July 2, 1946. G. F. TURNER 2,403,142

BURNER CONSTRUCTION

Filed March 7, 1942

Fig. 1

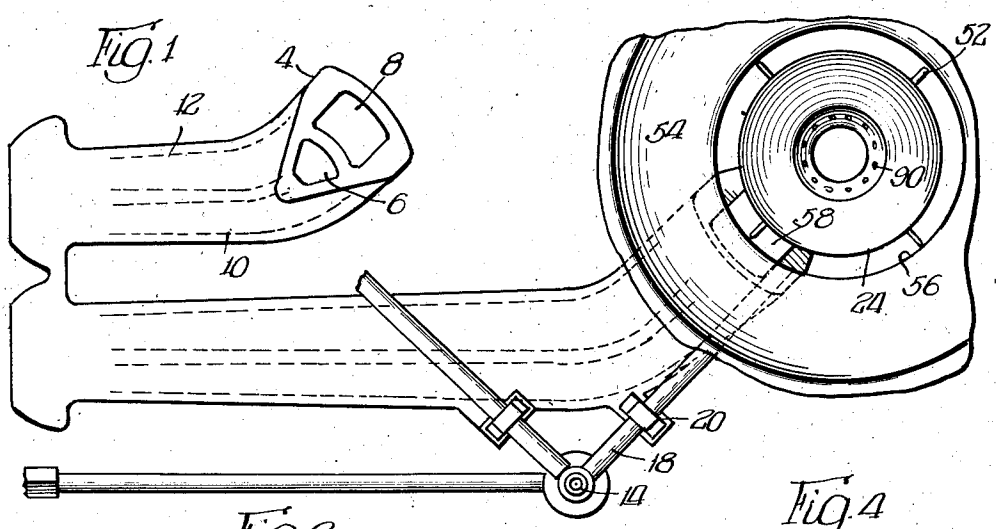


Fig. 2

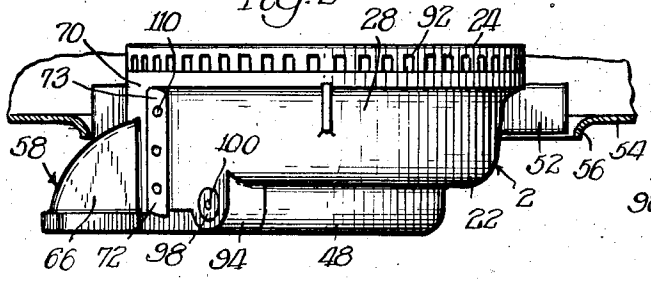


Fig. 4

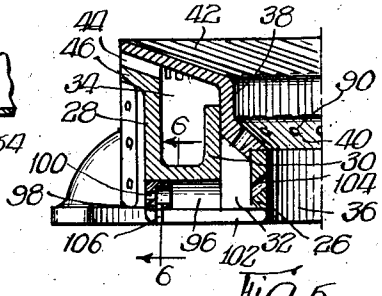


Fig. 3

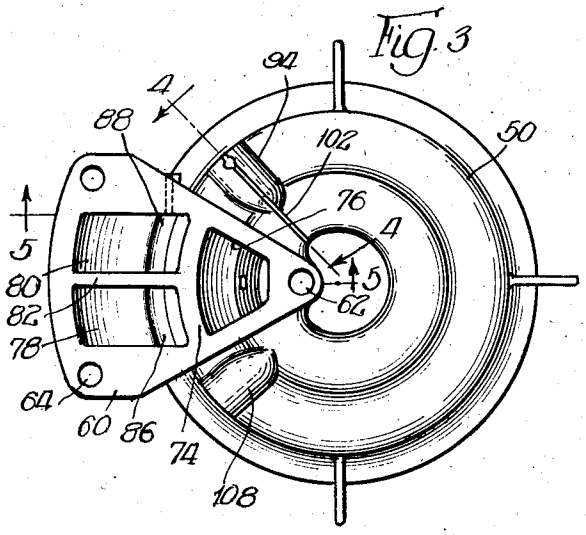
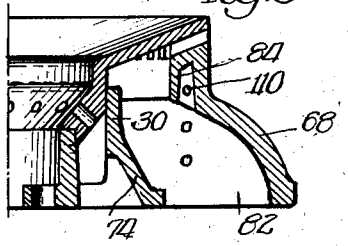


Fig. 5



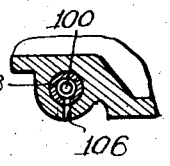


Fig. 6

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UNITED STATES PATENT OFFICE

2,403,142

BURNER CONSTRUCTION

George F. Turner, Chicago, Ill., assignor of one-fourth to Philip S. Harper, one-fourth to Carolyn L. Harper, both of Chicago, Ill., one-fourth to Harris Trust and Savings Bank, Chicago, Ill., as trustee for a trust known as "The Philip S. Harper Trust," and one-fourth to Harris Trust and Savings Bank, Chicago, Ill., as trustee for a trust known as "The Carolyn L. Harper Trust"

Application March 7, 1942, Serial No. 433,713

8 Claims. (Cl. 158—105)

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The present invention relates to novel burner constructions and more in particular to multiple type burners for gas stoves and the like embodying novel means for lighting said burners and for cross lighting between the said burners.

The invention pertains more specifically to a double burner constituted by a burner member having inner and outer non-communicating gas chambers each adapted to be connected to an independently controlled source of gas supply, and which burner member has a series of inner gas ports in communication with the inner gas chamber and a series of outer gas ports in communication with the outer gas chamber, the said inner and outer gas ports being disposed so that the flames from one of the said series of gas ports will not directly ignite the gas emerging from the other of said series of gas ports.

Among the objects of the present invention is to provide a novel burner of the type hereinabove identified, which is further characterized by the incorporation of novel means for lighting the said inner and outer gas ports or cross lighting between the said inner and outer gas ports.

The art in which the present invention resides has been developed to a certain extent to incorporate various means for lighting the inner and outer gas ports of burners of the type herein indicated, and also for cross lighting between said inner and outer gas ports. While such improvements as have taken place in the art to date serve satisfactorily to a certain degree for producing the results desired, nevertheless they may be open to the criticism of involving cross lighting means which is expensive to incorporate in the burner assembly, are difficult and hard to machine, and because of the use of too much gas in lighting lowers the efficiency of the burner. Additional deficiencies reside in the fact that such lighting means are so disposed in respect to the outer and main burner ports that considerable disturbance of the flames emitted therefrom takes place due to blowing and lengthening thereof, with the result that much lower efficiency for the burner is secured. Furthermore, such lighting means as have heretofore been provided are arranged in such a position relative to the aeration bowl forming a part of the completed burner assembly that flames emitted from such lighting means impinge upon the edge of said aeration bowl, thus resulting in poor combustion characteristics for the said burner assembly.

It is, therefore, an object of the present invention to provide a burner of the type hereinmentioned having improved means for lighting the

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said inner and outer gas ports and for cross-lighting therebetween which can be more readily incorporated into such burners, and which will operate and function to produce the desired results without having the disadvantages hereinabove enumerated.

More particularly, the invention has as one of its objects the provision of novel lighting means for the said inner and outer gas ports and for cross lighting therebetween, which is so designed as to facilitate assembly of the burner in respect to the flash tube constituting an element in the entire burner assembly. One form of such novel means as incorporated in a burner of the type before mentioned, is constituted by a conduit extension leading from the inner chamber and being formed with a flash tube feeding port disposed at a position adjacent the outer margins of the burner whereby the same is suitably located to facilitate assembly of the flash tube in operative association with the burner.

More particularly, the invention contemplates lighting means involving the disposition of the flash tube feeding port as immediately above indicated, and with which is associated a gas outlet means forming a flame propagating means for igniting the inner gas ports therefrom.

The present invention has as its principal object, however, the incorporation of novel means for lighting the inner and outer gas ports and for cross lighting therebetween in a burner as indicated herein, the said means incorporating a flash tube feeding port communicating with either the inner or outer chamber of the burner and which has associated therewith gas outlet means constituting flame propagating means for igniting the inner gas ports, and in addition involves the further provision of gas outlet means communicating with the outer chamber and which is associated with the said flash tube feeding port and the outer gas ports whereby flame may be propagated therebetween for igniting the outer gas ports.

As a further object the invention involves the use of gas outlet means communicating with the outer chamber and constituting flame propagation means between the flash tube feed port and the outer gas ports which is so disposed as to facilitate manufacture of the particular burner at low cost, and which has the further attribute of being so disposed as to increase the efficiency of the burner and its combustion characteristics by virtue of the fact that the propagating flame from such gas outlet means does not impinge upon the aeration bowl of the assembly, and is so

disposed in respect to the flames from the outer gas ports that a minimum of disturbance of the flames from the outer gas ports results.

More particularly, another object within the purview of the present invention is to provide gas outlet means as immediately above described, which is angularly disposed with respect to the flash tube feeding port as well as the outer ports immediately adjacent thereto, so that flame propagation is readily effected between said flash tube feeding port and such gas outlet means with minimum disturbance of the flames from the outer gas ports and with more efficient operation of the said burner.

The present invention is further characterized in the provision of such gas outlet means which is disposed substantially in a plane parallel to the axis of the burner and which may be formed as a series of openings, the longitudinal axes of which are approximately tangentially disposed in respect to the series of outer gas ports.

A still further object of the present invention is to provide gas outlet means forming in part the flame propagating means of the present device, which is disposed beneath a ledge or outwardly extending flange formed in the burner member and defining the perimeter of the said burner adjacent the outer gas ports, whereby the said gas outlet means is protected and less liable to become fouled due to overflow of fluids or food products from cooking utensils disposed above the burner member.

As a further object of the present invention a burner incorporating the novel gas outlet means hereinbefore referred to, may further include a partitioned recess in the outer chamber with which one or more of the openings forming the said series may communicate to assist in maintaining such ports operative at all times, thus avoiding any chance of the said ports or openings momentarily failing due to sweep of gas past the same which might otherwise occur in the absence of said recess.

Other objects, features, capabilities and advantages are comprehended by the invention, as will later appear and as are inherently possessed thereby.

Referred to the drawing—

Figure 1 is a top plan view of a burner assembly incorporating a burner head made in accordance with the present invention;

Figure 2 is a view in side elevation of the burner head shown in the assembly of Figure 1 of the drawing;

Figure 3 is a bottom plan view of the burner head shown in Figure 2 of the drawing;

Figure 4 is a fragmentary view in section, taken in the plane represented by line 4—4 of Figure 3 of the drawing;

Figure 5 is a fragmentary view in cross section taken in the plane represented by line 5—5 of Figure 3 of the drawing; and

Figure 6 is a fragmentary view in cross section taken in the plane represented by line 6—6 of Figure 4 of the drawing.

Referring now more in detail to the drawing, a burner head embracing the present invention and selected to illustrate the improvements therein, is generally referred to as 2, and is disclosed in Figure 1 of the drawing in operative association with a base 4, which is one of a group or battery of such burners which may be used in a burner device for gas stoves or the like. The base 4 of the burner device of Figure 1 comprises essentially the gas conducting chambers 6 and 8 communicating by way of suitable conduits 10 and 12, respectively, with a valved gas supply and with the said burner head 2 which incorporates improved structure in accordance with the present invention. Operatively associated with a battery of such burners is a pilot light 14 supplied with gas through valved jet 16 and with which is associated a plurality of flash tubes such as 18, each of which may be mounted as disclosed upon a bracket, such as 20, on one of the gas conduits and which extends into operative association with an individual burner head, as will be hereinafter more fully described.

The present invention is directed more in particular to the construction of the burner head 2, with special provision for lighting the two burners provided on the head or for cross lighting therebetween. In the illustrative embodiment of the invention the burner head 2 is of multipart construction involving the burner member 22 and the burner member 24, each of which is formed as a die casting from aluminum or the like, but it is to be understood that various types of construction may be used as well as various materials in order to produce the finished article, all within the scope of the present invention.

Referring specifically, however, to the present illustrative embodiment, the said burner member 2 is provided with the inner and outer walls 26 and 28, as well as an intermediate wall 30, extending substantially through 360° and forming in part the inner chamber 32 between the inner wall 26 and the intermediate wall 30, and the outer chamber 34 between the intermediate wall 30 and outer wall 28. The burner member 22 is of annular formation, the center flue or opening 36 being formed in part by the inner wall 26. The chambers 32 and 34 are completed through the medium of the member 24 which has an annular wall 38 flared inwardly to form the apron 40, and flared outwardly to form the apron 42, the said member 24 fitting the walls of the member 22 and being secured in position in any desired manner. The apron 42 of the member 24 is further formed with a plurality of spaced projections, such as 44, on its under surface, which rest upon the top inclined surface of a flange or ledge 46 outwardly disposed in respect to the wall 28 and being integrally formed as a part thereof.

As will be clearly apparent from Figures 2 and 3, the inner chamber 32 is further formed in part by an outer wall 48 stepped inwardly from and concentrically arranged with respect to the wall 28 for the outer chamber 34, the said walls being interconnected by the substantially annular shaped wall 50. The said wall 28 is further provided with a plurality of radially projecting flanges or lugs, such as 52, serving as centering and positioning means for the aeration bowl 54 forming a part of the complete burner assembly, said aeration bowl having its inner rim 56 spaced in relation to the burner head to provide an air intake for the burners.

The burner head 2 is provided with a base 58 extending transversely of the burner head 2 and including a mounting flange 60 extending into the flue 36 and being provided as at 62 with a bolt opening. Other bolt openings as desired are provided adjacent the perimeter of the said mounting base as at 64. The base 58 is further formed with spaced laterally extending walls such as 66, interconnected by the arcuate shaped wall 68 terminating in the base flange 60 at one edge and in the vertical and circumferentially disposed wall

70 at its other marginal edge. The circumferentially disposed wall 70 merges with the opposite wall sections such as 72, which are offset circumferentially with respect to the walls 66 and form a part thereof. The said construction above described is symmetrical along the transverse axis through the bolt opening 62. The base 58 is further formed with a partition wall 74 extending between the base flange 60 and the intermediate wall 30 to provide an opening 76 into the inner chamber 32, said opening communicating with conduit 10 of the base structure shown in Figure 1 of the drawing. The base is further provided with openings 78 and 80 formed in the base flange 60 and separated by the partition wall 82 extending from the base flange 60 to the wall 68 and merging with circumferentially arranged partition walls 84 disposed in the outer chamber 34 to form recesses 86 and 88.

The inner apron 40 is provided with a plurality of inner gas ports 90 constituting an annular series of gas ports in communication with the inner gas chamber 32. The openings 92 formed between the projections 44 and the flange or ledge 46 constitute an annular series of outer gas ports communicating with the outer gas chamber 34. As will be clearly apparent, the disposition of the ports 90 and 92 is such that the flames from one of the series of gas ports will not directly ignite the gas emerging from the other of said series of gas ports, this disposition of the said ports being relied upon principally to secure maximum operating efficiency for the said burner.

The present invention is particularly concerned with the provision for lighting the burners and for cross lighting between the inner and outer series of gas ports. Such improvement further possesses a novel feature of construction involving a transversely arranged wall extension 94 forming the conduit extension 96 communicating with the inner chamber 32, in the end of which is a plug 98 having an axially disposed opening 100 to provide a flash tube feeding port communicating with the conduit 96 and disposed to open exteriorly of the wall 28. This arrangement for the flash tube feeding port radially and outwardly from the wall 48 of the inner chamber facilitates the arrangement of the flash tubes 18 to avoid obstructions and to assure proper functioning of the flash tube for lighting purposes, as well as to simplify the burner head construction and its assembly on its base.

Associated with the flash tube feeding port 100 is means for lighting the series of inner gas ports 90 which, in the present illustrative embodiment of the invention comprises a transversely arranged slot 102 communicating with the inner chamber 32 and terminating in an enlarged port 104 in the wall 26 in flame propagating relation to the series of inner gas ports 90. It will be noted that the port 104, as shown in the drawing, is slightly inclined upwardly to direct the flame being emitted therefrom in the general direction of the said series of inner ports 90. Flame propagation is further assured by virtue of the port opening 106 extending through the wall structure 94 and the plug 98.

It will be noted that the burner head assembly above described is symmetrically formed to provide the wall section 108 corresponding to the wall section 94 on the opposite side of the base 60, whereby the burner may be used in right or left hand position, the flame propagating means, constituted by the slot 102 and associated structure, being incorporated on either side of the base 58 to dispose the flash tube feeding port in proper relation to a flash tube, depending upon the particular mounting for the burner head.

The means for cross lighting between the inner and outer series of gas ports includes flame propagating means consisting of gas outlet means communicating with the outer chamber and associated in flame propagating relation with both the flash tube feeding port 100 and the outer series of gas ports 92. According to the present embodiment, such flame propagating means is constituted by a series of openings 110 disposed in spaced relation to one another and drilled through the face 73 of the offset wall section 72 into the outer chamber 34. The lower opening of the series is closely associated with the flash tube feeding orifice 100, and the upper opening of the series is disposed in operative association with certain of the outer gas ports 92 immediately thereabove. The series of openings 110 is in a plane substantially parallel to the axis of the burner head and angularly disposed with respect to the axes of the immediately above outer gas ports 92, or more particularly the said plane in which the openings 110 are provided is disposed approximately tangentially to the outer series of gas ports 92. The angular disposition of the gas outlet means is desirable so as to avoid direct impingement of the flames emitted from such means on the aeration bowl 54 and to create a minimum of disturbance to the flames being emitted from the outer gas ports 92. It is to be noted further that the facing 73 of the wall section 72 is disposed beneath the ledge or outwardly extending flange 46, which ledge protects the openings 110 or other gas outlet means which may be provided and prevents fouling thereof from fluids or food stuffs which may fall onto the burner from cooking utensils disposed above the same.

In accordance with the embodiment herein illustrative of the invention, the upper opening 110 communicates with the recess 88. The arrangement is of particular advantage in maintaining this port operative at all times which might otherwise not be the case were the said port unprotected by the partition wall 84 and subjected to the sweep or turbulence of the gas at this point in its passage into the outer chamber.

As previously described, the symmetrically constructed burner head includes an oppositely disposed wall section corresponding to wall section 72 which is in juxtaposed relation to the wall extension 108 through which openings or gas outlet means may be provided for effecting a lighting of the outer burner ports 92.

As will be readily comprehended from the above description, either the series of inner or outer gas ports may be lighted directly from the flash tube feeding port or orifice 100. For example, by introducing the gas into the inner chamber 32 the gas emitted from the flash tube feeding port 100 will be ignited, which in turn will ignite gas being emitted through the flame propagating means between the same and the inner series of gas ports 90, whereby the said gas ports 90 will be lighted. This inner series of gas ports 90 constitutes a simmer burner in the present embodiment which may be lighted in the manner above described. Cross lighting from the inner series of gas ports 90 and the outer series of gas ports 92 may be readily effected by introducing gas into the outer chamber 34, at which time the gas is discharged through the openings 110 and becomes

ignited from the flames being emitted from the flash tube feeding port 100, whereby flame is propagated from the flash tube feeding port 100 directly to the gas being emitted from the outer series of gas ports 92 through the medium of the openings 110. On the other hand, the main burner constituted by the gas ports 92 may be directly lighted by the flash tube feeding port 100 by introduction of gas into the inner chamber followed by the introduction of gas into the outer chamber 34, after which flow of gas into the inner chamber 32 can be stopped.

With the arrangement above described for the lighting means, increased operating efficiency is secured with improved burning characteristics for the burner by virtue of the fact that none of the flames from the said lighting means impinges upon the aeration bowl nor creates any disturbance to the flames being emitted from the outer series of gas ports 92. The construction likewise is of simple design facilitating manufacturing procedures at low cost while maintaining simplicity of design in the burner assembly as a whole.

While I have herein described and upon the drawing shown an illustrative embodiment of the invention, it is to be understood that the invention is not limited thereto but may comprehend other constructions, arrangements of parts, details and features without departing from the spirit of the invention.

What is claimed is:

1. A double burner comprising a member having inner and outer non-communicating gas chambers, a transversely arranged base having passage means formed in part by laterally disposed walls exterior of the outer wall for said outer gas chamber and communicating with said chambers whereby each of said chambers is adapted to be connected to an independently controlled source of gas supply, said member having a series of inner gas ports in communication with said inner gas chamber and a series of outer gas ports in communication with said outer gas chamber, said inner and outer series of gas ports being disposed so that the flames from one of said series of gas ports will not directly ignite the gas emerging from said other series of gas ports, a flash tube feeding port removed from said two series of gas ports disposed to one side of one of said laterally disposed walls and communicating with one of said gas chambers, gas outlet means in said burner member communicating with said inner gas chamber and constituting a flame propagating means for igniting said inner series of gas ports from said flash tube feeding port, and gas outlet means in said one of said laterally disposed walls communicating with said passage means for the outer of said gas chambers, said gas outlet means being in flame propagating relation to said flash tube feeding port and constituting a flame propagating means projecting flame adjacent certain of said outer ports for igniting said outer series of gas ports from said flash tube feeding port.

2. A double burner comprising a member having inner and outer non-communicating gas chambers, said chambers being formed in part by concentrically arranged inner and outer walls, a transversely arranged base having passage means formed in part by laterally disposed walls exterior of said outer concentrically arranged wall and communicating with said chambers whereby each of said chambers is adapted to be connected to an independently controlled source of gas supply, said member having a series of inner gas ports in communication with said inner gas chamber and an annular series of outer gas ports in communication with said outer gas chamber, said inner gas chamber having a radial conduit defined by a wall extension from said inner concentrically arranged wall terminating at said outer concentrically arranged wall, said inner and outer series of gas ports being disposed so that the flames from one of said series of gas ports will not directly ignite the gas emerging from said other series of gas ports, a flash tube feeding port communicating with said conduit, gas outlet means in said burner member at said wall extension communicating with said inner gas chamber and said conduit and constituting a flame propagating means for igniting said inner series of gas ports from said flash tube feeding port, and gas outlet means in said one of said laterally disposed walls communicating with said passage means for the outer of said gas chambers, said gas outlet means being in flame propagating relation to said flash tube feeding port and constituting a flame propagating means projecting flame adjacent certain of said outer ports for igniting said outer series of gas ports from said flash tube feeding port.

3. A double burner comprising a member having inner and outer non-communicating gas chambers, a transversely arranged base having passage means formed in part by laterally disposed walls exterior of the outer wall for said outer gas chamber and communicating with said chambers whereby each of said chambers is adapted to be connected to an independently controlled source of gas supply, said passage means for said outer chamber being defined in part by an outer wall, a partition spaced from said wall to provide a recess communicating with said passage means, said member having a series of inner gas ports in communication with said inner gas chamber and a series of outer gas ports in communication with said outer gas chamber, said inner and outer series of gas ports being disposed so that the flames from one of said series of gas ports will not directly ignite the gas emerging from said other series of gas ports, a flash tube feeding port removed from said two series of gas ports disposed to one side of one of said laterally disposed walls and communicating with one of said gas chambers, gas outlet means in said burner member communicating with said inner gas chamber and constituting a flame propagating means for igniting said inner series of gas ports from said flash tube feeding port, and gas outlet means in said one of said laterally disposed walls communicating with said passage means for the outer of said gas chambers constituting a flame propagating means for igniting said outer series of gas ports from said flash tube feeding port, said last named gas outlet means comprising a series of openings one of which directly communicates with said recess, said partition for said recess being disposed in opposed relation to said opening to render the same operative at all times.

4. A double burner construction according to claim 1, wherein said outer wall is formed with an outwardly disposed ledge and said gas outlet means for igniting said outer series of gas ports is disposed beneath said ledge.

5. A double burner construction as defined by claim 1, wherein said last named gas outlet means comprises a series of openings disposed in a plane substantially parallel to the axis of the burner member and which openings are angu-

larly positioned with respect to the axes of the adjacent gas ports of said outer series.

6. A double burner construction as defined by claim 2 wherein said last named gas outlet means comprises a series of openings disposed in a plane substantially parallel to the axis of the burner member and which openings are angularly positioned with respect to the axes of the adjacent gas ports of said outer series.

7. A double burner construction comprising, in combination, a burner member having inner and outer non-communicating gas chambers, each adapted to be connected to an independently controlled source of gas supply, said burner member having a series of inner gas ports in communication with said inner gas chamber and an annular series of outer gas ports in communication with said outer gas chamber, said inner and outer gas chambers being defined in part by concentrically arranged inner and outer walls, a recessed wall member defining a radial conduit having communication with the inner gas chamber and terminating at said outer wall, said inner and outer series of gas ports being disposed so that the flames from one of said series of gas ports will not directly ignite the gas emerging from said other series of gas ports, a flash tube feeding port communicating with said conduit and adapted to project gas into the end of a flash tube associated with said burner, gas outlet means in said inner wall in substantial alignment with the radial conduit communicating with the inner gas chamber to constitute flame propagating means for igniting the inner series of gas ports from said flash tube feeding port, said burner having a wall angularly disposed with respect to said outer concentrically disposed wall and being spaced with respect to said flash tube feeding port, and other gas outlet means in said angularly disposed wall, said other gas outlet means having communication with said outer

chamber and having flame propagating relation with said flash tube feeding port for projecting a flame adjacent certain of said outer ports for igniting said outer series of gas ports from said flash tube feeding port.

8. A double burner construction comprising, in combination, a member having inner and outer non-communicating gas chambers, a transversely arranged base having passage means formed in part by laterally disposed walls exteriorly of the outer wall for said outer gas chamber and communicating with said chambers whereby each of said chambers is adapted to be connected to an independently controlled source of gas supply, said member having a series of inner gas ports in communication with said inner gas chamber and a series of outer gas ports in communication with said outer gas chamber, said inner and outer series of gas ports being disposed so that the flames from one of said series of ports will not directly ignite the gas emerging from said other series of gas ports, a flash tube feeding port removed from both said gas ports, said flash tube feeding port being disposed to one side of one of said laterally disposed walls and in communication with one of said gas chambers, gas outlet means in said burner member communicating with said inner gas chamber and constituting flame propagating means for igniting said inner series of gas ports from said flash tube feeding port, and other gas outlet means in one of said laterally disposed walls and having communication with said passage means for the outer of said gas chambers, said other gas outlet means being disposed in a plane substantially parallel to the axis of the burner member and being in flame propagating relation to the flash tube feeding port and to said outer series of gas ports whereby said outer series of gas ports may be ignited from said flash tube feeding port.

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