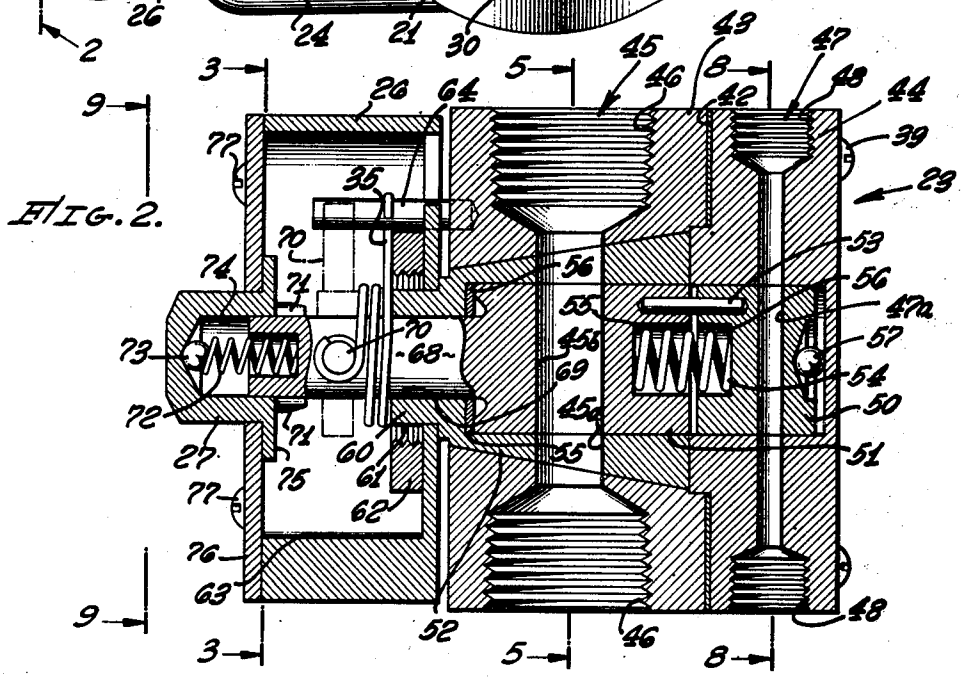


FIG. 2.

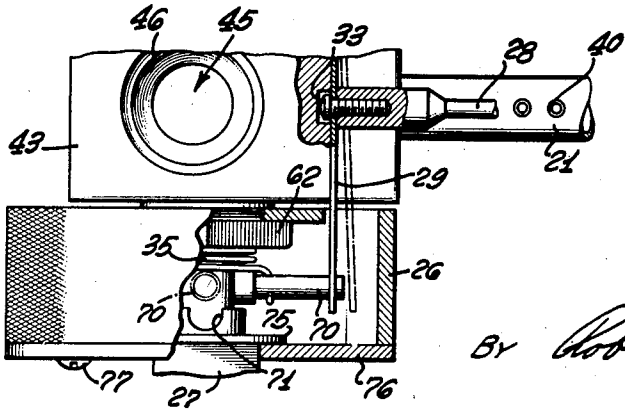


FIG. 4.

AVY L. MILLER,
INVENTOR

BY Robert N. Fulwider
ATTORNEY.

June 3, 1952 A. L. MILLER 2,599,063

SAFETY CONTROL VALVE FOR GAS BURNERS

Filed March 6, 1948 3 Sheets-Sheet 2

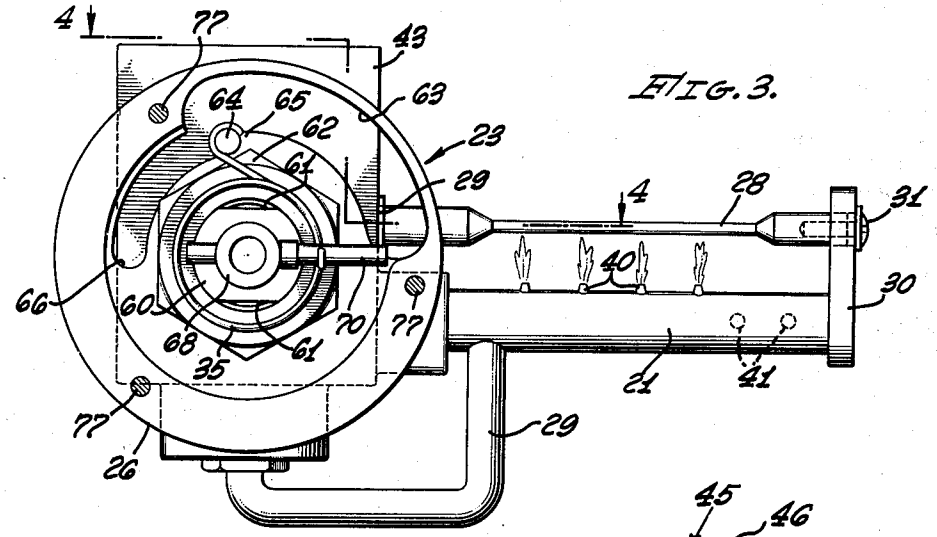


FIG. 3.

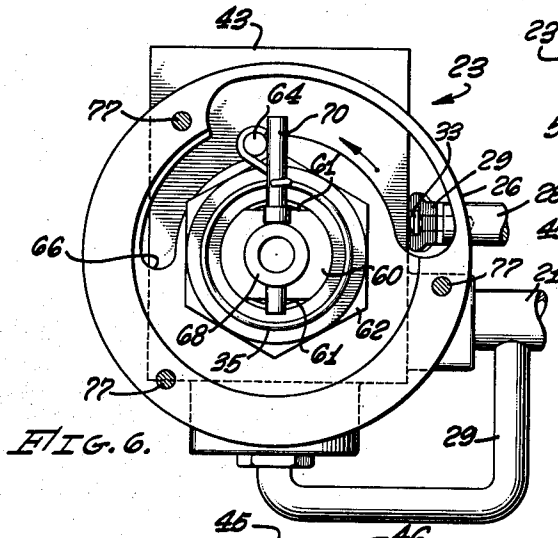


FIG. 6.

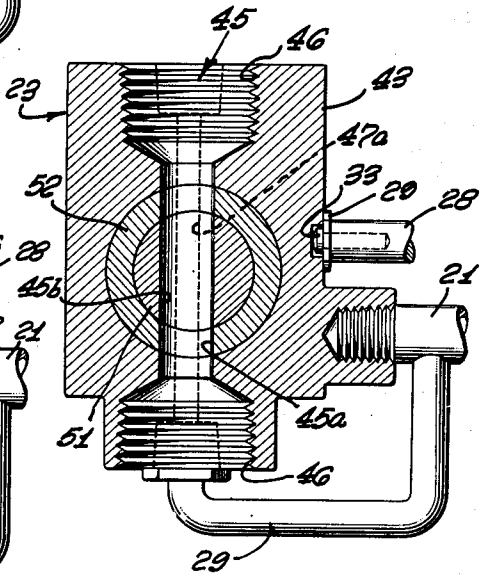


FIG. 5.

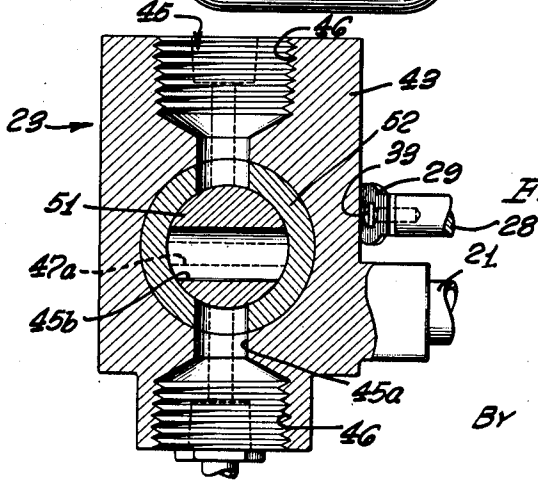


FIG. 7.

AVY L. MILLER,
INVENTOR

BY Robert M. Fulwider
ATTORNEY.

June 3, 1952 A. L. MILLER 2,599,063

SAFETY CONTROL VALVE FOR GAS BURNERS

Filed March 6, 1948 3 Sheets-Sheet 3

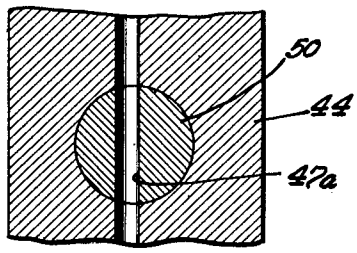


FIG. 8.

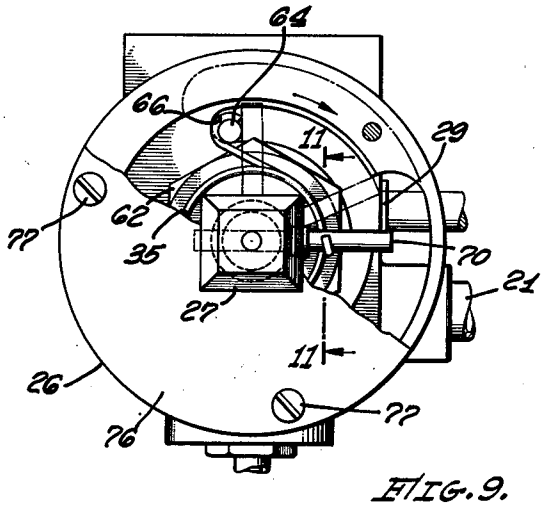


FIG. 9.

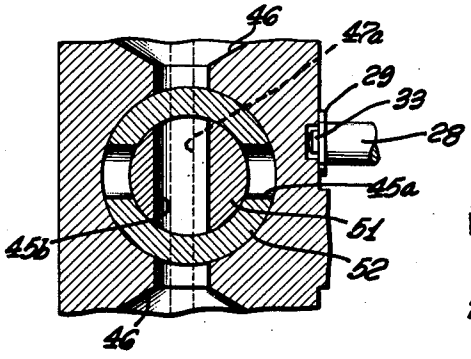


FIG. 10.

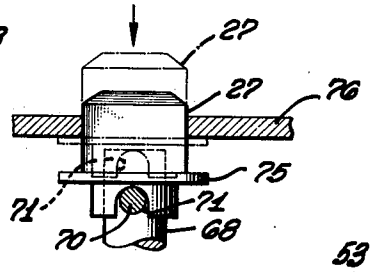


FIG. 11.

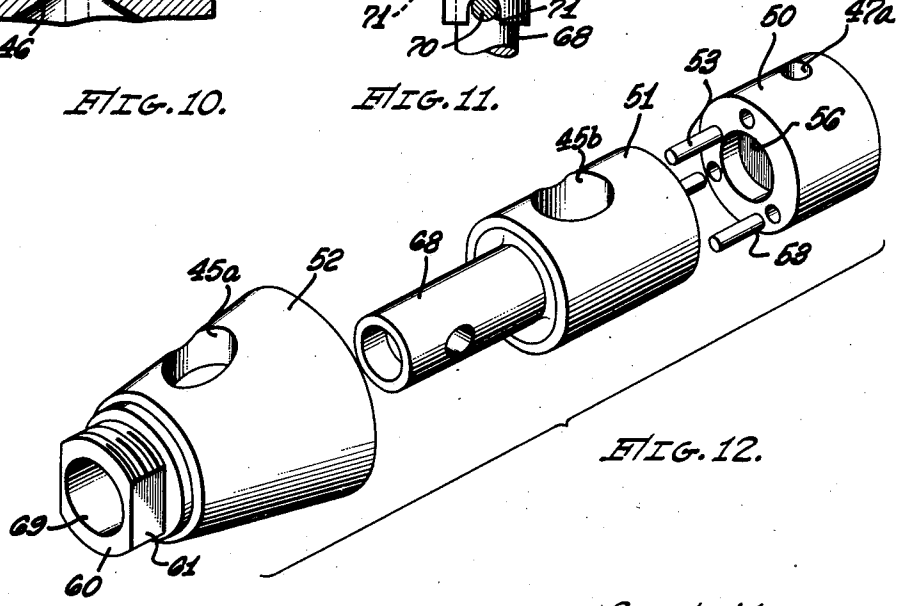


FIG. 12.

AVY L. MILLER,
INVENTOR
BY Robert N. Fulwider
ATTORNEY.

Patented June 3, 1952 2,599,063

UNITED STATES PATENT OFFICE

2,599,063

SAFETY CONTROL VALVE FOR GAS BURNERS

Avy L. Miller, North Hollywood, Calif.

Application March 6, 1948, Serial No. 13,503

10 Claims. (Cl. 158—138)

1

My invention relates generally to gas valves for controlling the delivery of gaseous fuel to the gas burners of such appliances as water heaters, furnaces, and the like. More particularly, my invention relates to a valve of the class described which incorporates safety features designed to prevent the accumulation of unignited gas.

In most gas burning appliances for home use, such as automatic water heaters, hot air furnaces, stoves and the like, it is customary to provide a small burner called a pilot which burns continuously and serves to ignite the main or heating burner when gas is delivered thereto. One of the difficulties encountered with such arrangements is that, should a sudden and unexpected draft of air extinguish the pilot light or should the delivery of gas thereto be momentarily interrupted and then renewed, the resulting accumulation of unignited gas presents a very dangerous fire and explosion hazard. Particularly is this true in the case of thermostatically controlled devices in that the gas accumulation coming from the pilot burner is augmented by gas from the main burner as soon as the thermostat operates to open the main gas valve.

Thermostatically operated safety control valves have been designed in the past, and usually incorporate a thermostatic element responsive to the heat of the pilot burner which element is operatively connected to a safety control valve in a manner to turn off the supply of gas to both the pilot and main burners, should the pilot go out. A major difficulty encountered in such previously designed valve systems is, however, that they seriously interfere with reigniting the pilot burner after operation of the safety control valve. It is obviously necessary to reopen the safety control valve to reinstitute flow of gas to the pilot and main burners before such can be reignited. Thus a manual control for the safety control valve is required which must be independent of the operative controls responsive to the thermostatic element. The provision of such manual control is, of course, simple but fails to take into consideration the human element involved in relighting the pilot after accidental extinguishing thereof.

For example, if the manual control for the safety control valve is turned to "on" position, the pilot is relighted, and the operator then forgets to return the manual control of the safety valve to its original position. The latter valve will be inoperative should the pilot again fail.

Various arrangements have been evolved to overcome this difficulty but have heretofore involved a multiplicity of valves and thermostatic elements and somewhat complicated mechanical linkages interconnected between such valves. Other arrangements designed to overcome the

2

difficulty above described include one in which it is necessary to heat the thermostatic element with matches or other independent heating means before the pilot can be reignited.

Bearing in mind the foregoing difficulties, it is a major object of my invention to provide a safety control valve of the class described which serves to cut off the flow of gas to both the pilot and the main burner of a gas appliance should the pilot accidentally become extinguished.

Another object of my invention is to provide a valve of the class described which cannot be left in an inoperative condition after reigniting the pilot.

Still another object of my invention is to provide a safety control valve operative as above described and further adapted to permit relighting the pilot without the necessity of employing independent means to heat a thermostatic element.

A further object of my invention is to provide a valve of the class described which is capable of meeting regulatory requirements of the Underwriters' Laboratory and other such bodies concerning fuel gas control valves.

A still further object of my invention is to provide a control valve of the class described which is compact and relatively simple to manufacture.

The foregoing and other objects and advantages of my invention will become apparent from consideration of the following description of a valve embodying my invention, such consideration being given also to the attached drawings in which:

Figure 1 is a perspective view of a valve embodying my invention as incorporated in the fuel supply of a typical gas appliance burner system;

Figure 2 is an elevational section on the line 2—2 in Figure 1;

Figure 3 is an elevational section taken on the line 3—3 in Figure 2;

Figure 4 is a horizontal, fragmentary section taken on the line 4—4 in Figure 3;

Figure 5 is an elevational section taken on the line 5—5 in Figure 2;

Figure 6 is an elevational view similar to Figure 3 but showing the valve in an "operated" position;

Figure 7 is a view similar to Figure 5 but showing the parts of the valve in the operated position illustrated in Figure 6;

Figure 8 is a fragmentary, elevational section taken on the line 8—8 in Figure 2;

Figure 9 is a fragmentary elevational view taken on the line 9—9 in Figure 2 with a portion of the valve broken away to reveal interior parts;

Figure 10 is an elevational section similar to Figure 7 but showing the parts of the valve in an intermediate position during the reigniting operation thereof;

Figure 11 is an elevational section taken on the line 11—11 in Figure 9; and

Figure 12 is an "exploded" perspective view of the operative parts of the valve assembly illustrated in Figure 1.

Referring now to the drawings and particularly to Figure 1, it will be seen that the valve embodying my invention is incorporated in a gas appliance which includes a main burner 20 and a pilot burner 21. Gas is supplied to the main burner 20 from a main supply pipe 22 through the valve embodying my invention and indicated generally by the reference character 23, gas being delivered from the valve to the burner by a tube 24. It will be understood that a plenum chamber for mixing air with the gas would be included in a conventional gas burner. Since such a plenum chamber formers no part of the present invention, however, it is not included in the drawings and the representation of the burner 20 may be considered as "schematic" and for illustrative purposes only.

Gas for the pilot burner 21 is supplied to the valve from a small pipe 25 and is delivered from the valve into the burner 21 through a tube 24.

It will be understood that the small supply tube 25 may includes a regulating valve (not shown) therein upstream from the control valve 23 illustrated herein, the purpose of said upstream regulating valve being to regulate the amount of gas supplied through the small pipe 25. Since such regulating valves are well known in the art, this element too is omitted from the drawings.

The manually operable members of the valve 23 comprise a knurled knob 26 and a square push button 27, coaxially positioned in the center of the knob 26. The mode of operation and the function of the knob 26 and the button 27 will be described in detail hereinafter.

The thermostatic element which functions to effect closure of the control valve 23 upon failure of the pilot burner 21, comprises a heat responsive rod 28 and a flat leaf spring 29 connected thereto. The heat responsive rod 28 is secured at its outer end to an upwardly extending support member 30 by an adjustment screw 31 by which tension adjustment of the rod 28 may be made as best seen in Figure 3. The leaf spring 29 is secured at its rearward end to the body of the valve 23 by means of screws 32, the spring extending forwardly and having a free end thereof projecting into the knob 26 as best seen in Figure 4. The rod 28 is attached to the leaf spring 29 adjacent the center thereof by means of a single screw 33 threaded into the rod 28 as shown in Figure 4.

The pilot burner 21 is provided with a number of upwardly directed jets 40 which serve to apply heat to the rod 28 when the pilot burner is in operation, and horizontally directed jets 41 which serve to convey an igniting flame to the main burner 20 thus to perform the "pilot" function of the burner 21.

The heat responsive rod 28 is constructed of a material which will resist the corrosive action of the burner jets 40 and having a relatively high coefficient of thermal expansion whereby when said rod is heated it extends to move the leaf spring 29 toward the body of the valve 23 to a position shown in full line in Figure 4, whereas contraction of the rod 28 which takes place upon the burner jets 40 being extinguished, causes the rod 28 to pull the leaf spring 29 away from the body of the valve 23 to a position shown in phantom line in Figure 4.

It will be further noted from an examination of Figure 4 that the mechanical motion of the inner end of the rod 28 at the screw 33 is amplified at the free end of the leaf spring 29 within the knob 26. As described in more detail later herein, the free end of the leaf spring 29 is employed as one member of a latch merchanism serving to hold the valve 23 in open or "on" position so long as the rod 28 is heated by the burner jets 40 in the pilot burner 21. Upon cooling of the rod 28, the spring 29 is moved to the phantom line position shown in Figure 4, whereon to release the aforesaid latch mechanism and permit a helical torsion spring 35 within the knob 26 to close the valve.

For a more detailed description of the valve operation, reference should now be had to Figure 2 wherein the interior operative portions of the valve are illustrated. The valve 23 includes in addition to the manually operable knob 26 and the button 27, a two-piece body including the main supply body portion 43 and the pilot supply body portion 44. The main body portion 43 and the pilot body portion 44 are secured together by suitably positioned attachment screws 39 threaded into the main body portion 43 and a gas-tight gasket 42 is positioned between the body portions 43 and 44 to hermetically seal interior cavities in these members.

The main body portion 43 is provided with a vertical passage 45 therethrough which is provided with threaded opening 46 therein adapted to receive conventional fittings for the attachment of the supply pipe 22 and tube 24.

The pilot body portion 44 is also provided with a passage 47 therethrough having threaded opening 48 adapted to receive the supply pipe 25 and the tube 24 through which pilot gas is conducted from the body portion 44 to the pilot burner 21.

Coaxially mounted within the body portions 43 and 44 are three rotary core members, the nature of which is best seen from an examination of Figure 12. The three rotary core members comprises a pilot valve core 50, having a transverse opening 47*a* therethrough, an inner core 51 having a transverse opening 45*b* therethrough, and an outer conical core 52 having an interrupted transverse opening 45*a* therethrough. The transverse openings 45*a*, 45*b* and 47*a* in the various core members are positioned and adapted to be placed in alignment with the gas passages 45 and 47 to permit flow of gas to the main and pilot burners. Such alignment of the passages is accomplished by appropriate rotation of the core members as will be described hereinafter.

The assembly and mode of operation of the three core members 50, 51 and 52 is best seen in Figure 2. Here it will be seen that the inner core member 51 is concentrically mounted within the conical core member 52 and makes gas-tight, cylindrical contact therewith. The conical core 52 is, in turn, mounted in a suitable conical seat in the main body portion 43, a gas-tight fit being provided at the conical surfaces of the last mentioned parts. The pilot core 50 is mounted in a suitable cylindrical opening in the pilot body portion 44 and also makes sealing cylindrical connection therewith.

In Figures 2 and 12, it will be noted that inner core member 51 has rotary drive connection with the pilot core 50, effected by three drive pins 53 loosely carried in aligned holes in the members 50 and 51.

A compression spring 54 is positioned in terminal cavities 55 and 56 in the inner core 51 and the pilot core 50, respectively. The thrust of the compression spring 54 is such as to tend to push the core members 50 and 51 away from each other, the purpose being to force the member 51 into tight sealing contact with the conical core member 52 at the end surface 55 of the inner core member 51. A thrust washer 56 is positioned between the end of the core 51 and the inner end of the cylindrical recess in the conical core member 52, the purpose of the thrust washer 56 being to prevent galling of the members 51 and 52 since these members are preferably constructed of the same material, for example, brass. To accomplish its purpose, therefore, the washer 56 should be preferably of a different material than that of the members 51 and 52.

The resultant thrust on the pilot core 50 is taken by a single ball thrust bearing 57 located at the bottom of the cylindrical recess in the pilot body 44.

As can be seen best in Figure 12, the conical core member 52 is shouldered at its outer end and provided with a threaded extension 60 having parallel flats 61 formed therein. The threaded projection with the flats 61 is received in a coordinately shaped opening in a rear wall of the knob 26 and projects into the hollow interior thereof. An attachment nut 62 is screwed onto the extension 60 whereby to secure the knob 26 thereto for driving connection therewith by virtue of the flats 61. Thus rotation of the knob 26 is effective to rotate the conical core member 52.

As can be seen best in Figure 3, the bottom or rear wall of the hollow knob 26 is provided with an arcuate opening 63 which opening has a two-fold purpose. One purpose of the opening 63 is to admit the free end of the leaf spring 29 as previously described while still permitting limited rotation of the knob 26. The other purpose of the opening 63 is to provide limiting stops for the rotary motion of the knob 26. To accomplish this latter function, a stationary stop pin 64 is secured in the main body portion 43 and projects outwardly into the hollow knob 26 through the arcuate opening 63. A shoulder 65 is provided in the inner edge of the opening 63 in position to engage the pin 64 to limit counterclockwise rotation (in Figure 3) of the knob 26 whereas clockwise rotation thereof is limited by the end 66 of the arcuate opening 63 striking against the pin 64. As can be seen in Figure 3, the permitted rotation of the knob 26 and of the conical core member 52 driven thereby is approximately 90°.

It will be noted that the pin 64 also forms an anchorage for the torsion spring 35.

The inner core member 51 is provided with a stem 68 which is of sufficient length to project outwardly beyond the extension 60 on the conical core member 52, a suitable opening 69 being provided in the latter member. A cross pin 70 is secured in the stem 68, the pin 70 being of sufficient length to engage the stop pin 64 whereby to limit counterclockwise rotation of the inner core member 51. As can be seen in Figure 2, the torsion spring 35 is anchored against the cross pin 70 and the arrangement thereof is such as to urge counterclockwise rotation of the inner core member 51, thus to place the cross pin 70 in engagement with the stop pin 64.

The pin 70 also serves as a latch member for

cooperation with the free end of the leaf spring 29 as previously described. The latching operation is illustrated in Figure 9 wherein it will be seen that clockwise rotation of the inner core member 51 carries the cross pin 70 past the free end of the leaf spring 29 so that when the spring 29 is in its innermost or "hot" position, the pin 70 cams the spring 29 outwardly until the pin has rotated beyond the spring 29 at which time the spring snaps into the position shown in full line in Figure 9 whereby to retain the cross pin in the horizontal position illustrated therein. Upon cooling and contraction of the rod 28, the spring 29 is pulled outwardly as shown in Figure 4 in phantom line, thus releasing the pin 70 and allowing the torsion spring 35 to rotate the same and drive the core member 51 in counterclockwise rotation until the cross pin 70 reaches the stop pin 64.

The purpose of the manually operable push button 27 in the knob 26 is to serve as a clutch to engage the knob 26 with the cross pin 70 in order to manually rotate the latter in clockwise direction to re-engage the same with the spring 29 as above described. To this end the push button 27 is provided with a pair of diametrically opposed U-shaped notches 71, one of which may be seen in Figure 4, which notches 71 are adapted to engage the cross pin 70 when the push button 27 is pushed inwardly. Such inward motion of the push button 27 is opposed by a compression spring 72 which is anchored in a recess in the outer end of the stem 68 and thrusts against a single ball thrust bearing 73 in the inner end of an interior circular recess 74 in the button 27. The button 27 is also provided with a radially extending flange 75 which engages a cover 76 of the knob 26 to limit outward motion of the push button 27 urged by the compression spring 72. The cover 76 is secured to the knob 26 by screws 77, threaded into the body of the knob 26.

The opening in the cover 76 through which the push button 27 extends is square as is the button 27, whereby to effect driving connection between the knob 26 and the button 27.

When the push button 27 and the cross pin 70 are in such relative position that the notches 71 may engage the pin 70, pressure on the button serves to effect driving connection between the knob 26 and the inner core member 51, whereby rotation of the knob 26 in a clockwise direction rotates both the conical core member 52 and the inner core member 51 and the pilot core 50. The relative direction of the various openings through the core members 50, 51 and 52 can be best understood from an examination of Figures 5, 6 and 7. When the cross pin 70 is against the stop pin 64 and the shoulder 65 in the knob 26 is also against the stop pin 64, which position is illustrated in Figure 6, the arrangement of the passages is that shown in Figure 7. In Figure 7, it will be seen that the transverse opening 47*a* in the pilot core 50 and the opening 45*b* in the inner core 51 both lie transverse to the respective passages 47 and 45 in the body of the valve 23. Thus both the main and pilot gas supplies are shut off when the valve is in the condition illustrated in Figure 7. This is the condition which obtains immediately after the operation of the thermostatic latch mechanism previously described.

When it is then desired to relight the pilot, it will, of course, be necessary to rotate the pilot core to a position where the passage 47*a* is

aligned with the pilot passage 47 through the body portion 44. To accomplish this alignment of the opening 47a it is necessary to rotate the pilot core and concurrently the inner core member 51 in a clockwise direction through approximately 90°. To manually rotate the inner core member by means of the knob 26, it is necessary that these two parts be "clutched" together by means of the push button 27.

The relative position of the knob 26 and the cross pin 70 required to enable engagement of the push button with the latter is illustrated in Figure 6. With the parts in this relative position, the push button 27 is depressed and the knob 26 is rotated clockwise, carrying the cross pin 70 around to the position shown in Figure 3. This serves to place the transverse openings 47a and 45b in "open" position whereby to supply gas to the burner 21 and to remove the blocking action of the inner core member 51.

It should be noted, however, that in rotating the knob 26 in a clockwise direction to carry the pin 70 around to the position illustrated in full line in Figure 9, the resultant rotation of the conical core member 52 is such as to close the main fuel supply passage 45. This position is illustrated in Figure 10. It will be seen, however, that the pilot burner passage 47 is open.

Since at this point in the reigniting operation, the rod 28 is still cold the leaf spring is pulled outwardly and is not in position to engage the end of the cross pin 70. Thus if the push button is released, it is moved outwardly by the compression spring 72 and is thereby disengaged from cross pin 70 permitting the torsion spring 35 to rotate the inner core 51 and the pilot core 50 to the transverse or closed position illustrated in Figure 7. Such an arrangement is provided so that if for any reason the operator is unable to light the pilot, release of the push button 27 will automatically shut off the supply of gas thereto and prevent an accumulation of unignited gas.

Continuing now with a description of the reigniting operation, the control knob 26 is held in the position indicated in Figure 9 and the push button 27 is held down whereby to hold the core members in the relative positions illustrated in Figure 10. With the valve in this condition, the pilot is then ignited and the controls are held in such position until the rod 28 has been sufficiently heated to move the leaf spring inwardly into position to engage the cross pin 70. When such engagement has occurred releasing the push button 27 will not cause the gas supply to the pilot burner 21 to be shut off since the cross piece 70 and consequently the inner core and pilot core 51 and 50 respectively are held in open position by the latching operation of the spring 29.

It will be remembered, however, that the conical core member was rotated to passage-blocking position as illustrated in Figure 10 in order to open the pilot passage 47. Thus after igniting the pilot and heating the rod 28 so as to maintain the pilot supply, the knob 26 must be rotated in counterclockwise direction until the shoulder 65 strikes against the stop pin 64 whereby to open the main burner supply passage 47 as shown in Figure 5.

The mode of operation just described in which the main burner supply is shut off during the reigniting operation is necessary since it is undesirable that a relatively large flow of gas takes place until the pilot has been ignited. Otherwise it would be possible for a considerable accumulation of gas to take place even during the time necessary to strike a match to ignite the pilot. Striking the match and attempting to light the pilot might then result in a dangerous explosion. The rate of gas supplied to the pilot burner 21, however, is so slow as to obviate the possibility of such a dangerous accumulation of gas during the time required to ignite the pilot burner.

It should be noted that the arrangement just described is substantially foolproof in that there is no way in which the operator can open the main fuel supply until the pilot burner has actually been ignited whereby to heat the rod 28. Furthermore, should the operator fail to ignite the pilot and release his hold on the knob 26 and the push button 27, the valve will immediately be returned to a closed position by virtue of the torsion spring 35. The torsional strength of the spring 35 is sufficient so that this spring is capable of rotating not only the inner core and pilot core 51 and 50 respectively, but will also, if necessary, rotate the conical core 52. Thus if the button 27 should inadvertently remain in engagement with the pin 70 after manual pressure has been released, the torsion spring 35 will then rotate all of the core members to the position illustrated in Figures 6 and 7 and thus shut off both supplies.

If at any time the rod 28 is cooled for any reason, either by extinguishing of the pilot or by reduction in gas pressure such as to render the pilot burner 21 incapable of igniting the main burner 20, the latch mechanism previously described is operated to release the pin 70 and shut off the gas supply.

While the valve shown and described herein is fully capable of achieving the objects and providing the advantages hereinbefore stated, it will be realized that it is capable of considerable modification by those skilled in the art without departing from the spirit of the invention. For this reason, I do not mean to be limited to the form shown and described but rather to the scope of the appended claims.

I claim:

1. In a control valve for a gas burning appliance of the type having a main burner and a pilot burner, the combination of: means having separate passageways adapted for connection to said burners to supply gas to said main burner and to said pilot burner; manually operable valve means in one of said passageways to control the flow of gas to said main burner; automatic valve means adjacent to, and independent of said manually operable means to control flow of gas to said main burner, said automatic means including a thermostatic latch mechanism having a thermal element positioned and adapted to respond to the heat of a pilot burner connected to one of said passageways to normally hold said automatic means in open position while said pilot burner is ignited and spring means urging said automatic means toward closed position; valve means to control the flow of gas to said pilot burner, said pilot valve means being operatively connected to said automatic means for concurrent motion therewith, the relative positions of said automatic means being such that the same and said pilot control means are always simultaneously open or simultaneously closed; and means movable to open said automatic means against the urging of said spring means, said opening means including clutching means to connect said automatic means with said manually operable control means when said last two means

are in such relative position that one is open and the other closed whereby opening of said automatic means is accompanied by closing of said manually operable means to interrupt flow of gas to said main burner.

2. The apparatus set forth in claim 1 further characterized by the fact that said clutching means includes a member adapted to be manually moved against yielding pressure means whereby to engage said clutching means and whereby release of manual pressure against said member disengages said clutching means and permits said spring means to return said automatic means to closed position unless the latter is held by said latch mechanism.

3. In a control valve for a gas burning appliance of the type having a main burner and a pilot burner, the combination of: a valve body having a first passage therein adapted for connection to conduct gas to said main burner and a second passage therein adapted for connection to conduct gas to said pilot burner; a first valve member in said body movable to close said first passage; a spring urged second valve member movably mounted in said body and adapted to normally close said first passage; thermostatic latch mechanism adapted to engage and hold said spring urged member in open position, said latch mechanism having a thermal element positioned to respond to heat of said pilot burner to hold said latch in said engagement whereby failure of said pilot burner disengages said latch mechanism to permit closing of said spring urged member; a third valve member in said body movable to selectively open or close said second passage, said third valve member being operatively connected to said spring urged member for concurrent opening and closing movement therewith; and manually operable means to concurrently return said spring urged member to open position and control said main burner, said manually operable means including means for effecting driving connection between said first and second valve members when the latter are in opposite positions, said second valve member being inaccessible for independent manual operation whereby opening of said second valve member can be accomplished only by closing motion of said manually operable means to shut off gas supply to said main burner and said driving connection means being releasable to permit independent movement of said first valve member whereby said manually operable means may be reopened after motion to open said spring urged member.

4. In a control valve for a gas burning appliance of the type having a main burner and a pilot burner, the combination of: a valve body having a first passage therein adapted for connection to conduct gas to said main burner and a second passage therein adapted for connection to conduct gas to said pilot burner; a valve member in said body movable to close said first passage; separate valve means mounted in said body to normally close said first and second passages, said separate valve means being movable to a position to open said first and second passages and including a spring connected to urge said separate valve means to closed position; thermostatic latch mechanism having a member adapted to engage and hold said separate valve means in said open position against the urging of said spring, said latch mechanism being responsive to heat of said pilot burner to hold said separate valve means as aforesaid whereby failure of said pilot burner disengages said latch member to permit movement of said separate valve means to close said passages; and means to control said valve member and separate valve means, said controlling means including an operating handle connected to said valve member and adapted for manual operation to move said valve member selectively to open or closed position, and a clutch member carried by said handle adapted when in a predetermined position to make driving engagement with said separate valve means to move the same concurrently with said valve member whereby to move said separate valve means to open said first and second passages when said valve member is moved to closed position.

5. The apparatus set forth in claim 4 further characterized in that said clutch member is normally spring urged into disengaged position and is engageable by manual pressure whereby the release of said manual pressure disengages said clutch means and permits said separate valve means to return to said closed position unless held open by said latch member.

6. In a control valve for a gas burning appliance of the type having a main burner and a pilot burner, the combination of: a valve body having a passage therethrough adapted for connection to deliver gas to said main burner; a pair of valve members in said body, each independently movable to close said passage; thermostatically controlled means to close a first of said valve members upon failure of said pilot burner; normally disengaged clutch means manually operable to connect said valve members for concurrent movement, said clutch means being engageable at only such relative position of said valve members wherein one is open and one is closed whereby said concurrent movement closes one valve member while opening the other; and pilot valve means adapted for connection in the gas supply of said pilot burner to control flow of gas to said pilot burner, said pilot valve means being connected for concurrent movement with said first valve member to open or closed position thereof.

7. A control valve for gas burning appliance of the type having a main burner and a pilot burner, which comprises in combination: a valve body having a passage therethrough adapted for connection to said appliance to deliver gas to a main burner in said applicance; a rotatable valve member mounted for rotation in said body, said valve member having a transverse opening therethrough adapted to be aligned with said passage and having a substantially gas tight fit with said body whereby to hermetically seal said passage upon rotation of said member to move said opening therethrough out of alignment with said passage; a core member rotatably and coaxially mounted within said valve member, said core member having an opening therethrough alignable with said valve member opening, said core member having a substantially gas tight fit with said valve member and being independently rotatable to close said passage; a rotating knob secured to said valve member to manually rotate the same selectively to open or closed position in said body; a rotary spring secured to said core member and anchored to said body, said spring being stressed to urge said core member to a normally closed position; a push button carried by said knob having driving engagement with said knob and being selectively slidable therein to engage said core member whereby to connect said knob and core member for concurrent ro-

tation, said push button being positioned and adapted to engage said core member only when said valve member and said core member are in such relative position that on is closed and the other is open; movable latch means adapted to hold said core member in open position against the urging of said rotary spring; a thermostaticly movable member operatively connected to said latch means and responsive to heat from said pilot burner to hold said latch means in said engagement whereby upon failure of said pilot burner, said last member contracts and said latch means is thereby moved out of engagement with said core member to permit closing thereof by said rotary spring; and a rotary pilot valve adapted for connection to said appliance to control the gas supply for said pilot burner, said pilot valve being connected for concurrent rotation with said core member and with said core member and pilot valve in the same relative position whereby said core member and pilot valve move simultaneously to closed or open position and whereby reinstituting the flow of gas to said pilot upon failure thereof can be accomplished only by simultaneously closing said passage to shut off the flow of gas to said main burner.

8. A control valve for a gas burning appliance having a main burner and a pilot burner therein which comprises in combination: a first valve body portion adapted for connection in the fuel supply of said appliance having a transverse passage therethrough adapted when so connected to deliver fuel to said main burner; a second body portion secured to said first body portion; adapted for connection in the fuel supply of said appliance, and having a second passage therethrough adapted when so connected to deliver gas to said pilot burner; a conical valve member in said main body adapted for sealing rotary motion therein, said conical valve member having an opening therethrough adapted to be aligned with said first passage; a control knob secured to said conical member to rotate the same selectively to open or closed position; a cylindrical core valve member mounted for sealing rotary motion within said conical member, said core member having an opening therethrough adapted to be aligned with said passage; a pilot valve member in said second body portion, said pilot valve member having an opening therethrough adapted to be aligned with said second passage; means effecting a driving connection between said pilot valve member and said core member for concurrent rotation of said last two members to simultaneously open or close said passages; means including a shoulder on said core member and an abutment in said conical member to impart axial thrust from said core member to said conical member in a direction to hold said conical member in gas tight engagement with said first body portion; a compression spring positioned between said pilot valve member and said core member, said compression spring being adapted to urge said axial pressure against said core member; a thrust bearing between said pilot valve member and said second body portion; a stem portion in said core member adapted to permit rotation of said core member from outside of said body; a transverse pin in said stem portion, positioned outside of said body; a torsion spring connected between said transverse pin and said body, said torsion spring being adapted to urge rotation of said core member in a direction to close said first passage; a latch member secured to said body and adapted to engage said transverse pin to hold said core member in an open position against the urging of said torsion spring; and a heat responsive member mounted on said control valve and arranged to be positioned adjacent said pilot burner when said body sections are connected as aforesaid and operatively connected to said latch member to move the latter when said heat responsive member contracts whereby failure of said pilot burner causes said heat responsive member to move said latch member out of engagement with said transverse pin to permit said torsion spring to close said core member.

9. The construction set forth in claim 8 further characterized by having a movable clutch member carried by said control knob, said clutch member being manually operable to engage said transverse pin to connect said knob and said core member for concurrent rotation of said last two members, said clutch member being further adapted to make such engagement with said transverse pin only at a relative position of said conical member and said core member at which one of said last members is open and the other is closed whereby said core member may be rotated against the urging of said spring to reinstitute flow of gas to said pilot burner by engaging said clutch member and rotating said knob and whereby release of said knob or release of said clutch member permits said torsion spring to return said core member to closed position unless said transverse pin is engaged by said latch member.

10. In a control valve for a gas burning appliance of the type having a main burner and a pilot burner, the combination of: means adapted for connection to said appliance to supply fuel gas to said main burner; separate means adapted for connection to said appliance to supply fuel gas to said pilot burner; a normally open valve member in said first means movable to a position to shut off said main burner supply; thermostatic valve means having a thermal element adapted to be positioned to respond to the heat of said pilot burner and including separate valve members for shutting off said main and pilot burner supplies upon extinction of said pilot burner; and means to reinstitute said pilot burner supply, said last means including a manual control member for moving said first valve member and means for connecting said first valve member and separate valve members for concurrent movement of said members to move said separate valve members to open position by closing movement of said first valve member.

AVY L. MILLER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,943,075	Horton	Jan. 9, 1934
1,981,012	Wegener	Nov. 20, 1934
2,361,944	Jackson et al.	Nov. 7, 1944
2,372,537	Wantz	Mar. 27, 1945
2,395,470	Ewing	Feb. 26, 1946
2,403,611	Ray	July 9, 1946