Sept. 9, 1930. C. A. HENRY ET AL 1,775,458

OIL BURNER

Filed Aug. 22, 1928

Fig. 1

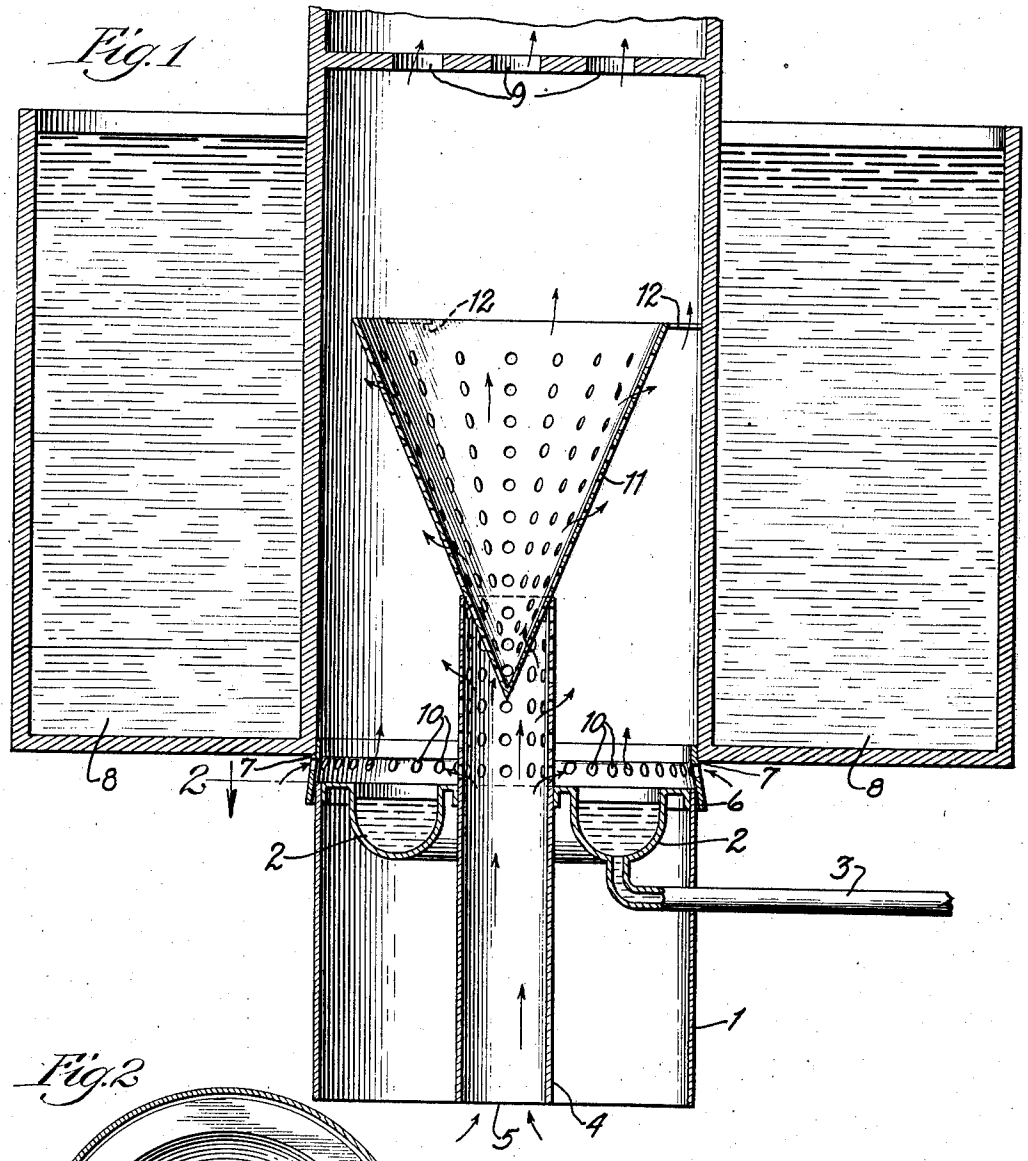
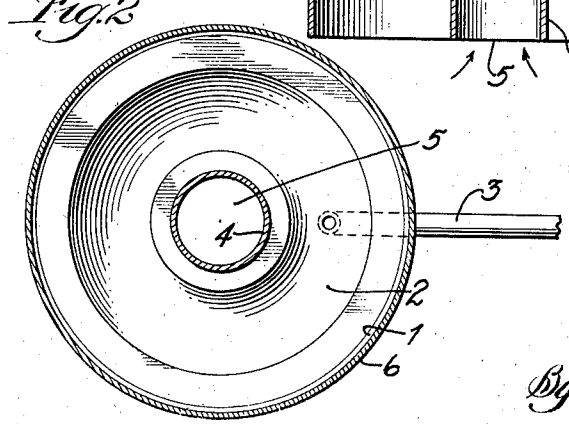


Fig. 2



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OIL BURNER

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This invention relates to an improvement in oil burners, and particularly to an oil burner adapted for the heating of the internal surface of a flue.

An object is to provide a burner which can be easily inserted in a flue and which will effect complete combustion of the fuel and eliminate all objectionable odors due to unburned gases.

The invention will be fully understood from the following description, together with the accompanying drawings, in which

Figure 1 is a vertical section of the improved burner, and Fig. 2 is a horizontal section taken on the line 2 of Fig. 1.

Referring in detail to the drawings, 1 represents a cylindrical member, the upper surface of which has an annular oil receptacle 2 with a duct 3 for feeding the oil such as, and preferably, kerosene or benzine. A vertical air tube 4 formed integrally with the oil container extends through the center of the annular oil pocket and projects a substantial distance above the upper surface of the oil container. The portion of the air tube extending above the oil receptacle is perforated, as shown, to allow passage therethrough of air taken in at the lower extremity 5. The path of the air entering at 5 is shown by arrows.

An annular sleeve 6 encircles the upper edge of the oil container and may be conveniently formed with a shoulder 7 which regulates the depth or extent to which the burner is inserted in the flue 8. The flue 8 is shown diagrammatically, and represents a body, such, for example, as a boiler flue tube containing water or other solution to be heated. The flue should contain openings 9 to permit the escape of the burned gases as they ascend through the flue. The sleeve 6 has a peripheral series of openings 10 located just below the offset collar portion 7 to permit the entrance of air immediately over the surface of the oil. The path of the air entering at this point is shown by arrows.

An inverted acute angled cone 11 is placed in the upper end of the air tube 4. It may be conveniently held in vertical position by the arms 12 which are secured to the base of the cone and extend laterally out against the side walls of the flue. The cone is hollow, and is perforated over its entire surface in the same manner in which the upper portion of the tube 4 is perforated. A hole of from $\frac{1}{16}$th to $\frac{3}{32}$nds inches in diameter is satisfactory, the holes taking up about one-fifth of the total perforated surface. The base of this cone should be such as to approach rather closely the interior wall of the flue 8.

The operation of the burner is substantially as follows:

Upon lighting the surface of the oil, a small amount of air, perhaps ten per cent of the total amount necessary for complete combustion, enters through the openings 10 over the surface of the oil causing partial combustion. As these partitally burned vapors rise they are deflected outwardly toward the sides of the flue by the inclined faces of the perforated cone. The air entering at 5 through the lower end of the air tube 4 is drawn by a natural draft upwardly and emanates from the interior through the holes in the tube, and also partially through the holes in the tip of the cone extending within the tube, and is baffled or deflected laterally into contact with the partially burned gases. The air entering in this manner affords sufficient oxygen to complete the combustion of the partially burned gases resulting in an intense heating area in the vicinity of the upper portions of the side walls of the cone immediately adjacent the vertical walls of the flue 8. The baffling effect produced by the cone thus serves to produce a concentrated and intense heat over a very restricted portion of the interior wall of the flue 8. Complete combustion is thus effected, the burned gases passing around the base of the cone and up through the openings 9 in the flue. As the burner becomes heated toward the upper portion of the cone, the heat is conducted downwardly toward the tip, thus serving to preheat the fresh incoming air. The bulk of the air is thus introduced into the interior of the combustion zone and emanates outwardly as combustion progresses.

An outstanding advantage of the burner is that it is adapted to be inserted in any cavity

or flue having an internal surface which is surrounded by a medium to be heated. It works under normal atmospheric pressure and is noiseless. The combustion is wholly internal, no heat being lost by the circulation of air around the outside of the burner. The vertical air tube and the oil container may be made integral with each other and the perforated sleeve and the cone usually are made separately. All of these parts may be made of mild sheet steel.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What we claim as new, and desire to secure by Letters Patent, is:

1. An oil burner adapted for heating the inside surface of a flue comprising an oil receptacle and means for supplying oil thereto, an air tube extending vertically through said receptacle, said air tube being perforated to permit passage of air from the interior of said tube into the exterior zone of combustion, an inverted cone in the upper end of said air tube, and means for introducing air into the space above said oil receptacle.

2. An oil burner adapted for heating the inside surface of a flue comprising an oil receptacle and means for supplying oil thereto, an air tube concentric with said oil receptacle and extending vertically therethrough, said air tube being perforated in the portion extending above the upper surface of said oil receptacle, a perforated cone placed in inverted position in the upper end of said air tube, and means encircling the top of said oil receptacle to permit the introduction of air into the space over said oil receptacle.

3. An oil burner adapted for heating the inside surface of a flue comprising an oil receptacle having an annular oil pocket in its upper surface and means for feeding oil into said pocket, a vertical air tube concentric with said oil receptacle and projecting a substantial distance above the upper surface thereof, an inverted cone placed in the upper end of said air tube, said air tube and cone being perforated, and an annular sleeve encircling said oil container and positioned between the upper surface thereof and the lower edge of the flue, said sleeve being perforated to admit air at the surface of the oil to effect a partial combustion of the oil vapors.

4. An oil burner adapted for heating the inside surface of a flue comprising an oil receptacle and means for supplying oil thereto, a vertical air tube concentric with said oil receptacle and having a perforated portion projecting a substantial distance above the upper surface thereof, a perforated sleeve encircling the top of said oil receptacle, and a perforated cone of slightly less diameter than said flue, said cone being placed in inverted position in the upper end of said air tube to afford a baffling surface to concentrate the zone of heat against the flue wall.

5. An oil burner adapted for heating the inside surface of a flue, comprising an oil receptacle and means for supplying oil thereto, an air tube extending vertically through said receptacle, said air tube being perforated to permit passage of air from the interior of said tube into the exterior zone of combustion, an inverted cone in the upper end of said air tube, said cone being perforated at the portions thereof extending above and below the top of said tube, and means for introducing air into the space above said oil receptacle.

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