

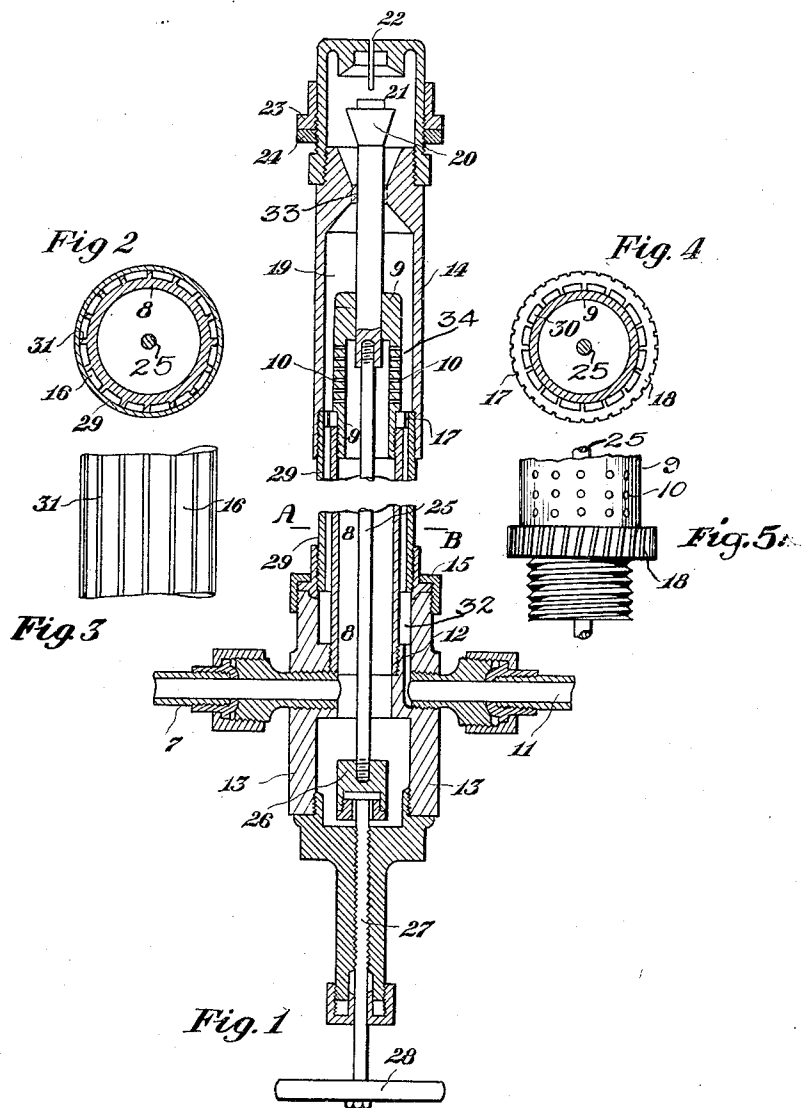
March 4, 1930.

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1,749,401

OIL BURNER

Filed April 19, 1928



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OIL BURNER

Application filed April 19, 1928. Serial No. 271,295.

This invention relates to improvements in fuel oil burners whereby a thorough and intimate mixture of the fuel and the steam, air or other agent is effected, and the volume of the aforesaid mixture which passes to the flame jet is under complete regulation and control, without alteration of the proportions, and also whereby an easily effected and closely adjusted control of the width and shape of the flame is obtained.

These objects are attained by means of the device illustrated in the accompanying drawings, which form part of this specification, and in which:

Fig. 1 is a central longitudinal section showing the relation of all the principal parts.

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

Fig. 3 is a side view of the internal tubular member shown in Fig. 2.

Fig. 4 is an end view of the oil disc or annular member provided for the final subdivision of the oil fuel into fine stream threads.

Fig. 5 is a side view of the said oil disc showing the spiral nature of the oil ways or passages.

In these views 13 represents the connection head which is provided with branch openings 7 and 11 for the supply of steam and fuel oil respectively. The passage 7 is in direct communication through the centre of the chamber 13 with the central tubular member 8. Into the far end of the tube 8 is secured a tubular tip or steam nozzle 9 which is provided with a series of small radial apertures 10 through which the steam escapes into the atomizing chamber 19.

This central tube 8 has formed upon its outer periphery a plurality of axial grooves 16 leaving an equal number of radial ridges 31. The tube is pressed into a larger concentric tubular member 29 which is secured to the connection 13 by the union 15, and Fig. 2 shows a cross section of the combination, the grooves 16 forming a plurality of axial passages between the tubes 8 and 29.

The fuel oil is admitted through the branch pipe 11, and is diverted along the passage 12

into the annular space 32 between the tubular members 8 and 13, and passes towards the vaporizing chamber 19 by way of the axial passages 16. During this passage it is preheated by its contact with the tube 8, which is kept hot by the steam current within, and finally arrives at the vaporizing chamber 19 by issuing through apertures formed in the annular disc member 17.

This member, subsequently referred to as the oil disc, is pressed on to the tubular tip 9 before the latter is secured into the end of the central tube 8. This oil disc is illustrated in end view in Fig. 4, and in side view in Fig. 5, in its correct position upon the inner end of the tubular nozzle 9. The oil disc is provided with a plurality of spirally disposed grooves upon its internal and external peripheries, the external grooves being shown at 18 in Figs. 4 and 5, and the internal grooves at 30.

The grooves 30 are made deeper in a radial direction than the difference in radius of the members 9 and 8, so that the fuel oil can pass from the annular space between 8 and 29 into the vaporizing chamber 19 by spiral passages formed by the grooves 30.

The external periphery of the oil disc fits snugly into the inside of the tube 29, the external spiral grooves 18 thereon thus forming a similar set of passages by which the fuel oil can also issues into the vaporizing chamber 19. The oil thus arrives in a preheated and finely divided state in the vaporizing chamber 19, passing over and intimately mixing with the steam issuing from the apertures 10 in the steam nozzle 9.

The mixture of oil and steam thence passes forward into the burner tip 21 through the open volume valve 20, the amount of opening being regulated by the hand wheel 28 through the valve stem 27, the swivel connection 26 and the valve rod 25.

The valve 20 is centrally disposed within the burner and its motion is axial, being constrained by guides 33 adjacent to its seat in the end of the vaporizing chamber 19 and also by its slidable connection with the end of the steam nozzle 9.

The mixture finally issues through the slit

22 in the end of the burner tip where it is ignited. The slit 22 extends across the end of the burner tip and some distance down the sides, so that a lateral spreading action of the flame is obtained. This spreading action
5 is controlled by the tubular member 23 which can be adjusted axially to cover up the side portion of the slit 22 as required and is secured in any desired position axially by
10 means of the lock-nut 24.

The burner tip 21 is removably secured to the end of the tubular member 14 forming the outside of the vaporizing chamber 19, and can be easily replaced by another tip with a
15 different width or arrangement of slit 22 in order to suit any variation in the heating requirements of the burner.

It will thus be seen that the amount of ignitable mixture issuing from the burner is
20 strictly under control by means of the volume valve 20 without it being necessary to alter the proportions of the mixture by regulating the area of the steam or fuel passages.

Having now particularly described my invention, what I claim and desire to be protected in by Letters Patent, is:

An oil burner comprising, a connection head or body member, pipe branches on said body member adapted to receive pipe connections for the supply of fuel and steam
30 respectively, a tubular casing secured at one end to said body member, a conical aperture in the outer extremity of said casing, a rod through said casing with its axis coincident
35 with that of the casing and having a coned extremity adapted to engage the said conical aperture in the end of the casing, a hand wheel on the other extremity of said rod, an interior tubular member secured to said body
40 member communicating with said steam pipe branch, longitudinal flutings in the outer periphery of said interior member whereby its heating surface is augmented and a plurality of channels is provided for the passage of
45 the fuel oil, a duct connecting the said channels with the said body member and the said fuel pipe branch, an oil disc forming a perforated annular extremity to the chamber formed by the said casing and the said interior member, said disc having on its outer
50 and inner peripheries helical grooves through which the heated fuel oil passes into the atomizing chamber adjacent the outer extremity of the said casing, a portion of the said interior member projecting beyond the said
55 oil disc and having perforations in its circular wall whereby steam issuing there-through from the said interior central member unites with the heated fuel oil issuing
60 from the said helical grooves thereby completing the atomizing process.

In testimony whereof I affix my signature.
BARNARD J. TIDY.