

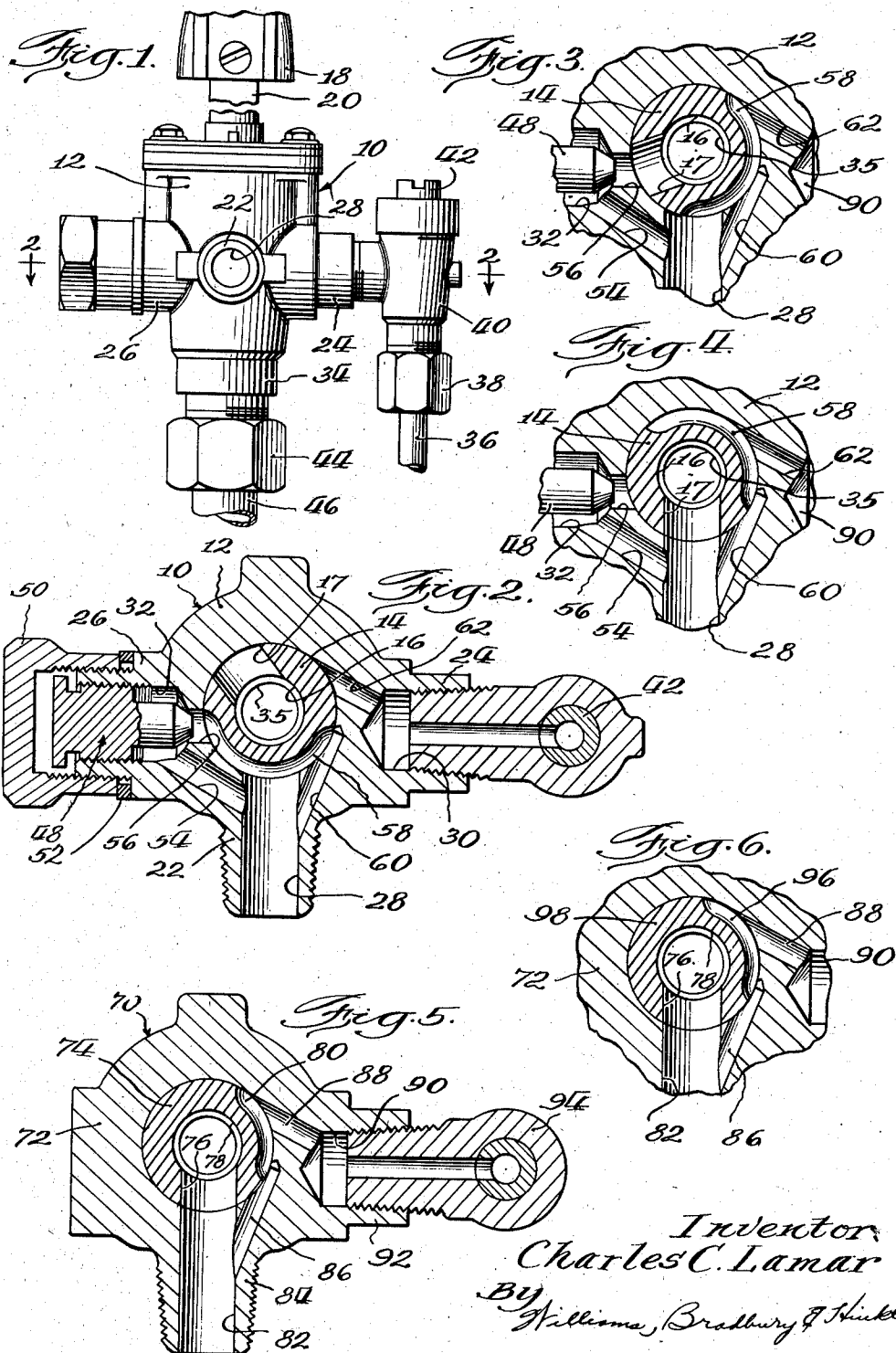
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GAS VALVE

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GAS VALVE

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The present invention relates to valves and more particularly to gas valves intended for use with oven or other burners of kitchen ranges.

Oven valves are ordinarily constructed to control the supply of gas to the burners and to a pilot burner. Some of these valves are of the "high-low" type, i. e., they are so constructed that when the valve is operated to a certain position, gas is supplied to the burner at a predetermined low rate, and when operated to another position, gas is supplied to the burner at a maximum rate. In intermediate positions gas is supplied to the burner at rates dependent upon the setting of the valve.

One of the primary objects of the present invention is the provision of a high-low type valve wherein gas is supplied to the pilot at substantially constant pressure at all times that gas is supplied to the burner.

A further object of the present invention is the provision of a new and improved valve wherein gas is supplied at substantially constant pressure to the pilot prior to the time gas is supplied to the burner, as well as at all times that gas is supplied to the latter.

A further and important object of the present invention is the provision of a new and improved plug type valve wherein all of the ports or passageways, except the passageway leading to the burner, are located in a common plane perpendicular to the axis of the valve plug. The location of the passageways in a common plane makes it possible to construct a shorter valve and to utilize a shorter valve plug, whereby a decided reduction in the cost of the valve is effected.

A further object of the present invention is the provision of a new and improved valve wherein gas is supplied to the pilot at substantially constant pressure in all positions of the valve in which gas is supplied to the burner and wherein all the passageways, except the passageway leading to the burner, are located in a common plane perpendicular to the axis of the valve plug.

A further object of the present invention is the provision of a new and improved valve of the high-low type wherein gas is supplied to the pilot at a substantially constant pressure in all positions of the valve in which gas is supplied to the burner, and wherein all the passageways, except the one leading to the burner, are located in a common plane perpendicular to the axis of the valve plug.

Other objects and advantages of the present invention will become apparent from the ensu-

ing description, in the course of which reference is had to the accompanying drawing, in which:

Fig. 1 is an elevational view of a high-low type valve embodying the present invention;

Fig. 2 is an enlarged sectional view through the plane of the passageways (taken along the line 2-2 of Fig. 1) with the valve in its closed position;

Fig. 3 is a fragmentary sectional view of the valve shown in Figs. 1 and 2 showing the valve in its "low" position;

Fig. 4 is a view similar to Fig. 3 showing the valve with the valve in its fully open position;

Fig. 5 is a sectional view of a valve embodying the present invention which valve, however, does not have a low adjustment; and

Fig. 6 is a fragmentary sectional view of a valve of the type shown in Fig. 5, illustrating a further modification of the present invention.

Referring now to the drawing and more particularly to Figs. 1 and 2, it may be seen that the valve, which is indicated generally by the reference character 10, is a gas valve of the high-low type adapted particularly for use in broilers.

The valve comprises a valve body 12, within which is mounted a control member illustrated as a rotatably mounted plug 14, provided with intercommunicating axial and radial passageways 16 and 17. The valve plug is illustrated in its off position in Fig. 2, in its low position in Fig. 3, and in its fully open position in Fig. 4. Variable amounts of gas are supplied to the broiler burner when the plug is operated to various angular positions intermediate the positions occupied thereby in Figs. 3 and 4.

The valve plug is rotated by a handle 18 removably secured to a valve stem 20 operatively connected in any suitable manner to the plug.

In accordance with one of the primary features of the present invention, the valve body 12 is formed with a plurality of radially extending projections or bosses 22, 24 and 26, all located in a common plane disposed transversely of the axis of rotation of plug 14. These bosses are drilled or otherwise formed with ports or passageways 28, 30 and 32, respectively, which define inlet, pilot and low adjustment passageways. The valve body is also provided with a boss 34 which is located coaxially with respect to plug 14 and is drilled or otherwise provided with a central passageway 35 communicating at one end with the axial passageway 16 of the plug.

Gas is supplied to the burner and pilot under the control of the valve through the inlet passageway 28 from a suitable supply conduit (not

shown) which may be secured to the externally threaded boss 22.

Gas is supplied to the pilot in a manner to be described shortly through a conduit 36 connected to the pilot passageway 30 by a coupling member 38 and a T-connection 40, provided with a rotatable adjusting valve 42 by means of which the supply of gas to the pilot may be adjusted. The T-connection is preferably threaded into the internally threaded pilot boss 24.

Gas is supplied to the burner through the outlet passageway 35 in the outlet boss 34, which is externally threaded to receive a coupling member 44 and conduit 46.

The low adjustment comprises a needle valve 40 adjustably mounted in the low adjustment boss 26. The desired adjustability of the needle valve is preferably obtained by providing it with external threads so that it may be threaded into the internal threads provided on the boss 26. Undesired access to and adjustment of the needle valve is prevented by a cap 50 threaded internally so that it may be secured to boss 26. A bushing 52 is provided to prevent leakage.

The low adjustment passageway 32 communicates with inlet passageway 28 through a passageway 54, which may conveniently be termed an auxiliary passageway. In passing it may be noted that the passageway 32 terminates in a portion 56 of reduced diameter leading to the valve plug.

According to another important feature of the present invention, gas is supplied to the pilot at constant pressure whenever gas is supplied to the burner, irrespective of whether the valve plug is in its low, high, or any of its intermediate positions. This is achieved by providing the valve plug 14 with a peripheral groove or passageway 58 adapted to connect the inlet passageway 28 to the pilot passageway 30 in all the above mentioned positions of the valve plug through auxiliary passageways 60 and 62.

The peripheral passageway, like all the other passageways leading to the peripheral surface of the valve plug are all in the same plane transverse to the axis of rotation of the plug. This location of the passageways is another of the important features of the present invention as it makes possible the construction of a shorter valve body and valve plug, whereby a reduction in cost of the valve is effected.

Another advantage of the construction illustrated in Figs. 1 to 4 and described above is that the auxiliary passageways 54, 60 and 62 may be drilled through the low adjustment, inlet and pilot passageways 32, 28 and 30, respectively, as may be apparent from an inspection of Fig. 2. Another advantage of the illustrated and described valve construction is that the same valve body may be utilized, irrespective of the direction in which the valve plug is to be rotated to supply gas to the burner. In the illustrated embodiment, the valve plug 14 is rotated in a counterclockwise direction (referring to Fig. 2) when it is desired to supply gas to the burner. If it is desired for any reason whatever to rotate the valve plug in the opposite direction, then the boss 24 would be constructed like boss 26, and the latter like the former. In case this is done, then the location of the auxiliary passageways and the peripheral passageway in the valve plug would have to be changed accordingly.

When the valve is in its off position, as illustrated in Fig. 2, it may be noted that the supply of gas to the outlet conduit 46, which leads to

the burner as heretofore indicated, and to the pilot conduit 36, is cut off by reason of the fact that the valve plug 14 occupies a position where-in passageways 16 and 30 are cut off from communication with inlet passageway 28.

When the valve is in its low position, as illustrated in Fig. 3, gas is supplied to the pilot at constant pressure through the inlet passageway 28, auxiliary passageway 60, the peripheral passageway 58 in plug 14, auxiliary passageway 62, pilot passageway 30, T-connection 40 and conduit 36. Gas is also supplied to the burner, at a rate dependent upon the setting of needle valve 48, through the inlet passageway 28, auxiliary passageway 54, low adjustment passageways 32, 56, radial and axial passageways 17 and 16 in plug 14, the outlet passageway 35 and burner conduit 46. In the embodiment of Figs. 1 to 4, gas is supplied to the pilot at substantially the same time as it is supplied to the burner by reason of the fact that the passageway 62 is connected to the inlet at the same time that passageway 17 is connected to passageway 56.

When the valve is in its high position, as illustrated in Fig. 4, gas is supplied to the burner at a maximum rate through inlet passageway 28, the radial and axial passageways 17 and 16 of the plug and outlet passageway 35. Gas is supplied at the same constant pressure as previously to the pilot through the passageways previously indicated, the peripheral passageway 58 in the plug being of a length sufficient to connect passageways 60 and 62 in the low and high positions, as well as in all positions of the valve plug intermediate the low and high positions.

The features of the present invention described above are also applicable to oven valves of the type having no low adjustment, as illustrated in Fig. 5. Referring now to this figure, the valve is indicated generally by reference character 70. It comprises a body 72 within which is mounted a rotatable plug 74 provided with a radial passageway 76 communicating with an axial passageway 78, communicating in turn with the burner, just as in the previously described embodiment. The plug is provided also with a peripheral passageway 80 of a length and so located angularly that gas is supplied to the burner and pilot at substantially the same time as the valve is moved from its closed to open positions.

Gas is supplied to the burner through an inlet passageway 82 extending through a radial boss 84 and the previously mentioned passageways 76 and 78 in the plug and is supplied to the pilot at the same time and also at constant pressure through the inlet passageway 82, an auxiliary passageway 86 leading from the latter to the valve plug, and an auxiliary passageway 88 leading to the pilot passageway 90 extending through a radial boss 92. The latter is internally threaded to receive a T-connection 94 which may be and which is illustrated as being similar to the T-connection 40 of the previously described modification.

The radial bosses 84 and 92 are located in the same plane transverse to the axis of rotation of valve plug 74.

The principles of the present invention can be utilized to provide a valve operable to supply gas to the pilot prior to the time that gas is supplied to the burner. A valve of this nature is shown in Fig. 6. The valve illustrated in this figure is identical with the one illustrated in Fig. 5, with the exception that the peripheral passageway 96 in the valve plug 98 is made some-

what longer than the passageway 80 so that gas is supplied to the pilot passageway 90 prior to the time that gas is supplied to the burner through passageways 76 and 78.

It should be understood that the principles of the present invention may be utilized in connection with valves of different forms and sizes and that while the invention has been described in conjunction with certain preferred embodiments, these are deemed to be illustrative only.

I claim:

1. In a valve of the type comprising a body apertured to receive a rotatable control member operable to control the supply of a fluid medium, said control member being provided with a central axial passageway and a radial passageway for controlling the supply of the medium to a burner, an inlet passageway, a passageway adapted to be connected to a pilot burner and communicating with the control member at a point angularly displaced in one direction from said inlet passageway, and a low adjustment passageway providing communication between the inlet passageway and control member at a point angularly displaced in the opposite direction from said inlet passageway through which a predetermined amount of fluid medium flows when the control member is operated to a predetermined position, including in combination, an auxiliary passageway leading from said inlet passageway to the control member at a point between said inlet and pilot passageways, and a passageway in said control member spaced from the axial and radial passageways therein, said pilot, auxiliary and last mentioned passageways being so constructed and located angularly with respect to each other and the inlet, the low adjustment and the radial and axial passageways that gas is supplied to the pilot burner at a substantially constant pressure whenever gas is supplied to the burner.

2. In a valve of the type comprising a body apertured to receive a rotatable control member operable to control the supply of a fluid medium, said control member being provided with central axial passageways and a radial passageway for controlling the supply of the medium to a burner, an inlet passageway, a passageway adapted to be connected to a pilot burner and communicating with the control member at a point angularly displaced in one direction from said inlet passageway, and a low adjustment passageway providing communication between the inlet passageway and control member at a point angularly

displaced in the opposite direction from said inlet passageway through which a predetermined amount of fluid medium flows when the control member is operated to a predetermined position, including in combination, an auxiliary passageway leading from said inlet passageway to the control member at a point between said inlet and pilot passageways, and a passageway in said control member spaced from the axial and radial passageways therein, said pilot, auxiliary and last mentioned passageways being so constructed and located angularly with respect to each other and the inlet, the low adjustment and the radial and axial passageways that gas is supplied to the pilot burner at a substantially constant pressure whenever gas is supplied to the burner, all said passageways, with the exception of the axial passageway in said control member, being located in a common plane transverse to the axis of rotation of said control member.

3. In a gas valve of the character described, the combination including, a passageway for supplying a relatively small quantity of gas to a burner, a passageway for supplying a larger quantity of gas to the burner, a passageway for supplying gas to a pilot for said burner, an inlet passageway for supplying gas to the valve, and control means so constructed and arranged with respect to said passageways that the inlet passageway is connected to said pilot passageway with the connection of said inlet passageway to said first mentioned passageway and remains connected to said pilot passageway to supply gas at a substantially constant pressure thereto while the burner passageway is connected to either of the two first mentioned passageways.

4. In a gas valve of the character described, the combination including, a passageway for supplying a predetermined relatively small quantity of gas to a burner, a passageway for supplying a predetermined larger quantity of gas to the burner, control means associated with said passageways operable to a first position to supply said small quantity to the burner and to a second position to supply said larger quantity to said burner, said control means being operable also to supply variable amounts of gas to the burner in positions intermediate said first and second positions, a pilot passageway, said pilot passageway and control means being so constructed and arranged that gas is supplied to the pilot passageway at a substantially constant pressure in all said positions of the control means.

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