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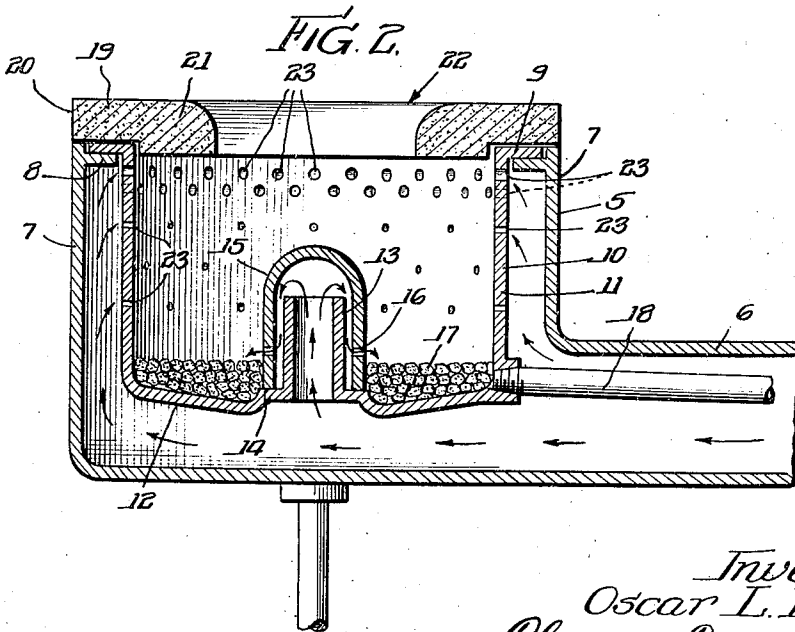
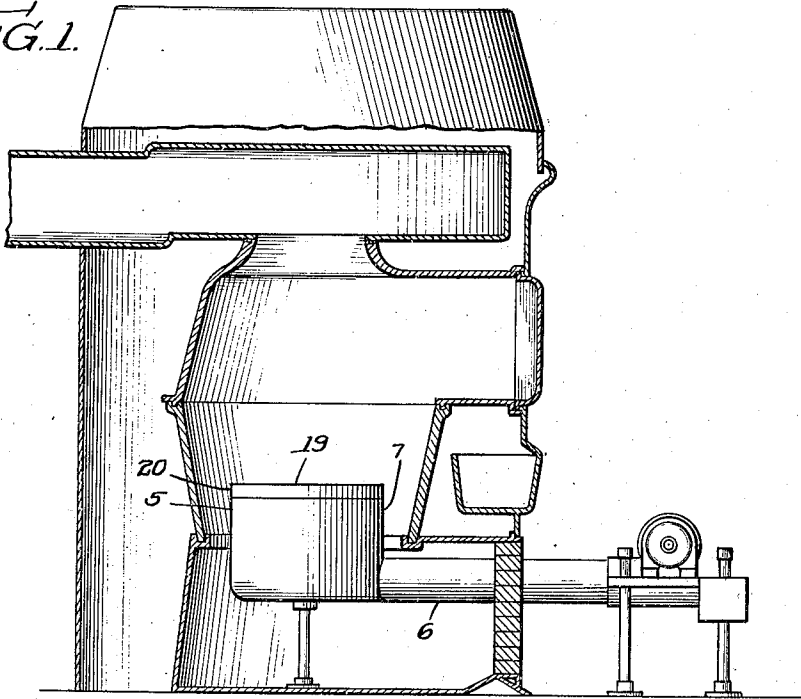
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2,038,522

BURNER CONSTRUCTION

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FIG. 1.



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UNITED STATES PATENT OFFICE

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BURNER CONSTRUCTION

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1 Claim. (Cl. 158—92)

This invention relates to oil burners in general and is particularly adaptable and advantageous in smaller oil burners such as are used in hot water heaters, small room circulators and stoves.

The primary object of the invention is to provide an oil burner which can be economically manufactured; which prevents the accumulation of carbon in the lower pan, and consequently preventing the tendency to choke off the oil feed line; which provides a clean flame having a blue base, which is free from soot and not subject to clogging; and which causes the flames to turn down forming a rotary flame or a recirculation of the flame in that the flame assumes a rotating action consuming any unburned parts, thereby giving clean combustion.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

This application is for a modified form of the invention shown in applicant's Patent No. 1,950,161, filed January 4, 1932.

The accompanying drawing illustrates a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail sectional view of a furnace and embodying the invention.

Fig. 2 is a detail sectional view of the improved burner.

The burner comprises a cylindrical outer body 5 to which a draft tube 6 is operatively connected, particularly at the lower end of the body as shown in Fig. 2. The body 5 comprises a bowl having a tubular draft tube leading thereto. This body or bowl 5 has relatively straight vertical walls 7 on which an annular flange 8 is arranged. This flange supports an annular flange 9 on a fire pot 10 which extends down into the bowl 5 and has its walls 11 spaced uniformly from the walls 7 of the bowl 5. The bottom 12 of the fire pot slopes downwardly toward the center and connects with an upstanding tube or riser 13, there being a flat ledge 14 surrounding the riser 13. The riser 13 has communication with the draft tube 6 so that air is free to pass through the tube 6 and through the riser 13 where it is directed downwardly by a dome-shaped member 15 which is supported on the ledge 14. The dome-shaped member 15 is provided with a series of apertures 16 through which the air coming through the riser or standpipe 13 will flow or be diffused. The holes 16 are located a predetermined distance above the ledge 14 and are located so that the air coming through the openings will be above the top of the loose refrac-

tory material 17 which is arranged in the bottom of the fire pot. A fluid line 18 may be provided in the tube 6 and have communication with the interior of the fire pot to furnish fuel to the refractory material 17.

A refractory material choke ring 19 is provided with a flange portion 20 which rests on top of the flange 9 of the fire pot and extends inwardly a predetermined distance, as indicated at 21, the ring having an opening 22 which is considerably less in diameter than the interior diameter of the fire pot. A series of apertures or openings 23 are formed in the annular walls of the fire pot so that air coming through the tube 6 may pass therethrough for the purpose of assuring complete combustion. The openings 23 preferably increase in number toward the upper part of the fire pot.

The construction so far described provides a distinct improvement over other oil burning construction in that it assures perfect combustion, gives a flame having a blue base which rises and burns in suspension, the flame being free from soot and thereby preventing clogging up of the furnace as there is no carbon material or deposit built up on the bottom of the fire pot. The burner may operate on what is ordinarily termed in the art as the "high-low" flame principle and thus not require the use of an auxiliary pilot except a tiny flame which continues to burn from one high operating period to another. The flame, however, is the present instance, is clean in contrast to the low, smoky and dirty flame of the conventional type which causes soot deposits.

The current of air that flows upwardly through the upstanding tube 13 flows downwardly outside the tube and through the openings 16 where, in its upward flow, it commingles with the fuel and the incoming air and produces a desirable turbulent motion of the fuel and air.

In the construction shown in applicant's Patent No. 1,950,161 a substantial portion of the current of air passes out through the openings in the upper end of the stack, forming a secondary current that is fed upwardly and outwardly under the spreader into the flame.

Oil flows underneath the refractory material in the fire pot and when burning heats the top of the refractory material, and this heated refractory material gives off heat upwardly keeping the bottom of the bowl much cooler than conventional burners. Air, which is diffused from the central standpipe or riser, keeps the flame blowing outwardly toward the outside walls and also upwardly, keeping the bowl free from carbon ac-

5 cumulation. Added turbulence is also provided as the air flows outwardly and is then deflected backwardly by the rows of holes at the upper portion of the bowl. This causes the tips of the tiny flames to be blown back inwardly and then be
10 turned downwardly forming a rotating flame which may be termed "recirculation" in that the flame keeps rotating around causing any unburned particles to be consumed and thereby
15 give clean combustion.

When, however, the oil from the line 18 runs in rapidly, the flame in the fire pot will lift and burn under the choke ring 19. During this stage of operation the choke ring will reflect the heat
20 back into the flame and produce clean combustion. The refractory choke ring reflects the heat back into the flame as it rises through the opening 22 and produces clean combustion whereas if a metal choke ring were used, the metal ring
25 would absorb the heat and cause the flame to burn at a lower temperature with a resulting sooty deposit.

The flame characteristic resulting from the present construction has a color which is entirely
25 distinct from flames resulting from conventional

construction. The present construction provides a clean non-smoky flame, and assures complete combustion of the fuel.

Changes may be made in the form, construction, and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following
10 claim.

The invention is hereby claimed as follows:

A burner comprising a fire pot having air inlet holes in the upper portion thereof, an upstanding tubular riser located at the center of the pot, a closed top member completely inclosing the
15 outlet of the riser, and a plurality of openings in said member below the top of the riser and below the holes in the fire pot, means for delivering oil to the burner, and means for delivering air
20 through said riser and through the holes in the top member and through the holes in the fire pot, said top member being located below the upper plane of the fire pot.

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