

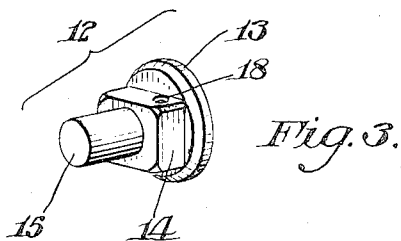
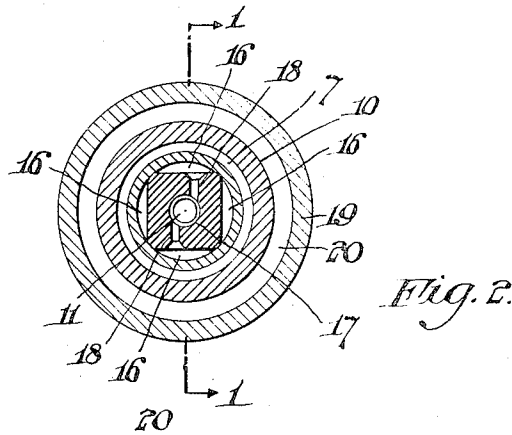
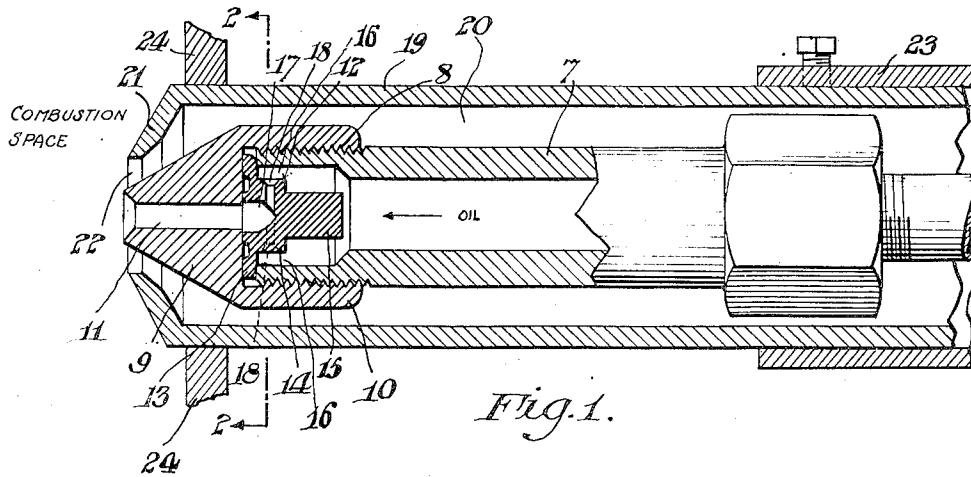
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OIL BURNER

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OIL BURNER

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2 Claims. (Cl. 299—120)

The invention relates to oil burners. The object is to provide an improved fuel oil burner device, and method of operation, which shall cover a wide range of oil pressures and which shall provide extremely simple and efficient means for projecting and atomizing the oil with such controls as shall produce complete combustion and which shall control the flame to required dimensions and which shall be free from clogging.

The invention also provides improved and efficient method and means for controlling the distribution and pressures as required.

An important feature of the invention is that the necessary turbulence is secured without undue loss of initial pressure of the oil.

Referring to the drawing which illustrates merely by way of example, suitable means for effecting the invention.

Fig. 1 is a longitudinal section on line 1—1, of Fig. 2.

Fig. 2 is a vertical cross-section on line 2—2 of Fig. 1.

Fig. 3 is a view in perspective of the tangential element.

Similar numerals refer to similar parts throughout the several views.

In the present example, as shown in the drawing, the oil pipe 7 is adapted to be connected with a source of fuel oil under pressure. The outer or discharge end of this pipe 7 is exteriorly threaded as at 8. The burner tip 9 is conical in form and provided at its base with an annular flange 10, interiorly threaded to receive the threaded end of pipe 7. This tip 9 is provided with an axial straight channel 11 which is preferably provided with a flare at its discharge end. The body or formation 12 comprises a disc-like part 13 adapted to be positioned within the annular flange 10 of tip 9, and to be clamped between the end of pipe 7 and the opposite face of the tip member 9. This body 12 is provided with a part 14 of rectangular shape, centrally positioned on the inner face of the disc 13, and a cylindrical part or stem 15 extending from the inner face of part 14 and axially concentric with the disc 13. This stem or cylindrical portion 15 serves as convenient means for handling the element 12, to facilitate the machine operation when making it upon the lathe. It also serves as convenient means for handling the element 12 for cleaning or replacing. It may also, in some cases, serve to distort in part, the lines of flow of oil.

It will be noted that the square or rectangular part 14 is so shaped and dimensioned as to leave

spaces 16 between the corners of part 14 and the surrounding wall of pipe 7.

A centrally positioned chamber 17 is provided in the disc 13 and the rectangular part 14. This chamber 17 registers with, and delivers to the discharge channel 11, but is of slightly greater cross-sectional diameter.

One or more tangential channels 18 are provided in the part 14 leading from space or spaces 16 to chamber 17.

An air pipe or sleeve 19, adapted to be connected with a source of air under pressure, surrounds the discharge end of oil pipe 7 and the burner tip 9, thereby forming an annular air passage 20. This air pipe 19 has a contracted or tapered discharge formation or nozzle end 21, which cooperates with the tapered tip 9 for delivering the air in converging lines toward the axis of the channel 11. The nozzle 21 is relatively movable, in any suitable way, with respect to burner tip 9, so that the air discharge opening 22 may be adjusted to control said air delivery. For example, the air nozzle member 19 is shown as supported in telescoping relationship with the air pipe 23 leading from a source of air supply under pressure. By this means the nozzle end 21 is adapted adjustably to control as required the air passage 22.

The section of wall 24, shown in section in Fig. 1, represents the wall of an enclosed combustion space as indicated.

In operation

The oil, under required pressure, for example, from 100 lbs. to 150 lbs., is delivered to the space, or spaces 16, and thence through the tangential channel or channels 18 to the central chamber 17, which delivers to the discharge channel 11 in burner tip 9.

The delivery of oil, under pressure, through the tangential channel or channels 18 to the chamber 17, causes a whirling or revolving motion of the oil in said chamber.

Where the discharge channel, such as 11, through the tip 9, is of sufficient length and cross-section, this whirling of the oil is carried on, or continued, during the passage through its channel 11 and even after its discharge into the combustion space. This contributes to the atomization of the oil mixed with the air delivered by nozzle 21. The resulting turbulence of the issuing oil facilitates the mixing of the air therewith, thus securing a much more effective combustion. The controlled pressure of the oil feed, and the adjusted delivery of the air through the

nozzle 21, renders the adjustment of the flame, as to shape and size, much more effective.

The relatively long passage in the burner tip, and its ample cross-sectional dimension add greatly to the efficiency of the burner, because very little of the initial oil pressure is lost, in its passage from chamber 17 to the combustion space. The relatively long passage 11, from the chamber 17 to the discharge end of the burner tip 9, protects the chamber 17 from undue heat, and prevents accumulations which tend to clog, and thus impair or interrupt satisfactory functioning.

The initial pressures of the oil which may be utilized, may have a wide range. For example I have operated the burner successfully with as little as ten pounds fuel oil pressure, or the pressure may be as high as three hundred to four hundred pounds pressure, depending upon the size of the channels 18 and 11, for a given capacity.

It is believed that little atomization results from merely passing the fuel through the channels 18 and 11.

It is rather believed that the fuel oil issues from channel 11, either in a film or fairly large particles, preferably the former, and that this film is acted upon by the air delivered through nozzle 21, which completes the atomization.

In other words, it is believed that channel 11, 30

may be considered more as a distributor, to supply the oil evenly to the column of air, and this is notwithstanding the fact, as I understand, that designers and vendors of competitive burners claim that atomization is completed in the burner tip, rather than as above described.

What I claim is:

1. In an oil burner, the combination, with an oil supply pipe and a burner tip having a relatively long passage, of an integral body having a disk-like part and a rectangular part, the disk-like part being clamped between the oil pipe and the tip, the said body having a centrally disposed chamber delivering to the said elongated channel, and a passage delivering tangentially through the rectangular part to said chamber.

2. In an oil burner, the combination, with an oil supply pipe and a burner tip having an elongated channel, of an integral body having a disk-like part, a rectangular part, and a cylindrical part, of less diameter than that of the rectangular part, projecting axially from the rectangular part, the disk-like part being clamped between the oil pipe and the tip, the said body having a centrally disposed chamber delivering to the said elongated channel, and a passage delivering tangentially through the rectangular part to said chamber.

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