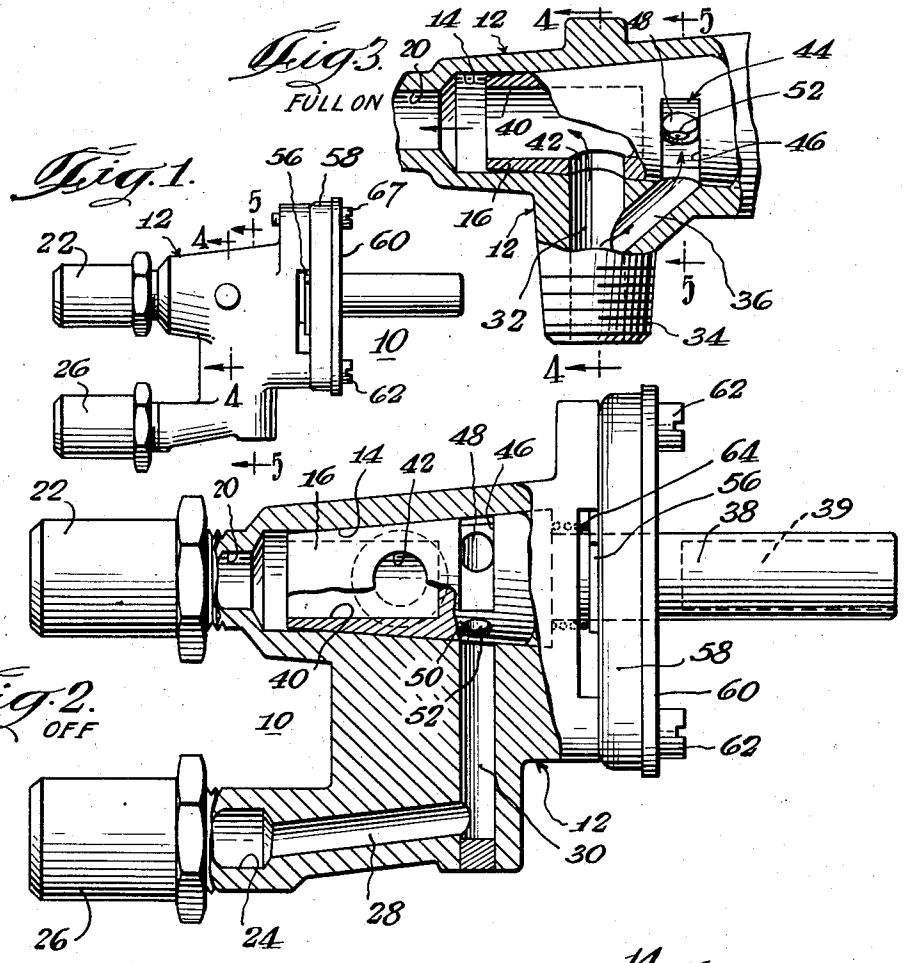
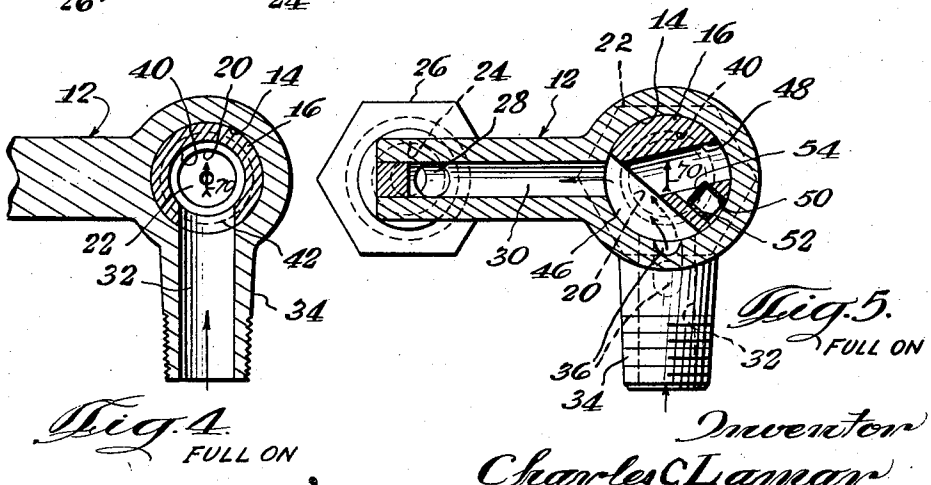
Nov. 4, 1958 C. C. LAMAR 2,858,852

GAS VALVES

Original Filed Jan. 19, 1952 2 Sheets-Sheet 1





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GAS VALVES

Original Filed Jan. 19, 1952 2 Sheets-Sheet 2

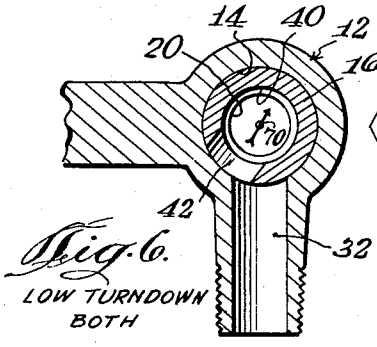


Fig. 6.
LOW TURNDOWN
BOTH

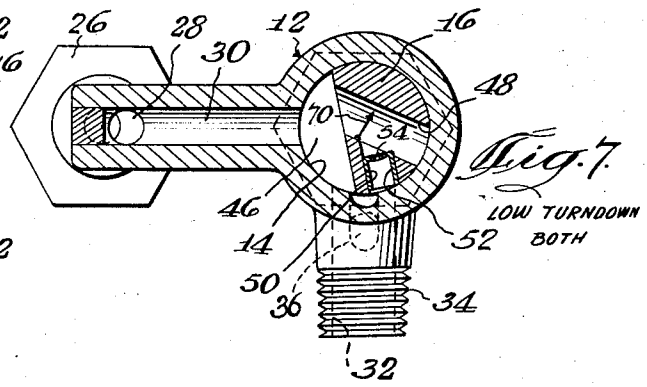


Fig. 7.
LOW TURNDOWN
BOTH

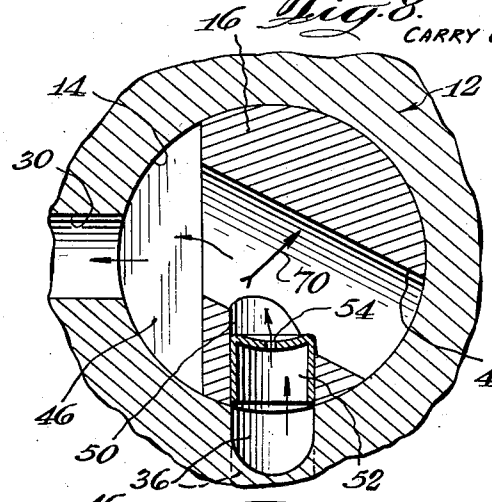


Fig. 8.
CARRY OVER

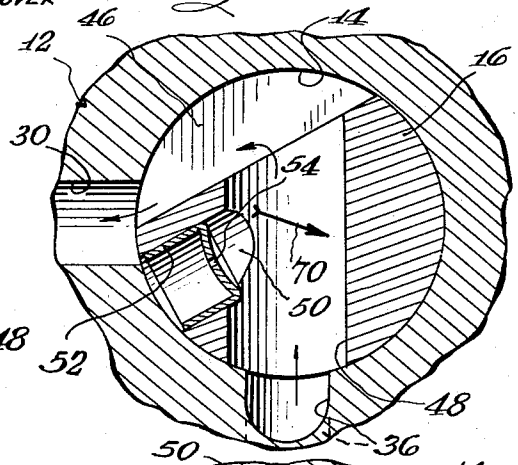


Fig. 9.
FULL SIMMER

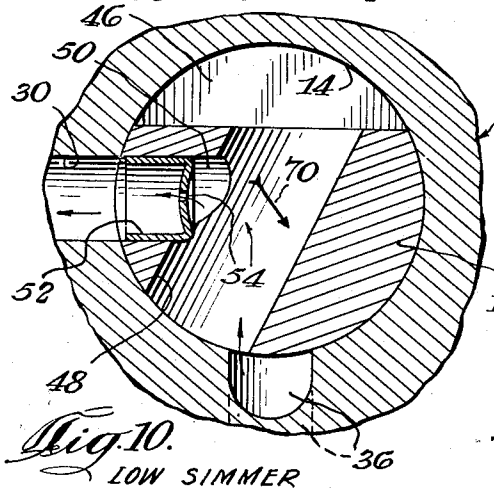


Fig. 10.
LOW SIMMER

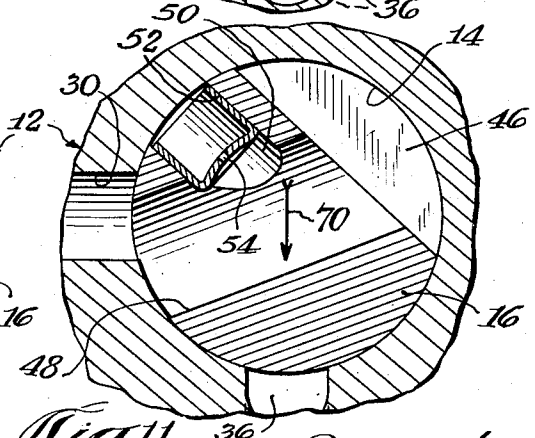


Fig. 11.
OFF

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United States Patent Office

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GAS VALVES

Charles C. Lamar, Chicago, Ill., assignor, by mesne assignments, to Harper-Wyman Company, Chicago, Ill., a corporation of Illinois

Continuation of application Serial No. 267,237, January 19, 1952. This application October 4, 1956, Serial No. 613,991

3 Claims. (Cl. 137—625.32)

The present invention relates to gas valves and particularly to double gas valves for use with gas burners having two burner sections. Burners of this character are commonly called double burners and the two burner sections are called the main and simmer burner sections. This application is a continuation of my presently copending application Serial No. 267,237, filed January 19, 1952, now abandoned.

There are many known types of double gas valves. They are constructed and arranged selectively to supply gas to the two burner sections and also to supply a predetermined small quantity of gas to the simmer burner section only to provide what may be termed a "keep warm" heat. The present invention relates to a gas valve of this character which is operable into several operating positions. These include a full on position in which gas is supplied to both the main and simmer burner sections in maximum quantities. From this position the valve can be turned gradually to decrease the quantity of gas supplied to both burners through what may be called a turndown range. Further movement of the valve brings it to a full simmer position in which a full quantity of gas is supplied to the simmer burner only. Further movement of the valve brings the valve into its low simmer position in which a predetermined small quantity of gas is supplied to the simmer burner only. Continued movement from the low simmer carries the valve to its off position in which the supply of gas is cut off.

The primary object of the present invention is to provide a new and improved gas valve for a double gas burner, i. e., a new and improved double gas valve.

Another object of the present invention is to provide a new and improved double gas valve including a simplified arrangement for enabling the valve to supply the gas selectively to the two burners or the simmer burner only and to supply a low predetermined quantity of gas to the simmer burner only.

A further object of the present invention is to provide a new and improved double gas valve in which the outlet to the main burner is located coaxially of the movable valve element which may be, for example, a tapered valve plug.

Another object of the present invention is to provide a new and improved double gas valve operable into the several positions mentioned above including axially displaced systems of control passageways in the valve plug for the two burner sections and including also a novel arrangement for providing what may be termed "carry-over" for the purpose of maintaining the flame in the simmer burner when the valve is moved from the lower end of the turndown range to the simmer burner only condition.

In brief, the double gas valve of the present invention comprises a valve body having mounted within it a rotatable valve element such as a tapered valve plug having a first system of control passageways for controlling the supply of gas to the main burner and including an axially extending portion open at one end and coaxially related

to a main burner outlet passageway connected to the main burner section of the double gas burner. The rotatable valve element also includes a system of coplanar control passageways axially displaced from the main burner system of passageways for supplying gas in selected quantities to the simmer burner, the outlet passageway for which terminates in a portion laterally displaced from the main burner outlet passageway. The valve body includes also gas inlet passageway defining means extending lengthwise of the rotatable valve element and associated with the two systems of control passageways. The simmer burner system of control passageways is simple in construction. It includes a segmental slot, an angularly extending full simmer passageway extending between the slot and the exterior of the valve plug, and a low simmer passageway located angularly between the slot and the full simmer passageway and communicating with them. The low simmer passageway includes an orifice defining insert. This passageway and the insert therein are utilized not only in the low simmer position, but also to provide the flame maintaining carry-over between the low turndown of both main and simmer and the full on of simmer only.

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 elevational view of the valve of the present invention, the valve being shown in full scale;

Fig. 2 is an enlarged top elevational view of the valve, partly in horizontal axial cross section, the valve being shown in its off position;

Fig. 3 is a fragmentary side elevational view, partly in vertical axial cross section, illustrating the valve in its full on position;

Fig. 4 is a fragmentary transverse cross sectional view taken along the lines 4—4 of Figs. 1 and 3 and with the valve in its full on position;

Fig. 5 is a transverse cross sectional view taken along the lines 5—5 of Figs. 1 and 3 and with the valve in its full on position;

Figs. 6 and 7 are views similar to Figs. 4 and 5 with the valve at the low end of its turndown range for both burners;

Fig. 8 is a fragmentary enlarged transverse cross sectional view illustrating the valve in its carry-over position; and

Figs. 9, 10 and 11 are enlarged cross sectional views illustrating the valve in its full simmer, low simmer, and off positions, respectively.

Referring now first more particularly to Figs. 1 and 2, it may be noted that the double gas valve of the present invention is indicated as a whole by reference character 10. It comprises a valve body 12 having a chamber 14 for the reception of a rotatable control member 16. The chamber, it may be noted, is illustrated as being of conventional construction having a conical inner surface and the rotatable control member is similarly indicated as a tapered or conical plug.

In accordance with one of the features of the present invention, the chamber 14 communicates with a coaxially located main burner outlet passageway 20 through which the main burner section of the double gas burner (not shown) is supplied with gas through a conventional adjustable hood 22. The valve includes also a simmer burner section outlet passageway 24 through which the simmer burner section of a double burner (not shown) is supplied through the adjustable hood 26. The outer end of the simmer burner outlet passageway is laterally displaced from the main burner outlet passageway and it includes the generally axial portion 28 and the transverse portion 30 which opens into the valve chamber.

Gas is supplied to the valve through gas inlet passageway defining means extending lengthwise of the chamber and illustrated as including a main inlet passageway **32** leading into the valve chamber and formed in an externally threaded transverse boss **34** extending downwardly below the main portion of the valve body and adapted for attachment to the usual gas supply manifold (not shown). The gas inlet passageway defining means as illustrated includes also an inclined branch inlet passageway **36** which also leads to the valve chamber and through which gas is supplied to the simmer burner section.

Gas is supplied selectively to the two outlet passageways under the control of the valve plug, which is adapted to be rotated through a valve operating stem **38** having a flat **39** as its outer end for the reception of a handle (not shown). In order to control the flow of gas to the main burner, the valve plug is provided with a first system of control passageways including an axial passageway **40** and a transverse passageway **42**. The passageway **40** is open to the chamber **14** and main burner outlet passageway **20** and is adapted selectively to be placed in communication with the inlet passageway **32** through the passageway **42** which, as may be noted best from Fig. 3, is in registry with the inlet passageway in the full on position of the valve plug.

In accordance with another feature of the present invention the valve is provided with an improved arrangement for supplying the desired quantities of gas to the simmer burner section. This means includes a system of control passageways in the valve plug, indicated generally by the reference character **44**. This system is displaced axially toward the front of the valve from the main burner system and it is located axially of the valve so as to be in alignment with the valve chamber end of the branch inlet passageway and portion **30** of the simmer burner outlet passageway, as best illustrated in Figs. 2 and 3.

The simmer burner system of control passageways **44** includes a segment shaped passageway **46** located at one side of the valve plug; a passageway **48** extending angularly relative to the segment shaped passageway and extending from the latter to the surface of the valve plug, and which passageway may be termed the simmer passageway; and a combined carry-over and low simmer passageway **50** located angularly between one end of the segment shaped passageway **46** and the simmer passageway **48** and extending between the latter and the exterior of the valve plug. A flow restricting and predetermining element is located in passageway **50**. It is illustrated as a cup-like insert **52** having a small orifice **54** in what may be considered the bottom of the cup. The orifice determines the quantity of gas supplied to the simmer burner in the "keep warm" position of the valve and also the amount supplied to it in the carry-over position.

The valve may be provided with suitable position indicating means and since these form no part of the present invention they will be described but briefly. The position indicating means may include a washer **56** and other indicating means, not shown, but housed within a housing consisting of a cup-like member **58** and an end cap **60** secured to the end of the valve body as by the screws **62**. The valve plug is resiliently held in place within the valve chamber and the disc **56** is held against the housing **58** in known manner as by the spring **64** encircling a portion of the valve stem.

Further details and advantages of the present construction will become apparent from the following description of the operation of the valve.

The full on position of the valve is illustrated in Figs. 3, 4 and 5. In order to provide a reference for the position of the valve plug, the direction in which the flat **39** faces is indicated by the double ended arrow **70**. In the full on position, it will be noted from Figs. 4 and 5, the flat faces up. In the full on position, gas is supplied in maximum quantities to both the main and simmer burner sections, as determined by adjustment of the hoods. Gas flows to the main burner section from the inlet **32**, the passageway **42** in full registry therewith, the axial passageway **40**, the valve chamber **14**, the outlet passageway **20** and hood **22**. Gas is supplied to the simmer burner section at the same time through inlet passageway **32**, branch inlet passageway **36**, the segmental passageway **46**, passageways **30**, **28**, **24** and hood **26**.

The quantity of gas supplied to both burners may be turned down by rotating the valve plug in a clockwise direction. When the valve plug reaches the position shown in Figs. 6 and 7 the turndown is at its low end. From Figs. 6 and 7 it will be noted that passageway **42** in the plug is substantially out of registry with the inlet passageway **32** and that the segmental passageway **36** is similarly substantially out of registry with branch inlet passageway. The combined carry-over and low simmer passageway **50** is at this time beginning to register with the branch inlet passageway.

In order to prevent extinguishment of the simmer burner flame in going from the low turndown of both burner sections to the full simmer position, a small quantity of gas is supplied to the simmer burner only during such movement. Referring now to Fig. 8, which shows the valve plug in what might be called its carry-over position, it will be noted that gas is being supplied to the simmer burner section only through the passageway **50**. It connects the simmer burner outlet passageway to the branch inlet passageway, the connection being effected through the orifice **54** in the insert **52**, the simmer burner passageway **48** and the segmental passageway **46**. At this time the main burner is supplied with no gas, the passageway **42** having been moved completely out of registry with inlet port passageway **32**.

When the valve is moved further in a clockwise direction from the position of Fig. 8, it reaches the full simmer position indicated in Fig. 9. In this position, a maximum quantity of gas is supplied to the simmer burner outlet passageway through the simmer burner passageway **48** and the segmental passageway **46**

Low simmer position is reached by further moving the plug in a clockwise direction to the position indicated in Fig. 10. Upon reference to this figure it will be seen that the branch inlet passageway **36** is connected to the simmer burner outlet passageway through the simmer burner passageway **48** and the orifice **54** in the insert **52**. It should be noted that the flow of gas through the insert is in the opposite direction from the flow occurring in the carry-over position in Fig. 8.

The off position of the valve is indicated in Fig. 11. In this position the valve plug closes both the main and branch inlet passageways **32** and **36**. The flat **39** in the valve handle faces downward, so that it may be seen that the various positions of the valve are obtained by a relatively short angular movement of 180°

While the details of the present invention have been described in connection with an illustrative embodiment of the invention, it should be understood that the details thereof 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. A valve of the character described for supplying gas to the main and simmer sections of a double burner and high and low quantities of gas to only the simmer section of the burner, including a valve body having a valve chamber and transversely extending substantially coplanar simmer burner section outlet and gas inlet passageways opening into said chamber with their axes located about ninety degrees apart, said body having also main burner section gas inlet and outlet passageways of which the former extends transversely of the chamber and the

latter is coaxially located relative to and opens into the chamber beyond the plug, an open ended valve plug mounted in said chamber for rotation in sequence through a plurality of angular positions of which a first is a full on position in which gas is supplied at a high rate to both the simmer and main burner outlet passageways, a second provides a carry-over range in which a small predetermined quantity of gas is supplied to the simmer burner section, a third is the full simmer position in which gas is supplied at a high rate to only the simmer burner outlet, and a fourth of which is a low simmer position in which gas is supplied only to the simmer burner outlet as in the second position, means including a first system of control passageways in said plug with portions at the plug surface in the plane of said simmer burner section inlet and outlet passageways for controlling the flow of gas from said simmer inlet passageway to said simmer outlet passageway, said system comprising a slot at the exterior of the plug and an angularly extending passageway connecting said slot to the periphery of said plug at a point generally opposite the slot for supplying high quantities of gas from said inlet to said outlet passageway in the first and third angular positions of the plug, in the first of which positions the slot directly connects the simmer inlet to the simmer outlet and in the third of which positions the simmer inlet is connected to said angularly extending passageway and the slot is connected to said outlet, and said system including an orificed flow limiting passageway in said plug having an opening at the surface of the plug angularly between said slot and angularly extending passageway and communicating with both said slot and angularly extending passageway and registrable with said simmer inlet passageway in the second angular position of the plug in which the flow limiting passageway is connected to said simmer outlet through said angularly extending passageway and slot, and registrable with said outlet passageway in the fourth angular position of said plug in which the flow limiting passageway is connected to the inlet through said angularly extending passageway for supplying said outlet passageway with a predetermined small quantity of gas in said second and fourth angular positions, and means including a second system of passageways in said rotatable valve plug axially displaced from the first system and comprising the axial open ended portion of the plug open to said chamber and a transverse portion in the plane of the main burner section inlet passageway and communicating with the latter in the first said angular position of said plug, said plug being movable also to an off position in which both inlet passageways are closed.

2. A valve for supplying high and low quantities of gas to a burner, including a valve body having a valve chamber and transversely extending burner outlet and gas inlet passageways opening into said chamber in a plane transverse to said chamber, a valve plug rotatably mounted in said chamber, and means including a system of control passageways in said valve plug having portions opening at the plug surface in the plane of said inlet and outlet passageways for controlling the flow of gas from said inlet to said outlet passageway, said system comprising a pair of angularly displaced coplanar passageways one of which interconnects said inlet passageway with said outlet passageway in one angular position and of which the two interconnect said inlet

passageway with said outlet passageway in a different angular position for supplying high quantities of gas from said inlet to said outlet passageway in two different angular positions and a further passageway with a portion at the plug surface angularly between and coplanar with said angularly displaced passageways and communicating with said pair of passageways and registrable with said inlet passageway in a third angular position of said element and with said outlet passageway in a fourth angular position of said element, and said further passageway including flow restricting means through which said gas flows in one direction in said third position and in the opposite direction in the fourth position for supplying said outlet passageway with a predetermined small quantity of gas in said third and fourth angular positions.

3. A valve of the character described for supplying gas to the main and simmer sections of a double burner and high and low quantities of gas to only the simmer section of the burner, including a valve body having a valve chamber and transversely extending substantially coplanar simmer burner section outlet and gas inlet passageways opening into said chamber, said body having also other gas inlet and outlet passageways for the main burner section of which the former extends transversely of the chamber and the latter is coaxially located relative to and opens into the chamber, a valve element rotatably mounted in said chamber, means including a first system of coplanar control passageways in said element in the plane of said simmer burner section inlet and outlet passageways for controlling the flow of gas from said simmer inlet passageway to said simmer outlet passageway, said system comprising a slot and an angularly extending passageway connecting said slot to the periphery of said element for supplying high quantities of gas from said inlet to said outlet passageway in different angular positions in one of which positions the slot connects the inlet to the outlet and in the other of which positions the inlet is connected to said angularly extending passageway and the slot is connected to said outlet, and said system including a further passageway in said element angularly between and communicating with said slot and angularly extending passageway and registrable with said inlet passageway in one angular position in which it is connected to said outlet through said angularly extending passageway and slot, and registrable with said outlet passageway in another angular position of said element in which it is connected to the inlet through said angularly extending passageway for supplying said outlet passageway with a predetermined small quantity of gas in said two angular positions, and means including a second system of passageways in said rotatable valve element axially displaced from the first system and comprising an axially extending portion open to said chamber and a transverse portion in the plane of the main burner section inlet passage and communicating with the latter in one of said different angular positions of said element.

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