April 5, 1949. C. J. HARRAH 2,466,100

OIL BURNER

Filed Jan. 19, 1946

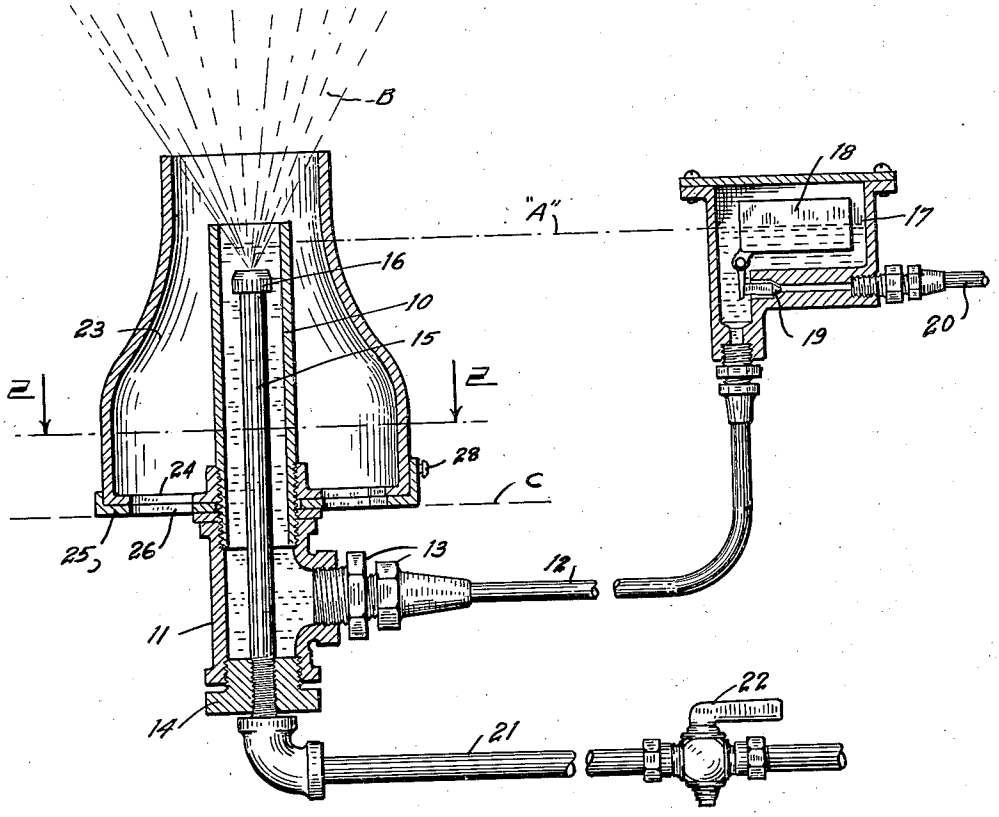


Fig. 1

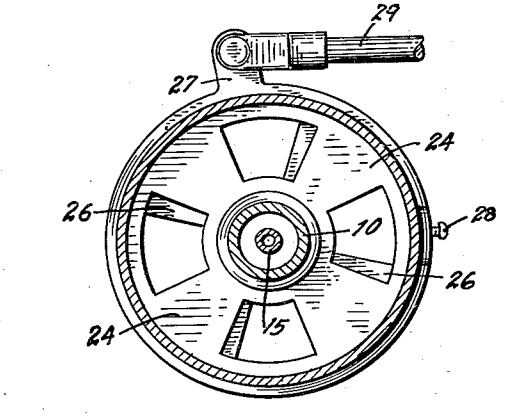


Fig. 2

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Patented Apr. 5, 1949 2,466,100

UNITED STATES PATENT OFFICE

2,466,100

OIL BURNER

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Application January 19, 1946, Serial No. 642,342

1 Claim. (Cl. 158—76)

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This invention relates to an oil burner, more particularly designed for installation in household and commercial heating plants, cook stoves, and the like.

The principal object of the invention is to provide a burner of this type which will obtain an efficient mixture between the air and the oil by making use of the incoming air to spray the oil into the combustion zone, and to provide a burner in which it will not be necessary to pump or maintain pressure on the fuel oil.

A further object is to provide automatic means for supplying the oil, so arranged that the oil entering the combustion mixture will be automatically proportioned to the amount of the incoming air.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a vertical sectional view, illustrating the operating parts of the improved burner; and

Fig. 2 is a horizontal section therethrough, taken on the line 2—2, Fig. 1.

The improved burner employs a standpipe 10 extending upwardly from a T-fitting 11 through suitable reducing bushings 13. The bottom of the T-fitting is closed by means of a drilled plug 14 which supports and axially positions a tubular air nozzle 15.

The air nozzle 15 is capped by means of an orifice cap 16. The fuel is supplied from a float chamber 17 containing a suitable float 18 for operating a float valve 19. The fuel flows to the float chamber 17 from any suitable reservoir through a feed pipe 20. The float chamber 17 and the float 18 are positioned at an elevation which will maintain a liquid level, as indicated by the broken line "A," at a point below the upper extremity of the standpipe 10 and above the orifice cap 16, as shown in Fig. 1.

Compressed air is supplied to the air nozzle 15 through an air line 21, controlled by means of a cock 22, the preferred pressure on this air in the usual installation being about 100 p. s. i. A secondary air chamber 23 is supported about the upper extremity of the standpipe 10. The upper extremity of the air chamber 23 is open. The

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bottom thereof is threaded on or otherwise attached to the standpipe 10. The latter bottom is provided with secondary air openings 24 surrounding the standpipe 10. These air openings are controlled by means of a rotatable port plate 25 having ports 26 therein which can be brought into register with the ports 24 of the bottom of the secondary air chamber 23.

The orifice cap 16 is perforated with a very small orifice approximating a No. 30 drill. This orifice, the upper extremity of the standpipe 10, and the air chamber 23 are so positioned that a line drawn from the orifice cuts the upper edge of the standpipe 10 and the upper edge of the secondary air chamber 23, as illustrated in Fig. 1.

In use, the float chamber 17 is filled with oil, which of course brings the oil level in the T-fitting 11 and the standpipe 10 to a point above the orifice cap 16. Air is then admitted under pressure to the air nozzle 15. This air blows from beneath the surface of the oil in the standpipe 10, picking up and vaporizing the latter into an inverted conical combustion area, as indicated at "B" in Fig. 1, which carries the flame of the burner.

The air and vapor, in blowing across and upwardly between the standpipe 10 and the secondary air chamber, create a suction in the latter which draws secondary air through the ports 24 and 26.

The latter ports are adjusted by means of an adjusting ear 27 to obtain the proper degree of combustion, after which the port plate 25 can be locked in position by means of a set screw 28. An adjusting rod 29 may be provided in installations where the port plate cannot be conveniently reached.

It will be noted that the incoming air both supplies and vaporizes the fuel to the flame. No pressure is placed upon the fuel and the fuel entering the flame is directly proportioned by the amount of air discharging from the orifice in the cap 16 so that an automatic control is obtained. In the usual installation the orifice plate is rested upon the grate bars of the usual furnace or stove, the position of the surface of which is indicated in broken line at "C" in Fig. 1.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

An oil burner comprising: a vertically positioned standpipe having an open upper end; means for maintaining fuel oil in said standpipe at a pre-determined level adjacent the open upper end of the standpipe; an air nozzle axially positioned within said standpipe and terminating below the pre-determined level therein and being provided with an axially positioned air discharge orifice in its upper extremity; means for supplying compressed air to said air nozzle so as to direct a jet of air through the fluid surface to spray the fuel oil in an inverted conical spray from the open upper extremity of said standpipe; a bell-shaped secondary air chamber; a bottom in said secondary air chamber, said standpipe passing through said bottom and supporting said air chamber concentrically about the upper extremity of said standpipe, the upper extremity of said air chamber being open at its top and having a lesser diameter than said bottom, said open top being positioned above the upper extremity of the standpipe and the open upper end of said standpipe being positioned above said orifice at levels which will cause the exterior surface of

said conical spray to touch the upper edges of both said standpipe and said air chamber; ports in the bottom of said air chamber; and means for controlling the amount of secondary air entering through said ports.

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