June 13, 1939. R. E. SCHOENBERGER 2,162,232.

GAS VALVE

Filed May 7, 1938 2 Sheets-Sheet 1

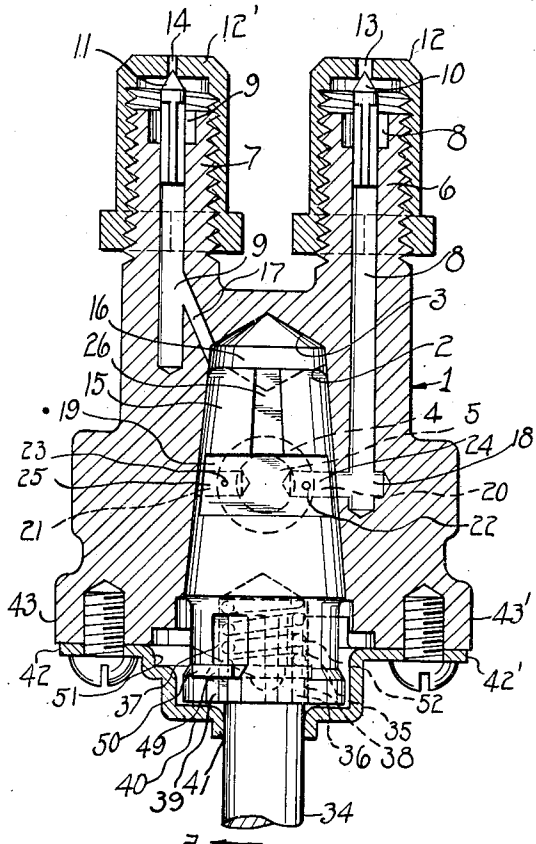


Fig-1

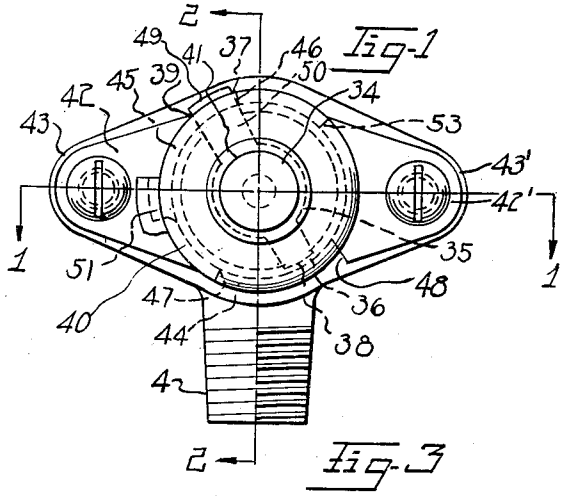


Fig-3

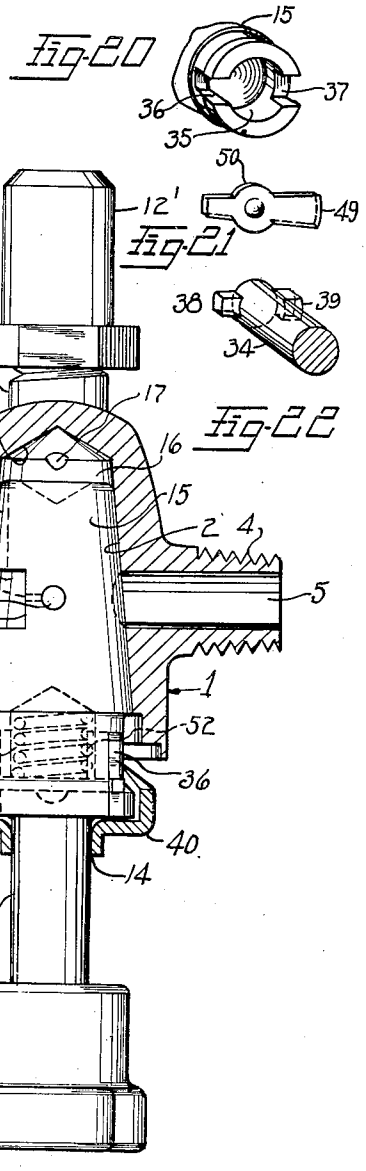


Fig-2

Fig-20

Fig-21

Fig-22

INVENTOR

BY Robert E. Schoenberger

Fisher, Mosser & Moore

ATTORNEYS.

June 13, 1939. R. E. SCHOENBERGER 2,162,232

GAS VALVE

Filed May 7, 1938 2 Sheets-Sheet 2

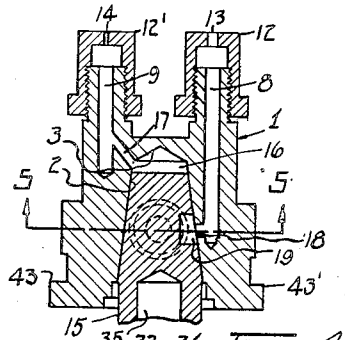


Fig-4

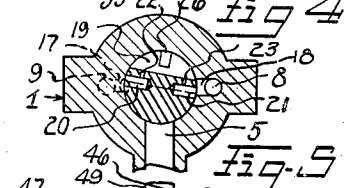


Fig-5

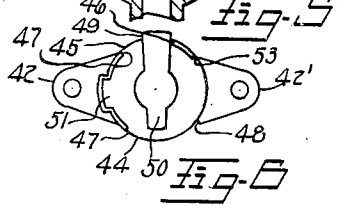


Fig-6

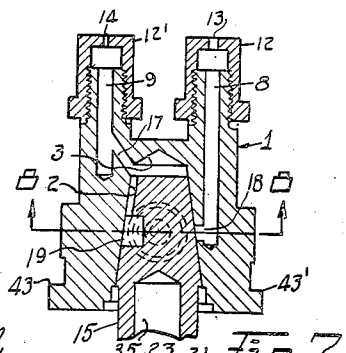


Fig-7

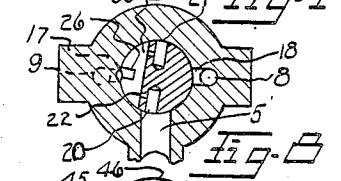


Fig-8

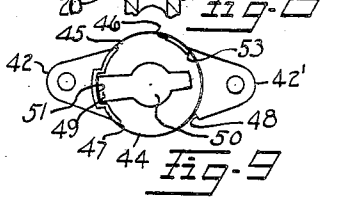


Fig-9

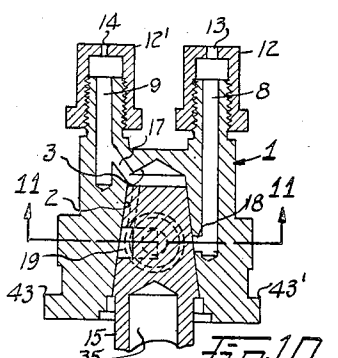


Fig-10

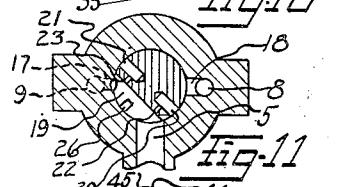


Fig-11

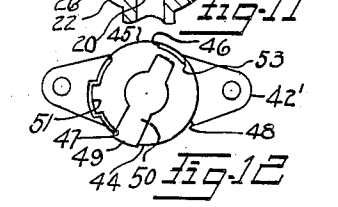


Fig-12

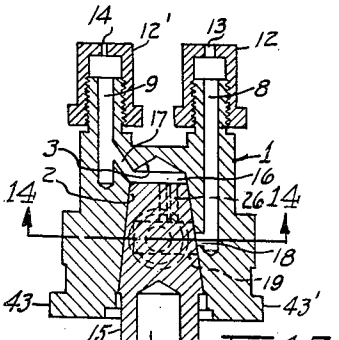


Fig-13

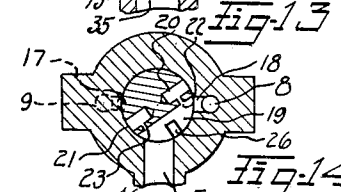


Fig-14

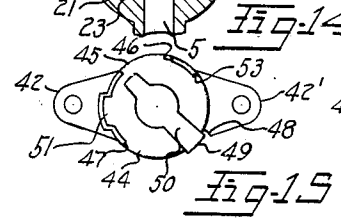


Fig-15

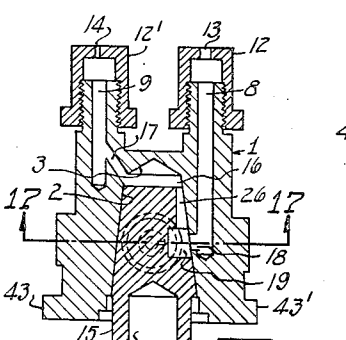


Fig-16

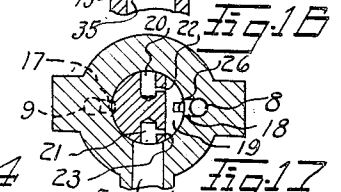


Fig-17

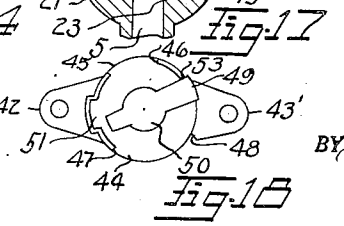


Fig-18

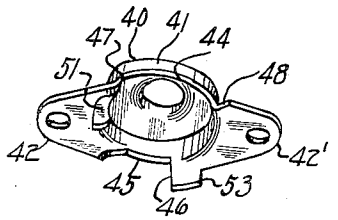


Fig-19

INVENTOR

BY Robert E. Schoenberger

Fisher, Morsman & Moore

ATTORNEYS.

Patented June 13, 1939

2,162,232

UNITED STATES PATENT OFFICE

2,162,232

GAS VALVE

Robert E. Schoenberger, Shaker Heights, Ohio; assignor to The W. J. Schoenberger Company, Cleveland, Ohio, a corporation of Ohio

Application May 7, 1938, Serial No. 206,651

4 Claims. (Cl. 251—105)

This 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.

One of the principal objects of the invention is to provide a simply constructed efficient valve, economical of manufacture and having four positions, wherein, 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 this 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 3;

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.

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.

A tapered plug valve 15 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 16 in the lower end of the bore with which the simmer burner outlet passage 9 communicates. Thus a small orifice or passage 17 through the wall of the bore, adjacent the bottom wall 3 thereof, leads directly to the simmer passage 9. The main burner outlet passage 8, communicates at its outer end with the bore 2, through the medium of a cross passage 18, which extends through the casing to the bearing surface of the bore. The main supply passage 5 terminates at its inner end in the bearing surface of the plug receiving bore, in the same vertical plane as that of the passage or orifice 18.

The valve plug is formed with a relatively large transverse slot 19 cut in the side of the plug. There are also two aligned oppositely disposed bores or pockets 20 and 21 drilled in the plug

parallel to the cross slot. Small by-pass orifices 22 and 23, drilled through the walls 24 and 25 separating the pockets 20 and 21 from the cross slot 19, place the inner ends of these pockets in communication with the slot. A substantially longitudinally disposed slot 26, in the plug 15, places the transverse slot or passage 19 and the space or chamber 16, in the inner end of bore 2, in communication with each other in all positions of the plug.

In operation the plug valve 15 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 apertured 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 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.

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 15, 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 44 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 60, and the lock washer is thus moved out of recess 44, 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 inlet end of the short pocket or passage 20 in the plug registers with the gas supply passage 5, thus permitting gas to flow into this passage or pocket and thence through the relatively small by-pass orifice or passage 22, leading from pocket 20 to the cross slot 19. From the cross slot 19 the flow is through longitudinally disposed slot 26 to the chamber 16 at the bottom of plug receiving bore 2 and thence out through passage 17 to the simmer burner outlet passage 9, the outlet passage 8 to the main burner being closed in this position. The apertured caps 12 and 12' are always set for the desired maximum flow of gas to the respective burners, but the restricted or metered by-pass passage 22 is of a size or capacity to amply meet maximum low flame simmer burner requirements.

Further anti-clockwise movement brings the plugs into second or full simmer position in which the transverse slot 19 in the plug valve communicates with the simmer burner outlet 9, as well as with the supply passage 5, the outlet passage to the main burner remaining closed. A full flow of gas will thus flow into cross slot 19 and through the substantially longitudinally disposed slot 26 and thence into the chamber or space 16 in the end of bore 2. From chamber 16 the gas passes out through orifice 17 into the simmer burner outlet passage 9, as in the first or low simmer position.

Still further rotation in an anti-clockwise direction brings one end of the cross slot 19 into communication with the main burner outlet passage 8, while the other end of the cross slot remains in communication with the supply passage. A full volume of gas will now flow through the slots 19 and 26 into chamber 16 and thence to simmer burner outlet passage 9. At the same time a portion of the gas from the main supply, sufficient to maintain the main burner on high flame, flows from slot 19 into and through main burner outlet passage 8.

Slight anti-clockwise rotation of the valve will now bring the passage or pocket 21 into register with supply passage 5, and the cross slot 19 will remain in communication with the main burner outlet passage 8 and the supply to both burners will be reduced. Thus a reduced volume of gas from pocket 21 will flow through the metered or restricted by-pass orifice or passage 23 to the cross slot 19 and thence through slot 26 to chamber 16 and simmer burner outlet 9. At the same time a portion of this gas, enough to support a reduced main burner flame flows from the cross slot 19 to main burner outlet passage 8. It will be noted that the by-pass orifice or passage 22, leading from pocket 20, meets the low flame requirements of the simmer burner only, whereas the by-pass 23 services both burners when the valve is in its last position. Consequently the latter by-pass is larger than the former, or of an area to carry a maximum supply of gas for maintaining a reduced or low flame at both burners.

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 bear-

ing in said bore and spaced from said end wall to form a gas chamber in the end of said bore, a first outlet passage leading from said gas chamber to one burner and a second outlet passage leading from the bearing surface of said bore to the other burner, said casing having a gas supply passage opening into the bore in a plane with the inlet end of said second outlet passage, said plug having a cross slot opening into the bearing surface of said plug receiving bore in a plane with said gas supply passage, and a substantially longitudinally disposed slot in the plug communicating at opposite ends with said transverse slot and said gas chamber, and two restricted by-pass passages placing said transverse slot in communication with the bearing surface of said bore such that in one rotary position of the plug a reduced volume of gas may flow through one of said by-pass passages into the cross slot and thence through the longitudinally disposed slot into said gas chamber and first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such that in a second position a full volume of gas may flow from the gas supply passage directly through said slots to said gas chamber and first outlet, and such that in a third position of the plug a full volume of gas may flow from the gas supply passage through the said cross slot direct to the second outlet passage and through both slots 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 other of said by-passes to said cross slot direct to said second outlet passage, a portion of the gas delivered to the cross slot flowing into the gas chamber through said longitudinally disposed slot and thence to said first mentioned outlet passage and means for rotating said plug.

2. 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 in the end of said bore, a first outlet passage leading from said gas chamber to one burner and a second outlet passage leading from the bearing surface of said bore to the other burner, said casing having a gas supply passage opening into the bore, said plug having 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, and two restricted by-pass passages placing said transverse slot in communication with the bearing surface of said bore such that in one rotary position of the plug a reduced volume of gas may flow through one of said by-pass passages into the cross slot and thence through the longitudinally disposed slot into said gas chamber and first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such that in a second position a full volume of gas may flow from the gas supply passage directly through said slots to said gas chamber and first outlet, and such that in a third position of the plug a full volume of gas may flow from the gas supply passage through the said cross slot direct to the second outlet passage and through both slots 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 other of said by-passes to said cross slot direct to said second outlet passage, a portion of the gas delivered to the cross slot flowing into the gas chamber through said longitudinally disposed slot and thence to said first mentioned outlet passage and means for rotating said plug.

3. 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 in the end of said bore, a first outlet passage leading from said gas chamber to one burner and a second outlet passage leading from the bearing surface of said bore to the other burner, said casing having a gas supply passage opening into the bore in a plane with the inlet end of said second outlet passage, said plug having a cross slot opening into the bearing surface of said plug receiving bore in a plane with said gas supply passage, and a substantially longitudinally disposed slot in the plug communicating at opposite ends with said transverse slot and said gas chamber, and a restricted by-pass passage placing said transverse slot in communication with the bearing surface of said bore such that in one rotary position of the plug a reduced volume of gas may flow through said by-pass passage into the cross slot and thence through the longitudinally disposed slot into said gas chamber and first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such that in a second position a full volume of gas may flow from the gas supply passage directly through said slots to said gas chamber and first outlet, and such that in a third position of the plug a full volume of gas may flow from the gas supply passage through the said cross slot direct to the second outlet passage and through both slots to the gas chamber and thence to the first outlet passage, and means for rotating said 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 in the end of said bore, a first outlet passage leading from said gas chamber to one burner and a second outlet passage leading from the bearing surface of said bore to the other burner, said casing having a gas supply passage opening into the bore, said plug having 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, and a restricted passage placing said transverse slot in communication with the bearing surface of said bore such that in one rotary position of the plug a reduced volume of gas may flow through one of said by-pass passages into the cross slot and thence through the longitudinally disposed slot into said gas chamber and first outlet passage, the flow of gas to the second outlet passage being sealed by the plug, and such that in a second position a full volume of gas may flow from the gas supply passage directly through said slots to said gas chamber and first outlet, and such that in a third position of the plug a full volume of gas may flow from the gas supply passage through the said cross slot direct to the second outlet passage and through both slots to the gas chamber and thence to the first outlet passage, and means for rotating said plug.

ROBERT E. SCHOENBERGER.