

June 13, 1939.

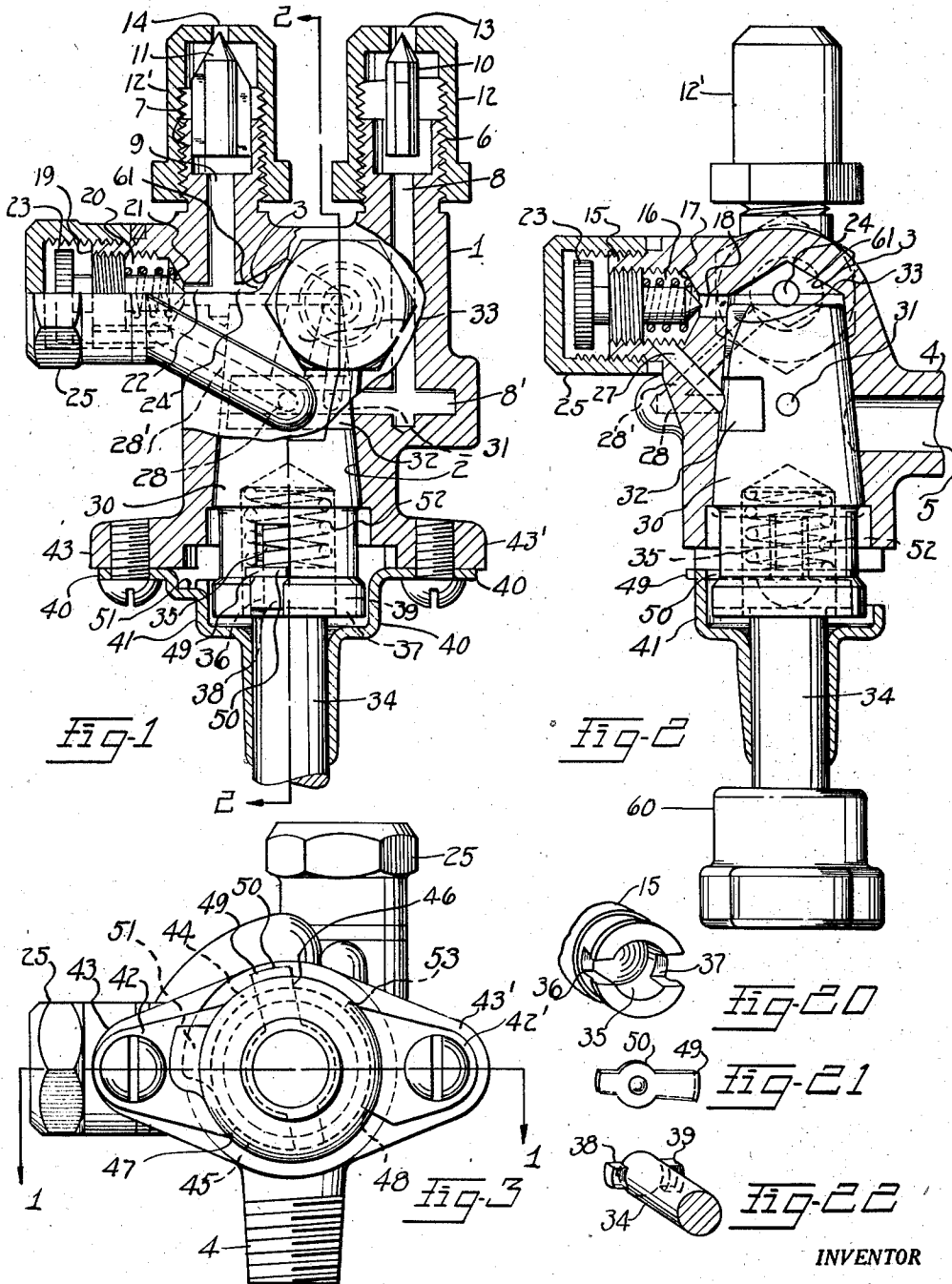
R. E. SCHOENBERGER

2,162,231

GAS VALVE

Filed April 20, 1938

2 Sheets-Sheet 1



INVENTOR

BY *R. E. Schoenberger*
Fisher, Moore & Moore
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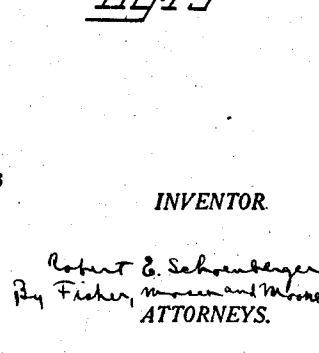
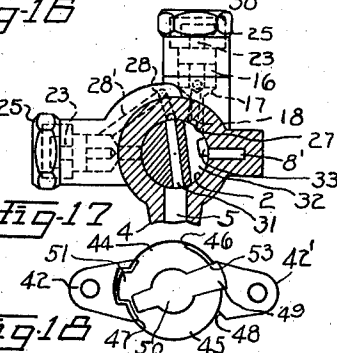
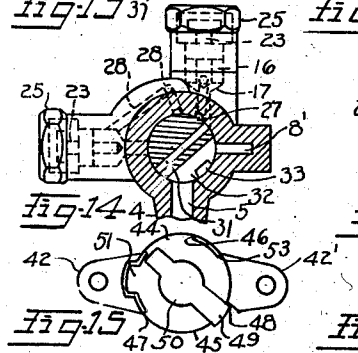
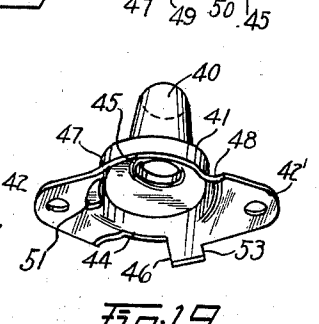
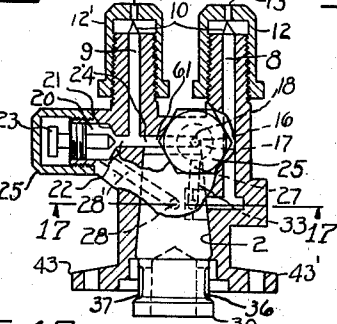
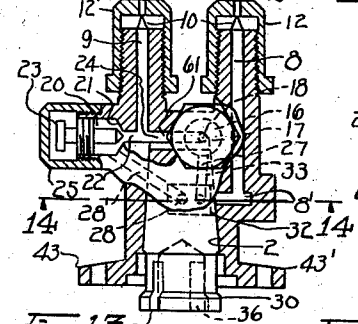
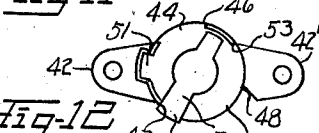
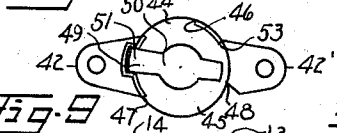
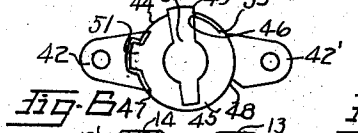
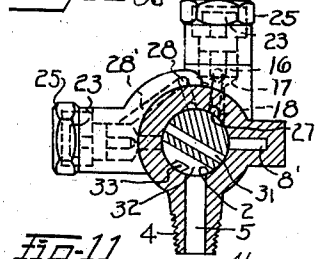
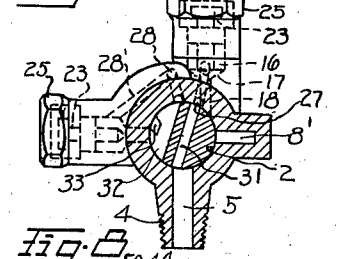
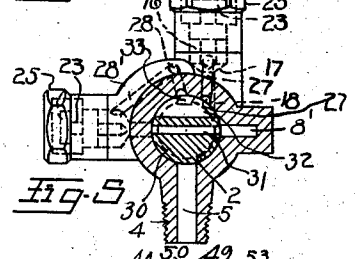
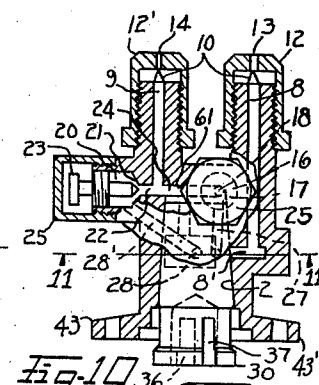
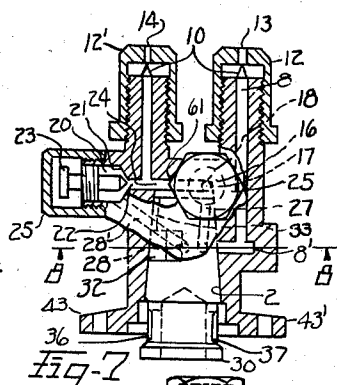
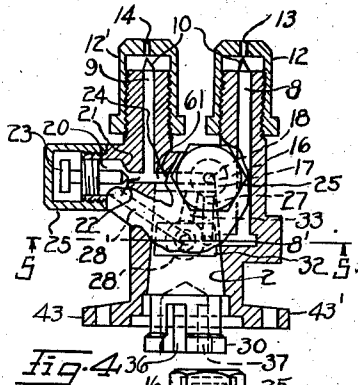
R. E. SCHOENBERGER

2,162,231

GAS VALVE

Filed April 20, 1938

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,162,231

GAS VALVE

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Application April 20, 1938, Serial No. 203,208

5 Claims. (Cl. 251—104)

My invention relates to gas valves for controlling the flow of gas to a double gas range burner of the combined simmer and main burner type.

The principal object of the invention is to provide a simply constructed efficient valve, economical of manufacture and having four operative positions. In the first position of the valve a reduced supply of gas is directed to the simmer burner only. In a second position the simmer burner receives the full or maximum flow while in the other two positions full and reduced supply of gas is respectively delivered to both burners.

A still further object of our invention is to provide a valve of this type which is simple in construction and operation and very effective to accomplish the desired results and having certain details of structure and combination of parts hereinafter more fully described.

In the accompanying drawings:

Figure 1 is a partial section of the valve showing the leads to the simmer and main burner, taken on line 1—1 of Figure 3;

Figure 2 is a partial section of the valve on line 2—2 of Figure 1;

Figure 3 is a front end elevation of the valve;

Figure 4 is a diagrammatic view of the valve in section showing the leads to the main and simmer burner in shut off position;

Figure 5 is a section on line 5—5 of Figure 4;

Figure 6 is a diagrammatic view of the cap showing the floating washer in the position assumed when the valve is in shut off position;

Figure 7 is a diagrammatic view of the valve in section showing the leads to main and simmer burner in low simmer position;

Figure 8 is a section on line 8—8 of Figure 7;

Figure 9 is a diagrammatic view of the cap and floating washer in low simmer position;

Figure 10 is a diagrammatic view of the valve in section showing the leads to main and simmer burner in full simmer position;

Figure 11 is a section on line 11—11 of Figure 10;

Figure 12 is a diagrammatic view of the cap showing the floating washer in the position assumed by the washer when the valve is in full simmer position;

Figure 13 is a diagrammatic view of the valve in section showing the leads to main and simmer burner in full simmer and main burner position;

Figure 14 is a section on line 14—14 of Figure 13;

Figure 15 is a diagrammatic view of the cap and

floating washer in full simmer and main position;

Figure 16 is a diagrammatic view of the valve in section showing the leads to main and simmer burner in low simmer and low main burner position;

Figure 17 is a section on line 17—17 of Figure 16;

Figure 18 is a diagrammatic view of the cap and floating washer in low simmer and low main position;

Figure 19 is a perspective view looking from the bottom showing the several stop positions in the cap;

Figure 20 is a partial view in perspective of the plug valve;

Figure 21 is a perspective view of the floating washer; and

Figure 22 is a partial perspective view of the valve stem.

Referring more particularly to the drawings the improved valve comprises a valve 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 from the casing is a threaded nipple 4 adapted for mounting the valve preferably in 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 5, for feeding the burners 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 1, on opposite sides of the longitudinal axis of the bore 2, are two screw threaded parallel nipples 6 and 7 for connection with the respective main and simmer burners. The gas outlet passages 8 and 9 through these nipples are provided with fixed needle valves 10 and 11 which cooperate with adjustable threaded and perforated caps 12 and 12' for regulating the volume of gas which may flow through the cap perforations or orifices 13 and 14 to the usual mixing tubes, not shown.

The casing is formed with a drilled externally and internally threaded upwardly projecting extension 15 forming a chamber 16. Extending through the bottom wall 17 of chamber 16 is a restricted bore or passage 18 opening at its inner or lower end into the bearing surface of plug receiving bore 2, on a plane with or just above the tapered bottom wall 3 thereof. A drilled internally and externally threaded extension 19,

similar to the extension 15, and projecting laterally from the casing at approximately a right angle to extension 15, provides a gas chamber 20. The inner end or wall 21 of the chamber 20 is formed with a reduced orifice or passage 22 and communicating at its inner end with the outlet passage 9 leading to the simmer burner. A short outwardly and rearwardly extending passage 24 leading from the bottom of bore 2 also leads into the simmer burner passage 9. Needle valves 23 screwing into chambers 16 and 20 are used to restrict the size of orifices or passages 18 and 22, thus regulating the amount of gas which may flow through these passages. Under certain gas conditions it might be practical to permanently restrict the orifices or passages 18 and 22 to the desired extent thus making it possible to eliminate the needle valves. Caps 25 close the chambers 16 and 20 to the atmosphere and enclose the needle valves and prevent unauthorized tampering after the valves have been adjusted.

An upwardly and rearwardly inclined by-pass passage 27 communicates at its inlet end with the plug receiving bore 2, and at its other end with the chamber 16. A second by-pass passage 28, having a short branch 28', leads from the bearing surface of the plug receiving bore to the chamber 20 and places this chamber in communication with the bore 2 at a point substantially opposite the gas inlet 5. There is also a short laterally extending branch passage 8' which leads from the bearing surface of the plug receiving bore 2 directly to the inlet end of the rearwardly extending gas outlet passage 8 for the main burner. Passages 8 and 8' and 28 and 28' respectively are in effect, continuous passages and will be considered as such. The passages 27, 28 and 8' as well as the gas inlet passage 5, all open into the plug receiving bore in substantially a common plane, and at a point considerably forward of the bottom or inner wall of the bore 2, while passages 18 and 24 also open into the bore in substantially a common plane adjacent the bottom of the bore.

A tapered plug valve 30 adapted to be snugly but rotatably received in the bore 2, of the casing with its inner end spaced from the bottom wall 3 of the bore provides a space or chamber 61 in the lower end of the bore 2, with which the passages 18 and 24 communicate. The plug valve is formed with a relatively small straight passage 31 extending transversely therethrough and communicating at opposite ends with the bore 2. A relatively large transverse slot or passage 32, is also cut in the side of the plug in the same plane with and parallel to that of the passage 31, both of these passages being adapted to be brought into register with one or more of the casing passages 5, 27, 28 and 8 when the plug is rotated to its respective positions. A substantially longitudinally disposed slot or passage 33 in the plug 30, places the transverse passage 32 and the space or chamber 61 in the inner end of bore 2, in communication with each other in all positions of the plug valve.

In operation the plug valve 30 is manually rotated by means of a valve stem 34 having its inner end extending into and interengaging with a hollow extension 35 formed on the outer end of the plug, the stem being provided with an operating handle 60 rigidly attached thereto by any suitable fastening means. Hollow extension 35 is formed with two oppositely arranged slots 36 and 37 of different width to slidably receive finger portions 38 and 39, integrally formed on the inner

end of stem 34 when the latter is partly inserted within the hollow extension. The finger portions are proportioned to fit the slots 36 and 37 and are of different width to insure proper assembly.

A flanged aperture cap member 40 sleeved over the valve stem is formed with a depending flange 41 having apertured ears 42 and 42' which seat upon and are secured to laterally extending apertured lugs 43 and 43', formed on the outer end of the casing 1 and in spaced relation to the end face thereof. The upwardly facing portion of the flange 41 is formed with a cut away portion or recess 44 adjacent one side of the ear 42, and the downwardly facing portion of the flange has a cut away portion or recess 45 between the two ears 42, 42'. One end of recess 44 serves as a stop shoulder 46 and the opposite end walls of recess 45 likewise provide stop shoulders 47 and 48 for halting rotation of the valve at certain positions, when the elongated arm 49 of a lock plate or washer 50 is slidably but non-rotatably seated within the hollow extension 35 of the casing and in engagement with the slots or recesses 44-45. The arm 49 is of a size and length to extend snugly but slidably through slot 37 and to engage and ride over the edge of flange 41.

When the valve is in off or inactive position arm 49 engages stop shoulder 46 and prevents rotation in a clockwise direction. If the valve is now rotated in an anti-clockwise direction until the arm 49 of lock washer 50, registers with a recess 51 formed in the ear 42 of cap 40, a coil spring 52 seated in hollow extension 35 of plug 30, forces the arm 49 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. Further anti-clockwise movement of the valve to its second position causes the lock washer to snap into recess 45 where it is held against reverse movement by the shoulder 47, except that when the stem is manually moved in an axial direction by pressing on handle 50, and the lock washer is thus moved out of recess 45, 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 the lock washer engages shoulder 48, 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, in which there is a restricted flow of gas to both main and simmer burners, it is necessary to move the stem axially to disengage the lock washer from the shoulder 48 to permit further anti-clockwise movement of the valve, until halted by a stop shoulder 53.

As previously stated there are four active valve positions, low simmer only, high simmer only, full main and simmer and low simmer and main positions respectively. In the first position the relatively small or restricted transverse port or passage 31 through the valve plug registers at opposite ends with the main gas supply passage 5 and the upwardly and rearwardly inclined restricted by-pass passage 27 respectively. Gas thus flows through passages 5 and 31 and by-pass passage 27 to the chamber or pocket 16 and thence through needle valve controlled passage 18, into one side of the chamber or space 61, at the bottom of plug receiving bore 2, from whence it reaches the simmer burner main outlet passage 9 by means of oblique passage 24, leading from the opposite side of said space 61. The apertured caps 12 and 12' are always set for the desired maximum flow of gas to the respective

burners, but the passage 31 is of the necessary restricted area to deliver only sufficient gas to maintain a reduced or low flame at the simmer burner, it of course being understood that all other outlet passages leading from the bore 2 to the respective burners are closed by the plug in this position.

In the second position of the valve plug the latter has been turned counter clockwise sufficiently to just bring the cross slot or port 32 into register with main gas supply passage 5 and to close the passage 27, the main burner outlet passage 8 also remaining closed. Gas now flows from the cross slot 32 down through the substantially longitudinally disposed slot 33 in the plug to the chamber or space 61 in the bottom of bore 2, and thence out through passage 24 to the simmer burner outlet passage 9, as in the first position. The slots 32 and 33 and passages 24 and 8 are of a size to carry sufficient gas to maintain the simmer burner on high or maximum flame requirements. Any gas which backs up into chamber 16 through passage 18 will of course be trapped, and therefore ineffective because passage 27 is closed by the plug valve.

Further anti-clockwise movement brings the plug into third or full simmer and full main burner position, in which the transverse slot 32 in the plug registers with the main burner outlet opening or passage 8. A full flow of gas is thus permitted to flow from main supply passage 5 to cross slot 32 and thence direct through passage 8 to the main burner. At the same time a full supply of gas flows to the simmer burner from the transverse slot 32, down through the longitudinally disposed slot 33, to the bottom of the casing bore 2, from where it passes out through passages 24 and 9 to this burner. Back pressure will also cause gas to back up from outlet passage 9 through valve controlled passage 22 into chamber 20, and thence into by-pass passage 26. However, this back pressure gas is ineffective due to the fact that the passage 28 is closed at the bore 2 by the plug.

In the fourth position of the valve the plug has been turned approximately 180° from its first or low simmer position thus bringing one end of by-pass passage 31 into register with main supply passage 5 and the other end into register with the by-pass passage 28, leading from the bore 2 to the chamber 20. A reduced or low volume of gas, sufficient to support a low flame at both burners, will thus flow through passages 31 and 28 into chamber 20, and thence out through restricted passage 22, into and through simmer outlet passage 9 to the simmer burner. At the same time, a back pressure is built up in chamber 20 due to the restricted size of the valve controlled inlet end of passage 22 which causes the excess supply of gas, or that gas not taken by the passage 9, to flow through the passage 22 into the bottom of plug receiving bore 2. From bore 2 this gas flows through longitudinally disposed slot 33 into the cross slot 32 which is now in register with the casing outlet passage 8', in turn leading into main burner outlet passage 8, and thence to the main burner.

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 solid plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber in the end of said bore, 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, said casing having a gas supply passage leading into the plug receiving bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted passage leading into said gas chamber, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having a cross by-pass passage and a cross slot opening into the bearing surface of said plug receiving bore and 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 through the gas supply passage into one of said pockets and thence through said gas chamber into 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 from the gas supply passage through said cross longitudinal slot to the gas chamber and thence 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 passage through the cross slot direct 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 by-pass passage into one of said pockets and thence to said first outlet passage, a portion of the gas delivered to said last mentioned pocket flowing into the gas chamber and thence through the slots in said plug to the second outlet passage and means for rotating the plug.

2. A gas range valve 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 in the end of said bore, 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, said casing having a gas supply passage leading into the plug receiving bore, a pair of hollow extensions on said casing forming pockets, each of said pockets having a restricted passage leading into said gas chamber, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having a cross by-pass passage and a cross slot opening into the bearing surface of said plug receiving bore, said cross slot also communicating with said gas chamber such that in one rotary position of the plug a reduced volume of gas may flow through the gas supply passage into one of said pockets and thence through said gas chamber into 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 from the gas supply passage through said cross slot to the gas chamber and thence 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 passage through the cross slot direct to the second outlet passage and from the cross 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 by-pass passage into one of said pockets and thence to said first outlet passage a portion of the gas delivered to said last mentioned pocket flowing into the gas chamber and thence through the slots in said plug to the second outlet passage and means for rotating the plug.

3. A gas range valve 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 in the end of said bore, 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, said casing having a gas supply passage leading into the plug receiving bore, a hollow extension on said casing forming a pocket, said pocket having a restricted passage leading into said gas chamber, said casing having a by-pass passage leading from the plug receiving bore to the pocket, said plug having a cross by-pass passage and a cross slot opening into the bearing surface of said plug receiving bore, said cross slot also communicating with said gas chamber such that in one rotary position of the plug a reduced volume of gas may flow through the gas supply passage into said pocket and thence through said gas chamber into 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 from the gas supply passage through said cross slot to the gas chamber and thence 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 passage through the cross slot direct to the second outlet passage and from the cross slot to the gas chamber and thence to the 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 solid plug having rotatable bearing in said bore and spaced from said end wall to form a gas chamber in the end of said bore, 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, said casing having a gas supply passage leading into the plug receiving bore, a hollow extension on said casing forming a pocket, said pocket having a restricted passage leading into said gas chamber, said casing having a by-pass passage leading from the plug receiving bore to the pocket, said plug having a cross by-pass passage and a plurality of communicating slots opening into the bearing surface of said plug receiving bore, said slots also communicating with said gas chamber such that in one rotary position of the plug a reduced volume of gas may flow through the gas supply passage into said pocket

and thence through said gas chamber into 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 from the gas supply passage through said slots to the gas chamber and thence 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 passage through the slots direct to the second outlet passage and from one of said slots to the gas chamber and thence to the first outlet passage and means for rotating the plug.

5. A gas range valve 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 in the end of said bore, 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, said casing having a gas supply passage leading into the plug receiving bore, a pair of pockets formed on said casing, each of said pockets having a restricted passage leading into said gas chamber, said casing having separate by-pass passages leading from the plug receiving bore to the respective pockets, said plug having a cross by-pass passage and a cross slot parallel to and substantially in the same plane as said cross by-pass passage, opening into the bearing surface of said plug receiving bore, the main supply passage, the inlet end of said second outlet passage and said casing by-pass passages opening into the plug receiving bore in substantially a common plane, said cross slot also communicating with said gas chamber such that in one rotary position of the plug a reduced volume of gas may flow through the gas supply passage into one of said pockets and thence through said gas chamber into 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 from the gas supply passage through said cross slot to the gas chamber and thence 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 passage through the cross slot direct to the second outlet passage and from the cross 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 by-pass passage into one of said pockets and thence to said first outlet passage, a portion of the gas delivered to said last mentioned pocket flowing into the gas chamber and thence through the slot in said plug to the second outlet passage and means for rotating the plug.

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