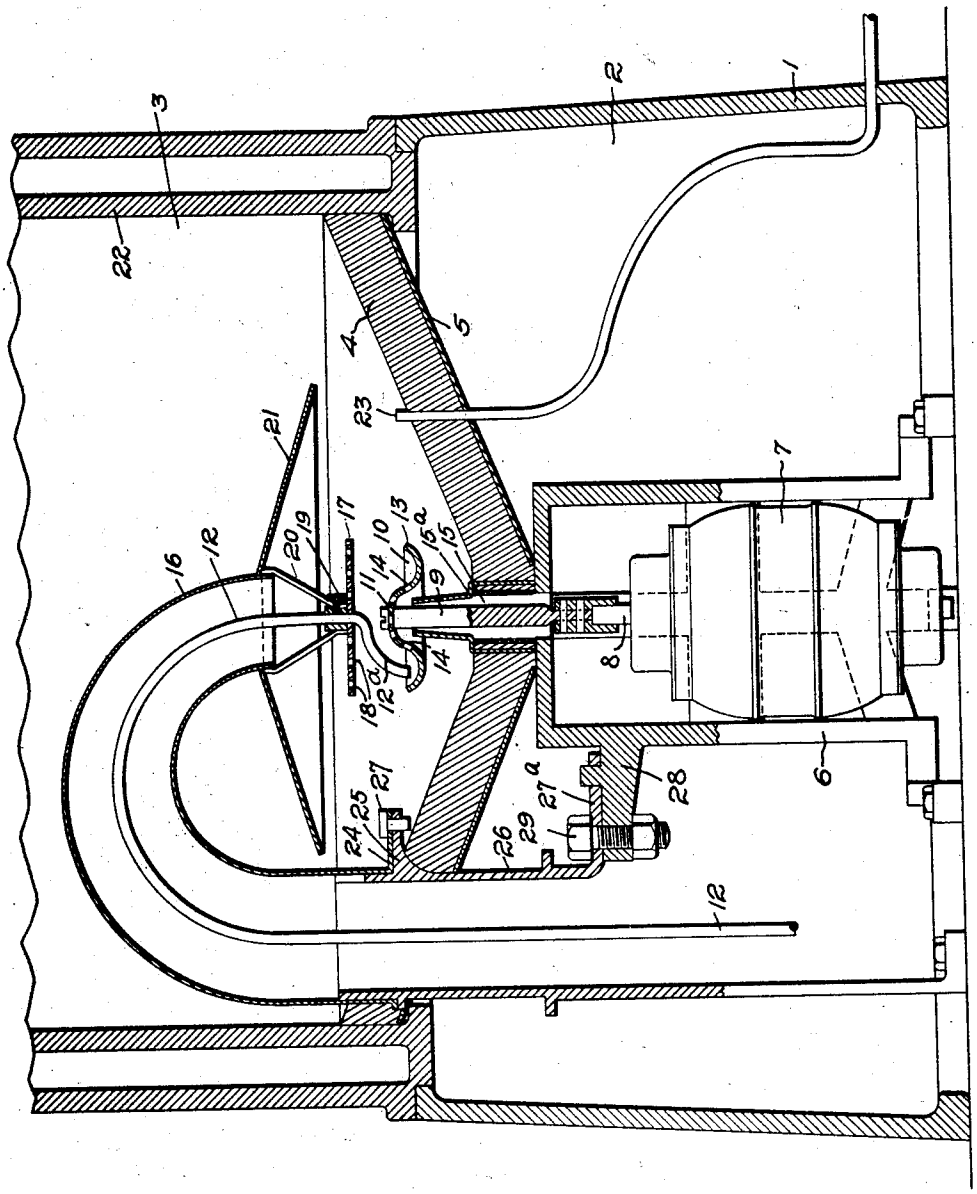
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OIL BURNER

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OIL BURNER

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This invention relates to oil burners, and especially to such burners adapted for private heating plants, and my invention aims to provide an improved burner having, among others, the novel features herein described and illustrated.

In the drawing of one embodiment of my invention described and claimed herein,

The figure is a vertical section through a typical, conventional hot water heater, with my improved burner installed therein.

In the drawing the base 1 forming the ash pit 2 of the heater is shown as extending up to the fire pot 3, and divided therefrom by a wall 4 of asbestos or the like on a suitable support as wire netting 5. In oil burners as generally constructed there is very imperfect combustion, and consequently large waste of oil, and inefficiency. To overcome this difficulty is one object of my invention and one of the principal results to be attained is the complete mingling of the air and gas preliminary to their combustion. In the ash pit 2, on a suitable frame 6, is mounted a motor 7 of necessary size and with its shaft 8 upwardly extended. On the end of the shaft is secured, by any suitable means, as a spindle 9, an oil cup 10 with a raised center 11, to receive the oil from the feed pipe 12.

I have found that if the cup is provided with a high side wall or edge there is a tendency in the wall to resist the spreading of the vaporized oil; and if the cup wall is too low it has the effect to promote too general spreading of the vapor. Accordingly, I have provided a cup with a wall 13 of the proper height.

I have also discovered that if the center of the cup is flat or substantially so, there is a tendency in the oil to remain there, notwithstanding the rapid rotating of the cup. Accordingly, I have raised the cup center to prevent the oil from remaining there and carbonizing, with the effect of fouling the cup and causing more or less smoke. I provide openings 14 in the upwardly directed wall of the cup center, through which a desired air current may be had which much assists proper combustion, depending upon the kind of oil used and other conditions.

There is also an air passage 15 about the shaft 9 within a sleeve 15*a* or the like in the wall 4 which is important to provide proper combustion and to keep the cup cool.

I have ascertained that, if all the air is introduced into the combustion chamber either behind or beside the flaming oil, it is difficult to cause them to commingle properly. Accordingly I have provided means to feed them in part into the combustion chamber in a manner to avoid this difficulty. The oil is fed from any source through a pipe 12, as stated, into the oil cup, and ignited, and more air is fed through a cool air duct 16 toward and against the flame, and the air and oil are thus given the first impulse toward proper combination or commingling.

The next step is to prevent them from separating and spreading through the fire pot or combustion chamber 3 before they have been ignited. To that end I provide a flame spreader 17 of suitable size, which can be determined from the nature of the oil and size of the burner, and provide it with perforations 18 for a purpose to be described. The distance from the member 17 to the cup 10 should depend upon the size of the cup and other conditions. If the cup is three inches in diameter I have found that best results are obtained by placing the spreader 17 about one and one-quarter inches above the cup.

One function of the member 17 is to prevent the flame from concentrating too much over the center of the cup with the result that it would not promote best combustion and would concentrate the heat at one point. This member 17 may be adjustably locked upon the end of the oil supply pipe 12 by any suitable clamping means 19 as a collar and lock screw, supported by bars 20 from the air duct 16, if desired. A second function of the member 17 is to cause the cool air from the conduit 16 to flow outwardly beneath and toward the edge of the hood 21 and thus scatter the flame and carry the heat away from the burner.

I also provide a substantially restricted area within which the air and gas are properly combined to promote and during ignition and preliminary combustion, by combining

with the fire pot division wall or bottom wall 4 a substantial hood 21 to cover the area required, according to my experience, for best results in combustion.

While this area will depend largely upon the size of the fire pot, the amount of air and oil fed to it and its distance from the oil cup, my experience has demonstrated that with a cup three inches in diameter and a fire pot twenty-two inches in diameter, the hood should be about from ten to twelve inches in diameter. The hood may be made, of course, in two or more sections as desired for convenience both in making and assembling, and preferably of alundum or other good heat resisting material.

The provision of the hood 21 and the spreader 17 with the oil cup 10 with upstanding wall 13 and wall 4 promote very complete combustion, so that when the flame spreads from beneath the hood 21 the air and gas are very completely commingled and are not escaping each by itself and avoiding combustion. When they reach the fire pot side wall 22 they are in condition to give off the greatest amount of heat that is possible, with best results.

While the hood may of course be suspended in any convenient manner, I have found it satisfactory to secure it to the cool air duct 16 by any suitable clamping means, not shown.

Much trouble is experienced at present in the use of oil burners from the carbonization of the oil and its sediment by heat, in the pipe near the feed nozzle. This is particularly true of burners where the oil is fed through an upstanding or horizontal nozzle. Each time the oil supply is stopped, the oil remaining near the outlet remains and is more or less carbonized by the heat about it. To avoid this difficulty, I have conceived the plan of feeding the oil through a downwardly extended nozzle 12^a in a cool air duct 16. This duct extends upwardly from the ash pit, the door to which is removed or the pit otherwise provided with a free circulation of fresh cool air.

This free air circulation keeps the duct 16 and contained oil pipe 12 remarkably cool and thus the heat from the flame does not carbonize the oil in the feed pipe. Of course when the oil is shut off, that remaining in the goose neck or downturned end, or nozzle portion 12^a, automatically runs from the pipe to the cup 9 and leaves the downwardly extended pipe end substantially clean, and what little oil may cling to the wall of the pipe 12 is prevented from carbonizing by the cool air surrounding it.

A pilot gas light 23 may be provided at any convenient point. The goose neck or curved portion of the air duct 16 has a flange 24 which rests upon a flange 25, on the upright section 26 of the duct and is held in position thereon by a pin 27, permitting rotation of the goose neck for repairs and observation. The duct section 26 has a flange $27a$ resting in turn upon an arm 28 on the support 6, and secured conveniently as by a bolt 29.

The spreader 17 is provided with perforations 18 to permit the passage of air from the duct 16 directly against the flame and into the oil cup.

I am aware that a downwardly directed air conduit of warm air, with a flaring outlet, is not new; but a similar conduit or duct of fresh cool air is new, so far as I am aware.

It is also important to notice that I use a broad spreading hood, not merely a flaring outlet, the hood being provided, not to facilitate the escape of the air from the duct but to force intimate contact of the air and gas until combustion is complete, and not to permit the draft suction to draw the air and gas toward the flue too soon, and with necessarily incomplete combustion.

My invention is not restricted to the particular embodiment thereof described and illustrated.

I claim:

An oil burning apparatus comprising, in combination, a combustion chamber, a rotatable oil holding cup, an air passage beneath the cup leading into the chamber, a cool air duct over the cup, an oil feed pipe therein, a hood over the cup acting with the bottom of the combustion chamber to compel intimate contact of the air and gas to promote ignition and a perforated flame and cool air spreader over the cup.

In testimony whereof, I have signed my name to this specification.

FREDERICK A. ROBINSON.