

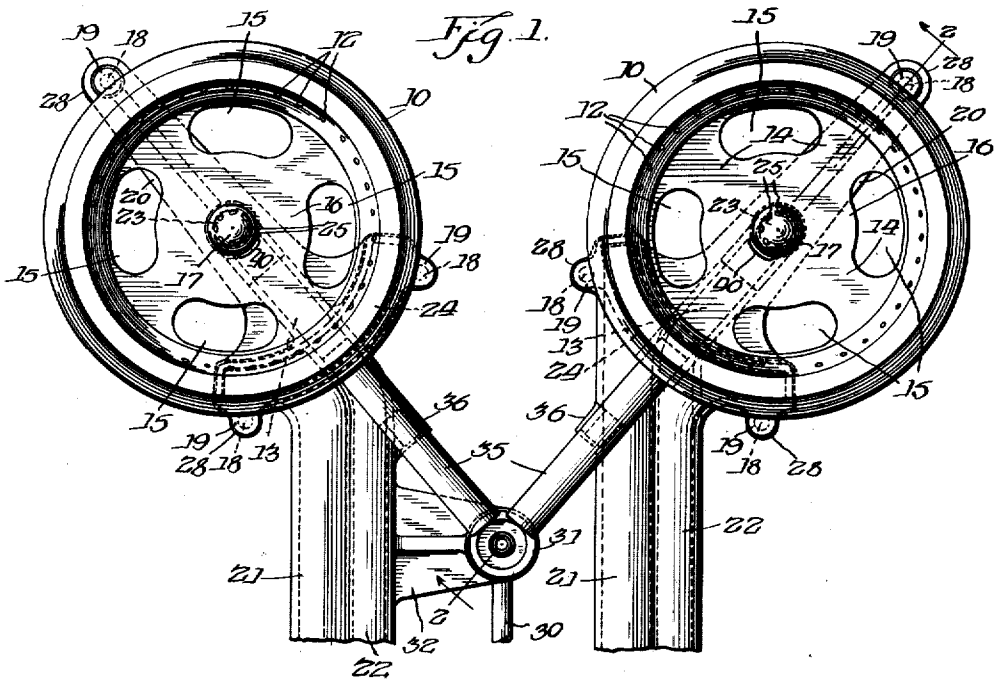
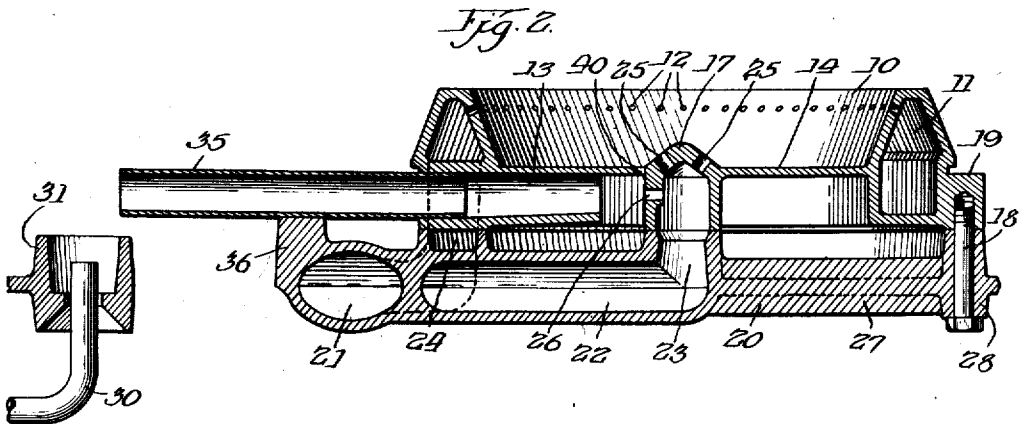
May 2, 1939.

P. S. HARPER

2,156,533

GAS BURNER

Filed May 1, 1937



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## UNITED STATES PATENT OFFICE

2,156,533

## GAS BURNER

Philip S. Harper, Chicago, Ill., assignor, by direct and mesne assignments, of one-fourth to Carolyn L. Harper and one-fourth to Philip S. Harper, both of Chicago, Ill., and one-half to Philip S. Harper and Carolyn L. Harper as trustees

Application May 1, 1937, Serial No. 140,110

8 Claims. (Cl. 158-115)

This invention relates to gas burners of the type used in top burner assemblies of kitchen ranges and particularly to so-called double burners which embody in their construction, a main burner and a simmer burner.

The improvement provided by this invention has particular application to double burners of the above mentioned type which employ an automatic lighting means in the form of a flash tube which extends from a pilot light located at one side of the burner and serves to convey gas to a point adjacent the simmer burner so that in operation the simmer burner may become automatically lighted and after becoming so lighted may serve to light the main burner when the main burner is supplied with a combustible gas mixture through suitable valve means. Burners of the type here referred to are usually provided with separate supply pipes for conveying the combustible mixture to the simmer and main burners, respectively, and in addition, each pipe is preferably provided with suitable valve means which may be of any suitable construction and if desired, may be formed in accordance with the disclosure of the copending application of the applicant and George F. Turner, Serial No. 119,982, filed January 11, 1937.

In the applicant's Patent No. 2,032,877, of March 3, 1936, there is disclosed a double burner comprising an annular main burner and a central simmer burner in connection with which an automatic flash tube is provided which passes through the annular burner and terminates at a point adjacent the simmer burner. This tube is adapted to receive gas from a lighter port or jet provided in the side of the simmer burner and when the valve is operated to feed the combustible mixture to the simmer burner it passes the desired amount of gas into the flash tube where it ignites upon reaching the pilot light and then burns or flashes back in the tube so as to light the simmer burner. The burner construction disclosed in this patent provides an annular space between the simmer burner and the surrounding main burner through which secondary air of combustion passes in an upward direction to sustain combustion of the burners.

Whereas the burner disclosed in said patent constitutes a desirable improvement in the art and works satisfactorily, with most gases, it has been found that the annular opening defined by the main burner and the centrally disposed simmer burner, under certain conditions creates an upward draft of air of such intensity that it interferes to some extent with the feeding of a

combustible mixture into the flash tube as intended for its automatic operation as described in said patent. It will be apparent that the upward draft of air passes at right angles to the opening in the lighter port or jet and that if the draft is sufficiently great in comparison to the feeding pressure of the combustible mixture, that some difficulty may be experienced in assuring the passage of the combustible mixture across the annular space into the flash tube in sufficient quantity to permit the igniting and back burning from the pilot light to the simmer burner within the limited period of time which is required for good commercial operation. This is particularly true in cases where the burner has been used and is still hot as the heat of the burner serves to increase the upward draft of air through the annular space referred to. This condition is aggravated in those installations where the gas pressure is low.

Accordingly, the main object of this invention is to provide a double burner of the type referred to which embodies all of the advantages of the burner set forth in applicant's said Patent No. 2,032,877 and yet is capable of being lighted under all conditions of temperature and gas pressure and in the minimum period of time and well within the time allowed for good commercial practice.

The invention in its broadest aspect embodies in its construction means located between the main burner and the central simmer burner which serves to control the upward draft at the location where the gas is fed from the lighter port or jet into the flash tube and yet, which will at the same time, permit the upward passage of a sufficient supply of secondary air to support combustion at the location of the main and simmer burner openings.

A further object of this invention is to provide a novel construction for accomplishing the results referred to which may be so made as to provide the main and simmer burners as one structural element, either formed integrally or as separate parts secured together to form a unitary structure.

This invention is applicable to burners having the main burner openings extending inwardly or outwardly or in any other convenient manner. In cases where the main burner openings are centrally disposed they are naturally presented in such relationship to the simmer burner that upon supplying the combustible mixture thereto, they will immediately become lighted from the simmer burner. In those cases

however, where the main burner openings are so remote from the location of the simmer burner openings as to preclude the automatic lighting of the main burner from the simmer burner, then, some suitable means must be provided for causing the lighting of the main burner from the previously lighted simmer burner. In this connection attention is directed to the applicant's copending application Serial No. 96,938, filed August 20, 1936, which shows a construction somewhat similar to the construction here described and claimed but different therefrom particularly in that the main burner openings are located on the exterior of the main burner rather than on the interior thereof. A comparison of this case and the applicant's copending case, Serial No. 96,938, above referred to will reveal that some of the structural features embodied in the present invention are disclosed in said copending application and to the extent of such common subject matter, this application is based upon and carved out of the disclosure of said copending application, and thus may be considered as a division in part, thereof.

The invention is illustrated here as applied to a burner having the main burner openings extending inwardly and it will be apparent that this placement of the main burner openings which is desirable in some instances for centrally concentrating the heat, necessitates the supplying of the secondary air of combustion upwardly through the central annular space and that this makes the problem solved by this invention all the more difficult.

The means employed in this invention for controlling the upward draft of air adjacent the lighter port comprises a horizontally disposed plate or partition which extends between the main burner and the simmer burner preferably in a plane above the lighter port but below the plane of the simmer burner openings. This partition is positioned between the lighter port and the simmer burner openings so as to effectively interrupt the upward passage of such large amounts of air at the location of the lighter port as would create undesirable drafts.

This partition must however, be so designed as to provide for the upward passage of a sufficient quantity of secondary air to sustain combustion at the burners. In those instances where the main burner openings are placed interiorly and rely upon secondary air coming up through the center of the burner there is necessarily required a greater capacity for the passage of air in the annular space. In addition, a suitable opening must be provided in the partition adjacent the lighter port to enable the passage of the igniting flame from the lighter port to the openings in the simmer burner.

One embodiment of the present invention is hereinafter described in detail and consideration of the following description of this illustrative embodiment in connection with the accompanying drawing will provide a better understanding of this invention, it being understood that the invention may take other forms and is not to be limited other than as hereinafter set forth in the appended claims.

In the drawing, Figure 1 represents a plan view of a portion of a burner assembly showing two burners constructed in accordance with this invention together with an associated pilot light, and

Figure 2 is a cross sectional view in elevation taken on the line 2-2 of Figure 1 and looking

in the direction of the arrows and showing one of the burners and the associated pilot light.

The embodiment of the invention illustrated in the drawing comprises a main annular burner 10 which has the enclosed interior gas space 11 and the inside burner openings 12. The annular burner 10 is interrupted at one point in its circumference by the radially disposed tube member 13 which may be formed as an integral part of the annular burner as shown in Figure 2. At the location of the tube 13, which constitutes the inner end of the flash tube and on each side thereof, the bottom of the annular gas space 11 is cut away to form communicating openings for connection with a suitable conduit for supplying the combustible mixture of gas and air to the main burner.

Within the center of the main burner a partition 14 is provided which has a plurality of openings 15 therethrough, preferably of substantially the size and shape represented in Figure 1. These openings are disposed adjacent the outside edge of the partition 14 so as to provide a centrally disposed disk-like portion 16 surrounding the head 17 of the simmer burner.

As shown in Figure 2, the head of the simmer burner, the main burner, the partition, and the portion 13 of the flash tube may all be formed as an integral casting or if desired, they may of course be formed of separate parts suitably attached one to the other. The construction so formed, however, is adapted to be attached by suitable bolts 18 and lugs 19 to an underneath portion 20, which serves as a double conduit for supplying the air and gas mixture to the main and simmer burners, respectively.

From the drawing it will be noted that the main burner is supplied by means of a relatively large duct 21 whereas the simmer burner is supplied with a smaller duct 22, both of which are preferably formed as an integral conduit. These ducts are supplied by a suitable valve which is not here illustrated because it does not constitute a part of this invention.

The gas duct 22 for supplying the simmer burner has an upwardly extending neck 23 at its inner end which connects with the lower edge of the simmer burner head 17 and in effect, forms a continuation thereof. Similarly, the conduit 21 has upwardly extending terminal portions 24 which communicate with the previously mentioned openings in the bottom of the main burner so as to supply the required amount of gas mixture to the main burner.

The simmer burner is provided with burner openings 25 and also with a lighter port 26, which of course, if desired, may be in the form of a jet as shown in the applicant's Patent No. 2,032,877. The under conduit construction is preferably provided with an extension bracket 27 having an eyelet 28 which receives the holding screw 18. Similar eyelets 28 and holding screws 18 may be provided at other points in the circumference of the main burner such as those shown.

Burners of this type usually constitute an assembly of four burners which are grouped around a pilot light in the manner represented in Figure 1, by the two rear burners of such an assembly. The pilot light in this instance, is shown as consisting of a gas pipe 30 and a housing 31 mounted by a suitable bracket 32 on the side of the gas conduit pipes of the burner on the left hand side of Figure 1. It will be observed that the burner is so positioned in the assembly that

the flash tube 13 extends radially from the center of the burner in the direction of the pilot light so that a tube 35 which forms a continuation of the flash tube 13 may be inserted therein as shown in Figure 2. Tube 35 may be secured within the tube 13 by any suitable means and may also be supported in a suitable cradle 36 to prevent accidental displacement or breakage thereof.

The inner end of the flash tube 35 extends to a location adjacent the pilot light 31 so that when the tube becomes filled with gas from the lighter port 26, the gas is ignited from the pilot light and burns or flashes back through the tube 15 to the lighter port 26.

For the purpose of lighting the simmer burner from the back flash referred to, an opening 40 is provided in the partition 14 at the location illustrated in Figure 2, that is to say, at the juncture of the partition 14 with the side of the simmer burner directly above the lighter port 26. It will be observed that this opening by virtue of its placement is also adjacent certain of the simmer ports 25 in the simmer burner.

In operation, a multiple valve is provided to supply a mixture of gas and air to the conduits 21 and 22 and thus to the main and the simmer burner respectively. The valves may be of any construction provided only that they permit the simmer burner to be operated independently of the main burner. When the simmer burner is operated, the gas mixture passing in through conduit 22 passes upwardly through neck 23 and out through the simmer burner openings 25.

The burner port 26 being located directly opposite the inner end of the flash tube 13 passes a quantity of the gas mixture into the flash tube 13—35 in amount sufficient to cause the same to become ignited by the pilot light 31 and to flash back to the location of the burner port 26 in the limited time required for good performance in use. This flashing action causes a portion of the flame to pass upwardly through the opening 40 in the partition 14 and to immediately ignite the gas passing from outlet openings 25 of the simmer burner. In this way, the simmer burner will always become automatically and quickly ignited under all conditions of burner temperature and gas pressure such as will be encountered in practical operation. In the burner here disclosed the main burner openings 12 extend inwardly and when the main burner is turned on they are presented in such relationship to the simmer burner that the main burner will immediately become ignited.

The important feature of this construction is the partition 14, which is provided with the openings 15 around the outer periphery thereof serving to supply an adequate quantity of secondary air to support combustion at the openings of the main and simmer burners. At the same time, the partition 14 provides a central disk portion 16 adjacent the simmer burner disposed in a horizontal plane between the lighter port 26 and the simmer burner ports 25. The partition so disposed is found to effectively prevent the creation of the unwanted drafts of air at a point adjacent the lighter port 26. As a result, the gas passing out of the lighter port 26 always passes across the space and into the mouth of the flash tube 13—35 in sufficient quantity to produce the automatic lighting of the simmer burner within the relatively short period of time required for good performance in operation.

It is found that the prevention of the undesir-

able drafts is particularly effective when the partition is placed in a horizontal plane between the lighter port and the openings of the simmer burner and that the same good results cannot be realized by placing the partition below the lighter port 26. Accordingly, the effective control of the upward drafts is not merely a matter of providing a barrier in the annular opening but one of locating the partition between the lighter port and the simmer burner openings.

Further, the opening 40 must be provided of sufficient size to permit the flashing action to quickly ignite the simmer burner and at the same time be sufficiently small to prevent any serious disturbance to the control of the drafts provided by the partition.

From an inspection of Figure 2, it will be observed that this type of burner admits of a construction in which the simmer burner may be formed as an integral part of the annular main burner and carried thereby either as one piece or by forming the burner in several pieces and mounting them to form a unitary structure of the type illustrated.

I claim:

1. A gas burner comprising a simmer burner and a main burner, separate means for supplying air and gas to each of said burners respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to at least one of said burners, means for automatically igniting said simmer burner comprising a flash tube extending from a point adjacent a pilot light to a point in said air space and adjacent the simmer burner, a lighter port in said simmer burner for feeding gas to said flash tube and a partition extending across said air space at a location adjacent said lighter port.

2. A gas burner comprising a simmer burner and a main burner, separate means for supplying air and gas to each of said burners respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to at least one of said burners, means for automatically igniting said simmer burner comprising a flash tube extending from a point adjacent a pilot light to a point in said space and adjacent the simmer burner, a lighter port in said simmer burner for feeding gas to said flash tube and a partition extending across said air space and having means therein remote from the location of said lighter port for passing secondary air of combustion.

3. A gas burner comprising a simmer burner and a surrounding main burner, separate means for conveying air and gas to each of said burners, respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to at least one of said burners, said simmer burner having burner openings adjacent the top thereof, means for automatically igniting said simmer burner from a point exteriorly of the main burner to a point in said air space and adjacent the simmer burner, a lighter port in said simmer burner below said burner openings for feeding gas to said flash tube and a partition extending across said space between said main and simmer burners in a horizontal plane above said lighter port but below said simmer burner openings, said partition having an opening therethrough for passing secondary air of combustion disposed at a location removed from said lighter port.

4. A gas burner comprising a simmer burner and a surrounding main burner, separate means for conveying air and gas to each of said burners, respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to at least one of said burners, said simmer burner having burner openings adjacent the top thereof, means for automatically igniting said simmer burner from a pilot light comprising a flash tube extending from a point exteriorly of the main burner to a point in said air space and adjacent the simmer burner, a lighter port in said simmer burner below said burner for feeding gas to said flash tube and a partition extending across said space between said main and simmer burners in a horizontal plane above said lighter port and below said simmer burner openings, said partition having an opening therethrough for passing secondary air of combustion disposed at a location removed from said lighter port, and a flash opening in said partition between said lighter port and at least one of the openings of said simmer burner.

5. A gas burner comprising a simmer burner and a surrounding main burner, separate means for conveying air and gas to each of said burners, respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to said burners, said simmer burner having burner openings adjacent the top thereof, means for automatically igniting said simmer burner from a pilot light comprising a flash tube extending from a point exteriorly of the main burner to a point in said air space and adjacent the simmer burner, a lighter port in said simmer burner below said burner openings for feeding gas to said flash tube and a partition extending across said air space in a horizontal plane above said lighter port and below said simmer burner openings, a flash opening in said partition between said lighter port and at least one of the openings of said simmer burner, said main burner having burner openings extending inwardly adapted to be automatically lighted from said simmer burner.

6. A burner of the character described having a simmer burner and a main burner, means for

supplying air and gas to said simmer and main burners, and an air space between said burners for supplying secondary air of combustion to said simmer burner, means for automatically lighting said simmer burner comprising a flash tube having its inner end disposed in said air space and spaced from said simmer burner and a lighter port in said simmer burner for supplying gas to said tube, and means disposed between said lighter port and said burner openings for eliminating strong drafts of air in said air space between said lighter port and the inner end of said flash tube.

7. A burner of the character described having a simmer burner and a main burner, means for supplying air and gas to said simmer and main burners, and an air space between said burners for supplying secondary air of combustion to said simmer burner, means for automatically lighting said simmer burner comprising a flash tube having its inner end disposed in said air space and spaced from said simmer burner and a lighter port in said simmer burner for supplying gas to said tube, and means disposed between said lighter port and said burner openings for eliminating strong drafts of air in said air space between said lighter port and the inner end of said flash tube, said means comprising a partition between said lighter port and said burner openings and having a flash opening therethrough.

8. A burner comprising a main annular burner, a central simmer burner and an annular air space between said burners, separate means for supplying air and gas to each of said burners respectively, a horizontal partition extending across the said annular air space, said simmer burner having burner openings above said partition, means for automatically lighting said simmer burner comprising a flash tube below said partition having its inner end adjacent but spaced from the side of said simmer burner and a lighter port below said partition adapted to feed gas into said flash tube, an opening in said partition between said lighter port and at least one of said burner openings, and a further opening in said partition removed from said first opening for passing secondary air of combustion.

PHILIP S. HARPER.

# CERTIFICATE OF CORRECTION.

Patent No. 2,156,533.

May 2, 1939.

PHILIP S. HARPER.

It is hereby certified that the above numbered patent was erroneously issued to "Philip S. Harper, of Chicago, Illinois, assignor, by direct and mesne assignments, of one-fourth to Carolyn L. Harper and one-fourth to Philip S. Harper, both of Chicago, Illinois, and one-half to Philip S. Harper and Carolyn L. Harper as Trustees" whereas said patent should have been issued to --Philip S. Harper, of Chicago, Illinois, assignor, by direct and mesne assignments, of one-fourth to Carolyn L. Harper and one-fourth to Philip S. Harper, both of Chicago, Illinois, and one-fourth to Philip S. Harper and Carolyn L. Harper, as Trustees, and one-fourth to Carolyn L. Harper and Philip S. Harper, as Trustees--, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of December, A. D. 1941.

(Seal)

Harry Van Arsdale,  
Acting Commissioner of Patents.

4. A gas burner comprising a simmer burner and a surrounding main burner, separate means for conveying air and gas to each of said burners, respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to at least one of said burners, said simmer burner having burner openings adjacent the top thereof, means for automatically igniting said simmer burner from a pilot light comprising a flash tube extending from a point exteriorly of the main burner to a point in said air space and adjacent the simmer burner, a lighter port in said simmer burner below said burner for feeding gas to said flash tube and a partition extending across said space between said main and simmer burners in a horizontal plane above said lighter port and below said simmer burner openings, said partition having an opening therethrough for passing secondary air of combustion disposed at a location removed from said lighter port, and a flash opening in said partition between said lighter port and at least one of the openings of said simmer burner.

5. A gas burner comprising a simmer burner and a surrounding main burner, separate means for conveying air and gas to each of said burners, respectively, and an air space between said simmer and main burners through which secondary air of combustion is supplied to said burners, said simmer burner having burner openings adjacent the top thereof, means for automatically igniting said simmer burner from a pilot light comprising a flash tube extending from a point exteriorly of the main burner to a point in said air space and adjacent the simmer burner, a lighter port in said simmer burner below said burner openings for feeding gas to said flash tube and a partition extending across said air space in a horizontal plane above said lighter port and below said simmer burner openings, a flash opening in said partition between said lighter port and at least one of the openings of said simmer burner, said main burner having burner openings extending inwardly adapted to be automatically lighted from said simmer burner.

6. A burner of the character described having a simmer burner and a main burner, means for

supplying air and gas to said simmer and main burners, and an air space between said burners for supplying secondary air of combustion to said simmer burner, means for automatically lighting said simmer burner comprising a flash tube having its inner end disposed in said air space and spaced from said simmer burner and a lighter port in said simmer burner for supplying gas to said tube, and means disposed between said lighter port and said burner openings for eliminating strong drafts of air in said air space between said lighter port and the inner end of said flash tube.

7. A burner of the character described having a simmer burner and a main burner, means for supplying air and gas to said simmer and main burners, and an air space between said burners for supplying secondary air of combustion to said simmer burner, means for automatically lighting said simmer burner comprising a flash tube having its inner end disposed in said air space and spaced from said simmer burner and a lighter port in said simmer burner for supplying gas to said tube, and means disposed between said lighter port and said burner openings for eliminating strong drafts of air in said air space between said lighter port and the inner end of said flash tube, said means comprising a partition between said lighter port and said burner openings and having a flash opening therethrough.

8. A burner comprising a main annular burner, a central simmer burner and an annular air space between said burners, separate means for supplying air and gas to each of said burners respectively, a horizontal partition extending across the said annular air space, said simmer burner having burner openings above said partition, means for automatically lighting said simmer burner comprising a flash tube below said partition having its inner end adjacent but spaced from the side of said simmer burner and a lighter port below said partition adapted to feed gas into said flash tube, an opening in said partition between said lighter port and at least one of said burner openings, and a further opening in said partition removed from said first opening for passing secondary air of combustion.

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