

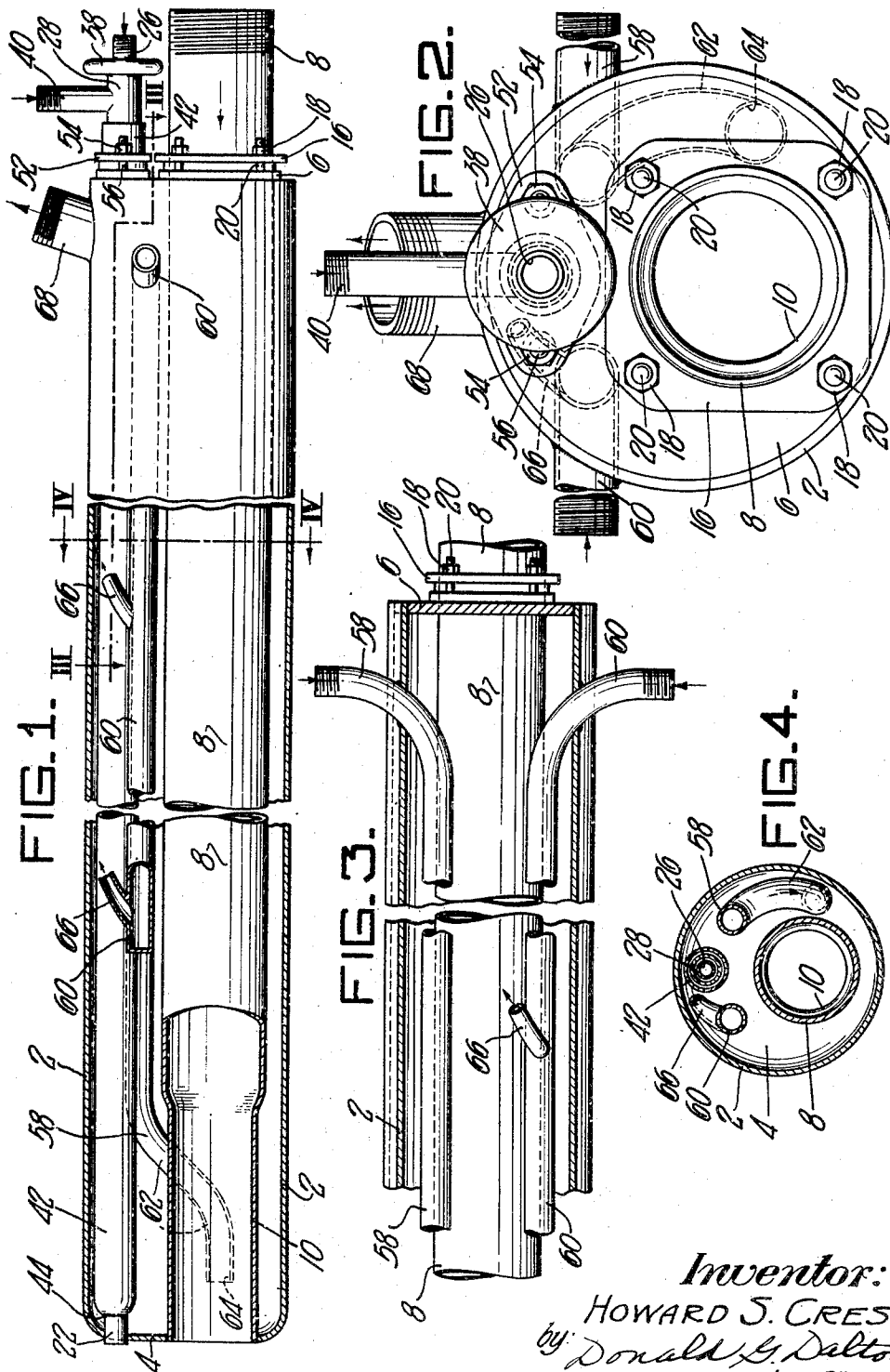
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WATER COOLED FLUID FUEL BURNER

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WATER-COOLED FLUID FUEL BURNER

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1 Claim. (Cl. 158—73)

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This invention relates to a water cooled fluid fuel burner, especially for use in open hearth furnaces and is a division of my copending application, Serial No. 525,218, filed March 6, 1944, now Patent No. 2,419,336, dated April 22, 1947.

The heat from the furnace causes the burner to overheat unless cooling water is provided which tends to chill the oil and thus decrease the efficiency of the burner. The steam which atomizes the oil causes its supply pipe to heat to a temperature higher than that of the oil supply pipe and if these two pipes are connected, the uneven expansion of the pipes causes the joint to break.

It is an object of my invention to provide a burner in which the oil is insulated from the cooling effects of the cooling water.

Another object is to provide cooling water to the burner in the most efficient manner.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is an elevation partly in longitudinal section of the gas and oil burner;

Figure 2 is a rear view of the burner;

Figure 3 is a sectional view on the line III—III of Figure 1; and

Figure 4 is a sectional view on the line IV—IV of Figure 1.

Referring more particularly to the drawings, the reference numeral 2 indicates the hollow body or jacket of the burner within which the cooling water is contained. This body may be made from a standard 12 inch pipe 11 feet long having a plate 4 welded to the front end, and a plate 6 welded to the rear end. A gas supply line 8 made from a standard 6 inch pipe extends longitudinally through the body 2 and terminates in a burner head 10 at the forward end of the body, the burner head merely being a 5 inch pipe welded to the pipe 8 and to the plate 4. The pipe 8 passes through an opening in the plate 6 and is sealed by means of packing which is held in place by the packing gland 16. Nuts 18 screwed on studs 20 which are fastened to the plate 6 determine the pressure exerted upon the packing by the gland 16.

Spaced from the pipe 8 is an atomizing oil burner head 22 of the orifice type welded to the front wall 4 and having its rear end welded to the steam supply pipe 26 which is made from a standard 1 inch pipe. Surrounding the pipe 26 is a standard 1½ inch pipe 28 which is welded to the burner head 22, the space between the pipes 26 and 28 forming a passageway for the oil. The steam and oil pipes 26 and 28 are con-

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nected at the rear end of the burner by means of the expansion joint 38. Oil is supplied to the pipe 28 through the line 40. Surrounding the tube 28 is a standard 2 inch pipe 42 which is welded to the burner head 22 at 44, the space between the tubes 28 and 42 protecting the oil from the cooling effects of the cooling water. The rear end of the pipe 42 passes through an opening in the wall 6 and is sealed therein by means of packing which is held in place by the packing gland 52. Nuts 54 threaded on the studs 56 fastened to the wall 6 determine the pressure exerted upon the packing by the gland 52.

There are two water cooling supply lines 58 and 60, the pipe 58 being bent downwardly around the periphery of the body 2 as shown at 62 in Figures 2 and 4 and discharging its water through the end of pipe 64. The other supply pipe 60 has a plurality of branch passageways 66 extending toward the top of the burner as shown in Figure 1. The water is discharged from the body through the pipe 68.

In operation, water is supplied to the pipes 58 and 60, being discharged by pipe 58 at 64 near the front of the burner and from pipe 60 through openings 66. In this manner the front of the burner which is the hottest receives the greatest degree of cooling and the water directed from passageways 66 toward the top of the burner prevents the formation of steam pockets and localized burning of the top of the jacket. It will be understood that the burner may operate on gas alone, on oil alone, or on both at the same time. Coke oven or other fuel gas is delivered through the pipe 8 to the burner head 10 where it ignites. Oil or tar, which are to be considered interchangeable here and elsewhere in the specification and claims, enters the passageway between the pipes 26 and 28 and is discharged into the path of the steam which enters the pipe 26. Relative movement between the pipes 26 and 28 due to the difference in temperature is absorbed by the expansion joint 38, thus preventing breaking of the joint between the pipes.

While one embodiment of the invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claim.

I claim:

A combined oil and gas burner comprising a hollow body member, a gas supply conduit extending longitudinally through the body and terminating in a burner head at the forward end of the body, a second burner head at the forward

end of the burner, means for delivering oil and steam to the second named burner head, a manifold extending longitudinally along the top interior portion of the hollow body member, means for delivering cooling water to said manifold, a plurality of spaced apart tubes connected to the top portion of the manifold and extending upwardly and rearwardly therefrom for directing cooling water against the top interior portion of the hollow body member and causing it to flow rearwardly along the lower side of the top wall of the body member, and means for discharging the cooling water from the rear end of the body member.

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