April 1, 1930. G. R. ROESCH 1,752,851

GAS PRODUCING APPARATUS

Filed Sept. 2, 1927

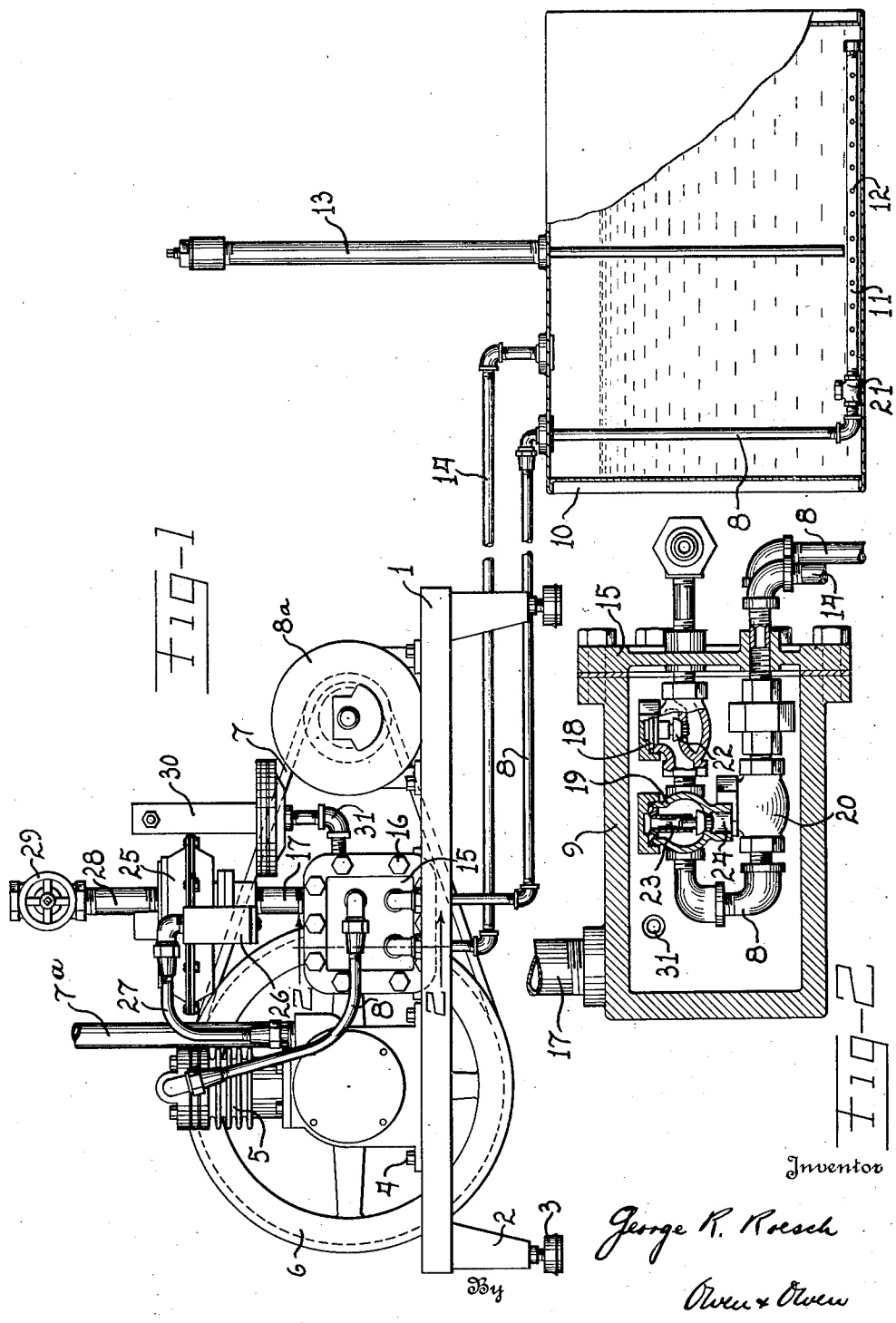


Fig-1

Fig-2

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Patented Apr. 1, 1930

1,752,851

UNITED STATES PATENT OFFICE

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GAS-PRODUCING APPARATUS

Application filed September 2, 1927. Serial No. 217,138.

This invention relates to gas producing machines of the type employing a volatile liquid through which a gaseous fluid is forced under pressure for forming the gas.

Objects of this invention are to produce a simple and efficient gas producing apparatus, which is automatic in its operation and designed to provide a uniform flow of gas and having certain safety features hereinafter described; to provide in a gas producing machine means for preventing the flow of seepage of the volatile liquid to the source of gaseous pressure fluid when the latter is shut off; and to provide a new and improved gas producing machine which is compact in its arrangement, simple in construction, reliable in operation and having the novel features of construction hereinafter described.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a side elevation showing the tank in vertical sectional elevation of a gas producing apparatus, and Fig. 2 is an enlarged sectional elevation of the gas receiving chamber showing the valve arrangement in the feed line.

The illustrated embodiment of the invention comprises a base 1 which is mounted on legs 2 having adjustable blocks 3 to enable the base to assume a level position. With the exception of the fuel tank and pipe threading thereto, the entire apparatus is mounted on the base 1 so as to provide a compact and unitary assembly for convenience in installation and handling.

Secured by bolts 4 to the base 1 is a compressor 5 having a relatively large driving wheel 6 connected by a belt 7 to an electric motor 8^a. The compressor may be of any suitable description, but preferably is of the enclosed type, drawing in air through a breather tube 7^a to the crank case and forcing the same out through a feed line 8. The feed line 8 extends through a gas receiving vault or chamber 9 forming a U-bend and extends through the top of a tank 10 to the bottom thereof. Connected to the end of feed line 8 and resting on the bottom of the tank is a pipe 11 having a plurality of holes or perforations 12 through which the air may be forced into the liquid in the tank. The tank 10 is of metal and is constructed fluid tight, having a suitable filling tube 13 extending above the tank so that the latter may be positioned below the surface of the ground with the filler tube extending thereabove.

The tank is partially filled with a volatile liquid, such as gasoline, and by blowing air through the liquid, the gas is formed in the space above the liquid. The gas so formed passes from the tank through a pipe 14 leading from the top of the tank and terminates in the closure plate 15 of the gas chamber 9. The gas chamber 9 is suitably connected to the base 1, and the closure plate 15 is connected to the gas box or chamber by bolts and nuts 16. The inside of the box 9 may be treated with litharges or shellac to insure a fluid tight and serviceable construction, and the gas passes from the box through an outlet or discharge pipe 17 extending from the top thereof.

The compressor 5 is designed to force air into the tank 10 at a certain pressure, for example, six pounds, and it will be apparent that the gas pressure in the tank will be equal to the pressure of the gas in the gas box 9. When the compressor 5 stops, it is apparent that unless some means is provided for closing the feed pipe 8, the pressure on top of the liquid in the tank 10 will force a liquid through the pipe 8 into the compressor, which would not only destroy the lubricant in the crank case, but also create a fire hazard and be otherwise dangerous. To militate against such conditions, valves 18, 19 and 20 are connected to the feed pipe 8 and positioned in the gas box 9. In addition to the valves 18, 19 and 20, a valve 21 is connected to the feed pipe 8 and positioned in the lower portion of the tank 10. The valves 18, 20 and 21 may be of the usual pressure reducing type having a valve stem 22 positioned in the line of air flow and adapted to close when the compressor 5 stops. It is apparent that the valve 21 being submerged in the liquid of the tank 10 is not in such position that it can be readily cleaned and serviced, so that it is not practical to depend on

that valve to prevent the passage of liquid from the tank to the compressor.

In order to supplement the valve 21 and to insure against seepage and flow of the liquid in a return direction through the feed line 8, the valves 20 and 18 are provided, the valve 18 being nearest to the compressor. It is apparent that gaseous fluid is at all times present in the feed pipe 8 between the valves 18 and 20, this being insured by the valve 19 having a poppet valve 23 and having a lower end 24 open to the inside of the gas box 9. When the pressure in the gas box, which is the same as the pressure in the tank, is greater than the pressure in the feed pipe 8 between the valves 18 and 20, the valve 23 is lifted from its seat allowing gas to enter the feed line, and thereby equalize the pressure between the gas in the box 9 and in the feed pipe 8. It is manifest that a gas cushion is provided between the valves 18 and 20 which counter-acts the tendency of the liquid in the tank 10 being forced in a return direction through the feed line 8 by the gas pressure on the top of the liquid. Release of seepage takes place through the feed line 8 past the valve 21, and the gas cushion between the valves 18 and 20 unmistakably prevents flow of liquid to the compressor 5.

From the gas box 9, the gas passes to a governor 25 of the flexible disc type, which is for the purpose of maintaining the pressure of delivered gas substantially constant at all times. Detailed description of the governor 25 is deemed unnecessary, as the construction thereof is well known to those skiled in the art, and forms no part of the present invention. Supplementing the action of the governor 25 and connected thereto is a mercury seal 26 connected by a tube 27 to the breather tube 7^a. In the event that the pressure in the governor 25 feeds a predetermined maximum, the mercury in the seal 26 is lifted and forced upwardly to allow passage of the gas out through the breather tube. The construction of the mercury seal is well known to those skilled in the art, and detailed description thereof is likewise deemed unnecessary.

From the governor 25, gas passes through the pipe 28 to the point of use, the flow being controlled by a globe valve 29.

The operation of the motor 8^a may be controlled by an automatic cut-out switch 30 having a diaphragm which communicates with the interior of the gas box 9 through a pipe 31. The switch 30 may operate, for example, when a minimum pressure of three pounds is reached in the gas box, and cut-out when a pressure of six pounds has been attained. It is not considered necssary to enter into a detailed description of the cut-out switch 30 as the same is well known to those skilled in the art, and the construction thereof forms no part of the present invention.

While I have shown and described a construction which is the best form known to me at the present time, it is to be understood that numerous changes in details of construction and arrangement may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a gas producing apparatus having a tank for vaporific liquid to which gaseous pressure fluid is fed through a pipe line, a gas collecting chamber, a duct leading from the tank to the chamber for supplying gas thereto, means to maintain the pressure of gas delivered from the chamber substantially uniform, and devices for providing a gas cushion in the pressure fluid line leading to the tank including a valve member in communication with the inside of the collecting chamber, thereby to prevent forcing liquid from the tank through the feed line.

2. In an automatic gas machine, a compressor, a tank for gasolene, a feed line connecting the compresser and tank, said feed line including a perforated tube disposed in the lower portion of the tank, a chamber, means providing a duct from the tank to the chamber, valve devices in the feed line including a valve member in communication with the inside of the chamber for producing a gaseous fluid cushion to prevent seepage of gasolene to the compressor, a discharge line from the chamber, and means in the discharge line for maintaining the pressure of the discharged gas substantially uniform.

3. In a gas producing apparatus having a feed line for gaseous pressure fluid, a tank for vaporific liquid to which said line leads, and a gas outlet line from the tank, a safety box to which the outlet line extends, and valve means in the feed line having a part communicating with the inside of said box for producing a gaseous fluid cushion in the feed line of a pressure substantially equal to the gas pressure within the box.

In testimony whereof I have hereunto signed my name to this specification.

GEORGE R. ROESCH.