Oct. 20, 1959 C. C. LAMAR 2,909,217

GAS VALVES

Filed Oct. 14, 1953 2 Sheets-Sheet 1

Fig. 1.

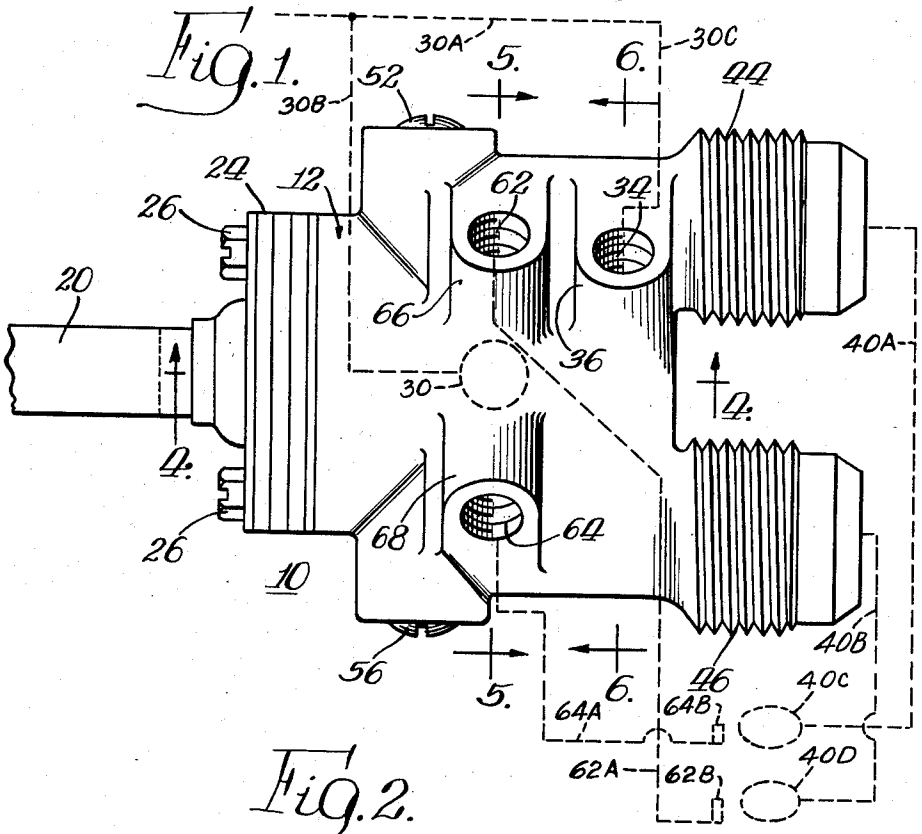
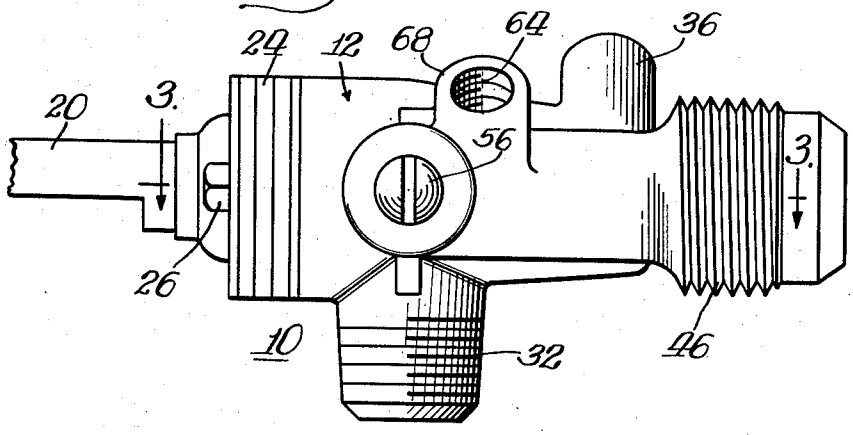


Fig. 2.



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Fig. 3. (OFF)

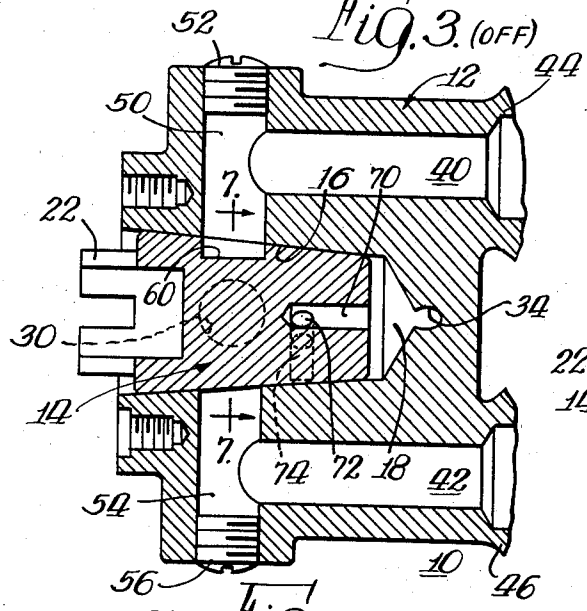


Fig. 4. (OFF)

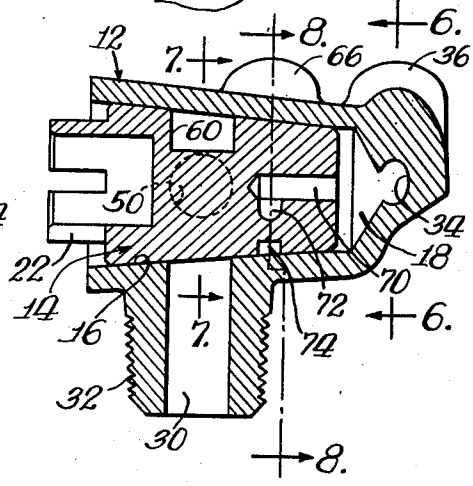


Fig. 5. (OFF)

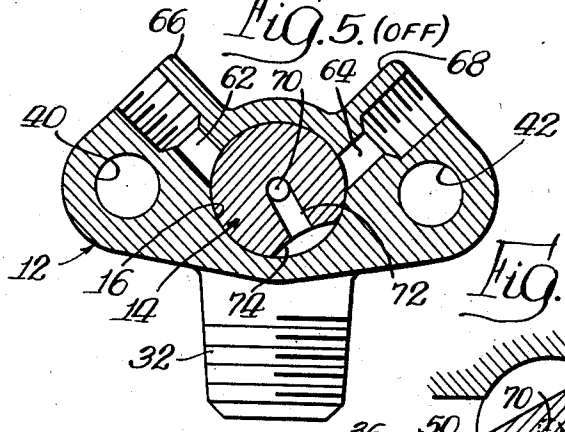


Fig. 7A.

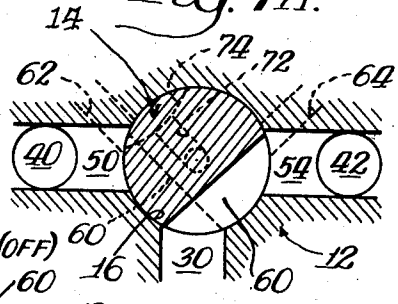


Fig. 7. (OFF)

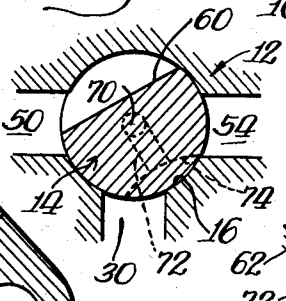


Fig. 8.

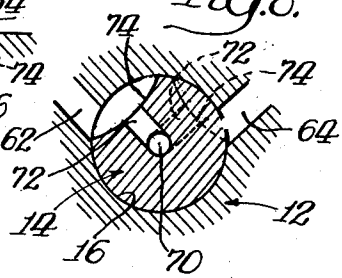
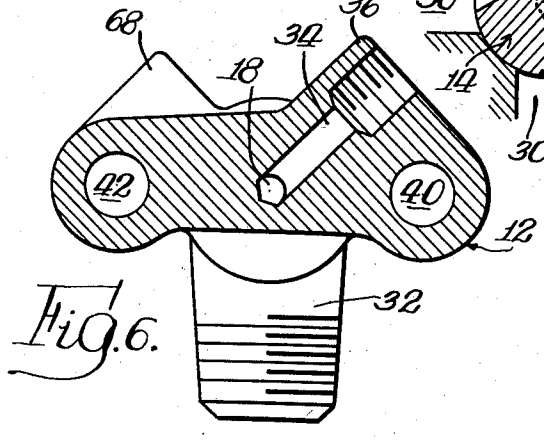


Fig. 6.



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2,909,217

GAS VALVES

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Application October 14, 1953, Serial No. 385,978

5 Claims. (Cl. 158—105)

The present invention relates to gas valves, and particularly to gas valves for use on gas ranges including oven and broiler burners.

The primary object of the present invention is to provide a new and improved combined oven and broiler gas valve.

A further object of the present invention is to provide a new and improved combined oven and broiler valve wherein gas may be supplied selectively to oven or broiler outlet passageways.

A further object of the present invention is to provide a new and improved combined broiler and oven valve wherein gas may be selectively supplied to either a broiler or oven passageway and wherein these passageways are disconnected from each other in the off position so that there is no possibility of gas flow as from a lower oven burner to a higher broiler burner, which gas might flow by convection, as it does in known valves, if the two outlet passageways are connected. When they are disconnected, as in the case of the valve of the present invention, gas in the pipe-lines from the valve to the respective burners, will remain in the lines.

Another object of the present invention is the provision of a new and improved multiple outlet gas valve having a tapered plug and main and pilot burner inlet and outlet passageways and wherein the pilot burner inlet passageway is at the small diameter end of the plug and includes an axial passageway at the end of the plug.

A still further object of the present invention is to provide a new and improved multiple outlet gas valve for use particularly with oven and broiler burners and including a pair of pilot burner outlet passageways, which passageways lead to pilot burners associated with the oven and broiler burners, respectively.

Another and still further object of the present invention is to provide a new and improved gas valve having two outlets for main burners such as an oven burner and a broiler burner, having two pilot outlets, one for a pilot burner associated with each of the burners, and having two inlet passages, one for use in connection with the main burner outlet passageways and the other for use in connection with the pilot burner outlet passageways, in which valve the arrangement of passageways in the valve body and valve plug is such as to enable a shorter plug and body to be used, thereby conserving material. A valve of this character is particularly adapted for use in connection with an oven-broiler combination wherein the flow of gas to the oven and broiler burners is modulated under the control of a thermostat, whereas the pilot burners are supplied with a constant quantity of gas.

In brief, the multiple outlet gas valve of the present invention includes a valve body having two main outlet passageways, two pilot burner outlet passageways, and two inlet passageways. The main outlet passageways are adapted to be connected to main burners which may be an oven burner and a broiler burner, which burners may be located at different levels and which may be in a single compartment vented through a single flue having a capacity for one burner, so that the burners should not be ignited at the same time. The pilot burner passageways are adapted to be connected to pilot burners associated with the main burners. The valve includes also a movable control element which may take the form of a tapered valve plug movable from an off position to different operative positions so that gas may be supplied selectively to either of the main outlet passageways and to the associated pilot burner outlet passageway. The control member is preferably rotatable between its various positions and the control of the main inlet passageway to the main outlet passageways is effected in such manner that in the off position the two main outlet passageways are not connected together. Accordingly, gas in the outlet lines leading from the valve to the burners will remain in the lines and not flow out as would be the case if the two passageways were connected and one of the burners was at a higher level than the other. If they were connected, then gas in the two lines leading, one to one burner and the second to the other, would be free to flow to atmosphere. Lighter-than-air gas would flow upwardly from the lower burner through the line leading to it, the valve, the line leading to the upper burner and escape through the upper burner. With heavier-than-air gas the flow would be in the reverse direction. The result is an escape of a small amount of gas and a resulting odor of escaping gas. This is avoided by the present invention. The pilot burner passageways are also disconnected from each other and from the main burner passageways for much the same reasons and the arrangement is such that gas is supplied to the pilot burners at least for as long as gas is supplied to the main burners. The construction and arrangement of the valve body and plug and passageways are also such that body and plug of short length may be utilized.

Other objects and advantages of the present invention will become apparent from the ensuing description of an illustrative embodiment thereof, in the course of which reference is had to the accompanying drawings, in which:

Fig 1 is a top plan view of a valve constructed in accordance with the invention, but omitting the operating handle and part of the valve stem and diagrammatically shown connected to the burners at different levels through suitable conduits;

Fig. 2 is a side elevational view of the valve shown in Fig. 1;

Fig. 3 is a fragmentary longitudinal cross-sectional view taken along the line **3—3** of Fig. 2;

Fig. 4 is a fragmentary longitudinal cross-sectional view taken along the line **4—4** of Fig. 1;

Fig. 5 is a fragmentary transverse cross-sectional view taken along the line **5—5** of Fig. 1;

Fig. 6 is a similar view taken along the line **6—6** of Figs. 1 and 4;

Fig. 7 is a fragmentary transverse cross-sectional view taken along the line **7—7** with the valve in its off position;

Fig. 7A is a fragmentary transverse cross-sectional view taken along the line **7—7** of Figs. 3 and 4 illustrating the valve in one of its selective operative positions; and

Fig. 8 is a fragmentary cross-sectional view taken along line **8—8** of Fig. 4 (also the line **5—5** of Fig. 1) but illustrating the valve in the same position as in Fig. 7A.

Referring now to the drawings and first, particularly, to Figs. 1, 2 and 3, it will be noted that the valve of the present invention is indicated as a whole by reference character **10**. It comprises a valve body **12** and a movable control member which may take the form of a tapered valve plug **14**. The valve plug is mounted within a tapered valve chamber **16** closed at its small diameter end and in such manner that the small diameter end of the plug is spaced from the inner end of the chamber

to provide a chamber **18** at the inner end of the valve plug.

The valve plug may be rotated in suitable manner as through a stem **20** at the outer end of which may be mounted in suitable manner an operating handle, not shown. The stem **20** is operatively connected to the keyed end **22** (see Fig. 3) of the valve plug in suitable manner. For example, the operative connection may be along the lines of that illustrated and claimed in Patent No. 2,276,271 and providing a locking type of valve which is locked in the off position. The large diameter end of the valve chamber **16** may be closed by a series of plates indicated generally by the reference character **24** and which are secured to the valve body as by the screws **26** passing therethrough.

In accordance with the present invention, the valve body is provided with two inlet passageways. One of these is a main inlet passageway **30**, preferably formed in a downwardly extending externally threaded boss **32**. The other inlet passageway is a pilot inlet passageway **34** extending diagonally through an internally threaded boss **36** to the chamber **18** (see particularly Figs. 3, 4 and 6) at the closed end of the plug receiving chamber **10**. The inlet passageways **30** and **34** are connected to gas supply means such as a manifold **30A** by connections **30B** and **30C** as diagrammatically illustrated in Fig. 1. The valve body is also provided with a pair of main outlet passageways **40** and **42**, the outlet ends of which pass through externally threaded projections **44** and **46**, respectively, formed integrally with the valve and by means of which they may be connected by conduits **40A** and **40B** as to oven and broiler burners **40C** and **40D**, as diagrammatically illustrated in Fig. 1.

The outlet passageway **40** is located to one side of the plug receiving recess and extends generally axially of the valve body but is connected to the chamber **16** through a right angle portion **50**, the outer end of which is closed in suitable manner as by a screw threaded cap **52**. The arrangement is such that the passageways **40** and **50** can be drilled readily. In similar manner passageway **42** is connected to the chamber by the portion **54** which is located in the same transverse plane as passageway **50** and the main inlet **30** and the outer end of which is closed by the cap **56**.

The valve plug includes a first portion associated with the main outlet passageways for selectively connecting the two passageways to the main gas inlet passageway **30**. In accordance with a feature of the invention this arrangement is such that in the off position the two passageways **40** and **42** are effectively disconnected from each other, as illustrated in Fig. 7. The selective connection of the inlet passageway **30** to either of the two main outlet passageways is effected through a slot **60** milled or otherwise formed in the valve plug. In Fig, 7A the slot **60** is shown connecting the inlet passageway **30** to outlet passageway **42**, this being one of the operative positions and one to which the plug is turned in a clockwise direction, as viewed from the stem, from the off position. In the other operative position, to which the plug is turned in a counterclockwise direction from the off position, inlet passageway **30** is connected to the outlet passageway **50—40** by the slot **60** in the dotted line position of Fig. 7A. In the off position, the valve plug also effectively disconnects the two pilot outlet passageways, its angular location being somewhat off center as far as the two operative positions are concerned.

In its operative positions the valve plug connects the pilot inlet passageway selectively to one or the other of the two pilot passageways which are indicated by the reference characters **62** and **64**, respectively. These passageways extend generally diagonally of the valve body through the internally threaded bosses **66** and **68**, respectively, to the valve chamber and to a point longitudinally of the chamber sufficient to provide adequate sealing between them and the transverse portions of the main outlet passageways.

The selective connection of the pilot inlet passageway **34** to the pilot outlet passageways **62** and **64** is effected through a system of passageways in the plug including an axially extending passageway **70** at the inner small diameter end of the plug and which is continuously open to chamber **18**, and a transverse passageway **72** and a short slot **74** at the exterior of the valve plug which are located substantially diametrically opposite the slot **60**. The two operative positions of the pilot burner control system **70**, **72** and **74** are best illustrated by the solid and dotted line positions of Fig. 8 (see also Fig. 7A). It should be noted also that the location of the pilot burner gas flow system is such that when gas flows through passageway **40** to the main burner, it flows through passageway **64** and connection **64A** to the associated pilot **64B**, and that when gas flows through outlet passageway **42** to a main burner, it flows at the same time through passageway **62** and connection **62A** to the associated pilot burner **62B**, as shown diagrammatically in Fig. 1. The arrangement is also such that gas flows to a pilot burner before it flows to a main burner. The use of an axial pilot inlet passageway at the end of the plug in combination with the transverse passageway to the exterior of the plug makes it possible selectively to supply the pilot outlet passageways with gas through a smaller slot, or the like, **74** at the plug surface. The reason for this is that the slot does not have to connect an inlet to an outlet directly, as is the case with slot **60**. Also, the pilot inlet passageway can be located in a different plane from the pilot outlet passageways.

It will be apparent from the foregoing detailed description that the present invention provides a readily constructed gas valve in which the main and pilot burner passageways are effectively disconnected from each other and that the two main burner outlet passageways are effectively disconnected from each other in the off position of the valve, as are the two pilot burner passageways. Accordingly, there is no likelihood of leakage of gas from the pipe-lines leading to the main and pilot burners when the valve is turned to its off position. Likewise, the valve may be readily used in a thermostatically controlled arrangement wherein the flow of gas to the main burner inlet **30** may be modulated by a thermostat while a full and unmodulated flow of gas is supplied to the particular pilot burner in use at the time. Also it is possible readily to control the flow of gas so as to selectively supply either of two main burners and an associated pilot burner, which two main burners may be the oven and broiler burners.

It may be noted also that the construction and arrangement of the main and pilot control passageways in the body and the associated main and pilot control passageways in the plug are such that in the off position, see Figs. 4 and 7, the plug pilot control passageway **72** and **74**, which is connected to pilot inlet passageway **34**, are adjacent the main inlet passageway **30**. The arrangement is thus such that in the off position of the plug the same gas pressure exists at the surface of the plug at the region of the main inlet passageway and the pilot burner gas supply with the result that there is no tendency of gas to flow from one to the other. As a result the axial spacing between the main inlet, and thus the main gas supply passageways, and the pilot control passageways in the plug may be shorter and still provide sufficient sealing to meet the A.G.A. specifications. This distance may be as short as one-sixteenth inch and, accordingly, the valve body and plug may be made shorter to conserve material.

While the present invention has been disclosed and described in connection with the details of a particular embodiment, it should be understood that these details are not intended to be limitative of the invention except insofar as set forth in the accompanying claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination with oven and broiler burners and associated pilot burners located at different levels, a multiple outlet valve including a valve body having a valve chamber which is closed at one end and open at the other, a main gas inlet passageway leading into said chamber near its open end, main burner outlet passageways for said oven and broiler burners each having an axial portion located to one side of said chamber and a radial portion connecting the associated axial portion to said chamber, said radial portions being angularly spaced from each other, said radial portions being substantially in the plane of said inlet passageway and the latter being angularly substantially midway between said portions, said body having also a pilot inlet passageway leading to said closed end of said chamber and pilot outlet passageways for said pilot burners having portions opening to said chamber at points located axially of the chamber between the closed end of said chamber and said main inlet and outlet passageways, a valve plug mounted in said chamber for selective rotation from an off to operative positions and having a portion closing the main gas inlet passageway in the off position, another portion preventing communication between said radial portions of the main burner outlet passageways in the off position, and also a slot therein for selectively connecting said main inlet passageway to one or the other of said main burner outlet passageways in said operative positions, and said plug having a pilot burner supply passageway system therein leading from the end of the plug adjacent the closed end of the chamber to the periphery of the plug for selectively connecting the chamber and pilot inlet passageway to one or the other of said pilot outlet passageways.

2. In combination with oven and broiler burners and associated pilot burners located at different levels, a multiple outlet valve including a valve body having a valve chamber which is closed at one end and open at the other, a main gas inlet passageway leading into said chamber, main burner outlet passageways for said oven and broiler burners each having an axial portion located to one side of said chamber and a radial portion connecting the associated axial portion to said chamber, said radial portions being substantially in the plane of said inlet passageway and the latter being angularly substantially midway between said portions, said body having also a pilot inlet passageway leading to said closed end of said chamber and pilot outlet passageways for said pilot burners having portions opening to said chamber at points located axially of the chamber between the closed end of said chamber and said inlet and outlet passageways, said main and pilot inlet being connected to gas supply means at the same pressure, a valve plug mounted in said chamber for selective rotation from an off to operative positions and having a slot therein for selectively connecting said main inlet passageway to one or the other of said main burner outlet passageways, and said plug having a pilot burner supply passageway system therein leading from the end of the plug adjacent the closed end of the chamber to the periphery of the plug for selectively connecting the chamber and pilot inlet passageway to one or the other of said pilot outlet passageways, said passageway system being also so located that in the off position the pilot burner supply passageway at the periphery of the plug is angularly adjacent to but axially spaced from the main inlet, whereby in the off position of the plug the gas pressures at the surface of the plug at the region of the main inlet passageway and the pilot burner gas supply are equal and opposed to enable the passageway and supply to be located axially close to each other with adequate sealing.

3. In combination with oven and broiler burners and associated pilot burners located at different levels, a multiple outlet valve including a valve body having a valve chamber, which is closed at one end and open at the other, a main gas inlet passageway from the bottom of the valve body to the lower side of said chamber, main burner outlet passageways for said oven and broiler burners each having an axial portion located to one side of said chamber and a radial portion connecting the associated axial portion to said chamber, said radial portions being transversely substantially in the plane of said inlet passageway and the latter being angularly substantially midway between said portions, said body having also a pilot inlet passageway leading from the upper side of the valve body to said closed end of said chamber and pilot outlet passageways for said pilot burners leading diagonally from the upper side of the valve body to said chamber at points located axially of the chamber between the end of said chamber and said inlet and outlet passageways, a valve plug mounted in said chamber for selective rotation from an off to operative positions and having a slot therein for selectively connecting said main inlet passageway to one or the other of said burner outlet passageways and which provides no communication between said main burner outlet passageways in the off position, and said plug having a pilot burner supply passageway system therein leading from the end of the plug adjacent the closed end of the chamber to the periphery of the plug at a point axially displaced toward the small end of the plug from said slot for selectively connecting the chamber and pilot inlet passageway to one or the other of said pilot outlet passageways, said pilot system also providing no communication between said pilot burner outlet passageways in the off position of the valve.

4. In combination with oven and broiler burners and associated pilot burners located at different levels, a multiple outlet gas valve including a valve body having a plug receiving chamber closed at one end, and valve plug mounted in said chamber, said valve body having a main gas inlet passageway leading to said chamber near its open end and a pilot gas inlet passageway leading to the closed end of said chamber, said valve body including also main outlet passageways for said oven and broiler burners at diametrically opposed positions in the plane of said inlet passageway, and angularly spaced apart pilot burner outlet passageways for said pilot burners leading into said chamber in a second plane located axially of said chamber between said first mentioned plane and the closed end of the chamber, said plug having structure and a passageway in the plane of said main inlet and outlet passageways for disconnecting said main outlet passageways from each other and from said main inlet passageway in an off position and for selectively connecting said inlet passageway to said outlet passageways in different positions of the valve plug, and said plug also having structure and a system of passageways leading from the end of the plug to said second plane for disconnecting said pilot burner outlet passageways from each other and said pilot burner inlet passageway in the off position of the plug and for selectively connecting said pilot inlet passageway to said pilot outlet passageways in different positions of the valve plug.

5. A multiple outlet gas valve including a valve body having a plug receiving chamber, a rotatable valve plug mounted in said chamber, said valve body having a main gas inlet passageway leading to said chamber near one end and a separate pilot gas inlet passageway leading to the other end of said chamber, said main and pilot inlet passageways being connected to gas supply means at the same pressure, said valve body including also a main outlet passageway in the plane of said main inlet passageway and angularly spaced from the latter, pilot burner outlet passageway means connected to said chamber in a second plane axially spaced from said first plane toward said

other end of said chamber, said plug having passageway means in said first plane for selectively connecting said main inlet to said main outlet passageway, and said plug having a system of passageways including an axial portion open to said chamber and a connecting transverse portion opening on the surface of said plug in said second plane for selectively supplying gas to said pilot burner outlet passageway means, said plug having an off position in which the main inlet passageway and the pilot burner outlet passageway means are closed by the plug and in which said transverse portion in the plug is angularly aligned but axially spaced from said main inlet passageway, whereby in the off position of the plug the gas pressures at the surface of the plug at the region of the main inlet passageway and the pilot burner gas supply are equal and opposed to enable the passageway and supply to be located axially close to each other with adequate sealing.

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