Feb. 24, 1942. T. B. FOCKE ET AL 2,274,475

CLOSURE FOR THE HANDHOLE OF BURNER BOWLS

Filed Jan. 17, 1939 2 Sheets-Sheet 1

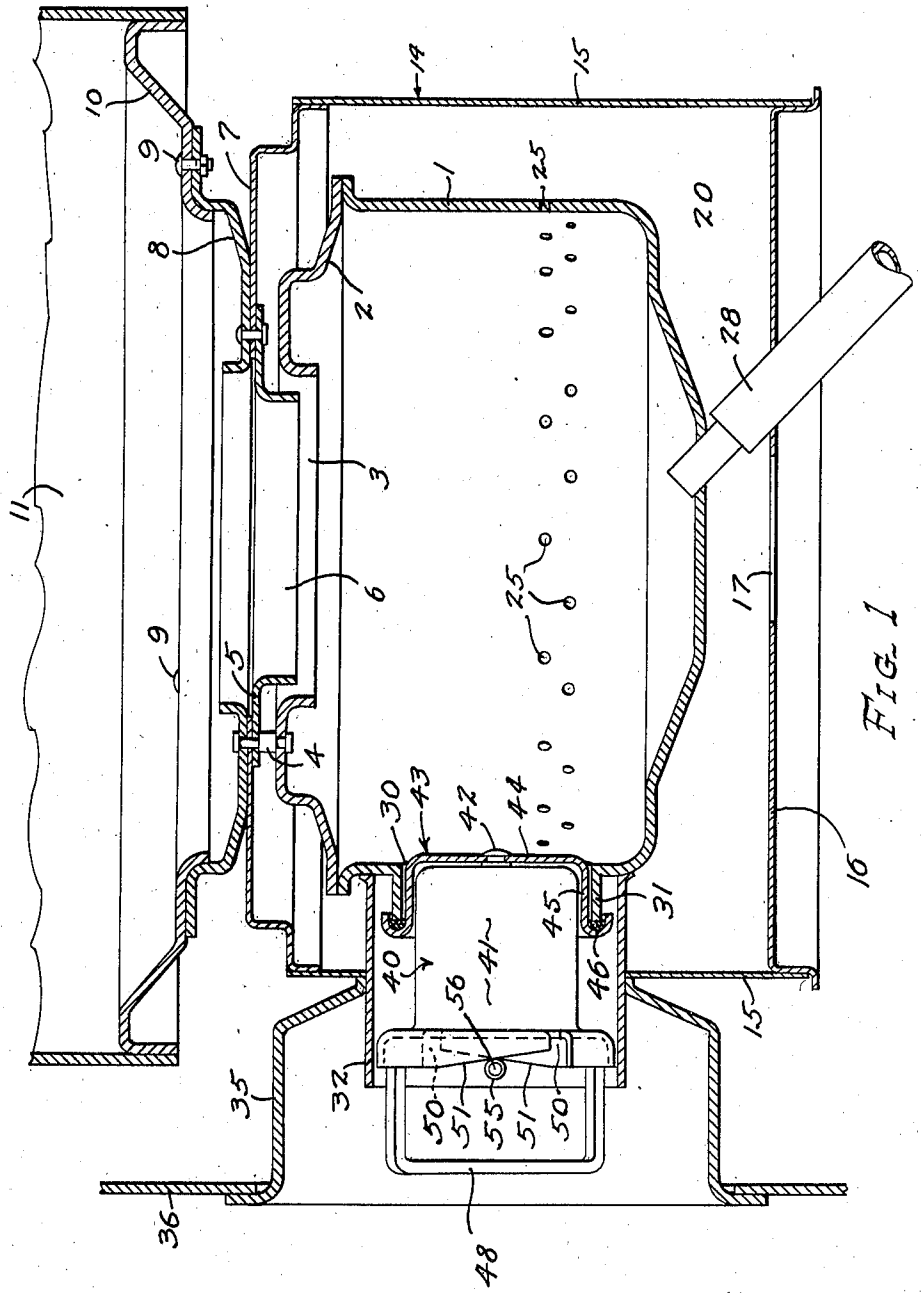


FIG. 1

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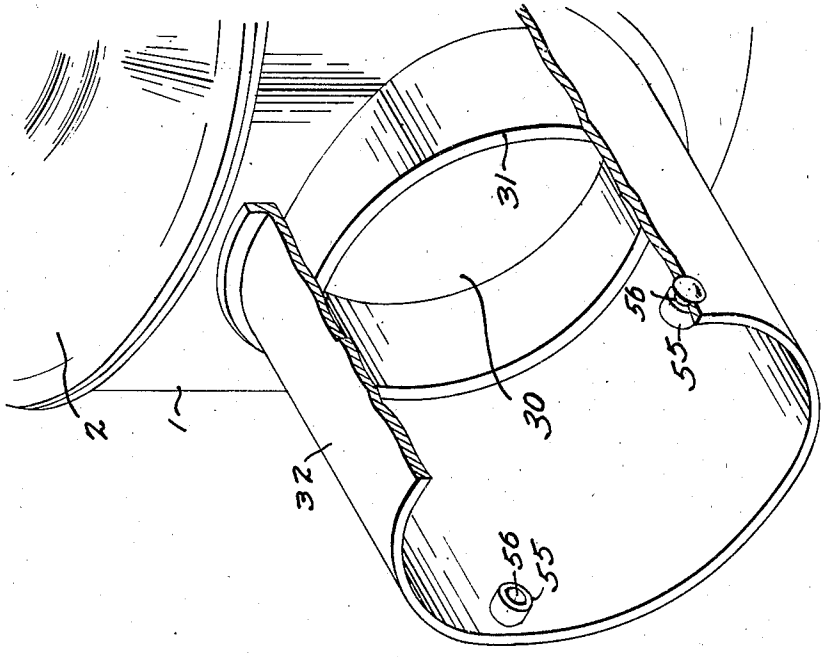


FIG. 3

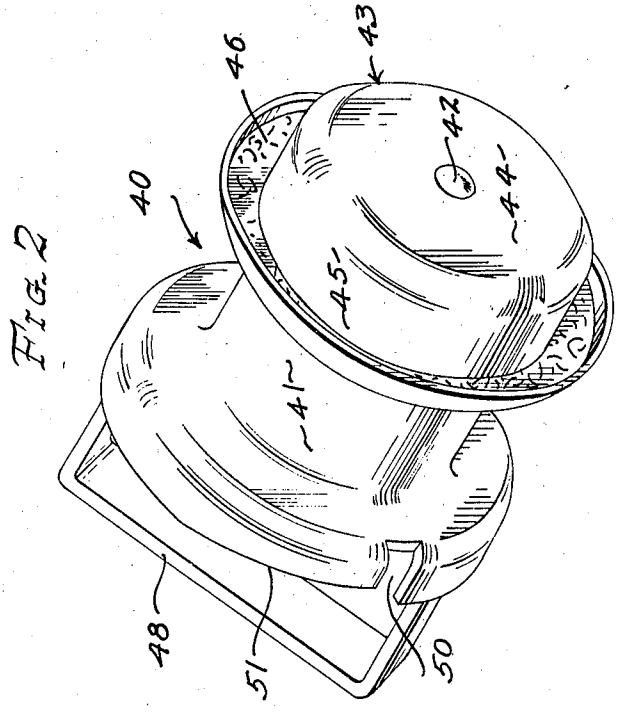


FIG. 2

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2,274,475

CLOSURE FOR THE HANDHOLE OF BURNER BOWLS

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Application January 17, 1939, Serial No. 251,393

1 Claim. (Cl. 220—40)

This invention pertains to liquid fuel burning apparatus of the type in which the fuel is fed to a burner bowl wherein it is vaporized by the heat of combustion after the apparatus is in operation. The bowl has means for admitting a limited quantity of air, known as primary air, which, with the vapors, produces a relatively rich mixture; and this slowly burning mixture, rising through a zone wherein secondary air is added, burns vigorously in the combustion space or chamber above. To insure satisfactory operation, the capacity of the primary air admitting means should remain substantially constant.

The burner bowl wherewith the invention is concerned has a relatively large side opening or hand hole that is provided for lighting and clean-out purposes, and the same is normally closed by suitable means; and unless said means is quite effective in the attainment of its purpose it will admit an excess of air to the bowl that will cause an unbalanced air and vapor condition resulting in unsatisfactory operation.

It is the fundamental purpose of the invention, therefore, to provide a closure for the lighting and clean-out openings or hand holes of burner bowls of the kind referred to that will effectively seal such opening against leakage, and that is simple, quick and convenient of manipulation.

Another object is to provide a closure comprising a body having a bayonet joint or similar rotary connection with the apparatus and to which is rotably connected or swiveled a gasket carrier that supports a gasket in position to engage a seat or flange surrounding the lighting and clean-out opening, whereby the gasket, upon engaging said seat or flange, remains stationary while the body is turned so as to avoid wear of the gasket by abrasion, this being important because gaskets for use in such connections have to be non-inflammable wherefore they are usually of a fibrous material, such as asbestos or the like.

A further object is to provide a connection between the body and gasket carrier that permits limited rocking of the latter with respect to the former to compensate for any slight irregularity in the relation of the gasket seat to the part to which the body of the closure is connected.

The objects and advantages above enumerated, with others hereinafter appearing, are attained in the embodiment of the invention illustrated in the accompanying drawings wherein Fig. 1 is a fragmentary central vertical section through a liquid fuel burning apparatus incorporating our improvement; Fig. 2 is a perspective view of the closure, and Fig. 3 is a fragmentary perspective of the burner bowl with a part of the tube or sleeve that receives the closure broken away to reveal the gasket engaging flange or seat.

The structure shown fragmentarily in Fig. 1 is that of a furnace incorporating liquid fuel combustion apparatus of the kind hereinbefore referred to. The burner bowl is designated 1 and includes an annular top wall 2 the central opening of which is surrounded by a depending lip 3. Connected to and spaced above the top wall 2 by means of a number of shouldered rivets or the like, one of which is shown at 4 in Fig. 1, is an assembly comprising an annulus 5 that is flanged downwardly about its inner edge to form a lip 6 that is spaced inwardly from and is substantially concentric with the lip 3; a centrally apertured top wall 7 of a housing later to be described, and a ring-like member 8, the outer rim portion of which is connected, as by fastening means or bolts 9, to the annular bottom wall 10 of a combustion chamber 11.

The previously mentioned top wall 7 constitutes a part of a housing indicated generally by the numeral 14, the same including also a peripheral wall 15 and a bottom wall 16, the latter having a central opening 17 for admitting air to an air chamber 20 enclosed by said housing and surrounding the burner bowl 1. The bowl communicates with the combustion chamber 11 through the passageway provided by the openings in the annulus 5, top wall 7 and ring-like member 8.

From the chamber 20, primary air enters the bowl 1 through holes 25 in the peripheral wall thereof, while secondary air enters over the top of the bowl and through the annular slot between the lips 3 and 6 that serve to deflect the secondary air downwardly into the interior of the bowl. Liquid fuel is supplied to the sump-like bottom of the bowl through a conduit designated 28 that leads from a suitable source of supply (not shown). In accordance with common practice, a liquid level control is desirably included in the connections between said source and the bowl.

The peripheral wall of the bowl on the side toward the front of the furnace is provided with a relatively large lighting and clean-out opening or hand hole 30 that is surrounded by a forwardly projecting flange 31. A tube or sleeve 32 is welded or otherwise attached to the wall of the bowl about the flange 31 in outwardly spaced concentric relation thereto, the tube or sleeve ex-

tending forwardly a considerable distance beyond the flange 31 through an opening in the adjacent portion of the peripheral wall 15 of the housing 14. A bell-like member 35 surrounds the portion of the tube or sleeve 32 that extends forwardly beyond the wall 15 and its flanged outer end joins the front wall 36 of the furnace about an opening therein. A closure, designated generally by the reference numeral 40 and later to be described in detail, is provided for the lighting and clean-out opening 30.

To start the fire, the closure 40 is removed and a lighted match, burning taper or other igniting means is projected through the opening 30 to set fire to the fuel that has been fed to the bowl through the conduit 28. As soon as the fuel is ignited the closure 40 is replaced to tightly close the opening 30, and as the bowl becomes heated the fuel is vaporized, the vapors mixing with primary air admitted through the holes 25 and burning slowly. As combustion progresses and the heat increases vapors in greater volume are produced and ultimately a relatively rich slowly burning mixture occupies the bowl 1 and as the mixture rises it is rendered more highly combustible by the addition of secondary air that enters between the lips 3 and 6, the greater percentage of combustion occurring above this point within the combustion chamber 11.

The previously mentioned closure 40 is composed of a cylindrical plug-like body 41 to the inner end wall of which is rotatably connected or swiveled, by means of a pivot member 42, a gasket carrier designated generally by the numeral 43. This element is desirably drawn or otherwise formed from a single piece of sheet metal and comprises a circular end wall 44 and a cylindrical wall 45 that extends forwardly over the inner end of the body 41 and has its forward end gradually curled outwardly and then back over itself to provide an inwardly facing annular channel that contains a ring or gasket 46 of suitable non-inflammable packing material, desirably of a fibrous nature, such as asbestos. The packing ring or gasket 46 is thus sustained in a position to engage the seat formed by the forward end of the flange 31 when the closure 40 is inserted into the tube or sleeve 32 by means of a handle 48 that is suitably fastened to its forward end. The forward end of the body 41 is enlarged to nearly the internal diameter of the tube or sleeve 32 and at diametrically opposite points is provided with slots 50. The forward edge portion of the enlarged end of the body 41 is cut away on the corresponding sides of the slots 50 to provide cam surfaces 51.

Diametrically opposed abutments 55 that are carried by and project inwardly from the tube or sleeve 32, are arranged to pass through the slots 50 when the closure is inserted into the tube or sleeve. The abutments 55 desirably consist of rollers that are mounted on studs 56, shown as riveted to the sleeve or tube. When the plug-like body 41 is turned by means of the handle 48, the cam surfaces 51 are caused to ride under the abutments or rollers 55 thereby to force the closure inwardly and compress the packing ring 46 against the seat provided by the forward end of the flange 31 and seal the lighting and clean-out opening 30 against the admission of air. Consequently when the closure 40 is in place air is admitted to the bowl only through the holes 25 and the slot between the lips 3 and 6 and a properly balanced condition of air and vapors prevails to insure satisfactory operation of the apparatus.

Having thus described our invention, what we claim is:

In combination with a wall having an opening, a sleeve connected to the wall about said opening in outwardly spaced substantially concentric relation thereto, a flange surrounding the opening in inwardly spaced relation to the sleeve, the sleeve extending a material distance beyond the outer end of the flange, a closure comprising a cylindrical plug-like body that is closed at its inner end and is adapted to be received by the sleeve, the plug having a bayonet joint connection with the sleeve, a gasket carrier in the form of a cup wherein the inner end of the plug-like body is loosely received, the perimeter of the carrier being turned outwardly and back over itself to provide an annular inwardly facing channel, a gasket within said channel for engagement with the aforesaid flange, and a pivot member extending through the end walls of the body and carrier axially thereof and rotatably connecting them together in spaced relation to each other.

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