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A. BEHR SIN

1,861,997

OIL BURNER

Filed May 23, 1930

FIG. 1

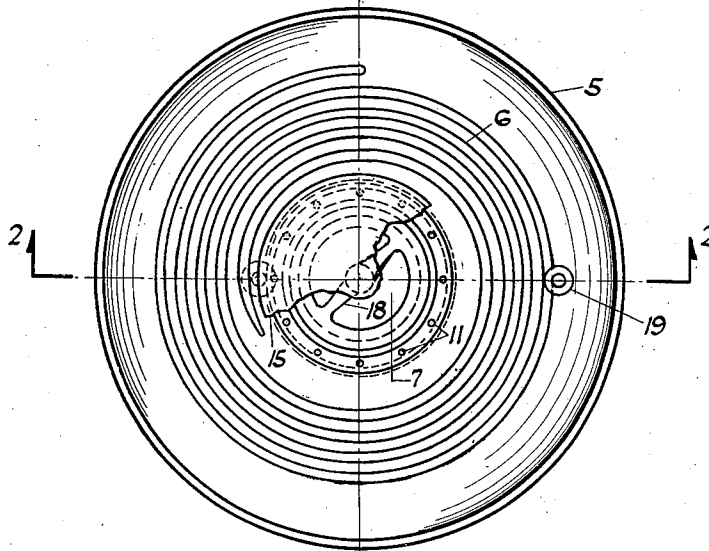


FIG. 2

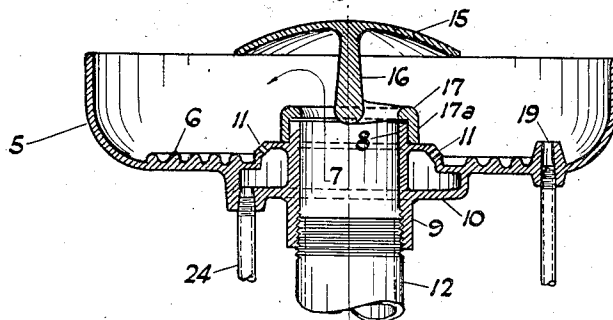
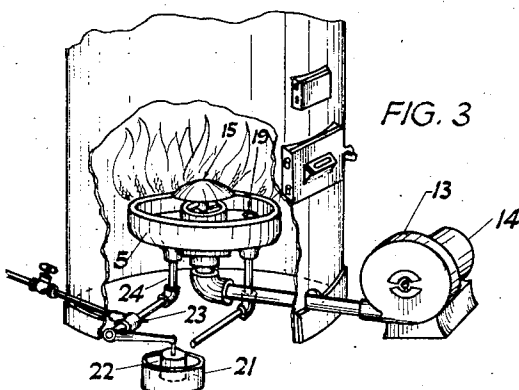


FIG. 3



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OIL BURNER

Application filed May 23, 1930. Serial No. 454,993.

My invention relates to oil burners and more especially to a type of gravity or pressure fed oil burner particularly adapted for producing low or intense flame, and wherein there is a peculiar commingling of the air and fuel prior to ignition forming a vapor having a high combustible flash point.

An important object of the invention is the provision, in combination with a burner bowl, of a preheater receptacle adapted to preheat the fuel in an improved manner prior to its injection into the burner bowl.

Another object is the provision of an umbrella or dome shaped deflector in combination with a burner having a spirally grooved bottom, there being means provided around the central portion of said bowl for preheating the fuel, and for injection thereof into the burner bowl in the form of finely divided streams, and means to direct air against said deflector to be again redeflected into the path of fuel admitted so as to spatter the fuel upon the spirally grooved portion to distribute it evenly over the bottom of said bowl and at the same time to atomize it into a quickly ignitable combustible vapor.

Another object of the invention is the provision of an annular preheating chamber in juxtaposition with the bottom of a burner bowl having a fluted bottom surface and an air conduit, there being a plurality of holes adapted to direct fuel upwardly into the path of the air supplied through said conduit into said bowl to be spattered against the fluted portion of said bowl, atomized and ignited, the heat from the combustion of a vapor being adapted to preheat the oil before its ingress into said bowl and before its commingling with the air from said conduit.

Another object of the invention is in the provision of a burner insuring perfect combustion, positive control and uniform distribution and one having economy in first cost and in its upkeep, as well as in its fuel consumption.

Other distinct objects and features of the invention may hereinafter appear as the description proceeds, and especially when illustrated by the drawing accompanying, wherein:

Figure 1 is a plan view.

Figure 2 is a section taken on the line 2—2 of Figure 1, and

Figure 3 is a perspective view showing an installation of the burner.

Referring to the drawing, the numeral 5 indicates the burner bowl having a spirally grooved floor 6. There is a central air inlet 7 in said floor, the wall of said air inlet being cast integral with said bowl, and being formed in part by an upwardly directed annular rim flange 8 extending above the level of the bottom of said bowl, and by a downwardly directed annular flange 9 extending below said bowl.

Surrounding the central portion of the floor of said bowl and said air inlet is an annular preheating chamber 10, and communicating with said preheating chamber and said burner bowl are a plurality of fuel outlet ports 11 adapted to direct a circularly arranged series of finely divided streams of oil into said bowl.

Secured to said flange 9 is an air conduit 12 that connects with a blower 13, said blower being driven by motor 14.

Removably mounted upon the upstanding flange 8 is a concavo-convex umbrella deflector 15 having a downwardly extending stem 16. Attached to the lower end of said stem is an apertured cap 17 having a flange 17a adapted to fit around the upstanding portion of said air inlet, said cap being provided with a spider portion 18 which forms a support for said deflector.

Said deflector is adapted to direct the air admitted through said cap and conduit downwardly into the bowl and on to the path of the fuel admitted through the aforesaid ports, said ports being adapted to supply fuel on all sides of said bowl whereby to mix it with the air admitted through said conduit to form a combustible substance.

The ports 11 permit streams of the oil to enter the bowl at an angle so as to be encountered and broken up by air deflected downwardly and outwardly by said deflector. The mingled air and oil are thus brought into forcible contact with the grooved floor of the

burner bowl causing a further molecular separation of the liquid fuel.

There is an overflow port 19 connected by a pipe leading from the bottom of a bowl to a sump 21 to discharge overflow of the fuel oil in case the fire goes out. In said sump is a float 22, and connected to said float is a valve 23. When the sump is sufficiently filled the float will operate said valve to shut off the flow of oil to the preheater 10 through the pipe 24.

The spider portion of the cap 17 is shown as consisting of a single bar 18 which extends diametrically across the upper end of said cap, but it is to be understood that a larger number of spider arms may be used to support the deflector 15 which is preferably cast integral with said cap 17. The cap flange 17a is desirably made long enough to rest upon the top of the preheating chamber 10.

The operation of the burner will now be described.

Fuel is admitted from any convenient source through piping to valve 23 thence through pipe 24 to the chamber 10 and finally through the ports 11 whence it enters on all sides of the burner bowl 5 in finely divided streams.

At the same time air is delivered to the burner bowl from the blower 13 thru the conduit 12, and directed against the deflector 15, where it is in turn, redirected to commingle with the finely divided streams of oil by spattering the fuel on to the spirally grooved bottom of the burner bowl, thereby atomizing the combustible agents and forming a highly inflammable vapor.

The spirally grooved bottom also prevents the oil from puddling at any one point.

I claim:

1. In an oil burner, a burner bowl having a substantially flat spirally ribbed bottom portion, an annular fuel-preheating chamber surrounding the center of the bottom of said bowl, an air supply conduit leading up thru the space enclosed by said annular chamber, a deflector mounted above said conduit to deflect toward the bottom of the bowl air supplied from said conduit, there being outwardly inclined fuel vents leading thru the wall of said annular chamber to discharge a circularly arranged series of oil streams upwardly around said deflector in order that air directed outwardly and downwardly by said deflector may strike laterally upon and scatter oil thus supplied to the burner bowl over the bottom portion of said bowl.

2. In an oil burner, a burner bowl having a substantially flat spirally ribbed bottom portion, an annular fuel-preheating chamber surrounding the center of the bottom of said bowl, an air supply conduit leading up through the space enclosed by said annular chamber, a deflector mounted above said conduit to deflect toward the bottom of the bowl,

air supplied from said conduit, there being fuel vents leading through the wall of said annular chamber to discharge a circularly arranged series of oil streams upwardly around said deflector in order that air directed downwardly and outwardly by said deflector may strike laterally upon and scatter oil thus applied to the burner bowl over the bottom portion of said bowl.

3. In an oil burner, a burner bowl having a substantially flat spirally grooved bottom portion; an air supply conduit adapted to direct air upwardly through the central portion of the bottom of said bowl, a deflector mounted on said bowl and adapted to direct the air radially outwardly and downwardly which is supplied from said conduit, and fuel inlet means adapted to supply streams of fuel through the bottom of said bowl on all sides of said air conduit upwardly around said deflector in order that the air directed outwardly and downwardly by said deflector may strike laterally upon and scatter the streams of fuel thus supplied to the burner bowl over the bottom portion of said bowl.

4. In an oil burner, a burner bowl having a substantially flat spirally grooved bottom portion, an air supply conduit adapted to direct air upwardly through the central portion of the bottom of said bowl, a deflector mounted on said bowl and adapted to direct the air radially outwardly and downwardly which is supplied from said conduit, fuel inlet means adapted to supply streams of fuel through the bottom of said bowl on all sides of said air conduit upwardly around said deflector in order that the air directed outwardly and downwardly by said deflector may strike laterally upon and scatter the streams of fuel thus supplied to the burner bowl over the bottom portion of said bowl, and means for preheating the streams of fuel supplied to the burner.

5. In an oil burner, the combination with a burner bowl having a substantially flat spirally ribbed bottom portion and means for supplying fuel to the bottom portion of said bowl; of an annular fuel-preheating chamber surrounding the central portion of said bowl, an air conduit to deliver air upwardly thru the space enclosed by said annular chamber, a cap having a spider shaped top portion, said cap being adapted to seat over the discharge of said air conduit, and an umbrella deflector having its stem located axially of said cap and mounted upon said spider to deflect radially outwardly and downwardly the air delivered by said conduit.

AUGUST BEHRSIN.