

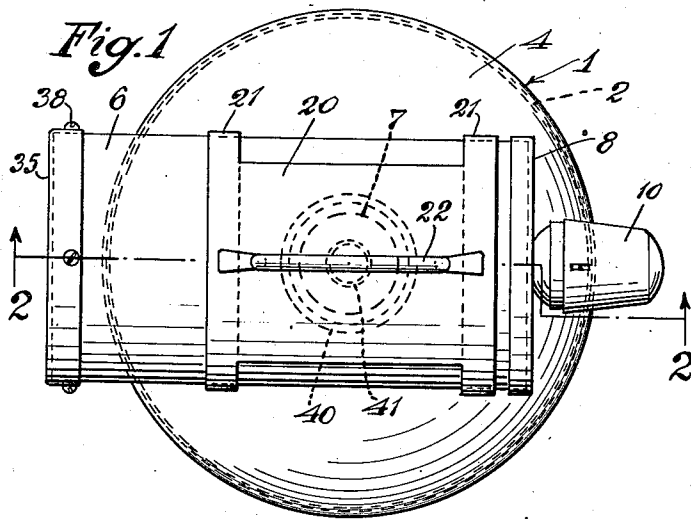
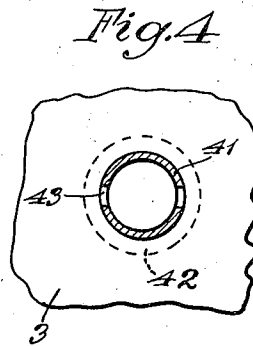
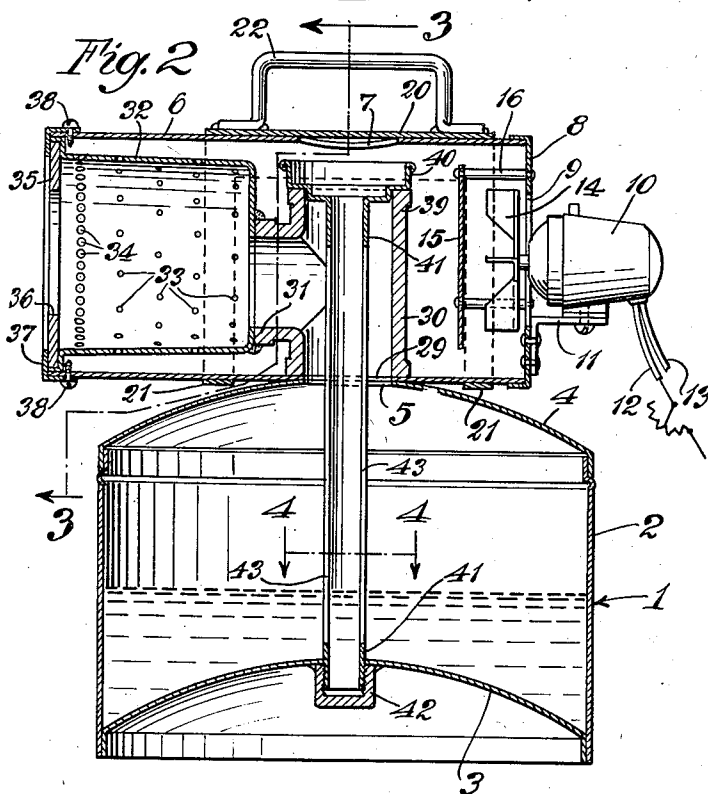
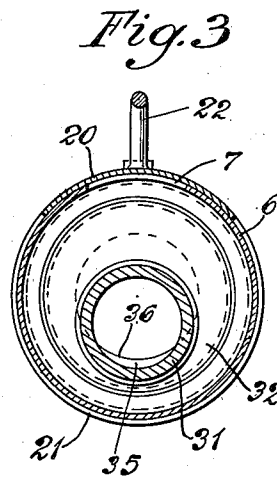
March 19, 1946.

J. L. BREESE

2,396,821

LIQUID FUEL BURNER STRUCTURE

Filed July 13, 1944



Inventor
James L. Breese
by Parker Plaster
Attorney.

UNITED STATES PATENT OFFICE

2,396,821

LIQUID FUEL BURNER STRUCTURE

James L. Breese, Santa Fe, N. Mex., assignor to
Oil Devices, Santa Fe, N. Mex., a limited partnership of Illinois

Application July 13, 1944, Serial No. 544,735

8 Claims. (Cl. 158—91)

My invention relates to an improvement in vapor generating type burners and has for one purpose to provide a vapor generating type burner in which the air supply is controllable and in which control of the air supply is employed to control the rate of combustion.

Another purpose is to provide an improved vapor generating type burner with means for controlling the rate of flow of air to the burner pot.

Another purpose is to provide an improved vapor generating type burner in which the vaporization of its liquid fuel takes place adjacent the path of flow of air into the vaporization chamber and of the path of flow of the vaporized liquid fuel out of the vaporization chamber to the zone of combustion.

Other purposes will appear from time to time in the course of the specification.

I illustrate the invention more or less diagrammatically in the accompanying drawing wherein:

Figure 1 is a plan view;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 2; and

Figure 4 is a section on the line 4—4 of Figure 2.

Like parts are indicated by like symbols throughout the specification and drawing.

Referring to the drawing 1 generally indicates a base or vaporization chamber having a circumferential side wall 2, a bottom 3 and a top 4 having a central aperture 5. Mounted in any suitable fashion upon the top 4, and for example welded thereto, is a generally horizontally axised generally cylindrical housing 6 having an air inlet aperture 7 in one side thereof. 8 is an end member for the cylinder 6, centrally apertured as at 9 and provided with any suitable booster motor 10 mounted for example on a bracket 11 and provided with conductive connections 12, 13, in circuit with any suitable source of electric power. Any suitable means may be employed for varying the rate of rotation of the motor, such as the rheostat diagrammatically indicated at 10a in Figure 2. 14 is a booster fan and 15 is any suitable air deflector mounted on the wall 8 for example by spacers 16. The end wall 8 may be bodily removable, if desired. The aperture 7 may be controlled by any suitable shutter 20 shown as a segmental plate provided with circumferential strips 21 which extend about the housing 6. 22 is a handle secured to the shutter 20. Thus when the operator lifts on the handle the shutter 20 is auto-

matically in closing position. 30 generally indicates a tubular fitting extending upwardly from the aperture 5 and the aligned aperture 29 of the cylinder 6. It has a side branch portion 31 secured to the bottom of the burner pot 32. The pot has a plurality of air inlets 33 located at various distances from the end of the pot. It may also have secondary air inlets 34 which are shown as arranged in a single circumferential row adjacent the outlet end of the pot. The apertures 34 may be larger and more closely spaced than the apertures 33 and are shown as tilted in the direction of the central aperture 36 of the flame ring 35 which partially closes the open end of the pot. 37 is any suitable securing angle ring which may be held in position for example by screws 38. The fitting 30 has an upward extension 39 which receives the upper cup 40 associated with the downwardly extending tube 41. The tube 41 extends to and through the bottom 3 of the generator chamber and is shown as screw threaded into the fitting 42 which is secured to and located below the bottom 3.

The tube 41 is also provided with longitudinal air inlet slots 43. It will be observed that the tube 41 and the cup 40 is aligned with the inlet aperture 7.

It will be realized that, whereas I have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawing to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting me to my precise showing.

The use and operation of my invention are as follows:

I provide a vapor generating type burner in which the base 1 constitutes a receptacle for a charge of the liquid fuel to be burned. The fuel may be delivered to the receptacle through the aperture 7, the cup 40 and the pipe or duct 41. The shutter 20 is effective to give access to the aperture 7 and thus to the duct 41.

In the use of the device air to support generating combustion flows downwardly through the duct 41 and through the slots 43, supporting combustion adjacent the level of the liquid fuel. This combustion is effective to vaporize the liquid fuel vapor flowing upwardly about the exterior of the duct 41, through the ducts 30 and 31 to the interior of the pot 32. It there receives primary air through the inlets 33 and secondary air through the inlets 34. Air is delivered into the

housing 6 by the fan operated by the booster motor 10. Any suitable means may be employed for controlling the speed of rotation of the motor and thus the rate of flow of air to the burner. At the same time variations in the rate of air inflow to the interior of the housing 6 effect changes in the rate of flow of air through the slots 43. Thus as the supply of air effective for mixture with the vaporized fuel increases, the amount of fuel vaporized also increases. I may also use any suitable means for varying the flow of air downwardly along the duct 41 to the interior of the liquid fuel receptacle.

I claim:

1. In a vapor generating type burner, a base including a tank adapted to receive a substantial charge of liquid fuel, said tank having a top provided with an aperture, an air housing positioned upon said top and apertured in communication with said aperture in the top, the interior of said housing being in communication with the outside air, a burner pot in said housing, having a circumferential wall provided with a plurality of air inlet apertures located at various distances from the end of the pot, a passage member in said housing extending between the interior of the pot and the interior of the tank, an air admission duct extending downwardly through said passage member into said tank and terminating below the normal level of the fuel in said tank, said duct having openings adapted to admit air to the interior of said tank for supporting partial combustion, the upper end of said duct being in communication with the space within the interior of said housing and therethrough, with the outside air.

2. In a vapor generating type burner, a base including a tank adapted to contain a charge of liquid fuel, a housing, the interior of which is in communication with the outside air, a burner pot positioned in said housing and having an open end, a centrally apertured flame ring partially closing said open end, located in one end of the housing, a duct extending between the opposite end of the pot and the tank, an air inlet duct, of smaller diameter, extending through said duct and into the tank and terminating below the normal level of the fuel in the tank, said air inlet duct having air discharge slots extending above and below the maximum fuel level of fuel in the tank, the upper end of said air inlet duct being in communication with the outside air through the interior of the housing.

3. In a vapor generating type burner, a liquid fuel tank adapted to serve as a base for the burner, a burner pot having a circumferential side wall provided with a plurality of air inlet apertures located at various distances from the end of the pot, a duct extending between said liquid fuel tank and one end of said pot, and providing a communication between the interior of the pot and the tank, and an air supply duct extending within and through said first mentioned duct into the interior of the tank, and terminating at a level below the level of the liquid fuel in the tank, said duct being in communication with the outside air and having apertures adapted to admit outside air to the interior of the liquid fuel tank.

4. In a vapor generating type burner, a liquid fuel tank, a foraminous walled burner pot, a duct extending between the interiors of the tank and the pot, and an air inlet duct adapted to supply air to the interior of the fuel tank, said air inlet

duct being of less diameter than said first mentioned duct and extending downwardly through said first mentioned duct into the tank, and an air housing surrounding said pot and the intake end of said air inlet duct and means effective to vary the rate of flow of air into said housing and thus through the foraminous wall of the pot and through said air inlet duct.

5. In a vapor generating type burner, a liquid fuel tank, a foraminous walled burner pot, a duct extending between the interiors of the tank and the pot, and an air inlet duct adapted to supply air to the interior of the fuel tank, said air inlet duct being of less diameter than said first mentioned duct and extending downwardly through said first mentioned duct into the tank, and an air housing surrounding said pot and the intake end of said air inlet duct and means effective to vary the rate of flow of air into said housing and thus through the foraminous wall of the pot and through said air inlet duct, including a fan and means for operating it at varying speeds.

6. In a vapor generating type burner, a liquid fuel tank, a foraminous walled burner pot, a duct extending between the interior of the tank and the pot, a duct for supplying air, sufficient to support partial combustion, to the interior of the liquid fuel tank and means for simultaneously increasing or diminishing the rate of air flow to the interior of the tank and through the apertures of the burner pot and for thereby controlling the rate of partial combustion and the rate of the combustion in the pot, said means including an air housing surrounding the pot and the intake end of the air duct, and means for varying the input of air thereto.

7. In a vaporizing burner, a liquid fuel storage tank, a foraminous walled burner pot mounted on said tank, a duct extending between interiors of the tank and the pot, and adapted for the passage of vaporized fuel from the interior of the tank to the interior of the pot, and an air inlet duct, adapted to supply air to the interior of said fuel tank, said duct being of less diameter than the first-mentioned duct and extending downwardly through said first-mentioned duct into the interior of the tank to a point below the level of liquid fuel in said tank, said duct having an aperture extending both above and below the normal level of liquid fuel in said tank, adapted to deliver air to the liquid fuel, at the surface of the liquid fuel, throughout a substantial variation of level of liquid fuel in said tank.

8. In a vaporizing burner, a liquid fuel storage tank, a foraminous walled burner pot mounted on said tank, a duct extending between interiors of the tank and the pot, and adapted for the passage of vaporized fuel from the interior of the tank to the interior of the pot, and an air inlet duct, adapted to supply air to the interior of said fuel tank, said duct being of less diameter than the first-mentioned duct and extending downwardly through said first-mentioned duct into the interior of the tank to a point below the level of liquid fuel in said tank, said duct having an aperture extending both above and below the normal level of liquid fuel in said tank, adapted to deliver air to the liquid fuel, at the surface of the liquid fuel, throughout a substantial variation of level of liquid fuel in said tank, and means for simultaneously increasing or diminishing the rate of air flow through said air inlet duct and through the apertures of the burner pot.

JAMES L. BREESE.