March 27, 1956 R. W. WILSON 2,739,844

OIL BURNER

Filed April 27, 1953

Fig. 1

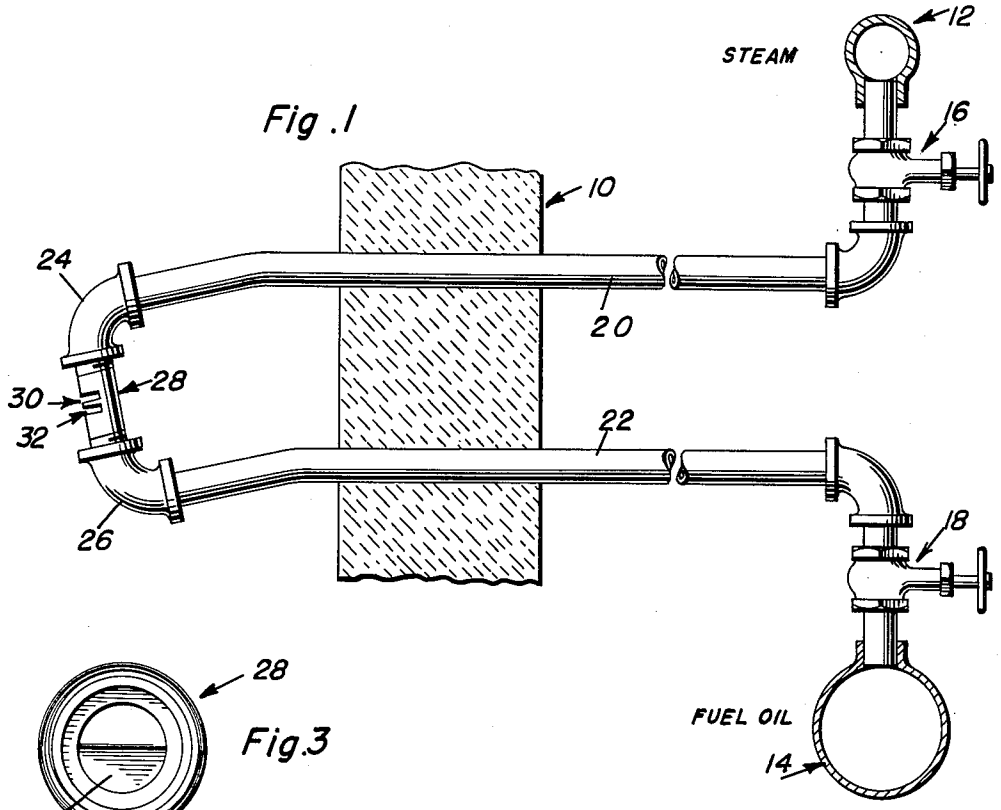


Fig. 3

Fig. 5

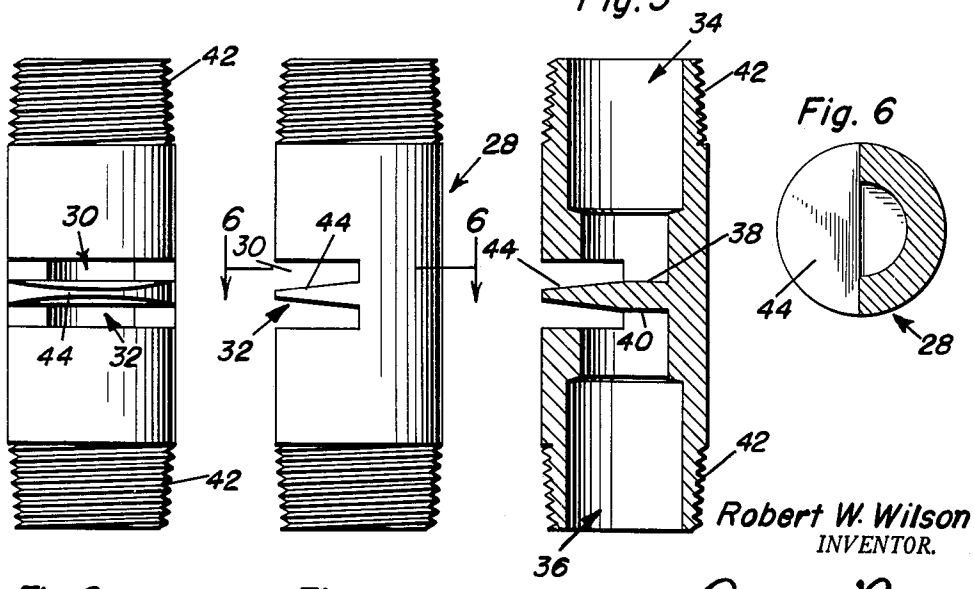


Fig. 6

Fig. 2

Fig. 4

Robert W. Wilson
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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OIL BURNER

Robert W. Wilson, Port Arthur, Tex., assignor of fifty per cent to Fay Wilson, Port Arthur, Tex.

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2 Claims. (Cl. 299—143)

This invention relates to oil burners generally and pertains more particularly to an improved form of atomizing nozzle assembly.

The primary object of this invention is to provide an improved atomizing nozzle for oil burners which is of simple yet effective design and which lends itself readily to economical mass production.

Another object of this invention is to provide a burner nozzle of unitary construction for ease of assembly, disassembly and cleaning.

Another object of this invention is to provide an improved form of nozzle assembly for use in oil burners of the type utilizing steam as a carrier for atomized oil.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a vertical elevation through a portion of the wall of a kiln or the like showing a burner unit installed therein;

Figure 2 is an enlarged vertical elevation of the improved nozzle assembly;

Figure 3 is a plan view of the nozzle;

Figure 4 is a side elevation of the nozzle;

Figure 5 is a vertical section taken through the burner and showing details of its internal construction; and,

Figure 6 is a transverse section taken substantially along the plane of section line 6—6 of Figure 4 showing the disposition of the nozzle blade.

Referring now more particularly to Figure 1, reference numeral 10 indicates generally the ceramic wall of a kiln, boiler or the like and disposed outwardly of this wall are the steam pipe line 12 and an oil pipe line 14 respectively, these pipe lines being provided with outlet assemblies including the control valves 16 and 18 parallel inlet lines 20 and 22. The discharge end of the inlet lines are provided with elbows 24 and 26 so as to present spaced discharge openings between which is secured the burner nozzle assembly 28.

The principle of operation of the oil burner itself is such that the steam is discharged through the opening 30 in the nozzle and the oil is discharged through the opening 32, see Figure 4. At this point, the steam atomizes the oil and carries it to be diffused within the interior of the kiln to provide an even and well distributed flame front. Control of the steam and oil is, of course, maintained by means of the valves 16 and 18.

Referring now more particularly to Figures 2–6, the atomizing burner nozzle is of cylindrical construction and is provided at its opposite ends with recesses 34 and 36 which terminate at their inner ends in reduced portions, the bottoms 38 and 40 of the recesses being slightly spaced to present a partition therebetween. The member is provided with pipe threads 42 at its opposite ends so that the assembly may be inserted into the aforementioned elbows 24 and 26. When installed, the nozzle recesses form chambers for the reception of steam and oil respectively. The previously mentioned discharge openings 30 and 32 are formed by providing transverse slots through the nozzle member, which slots extend substantially throughout half the circumference of the member and the nozzle blade partition member formed as a result of the disposition of the longitudinal recesses and the transverse slots is provided with the tapering portion 44 coextensive with the transverse extent of the transverse slots. This particular construction provides a smooth and even flow of both the oil and the steam and directs the two streams in convergent relation so that the oil is most effectively atomized and intermixed with the steam so that it may be carried by the latter and diffused in a fan-like manner within the interior of the kiln or boiler.

By this particular construction of burner nozzle, the assembling of the unit into the steam and oil lines is considerably simplified and due to the lack of irregularities in the interior of the nozzle as are common in nozzles composed of component parts, there is only a very slight tendency for deposits to begin building up within the nozzle which might ultimately clog and impair the operation of the same. For this reason, a minimum of servicing is required in this nozzle in addition to its ease of installation.

Due to the efficient design of the nozzle blade, it is not necessary to pre-mix the steam and oil in an antechamber, the burner operating entirely satisfactorily in the manner shown, that is, by simply installing the burner nozzle between the two independent and separate supply lines.

With more particular reference to Figure 2, it will be seen that the extent of the two openings 30 and 32 as provided for by the tapering portion of the nozzle blade presents a larger opening toward the center of the slot which tapers gradually toward the opposite sides so that there is a slightly greater concentration of steam and oil at this point for providing a more effective control of the flame front, it being desirable that the flame front be slightly heavier at this point and tapering gradually toward its sides. Therefore, it will be seen that the convergency of the opposite sides of the blade provide not only the more efficient intermixing or atomizing effects previously set forth but also provides the correct concentration and disposition of the flame front.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. An atomizing oil burner nozzle comprising an elongated member provided with threaded portions having threads thereon on its opposite ends for connection between steam and oil supply lines, said member having a recess extending inwardly from each of its ends, the recesses terminating in spaced relation at the medial portion of the member, the medial portion having a pair of spaced shoulders at the inner ends of said recesses between which said member has a smaller interior diameter than said recesses, said member also having in said medial portion a transverse slot communicating with the inner end of each of the recesses to present a nozzle blade therebetween whereby oil flowing from one recess will be atomized by steam flowing from the other, said nozzle blade

being tapered whereby the center of the slots will present the maximum area of opening and the opening area will increasingly diminish from the center toward the ends of the slots.

2. The atomizing oil burner nozzle of claim 1 wherein said threads are on the exterior surface of said member in order to accept a coupling on the exterior surface thereof.

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