Aug. 16, 1955 D. F. DROW 2,715,437

PILOT OPERATED SAFETY VALVE FOR HEAT APPLIANCE

Filed Aug. 7 1951 2 Sheets-Sheet 1

FIG. 1

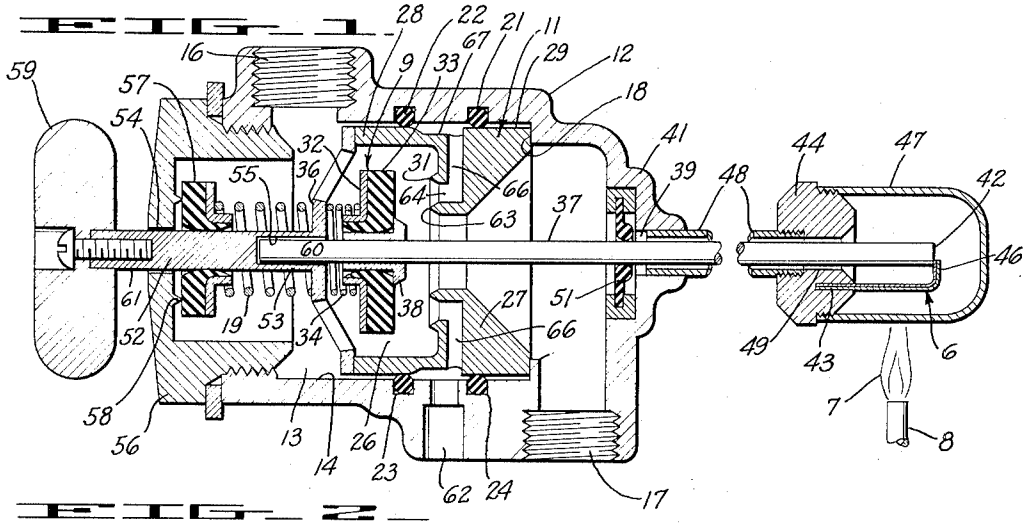


FIG. 2

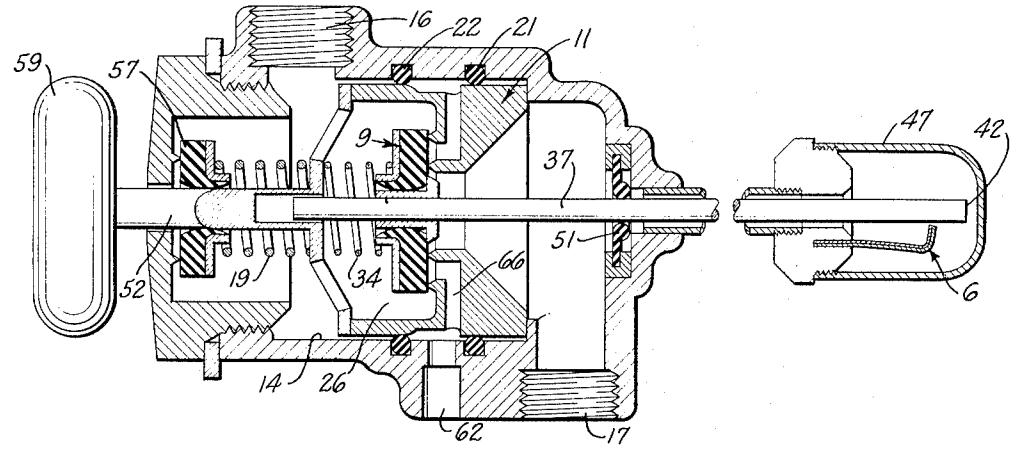
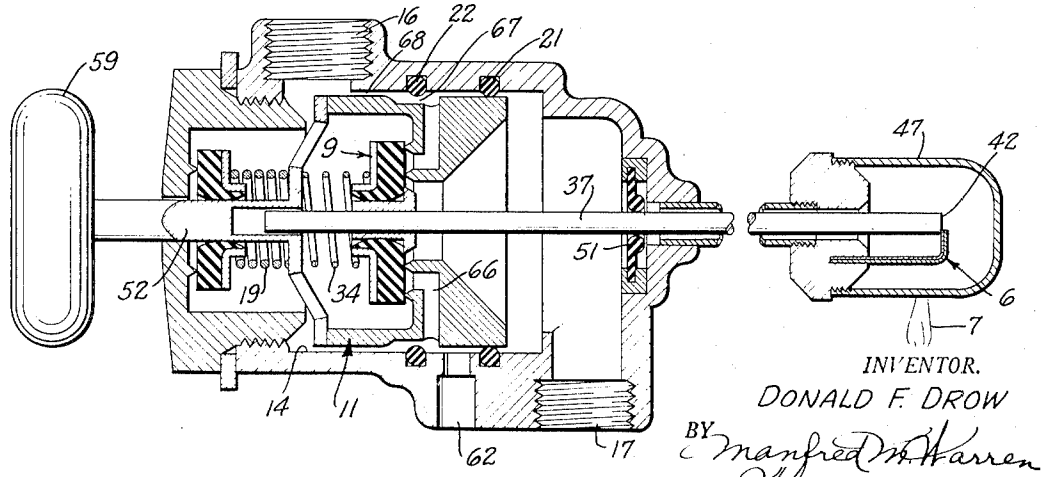


FIG. 3



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PILOT OPERATED SAFETY VALVE FOR HEAT APPLIANCE

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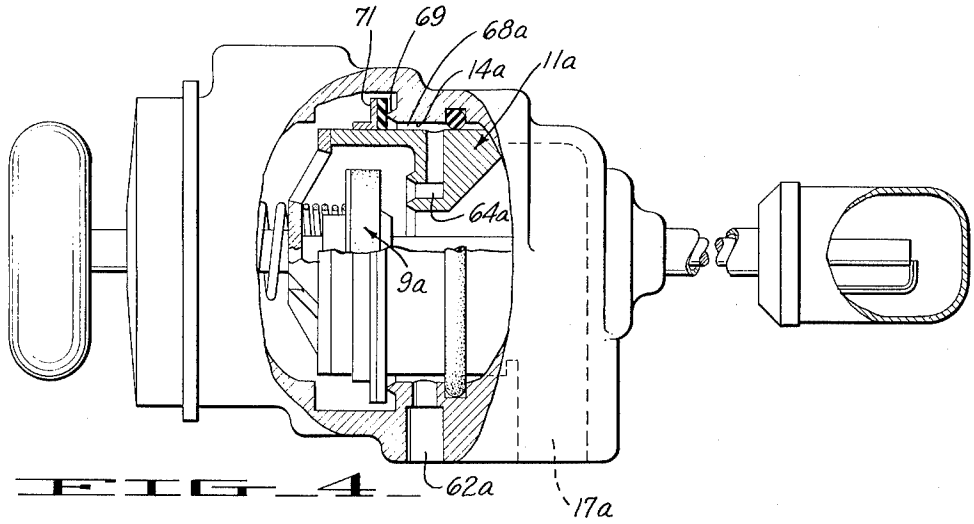


FIG. 4

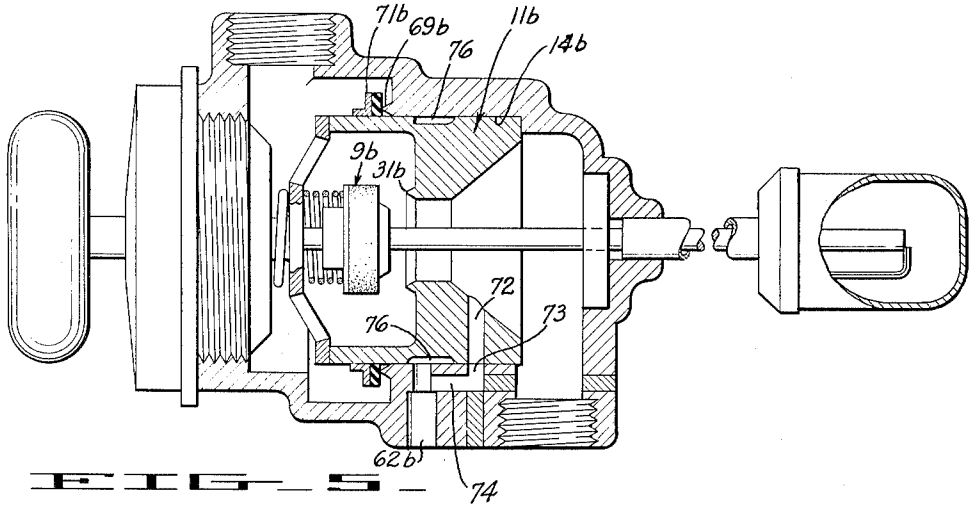


FIG. 5

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PILOT OPERATED SAFETY VALVE FOR HEAT APPLIANCE

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Application August 7, 1951, Serial No. 240,703

8 Claims. (Cl. 158—138)

The invention relates to thermostatically controlled valves and more particularly to the type designed for use with a pilot burner of a heat appliance for controlling the flow of fuel to the main burner of such appliance and functioning automatically to shut off such flow on extinguishing of the pilot burner flame. Pilot safety valves of the character described fall into two general categories: self-setting on re-establishing of the pilot flame, or manual resetting. The present invention relates to the latter type.

The manual resetting type of safety valve includes a thermostatic latch or holding means adapted when energized by the pilot burner to hold a valve member in open position against the resistance of a valve closing spring. Thus on extinguishing of the pilot flame, the thermostat means releases the valve for closing under spring action. When the pilot flame has been properly re-established and the thermostat means re-energized, the valve may be opened by a manual reset means which is operated to displace the valve to open position where it is again caught and held by the energized thermostatic means. In this resetting operation, it is important that the flow of fuel to the main burner be prevented. Various arrangements for accomplishing this have been evolved in the art and safety valves which incorporate this feature are normally referred to as "safe lighting." Customarily such devices have relied upon an interlocking relationship and operation of a plurality of series of connected valves. An object of the present invention is to provide an improved form of safe lighting structure in a pilot operated safety valve wherein the multiplicity of valves heretofore required has been eliminated.

Another desirable feature of pilot operated safety valves of the character described is an arrangement wherein the flow of fuel to the pilot burner is shut off at the same time that the flow of fuel to the main burner is cut off on extinguishing of the pilot flame. Devices which include this feature are generally referred to as "100%." Another object of the present invention is to provide a pilot operated safety valve of the character described above which is additionally adapted to and may be readily constructed to provide 100% operation.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the same drawings and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawings:

Figure 1 is a longitudinal cross-sectional view of a pilot operated safety valve constructed in accordance with the present invention. The view shows the valve parts in normal operating position.

Figure 2 is similar to Figure 1 but showing the valve

parts in closed position on extinguishing of the pilot flame.

Figure 3 is a view similar to Figure 1 but showing the position of the parts during the resetting operation.

Figure 4 is a side elevational view of a modified form of the invention and is shown with portions broken away to illustrate parts in longitudinal section.

Figure 5 is a longitudinal sectional view of a further modified form of the invention.

The pilot operated safety valve of the present invention and as depicted in the accompanying drawings consists briefly in the combination with a thermostat latch or holding means 6 responsive to the flame 7 of a pilot burner 8 arranged additionally for ignition of the main burner (not shown) of a heat appliance, of valve and valve seat members 9 and 11 arranged in a valve housing 12 inserted in the fuel line to the main burner, and being moveable to and from each other to provide closed and open fluid flow conditions, and being jointly moveable in closed position to permit manual resetting of the mechanism while preventing the flow of fuel to the main burner.

The several parts are conveniently mounted in or associated with the housing 12 which is provided with a valve chamber 13 connected at spaced points along a wall 14 thereof to a source of fuel and to the main burner respectively. The valve seat member 11 is formed for sliding connection to the chamber wall and for longitudinal reciprocation thereon between terminal positions as illustrated in Figures 2 and 3, and is normally urged by a helical spring 19 to one terminal position against an interior shoulder 18 provided in the chamber adjacent to discharge passage 17. Preferably the member 11 is of generally cylindrical form as is also the interior wall 14 of the chamber so as to provide a desired sliding connection therebetween, and if desired and as here shown one or more sealing rings 21 and 22 may be mounted between the external periphery of member 11 and the wall 14 for insuring a seal. In the present mechanism the wall 14 is provided with annular recesses 23 and 24 in which are mounted O-rings which extend from the recess and into engagement with the outer periphery of member 11. The member 11 is preferably of hollow or ring or sleevelike form so as to provide axially and centrally through the length of the member a fuel passage 26 normally connecting the inlet and discharge passages 16 and 17. Provided in the passage 26 intermediate the opposite ends 28 and 29 of the member, is an internally projecting flange or section 27 which is formed with an annular knife-edge seat 31 arranged for engagement with the valve member 9 for shutting off the flow of fuel through passage 26 and consequently to the main burner.

The valve 9 is preferably of disk form and here includes a backing member 32 having secured to one face thereof a layer 33 of compressible valve face material such as rubber, neoprene or the like adapted for sealing engagement with the valve seat 31. Normally the valve member is constantly urged to the seat 31 by means of a helical spring 34 mounted between the backing plate 32 and a spider member 36 mounted across the end 28 of the valve seat member 11. In the present construction the valve is guided axially to and from the seat 31 by a centrally or axially positioned rod 37 supported for reciprocation centrally through the valve seat and being fixed to the valve member by a tubular fastening member 38.

The rod 37 projects through an opening 39 provided in one end wall 41 of the valve body and from the body for operation by the thermostatic means 6. The latter, as above noted, is of the latch or holding type and functions when energized to engage the outer end 42 of the rod and to hold the valve 33 in spaced or open position with

respect to seat 31 against the resilient resistance of spring 34, and functioning further when de-energized (upon extinguishing of the pilot flame) to release the rod end 42 for closing of the valve by its closing spring 34. Various forms of thermostatic latch or holding means are available in the art including electromagnet means, energized by a thermocouple heated by the pilot burner; rod and tube members constructed of materials of different co-efficients of heat expansion; bi-metal elements; and the like. The latter form is illustrated in the accompanying drawing, but it will be understood that the mechanism may be adapted for use with any of the customary thermostat latch or holding means used in pilot operated safety valves. In the present construction the thermostat 6 consists of an elongated bi-metal strip which is secured at one end 43 to a base 44 having a fixed position with respect to the valve housing 12, and projects therefrom generally parallel to the rod 37 and is provided with a substantially right-angle hook portion 46 at its opposite end which may swing to and across the end face 42 of the rod. The bi-metal strip is so arranged as to flex when heated in the direction of the rod and to flex away from the rod when cool. Preferably the bi-metal element is protected from direct impingement by the pilot flame and sealed off from the products of combustion by means of an envelope 47 secured to the base 44. The base 44 is supported in fixed relation to the valve casing 12 by means of a tube 48 which is secured to the casing end 41 in the opening 39 and projects therefrom in surrounding relation to rod 37 and is secured at its opposite end in an opening 49 provided centrally through the base 44. A more detailed disclosure of the bi-metal thermostatic latch means here illustrated may be found in Jenkins Patent 2,322,520, dated June 22, 1943. Preferably the fuel, such as gas or the like, is prevented from flowing from the valve chamber through the tube 48 and into the envelope 47. As here shown there is provided for this purpose a sealing ring 51 which is mounted at the end wall 41 to the casing in surrounding sliding sealed engagement with the rod 37.

After the valve 9 closes, as above explained, the device may be placed back in operation by first establishing the pilot flame so as to heat thermostat 6, following which the valve may be displaced to a thermostatically caught position by what is normally referred to as a resetting means. Ordinarily in such resetting operation, the valve is moved to open position and thus fuel is permitted to pass to the main burner during the resetting operation. In order to avoid this fuel passage and thus render the device "safe lighting," it has been customary to incorporate a second valve on the upstream side of the thermostatically controlled valve and which second valve is closed during the resetting operation. Various arrangements for obtaining of interlocking relationship and operation of the two valves have been used. In the present construction and as a principal feature thereof, the use of such second upstream valve and attendant interlocking and/or co-acting mechanisms have been completely avoided by using the seat 31 to displace the valve 9 to reset position so that during the reset operation the valve will be closed on its seat. This is accomplished in the present construction by making the valve seat moveable in the direction of opening and closing of the valve, that is axially as viewed in the drawings, by the slidable mounting of the valve seat member 11 as above described, and by attaching to the seat member 11 a reset member 52 which projects from the casing for manual engagement and displacement. As here shown, the member 52 is a generally rod-like shape secured at its inner end 53 centrally to the spider member 36 and extending axially therefrom through an opening 54 provided in a closure plug 56 conveniently threaded into an open end of the valve chamber through which the valve parts may be assembled. Preferably the end portion 53 is formed with an axial bore 55 for slidably supporting the inner portion 60 of the rod 37. In order to effectively seal off the opening 54 around the reset rod 52, a valve 57 may be secured to the rod 52 for movement to a knife-edge seat 58 provided in the closure surrounding the opening 54. Conveniently the valve 57 additionally provides a rest for one end of the helical spring 19 which has its opposite end supported on the spider member 36 thereby normally urging valve 57 against seat 58, and valve seat 11 to its terminal position against shoulder 18. A knob 59 is preferably provided on the outer end 61 of the reset rod 52 to facilitate manual engagement and displacement. As will be seen from Figures 2 and 3, the manual grasping and outward pulling of knob 59, will, in the closed position of the valve 9, pull the valve seat outwardly, that is, to the left as viewed in the drawings to a second terminal position and in this movement, the valve will be picked up and displaced by the seat thereby carrying the attached rod 37 to reset position as illustrated in Figure 3. In this movement of the reset means, spring 19 is compressed while spring 34 remains unaffected. Upon releasing of the reset knob 59 from its outward reset position, the valve will be held constant with respect to the valve casing while spring 19 returns the valve seat member 11 to its first terminal position against shoulder 18, thereby opening the valve and compressing spring 34 as illustrated in Figure 1. In this connection it will be noted that spring 19 is stronger than and will overpower spring 34.

In order to obtain 100% operation in the above described safe lighting construction, the pilot fuel is normally taken on the downstream side of seat 31 so that on closing of valve 9, pilot fuel will be shut off along with fuel flow to the main burner. Accordingly, in the present device means is provided for the flow of fuel in bypassing relation around the valve 9 and its seat during the resetting operation when fuel flow to the pilot must be had. As here shown, the casing 12 is provided with a pilot fuel passage 62 which opens to the interior wall 14 between the inlet and discharge passage 16 and 17 and between the two sealing rings 21 and 22 for the valve seat member 11. Also a second knife-edge seat 63 is provided by member 11 internally of and concentric to and in a common plane with valve seat 31 so as to simultaneously engage valve 9 with seats 31 and 63. An annular groove or passage 64 is formed between the seats 31 and 63 and connects with one or more radially extending passages 66 formed in member 11 which open to an annular recess 67 in the outer periphery of member 11 in communication with pilot passage 62. The fuel for the pilot burner thus normally flows from the valve chamber through passages 64 and 66 to the fuel passage 62 when the valve 9 is in open position as illustrated in Figure 1. Fuel flow to the pilot burner is shut off by the closing of valve 9 by the simultaneous engagement of this valve with seats 31 and 63 as shown in Figure 3. During the resetting operation, however, the outwart displacement of the valve member 11 places the recess 67 in registration with sealing ring 22 as shown in Figure 3, thereby permitting fuel flow from the inlet passage 16 past the periphery of member 11 to the recess 67 and thence to the pilot passage 62. In this connection, it will be noted that the sealing ring 22 is positioned, and the parts are so dimensioned as to locate the recess 67 at the sealing ring 22 in the reset position, and the outside diameter of the member 11 is sufficiently smaller than the internal diameter of wall 14 as to provide a passage 68 from the inlet passage 16 to the recess 67 during the resetting operation as illustrated in Figure 3.

The operation of the device illustrated in Figures 1–3 of the drawing is as follows. The normal operating (open) position of the valve mechanism is illustrated in Figure 1. It will be noted that seat member 11 is pressed to its right-hand terminal position (as viewed in the drawing) and valve 9 is held generally to its left terminal position by reason of the caught engagement of the thermostat with the outer end 42 of rod 37 to which

the valve is attached, it being further noted that in this position spring 34 is under compression. Upon extinguishing of the pilot flame 7 and the cooling of the thermostat element 6, the rod end 42 is released as illustrated in Figure 2 thereby permitting valve 9 to snap closed under the action of spring 34, thus shutting off fuel flow to the main burner and to the pilot burner. To re-establish operation, the knob 59 is manually grasped and pulled outwardly, that is to the left as viewed in the drawings, thus carrying with it the valve seat member 11 and valve 9 to the terminal resetting position illustrated in Figure 3 when the outer end 42 of the rod 37 is positioned for latching by the thermostat element 6. In this position of the parts, fuel for the pilot burner will flow from the inlet passage 16 through passage 68 and recess 67 to the pilot passage 62, when the pilot burner may be ignited. In this position of the parts, flow of fuel to the main burner is prevented by reason of the closed position of valve 9 and the sealing action of ring 21. After the pilot flame has been properly re-established, the thermostat 6 will re-engage the rod end 42 thereby holding valve 9 in its left terminal position. Upon releasing of reset knob 59, spring 19 will then displace the seat member 11 to its first (right) terminal position so as to open the valve 9 as illustrated in Figure 1, and in so doing will overpower and compress spring 34.

A modified form of the invention is illustrated in Figure 4 of the drawings wherein the sealing ring 22 contained in the embodiment illustrated in Figures 1–3 is replaced by an annular knife-edge valve seat 69 formed by the chamber wall 14*a* for engagement with an annular valve member 71 carried by and surrounding the valve seat member 11*a*. In the normal position of the member 11*a*, the valve 71 is seated upon the valve seat 69 thus sealing off the auxiliary pilot passage 68*a* around the member 11*a* and also defining the first (right) terminal position for the member 11*a*. In other respects the construction of the valve mechanism is the same as in the embodiment illustrated in Figures 1–3. Thus in the normal open position of the valve 9*a*, as illustrated, fuel flow is confined to around the valve 9*a* and into pilot passage 64*a* and through the central passage of the member 11*a* to the discharge passage 17*a* of the unit. In resetting the device, the valve member 11*a* is pulled to the left, as viewed in the drawing, in the same manner as in the first described embodiment, thus opening valve 71 from its seat 69 and permitting the flow of pilot fuel through passage 68 to the pilot passage 62*a*.

A further modified form of the invention is illustrated in Figure 5 of the drawing wherein 100% and safe lighting features are obtained without the use of a double valve seat such as seats 31 and 63 in the first described embodiment. In the device as illustrated in Figure 5, valve member 9*b* is mounted to co-act with a single valve seat 31*b* provided by the moveable seat member 11*b* to control the flow of fuel to both the main burner and the pilot burner. In the normal position of the device, pilot fuel is taken from the downstream side of seat 31*b* by way of a radial passage 72 provided in member 11*b* and registering with a port 73 in the chamber wall 14*b* and this port 73 is communicated by a passage 74, in the body of the casing, back to the pilot passage 62*b*. If desired and as here shown valve 71*b* and seat 69*b*, of the type illustrated in Figure 4, may be used to seal off the flow of fuel between the outer periphery of member 11*b* and the interior chamber wall 14*b*. Thus in the closed position of valve 9*b* the fuel is shut off to both the main burner and the pilot burner. To reset the device, the seat member 11*b* is displaced, to the left in the same manner as in the first embodiments, thus opening valve 71*b* and positioning a recess 76 provided in the outer periphery of member 11*b* in communication with the valve chamber at the upstream side of seat 69*b*, the length of the recess being such as to extend from such position to the pilot port 62*b* and thus bypass pilot fuel around the closed valve 9*b* during the reset operation. In this reset position, it will be noted that passage 72 is moved out of registration with port 73 and the latter is closed off by the periphery of member 11*b* so as to prevent the flow of fuel from the pilot passage 62*b* to the downstream side of valve seat 31*b*.

I claim:

1. A valve mechanism for controlling the flow of fuel to the main and pilot burners of a heat appliance comprising, a valve housing formed with a valve chamber defined in part by an internal cylindrical wall and formed with inlet and discharge passages opening to said chamber at spaced positions along said wall and adapted for connection to a source of fuel and the main burner of a heat appliance respectively, said housing being formed with a third fuel passage opening through said wall to said chamber at a position between said inlet and discharge passages and being adapted for connection to the pilot burner of said appliance, a valve seat member having an internal transverse wall thereacross provided with a fuel opening and a valve seat surrounding said opening and being formed with a hollow sleeve portion having one end extending from said transverse wall in the direction of said inlet passage, said sleeve portion being slidably mounted for reciprocation between terminal positions on said wall in sealed engagement therewith between said inlet passage and said outlet passage, spring means normally urging said member to a first terminal position, a spider member connected across said end of said hollow sleeve portion, actuator means connected to said spider member and extending therefrom through said housing for manual engagement for displacement of said valve seat member to a second terminal position against the resistance of said spring means, a valve mounted interiorly of said hollow sleeve portion and between said spider member and said seat for movement to and from said seat, second spring means compressed between said valve and spider member for urging said valve to said seat, thermostatically controlled means adapted to be responsive to said pilot burner and engageable with said valve for holding said valve in open position against resistance of said second spring means when said valve seat member is in its first terminal position and adapted to function on extinguishing of said pilot burner to release said valve for closing by said second spring means, said valve being movable by and with said seat upon displacement of said valve seat member to its second terminal position so as to position said valve for engagement with said thermostatically controlled means, and cooperating valve and seat means provided by said chamber wall and said valve seat member between said inlet and pilot passages for admitting fuel flow to said pilot in said second terminal position and preventing said flow in said first terminal position.

2. In a pilot operated safety valve mechanism for a heat appliance having a main burner ignited by a pilot burner, a housing formed with a valve chamber defined in part by an internal cylindrical wall and formed with inlet and discharge passages opening to said chamber at spaced positions along said wall and adapted for connection to a source of fuel and said main burner respectively and a third passage opening through said wall to said chamber intermediate said inlet and discharge passages and adapted for connection to said pilot burner, a sleeve shaped member slidably mounted for reciprocation between terminal positions on said wall in sealed engagement therewith between said pilot passage and said outlet passage and having a peripheral wall spaced from said chamber wall between said pilot passage and said inlet passage to define a fourth passage therebetween, said member being formed with a pair of internally arranged concentric valve seats and with a fifth passage extending from between said seats to said peripheral wall of said sleeve member into communication with said fourth passage, spring means normally urging said mem-

ber to a first terminal position, actuator means connected to said member and extending from said housing for manual engagement for displacement of said member to a second terminal position against the resistance of said spring means, a valve mounted for movement into simultaneous engagement with said concentric valve seats to shut off flow from said inlet passage to said outlet and fifth passages, second spring means carried by said member and normally urging said valve to said seats, thermostat means adapted to be responsive to said pilot burner and engageable with said valve for holding said valve in open position against the resistance of said second spring means when said member is in first terminal position and adapted to function upon extinguishing of said pilot burner to release said valve for closing against said seats by said second spring means, and an O-ring mounted in one of said walls defining said fourth passage between said inlet and pilot passages and extending across said fourth passage into sealing engagement with the other of said walls when said sleeve member is in said first terminal position, said last named wall being formed with a groove positioned for registration with said O-ring when said sleeve member is in said second terminal position so as to permit fuel flow from said inlet passage through said fourth passage to said pilot passage.

3. In a pilot operated safety valve mechanism for a heat appliance having a main burner ignited by a pilot burner, a housing formed with a valve chamber defined in part by an internal cylindrical wall and formed with inlet and discharge passages opening to said chamber at spaced positions along said wall and adapted for connection to a source of fuel and said main burner respectively and a third passage opening through said wall to said chamber between said inlet and discharge passages and adapted for connection to said pilot burner, a valve seat member having an internal transverse wall thereacross provided with a fuel opening and a valve seat surrounding said opening and being formed with a hollow sleeve portion having one end extending from said transverse wall in the direction of said inlet passage, said sleeve portion being slidably mounted for reciprocation between terminal positions on said wall in sealed engagement therewith between said pilot passage and said outlet passage and being spaced from said wall between said pilot passage and said inlet passage to define a fourth passage therebetween, spring means normally urging said valve seat member to a first terminal position, a spider member connected across said end of said hollow sleeve portion, actuator means connected to said spider member and extending therefrom through said housing for manual engagement for displacement of said valve seat member to a second terminal position against the resistance of said spring means, a valve mounted interiorally of said hollow sleeve portion between said spider member and said seat for movement into engagement with said valve seat to shut off flow from said inlet passage to said outlet passage, second spring means carried by said valve seat member and normally urging said valve to said seat, thermostat means adapted to be responsive to said pilot burner and engageable with said valve for holding said valve in open position against the resistance of said second spring means when said valve seat member is in first terminal position and adapted to function upon extinguishing of said pilot burner to release said valve for closing against said seat by said second spring means, said chamber wall being formed with an internal valve seat arranged in said fourth passage, and said member being formed with an external valve face arranged in said fourth passage and positioned to engage said last named seat in said first terminal position to shut off flow through said fourth passage and to lie in spaced relation to said seat in said second terminal position so as to permit flow through said fourth passage.

4. In a pilot operated safety valve mechanism for a heat appliance having a main burner ignited by a pilot burner, a housing having an internal wall defining a valve chamber and formed with inlet and discharge passages opening to said chamber and adapted for connection to a source of fuel and said main burner respectively and a third passage opening to said chamber between said inlet and discharge passage and adapted for connection to said pilot burner and a fourth passage opening to said wall on the downstream side of said third passage and connected to said third passage, a sleeve shaped member slideably mounted for reciprocation on said wall in covering relation to said third and fourth passages, said member being formed with an internally arranged valve seat and with a fifth passage extending radially from a point on the discharge side of said valve seat into registration with said fourth passage in a first terminal position of said sleeve member, spring means normally urging said member to said first terminal position, actuator means connected to said member and extending from said housing for manual engagement and displacement of said member to a second terminal position against the resistance of said spring means, a valve mounted for movement into engagement with said valve seat to shut off flow from said inlet passage to said discharge and fifth passages, second spring means carried by said sleeve member and normally urging said valve to said seat, thermostat means adapted to be responsive to said pilot burner and engageable with said valve for holding said valve in open position against the resistance of said second spring means when said member is in first terminal position and adapted to function upon extinguishing of said pilot burner to release said valve for closing against said seat by said second spring means, and a recess in the outer surface of said sleeve member formed and arranged to provide communication between said third and inlet passages when said sleeve member is in said second terminal position.

5. In a safety valve of the character described, a housing formed with a valve chamber and provided with inlet and outlet passages opening thereto and arranged for connection to a source of fuel and the main burner of a heat appliance, said housing being formed with a pilot passage opening to said chamber between said inlet and outlet passages, a valve seat member mounted for sliding reciprocation in sealed relation in said chamber intermediate said inlet and outlet passages and being formed with a fuel opening therethrough and a valve seat surrounding said opening, a valve member mounted for movement to and from said valve seat to provide closed and open flow positions between said inlet and outlet passages and being jointly movable with said seat member between first and second terminal positions in said chamber, thermostat means adapted to be responsive to a flame at a pilot burner of said appliance to hold one of said members in said second terminal position and to release such member from such position upon extinguishing of the flame of said pilot burner, reset means connected to the other of said members and projecting from said housing for manual engagement and displacement for effecting joint movement of said members to said second terminal position, spring means urging said last named member to said first terminal position thereby normally maintaining said members in open flow position while said thermostat means is operated by said pilot flame and urging said members to closed position upon release of said thermostat means on extinguishing of said pilot burner, and cooperating valve and seat means provided by said housing and said valve seat member between said inlet and pilot passages for admitting fuel flow to said pilot in said second terminal position and preventing said flow in said first terminal position.

6. In a safety valve of the character described, a housing formed with a valve chamber and provided with inlet and outlet passages opening thereto and arranged for connection to a source of fuel and the main burner of a heat appliance, said housing being formed with a

pilot passage opening to said chamber between said inlet and outlet passages, a valve seat member mounted for sliding reciprocation in sealed relation in said chamber intermediate said inlet and outlet passages and across said pilot passage and being formed with a fuel opening therethrough and a valve seat surrounding said opening, a valve member mounted for movement to and from said valve seat to provide closed and open flow positions between said inlet and outlet passages and being jointly movable with said seat member between first and second terminal positions in said chamber, thermostat means adapted to be responsive to a flame at a pilot burner of said appliance to hold one of said members in said second terminal position and to release such member from such position upon extinguishing of the flame of said pilot burner, reset means connected to the other of said members and projecting from said housing for manual engagement and displacement for effecting joint movement of said members to said second terminal position, spring means urging said last named member to said first terminal position thereby normally maintaining said members in open flow position while said thermostat means is operated by said pilot flame and urging said members to closed position upon release of said thermostat means on extinguishing of said pilot burner, said seat member providing a sleeve valve action closing said pilot passage in said first terminal position and being formed to pass fuel from said inlet passage to said pilot passage in said second terminal position.

7. A safety valve for controlling the flow of fuel to the main and pilot burners of a heat appliance comprising, a housing formed with a valve chamber and inlet and outlet passages opening thereto and adapted for connection to a source of fuel and said main burner respectively, said housing being formed with a pilot fuel passage to said chamber between said inlet and outlet passages, a valve seat member mounted for sliding reciprocation in sealed relation in said chamber intermediate said inlet and outlet passages and formed with a fuel opening therethrough and a valve seat surrounding said opening, a valve member mounted for movement to and from said valve seat to provide closed and open flow positions between said inlet and outlet passages and being jointly movable with said seat member between first and second terminal positions in said chamber, thermostat means adapted to be responsive to said pilot burner to hold said valve member in said second terminal position and to release said valve member for return to said first terminal position upon extinguishing of said pilot burner, manually engageable reset means connected to said valve seat member and formed for manual displacement for effecting joint movement of said members to said second terminal position, spring means urging said valve seat member to said first terminal position thereby normally maintaining said members in open position while said valve member is held in said second position by said thermostat means, and cooperating valve and seat means provided by said housing and said valve seat member between said inlet and pilot passages for admitting fuel flow past said valve seat member to said pilot in said second terminal position and preventing such flow in said first terminal position, said valve seat member being formed to provide a passage for fuel from the downstream side of said valve seat to said pilot passage while in said first terminal position and to close off said last named passage while in said second terminal position.

8. In a safety valve of the character described, a housing formed with a valve chamber defined in part by an internal wall and provided with inlet and outlet passages opening to said chamber and adapted for connection to a source of fuel and the main burner of a heat appliance, a valve seat member having an internal transverse wall provided with a fuel opening and a valve seat surrounding said opening and being formed with a hollow sleeve portion having one end extended from said transverse wall in the direction of said inlet passage, said sleeve portion being slidably mounted for reciprocation between terminal positions on said wall in sealed engagement therewith between said inlet and outlet passages, spring means normally urging said member to a first terminal position, a spider member connected across said end of said hollow sleeve portion, actuator means connected to said spider member and extending therefrom through said housing for manual engagement and displacement outwardly from said housing to displace said valve seat member to a second terminal position against the resistance of said spring means, a valve member mounted interiorly of said hollow sleeve portion and between said spider member and said seat for movement to and from said seat, second spring means compressed between said valve member and said spider member for urging said valve to said seat, and flame responsive theromostat means adapted to function when flame is present to hold said valve member in open position against resistance of said second spring means when said valve seat member is in its first terminal position and adapted to function upon extinguishing of the flame to release said valve member for closing by said second spring means, said valve member being movable by and with said seat upon displacement of said valve seat member to its second terminal position so as to position said valve for engagement with said thermostat means.

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