

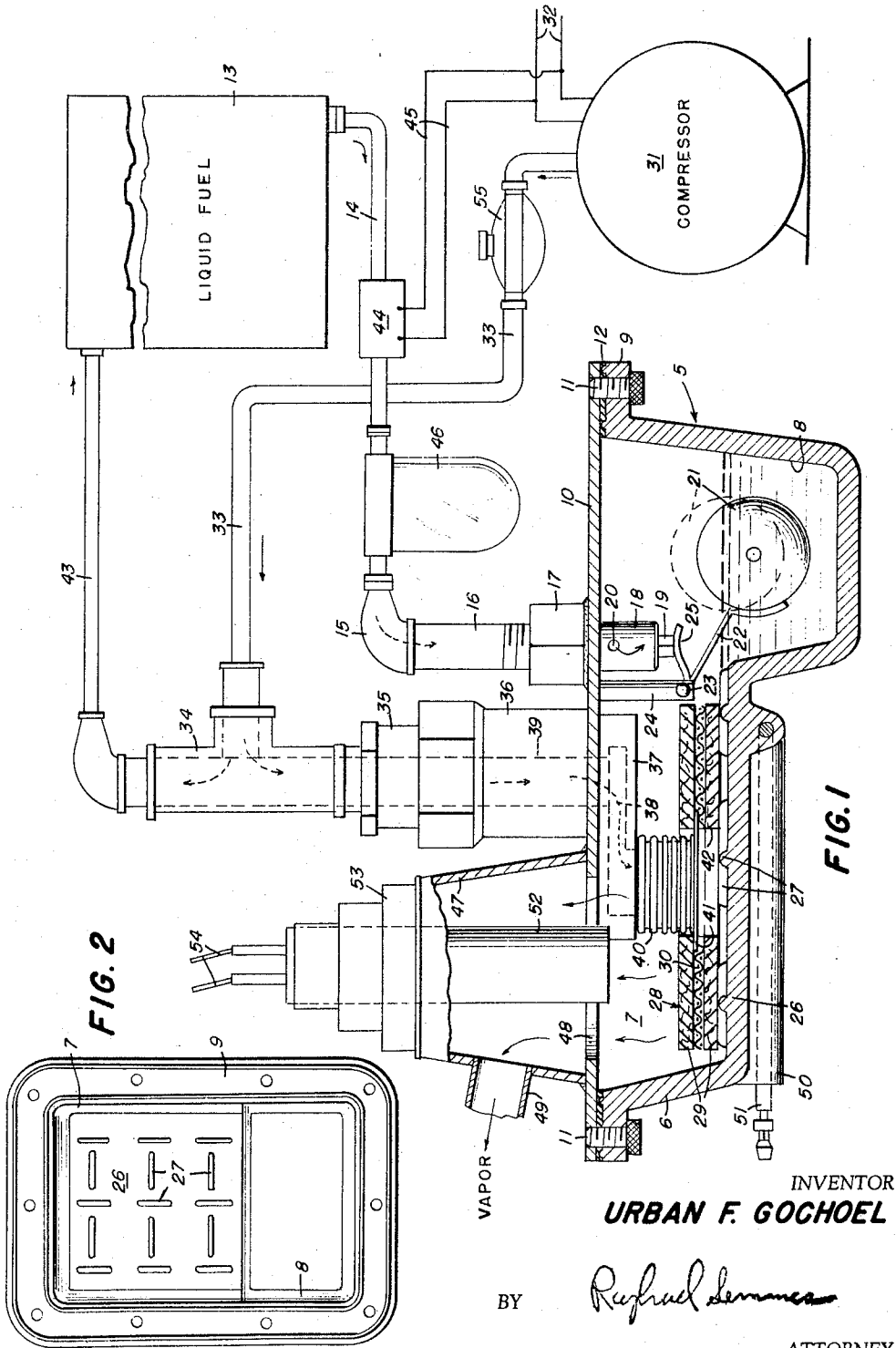
Sept. 22, 1959

U. F. GOCHOEL

2,905,800

GASEOUS FUEL GENERATOR

Filed Oct. 11, 1957



1

2,905,800

GASEOUS FUEL GENERATOR

Urban F. Gochoel, Dayton, Ohio, assignor to Vapo-Gas Corporation, Washington, D.C., a corporation of Delaware

Application October 11, 1957, Serial No. 689,707

10 Claims. (Cl. 219—38)

This invention relates to apparatus for generating gaseous fuel and consists more particularly in new and useful improvements in a device for gasifying a normally liquid fuel for use in connection with cooking stoves, water heaters, space heaters and other equipment of this character, the present invention being an improvement on that disclosed in my U.S. Patent No. 2,795,493, issued on June 11, 1957.

An object of this invention is to provide apparatus for converting a volatile liquid fuel into a gaseous fuel with a minimum of explosive hazard and which may be utilized indoors or outdoors with equal safety.

Another object of the invention is to provide apparatus for converting a liquid fuel such as gasoline into a gaseous fuel and in which a minimum amount of liquid fuel is handled at any one time and with minimum pressures being involved.

Still another object of the invention is to provide apparatus for converting a liquid fuel into a gaseous fuel for use in the burners of a cooking stove or other fuel consuming equipment with practically immediate response when turning on a burner or burners.

Still another object of the invention is to provide in a gaseous fuel generating system, a compact, self-contained gas generator which is completely automatic in operation.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel features herein set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings in which numerals of like character designate similar parts throughout both views:

Figure 1 is a view of the gaseous fuel generator shown partially in section with the system in general shown diagrammatically; and

Figure 2 is a reduced top plan view of the generator base with the cover removed.

In the drawings, the generator is represented by the numeral 5 and consists of a relatively shallow, hollow, base portion or pan 6 forming a gasifying chamber 7 which terminates at one end in a depression or well 8. The pan 6 is preferably formed of a suitable cast metal, such as aluminum, and its upper edge is bounded by a horizontal flange 9 for receiving the complementary edge of a top closure 10 of similar cast metal, the latter being secured in place on the base flange by means of suitably spaced screws or the like 11. A gasket 12 is preferably interposed between the top closure 10 and the flange 9 to insure an adequate seal for the gasifying chamber 7.

A gasoline or other volatile liquid fuel supply tank 13 is connected by line 14 and elbow coupling 15 to a vertical tube 16 which is screwed into a boss 17 formed on the upper face of the top closure 10, a suitable valve 18 controlling the admission of fluid from the tank 13 to the interior of the pan 6. The valve 18 is preferably a needle valve, actuated by a depending stem 19 which controls the admission of liquid fuel through the radial port 20 located immediately above the depression or well

2

8. A float 21 is carried by a float arm 22 pivotally mounted at 23 on a depending post 24 fixed to the underside of the top closure 10. The float arm 22 carries a valve actuating finger 25 which is arranged in line for abutment with the valve actuating stem 19.

Thus, when the liquid fuel in the well 8 reaches the level of the elevated top of ribs 27 of the gasifying chamber 7, the elevation of the float 21 through the finger 25, closes the valve 18 and prevents the further flow fluid through the port 20. The arrangement is such that a very slight movement of the float 21 controls the replenishment of liquid fuel to the well 8.

The upper face of the platform formed by bottom wall 26 is provided with a series of raised, horizontal ribs 27 preferably arranged in right-angular relation to one another to provide raised supports for a pad generally indicated by the numeral 28. This pad is preferably rectangular in shape to conform generally to the shape of the gasifying chamber 7 and is formed of two layers of felt or the like 29 between which is interposed a complementary strip of metal screen or mesh 30 for insuring the necessary rigidity and control of the pad.

A compressor 31, preferably driven by an electric motor (not shown) connected to a suitable source of electricity by power lines 32, furnishes air under pressure through pressure line 33 to the gasifying chamber 7. The pressure line 33 is connected by a T-connection 34 and gland 35 to an upstanding fitting 36 carried by the top closure 10 and feeding into the gasifying chamber 7 through a head 37 embracing the underside of the top closure 10. A conduit 38 in the head 37 connects the inner passageway 39 in the fitting 36 with the interior of a pressure seal 40 located substantially centrally with respect to the absorbent pad 29. The lower extremity of the seal 40 is provided with a radial flange 41 which engages over the central portion of the mesh screen 30 for the purpose of holding the pad in tight engagement with the ribs 27 on the platform or bottom member 26. The pad 29 and screen 30 are provided with a central aperture 42 which envelopes the discharge end of the pressure seal 40, so that the pressurized air from conduit 38 is fed through the saturated pad 29 to the gasifying chamber 7 without passing through a body of liquid to be vaporized. Thus, the vapor formed in the chamber 7 is free from droplets when it leaves the chamber, as will later appear.

The opposite end of the T-connection 34 is connected by a pipe line 43 to the top of the interior of the liquid fuel tank 13, to provide an equalizing pressure above the liquid level in the fuel supply tank so as to insure a steady feed of gasoline to the gasifying chamber 7, as will later appear.

The liquid fuel line 14 may be provided with a solenoid controlled valve 44 electrically connected by lines 45 to the power lines 32 whereby, when the compressor 31 is not in operation, the liquid line 14 is closed to prevent the feeding of fuel to the well 8. Also, a conventional filter 46 may be located in the fuel supply line 14 to prevent the admission of solid matter or dirt from entering the gasifying chamber.

An upstanding dome 47 is fastened to the top side of the closure member 10 and bounds an opening 48 in the latter, leading to the gasifying chamber 7. This dome is provided in one wall with a vapor outlet pipe 49 which in turn is connected to the gas appliance or appliances for which the gaseous fuel is being generated.

Preferably, cast integrally with the underside of the bottom 26, is a housing 50 for an electrical heating element 51 which is preferably embedded therein. A thermostat 52 supported by the cap 53 of the dome 47 depends vertically in the dome and is responsive to temperature conditions in the dome and the gasifying cham-

ber 7. This thermostat is connected by leads 54 to the heating element 51 which is thereby responsive to the temperature conditions in the gasifying chamber 7.

In order to maintain a uniform flame in the burner or burners which are fed through the vapor line 49, regardless of the number of burners in operation at any one time, the air pressure line 33 may be provided with a pressure regulator or pressure accumulator shown diagrammatically at 55. This pressure control device 55 is connected on one side to the compressor 31 and on the other to the gasifying chamber 7, to maintain a constant pressure for meeting varying demands of vapor, such as shifting from one burner to four burners on a stove and vice versa. The regulator will maintain the same height of flame per burner regardless of the number of burners in operation.

In use, when the compressor 31 is turned on, the solenoid valve 44 opens, permitting liquid fuel to flow through line 14 and tube 16 into the liquid well 8. When the liquid in the well reaches the level of the tops of the ribs 27 on the platform or bottom member 26, the float 21 automatically shuts the valve 18 to prevent the admission of further liquid fuel. The composite pad 28 resting on the ribs 27, absorbs the fuel lying on the platform 26 around the ribs 27 and due to the heat generated by the heating element 51, the liquid fuel is vaporized in gasifying chamber 7, from whence it rises through the dome 47 and is fed under pressure and free of droplets, to the gas burners of the various appliances. The compressor 31 and regulator 55 insure the maintenance of the necessary pressure in the gasifying chamber 7 and at the same time, an equalizing pressure on the liquid fuel in the tank 13, so as to prevent backing up of fuel in the line 14 or air locking the line. The state of the vapor developed in the gasifying chamber 7 being primarily determined by the degree of heat applied thereto, the heating element 51 is controlled by the thermostat 52 so that vapor fuel is immediately available for use and is constantly replaced as it is consumed.

It will thus be seen that I have provided a compact, self-contained gasifying unit which lends itself to a great variety of uses with complete safety and with a maximum of efficiency because of its ability to immediately respond to the demand for gas fuel. Furthermore, by embedding the heating unit in the metal of the bottom portion or platform of the gasifying chamber, a more effective utilization of heat is insured with the elimination of waste energy and being enclosed, the danger of fire hazards from the leaking of vapors and spilling of gasoline on hot heating elements is minimized.

An important feature of the invention and one which lends to its compactness, its economy of manufacture and its simplicity of construction and installation, is the arrangement wherein the removable top closure 10 for the pan 6, serves the added function of collectively supporting the liquid fuel feed line, the liquid level controller, the pressure line connection, the thermostat for controlling the temperature in the gasifying chamber, and the vapor outlet pipe.

From the foregoing, it is believed that the invention may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details disclosed without departing from the spirit of the invention as set forth in the following claims.

I claim:

1. A gaseous fuel generator comprising a pan forming a combined liquid fuel reservoir and adjoining gasifying chamber, a portion of the bottom wall of said pan forming a platform elevated with respect to said reservoir and adapted to receive a controlled overflow of liquid therefrom, an absorbent pad resting horizontally on said platform with its lower side contacting said overflow

and its upper side exposed in said chamber, an electric heating element for said platform, a top closure for said pan overlying said chamber and reservoir, said top closure collectively supporting feed means for supplying a liquid fuel to said reservoir, control means associated with said feed means and responsive to changes in the liquid level in said reservoir for maintaining a controlled overflow onto said platform, a line for supplying air under pressure to the overflow area underlying said pad, means responsive to the temperature in said chamber for controlling said heating element, and a discharge conduit for conducting gaseous fuel from said chamber.

2. A gaseous fuel generating system as claimed in claim 1, including means associated with said air pressure line for supplying an equalizing pressure to said liquid fuel supply.

3. A gaseous fuel generating system as claimed in claim 2, including pressure regulating means in said pressure line for maintaining a constant pressure in said chamber.

4. A gaseous fuel generator comprising a pan forming a combined liquid fuel reservoir and adjoining gasifying chamber, a portion of the bottom wall of said pan forming a platform elevated with respect to said reservoir and adapted to receive a controlled overflow of liquid fuel therefrom, a series of ribs on the upper surface of the platform, an absorbent pad resting horizontally on said ribs with its lower side contacting said overflow and its upper side exposed in said chamber, an electric heating element for said platform, a top closure for said pan overlying said chamber and reservoir, said top closure collectively supporting feed means for supplying a liquid fuel to said reservoir, control means associated with said feed means and responsive to changes in the liquid level in said reservoir for maintaining a controlled overflow onto said platform, a line for supplying air under pressure to the overflow area underlying said pad, means responsive to the temperature in said chamber for controlling said heating element, and a discharge conduit for conducting gaseous fuel from said chamber.

5. A gaseous fuel generator comprising a pan forming a combined liquid fuel reservoir and adjoining gasifying chamber, a portion of the bottom wall of said pan forming a platform elevated with respect to said reservoir and adapted to receive a controlled overflow of liquid fuel therefrom, an absorbent pad resting horizontally on said platform with its lower side contacting said overflow and its upper side exposed in said chamber, means on said platform supporting said pad in vertically spaced relation to the latter, resilient means for maintaining the engagement of said pad with said platform, an electric heating element for said platform, a top closure for said pan overlying said chamber and reservoir, said top closure collectively supporting feed means for supplying a liquid fuel to said reservoir, control means associated with said feed means and responsive to changes in the liquid level in said reservoir for maintaining a controlled overflow onto said platform, a line for supplying air under pressure to the overflow area underlying said pad, means responsive to the temperature in said chamber for controlling said heating element, and a discharge conduit for conducting gaseous fuel from said chamber.

6. A gaseous fuel generator as claimed in claim 5, wherein said resilient means comprises a pressure seal having its lower end open and in communication with said overflow area and said means for supplying air under pressure is associated with said pressure seal.

7. A gaseous fuel generator as claimed in claim 6, wherein said pad is formed of at least two layers of absorbent material with a mesh screen interposed therebetween, the lower end of said pressure seal being arranged in engagement with said mesh screen.

8. A gaseous fuel generator as claimed in claim 5,

5

wherein said heating element is embedded in the wall of said platform.

9. A gaseous fuel generator comprising a shallow pan forming a combined fuel reservoir and adjoining gasifying chamber, a portion of the bottom wall of said pan forming a platform adjacent said reservoir and elevated with respect thereto, an absorbent pad resting horizontally on said platform with its upper side exposed in said chamber, an electric heating element for said platform, a top closure for said pan, feed means for supplying a liquid fuel to said reservoir, control means associated with said feed means and responsive to changes in the liquid level in said reservoir for limiting the overflow from said reservoir to said platform, to the absorbent capacity of said pad, a line for supplying air under pressure to the pad and overflow area, means responsive to

the temperature in said chamber for controlling said heating element, and a discharge conduit for conducting gaseous fuel from said chamber.

10. A gaseous fuel generator as claimed in claim 9, wherein the upper side of said platform is provided with a series of raised ribs to support said pad.

6

References Cited in the file of this patent

UNITED STATES PATENTS

607,417	Bailey	July 19, 1898
2,678,202	Brake	May 11, 1954
2,795,493	Gochoel	June 11, 1957

FOREIGN PATENTS

145,454	Australia	Feb. 27, 1952
---------	-----------	---------------