Aug. 12, 1941. E. H. MUELLER 2,252,134

GAS COCK

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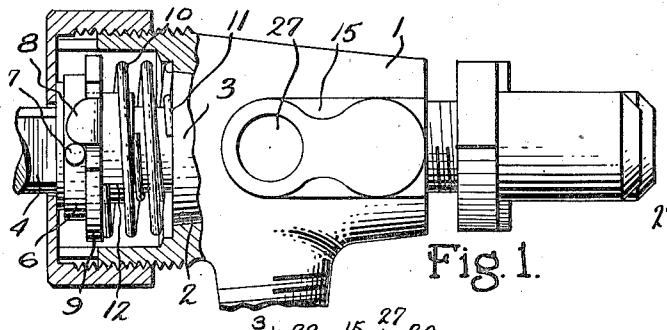


Fig. 1.

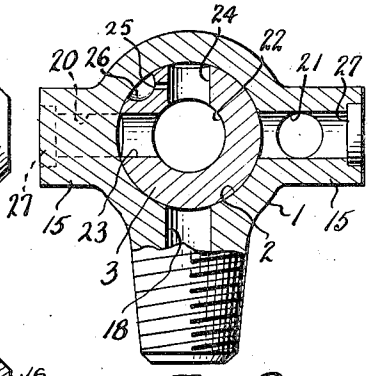


Fig. 3.

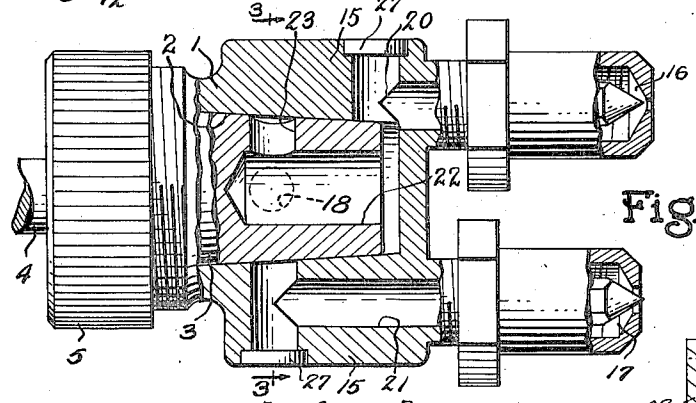


Fig. 2.

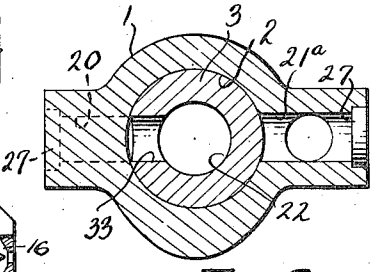


Fig. 6.

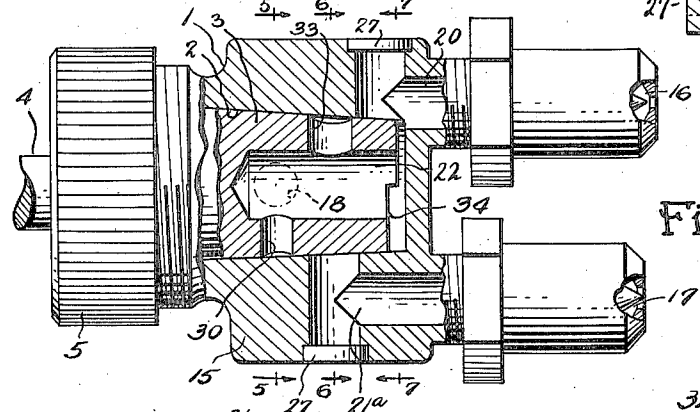


Fig. 4.

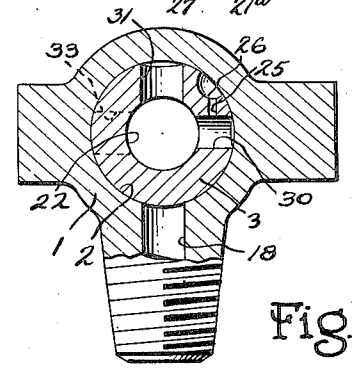


Fig. 5.

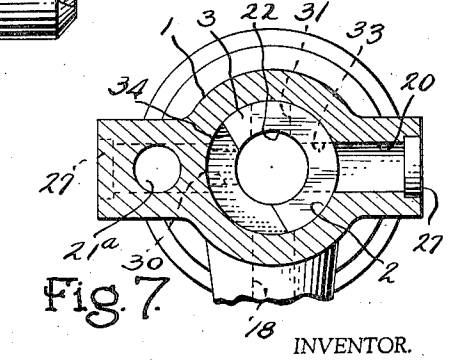


Fig. 7.

INVENTOR.
Ervin H. Mueller

BY Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

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GAS COCK

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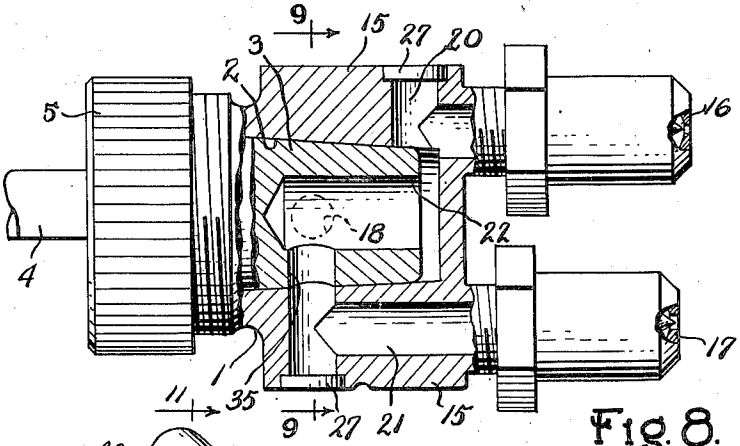


Fig. 8.

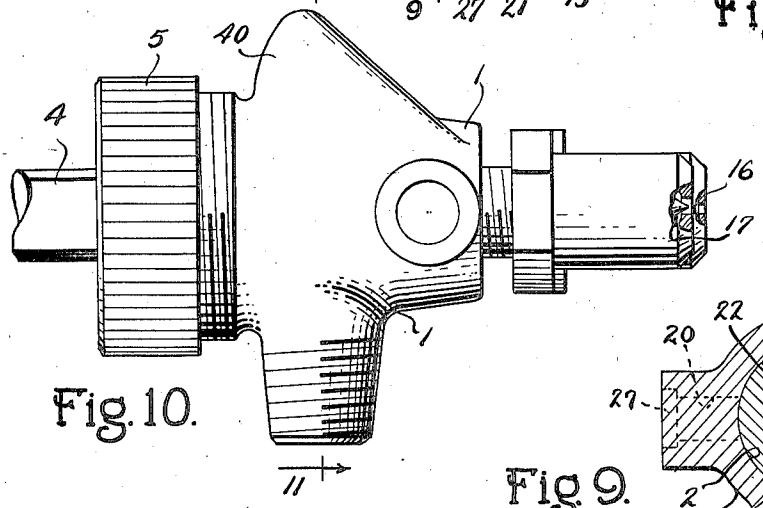


Fig. 10.

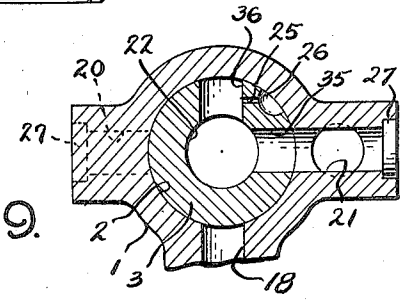


Fig. 9.

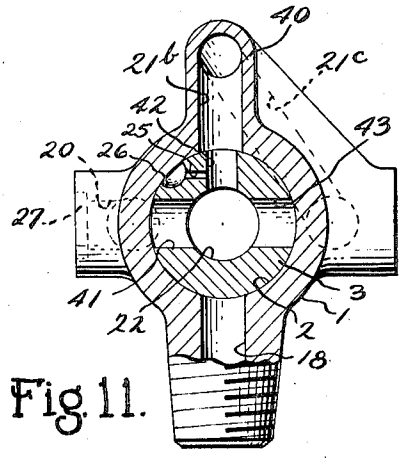


Fig. 11.

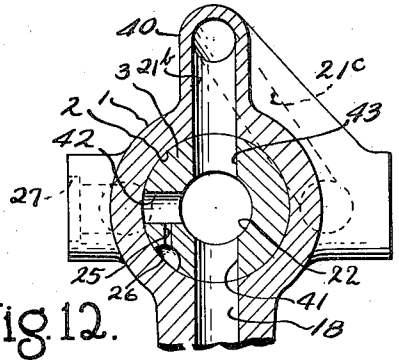


Fig. 12.

INVENTOR.
Ervin H. Mueller

BY
Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

Patented Aug. 12, 1941

2,252,134

UNITED STATES PATENT OFFICE

2,252,134

GAS COCK

Ervin H. Mueller, Grosse Pointe Park, Mich.

Application September 9, 1938, Serial No. 229,072

3 Claims. (Cl. 251—109)

This invention relates to a valve structure and has to do particularly with the provision of a valve structure suitable for gas cocks.

Different manufacturers and designers of gas ranges require valves of various specifications. For instance, some valves are required to be arranged so that they are turned on by a clockwise movement, and other are required to be turned on with a counter-clockwise movement. At the present time a single valve is used to control two burners or two sections of one burner, one of which is for a low simmering flame and the other of which is for a full flame for general cooking or frying. The specifications may require that the valve be arranged so that the simmering burner is first supplied with gas and then the main or full burner supplied with gas upon continued movement of the valve. Conversely, the specifications may require that the valve first supply the main burner and secondly supply the simmering burner. When all these possibilities are cumulated, a considerable problem is presented in the provision of these valve structures; as so many different points may be specified, the problem is one which tends to create a situation where a different valve structure is required for each different installation.

The present invention is devoted to the provision of a valve structure which will meet the above requirements but wherein the same valve body may be used for different installations, and the same valve plug or similar valve plugs may be used.

Fig. 1 is a side elevational view partly in section illustrating a valve arranged to be turned on by counter-clockwise motion and which supplies gas to the simmering burner first and finally to the main burner.

Fig. 2 is a horizontal cross sectional view taken through the valve structure of Fig. 1.

Fig. 3 is a cross sectional view taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a horizontal section through a valve arranged to be turned on by clockwise movement and to supply gas first to the simmering burner and then to the main burner.

Fig. 5 is a cross sectional view taken substantially on line 5—5 of Fig. 4.

Fig. 6 is a cross sectional view taken substantially on line 6—6 of Fig. 4.

Fig. 7 is a cross sectional view taken substantially on line 7—7 of Fig. 4.

Fig. 8 is a view largely in section taken through a valve arranged to be turned on by clockwise motion and to supply gas first to the main burner and second to the simmering burner.

Fig. 9 is a cross sectional view taken substantially on line 9—9 of Fig. 8.

Fig. 10 is a side elevational view of a valve arranged to be turned on by counter-clockwise motion and to first supply gas to the main burner and later to the simmering burner.

Fig. 11 is a cross sectional view taken substantially on line 11—11 of Fig. 10.

Fig. 12 is a sectional view similar to Fig. 11 showing the valve in full on position.

The valve shown in Figs. 1 to 3, inclusive, comprises a body 1 having a tapered valve chamber 2 therein and in which a rotatable valve member in the form of a plug 3 is disposed. A stem 4 projects from the plug for rotating the plug and the stem extends through a cap 5. Within the cap is a structure serving as an intermediate stop for the valve in one position. This structure may be substantially as that fully shown and described in my co-pending application Serial No. 165,837 filed September 27, 1937. The structure need not be described in great detail herein; suffice it to say that a washer 6 rotates with the stem and plug, and it has a projection 7 arranged to meet and pass over a cam shaped projection 8 on a washer 9 which is keyed to the housing and which is axially shiftable against the action of a spring 10. Another spring of smaller diameter 11 holds the plug on its seat and it reacts against a collar or sleeve 12, which in turn passes through the washer 9 and abuts against the washer 6.

The valve body has relatively elongated abutments 15 on opposite sides and two outlets, one being illustrated at 16 which is a small outlet jet for the simmering burner, and the other at 17 for the main burner.

The valve has an inlet passage 18 for gas leading into the valve chamber, and an outlet passage 20 running from the valve chamber to the outlet 16 and an outlet passage 21 running from the valve chamber to the outlet 17, these outlet passageways connecting into the valve chamber in the positions illustrated.

The valve plug or rotary valve member, as it may be termed, has an axial bore 22 and two lateral ports 23 and 24. Between these two ports is a small port 25, preferably having an enlarged counterbore structure 26 at the periphery of the plug member. The passageways 20 and 21 may be formed by drilling into the body, and the open ends may be closed by plugs 27.

In the position shown in Fig. 3 the valve is off.

By turning the valve about 90° counter-clockwise gas may pass from passageway 18 into port 23 through the axial bore 22 into the end of the valve chamber and out the passageway 20 to the small jet. When the valve is in this position the projection 7 may abut against the spring pressed cam member 8, as illustrated in Fig. 1. This arrangement sets up a resistance to the turning of the plug so that the valve is stopped in this position. By turning the valve member about another 90° the port 23 aligns with the outlet 21 and the port 24 aligns with the inlet passage 18. Thus gas flows out through both of the outlet passageways. Rotary movements of the plug valve member may be limited in this last described position and in the position shown in Fig. 3. As the port 23 is caused to move from the position where it registers with the inlet 18 to a position where it registers with the outlet 21, the hold-over port 25—26 passes across the inlet passageway 18 so that the supply of gas continues to flow into the axial bore of the plug and to the small outlet jet. The result is that once the simmering burner is turned on it stays on until the valve is turned back to off position as shown in Fig. 3.

In Figs. 4 to 7, inclusive, a valve is shown which is to be turned on by a clockwise movement and which is arranged to supply gas first to the simmering burner. The same general reference characters are applied to like parts, some, however, being additionally identified by a letter where the part, or the position of the part, is changed. The valve body is substantially the same except that the passageway 21*a* which corresponds to the passage 21 connects into the valve chamber in a position axially removed from the inlet passage 18. The plug has two ports 30 and 31 positioned substantially at right angles with each other, with the intervening hold-over ports 25—26, and these ports are positioned to align with the inlet 18. The plug also has a port 33 positioned to register with the outlet port 21*a*. This plug is a little longer than the plug in the previously described structure in order to provide an adequate surface seal around the port 33 which is positioned forwardly, and toward the small end of the plug. The end of the plug may have a cut-away portion as illustrated at 34 so as to provide an adequate opening into the outlet 20.

The valve is illustrated in off position as shown in Fig. 5. When it is turned about 90° clockwise gas will flow through the port 30 into the axial bore and then into the outlet 20. At this time the cut-away portion 34 registers in part with the outlet 20. Upon continued clockwise rotation the hold-over port passes across the inlet 18 and functions as above described, and when the valve has been rotated through about 180° port 31 registers with inlet passageway 18. At this time, the port 33 aligns with the port 21*a* so that gas is supplied to the main burner jet 17. This will be appreciated by reference to Fig. 6. The cut-away portion 34 extends for a considerable extent around the periphery of the plug as illustrated in Fig. 7, so that this cut-away portion is effective for the passage of gas all the while the plug is in an on position.

The valves just described are arranged both to be mounted on top of a gas manifold or supply pipe which connects to the inlet 18, and both supply gas first to the simmering, and then to the main burner as well as the simmer. One valve turns on with counter-clockwise rotary motion (as the figures are viewed), and the other turns on with a clockwise motion. Yet essentially the same valve structure is employed.

The valve shown in Figs. 8 and 9 has the same reference characters applied to similar parts, and this valve is for a clockwise turning on motion but supplies gas first to the main burner. The passageways 20 and 21 are substantially the same as those in the form shown in Figs. 1 to 3, inclusive. The plug member is similar to the forms already described and has the bore 22, two ports 35, 36, and the hold-over port structure 25, 26. In the position shown in Fig. 9 the valve is off. When turned through about 90° gas enters port 35 and flows through bore 22 and out the passageway 20. Also, at this time port 36 registers with outlet 21 with the result that gas is supplied to both jets. Upon rotation of the valve plug through another 90° or so, the hold-over port structure 25—26 passes inlet 18 to keep gas supplied to the bore of the plug and ultimately port 36 aligns with inlet 18 for flow of gas through the bore in the plug and to the outlet 20, but at this time the outlet 21 to the main burner is closed. This valve, like the others just described, is arranged to be mounted above the gas supply pipe or manifold.

The valve shown in Figs. 10 to 12, inclusive, is for a counter-clockwise turning on movement and is for mounting on top of a gas supply pipe or manifold and for supplying gas in its first on position to both outlet jets. This particular arrangement requires a different form of body. Such reference characters as are applied to like parts are used with reference to this form. The body 1 has a projecting portion 40 and the outlet 21*b* is positioned in this projecting portion substantially opposite the inlet 18. A passageway 21*c* leads angularly to the outlet jet 17. The outlet 20 for this valve is in the same position as the outlet 20 of the valve shown in Figs. 2, 4 and 8. The plug member has the axial bore 22 and it has ports 41, 42 and 43 positioned substantially in a common plane transverse of the axis for registration with the inlet 18 and outlet 21*b*, which are substantially diametrically opposite each other. The hold-over port arrangement 25—26 is between the ports 41 and 42. In the position shown in Fig. 11 the valve is turned off. Upon turning the valve about 90° counter-clockwise the port 41 aligns with inlet 18 and port 43 aligns with inlet 41*b*. Therefore, gas is supplied through the bore 22 to the outlet 20 and transversely through the plug to the outlet 21*b* so that gas is supplied to both jets. Upon turning the valve counter-clockwise about another 90°, the holdover port 25—26 functions to maintain a supply of gas into the bore, and at the end of this 90° movement outlet 21*b* is closed off, and gas flows through the port 42 into the bore 22 and into the outlet 20 to the jet 16.

This valve, like the others, is arranged to be disposed over or above the gas supply pipe or manifold. In a gas valve it is required that disaligned ports be not only disaligned to shut off the valve but have a substantial disalignment for a surface to surface engagement for safety purposes. In other words, a valve which just barely disaligns the port, with the edges almost meeting, would not be acceptable. It is for this reason that the projection 40 is provided in the valve shown in Figs. 10 to 12, in order to take advantage of a location on a plug member of a relatively large diameter to obtain the adequate

extent of disalignment when the valve is turned off.

All the modifications herein are shown for mounting on top of or above the manifold and have a similar structure and yet are arranged to meet various requirements not only as to the sequence in which the burners are turned on but as to the direction of rotation of the valve member.

I claim:

1. A gas cock comprising a body, a valve chamber in the body, two outlet passages for gas burners, one connecting into the valve chamber substantially at one end of the chamber and the other connecting into the valve chamber at a point intermediate the length of the chamber, a gas inlet passage connecting into the valve chamber at a point intermediate the length of the valve chamber and circumferentially removed from the said other outlet passage, a rotary valve plug seated in the chamber and having an axial bore therein which is open at the end of the plug adjacent to and in communication with the said one outlet passage, said valve plug having a plurality of radial ports therein leading into the bore, said ports being angularly disposed relative to each other, said valve plug being turnable in the valve chamber to the following positions, to-wit: (1) where the plug closes the inlet passage; (2) where one port registers with the inlet passage for the flow of gas through the bore and said one outlet passage while the plug closes the said other outlet passage; and (3) where one of the ports registers with the inlet passage and another of the ports registers with the said other passage for the flow of gas through the bore and both outlet passages and an auxiliary passageway in the plug opening into one of the ports and opening on the periphery of the plug between the two radial ports, for continued flow of gas into the bore as the auxiliary passageway moves across the inlet passage.

2. A gas cock comprising a body, a valve chamber in the body, a gas inlet passage leading into the chamber at a point intermediate the length of the chamber, two gas outlet passages, one connecting into the valve substantially at one end thereof, an enlargement on the valve body positioned substantially diametrically opposite the inlet passage, the other of said outlet passages connecting into the valve chamber through said enlargement, a rotary valve plug seated in the valve chamber and having an axial bore therein which is open at one end of the plug adjacent to and in communication with the said one outlet passage, said plug having three radial ports therein leading into the axial bore and two of which are substantially diametrically opposite each other, and a third which is positioned substantially at right angles to the first mentioned two ports, said plug being rotatable to the following positions, to-wit: (1) where the inlet passage is closed and the third port is in substantial alignment with the said other outlet passage; (2) where the two opposite ports are in alignment with the inlet passage and said other outlet passage; and (3) where the said third port registers with the inlet passage and the said other outlet passage is closed by that portion of the plug lying opposite the said third port and between said opposite ports, and a carry-over port in the plug between the said third port and one of the two opposite ports, and arranged to register with said inlet passage as the plug is turned.

3. A gas cock comprising, a body, a valve chamber substantially centrally disposed in the body, an outlet passage for gas at one side of the body and connecting into the chamber substantially at one side and at one end of the chamber, a second outlet passage for gas at the other side of the body and connecting into the chamber at a point intermediate the length of the chamber, an inlet passage for gas connecting into a side of the chamber at a point circumferentially removed from the connection of the second outlet passage, a rotary valve plug in the chamber having an axial bore which is open at the end adjacent to and communicating with the first outlet passage, said valve plug having a plurality of radial ports leading into the bore, said ports being angularly disposed relative to each other, and said ports, inlet passageway and second outlet passageway being disposed substantially in the same radial plane, said plug being turnable in the chamber, to close the inlet passage, and to register one port with the inlet passage for the flow of gas through the bore and the first outlet passage while the plug closes the second outlet passage, and to register one port with the inlet passage and another port with the second outlet passage for the flow of gas through the bore and both outlet passages, and a relatively small carry-over port in the plug positioned between two of the said radial ports and arranged to register with the inlet passage as the plug is turned from a position of registration of one radial port with the inlet passage to the position of registration of the other radial port with the inlet passage.

ERVIN H. MUELLER.