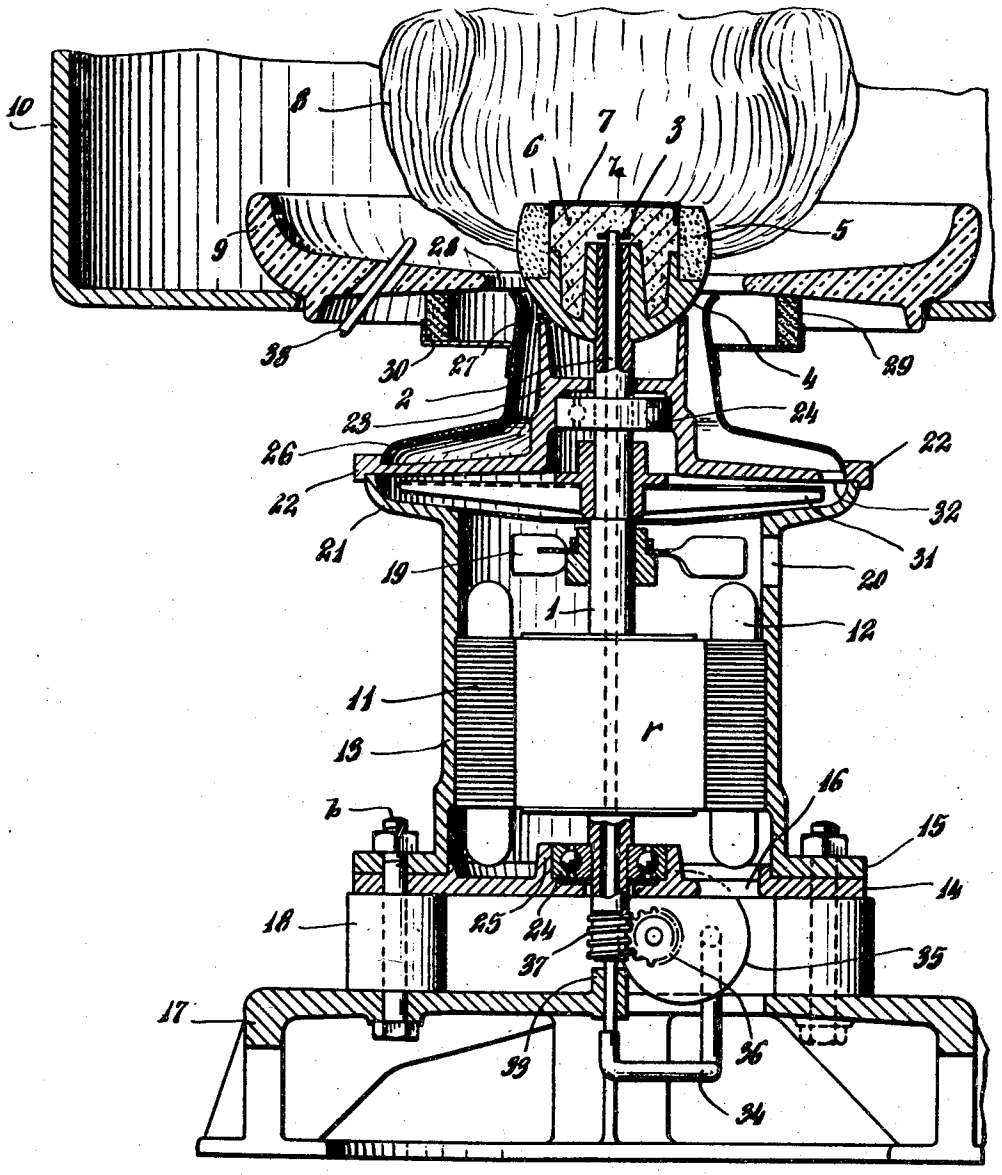
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ROTARY HEAD OIL BURNER

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ROTARY HEAD OIL BURNER

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1 Claim. (Cl. 158—77)

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This invention relates to improvements in fuel burners; and more particularly to an oil burner for the heating systems of dwellings, places of business and other installations.

An important object of the invention is to provide an oil burner which is economical and efficient; and which will work well with oil of great density and viscosity; atomizing the liquid fuel to a fine mist that can easily and readily be ignited and that will burn fully and perfectly without soot.

Another object of the invention is to provide an oil burner that is well adapted for small homes, operates quietly and smoothly; and is simple in construction and inexpensive to produce; compact and of reduced size; so that only a small space is required when the burner is set up for use.

Additional objects and advantages are set out in the following description, taken with the accompanying drawing, which illustrate a preferred form of my invention. But the disclosure herein is explanatory only, and in practice various changes may be made with reference to details of shape, size and arrangement of parts without deviating from the principle or exceeding the scope of the invention.

On said drawing the figure shows in longitudinal section an oil burner according to this invention.

The burner comprises a hollow rotatable shaft 1 having a central bore through it to receive a stationary oil delivery tube 2. The shaft is supported in vertical position and the tube 2 projects slightly from the upper end of the latter. Around the top or mouth of the tube is a fixed flat ring or collar 3, and as the oil emerges from the top of the tube 2, it spreads outward and flows over the upper surface of said collar. On the top of the shaft is a fixed, hollow, rounded head or cup 4, with an externally shouldered rim that fits into and seats a porous metal ring 5. The inside of this cup and ring is filled with an oil absorbent material 6, and in the top of the ring 5, secured in any suitable manner is a closure 7 which covers the absorbent material 6. This absorbent material, which may be asbestos fibres, retains and filters the oil and constitutes a small reservoir or container for the liquid fuel. Oil seeps through the porous ring 5 and at the outer surface takes the form of a fine mist which burns fully without producing soot and gives a hot clear flame 8. Beneath the flame is a guard ring 9 of refractory material for the flame, mounted and seated in a suitable opening in the wall 10 of the combustion chamber of the furnace.

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At 11 are indicated the polepieces of an induction motor, bearing stationary coils 12. The armature or rotor *r* is affixed to the shaft 1 and revolves the latter. The motor is encased in a cylindrical housing 13; the lower end of which is affixed to a cover 14 and is externally flanged at 15, so that it can easily be secured thereto by nuts and bolts *b*. The cover 14 has inlet openings for cooling air, shown at 16. The pedestal or base which supports the motor and burner is illustrated at 17, and on this base and under the cover 14 are thick rubber bushings or sleeves 18, surrounding the bolts *b* which attach the flange 15 to the cover 14, to damp vibration.

On the shaft 1, above the motor is an air fan 19; and around the fan the motor casing has a number of air ports 20. The upper end of the housing or casing 13 flares outward at 21, and receives a cover 22. The cover 22 has a neck or boss 23 projecting upward towards the cup or head 4, with a seat inside to receive a ball bearing 24 for the shaft 1. In the bottom cover is a seat to receive another ball bearing 24, for the shaft, this ball bearing being surrounded by a flange 25.

Attached to the top cover 22 is a bell-shaped cap or hood 26, with a contracted upper end or neck 27 that surrounds the boss 23. The neck terminates at a central opening 28 in the guard ring 9, which receives the head 4; and the neck envelops the lower part of this head. Surrounding this opening and the neck 27 is an asbestos guard ring 29, secured in place by a holder 30, having an upturned rim engaging the guard ring 29 and a flanged central opening to receive the neck 27.

In the flaring end 21 of the casing 13 and below the cover 22 is a second fan 31; and above this fan, in the cover 22 near the rim thereof, is a circular row of air holes 32 through which air is blown into the hood 26 and the neck 27 to the opening 28 to feed the flame 8.

Beyond the bottom of shaft 1 the tube 2 projects and is received in a fixed bearing 33 of the base 17. To the adjacent end of the tube an oil delivery pipe 34, leading to an oil pump casing 35 is connected. The rotor of this pump in the casing 35 is rotated by a gear 36 meshing with a worm 37 on the lower end of the shaft 1.

In action, the motor is started by closing the circuit switch and the pump starts delivering oil to the tube 2. The quantity can be regulated by a valve in the pipe 34 or any other suitable means. The fuel passes up through the tube 2 and spreads out on the top of the ring 3; whence it is distributed into the fibrous material 6. This it

permeates and then by centrifugal force it is impelled outward through the porous metal ring 5. The head 4, ring 5, and filter 6 thus constitute a diffusion member for the liquid fuel. It issues from the outer face of this ring not in small drops but in the form of a fine mist. It will now be ignited by the pilot burner 38, which may be a gas jet or an electric arc. The fuel is burnt without soot and is entirely consumed. The motor is of the induction type and runs swiftly and smoothly. It is cooled by the fan 19, the other fan or impeller 31 will supply the air for the flame; and if desired, the space inside the cap 26, the neck 27 of which forms an air flue, may be provided with a suitable damper or ring-valve arrangement, not shown, to govern the volume of air blown out around the head 3. All vibration and noise are suppressed by the elements 18.

The porous ring 5 is made from pressed metal powder, or fine metal spheres like gunshot. When the oil goes through, it becomes more or less mixed with air and the vaporization of the fuel is thus accelerated. I have found that heavy oil can be used in a burner according to my invention, even if it is of such high density that one cannot ignite it with a match. The quantity taken is quite small; so small in fact that a drop per second is enough to maintain flame in the ring 9. Thus I have originated a burner that will operate on either light or heavy oil; and is most economical in practice. In fact the same burner will answer for both house heating and hot water heating; which has heretofore required a burner with a wick. With my burner a single tank of oil is all that is needed. This tank can be filled with heavy oil and drawn upon for heating the rooms in the winter and giving hot water in summer; serving both purposes with maximum efficiency at the lowest possible expense.

Preferably a small hole 7*a* is located in the closure 7. Air is drawn in through this hole and mixes with the oil in the filter 6, which may be of steel wool, as well as asbestos, or any other suitable material. The process of vaporizing the fuel and effecting complete combustion is thus carried out.

This burner is silent, too, because there is no air compressor, as in the "gun" type of burner.

The burner is thus an ideal unit for small houses where space is limited, and where there may be no cellar.

Having described my invention, what I believe to be new is:

A burner having a diffusion member comprising an impervious upright cup-shaped head having an external shoulder on its rim, a porous metal ring engaging said shoulder, a porous fibre filler contained within said cup and ring, means for rotating said member, a fixed conduit to supply liquid fuel passing through the bottom of the cup and terminating within said filler, means forming an air flue having one end adjacent said member and an impeller to discharge air from said flue around said member.

DAGFRID HANSON.

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