

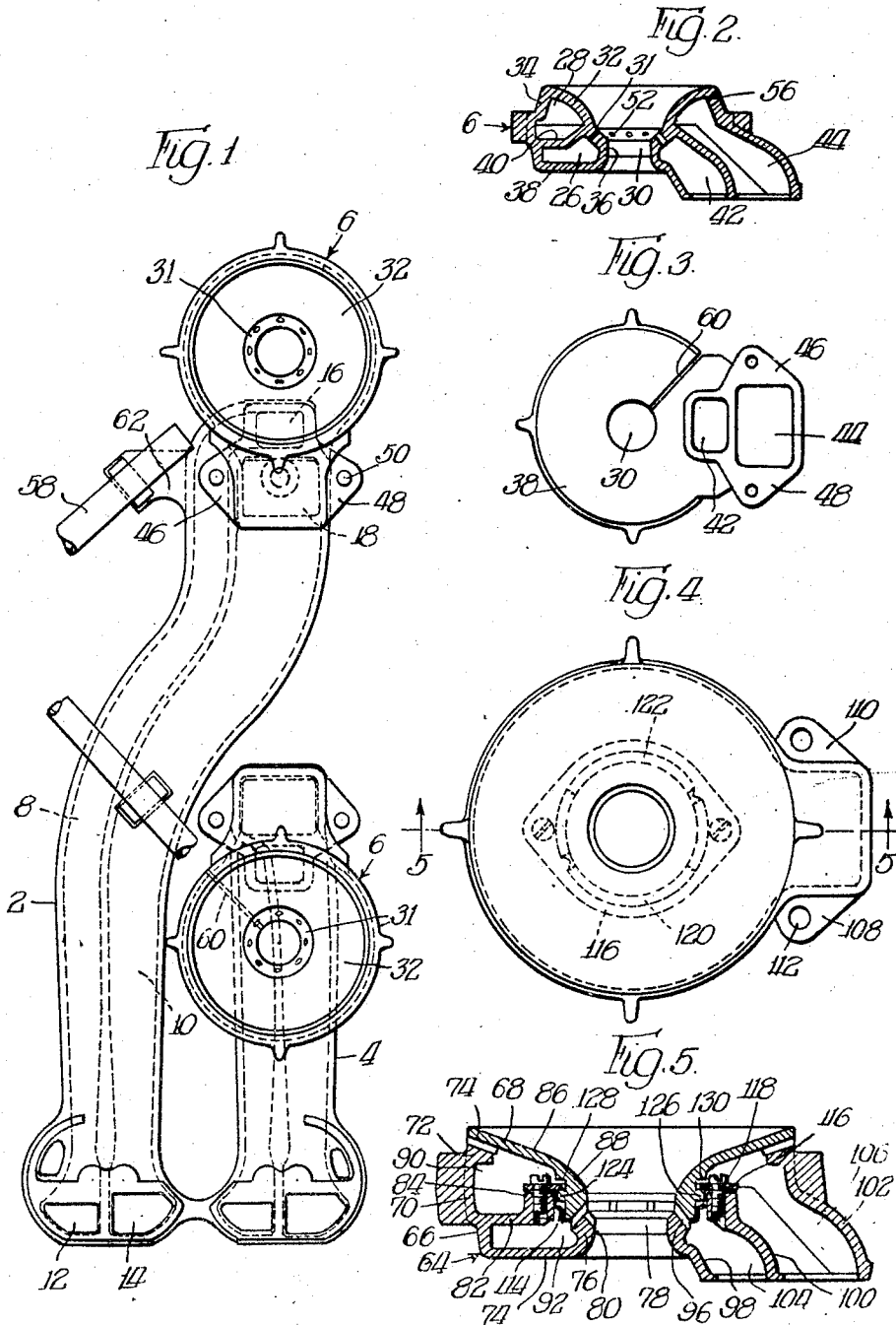
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GAS BURNER ASSEMBLY

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GAS BURNER ASSEMBLY

Philip S. Harper, Chicago, Ill., assignor, by direct and mesne assignments, of one-fourth to Philip S. Harper and one-fourth to Carolyn L. Harper, both of Chicago, Ill., and one-fourth to Harris Trust and Savings Bank, an Illinois banking corporation, as trustee of the Philip S. Harper Trust, and one-fourth to said Harris Trust and Savings Bank, as trustee of the Carolyn L. Harper Trust

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1 Claim. (Cl. 158—116)

The present invention relates to gas burner assemblies, and more particularly to a top burner assembly of the type used in kitchen ranges and the like which embody in their construction an inner simmer burner and an outer main burner.

Among the objects of the present invention is to provide a novel double gas burner assembly of the type herein contemplated which is compact in design, which provides for the efficient distribution of a combustible medium through the simmer and main burners, one which has adequate capacity and efficient burning characteristics for a particular diameter, and one which may be readily and easily produced by casting processes.

At the present time, gas burner assemblies for kitchen ranges and the like which have found favor in this field have included a top burner assembly having an inner central simmer burner disposed in association with a centrally disposed hole or flue and within the area defined by the large main burner. Burner assemblies of this type are highly satisfactory, and from a comparative standpoint have far superior burning qualities than the old type burners used prior to their introduction into this field. In the design of such double gas burner assemblies, certain characteristics are essential, and in incorporating these design features in such burner assemblies, certain limiting factors are involved which require certain minimum dimensions for certain parts of the construction. The size of the central air opening or flue is one of such limiting factors. Other important features of a double gas burner assembly of the type herein contemplated are compactness, proper distribution of gas to the gas escapement ports, and proper positioning of the main and simmer burner ports to facilitate lighting and to secure proper efficient burning characteristics.

While the said burners of the type under consideration have met such requirements to a large extent as compared to burners manufactured before their introduction into this field, nevertheless it has now been discovered that gas burner assemblies of this general type may be so designed as to meet all of these requirements to a far more satisfactory degree than obtained in the past without increase in cost and with a far simpler design than heretofore.

The improvements forming the subject matter of the present application involve a gas burner assembly formed to provide a centrally disposed hole or flue of standard design characteristics for

the fuel consumption of the burner and of much smaller diameter than gas burner assemblies of equivalent capacity of the prior art involving inner and outer chambers for the simmer and main burners thereof. This is a highly desirable characteristic for a burner of this type because of the desirability of confining the flame within the area of the bottom of utensils of average size usually used on kitchen ranges and the like, thus leading to more efficient operation with less waste of fuel than would otherwise prevail where the flames from the outer burner flare outwardly around the cooking utensil. Furthermore, as compared to burners of the prior art of equal capacity, burners embodying the present improvements have their gas escapement ports spaced closer together, which greatly facilitates propagation of flame therebetween. A further advantage of the improved burner assembly herein under consideration resides in the fact that the smaller diameter provides for more efficient design for the gas passages for the inner and outer burners to assure more uniform discharge of gas through the ports.

The present invention therefore has as its principal object the provision of a double gas burner assembly of compact design and small diameter providing the required centrally disposed hole or flue and a proper arrangement of the inner and outer gas ports, and which novel features of construction are secured by providing gas chambers for the simmer and main burners one above the other.

As a further object of the present invention, the same embraces within its scope the provision of a double gas burner assembly of small diameter secured by the provision of upper and lower gas chambers for the inner and outer burners and in which the same capacity is secured for said burners as would be secured from a burner assembly of far greater diameter formed with inner and outer gas chambers.

The present invention also includes as an additional desideratum the provision of a double gas burner assembly which has highly efficient burning characteristics, is of small diameter, in which the inner and outer gas ports are properly arranged with respect to one another, and in which the inner gas ports are associated with the central flue or opening and to the outer gas ports to assure proper distribution of heat to the utensil supported in heat transfer relation thereto.

The present invention also contemplates a novel double gas burner assembly of small di-

ameter embodying in its construction more efficient design characteristics for the gas passages thereof, thus resulting in the more uniform discharge of gas through the gas escapement ports than has been possible heretofore in burner assemblies of like capacity.

The present invention, characterized by the provision of upper and lower gas chambers for double gas burner assemblies, also has the further attribute that because of the disposition of the walls forming the lower gas chamber, the flash tubes used in lighting the burners can be more conveniently arranged than has heretofore been possible where the simmer burner is constituted by an inner chamber of the radial type, thus leading to greater and further economies in the manufacture and installation of the entire gas burner assembly.

The present invention in one of its aspects involving superimposed disposition of the gas chambers for the main and simmer burners, contemplates a structure which can be readily produced of cast iron to reduce cost and in which the cores forming the simmer burner chamber can be readily set in the casting procedure.

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

Referring to the drawing:

Figure 1 is a top plan view showing two burners of a four-burner assembly adapted for installation in kitchen ranges or the like;

Figure 2 is a cross-sectional view through one of the burners of the assembly shown in Figure 1 of the drawing;

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

Figure 4 is a top plan view of a modified form of burner assembly made in accordance with the present invention; and

Figure 5 is a view in cross-section taken in the plane represented by line 5-5 of Figure 4 of the drawing.

Referring now more in detail to the drawing, an embodiment selected to illustrate the present invention is constituted as a four-burner assembly adapted for installation in kitchen ranges or the like and which comprises opposed left and right-hand units assembled in associated relation with respect to one another. For convenience, however, the right-hand unit is shown in Figure 1 of the drawing and comprises integrally formed mixer tubes 2 and 4, at one end of which are mounted the burner heads 6. While the illustrated embodiment of the invention comprises four burner heads arranged in respect to one another in a conventional manner, nevertheless the invention is of such a scope as to comprehend other arrangements of a plurality of burner heads or burner assemblies with a single mixing tube and associated burner head.

The mixing tubes 2 and 4 are of somewhat conventional design embodying the ducts 8 and 10 forming mixing chambers for a combustible air-gas mixture introduced into the same by regulation of certain valves, all as is well known in the art, the said combustible mixture being controlled by the openings 12 and 14 communicating with the ducts 8 and 10, respectively, and normally closed by adjustable shutters (not disclosed in the drawing). These ducts or conduits 8 and 10 terminate in the openings 16 and 18, respectively, at their ends opposite the openings 12 and 14, which former openings are defined

in part by opposed securing flanges having bolt openings for supporting and securing the head or top burner assembly 6 in proper relation to the mixing tubes, as will later more fully appear.

The burner assembly 6 of this embodiment is formed as a casting and includes the substantially annularly arranged gas chambers 26 and 28 disposed substantially vertically above one another and forming, respectively, the gas chambers for the simmer and main burners. This burner assembly includes a centrally disposed hole or flue 30 defined by the wall 36 to provide the necessary air to support combustion for the main and simmer burners. The wall 36 merges with an outwardly flaring wall 32 through the medium of an intermediate wall 31. The burner is further constituted by the outer wall 34, which defines in part both the gas chambers 26 and 28 and which is connected to the inner cylindrically arranged wall 36 for the flue 30 by a lower wall 38 which defines the lower part of the gas chamber 26. Gas chambers 26 and 28 are non-communicating and are separated by the partition wall 40, all as shown in Figure 2 of the drawing. The said burner 6 is further formed with laterally extending intake ducts or conduits 42 and 44 communicating with the gas chambers 26 and 28, respectively, and which are flanged as at 46 and 48, the said intake ducts seating at their end with the ducts 16 and 18 for intercommunication between the conduits 8 and 10 with the said ducts 42 and 44, respectively. The flanges 46 and 48 are provided with bolt openings, such as 50, whereby the burner head may be secured in supporting relation to the mixer tube 4 through similar flanges provided adjacent the openings 16 and 18 of the said mixer tube.

The inner gas chamber 26 is formed with a plurality of gas escapement ports 52 extending through the wall 31 at the junction between wall 36 and apron or wall 32 and which are in associated relation to the flue 30 to provide an annular simmer burner having the desired burning characteristics. The gas chamber 28 is likewise formed with gas escapement ports 56 extending outwardly through the wall 34 adjacent an upper marginal edge of the apron 32 and at the point of joinder with said wall 34 and which openings form the main burner properly spaced to give the desired burning characteristics thereto.

In order to facilitate lighting of the burners of the assembly above described, flash tubes such as 58 may be provided in flame propagating relation to a central jet and disposed in flame propagating relation at their other end to a slot 60 formed in the walls 34 and 38 whereby the inner and outer burners may be lighted as desired. These flash tubes may be supported adjacent the burners by the supporting elements such as 62 formed on the mixer tube 2 and the said inner ends of the flash tube are disposed in opposed relation to the lower gas chamber 26, thus facilitating the lighting arrangement of the flash tube with respect to the burner and the assembling of the flash tube in the burner unit.

According to the arrangement for the gas chambers as provided in the burner assembly according to Figures 1, 2 and 3, the burner is of compact design with relatively small diameter for an equivalent capacity as compared to burners of the prior art, all without decreasing the burning efficiency of the same or the size of the central air opening 30 which is instrumental in securing such efficiency. Furthermore, the

smaller diameter for the burner renders it possible to design the gas chambers 26 and 28 to assure more uniform discharge of gas through the ports 52 and 56 than is possible with burners of larger diameter of the same capacity. The burner also has the further characteristic of assuring proper and efficient flame propagation between the gas ports 52 and 56 due to the spacing thereof, which is not possible in burners having inner and outer gas chambers requiring a larger diameter for equal capacity. In addition, the upper and lower chambers, which make possible a burner of small diameter without restricting the central opening 30, also facilitate replacement of the gas escapement ports 52 in proper relation to the flue 30 and to the gas escapement ports 56, thus leading to increased efficiency with far better burning qualities than have been possible heretofore.

As a further illustration of the present invention, a modified embodiment as shown in Figures 4 and 5 has been selected to disclose further possibilities of design which may be incorporated in a double burner assembly, yet which provides for all of the advantages and characteristics of the burner assembly hereinabove described. In this embodiment, the burner 64 is of multi-part construction comprising the inner and outer parts 66 and 68, respectively. The outer part is constituted by a casting having an upstanding wall 70 formed with a bearing surface 72 at one end and which merges with a lower substantially horizontally disposed wall 74 joined to an inner upstanding wall 76 which forms in part the centrally disposed flue 78, the said upstanding wall 76 terminating in a bearing surface 80. Disposed in spaced relation to the wall 76 and formed integrally with the part 66 is a partition wall 82 terminating in an upstanding wall such as 84 for a purpose to be hereinafter more fully described.

The part 68 may be formed as a die casting from aluminum or the like to provide a conical-shaped apron 86 terminating in the lower wall 88 whereby the said part 68, when secured in cooperative relation to the part 66, forms the upper and lower chambers 90 and 92 and further completes the centrally disposed flue 78 by way of the wall 88. The said part 68 is formed adjacent its outer marginal edge and on the bottom face thereof with a plurality of spaced projections 94 seating with the surface 72 to provide a plurality of gas discharge ports for the gas chamber 90. This part 68 at its lower marginal edge is likewise formed with a plurality of spaced projections 96 adapted to have seating relation with the surface 80 of wall 76 to provide a plurality of gas escapement ports for the lower chamber 92.

The inner, intermediate and outer walls 76, 82 and 70, respectively, extend downwardly and laterally as at 98, 100 and 102 at one point of the burner, and are interconnected to form the intake ducts 104 and 106 communicating with the lower and upper chambers 92 and 90, respectively. These intake ducts 104 and 106 are defined at their outer opening by the laterally extending flanges 108 and 110 having bolt openings such as 112 whereby the said burner may be secured in seating relation at the end of the mixer tube, all as previously illustrated in con-

nection with the description of the embodiment shown in Figures 1 to 3 inclusive of the drawing.

In the present illustration non-communication between chambers 90 and 92 is maintained by a gasket such as 114 which seats on the wall 84 along one marginal edge and has its other marginal edge in cooperative relation with the end of wall 88. In order to facilitate assembly and disassembly of the parts 66 and 68, a bayonet-type connection is provided therebetween. As illustrated, a ring 116 is provided which is secured to the wall 84 through the medium of bolts or screw members 118 which also provides for the securing of the gasket 114 in position between the said ring and the wall 84. This ring is formed with the opposed recesses 120 and 122 which are adapted to receive the oppositely disposed lugs 124 and 126 formed on the inner face of the wall 88. Adjacent the lugs 124 and 126 are the grooves 128 and 130, respectively, which are adapted to receive the ring member 116 when the part 68 is turned substantially through 90 degrees. Therefore, in assembling the member 68 with relation to the member 66, it is merely necessary to register the lugs 124 and 126 with the recesses 120 and 122 provided by the ring member 116 and the member 68 turned into locking engagement therewith. Removal of the member 68 for replacement or repair is readily and easily accomplished by reversal of the above procedure. The interlocking relation as provided between the members is suitable to hold the said members in proper operative relation in respect to one another.

The modified embodiment as shown in Figures 4 and 5 and as described above has all of the advantages hereinabove enumerated in connection with the description of the embodiment shown in Figures 1 to 3 inclusive and may be used in any burner assembly in which the first embodiment might also be used.

While I have herein described and upon the drawing shown illustrative embodiments 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.

I claim:

A double burner comprising a member of substantially annular shape providing a substantially centrally disposed flue, said member being formed with an inner wall portion and a substantially vertical outer wall portion, said portions being connected by a substantially horizontal lower wall portion and an upwardly and outwardly curved upper wall portion thereby forming an annular burner head, a partition member connecting said inner and outer walls intermediate said upper and lower wall portions thereby forming superimposed annular chambers in said burner head, said upper annular chamber having upwardly and outwardly directed ports and said lower chamber having upwardly and inwardly directed ports, said chambers having lateral openings, radial extending channel portions extending from said annular portions and communicating with said openings whereby gas may be fed into said annular chambers.

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