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GAS PRODUCING APPARATUS

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2 Claims. (Cl. 261—121)

My invention relates to improvements in gas producing apparatus and has to do, more particularly, with apparatus of the type in which a combustible gas is produced by forcing air through a liquid hydrocarbon fuel.

There is apparatus upon the market of that type, which includes a compressor unit and a pipe leading therefrom to the bottom of a fuel storage tank, so that the air from the compressor is forced through the liquid fuel to form a combustible gas which is stored under pressure above the liquid fuel in said tank. Such apparatus is relatively expensive, however, because of the complicated special compressor unit thought to be required under these circumstances.

Accordingly, the chief object of my invention is to provide a simple and efficient gas producing apparatus of this general type, which can be manufactured and sold or installed at a relatively low cost, and which will be just as safe, practical and efficient as the more expensive apparatus heretofore used.

A further object of my invention is to provide an apparatus of this character employing a simple and conventional motor driven air compressor and including, in the pipe line leading from the compressor, a simple combined check valve and oil reservoir unit, whereby the air passing to the fuel tank will be washed by the oil in the reservoir and said oil will form an oil seal for the check valve.

Further objects, and objects relating to economies of construction and details of operation, will definitely appear from the detailed description to follow. In one instance, I accomplish the objects of my invention by the devices and means set forth in the following specification. My invention is clearly pointed out and defined in the appended claims. A structure constituting a preferred embodiment of my invention is illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a view in side elevation of apparatus embodying my invention; and

Fig. 2 is a detail, vertical sectional view through the combined check valve and oil reservoir unit, showing the check valve unseated due to operation of the air compressor.

In the drawing, the same reference numerals indicate the same parts throughout the several views.

In general, my invention consists in providing a gas producing apparatus comprising an air compressor, a fuel storage tank, and a pipe line leading from the compressor to a point below the

level of fuel in said tank, which is filled with air at or above tank pressure together with an oil reservoir and a check valve inserted in said pipe line, with the valve between the compressor and reservoir so that, when the compressor operates, the check valve is unseated and air forced there-through to the tank is washed by passage through oil in the reservoir and, when the compressor ceases to operate and the valve seats, oil from the reservoir backs up in the valve so that it is oil sealed and reverse flow of air at tank pressure therethrough is prevented.

Referring to the numbered parts of the drawing, the numeral 10 indicates a simple air compressor of conventional form. This will comprise an electric motor and an air compressor driven thereby and needs no detailed description here as such units are well known and may be purchased on the open market at relatively low cost. The pipe 12 leads from the discharge port of the compressor and is connected to the inlet chamber 13 of a check valve 13. This check valve is of standard construction and includes the inlet chamber 13 and outlet chamber 19 connected by a passage 14 surrounded by a flat valve seat 15, upon which the flap valve 16, hinged at 17, is adapted to seat to close the passage.

The outlet chamber 19 of the check valve is connected by the pipe section 23 to a T-fitting 22, one arm of which is connected by pipe section 21 to the bottom of the chamber 20 forming an oil reservoir. The third arm of the T-fitting is closed by a removable plug 24. The upper end of the oil reservoir 20 is connected by a pipe section 25 to one arm of the T-fitting 26. A second arm of this fitting is connected to the pipe 27 and the third arm is closed by the removable plug 28.

The pipe 27 extends into the fuel storage tank 11, to a point below the level of fuel therein, where one or more openings are provided in the bubbler pipe extension to permit the compressed air to escape therefrom through the liquid fuel in said tank. A pressure gauge 37 may be connected into the pipe 27 to register the air pressure therein, which will be the same as that existing in tank 11. The valve 32 is also connected into pipe 27 to permit of cutting off the tank from the compressor, as when the latter is to be removed for repairs or adjustment. Numeral 33 indicates a pressure-operated electric switch connected into pipe 27, operated by air pressure therein and controlling the circuit of the compressor motor. This switch is of conventional construction and needs no further description here. It should be so connected that the motor circuit is closed when

the tank pressure falls to a certain point and opened when it is increased above the determined maximum. The tank 11 is provided with a filler pipe 30 and a fuel gauge pipe 31. The pipe 29 leads from the tank 11 to the burners or other appliances which consume the gas produced.

In operation, the tank 11 is filled with a suitable liquid hydrocarbon fuel, of a well-known character, to the level indicated by the dotted line and a supply of oil, preferably lubricating oil of good quality, is placed in the oil reservoir 20. Oil is introduced into the reservoir 20 through the T-fitting 26, the plug 23 being removed for that purpose. The compressor 10 being idle, the valve 16 is seated and oil from reservoir 20 enters outlet chamber 19 and provides an oil seat for the check valve, so that air pressure from pipe 27, which is the same as that existing in tank 11 cannot escape past the check valve. When the compressor 10 is operated, the air under pressure in pipe 12 is forced through the check valve opening valve 16, and through the oil in reservoir 20 and the connections between it and outlet chamber 19 of the check valve, thus washing the air and freeing it of dust or dirt entrained therein. The oil may be drained from reservoir 20, when desired, by removing plug 24. The compressed air, having been thus washed, is forced out through the openings in pipe 27 below the fuel level and bubbles through the liquid fuel in tank 11, thus producing a combustible gas which is stored for use above the liquid fuel in said tank. When the compressor ceases to operate, the air pressure in pipe 27, which is the same as the pressure of the gas in tank 11 causes the valve 19 to seat and this seating is rendered effective by the oil which backs up from reservoir 20 and forms an oil seat for the valve. Thus loss of tank air pressure from pipes 27 through the check valve is prevented.

This apparatus is very simple and inexpensive and a very simple and cheap motor-compressor unit may be used, but, nevertheless, I have found that the apparatus disclosed is just as efficient and safe as the more expensive equipment heretofore used, and more practical in operation because of its simplicity.

I am aware that the apparatus disclosed herein is subject to considerable variation, without departing from the spirit of my invention, and, therefore, I claim my invention broadly, as indicated by the appended claims.

What I claim is:

1. A gas producing apparatus comprising the combination of a motor-driven compressor, a fuel storage tank, a pipe leading from the outlet of said compressor, a check valve having its inlet chamber connected to said pipe, an oil reservoir connected below the level of oil therein with the outlet chamber of said check valve, a pipe leading from said reservoir above the level of oil therein to a point below the fuel level in said tank and maintained filled with air at or above tank pressure, and a pressure-operated switch connected to said last-named pipe line for controlling the operation of the motor compressor.

2. A gas producing apparatus comprising the combination of a motor-driven compressor, a fuel storage tank, a pipe leading from the outlet of said compressor, a check valve having its inlet chamber connected to said pipe, an oil reservoir connected below the level of oil therein with the outlet chamber of said valve, a pipe leading from said reservoir above the level of oil therein to a point below the fuel level in said tank and maintained filled with air at or above tank pressure, and a pressure-operated switch responsive to tank pressure for controlling the operation of the motor compressor.

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