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2,486,137

FUEL OIL BURNER WITH STEAM AND OIL MIXING MEANS

Filed June 4, 1947

2 Sheets-Sheet 1

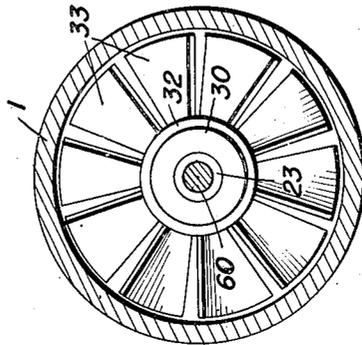
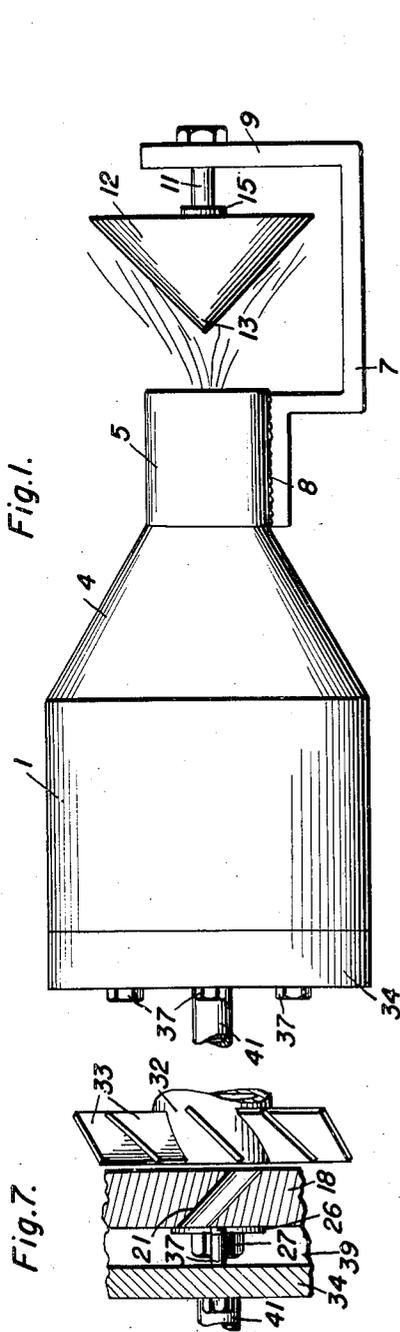


Fig. 4.

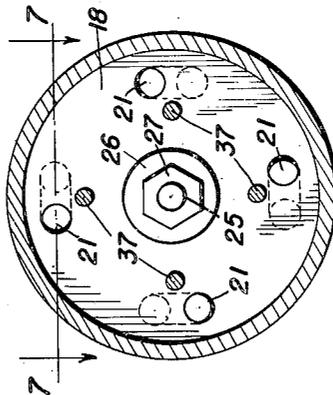


Fig. 3.

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2 Sheets-Sheet 2

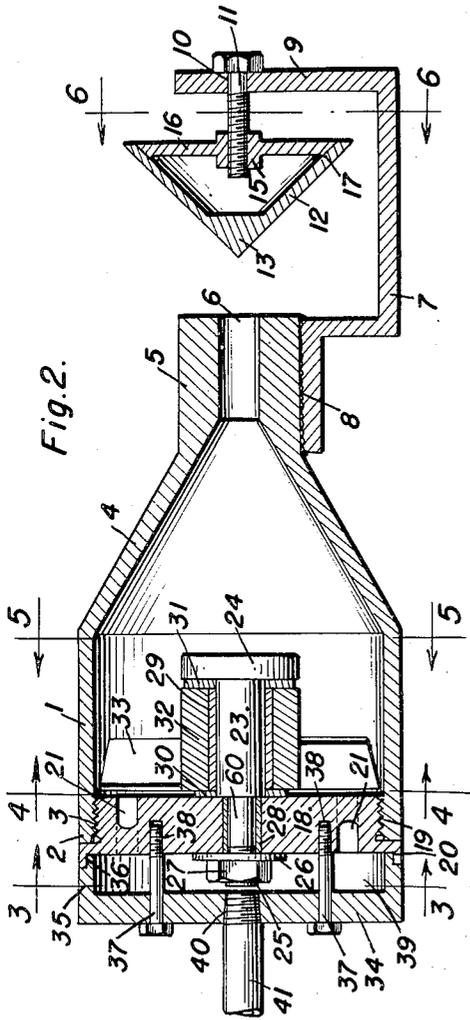


Fig. 2.

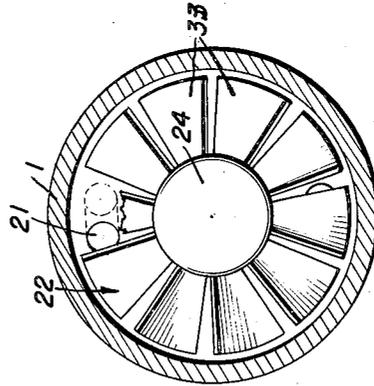


Fig. 5.

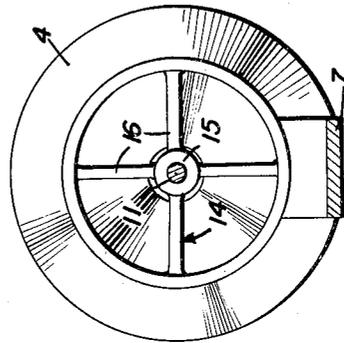


Fig. 6.

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UNITED STATES PATENT OFFICE

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FUEL OIL BURNER WITH STEAM AND OIL MIXING MEANS

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1 Claim. (Cl. 158—75)

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This invention relates to improvements in fuel oil burners.

An object of the invention is to provide an improved fuel oil burner which will utilize fuel oil and steam under pressure, being more especially adapted for firing marine or industrial boilers.

Another object of the invention is to provide an improved fuel oil burner in which fuel oil and steam under pressure will be fed through a series of angularly disposed fuel inlet passages to engage and rotate a rotatable turbine or fan disposed in the pressure chamber of the burner, then to be discharged through a reduced outlet and ignited.

A further object of the invention is to provide an improved form of fuel oil burner which will operate on fuel oil and steam under pressure, the same being used with an adjustable deflector cone positioned axially in front of the burner outlet for producing a long hot flame with the combustion taking place approximately fifteen to twenty inches in front of the deflector which consequently never has to be cleaned.

A still further object of the invention is to provide an improved fuel oil burner for marine or industrial boilers, one use being in connection with a still for extracting road tar.

Another object of the invention is to provide an improved fuel oil burner which will utilize fuel oil and steam under pressure, the same being highly efficient in operation, and relatively inexpensive to manufacture and produce.

Other objects will appear as the description proceeds.

In the accompanying drawings which form a part of this application,

Figure 1 is a side elevation of the improved fuel oil burner;

Figure 2 is a longitudinal sectional view taken through Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a sectional view taken on the line 4—4 of Figure 2;

Figure 5 is a sectional view taken on the line 5—5 of Figure 2;

Figure 6 is a partial sectional view taken on the line 6—6 of Figure 2, and

Figure 7 is a sectional view taken on the line 7—7 of Figure 3.

Like characters of reference are used throughout the following specification and the accompanying drawings to designate corresponding parts.

In carrying out the invention, there is pro-

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vided an improved form of fuel oil burner having a horizontally disposed elongated tubular body generally designated by the reference numeral 1, being open at its inlet end 2 and internally threaded as at 3 within said inlet end.

The opposite end 4 of the tubular burner body 1 is frusto-conical in shape, and terminates in the thickened annular discharge end 5, formed with the reduced axially disposed discharge outlet 6 formed therethrough.

A substantially U-shaped bracket 7 of any desired metal or material is preferably welded at 8 to the lower edge of the discharge end 5 of the burner body 1, and the outer end or arm 9 of the bracket 7 is apertured at 10 to receive and support the bolt 11 upon which the flame deflector 12 is adjustably supported for movement toward and away from the outlet or nozzle end 6 of the burner body 1.

The flame deflector 12 is formed in the shape of a cone with the thickened apex 13 thereof extending toward the outlet or nozzle end 6 of the burner body 1 through which the fuel will be discharged and ignited when the burner is in operation.

A grid 14 formed by a central threaded hub 15 and a plurality of radially extending spokes 16 extends transversely across the open rear end of the deflector 12 with the outer ends of the spokes being welded, as at 17, to the inner peripheral edge of said deflector 12.

A round cylinder head 18 is externally threaded as at 19 about its inner end for screwing into the internally threaded end of the tubular burner body 1, and is formed with a laterally extending L-shaped flange 20 about its inner periphery, the base of said L-shaped flange being adapted to engage and seat upon the peripheral edge of said burner body 1.

A series of angularly disposed fuel inlet passages 21 are formed through the cylinder head 18 for feeding the fuel oil and steam under pressure to the turbine or fan 22 which is rotatably supported in front of the cylinder head 18. The shaft 23 is provided with a head 24 on its outer end, while its inner end is reduced, as at 60, to extend through the center of the cylinder head 18, terminating in the threaded extremity 25 upon which the washer 26 and nut 27 are secured for holding the shaft 23 in rigid position.

Bronze bushings 28 and 29 will be disposed about the reduced end of the shaft 23 and about the outer portion thereof, and bronze washers 30 and 31 will be disposed in spaced relation

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about the shaft 23 forming end thrust bearings for the turbine or fan 22.

The turbine or fan 22 includes a tubular collar or body portion 32 and a plurality of angularly disposed blades 33 extending radially from the inner end of said body portion 32, whereby the fuel oil and steam under pressure as it passes through the fuel inlet passages 21 will strike against the blades 33 to cause the rapid rotation of the turbine or fan 22.

A cap member 34 will be provided with an inwardly directed peripheral flange 35 which is stepped as at 36 on its inner edge to cooperate with and interlock with the L-shaped flange 20 on the cylinder head 18.

A series of securing or cap bolts 37 will extend through the cap member 34 to be threaded into suitably threaded bores 38 in the adjacent surface of said cylinder head 18 for holding the cap member 34 tightly on the cylinder head 18.

A centrally disposed tapered and threaded fuel inlet opening 40 will be formed through the cap member 34 and will support the threaded tapered end of a fuel inlet pipe 41, which will be connected to a suitable supply (not shown) of fuel oil and steam under pressure.

The space in the frusto-conical end 4 of the tubular burner body 1 will provide a pressure chamber wherein the fuel oil and steam under pressure entering from the mixing chamber 39 through the fuel inlet passages 21, will build up to a relatively high pressure so that the mixed fuel under pressure will be directed through the outlet 6, and when ignited, will burn in a long flame with combustion taking place from fifteen to twenty inches in front of the deflector 12.

From the foregoing description, it will be apparent that the cone shaped deflector 12 may be adjusted as desired toward or away from the burner outlet passage 6 to control the length and intensity of the flame depending upon the type of heat required for the particular boiler being fired.

It will be further apparent from the foregoing description and from the accompanying drawings, that there has been devised and provided a highly efficient form of fuel oil burner which will be relatively inexpensive to manufacture and produce.

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While the preferred embodiment of the instant invention has been illustrated and described, it will be understood that it is not intended to limit the scope of the invention thereto, as many minor changes in detail of construction may be resorted to without departure from the spirit of the invention.

Having thus described the invention, what is claimed as new is:

A fuel burner comprising a tubular body open at one end and being frusto-conical shape adjacent its opposite end, said opposite end terminating in a thickened annular discharge nozzle, said open end being internally threaded, a cylinder head, having a plurality of circumferentially arranged annularly disposed fuel inlet passages, detachably threaded in the open end, an annular flange on the outer end of the cylinder head engageable with the peripheral edge of the open end, a flange longitudinally extending rearwardly from the annular flange, a cap member detachably supported on said cylinder head and having an outwardly projecting shoulder engageable with the longitudinally extending flange for defining a leak-proof joint, a fuel supply inlet pipe extending through said cap member, a shaft secured centrally to said cylinder head, a turbine rotatably supported upon the shaft and disposed in advance of the cylinder head whereby fuel discharged from the passages of said head will rotate the turbine, a pressure chamber defined by said frusto-conical portion of said body between the turbine and nozzle end, and a mixing chamber defined by said cylinder head and said cap member.

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