

June 13, 1939.

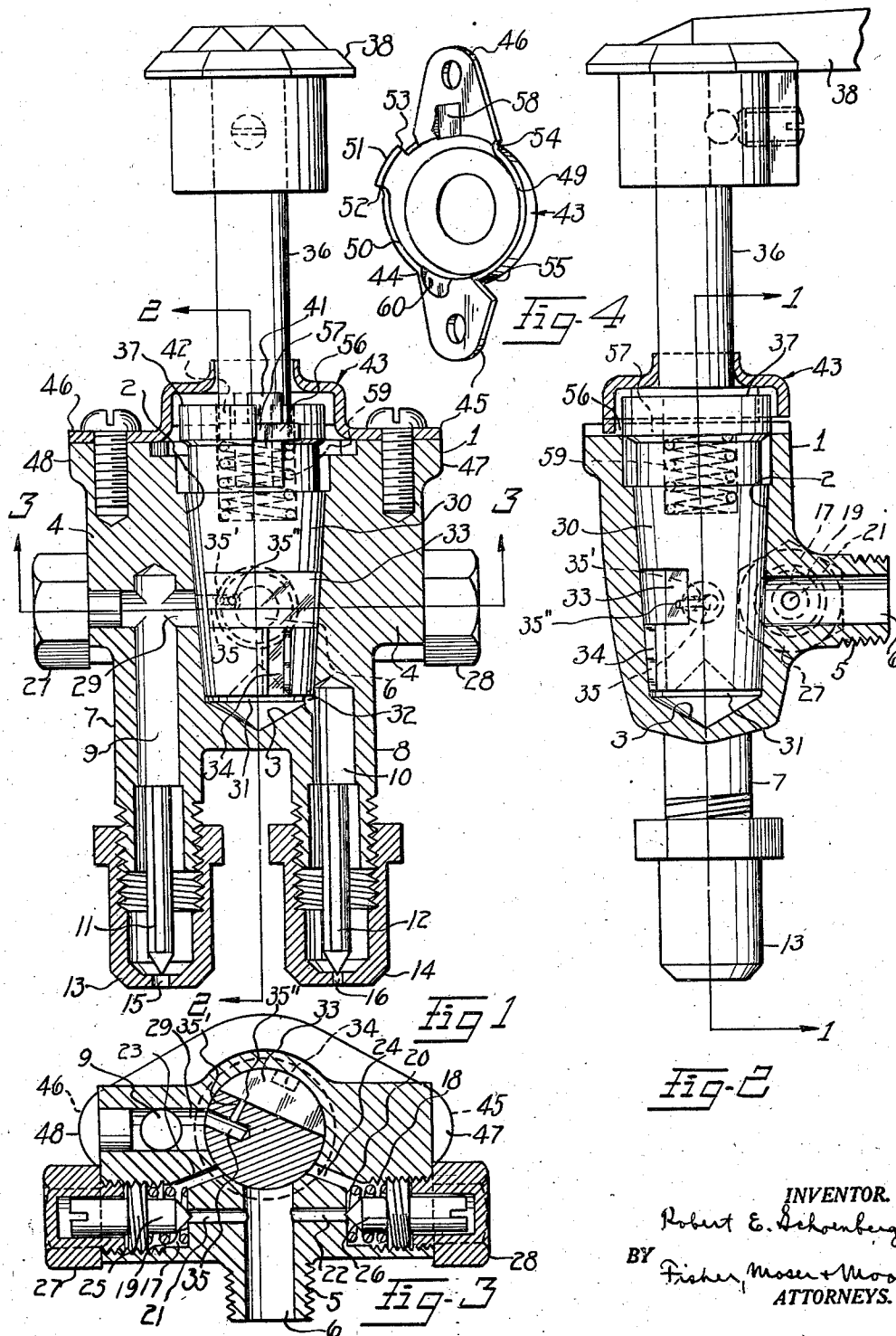
R. E. SCHOENBERGER

DOUBLE BURNER VALVE

Filed May 20, 1938

2,162,233

2 Sheets-Sheet 1



June 13, 1939.

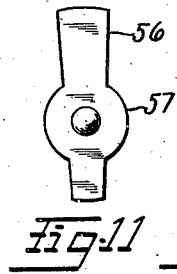
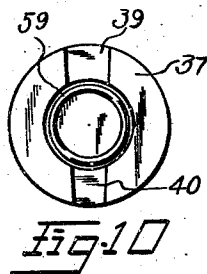
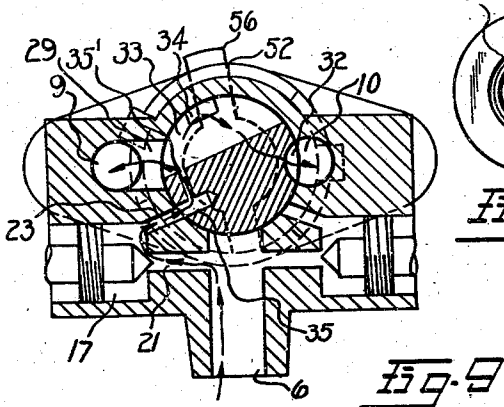
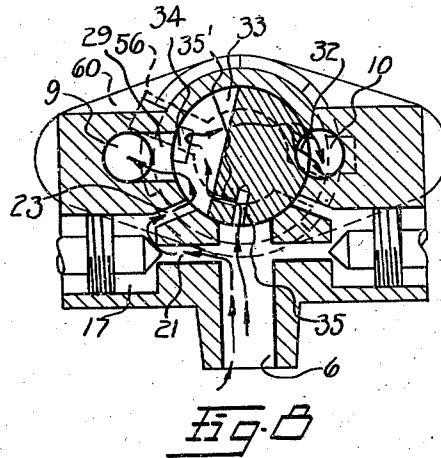
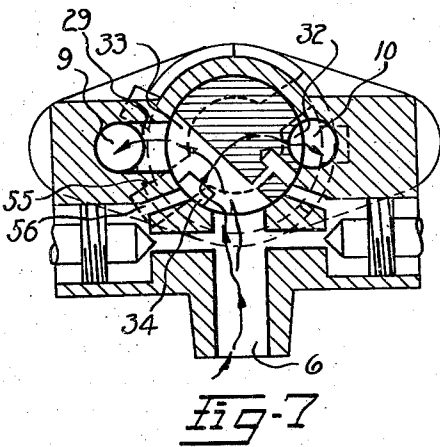
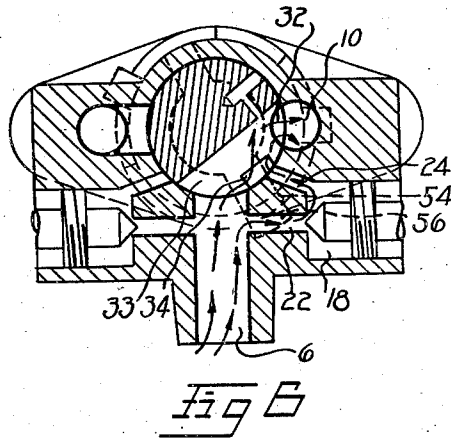
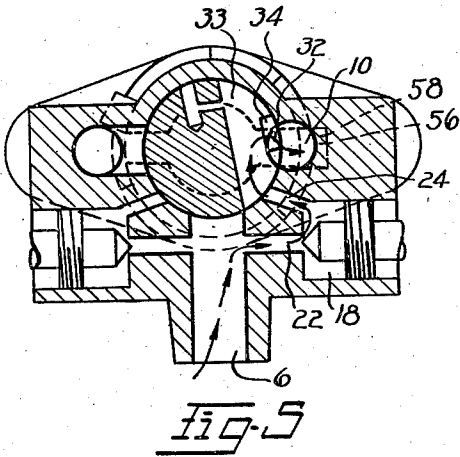
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,162,233

DOUBLE BURNER VALVE

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Application May 20, 1938, Serial No. 209,122

5 Claims. (Cl. 251-105)

The invention relates to gas valves for controlling the flow of gas to a combined simmer and main burner for gas ranges and the like.

An object of the invention is to provide a simply constructed economical and efficient valve having five operative positions, namely, a low simmer position in which a reduced supply of gas, sufficient for supporting maximum low flame requirements at the simmer burner, is delivered to the simmer burner; a high simmer position in which the simmer burner receives the full or maximum supply of gas for high flame requirements; a full simmer and full main burner position in which both burners receive a sufficient flow of gas to satisfy maximum full flame requirements; a low simmer and low main position in which a maximum flow of gas for simultaneously supporting maximum low or intermediate cooking flame at both burners is supplied to the respective burners and finally a position in which the reduced volume of gas supplied to both burners in the low simmer position is further reduced to a point where it will merely keep the flame alive for warming purposes.

Other objects and advantages of the invention will be apparent as the description is read in connection with the accompanying drawings, in which:

Figure 1 is a partial plan view and section taken on line 1-1 of Figure 2, showing the body of valve cut away to expose the gas passages;

Figure 2 is a side view partly in section on line 2-2 of Figure 1;

Figure 3 is a section through the valve taken on line 3-3 of Figure 1;

Figure 4 is a bottom perspective view of the locking cap showing the stop positions for the lock washer during normal valve operations;

Figure 5 is a diagrammatic sectional view of the valve taken on line 3-3 of Figure 1 showing operative passages for gas in low simmer position, the flow of gas being indicated by arrows;

Figure 6 is a diagrammatic sectional view of the valve taken on line 3-3 of Figure 1 showing operative passages for gas in full simmer position;

Figure 7 is a diagrammatic sectional view of the valve taken on line 3-3 of Figure 1 showing operative passages for gas in full simmer and main burner position;

Figure 8 is a diagrammatic sectional view of the valve taken on line 3-3 of Figure 1 showing operative passages for gas in simmer and main burner medium flame position;

Figure 9 is a diagrammatic sectional view of the valve taken on line 3-3 of Figure 1 showing

operative passages for gas in simmer and main burners in very low flame position;

Figure 10 is a top plan view of valve showing tapered slots for receiving the lock washer and valve stem lugs;

Figure 11 is a plan view of the lock washer or key; and

Figure 12 is a section through the valve stem showing the valve operating lugs.

Having more particular reference to the drawings my improved valve comprises a housing or casing 1 having therein a plug receiving bore 2, which extends inwardly from the open outer end of the casing to the bottom wall 3 thereof. Projecting downwardly and centrally from a transversely extending enlargement 4, integrally formed on the under side of the casing 1 is a threaded nipple 5, adapted for mounting the valve preferably in a horizontal position on the upper portion of a gas manifold, not shown, and whereby a supply of gas for the valve housing is obtained through the vertically disposed gas supply passage 6, for feeding the burners, also not shown, however it will be understood that the valve may be supported in any desired position.

Projecting inwardly or rearwardly from the inner end of the housing or casing 1, on opposite sides of the longitudinal axis of the bore 2, are two screw threaded parallel nipples 7 and 8 for connection with the respective main and simmer burners. The gas outlet passages 9 and 10 through these nipples are provided with fixed needle valves 11 and 12 which cooperate with adjustable threaded and perforated caps 13 and 14, for regulating the volume of gas which may flow through the cap perforations or orifices 15 and 16 to the usual mixing tubes, not shown.

The transversely extending enlargement 4 is formed with opposed pockets or chambers 17 and 18 on opposite sides of and aligned with the main gas supply nipple 5. Extending inwardly through the bottom walls 19 and 20 of these respective pockets are a pair of straight axially aligned by-pass passages 21 and 22 which place the chambers 17 and 18 in communication with the main gas supply passage 6. A second pair of angularly disposed short by-pass passages 23 and 24 extend from the respective pockets to the bearing surface of the bore 2. Needle valves 25 and 26 screwing into the pockets or chambers 17 and 18 are employed to restrict the size of by-passes 21 and 22, thus regulating the amount of gas which may flow through these passages. Under certain stabilized gas conditions it might be practical to permanently restrict the by-pass passages 21

and 22 to the desired extent thus making it possible to eliminate the needle valves. Caps 27 and 28 which close the pockets 17 and 18 to the atmosphere, also enclose the needle valves and prevent unauthorized tampering after the valves have been adjusted. The by-pass passages 23 and 24 and the main gas inlet passage 6 all open into the bore 2, in a substantially common plane and in the same plane with a short transverse outlet passage 29, leading from the bore 2 to the passage 9 of nipple 7 which services the main burner.

A tapered plug 30 adapted to be snugly but rotatably received in the bore 2, of the casing 1, with its inner end spaced from the bottom wall 3 of the bore provides a space or chamber 31, in the lower end of the bore 2, which communicates with the outlet passage 10 leading to the simmer burner through a passage 32 formed in the bottom wall 3, of chamber 31. The plug valve is formed with a transverse slot or passage 33 cut in the side thereof and a longitudinally disposed slot or passage 34, which places the space or chamber 31 in the inner end of bore 2, in communication with each other in all positions of the plug. The plug is also formed with an angularly disposed passage 35, in the plane of transverse passage 33, and leading from the periphery of the plug adjacent one end of passage 33 through an inlet orifice 35' and to an outlet orifice 35'' in the bottom wall of cross slot 33. The transverse passage 33 and by-pass passage 35 in the plug valve are adapted to be brought into register with one or more of the casing passages 6, 23, 24 and 28 when the plug is rotated to its respective positions. The passage 35 which only functions in the last or maximum low main and simmer burner position, has approximately double the capacity of either of the restricted passages 21 or 22, and the latter in turn of course have much less capacity than the main gas supply passage.

In operation the plug valve 30 is manually rotated by means of a valve stem 36 having its inner end extending into and interengaging with a hollow extension 37 formed on the outer end of the plug, the stem being provided with an operating handle 38 rigidly attached thereto by any suitable fastening means. Hollow extension 37 is formed with two oppositely arranged slots 39 and 40 of different width to slidably receive finger portions 41 and 42, integrally formed on the inner end of stem 36 when the latter is partly inserted within the hollow extension. The finger portions are proportioned to fit the slots 39 and 40 and are of different width to insure proper assembly.

A flanged apertured cap member 43 sleeved over the valve stem is formed with a depending flange 44 having apertured ears 45 and 46, which seat upon and are secured to laterally extending apertured lugs 47 and 48, formed on the outer end of the casing 1 and in spaced relation to the end face thereof. The downwardly facing portion of the flange 44 is formed with a cut away portion or recess 49 between the ears 45 and 46, and the upwardly facing portion of the flange has a cut away portion or recess 50 and an extension 51 adjacent one side of ear 46. Opposite sides or ends of extension 51 serve as stop shoulders 52 and 53 and opposite end walls of recess 49 likewise provide stop shoulders 54 and 55 for halting rotations of the valve at certain positions, when the elongated arm 56 of a lock washer or plate 57, is slidably but non-rotatably seated within the hollow extension 37, of the casing 1 and in

engagement with the slots or recesses 49 and 50. The arm 56 is of a size to fit snugly but slidably in slot 39 to engage and ride over the edge of flange 44.

When the valve is in off or inactive position arm 56 of locking plate or washer 57 is in engagement with stop shoulder 53 and can only be rotated in an anti-clockwise direction. Upon rotation in this direction until the arm 56, registers with a cam recess 58 formed in ear 46 of cap 43, a coil spring 59, seated in hollow extension 37 of plug 30, forces the arm 56 into this recess thus latching the valve in its first active position and in which a reduced supply of gas is supplied to the simmer burner as shown in Figure 5. Further anti-clockwise movement of the valve to its second position causes the lock plate to snap into recess 49, as shown in Figure 6, where it is held against reverse movement by the shoulder 54, except that when the stem is manually moved in an axial direction by pressing on handle 38 and the lock washer is thus moved out of recess 49, the washer will clear shoulder 54 and the valve movement can be reversed. In this second active position a full supply of gas is received by the simmer burner. If the anti-clockwise rotation of the valve is continued until arm 56 engages shoulder 55, the valve will be in position to deliver a full or maximum supply of gas to both burners. In order to rotate the valve to its fourth position, as shown in Figure 7, in which there is a reduced flow of gas to both main and simmer burners, it is necessary to move the stem axially and disengage the arm 56 from shoulder 55 to permit further anti-clockwise movement during which movement the arm 56 will ride over the inner face of ear 45 until the arm is halted by snapping into a cam recess 60 formed in this ear, as shown in Figure 8. Further and final anti-clockwise movement is possible without the necessity of manually moving the stem in an axial direction, because the arm 56 will ride out of the cam recess 60 against the tension of spring 59. This movement continues until arm 56 is stopped by the shoulder 52, at which time the valve will have reached its fifth and final position, as shown in Figure 9, and the intermediate or reduced flow of gas to both burners will be cut down still further to a point just sufficient to maintain a flame for food warming purposes.

There are, as previously stated, five active positions, namely, low simmer only, high simmer only, high main and simmer, intermediate main and simmer and low simmer and main positions respectively. In the fifth or final position the supply of gas is only just sufficient to prevent the flame at both burners from going out whereas in the fourth or intermediate position sufficient gas is received at both burners to support low cooking flames. In the first position the casing outlet 29 to the main burner is closed by the plug and the cross slot 33 is out of register with main gas supply passage 6. However the slot 33 does register with angular by-pass passage 24, thus permitting a portion of the gas from main inlet passage 6 to flow through straight by-pass passage 22 into pocket 18 and thence out through angular by-pass 24 to cross slot 33. From cross slot 33 this reduced volume of gas flows down through the longitudinal slot 34 in the plug to chamber 31 in the bottom of casing bore 2 and finally out through passage 32 to and through simmer burner outlet passage 10. The size of by-passes 22 and

and 24 is just sufficient to supply a maximum flow of gas for low simmer burner cooking.

In the second position of the valve the cross slot 33 is moved into register with the main supply passage 6 and a full volume of gas will flow directly into the cross slot and down through longitudinal slot 34 to chamber 31 and thence to the simmer burner.

Further anti-clockwise rotation of the plug to its third position will cause the cross slot to register at opposite ends with the main gas supply passage 6 and with the transverse passage 29, thus permitting a full flow of gas to outlet passage 9 leading to the main burner. At the same time a portion of the gas flowing in through supply passage 6, will flow through longitudinal passage 34 in the plug valve 30, to the chamber 31 and thence through passage 32 to outlet passage 10 leading to the simmer burner. A full supply of gas is thus simultaneously received by both burners.

In the fourth position of the valve plug the inlet end 35' of by-pass passage 35, registers with angular by-pass passage 23 and the cross slot 33 remains in communication with outlet passage 29. The reduced flow of gas to the main burner is thus through by-pass passage 35, cross slot 33, outlets 29 and 9, and to the simmer burner the flow is through longitudinal slot 34 to chamber 31 and thence through passages 32 and 10. Valve plug by-pass passage 35 has sufficient capacity to deliver the maximum amount of gas to support a low cooking flame at both burners, whereas casing by-pass passages 22 and 24 are only of sufficient size to carry enough gas to support a maximum low cooking flame at the simmer burner only. In other words passage 35 in the plug is about double the capacity of simmer by-pass passages 22 and 24.

Still further rotation of the valve plug to the fifth and final position will move the by-pass passage 35 in the plug out of register with supply passage 6 and into communication with the casing by-pass passage 23, leading from the pocket 17. The flow of gas to both burners will now be drawn down or reduced to the minimum supply of gas which will support a flame, because the capacity of casing by-pass passages 21 and 23 is only approximately one half that of plug by-pass 35. Consequently only half the amount of gas required to maintain both burners on a low or intermediate cooking flame at both burners is received by the burners in the final or fifth position. The flow is from main supply passages 6 through straight by-pass 21 to pocket 17, thence through angular casing by-pass 23 to plug by-pass 35 and finally to both burners as in the other positions.

Having thus described the invention, what I claim is:

1. A gas range valve for a double burner comprising a casing with a plug receiving bore having an end wall, a plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber, said casing having a first outlet passage leading from said gas chamber to one burner, said casing having a second outlet passage leading from the plug receiving bore to the other burner, a main gas supply passage leading through the casing to said bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted by-pass passage of substantially equal capacity, leading from said main gas supply passage, said casing having separate by-pass passages leading

from the plug receiving bore to the respective pockets, said plug having a cross slot opening into the bearing surface of said plug receiving bore, a by-pass passage leading from said slot adjacent one end thereof and opening through the bearing surface of the plug, said by-pass in said plug having a substantially greater capacity than that of either of said restricted by-passes in said casing, a substantially longitudinally disposed slot in the plug communicating at opposite ends with said transverse slot and said gas chamber, such that in one rotary position of the plug a reduced volume of gas may flow from the gas supply passage through one of said restricted by-passes into one of said pockets and thence through the said cross slot and longitudinal slot to and through the gas chamber to said first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such that in a second rotary position a full volume of gas may flow directly from the gas supply through said slots to said gas chamber and to said first outlet passage, and such that in a third position of the plug a full volume of gas may flow from the gas supply through the cross slot to the second outlet passage and from the cross slot through the substantially longitudinally disposed slot to the gas chamber and thence to the first outlet passage, and such that in a fourth position a reduced volume of gas may flow from the gas supply passage through the cross slot by-pass passage in the plug to and through said cross slot to said second outlet passage, a portion of the gas delivered to said cross slot flowing through said longitudinal slot to said gas chamber and to said first outlet passage, and such that in a fifth position of the plug a still further reduced volume of gas may flow from the gas supply passage to one of said pockets and thence through the by-pass in the plug to said cross slot and thence to said second outlet, a portion of the gas delivered to said cross slot flowing into the gas chamber through the longitudinal slot and thence to said first outlet passage, and means for rotating the plug.

2. A gas range for a double burner comprising a casing with a plug receiving bore having an end wall, a solid plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber, said casing having a first outlet passage leading from said gas chamber to one burner, said casing having a second outlet passage leading from the plug receiving bore to the other burner, a main gas supply passage leading through the casing to said bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted by-pass passage of substantially equal capacity, leading from said main gas supply passage, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having connecting slots communicating with the said bore and gas chamber, a by-pass leading from one of said slots and opening through the bearing surface of the plug, such that in one rotary position of the plug a reduced volume of gas may flow from the gas supply passage through one of said restricted by-passes into one of said pockets and thence through said slots to and through said gas chamber to said first outlet passage, and such that in a second position a full volume of gas may flow directly from the gas supply through said slots to said gas chamber and to said first out-

let passage, and such in a third position of the plug a full volume of gas may flow from the gas supply through one of said slots to the second outlet passage and from said last mentioned slot to the gas chamber and thence to the first outlet passage, and such that in another position a reduced volume of gas may flow from the gas supply passage through the by-pass passage in the plug to one of said slots and thence to said second outlet passage, a portion of the gas delivered to said slot flowing to said gas chamber and to said first outlet passage, and such that in another position of the plug a still further reduced volume of gas may flow from the gas supply passage to the other of said pockets and thence through the by-pass in the plug to one of said slots and thence to said second outlet, a portion of the gas delivered to said slot flowing into the gas chamber and thence to said first outlet passage, and means for rotating the plug.

3. A gas range for a double burner comprising a casing with a plug receiving bore having an end wall, a solid plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber, said casing having a first outlet passage leading from said gas chamber to one burner, said casing having a second outlet passage leading from the plug receiving bore to the other burner, a main gas supply passage leading through the casing to said bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted by-pass passage of substantially equal capacity, leading from said main gas supply passage, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having connecting slots communicating with the said bore and gas chamber, a by-pass leading from one of said slots and opening through the bearing surface of the plug, such that in one rotary position of the plug a reduced volume of gas may flow from the gas supply passage through one of said restricted by-passes into one of said pockets and thence through said slots to and through said gas chamber to said first outlet passage, and such that in another position of the plug a full volume of gas may flow from the gas supply through one of said slots to the second outlet passage and from said last mentioned slot to the gas chamber and thence to the first outlet passage, and such that in another position a reduced volume of gas may flow from the gas supply passage through the by-pass passage in the plug to one of said slots and thence to said second outlet passage, a portion of the gas delivered to said slot flowing to said gas chamber and to said first outlet passage, and such that in another position of the plug a still further reduced volume of gas may flow from the gas supply passage to the other of said pockets and thence through the by-pass in the plug to one of said slots and thence to said second outlet, a portion of the gas delivered to said slot flowing into the gas chamber and thence to said first outlet passage, and means for rotating the plug.

4. A gas range valve for a double burner comprising a casing with a plug receiving bore having an end wall, a plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber, said casing having a first outlet passage leading from said gas chamber to one burner, said casing having a second outlet passage leading from the plug receiving bore

to the other burner, a main gas supply passage leading through the casing to said bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted by-pass passage of substantially equal capacity, leading from said main gas supply passage, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having a cross slot opening into the bearing surface of the said plug receiving bore, a by-pass passage leading from said slot adjacent one end thereof and opening through the bearing surface of the plug, said by-pass in said plug having substantially double the capacity of either of said restricted by-passes in said casing, a substantially longitudinally disposed slot in the plug communicating at opposite ends with said transverse slot and said gas chamber, such that in one rotary position of the plug a reduced volume of gas may flow from the gas supply passage through one of said restricted by-passes into one of said pockets and thence through the said cross slot and longitudinal slot to and through the gas chamber to said first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such that in another position of the plug a full volume of gas may flow from the gas supply through the cross slot to the second outlet passage and from the cross slot through the substantially longitudinally disposed slot to the gas chamber and thence to the first outlet passage, and such that in another position a reduced volume of gas may flow from the gas supply passage through the cross slot by-pass passage in the plug to and through said cross slot to said second outlet passage, a portion of the gas delivered to said cross slot flowing through said longitudinal slot to said gas chamber and to said first outlet passage, and such that in another position of the plug a still further reduced volume of gas may flow from the gas supply passage to the other of said pockets and thence through the by-pass in the plug to said cross slot and thence to said second outlet, a portion of the gas delivered to said cross slot flowing into the gas chamber through the longitudinal slot and thence to said first outlet passage, and means for rotating the plug.

5. A gas range valve for a double burner comprising a casing with a plug receiver bore having an end wall, a plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber, said casing having a first outlet passage leading from said gas chamber to one burner, said casing having a second outlet passage leading from the plug receiving bore to the other burner, a main gas supply passage leading through the casing to said bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted by-pass passage of substantially equal capacity, leading from said main gas supply passage, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having a cross slot opening into the bearing surface of the said plug receiving bore, a by-pass passage leading from said slot adjacent one end thereof and opening through the bearing surface of the plug, said by-pass in said plug having substantially double the capacity of either of said restricted by-passes in said casing, a substantially longitudinally disposed slot in the plug communicating at opposite ends with said transverse slot and said gas chamber,

such that in one rotary position of the plug a reduced volume of gas may flow from the gas supply passage through one of said restricted by-passes into one of said pockets and thence
5 through the said cross slot and longitudinal slot to and through the gas chamber to said first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such
10 that in another position of the plug a full volume of gas may flow from the gas supply through the cross slot to the second outlet passage and from the cross slot through the substantially longitudinally disposed slot to the gas chamber and

thence to the first outlet passage, and such that in another position a reduced volume of gas may flow from the gas supply passage through the cross slot by-pass passage in the plug to and through said cross slot to said second outlet passage, a portion of the gas delivered to said cross slot flowing through said longitudinal slot to said gas chamber and to said first outlet passage, and such that in another position of the plug a still further reduced volume of gas may flow from the gas supply passage to both burners.

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