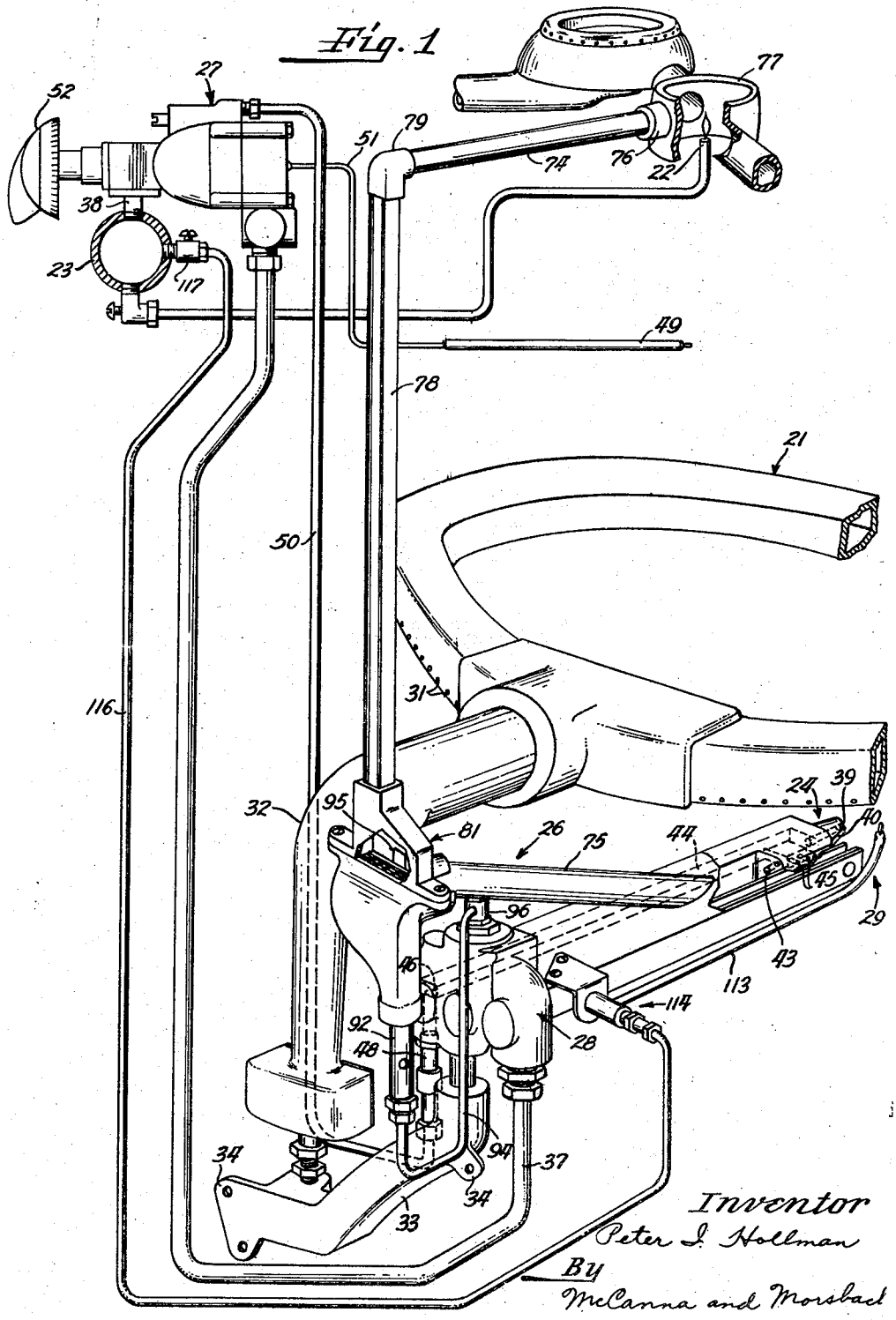
Aug. 25, 1953 P. I. HOLLMAN 2,649,904

MAIN BURNER IGNITION SYSTEM

Filed July 19, 1949 3 Sheets-Sheet 1

Fig. 1



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MAIN BURNER IGNITION SYSTEM

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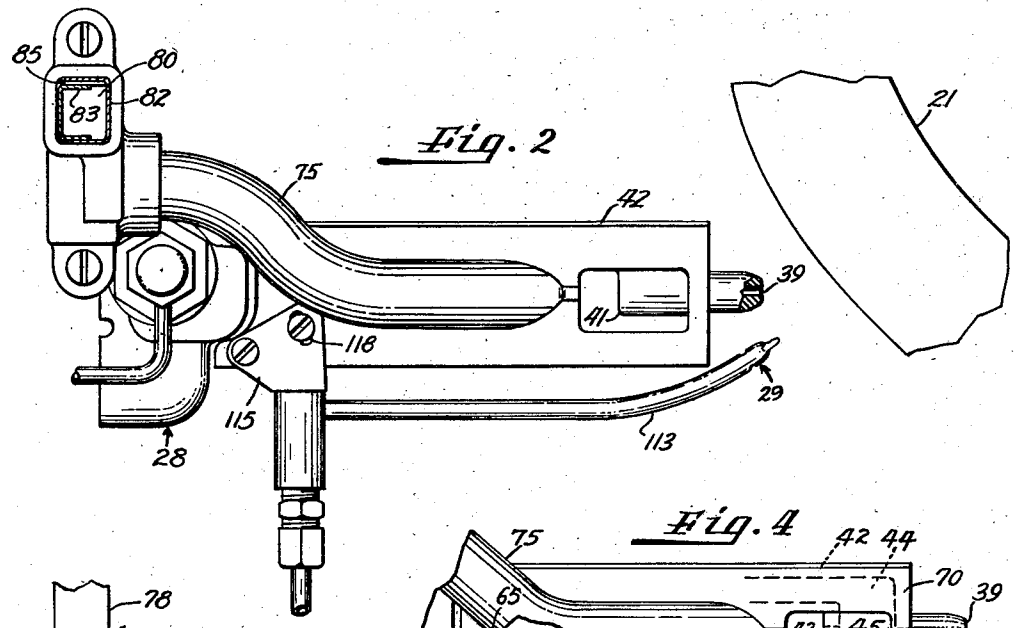


Fig. 2

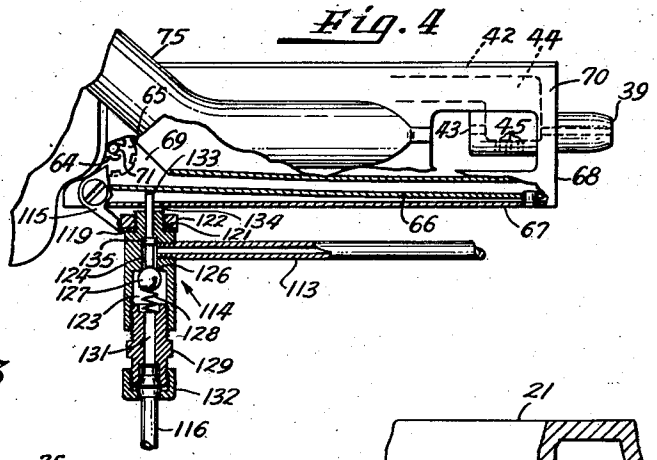


Fig. 4

Fig. 3

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MAIN BURNER IGNITION SYSTEM

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Fig. 5

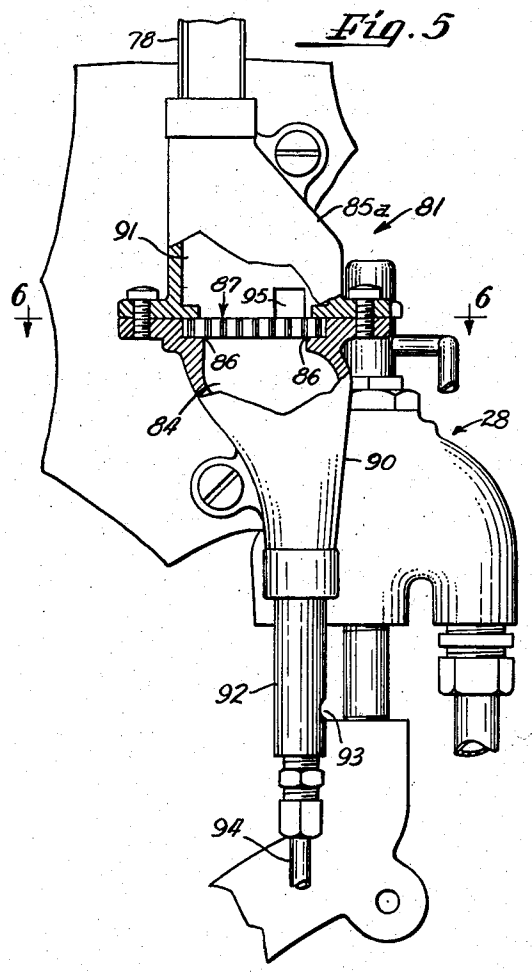


Fig. 6

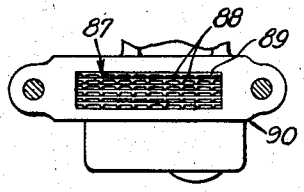


Fig. 7

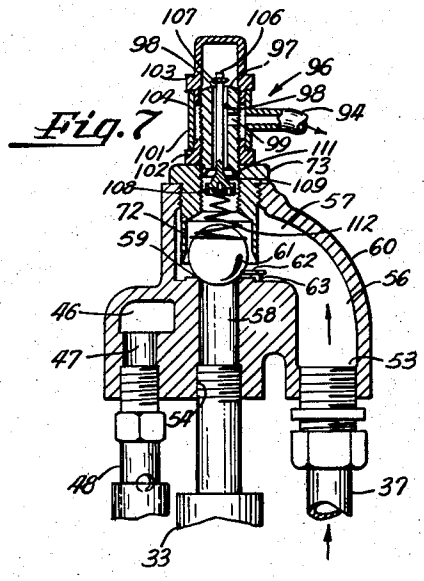
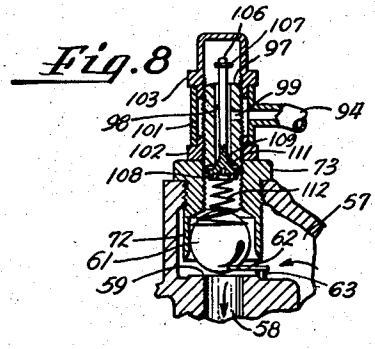


Fig. 8



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Patented Aug. 25, 1953

2,649,904

UNITED STATES PATENT OFFICE

2,649,904

MAIN BURNER IGNITION SYSTEM

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Application July 19, 1949, Serial No. 105,545

3 Claims. (Cl. 158—115)

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This invention relates to burner lighting systems for gas ranges and the like.

Prior burner lighting systems, particularly for oven and broiler burners have not been entirely satisfactory. In some systems a separate constantly burning pilot burner has been supplied for igniting the top burner and the pilot burner adjacent the oven and broiler burners. This is unsatisfactory due to the fact that there is a considerable amount of gas wasted since a supply must be furnished for each constantly burning pilot burner. In other systems while some degree of satisfaction has been obtained in effecting the lighting of burner lighters from a single burner, these systems have required complicated safety valves, thermocouples, and electromagnets. As a consequence these systems have been so expensive that it has been impractical to put such systems commercially on ranges. Another disadvantage of these systems is that they are very difficult to service in the field.

An object of this invention is the provision of a burner lighting system wherein all of the burners on a range may be positively lighted from a single point on the range.

Another object of this invention is to provide an oven burner lighting system on gas stoves or ranges for lighting the oven burner from a pilot burner at the top of the stove, wherein there is provided a novel arrangement for insuring that there is dependable flash ignition down from the top pilot burner to a sub-burner at the level of the oven burner over a wide range of gases.

Another object of the invention is the provision of a system for lighting burners which insures that ignition means are available for lighting the burner during both the initial lighting phases of the main burner and during operation thereof.

Another object of the invention is the provision of a lighting system of the above character with novel means for flashing flame from one pilot burner to another pilot burner disposed in spaced relation to the first pilot burner.

Another object of the invention is the provision of a lighting system for a main burner that is positive in its operation, that is relatively inexpensive to manufacture, that is relatively simple, and that is readily adaptable to any conventional range.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a main burner lighting system embodying the present invention;

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Fig. 2 is a sectional view taken through a part of the flash means showing the sub-burner assembly and the pilot burner means in elevation;

Fig. 3 is a side elevational view of the construction shown in Fig. 2;

Fig. 4 is a fragmentary view similar to Fig. 2 with portions of the parts cutaway to show details of construction;

Fig. 5 is a side elevational view of the sub-burner assembly with portions of the assembly cutaway to show details of construction;

Fig. 6 is a sectional view taken substantially along the line 6—6 of Fig. 5;

Fig. 7 is a sectional view of the safety valve taken substantially along the line 7—7 of Fig. 3 and shows the safety valve in its closed position; and

Fig. 8 is a fragmentary sectional view similar to Fig. 7 showing the safety valve in its open position.

Referring now to Figs. 1–8 the invention is shown embodied in a system for lighting a main burner 21 of a gas range from a constantly burning pilot burner 22 located remotely from the main burner and generally on top of the range. In general the system includes a gas supply such as a manifold 23, pilot burner means 24 mounted adjacent the main burner 21 for lighting the latter, flashback means for igniting the pilot burner means 24 from the constantly burning pilot burner 22, a temperature control and shut-off valve unit 27 for controlling and regulating the flow of gas from the manifold 23 to the main burner 21, a safety valve 28 having an open and a closed position also controlling the flow of gas to the main burner 21 and auxiliary pilot burner means 29 operable to provide a lighting flame adjacent the main burner 21 while the safety valve means 28 is in its open position.

For purposes of illustrating the invention, the main burner 21 is in the form of a generally annular oven burner having peripheral ports 31. The main burner 21 is located beneath a conventional oven, not shown. In view of the fact that this lighting system may be used on any range construction, as will be apparent to those skilled in the art, for purposes of simplification, the details of construction of the range have been omitted. The main burner 21 is connected to the manifold 23. The connection for this purpose includes a mixing tube 32 having one end rigidly affixed to the burner 21. At its opposite end the mixing tube 32 is connected to a conduit 33 having mounting flanges 34 for attaching the conduit to the side wall 36 of an oven as shown in

Fig. 3. The conduit 33 is connected to the safety valve 28 which in turn is connected to a conduit 37 in communication with the temperature control unit 27. As shown the heat control unit is mounted on the manifold 23 to be in communication therewith by a conventional connection 38.

The pilot burner means 24 includes a port 39 formed in a nozzle mounted at one end of a boss 41 on a support arm 42. The support arm 42, in this instance, is rigid with and extends outwardly from the safety valve 28, which is in spaced relation to the main burner 21, to position the port 39 adjacent the burner 21. On the opposite end of the boss 41 is a port 43 facing the safety valve. On the side of the boss 41 away from the support arm the boss is formed with a plurality of ports 45. A flame transmitting slot 40 is formed in the side of the boss 41 between the ports 39 and 45. The ports 39, 43 and 45 are in communication with a passageway 44 formed in the support arm 42 so that when gas issues from the ports and is ignited, the ports 39, 43 and 45 in effect define respectively an ignition pilot burner for lighting the main burner, a pilot burner for lighting the pilot burner and an actuating pilot burner. The opposite end of the passageway 44 is in communication with a passageway 46 in the casing of the safety valve 28 leading to a passageway 47 formed in the left hand side of the body of the safety valve, as shown in Fig. 7. A mixing tube 48 is connected at one end to the safety valve 28 to be in communication with the passageway 47 and at its opposite end to the temperature control unit 27 as shown in Figure 1 through a conduit 50.

The temperature control unit 27 may be of any conventional construction. The unit, as shown herein for purposes of illustration, is of the type disclosed in U. S. Patent 2,303,011, issued November 21, 1942, to which reference may be had for a more detailed description of its construction and mode of operation. In general the unit 27 includes mechanism operable in response to changes in temperatures on a bulb 49 connected to the unit 27 by a capillary tube 51. The bulb 49 may be disposed in any suitable location in the oven in a conventional manner. A control knob 52 mounted on the unit 27 is positioned to extend through the gas manifold cover plate, not shown, to be accessible at the front of the range. The knob 52 is provided for opening and closing the shut-off valve in the unit 27 and for positioning the parts of the control mechanism in the unit to effect a preselected temperature in the oven. Normally the knob 52 is biased outwardly from the cover plate so that the knob must be depressed before it is free to rotate. When the knob 52 is rotated and set for a preselected temperature in the oven the mechanism in the unit 27 is positioned so that gas is permitted to flow through the conduit 50 to the pilot burner means 24 and through the conduit 37 to the safety valve 28.

While any suitable safety valve 28 may be used, as shown herein it comprises a casing 60 having an inlet port 53 and an outlet port 54. The inlet port 53 is in communication with a generally vertically extending passageway 56 formed on the right hand side of the casing of the safety valve 28 as shown in Fig. 7 and terminating in a chamber 57 formed in the upper central portion of the casing of the safety valve 28. The outlet port 54 is in communication with a vertically extending passageway 58 disposed centrally of the casing of the safety valve 28 and

also in communication with the chamber 57. The lands adjacent the passageway 58 on the interior of the casing form a valve seat 59. Disposed in the chamber 57 is a ball or valve element 61. The later is movable between a position in which it seats on the seat 59 to prevent the flow of gas between the inlet and outlet ports 53 and 54 and an open position in which the gas is free to flow between the inlet and outlet ports. The ball 61 is normally biased to its closed position by the effect of gravity. Where desired spring means or the like may be used to cause the ball 61 to normally seat on the valve seat 59. The ball 61 is moved to its open position by a lever 62. The latter is connected at one end to a shaft 63 which projects through the casing 60 of the safety valve 28. The opposite or outer end of the shaft is connected to a lever 64 (see Fig. 4). A thermostatic or thermal strip 66 is mounted adjacent the pilot burner 45 so that when it is lighted it impinges against the thermostatic strip 66 to heat it up causing it to distort and move the lever 64 and in turn unseat the ball 61. As shown the thermostatic strip 66 has a generally channel or U-shaped cross section and is in substantially parallel relation with the arm 42. At one end the strip 66 is riveted, or may be welded as desired, to a bridging portion 67 of a U-shaped member 68, the sides or legs of which straddle the arm 42 to be supported thereby. This construction in effect provides a housing and support 70 for the strip 66. At its opposite end the strip is in spaced relation to the bridging portion 67 and terminates in a flange 69 (see Fig. 4). A pin 71 on the flange is disposed between the arms of the bifurcated end of the lever 64 to provide a driving connection between the thermostatic strip 66 and the lever 64. The pin 71 is eccentrically mounted on a rotatable base 65, suitable secured to the flange 69, so that the position of the pin relative to the lever 64 may be readily adjusted. While heating of the strip 66 by the actuating pilot burner 45 causes distortion of the thermostatic strip to open the safety valve through the levers 62 and 64, it is to be understood, also, that when the actuating pilot burner 45 is extinguished, that the thermostatic strip cools and tends to assume its original position. In so doing the lever 64 is moved to its initial position permitting the ball 61 to seat and thereby cause the safety valve to return to its normally closed position. A ball guide 72 in the form of a cylindrical extension on a bushing 73 in axial alinement with the passageway 58 and threaded into an opening at the top of the casing 60 of the safety valve positions the ball 61 in its movement between its open and closed positions and prevents the latter from becoming displaced when the ball 61 moves to an open position.

One phase of the invention is concerned with novel means for flashing the flame from the constantly burning pilot burner 22 to the pilot burner means 24. As shown in Figure 1 the flashing means includes a generally horizontally disposed tube 74. At one end the tube is supported in a housing 77 encircling the pilot burner 22. A vertically disposed tubular portion 78 is connected to the opposite end of the tube 74 by an elbow 79. A sub-burner assembly 81 is connected to and supports the opposite end of the vertical tubular portion 78. The latter is preferably constructed in a manner disclosed in my copending application, Serial No. 91,373 filed May 4, 1949 now Patent No. 2,605,822. In general it comprises a pair

of U-shaped members 82 and 83 telescoped together (see Fig. 2) to form a central passageway 80 having a passageway 85 in communication with the central passageway 80 to provide an air inlet for introducing air to the gas flowing through the passageway 80. The tube 74 may be either imperforate or constructed in the same manner as the tubular portion 78 described above. An inclined tube 75, is mounted to have one end in communication with the sub-burner assembly and its opposite end mounted on the upper side of the U-shaped member 68 to be disposed adjacent the pilot burner 43.

The sub-burner assembly 81 (see Fig. 5) includes a casing having an upper part 85a and a lower part 90, the parts being provided with flanges for securing them together. The upper part 85a of the casing, in the form of a generally inverted funnel, is closed and has a chamber 91 that tapers from the bottom of the part to the top of the part. At its extreme upper end the upper part 85a of the casing is shaped to receive the lower end of the tubular portion 78. Also as best seen in Figs. 3 and 5 the tube 75 is connected to one side of the upper part 85a of the casing to be in communication with the chamber 91 through an opening 95 formed in a side of the upper part of the casing. The lower part 90 of the casing, as shown in Fig. 5, is formed with a chamber 84 that flares upwardly from the bottom of the part to the top of the part. At the upper end of the chamber 84 the lower part of the casing is formed with shoulders 86 on opposite sides of the chamber to support a ribbon port structure 87. As shown the port structure is formed by a plurality of ribbons 88 having projections 89 on one side. The ribbons are disposed in side by side relation so that the projections 89 of one ribbon abut against the side of the adjacent ribbon and space one ribbon from the other. Thus, as best seen in Fig. 6, this arrangement of the ribbons provides a port structure in which there are a plurality of generally rectangular shaped ports. In general the port structure is constructed and operates in the manner disclosed in application, Serial No. 781,703 of Victor R. Abrams, filed October 23, 1947, now Patent No. 2,627,910. Projecting downwardly from the lower part of the casing is a cylindrical mixing tube 92 having an air inlet passageway 93 in communication with atmosphere. The mixing tube is connected to the manifold 23 through a conduit 94, an auxiliary valve 96 (see Fig. 7) mounted on top of the safety valve 28 and the conduit 37.

As shown in Fig. 7 the valve 96 includes a sleeve 97 threaded into an opening formed in the bushing 73. The sleeve 97 is formed with a generally vertically extending passageway 98 and a transaxial passageway 99 intermediate its ends in communication with the axially extending passageway 98. Encircling the sleeve 97 is an annular or ring member 101. The latter is supported at one end by a spacer 102 threadably mounted on the sleeve and at its opposite end by a combined spacer and cap member 103. The ring member 101, the spacers 102 and 103 and the sleeve 97 define an annular passageway 104 encircling the sleeve 97 in communication with the passageway 99 in the sleeve. The annular passageway 104 is arranged to be in communication with the conduit 94 as best seen in Fig. 7. Slidably disposed in the passageway 98 is a reciprocable member 106. At its upper end is a snap ring 107 positioned to prevent passage of the plunger 106 through the passageway 98. At its lower end the plunger 106 is formed with a head 108. A tapered portion 109 at the lower end of the plunger 106 connects the head 108 with the plunger 106. The lower end of the sleeve 97 is formed with a valve seat 111 against which the tapered portion 109 is shaped to seat. Normally the plunger 106 is in a position shown in Fig. 7 such that the tapered portion 109 is out of engagement with the seat 111. In this position of the parts gas flowing into the safety valve 28 through the conduit 37, the passageway 56 and the chamber 57 flows through the passageway 98, through the transaxial passageway 99, the annular passageway 104 to the conduit 94 and the sub-burner assembly 81. Seating of the tapered portion 109 on the seat 111 in the present instance is effected by upward movement of the ball 61. To this end a coil spring 112 is disposed between the lower end of the plunger 106 and the ball 61 to form a driving connection therebetween. The spring is of such length that in its normal position, such as shown in Fig. 7, the spring 112 rests on the top of the ball 61 and the plunger 106 rests on the upper end of the spring in a position so that the tapered portion 109 is away from the seat 111. The spring 112 in addition to providing a driving connection between the ball 61 and the plunger 106 also provides a lost motion or overtravel connection between the ball 61 and the plunger 106 in the event of misalinement of parts or the like.

The auxiliary or stand-by pilot burner means 29 in the present instance is formed at one end of a tube 113. The latter is in substantially parallel relation to one side of the housing 70. At its outer end the tube curves in the direction of the pilot burner 39 to be adjacent the latter as shown in Fig. 2. At its opposite end the tube 113 is connected to a valve 114 which in turn is connected to the manifold 23 through a conduit 116. A needle valve 117 may be connected in series in the conduit 116 for adjustment purposes.

The valve 114 is supported on the housing 70 by a bracket 115 secured thereto as by screws. For adjustment purposes at least one of the screw holes in the bracket may be in the form of an elongated slot 118 so that the position of the valve 114 relative to the housing 70 may be varied. One end of the casing of the valve 114 is of a reduced cross sectional area to define a shoulder 119 and is threaded. The reduced portion extends through an opening 121 in the bracket and a nut 122 on the opposite side of the bracket to the valve 114 secures the valve to the bracket 115. The valve casing is formed with an axially extending chamber 123. At one end of the casing is a passageway 124 arranged to be in communication with the chamber 123. The passageway 124 is of somewhat smaller cross sectional area than the passageway 123 and thereby defines a valve seat 126 at one end of the chamber 123. Disposed within the chamber is a ball or valve element 127. The latter is movable between a position in which it seats on the seat 126 to close communication between the passageway 124 and the chamber 123 and a position in which the ball 127 is spaced from the seat 126 to permit communication between the passageway 124 and the chamber 123. A spring 128 is disposed between an end of the chamber 123 defined by a bushing 129 and the ball 127 to normally urge the ball into engagement with the seat 126 or its closed position. As shown the passageway 124 is in communication with the tubular member 113. The bushing 129 is formed with an axially extending

passageway 131 in communication with the chamber 123. The conduit 116 is connected to the bushing 129 by a suitable coupling member 132.

Reciprocably mounted in the valve casing is a gland pin 133. The latter extends through the end of the casing as best seen in Fig. 4 and through an opening 134 in the bridging member 67 to be disposed adjacent the free end of the thermostatic strip 66. The opposite end of the plunger abuts against the ball 127. A collar 135 mounted on the gland pin 133 intermediate its ends is engageable with the end wall of the casing through which the passageway 124 extends to prevent accidental withdrawal of the gland pin 133 from the valve casing. The gland pin 133 is shaped so that upon distortion of the thermostatic strip 66 the pin operates to move the ball 127 away from the seat 126. Upon cooling the spring 128 acts to seat the ball 127 and push the pin 133 to its outermost position. It is to be understood that any other suitable valve construction such as a diaphragm valve or the like may be employed in lieu of the valve 114 so long as it has the operating characteristics described herein.

The operation of the aforegoing system is as follows: It is assumed that the parts of the system are in the position shown in Figure 1. The constantly burning pilot burner 22 is lighted and the main burner 21, the pilot burners 39, 43, 45, 29 and the sub-burner 81, are unlighted. The temperature control unit 27 is in its off position and the safety valve 28 is closed. To light the burner 21 the operator of the range initially depresses the control knob 2 and rotates the latter to position the parts of the control unit 27 for a preselected cooking temperature in the oven. As the knob 52 is rotated to its preselected temperature setting the shut-off valve in the temperature control unit 27 is opened. Under these conditions gas flows from the manifold 23 through the temperature control unit 27, the conduit 37 to the inlet port 53 of the safety valve 28. The ball 61 however is in its closed position and gas cannot pass to the burner 21. The tapered portion 109 on the plunger 106 of the auxiliary valve 96 is away from the seat 111 so that the valve is in its open position as shown in Fig. 7 and gas is free to flow from the chamber 57 in the safety valve 28 through the passageway 98, the transaxial passageway 99, the annular passageway 104, the conduit 94, the mixing tube 92, the chamber 84 to the port structure 87. Concurrently with this flow of gas, gas also flows from the temperature control unit 27 through the conduit 50 through the passageways 47 and 46 in the safety valve 28, the passageway 44 in the support arm 42 to the pilot burner 39, to the pilot burner 43 and to the actuating pilot burner 45. Gas flowing from the pilot burner 43 flows into the lower end of the tube 75, through the tube 75 into the upper part 85a of the casing of the sub-burner assembly 81 through the opening 95. This gas mixture together with the gas flowing through the port structure 87 of the sub-burner assembly 81 flows up through the tubular portion 78. In so flowing the gas intermixes with air in the tubular portion 78 entering the latter through the passageway 85. This air-gas mixture then flows through the tube 74 to the pilot burner housing 77. When gas issues from the tube 74 into the housing, the gas ignites and flame flashes back to the port structure 87 on the sub-burner assembly 81. As will be noted with this structure the upper part of the casing is completely enclosed except for the opening 95 leading to the tube 75 and the opening for connection to the tubular portion 78. Thus substantially all the air for the air-gas mixture in the sub-burner is supplied through the opening 93 in the mixing tube 92. This construction provides a substantially 100% primary air burner. While a slight amount of secondary air may be supplied to the sub-burner through the opening 95 in the upper part 85a of the sub-burner casing by way of tube 75 and pilot openings 45 and 39, this secondary air flow is negligible and is in no way essential to successful flash ignition from the top pilot burner 22 down to the sub-burner. Because the sub-burner operates as a substantially 100% primary air burner the flash ignition of the present invention is successful and dependable in operation over a wide range of domestic gases As soon as the flame is esablished at the port structure 87 the flame is flashed from the sub-burner assembly 81 to the pilot burner 43. Concurrently with the lighting of the pilot burner 43 flame is flashed to the actuating pilot burner 45 and in turn to the pilot burner 39 through the slot 40. The flame of the pilot burner 39 is positioned so that it is directed toward the ports 31 of the main burner 21. The flame of the actuating pilot burner 45 is directed against one side of the thermostatic strip 66 so that the heat of the flame causes distortion of the strip 66. Upon heating, the strip 66 moves in a counterclockwise direction of rotation about its riveted end as viewed in Fig. 4. This movement of the strip 66 causes the lever 64 to be moved to rotate the shaft 63 and in turn the lever 62. Rotation of the lever 62 unseats the ball 61, as shown in Fig. 8. With the ball 61 in this position gas flows from the chamber 57 in the safety valve 28 through the passageway 58, the port 54, the conduit 33, the mixing tube 32 to the burner 21 where it issues from the ports 31 and is ignited by the flame on the pilot burner 39.

Concurrently with the unseating of the ball 61 to permit the flow of gas to the main burner 21, the plunger 106 moves upwardly as shown in Fig. 8 so that the tapered portion 109 seats against the seat 111. This closes communication between the chamber 57 and the passageway 98. As a consequence the flow of gas to the sub-burner assembly 81 is stopped. During the movement of the thermostatic strip 66, in response to heat from the flame of the actuating pilot burner 45, it also engages the pin 133 and urges the latter against the ball 127 and moves the ball away from the seat 126. With the ball in this position gas flows directly from the manifold 23 through the conduit 116 through the valve 114, the conduit 113 to the stand-by pilot burner 29. The latter is lighted from the pilot burner 39. During a normal cooking operation, it will be noted that the pilot burner 45 continually heats the thermostatic strip 66 to maintain the latter in its distorted position and the pilot burner 39 and the stand-by pilot burner 29 are in lighting position with the main burner 21.

When the cooking operation is over, the operator of the range returns the knob 52 to its original position. This moves the shut-off valve in the temperature control unit to its closed position. As a consequence the flow of gas through the conduit 37 to the safety valve 28 is stopped. Simultaneously the flow of gas through the conduit 50, the passageways 46 and 47 in the body of the safety valve 28, the passageway 44 to the

pilot burners 39, 43 and 45 is stopped. As soon as the flow of gas to the burners is stopped the burners are extinguished. Due to the fact that there is a certain amount of residual heat in the thermostatic strip 66 and it takes an appreciable length of time for it to cool, the valve 114 is maintained in an open position, since the pin 133 holds the ball away from the seat 126 until the thermostatic strip 66 returns to its normal position. Consequently for a limited period of time after the return of the control knob 52 to its original position gas continues to flow through the conduit 116, the valve 114 to the pilot burner 29 and the flame on the stand-by pilot burner 29 is in lighting proximity with the main burner 21. It will also be noted that during the time required for the thermostatic strip 66 to cool that the safety valve 28 is in an open position since the ball 61 is not permitted to seat until the thermostatic strip 66 returns to its original position. Should the operator of the range for some reason or other desire to relight the main burner 21 immediately after shutting it off, it will be apparent that gas would flow from the gas manifold 23 through the heat control unit 27, the conduit 37, the passageway 56, the chamber 57, the passageway 58, the conduit 33, the mixing tube 32, to the main burner 21. The latter would be ignited by the pilot burner 29. Gas would also flow through the conduit 48, through the passageways 47 and 46, the passageway 44, to the pilot burners 39, 43 and 45. The pilot burner 39 would be lighted from the main burner 21. The actuating pilot burner 45 would be lighted from the pilot burner 39 by propagation of the flame through the slot 40. The pilot burner 43 would also be ignited by flashing of the flame from the actuating pilot burner. It is to be understood that since the valve 96 (controlling flow of gas to the sub-burner assembly 81) is closed, the lighting system would not go through its cycle of flashing back from the constantly burner pilot burner 22 as described hereinbefore. Without the above mentioned stand-by pilot 29 gas would flow to the open burner 21 without being ignited as long as the safety valve 28 is in the open position.

In the event that the control knob 52 is returned to its off position for a length of time, sufficient to allow the thermostatic strip 66 to cool and return to its normal position, the valve 114 closes since the spring 128 urges the ball 127 into engagement with the valve seat 126 as soon as the thermostatic strip returns to its original position. When the valve 114 closes, the supply of gas to the pilot burner 29 is stopped and the flame extinguished. Thereafter should the control knob 52 be turned again to some preselected temperature setting for a cooking operation the lighting system will go through its complete cycle of operation as described hereinbefore including the flashing of the flame from the constantly burning pilot burner 22 to the sub-burner assembly 81 and the pilot burners 39, 43 and 45.

It is obvious that there are many advantages with this system. As pointed out above, the flash ignition down from the pilot burner 22 at the top of the stove to the sub-burner is dependable over a wide range of gases because the sub-burner operates as a substantially 100% primary air burner. It is positive in its action. During the initial lighting of the oven burner 21 the pilot burner 39 is lighted and lights the burner 21 and should the pilot burner 39 fail, the pilot burner 29 is available for lighting purposes. The pilot burner 29 thus in effect is a standby pilot burner. Thus, there is a pilot burner flame in lighting proximity with the main burner 21 during all cycles of operation of the system. Consequently it is impossible for large quantities of combustible gas to collect in the oven to provide an explosive mixture at some stage in the lighting cycle. The system is inexpensive to manufacture and is readily adaptable for any gas range employing main burners remotely located with respect to the constantly burning pilot burner 22. This system also eliminates the need of more than one constantly burning pilot burner; consequently this system is inexpensive to operate. It is possible to make a number of changes in the system. For example in some instances, depending on gas characteristics and the like, the sub-burner assembly 81 may be replaced by a conventional burner operating as a substantially 100% primary air burner. While the thermal or thermostatic strip 66 performs a number of functions herein it could be replaced by a number of thermally responsive devices each performing a single function.

While in the foregoing description and in the accompanying drawings there is disclosed a specific preferred embodiment of the present invention, it is to be understood that various modifications, omissions and refinements departing from the disclosed form of the invention may be resorted to without departing from the spirit and scope of the present invention.

I claim:

1. In a burner lighting system, the combination of a constantly burning pilot burner, a main burner remotely located with respect to the constantly burning pilot burner and arranged to be connected to a source of fuel, first pilot burner means in lighting relation to said main burner, a substantially 100% primary air burner in spaced relation to the main burner, flashback means between the constantly burning pilot burner and the substantially 100% primary air burner, flashback means between the substantially 100% primary air burner and the first pilot burner means, and means for supplying gas to said substantially 100% primary air burner and said first pilot burner means to flash flame from the constantly burning pilot burner to the first pilot burner means.

2. In a burner lighting system, the combination of a constantly burning pilot burner, a main burner located below said constantly burning pilot burner arranged to be connected to a source of fuel, first pilot burner means in lighting proximity with said main burner, a substantially 100% primary air burner below said constantly burning pilot burner and spaced laterally of the main burner, flash tube means including a downwardly extending portion between the constantly burning pilot burner and the substantially 100% primary air burner, flash tube means between the substantially 100% primary air burner and the first pilot burner means, and means for supplying gas to said substantially 100% primary air burner and said first pilot burner means to flash flame from the constantly burning pilot burner to the substantially 100% primary air burner and thence to the first pilot burner means.

3. In a burner lighting system, the combination of a constantly burning pilot burner, a main burner located below said constantly burning pilot burner arranged to be connected to a source of fuel, first pilot burner means in igniting rela-

tion to said main burner, a substantially 100% primary air burner below said constantly burning pilot burner in igniting relation to said first pilot burner means and spaced laterally of the main burner, flash tube means including a downwardly extending portion between the constantly burning pilot burner and the substantially 100% primary air burner, and means for supplying gas to said substantially 100% primary air burner and said first pilot burner means to flash flame from the constantly burning pilot burner to the substantially 100% primary air burner and to ignite the first pilot burner means from the substantially 100% primary air burner.

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