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2,010,403

OIL BURNER

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FIG. 1.

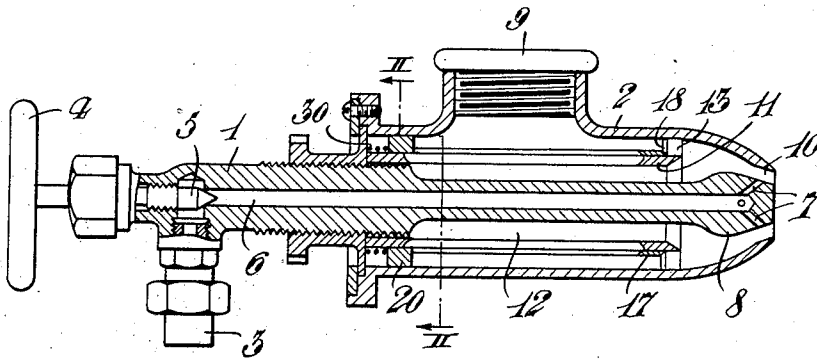


FIG. 2.

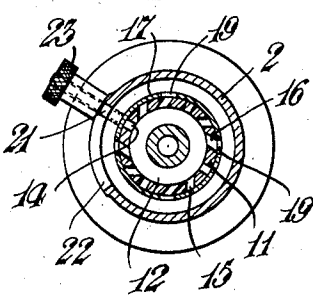
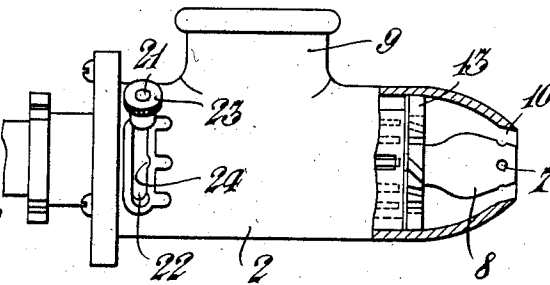


FIG. 3.



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OIL BURNER

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2 Claims. (Cl. 158-76)

The present invention relates to an improved oil burner and has for an object to provide a device constructed so as to permit a positive regulation of the length of the flame. Such a regulation is of great importance, especially in connection with oil heated furnaces. In order to permit this regulating operation the burner according to this invention is provided with means to cause rotation of the combustion air at variable speeds before the air is mixed with the oil.

In the accompanying drawing, Fig. 1 is a longitudinal section of a burner according to one embodiment of the invention; Fig. 2 is sectional view on the line II-II of Fig. 1, and Fig. 3 is a side elevation of the burner, with part thereof in section.

The oil burner shown in the drawing comprises an inner stem 1 which is hollow to constitute an oil pipe, and a surrounding casing 2 which forms a chamber to receive the combustion air. The hollow stem 1 carries at one end an oil admission pipe 3, outside the casing 2, and a needle valve 5 which may be operated from the outside by means of the handle 4 in order to control the connection between the admission pipe 3 and the oil channel 6 of the stem 1. At its other end the stem 1 is formed with a set of outlet orifices 7 which lead from the central channel 6 obliquely through the, preferably, conically tapering head 8 of the stem.

The casing 2 which forms an air chamber surrounding the stem 1 is provided with an air inlet 9 and affords an annular outlet opening 10 around the head 8 of the stem. The orifices 7 lead to said opening.

Within the casing 2 around the stem 1 is a sleeve 11 forming between itself and the stem an annular space 12 which is closed at its rear end by the enlarged portion of the stem but is completely open at its forward end, where it communicates with the outlet opening 10. At its forward end, the sleeve 11 carries an outwardly extending flange 13 which bears against the inner surface of the casing 2. Formed in the sleeve 11 and its flange 13 are three sets of ports with the ports of each set spaced 90° apart around the sleeve and flange. In the first set the ports are radial, as shown at 14 in Fig. 2, in the second set they are obliquely directed, as shown at 15 in Fig. 2, and in the third set they are approximately tangentially directed with respect to the space 12, as shown at 16 in Fig. 2. Rotatably mounted on the sleeve 11 is a second sleeve 17 which is provided at its forward end with an outwardly extending annular flange 18 bearing against the

flange 13. In the sleeve 17 and its flange 18 there is a set of ports which are spaced 90° apart around sleeve 17 and its flange 18, the spacing being similar to that of the ports of each set of ports of the inner sleeve 11, as shown at 19 in Fig. 2. At its rear end the sleeve 17 is formed with a flange 20 bearing internally against the undivided portion of sleeve 11 and externally against the inner surface of casing 2. Acting on said flange 20 is a spring 30 which tends to displace the sleeve 17 forwards. Secured to the flange 20 is a threaded pin 21 which projects radially through a circumferentially extending slot 22 formed in the casing 2. Outside the casing said pin carries a nut 23 which may be tightened against the border of the slot 22 so as thereby to lock the sleeve 17 against rotation. In one side of said slot 22 there are three notches 24 which are situated at a mutual angular distance equal to that of the various sets of ports of the sleeve 11. The spring 30 permits displacement of sleeve 17 rearwardly in order to bring the pin 21 out of engagement with the notches and, after turning it to the next notch, cause it to engage therewith.

In the position shown in the drawing, Fig. 2, the tangentially extending ports 16 are shown as coinciding with the ports 19 of sleeve 17. The air entering the casing 2 through the inlet 9 is thus caused to enter the space 12 and the space in front of the flange 13 in a tangential direction and is thereby caused to rotate at a high speed around the stem 1 prior to its escape through the opening 10, where it is brought together with the oil discharged through the orifices 7. Said oil is, as a result, subjected to an effective atomization and distribution, and the flame produced will consequently be spread, but short. After rotation of the sleeve 17 so as to cause the pin 21 to engage the central notch 24, the ports 19 will coincide with the less oblique ports 15 and, as a result, the rotation of the air will be slower, and the flame will be less spread, but longer. After further rotation of sleeve 17 so as to cause the ports 19 to coincide with the radial ports 14, no positive rotation of the air will take place, and the oil will, therefore, not be subjected to any proper distribution in this case but will form a long jet-shaped flame.

By adjustment of the sleeve 17 to intermediate positions a throttling or a complete suppression of the flow of air may be effected according to the extent to which the ports 19 are caused to register with a set of ports of the inner sleeve, or are brought into positions opposite solid portions of sleeve 11.

In the embodiment above described the number and shape of the passages for the air may be different from what is shown in the drawing, without departing from the principle of the invention.

What I claim is:—

1. An oil burner, comprising a central hollow stem, an oil supply pipe connected to one end of said stem and a delivery nozzle at the other end of the stem, a casing surrounding the stem and spaced from said stem so as to form an air chamber therearound closed at one end and open at the other end by an annular outlet opening surrounding said nozzle, an air inlet leading to said air chamber, a stationary sleeve in said chamber surrounding the stem and spaced from said stem and casing so as to divide the air chamber into two concentric parts, a rotatable sleeve concentric with respect to said stationary sleeve and in engagement therewith, said stationary sleeve having a set of radially extending ports and other sets of ports of different oblique directions with respect to the radial direction, the rotatable sleeve having a set of ports the spacing of which corresponds to that of the ports of each individual set of the stationary sleeve, so that the rotary sleeve may act as a slide valve for the stationary sleeve, allowing the air to pass either through the radial ports of the latter or through any one of the oblique sets of ports.

2. An oil burner, comprising a casing closed at one end and having a restricted outlet opening at the other end, a lateral air inlet on said casing, a central hollow stem in said casing, an oil admission pipe and valve connected to said stem at one end thereof, a delivery nozzle at the other end of the stem, said nozzle having oblique orifices leading to said outlet opening, a stationary sleeve concentrically surrounding the stem with in said casing and spaced from the stem and casing so as to divide the air chamber into two concentric parts, a concentric rotatable sleeve surrounding said first-mentioned sleeve and in engagement therewith, outwardly extending flanges at the end of said sleeves toward the outlet opening, the stationary inner sleeve and its flange having a set of peripherally spaced radially spaced ports and two other sets of ports of different oblique directions with respect to the radial direction, the rotatable sleeve and its flange having one set of ports, the peripheral spacing of which corresponds to that of the ports of each set of the stationary sleeve, and means for rotating said rotatable sleeve to bring the ports thereof into register with any one of the sets of ports of the inner sleeve.

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