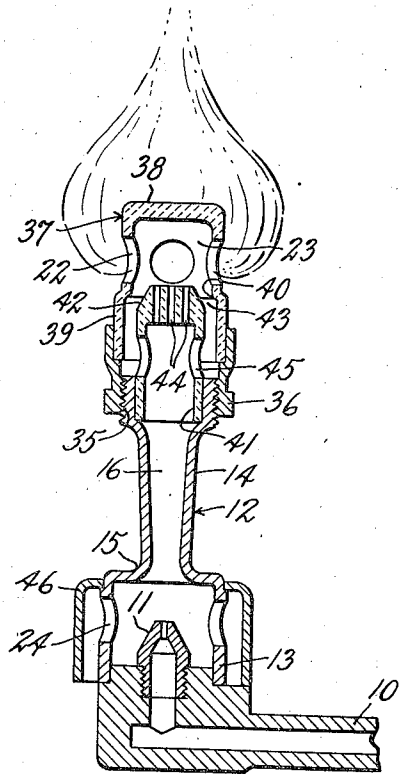
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GAS BURNER

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GAS BURNER

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3 Claims. (Cl. 158—99)

My invention relates to gas burners, and more especially to a gas burner suitable for burning comparatively small quantities of gas having a high hydrocarbon content. In the ordinary gas burner, such as a Bunsen burner, the gas issues from a jet which creates a suction effect capable of drawing in sufficient air to produce a combustible mixture within the tube of the burner. Such a device is suitable for burning gas having the ordinary hydrocarbon content, inasmuch as the suction effect draws in sufficient air to produce complete combustion. However, certain natural gases have such a high hydrocarbon content, and consequently require so much air for complete combustion, that the suction effect of the gas jet is not sufficient. This is particularly so when a comparatively small flame is desired, as for instance in a domestic gas heated absorption refrigerating apparatus.

In accordance with my invention I provide a gas burner suitable for producing complete combustion of comparatively small quantities of high hydrocarbon content gas. Further objects and advantages of my invention will be apparent from the following description, considered in connection with the accompanying drawing, which forms a part of this specification and of which the single figure is a cross-sectional view of an embodiment of my invention.

Referring to the drawing, reference character 10 designates a gas supply conduit, the outlet of which is provided with a jet 11. Secured to conduit 10 around jet 11 is an elongated member 12 having an enlarged lower portion 13 connected to or integral with a Venturi shaped tube 14 having a throat 15 and a mixing chamber 16. The enlarged portion 13 is formed with one or more openings 24 communicating with the atmosphere.

The upper end of tube 14 is provided with exterior threads 35 for engagement with similar threads formed on a collar 36, to which is secured the burner head 37. The head is preferably made of refractory material and includes a solid top wall 38 and a cylindrical side wall 39 formed with an internal shoulder 40.

A hollow member 41, preferably of refractory material, is secured to the upper end of tube 14 and extends into the burner head 37. Member 41 is formed with a conical upper end 42 which is disposed adjacent to the shoulder 40, thereby providing an annular passage 43, the cross-sectional area of which may be varied by screwing the collar 36 up or down on the end of tube 12, thus increasing or decreasing respectively, the area of the passage. The upper end of member 41 is provided with a plurality of comparatively long and narrow passages 44 which communicate with the interior of the burner head beyond the passage 43. Member 41 is also formed with one or more openings or ports 45 which communicate with the interior of the burner head between the upper end of tube 14 and the passage 43.

A skirt 46 is disposed around the primary air openings 24 in order to eliminate or minimize the effect of air currents.

The operation of the burner illustrated and described above is as follows:

Gas is discharged from the jet 11 and resulting suction effect draws primary air in through the openings 24. This gas and air mix in the primary mixing chamber 16 and flow into member 41. From here the mixture passes partly through the openings 44 and partly through the openings 45 into the secondary air mixing chamber 23 within the burner head 37. The air and gas mixture passes from the chamber 23 through the openings 22, while at the same time secondary air enters the chamber 23 through these same openings. The air and gas mixture, being lighter, flows through the upper part of each opening and the secondary air enters through the lower part, probably largely as a result of eddy currents. The introduction of this secondary air supplies the necessary amount of oxygen required to produce complete combustion of a high hydrocarbon content gas.

As shown in the drawing, the arrangement of the openings 22 is such that an onion-shaped flame is produced, which is desirable for heating the generator or heat receiving part of a refrigerating apparatus.

The annular passage 43, constitutes, in effect, a by-pass around the passages 44. Consequently, increasing the area of annular passage 43 decreases the resistance to flow from the primary air mixing chamber 16 to the secondary air mixing chamber 23, thereby increasing the suction effect produced by the jet 11. Thus, by adjusting the collar 36 on the tube 12 to vary the cross-sectional area of the passage 43, the quantity of primary air may be regulated to obtain complete combustion with gases having different hydrocarbon content.

It will thus be seen that, in accordance with my invention, I have provided a very simple burner suitable for burning small quantities of high hydrocarbon content gaseous fuels.

What is claimed:

1. A gas burner including structure forming a first mixing chamber, a nozzle projecting into said

chamber, the nozzle being provided with a passage terminating in a discharge orifice from which gas is discharged into said chamber, said structure having openings to permit flow of air into said chamber to mix with gas therein, a burner head mounted on said structure and forming the side and top walls of a second chamber, and a wall member separating said first and second chambers and having openings which are materially greater in length than in diameter to permit flow of the gas and air mixture from the first chamber to the second chamber and also prevent backfiring of the burner flame, said burner head being so constructed and secured to said structure as to provide an annular passage between said head and said structure adjacent said wall member, and said structure having ports providing communication for said first chamber with said annular passage adjacent said wall member so that the gas mixture may flow to the second chamber from the first chamber both through said openings in the wall member and also through said ports and said annular passage, and said burner head having openings therein for admitting secondary air into said second chamber to increase the proportion of air in the gas mixture therein and for discharging the gas mixture therefrom, the burner head being formed of refractory material and having the outer surface thereof serving as the region where the burner flame is produced and maintained.

2. A gas burner as set forth in claim 1 in which said burner head is movable with respect to said structure, and said head and said structure are so formed and arranged that movement of said head causes a variation in a cross-sectional area of said annular space.

3. A gas burner including structure forming a first mixing chamber having gas and air inlets, said structure including a wall member having openings therethrough for permitting flow of the mixture of gas and air from said first chamber, a burner head secured to said structure and providing the side and top walls of a second mixing chamber which receives the mixture of air and gas from said first chamber through the openings in said wall member, the openings in said wall member being materially greater in length than in diameter, said wall member having one or more ports to provide a path of flow for the mixture of air and gas from said first chamber to said second chamber without passing through the openings in said wall member, said head having flame ports in said side wall, and said top wall being imperforate to baffle flow of combustible mixture in the line of the axis of the openings in said wall member.

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