April 11, 1944. B. A. SCHAUMANN 2,346,333

HYDROCARBON BURNER

Filed Aug. 7, 1942

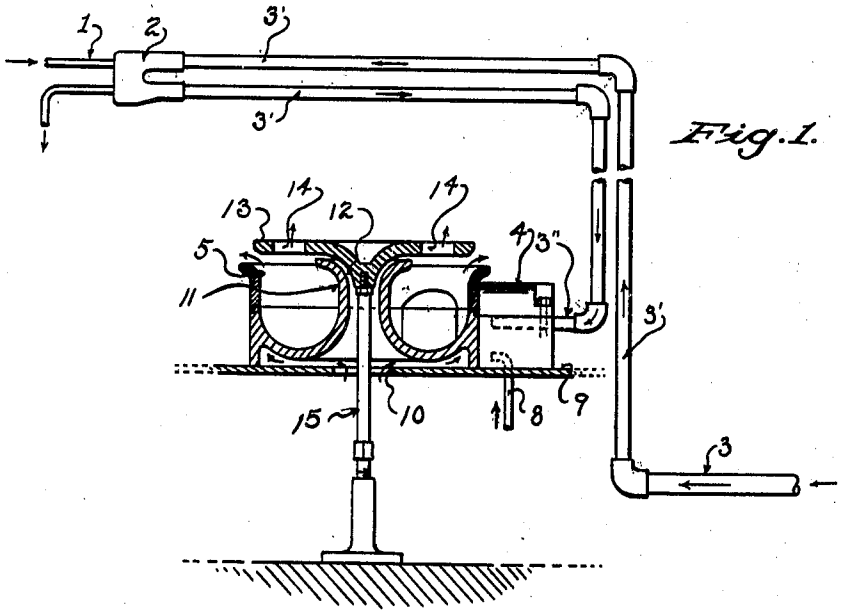


Fig. 1.

Fig. 2.

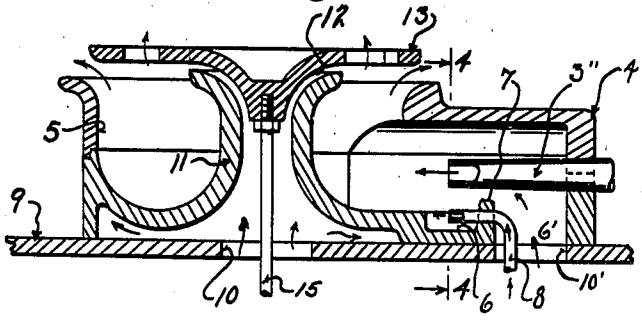
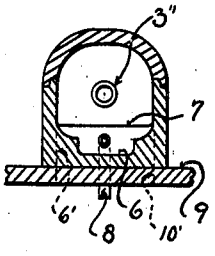


Fig. 4.



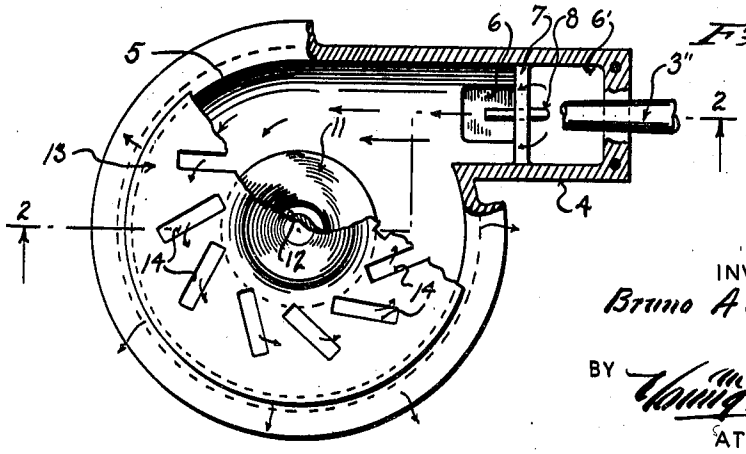


Fig. 3.

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HYDROCARBON BURNER

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Application August 7, 1942, Serial No. 453,922

1 Claim. (Cl. 158—63)

My invention refers to hydrocarbon burners of the general type disclosed in the Schaumann Patent No. 1,746,969, of February 11, 1930.

The object of the invention is to provide a hydrocarbon burner wherein the fluid fuel is volatilized by the introduction of minute drops of fuel oil into a return bend pipe containing air under pressure. The air is progressively increased due to variation in the area of the pipe prior to its introduction into a burner head positioned under the return bend air pipes, whereby the air and oil mixture is vaporized and generated into a gas, it being understood that the fuel oil is introduced by gravity.

Thus, practice has demonstrated that, due to the above arrangement of parts, the gas is discharged into what may be termed a "centrifugal burner head," wherein atmospheric air is commingled through the burner to produce a pure combustible mixture, producing what might be termed a "blue" hydrocarbon flame, which is sootless, carbonless, smokeless, and odorless at all times.

With the above object in view, my invention consists in certain peculiarities of construction and combination of parts, as will be hereinafter described with reference to the accompanying drawing and subsequently claimed.

Figure 1 is a sectional elevation of a burner head and fuel pipe connections embodying the features of my invention.

Figure 2 is an enlarged sectional elevation of the burner head, the section being indicated by the line 2—2 of Figure 3.

Figure 3 is a plan view of the same, with parts thereof broken away and in section to more clearly illustrate structural features.

Figure 4 is a cross section of the same, the section being indicated by the line 4—4 of Figure 2.

Referring by characters to the drawing, the numeral 1 indicates a fuel supply pipe in communication with a return bend coupling 2, into which drops of fuel oil are introduced by gravity, and at the bottom of said coupling an overflow fuel pipe is introduced.

The coupling has connected thereto an air pipe 3 supplied by air under pressure from any suitable source. The section 3' of this pipe is directed upwardly and positioned at a right angle over the burner head terminating in a leg of the coupling 2. The return bend of said pipe is in communication with said coupling and is arranged approximately parallel to the previously mentioned pipe sections. The discharge end 3'' is also slightly reduced in diameter and turned at a right angle and enters an enlarged neck 4, which forms part of the burner head, and which is in tangential relation to a circular chamber 5 of the head.

As best shown in Figure 2 of the drawing, the discharge end of the pipe 3'' is positioned directly over a pocket 6 formed in the bottom of the neck 4. The closed end of said neck 4 is formed with an air intake opening 6' communicating with the ash pit of a furnace (not shown). The neck is also formed with a transverse rib 7 adjacent the pocket 6, and a valve-controlled pilot light tube 8 is extended through the air opening 6' and terminates above the pocket in approximate alinement with the mouth of the pipe 3''.

The burner head is supported on any suitable bed plate 9 carried by the furnace above the ash pit. This plate 9 is also formed with an air opening 10 communicating with the ash pit and central portion of the burner, it being understood that a similar air opening 10' is provided for communication with the neck portion of the burner, as shown.

The central portion of the burner is formed with a hub 11, which is of the sleeve type, for the introduction of air to the circular chamber 5, said sleeve being flared outwardly at its upper end.

Fitted into the flared mouth of the hub sleeve is a correspondingly downwardly flared hub 12 of a deflector disc 13 having tangentially disposed slots 14 therein. The periphery of the disc 13, in conjunction with the rim of the circular chamber 5, forms a passage therebetween, variable in area, for the discharge of the flame as indicated by the arrows, which flame travels through the neck and swirls about the chamber prior to being discharged through the passage and also through the slots in the disc 13.

It will be noted that while the flame is traveling in a circular body within the head, air under atmospheric pressure from the ash pit is introduced into the neck portion 4 of the burner, and also into the hub portion 11 of the same, whereby the flame insures a perfect combustion of the gases, due to an auxiliary supply of air.

In order to vary the flame discharge at the upper edges of the circular burner head, the disc 13, in this particular instance, is supported by an adjustable stand 15 having a base resting upon the bottom of the ash pit. Obviously, this adjustment may be affected by a direct spider connection between the stand 15 and the hollow hub.

From the foregoing description it will be noted that in the operation of the device the air and oil mixture is superheated above the burner and converted into a gas, and said air is gradually compressed from its point of introduction in the furnace, to the burner head proper, whereby the mixture is rendered more effective prior to its discharge into the neck of the burner at the point of ignition, and thereafter the swirling flame will receive a further supply of air from the ash pit. Thus, the mixture of air and oil is in proper proportions to produce what is known as a pure "blue flame" having the desired maximum results, with a minimum supply of volatile fluid.

In practice, it has been found that the walls of the burner through which the flame swirls may be composed of suitable high temperature resistance material, whereby melting is avoided, as, in practice, the flame will develop a temperature of approximately 2500° to 3000°.

While I have shown and described one exemplification of my invention minutely as to details, it is understood that I may vary the structure within the scope of my claim.

I claim:

A hydrocarbon burner head comprising a cup forming a circular chamber, a tangentially disposed gas receiving neck extending from the cup chamber having an air port therein, a fuel conductor pipe in communication with the cup neck, a centrally disposed hollow hub extending from the cup bottom having a flared discharge mouth, and a deflector disc supported above the cup edge having a downwardly and inwardly flared hub nested within the mouth of the cup hub, and means for adjusting the disc relative to the cup edge and hub mouth, whereby the volume of flame discharged between the cup edge and disc is regulated and the volume of air through the hollow hub is controlled.

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