

March 6, 1934.

O. L. BOCK

1,950,161

OIL BURNER

Filed Jan. 4, 1932

FIG. 1.

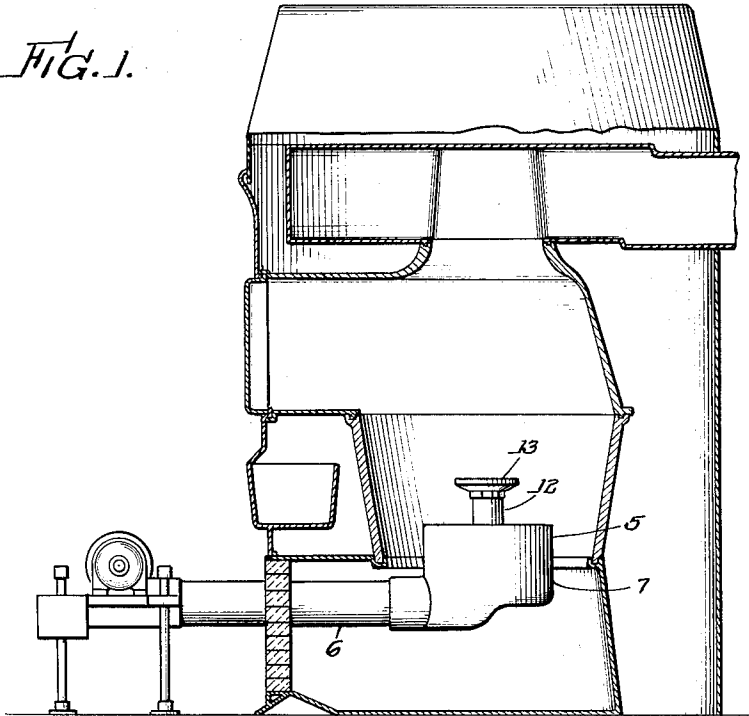
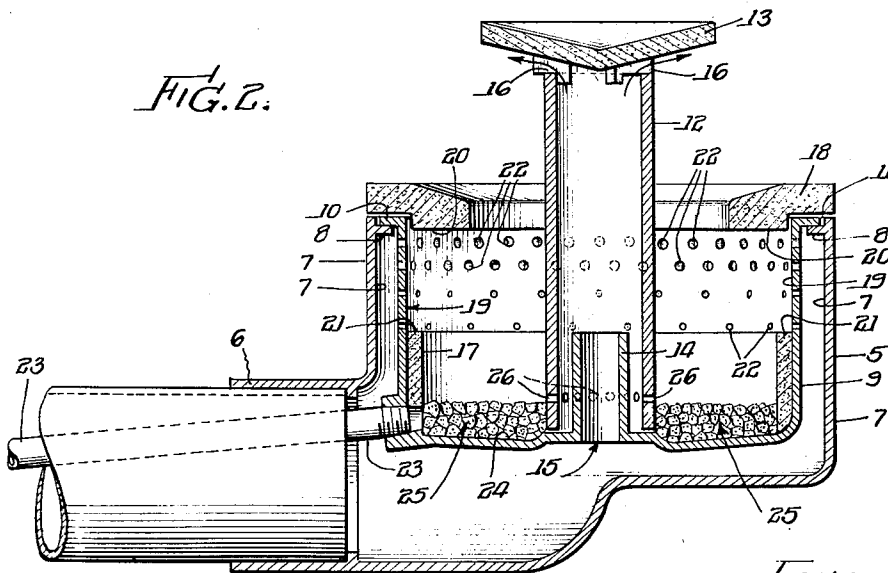


FIG. 2.



Inventor:  
Oscar L. Bock,  
By Cheever, Cox & Moore.  
attys.

# UNITED STATES PATENT OFFICE

1,950,161

## OIL BURNER

Oscar L. Bock, Madison, Wis.

Application January 4, 1932, Serial No. 584,627

3 Claims. (Cl. 158—92)

This invention relates to oil burners and its primary object is to provide a new and improved oil burner which will vaporize the fuel oil more readily than conventional burners, which concentrates the flames on the surface to be heated, which causes better combustion, which is smokeless, and which produces a full round flame.

Another object is to provide a burner which will produce a clean full round flame on high fire and which prevents carbon deposits thereby assuring a clean pilot not apt to be snuffed out.

A further object is to provide a burner which has its fire pot constructed and arranged in a particular manner, which is made of certain kinds of materials positioned to attain the utmost in practicability and maximum of efficiency to render practically complete combustibility of the fuel oil and thereby prevent smoking, and the formation of soot and carbon deposits.

A still further object is to provide a novel burner employing a loose layer of refractory material in the fire pot in combination with a flame spreader embodying a new and improved construction and arrangement.

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

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 an outer body 5 of substantially cylindrical shape and has a draft tube 6 operatively connected thereto, the body and tube comprising tubular members, the body 5 being a bowl and the draft tube being in the nature of a stem or pipe leading to the bowl. The body or bowl 5, as aforementioned, is cylindrical in shape having straight, or relatively straight vertical side walls 7. A peripheral flange 8 projects inwardly from the inner wall of the body or bowl 5 and supports a fire pot 9, the fire pot being cylindrical in shape, and of smaller size than the bowl or body, fitting inside the body as shown in Fig. 2. A peripheral flange 10 is formed on the fire pot and rests on the flange 8 and is supported thereby.

The flange 8 is located below the upper edge of the bowl a distance substantially the thickness of the flange 10 so that when the pot 9 is arranged in position, the top of the fire pot and the body or bowl will be relatively flush as indicated at 11.

An upstanding cylinder or stack 12 is arranged

centrally of the fire pot in the combustion chamber and extends above the top 11 a distance substantially greater than one half the height of the fire pot. A flame spreader 13, which is made of refractory material, is mounted on top of the stack 12 for the purpose of spreading the flame. A tube or pipe 14, having a passage 15, which communicates with the draft tube 6, extends upwardly a predetermined distance inside of the stack. Secondary air is provided from the draft tube and passes through the spaces or openings 16 directly under the spreader. An annulus or circular lining 17, which is made of refractory material, surrounds the inside wall of the fire pot at the lower end thereof while another annulus or choke ring 18 is arranged at the upper end of the fire pot. This latter annulus or choke ring is also made of refractory material and extends down into the combustion chamber a predetermined distance leaving an uncovered space 19 between the bottom edge 20 of the choke ring and the upper edge 21 of the annulus 17. The space 19 is provided with a plurality of openings or holes 22 for supplying secondary air to the combustion chamber to create combustion of the fuel in the fire pot or combustion chamber.

A fuel line or oil feed line 23 leads to the interior of the fire pot and the combustion chamber for the purpose of supplying fuel along the bottom 24 of the combustion chamber. The incoming fuel enters the lower part of the chamber beneath a loose layer of refractory material 25 and spreads evenly throughout the bottom of the pot. This loose layer of refractory material distributes the oil more evenly and contributes toward producing a full round flame, whereas if this material were not used, the oil would run along the bottom of the bowl and probably become vaporized before reaching the far end of the bottom and cause a lop-sided or uneven flame. The refractory material 25 also aids in combustion by reflecting the heat back and upwardly into the flame itself, causing the temperature of the flame to rise materially and providing proper combustion. If this loose refractory material were not employed, the fire would be at a relatively low temperature as well as being smoky and dirty.

Primary air for the purpose of assisting in vaporizing the fuel and feeding air to the flame is provided by a series of holes 26 formed in the bottom of the stack 12. These holes formed in the bottom or lower portion of the cylinder cause air to be blown outwardly across the top of the refractory material and assist in causing proper

vaporization of the fuel. These holes also allow air to be fed to the flame when the burner is operating on low fire, that is, its minimum capacity.

5 The particular burner is of the continuous flame type, a very small flame burning directly over the feed pipe opening when the burner is operating at its minimum capacity, the small flame acting as a pilot light. When turned on  
10 high fire, the flame gradually lifts and rises out of the pot so that there is no flame in the lower portion of the chamber itself, the vaporized fuel burning near the top of the burner. Combustion starts below the refractory ring which encircles  
15 the top of the pot and extends upwardly and outwardly, being deflected in this direction by the air flowing out underneath the flame spreader 13.

The important features of the present invention reside in the use of refractory material at the various points mentioned which include the flame spreader, the choke ring, the lower ring or annulus, and the loose material in the bottom of the pot. The incorporation of these members  
20 is essential in producing a clean, full, round flame on high fire and to also provide a clean pilot which is not apt to be snuffed out as often occurs where this material is not used. Also, the use of this present material prevents carbon from forming at the bottom of the bowl which would eventually choke up the said pipe opening. The row  
25 of holes in the lower portion of the cylinder or stack is also very important as these holes prevent the sooting up of the furnace, overcomes a smoky flame, and prevents choking up and snuffing out of the pilot.  
30

The invention provides a burner which is exceedingly simple in construction, which has many advantages over the conventional type of burner  
35 and which produces a full, round, clean flame without smoke or soot.

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  
40 hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. In a burner of the class described comprising a metal pot, a lower ceramic refractory material ring adjacent the inner surface of the pot at the bottom, an upper ceramic refractory material choke ring mounted on the upper edge of the pot, the metal side walls of the pot between  
45 the top of the lower ring and the bottom of the choke ring being provided with a plurality of

openings, an open top stack arranged centrally of the pot and extending above the upper edge thereof a predetermined distance, said stack being provided with openings near its base, a flame spreader arranged above the top of the stack, a jacket about the pot and spaced from the outer walls thereof, means for supplying air to the space between the jacket and the pot, and an air inlet tube located centrally of the pot and extending upwardly into the stack and in communication with the space between the pot and the jacket.  
50

2. In a burner of the class described comprising a metal pot, a lower ceramic refractory material ring adjacent the inner surface of the pot at the bottom, an upper ceramic refractory material choke ring mounted at the upper edge of the pot, the metal side walls of the pot between the top of the lower ring and the bottom of the choke ring being provided with a plurality of openings, an open top stack arranged centrally of the pot and extending above the upper edge thereof a predetermined distance, said stack being provided with openings near its base, a flame spreader arranged above the top of the stack, a jacket about the pot and spaced from the outer walls thereof, means for supplying air to the space between the jacket and the pot, an air inlet tube located centrally of the pot and extending upwardly into the stack and in communication with the space between the pot and the jacket, loose refractory material arranged on the bottom of the pot, and a fuel line extending through the pot near the bottom thereof and adapted to supply fuel to the loose refractory material.  
55

3. In a burner of the class described comprising a fire pot, a ceramic refractory material choke ring mounted at the upper edge of the pot, the walls of the pot near the upper edge thereof and below the choke ring being provided with a plurality of openings, an air inlet tube located centrally of the pot and extending upwardly a predetermined distance, a jacket surrounding the pot and spaced from the walls thereof, means for supplying air to the space between the pot and the jacket whereby air will pass through the central air inlet tube and the openings in the wall of the pot, a fuel supply line for delivering fuel to the pot near the bottom thereof, a central air stack surrounding the air inlet tube and spaced therefrom, said stack extending a predetermined distance above the upper edge of the choke ring, and a flame spreader carried by the stack and spaced a predetermined distance from the upper edge thereof.  
60

OSCAR L. BOCK. 130

60 135

65 140

70 145

75 150