Feb. 8, 1938. B. L. MATTHEWS ET AL 2,107,575

BURNER

Filed Dec. 28, 1934

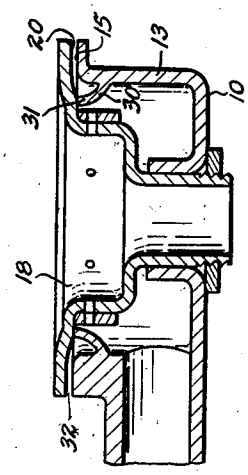


FIG. 3

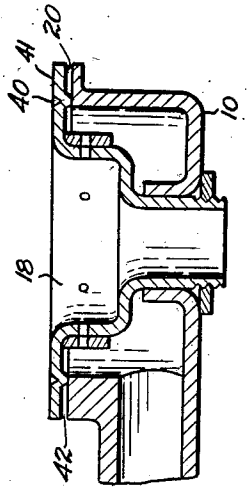


FIG. 4

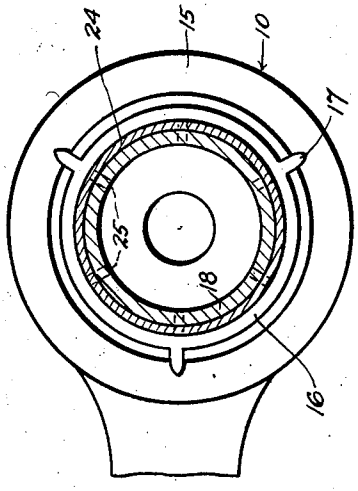


FIG. 1

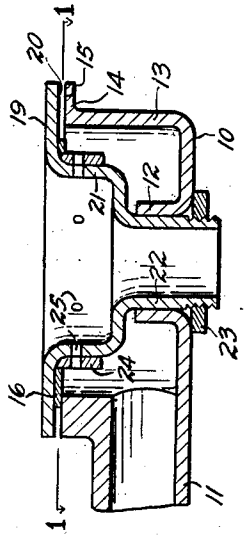


FIG. 2

BIRCHARD L. MATTHEWS
JOHN T. MARVIN
INVENTORS

Edmund B. L. Rogers
ATTORNEY

Patented Feb. 8, 1938 2,107,575

UNITED STATES PATENT OFFICE

2,107,575

BURNER

Birchard L. Matthews, Lakewood, and John T. Marvin, Fairview Village, Ohio, assignors to The Patrol Valve Company, Cleveland, Ohio, a corporation of Ohio

Application December 28, 1934, Serial No. 759,454

2 Claims. (Cl. 158—116)

It is an object of this invention to provide a fluid fuel burner having two principal parts that determine the size of the burner opening, and which size is fixed by two planar surfaces, one on each part.

The burner is designed to be of the ribbon flame type, wherein the flame comprises a continuous band around the periphery of the burner.

A further object is to provide a burner of this type wherein means is provided to elongate certain ports to prevent flash-back.

A further object consists in the manner of manufacturing the burner, such as set out in the accompanying specification, and wherein two important steps consist in providing two principal parts for the burner, forming a single reference surface on each, and using said reference surfaces as means for determining the dimensions of the burner.

In the drawing:

Fig. 1 is a section on the line 1—1 of Fig. 2.

Fig. 2 is a vertical section showing one form of burner.

Fig. 3 is a vertical section showing a second form of burner.

Fig. 4 is a sectional view showing a third form of burner.

Referring to the type shown in Figs. 1 and 2, the burner comprises a bowl 10 attached to a mixing tube 11, that may extend out and be controlled by a gas cock or any such valve and a shutter to admit primary air. The bowl has a central upstanding cylindrical portion 12, and an outer wall 13 terminating in a flange 14, the upper surface of which, as at 15, is machined to be perfectly flat. Resting upon surface 15 is a spacing device 16 having spaced prongs thereof extending radially outwardly therefrom. It is these prongs, here shown as three in number, that engage the upper surface 15 of flange 14, the ring portion being spaced back from this flange. Resting upon the fingers 17 is a cap member 18 having a flange 19, the under surface of which at 20 is manufactured to be smooth and planar. Thus the spacing of surface 20 from surface 15 is governed entirely by the thickness of fingers 17 of spacer member 16.

Cap member 18 has a depression centrally therein which provides substantially vertical walls 21. The depression terminates in a vertical cylindrical portion 22 adapted to fit within cylindrical portion 12 of the burner bowl. This fit is preferably close, and centralizes the cap in the bowl to hold the parts in proper relation. Portion 22 terminates in a threaded end over which is engaged a locking nut 23 that holds the burner together. It will be seen that a secondary air passage is provided through cylindrical portion 22.

Pressed or otherwise secured to the cylindrical portion of cap 18 is a ringlike member 24. In member 24 and portion 21 is provided a series of outlet ports 25. Ports 25 give an inner flame for the burner to cooperate with the ribbonlike flame supported between surfaces 20 and 15 to increase the efficiency of the burner. The use of ring 24 provides an elongated slot at 25 that reduces the possibilities of the back flash of the flame into the bowl and mixing tube.

In the construction of this burner the bowl 10 is manufactured and with a single grinding or other machine operation, the surface 15 is made smooth and planar. Cap member 18 may be made by a stamping. In its manufacture the surface 20 is made smooth and planar. Thus in the construction of the burner there are only two surfaces producable by only two operations with a single machine adjustment for each; and these two surfaces absolutely fix, with the use of spacer member 16, the size of the outer burner slot and also provide the slot itself. It will be seen that the slot is continuous and the pointed fingers 17 are so spaced and dimensioned that the outer flame issued between surfaces 20 and 15 will be a continuous ribbon around the burner. It is for this reason that fingers 17 are pointed.

In assembly of the burner after the manufacture of cap 18, ring 24 may be pressed in place. It is desirable, although not essential, that the ring be pressed on the outer surface of cylindrical portion 21 since thereby it is enclosed within the burner bowl, and under no circumstances is subject to dislocation, should such be possible after a pressed fit. Furthermore, the burner has better appearance with this element concealed.

With ring member 24 on cap 18, spacer ring 16 is dropped into position with the fingers 17 resting on surface 15. Cap member 18 is then put into position with cylindrical portion 22 extending through cylindrical portion 12 of burner bowl 10, and the locking nut 23 is fastened. It will be observed that the spacing of the outer burner slot is entirely unaffected by the degree of tightness of lock nut 23.

The burner of Fig. 3 is similar to that of Fig. 2. In this burner, however, lugs or bosses 30 extend inwardly from wall 13, and there should be at least three of these.

At the time of the surfacing of surface 15, the upper ends of lugs 30 are simultaneously made coplanar with surface 15, this being done in a single operation. Cap member 18 is pressed or

otherwise formed to have a lower surface 31 spaced from surface 20 by exactly the desired dimensions of burner slot 32. The surface 31 may be provided in the same stamping operation by which a cap member 18 is manufactured. Thus in the assembly of this burner the spacer ring 16 is eliminated. Other than these noted differences the burner is identical with the burner in Fig. 2.

The burner of Fig. 4 is similar to that of Fig. 2, save that at the time of stamping the cap member 18, depressions 40 are pressed or otherwise formed in flange member 41, these depressions 40 extending outwardly from the under surface 20 by a predetermined distance, which distance is the deciding spacing for slot 42. It will be seen that this burner requires only two machining operations to determine the width of the slot opening.

It will be observed that in all of these burners the manufacture of the burner bowl necessitates a single operation that requires fixed dimensioning. The burner bowl may be a single casting with the mixing tube as shown, thus materially simplifying this structure. After the bowl is cast it may be held against a grinding wheel or the like and the surface 15 made smooth and planar to fix simultaneously the slot surface and the reference surface thereof. Where the manufacture of the bowl, as frequently may occur, is separate from the manufacture of the cap member, it is readily seen how the number of machining operations and the possibility of divergence from a given dimensioning, involve very important questions. The manufacture of the cap member 18 may carry all of the variable dimensions involved in the manufacture of the burner. These variables include differences in size of the burner slot opening such as are occasioned by the use of different kinds of gas.

In all types of the burners shown, the cap members may have all of their fixed dimensions provided in a single operation, preferably in a stamping or die-casting machine.

Having described the burners, what is claimed is:

1. A burner comprising a bowl member having an annular planar upper surface of substantial width and a centrally located hollow tubular portion, a cap member having a planar surface of substantial width cooperating with said bowl planar surface to provide a substantially horizontal annular burner slot, said cap having a vertical cylindrically recessed central portion extending into said bowl to provide an annular passageway in communication with the burner slot and a cylindrically hollow tubular portion telescopically fitting said bowl tubular portion, and radially extending spacing means between said planar surfaces, said means having their outer extremities positioned a substantial distance inwardly of the outer edges of said surfaces and tapered to a sharp point in the direction of flow to permit the free flow of fuel in a continuous ring adjacent the outer edges of said planar surfaces to provide a continuous flame at the burner slot.

2. A burner comprising a bowl member having a planar upper surface of substantial width, a cap member having a planar lower surface also of substantial width cooperating with said first surface to provide a substantially horizontal burner slot, and radially extending spacing means between said planar surfaces, said spacing means engaging only the inner portions of said two planar surfaces and having their outer extremities positioned a substantial distance inwardly of the outer edges of such planar surfaces, and said spacing means having their outer extremities tapered to a sharp point in the direction of flow to permit the free flow of fuel in a continuous ring adjacent the outer edges of said surfaces to provide a continuous flame at the burner slot.

BIRCHARD L. MATTHEWS.
JOHN T. MARVIN.