

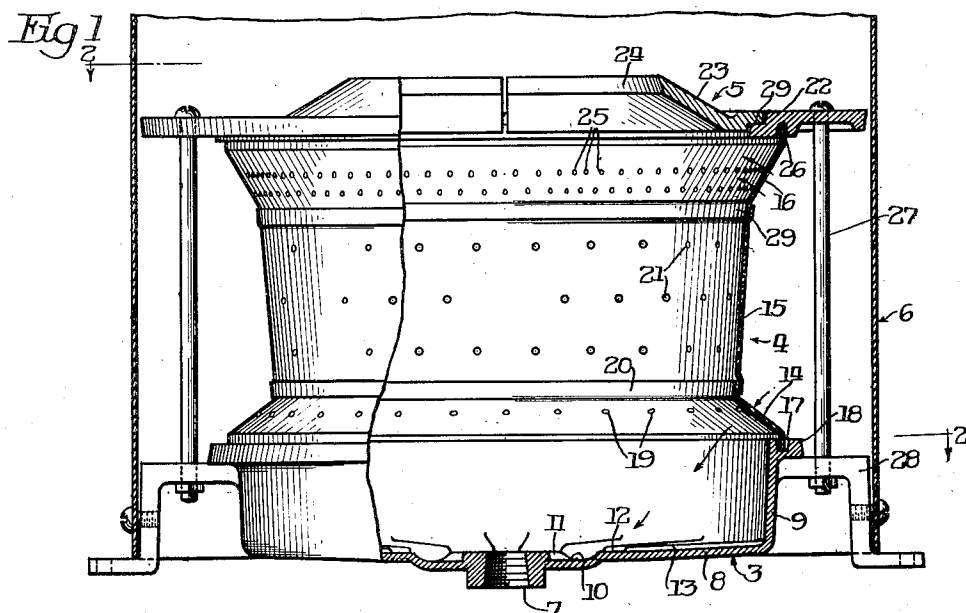
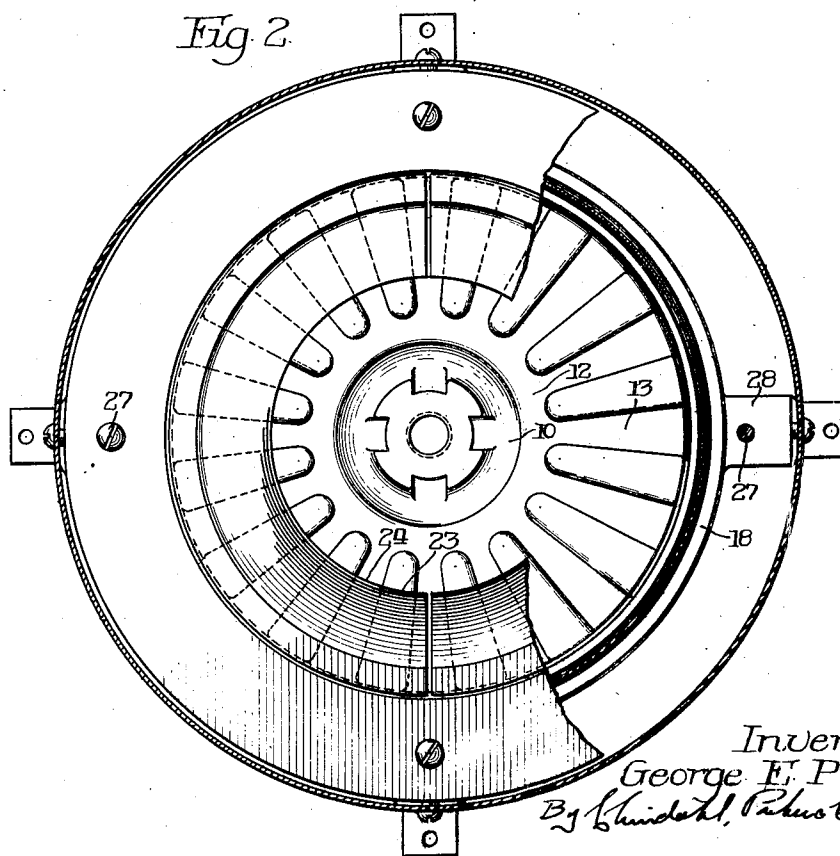
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LIQUID FUEL BURNER

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LIQUID FUEL BURNER

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The invention relates to a liquid fuel burner of the type in which the liquid fuel is supplied to a burner bowl formed at the bottom of a combustion chamber, the latter having an annular side wall perforated to govern and direct the supply of air to the chamber. One object of the invention is to provide an improved construction for the burner bowl to facilitate ignition of the fuel.

Another object is to provide an improved construction for the combustion chamber to insure the efficient combustion of the fuel.

A general object is to provide a burner of the character indicated which may be manufactured economically and which is otherwise of a practical character.

The objects of the invention thus set forth together with other and ancillary advantages are attained by the exemplary construction illustrated in the accompanying drawing.

Figure 1 is a fragmentary elevational section of the improved burner.

Fig. 2 is a top plan view of the burner shown in Fig. 1 with a portion of the burner broken away to show the bottom of the burner bowl.

As herein shown the improved burner comprises a burner bowl 3 coacting with an annular wall 4 to provide a combustion chamber having a centrally apertured, sectionally formed top plate designated generally as 5. 6 designates an annular outer casing within the lower end of which the burner is supported in a manner such as to permit the flow of air upwardly around the bowl and into the combustion chamber through the perforated annular wall 4. Fuel is admitted to the burner through the medium of an inlet port 7 preferably disposed centrally of the bottom of the bowl.

The bowl 3 is, in accordance with the preferred construction, made in the form of a casting shaped to provide a slightly dished bottom wall 8 in the center of which is disposed the inlet port 7; and rising from an edge of the bottom wall is a peripheral side wall 9 with a slight outward flare.

The bottom 8 of the bowl 3 is constructed so as to break up the oil as the same is supplied thereto through the central port 7, to the end that ignition of the fuel shall be facilitated. Thus I provide near the center of the bottom 8 an annular groove or channel 10 spaced outwardly a short distance from the port 7. This channel is connected by four radial grooves 11 with the upper end of the port 7. Oil overflowing from the annular channel 10 travels radially outwardly over a relatively narrow annular surface 12, and thence into radial passages 13 formed upon the upper surface of the bottom wall and terminating at the peripheral edge of the latter. In view of the dished character of the bottom

wall 8, the bottom surfaces of the passages 13 have a slight upward and outward inclination. Thus it will be observed that oil fed to the port 7 first flows through radial grooves 11 to the annular channel 10, and then spreads outwardly over the annular surface 12 into the radial passages 13, the oil in the radial passages 13 being of relatively small depth and decreasing gradually in depth toward the outer ends of the passages. Such distribution of the fuel has been found to expedite the ignition thereof, and to insure uniformity of combustion over the entire surface of the bowl.

The annular wall 4 is shaped and perforated so as to provide a proper supply of air to support and maintain combustion. This annular wall of the combustion chamber is preferably formed of sheet steel and comprises a lower substantially frusto-conical section 14, an intermediate upwardly and outwardly flaring section 15, and an upper outwardly inclined section 16, the latter being surmounted by the baffle 5. The lower frusto-conical section 14 has its lower edge resting in an annular groove 17 formed in a laterally extending flange 18 of the side wall 9 of the burner bowl; and substantially centrally of this frusto-conical section 14 is an annular series of perforations 19. The perforations 19 are disposed perpendicular to the conical wall portion of the section 14, and thus are inclined in a downward and inward direction so that air admitted through these perforations passes downwardly into the combustion of the fuel distributed over the bottom of the bowl.

The intermediate section 15 of the annular wall 4 is in the form of a ring having its lower end fitted over an upwardly extending flange 20 on the upper edge of the lower wall section 14, so as to be supported by the latter. As herein shown, said section 15 has three circumferential rows of perforations 21 admitting a further supply of air to the combustion chamber. The slight outward and upward inclination of the intermediate section 15, together with the slightly inclined positions of the apertures 21, facilitates the upward passage of the ignited mixture.

The upper wall section 16 of the combustion chamber is fitted at its lower end into the upper end of the intermediate section 15 so as to be supported thereby, and carries at its upper edge the sectional top plate 5. The latter comprises an outer flat ring section 22 and a central frusto-conical section 23, with a central discharge opening 24 therein. Two rows of perforations in the upper wall section 16 admit air which mixes with the fuel gas and passes through the central outlet opening 24 in the top of the plate 5. The inward and upward slope of the section 23 of the top plate 5 positions the outlet 24 inwardly

and upwardly of the perforations 25, and serves to direct the flame to the discharge opening 24, while the outward flare of the section 16 increases the cross sectional area of the burner near the top thereof so as to prevent the burner from becoming completely filled with gases, with the result that the roaring noise ordinarily present when a burner is operating at full capacity is substantially eliminated.

The outer ring section 22 of the baffle 5 has an annular groove 26 formed in the bottom side thereof for receiving the upper edge of the upper wall section 16 of the wall 4. From this groove the ring extends outwardly to a point adjacent the outer casing 6 so as to form a baffle tending to prevent the free passage of air upwardly between the burner and the casing 6. Furthermore such lateral extension of the ring 22 is connected by means of tie-bolts 27 with brackets 28 cast integral with the side wall 9 and having the lower portion of the outer casing 6 secured thereto. The bolts 27 it will be observed serve to hold the several parts of the burner in proper relation.

Preferably the inner conical section of the baffle 5 is made in two similar segmental sections, and has its outer peripheral edge portion seated in a rabbet groove 29 formed in the inner peripheral edge of the ring 22. By this construction the conical section 23 of the baffle may be readily removed when desired.

It has been found that with the construction of the burner bowl which has thus been provided, ignition of the fuel is substantially facilitated; and due to the shape of the combustion chamber efficient and noiseless combustion of the fuel is insured throughout a substantial range of variation in the amount of fuel supplied. Because of the separate character of the three differently shaped portions of the annular wall 4, the manufacture thereof is materially simplified, and the construction as a whole is such that the burner may be produced at a low cost.

I claim as my invention:—

1. A liquid fuel burner comprising a burner bowl, means for supplying fuel to said burner bowl, an annular wall rising from said bowl and coacting therewith to provide a combustion chamber, and a top plate for the combustion chamber having a central discharge opening, said annular wall comprising an outwardly and upwardly flaring section spaced above the bowl and perforated to permit the admission of air to the chamber, and said wall further comprising a section inclined upwardly and outwardly from said outwardly flaring section and having a plurality of perforations therein, said central discharge opening being spaced upwardly and inwardly from the upper edge of said outwardly inclined wall section.

2. A liquid fuel burner comprising a burner bowl, means for supplying fuel to said bowl, an annular wall rising from said bowl and coacting therewith to provide a combustion chamber, and a top plate for the combustion chamber having a central discharge opening, said annular wall comprising a lower frusto-conical section perforated to admit and direct air inwardly and downwardly toward said bowl, an outwardly and upwardly flaring section spaced above the bowl and perforated to permit the admission of air to the chamber, and said wall further comprising a section inclined upwardly and outwardly from said outwardly flaring section and having a plurality of perforations therein.

3. A liquid fuel burner comprising a burner bowl, means for supplying fuel to said bowl, means coacting with said bowl to form a combustion chamber having a side wall including a lower approximately frusto-conical section seated upon said burner bowl, an intermediate section having its lower end resting upon said frusto-conical section in interfitting relation therewith, and an upper section inclined upwardly and outwardly from the upper edge of the intermediate section and also having an interfitting relation therewith, a rigid top plate having a central discharge aperture communicating with the combustion chamber, and means connecting said top plate with said burner bowl to hold the parts together, said wall having perforations therein for admitting air to the combustion chamber.

4. A liquid fuel burner comprising bottom and side walls forming a combustion chamber, means for supplying fuel to said chamber, a top plate for said chamber having a central discharge opening, said side walls including an inwardly and upwardly sloping lower portion perforated to direct a primary supply of air inwardly and downwardly toward said bottom wall, said side walls also including an upwardly extending portion, above said inwardly sloping portion, flared gradually outwardly to permit gradual expansion of the flame and apertured to direct air into the chamber with a slight upward inclination whereby to promote gradual upward progress of the burning gases, said side wall further including an upper portion having an upward and a relatively great outward inclination and apertured to admit air to the upper portion of the combustion chamber.

5. A liquid fuel burner comprising a bottom and annular side walls defining a combustion chamber, a top plate for said chamber having a central discharge opening, means for supplying fuel to the upper surface of said bottom wall, said side wall having a vertically elongated perforated intermediate portion joined at its lower end with an outwardly and downwardly sloping frusto-conically formed side wall portion having openings therein to admit and direct air downwardly onto the fuel on said bottom wall, said frusto-conically formed side wall portion being joined at its outer edge with said bottom wall by a vertically extending side wall portion of a diameter substantially greater than said intermediate side wall portion, and the upper end of said intermediate portion being connected to said top plate by an upwardly and outwardly sloping side wall portion apertured to admit additional air into the upper portion of the chamber.

6. A liquid fuel burner comprising, a burner bowl, means for supplying fuel to said bowl, a top plate having a central discharge opening, and means extending between said burner bowl and said top plate and forming a combustion chamber, said means including an annular outwardly and upwardly flaring wall section above the burner bowl perforated to permit the admission of air to the chamber, and a wall section inclined upwardly and outwardly from the upper edge of said flaring wall section and constructed to permit the admission of additional air to the combustion chamber adjacent the top plate.

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