March 28, 1944. A. F. ERICKSON 2,345,247

GAS BURNER

Filed March 27, 1940

Fig. 1.

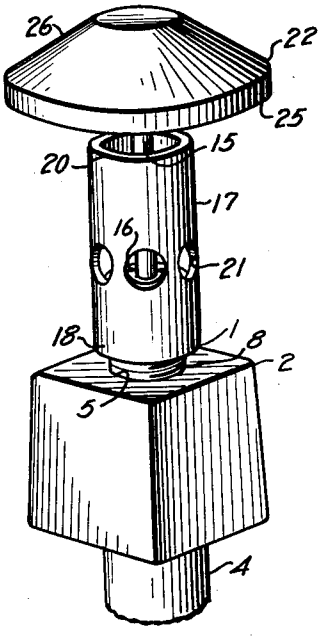


Fig. 2.

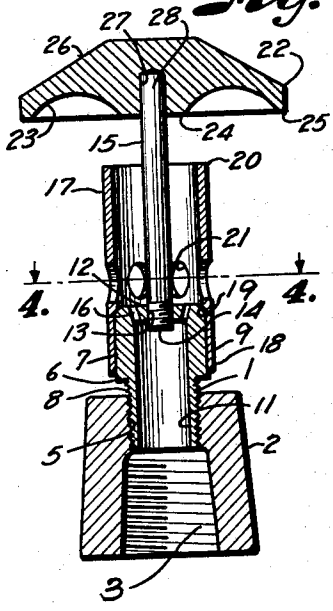


Fig. 3.

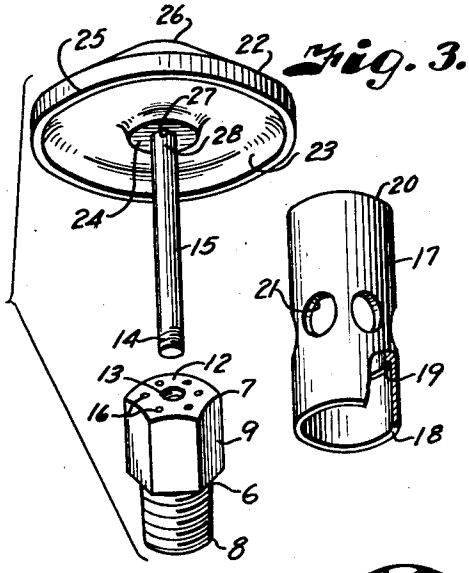


Fig. 4.

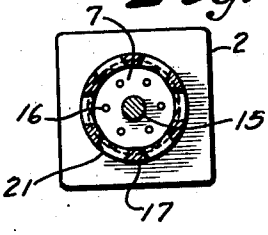
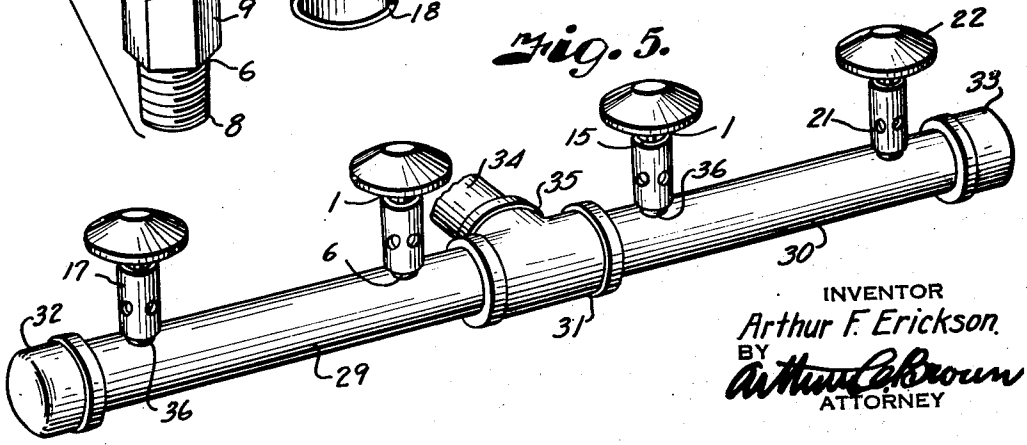


Fig. 5.



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GAS BURNER

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Application March 27, 1940, Serial No. 326,194

1 Claim. (Cl. 158—113)

This invention relates to burners, particularly those for gaseous fuels and adapted for installation in various heating appliances. Usually the fire-box or burner chambers of heating appliances vary in size and shape and require various distribution of heat within parts thereof in order to provide for maximum efficiency. The burners should, therefore, be designed to meet individual conditions encountered for each heating appliance. Heretofore this has been commercially impracticable so that burners have been manufactured in a variety of standard sizes and shapes, in order to have a burner available which will as near as possible fit any installation which may be encountered. Even with a minimum number of stock sizes a dealer has a large amount invested and the stock requires a considerable storage space. This results in increased cost of burner installations to the purchasers and does not assure that he is supplied with a burner which will operate at maximum efficiency.

It is, therefore, a principal object of the present invention to provide a burner construction consisting of parts which may be assembled in various arrangement to provide a burner, individually suited to a particular job in hand. Thus a dealer may stock only the individual parts and assemble these parts to form a burner of any desired size and capacity.

Other objects of the invention are to provide a jet type burner equipped with an improved jet structure whereby the primary air is more efficiently mixed with the gaseous fuel; to provide a jet construction wherein the parts are readily assembled and disassembled for cleaning and repairing; and to provide a jet structure wherein the flame is uniformly propagated around the entire periphery of the jet so that the jets when combined in a burner cover substantially the entire area to be heated.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a burner unit constructed in accordance with the present invention.

Fig. 2 is a vertical section through the burner unit.

Fig. 3 is a detail perspecttive view of the parts of the burner unit shown in disassembled spaced relation to better illustrate the construction thereof.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2.

Fig. 5 is a perspective view of one burner arrangement wherein a plurality of burner units are applied to a distributing manifold formed of pipe sections.

Referring more in detail to the drawing:

The present invention contemplates a burner 1 having in its simplest form a rectangular base 2 provided with an axial bore having threads 3 to receive the threads of a gas supply pipe 4 and an upper thread 5 to receive a nipple 6 of a burner jet 7. The nipple 6 includes a threaded neck 8 to engage the threads 5 and a perferably integral head 9 having a polygonal-shaped exterior 10 whereby the nipple may be readily engaged and rotated into the threads 5. The nipple has an axial bore 11 terminating within the head to provide a closed end 12 having a central axial opening 13 that is interiorly threaded to mount the threaded end 14 of a rod or stem 15.

Also formed in the closed end of the head circumferentially of the rod 15 is a plurality of fine outlet orifices 16 arranged in circular series and through which jets of gas are discharged into a Bunsen tube 17. The Bunsen tube 17 includes a sleeve-like body having the lower end 18 counterbored to provide an internal shoulder 19 for sleeving the Bunsen tube over the head of the nipple 6 so that the upper edge 20 of the tube is maintained at a fixed distance above the orifices. Formed in the side of the tube, above the outlet orifices, are a plurality of air inlet openings 21 through which jets of primary air are drawn incidental to discharge of the gas through the orifices to effect an air and gas mixture in the Bunsen tube which is discharged from the upper end thereof and deflected outwardly by means of a disk-shaped flame deflector 22. The flame deflector 22 is preferably formed of a material capable of withstanding the heat of the flame and includes a disk-shaped body having downwardly facing annular groove-like recess or chamber 23 formed in the lower face 24 thereof, the recess preferably being of arcuate cross-section so as to effect turbulence of the gases and guide the fuel mixture in a radial and downward direction while the mixture is contacting a secondary air supply. The rim portion of the deflector projects beyond the periphery of the Bunsen tube and serves to distribute the discharged mixture uniformly about the periphery thereof which results in a uniformly propagated flame that is spread over a relatively large area,

The annular groove also forms a mixing chamber for the secondary air when the fuel mixture is discharged from under the periphery 25 of the disk which is in condition for substantially complete combustion and the combustion takes place closely adjacent to and around the entire periphery of the disk. The upper face of the disk may be of any suitable shape but is shown in the form of a truncated cone 26, as this shape gives the required thickness to provide sufficient body to accommodate a downwardly opening socket 27 in the axis thereof to receive the upper end 28 of the rod or stem 15 so that the deflector is rigidly supported at a predetermined distance from the outlet end of the Bunsen tube. The socket 27 is preferably of such diameter that the deflector must be pressed thereon so that it is not readily disarranged.

Burner units comprising the elements just described may be used individually on a base 2 as shown in Fig. 1 to provide a complete burner or they may be installed in various groups to accommodate any particular size and shape of burner chamber. For example, the burner units may be installed on pipe sections 29 and 30 which are threaded onto a T 31 and having their outer ends closed by pipe caps 32 and 33, the gas being supplied to the T through a pipe 34 threaded into the other branch 35 of the T as clearly shown in the drawing.

The pipe sections are provided along the length thereof with a series of threaded openings 36 to receive the threaded necks of the jet nipples. This form of burner is particularly adapted to elongated fire-boxes or burner chambers and may be assembled from standard pipe fittings which are readily available. The size and capacity of the burner is made to accommodate the fire-box in which it is installed by providing pipe sections of the required length and equipping the pipe sections with a sufficient number of threaded openings 36 to accommodate the required number of burner units.

It is obvious that various combinations of manifold units and connection nipples will produce a burner of any desired shape and capacity and that the burner units may be uniformly spaced and in such a manner that they will cover the entire area of a burner chamber or fire-box. It is further obvious that with my invention a dealer may stock only the burner units and with these simple units construct burner shapes to suit any installation which may be encountered. He is thus enabled to supply burners at low cost and at the same time burners which are particularly designed for each individual installation, thereby assuring a burner which is capable of operation at maximum efficiency.

What I claim and desire to secure by Letters Patent is:

A burner including, a nipple having an integral head provided with a plurality of relatively fine gas outlet orifices arranged in circular series about an axial opening in the head of said nipple, a Bunsen tube sleeved over said head for support by said head and having a plurality of air inlet openings located above said gas outlet orifices for admitting jets of air into contact with jets of gas discharged through said orifice, a flame deflector having a rim portion extending beyond the periphery of the Bunsen tube and provided with a downwardly facing annular recess forming a secondary mixing chamber encircling a central downwardly facing socket, and a rod-like support extending coaxially through the Bunsen tube and having its lower end fixed within the axial opening in said head and having its upper end projecting from the Bunsen tube and engaged in the socket of the flame deflector to space the flame deflector from the Bunsen tube, said rod-like support cooperating with the Bunsen tube to form an annular primary air mixing chamber and for conducting heat through the mixing chamber to heat said head.

ARTHUR F. ERICKSON.