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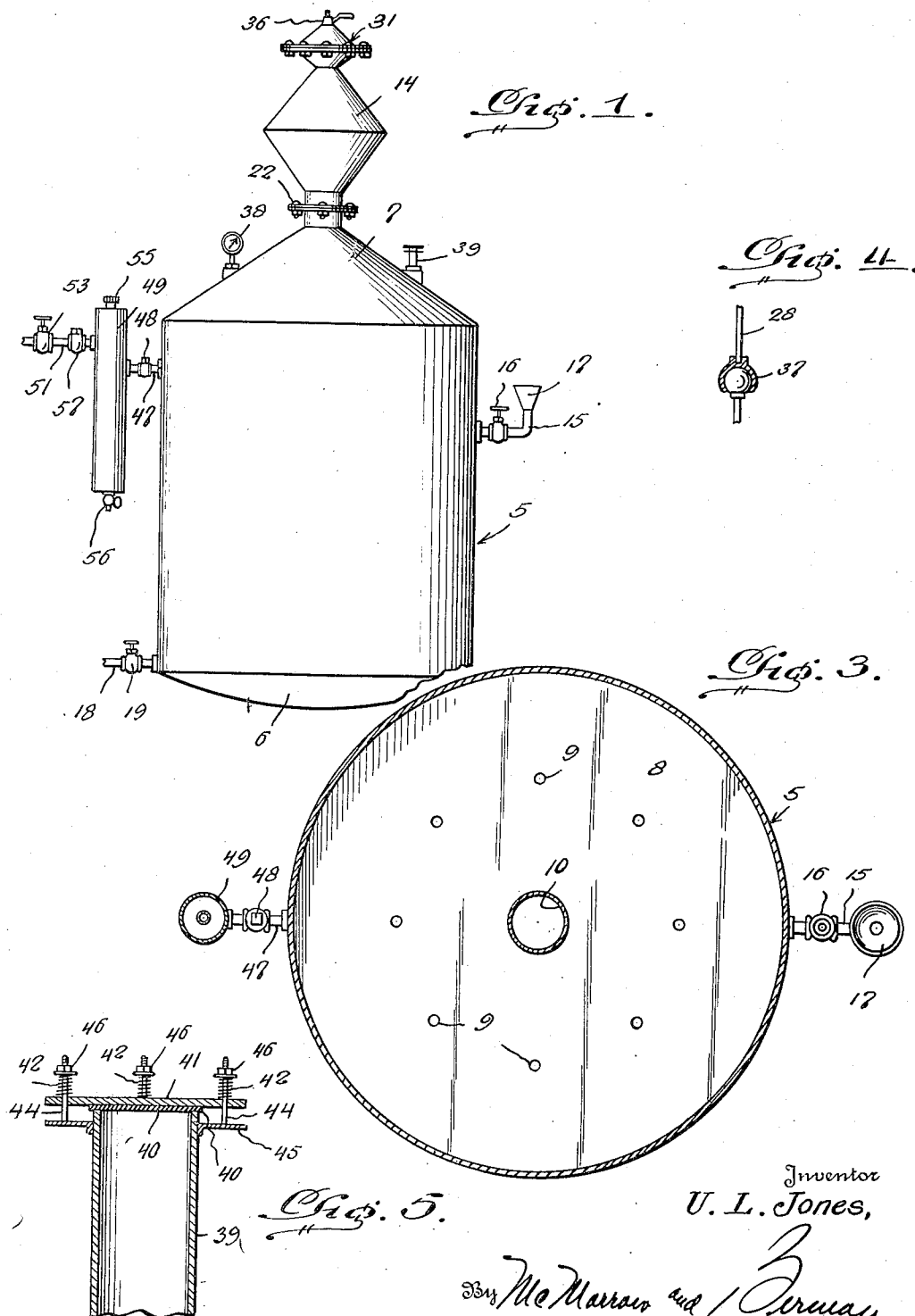
U. L. JONES

2,367,401

GAS GENERATOR

Filed Jan. 26, 1943

2 Sheets-Sheet 1



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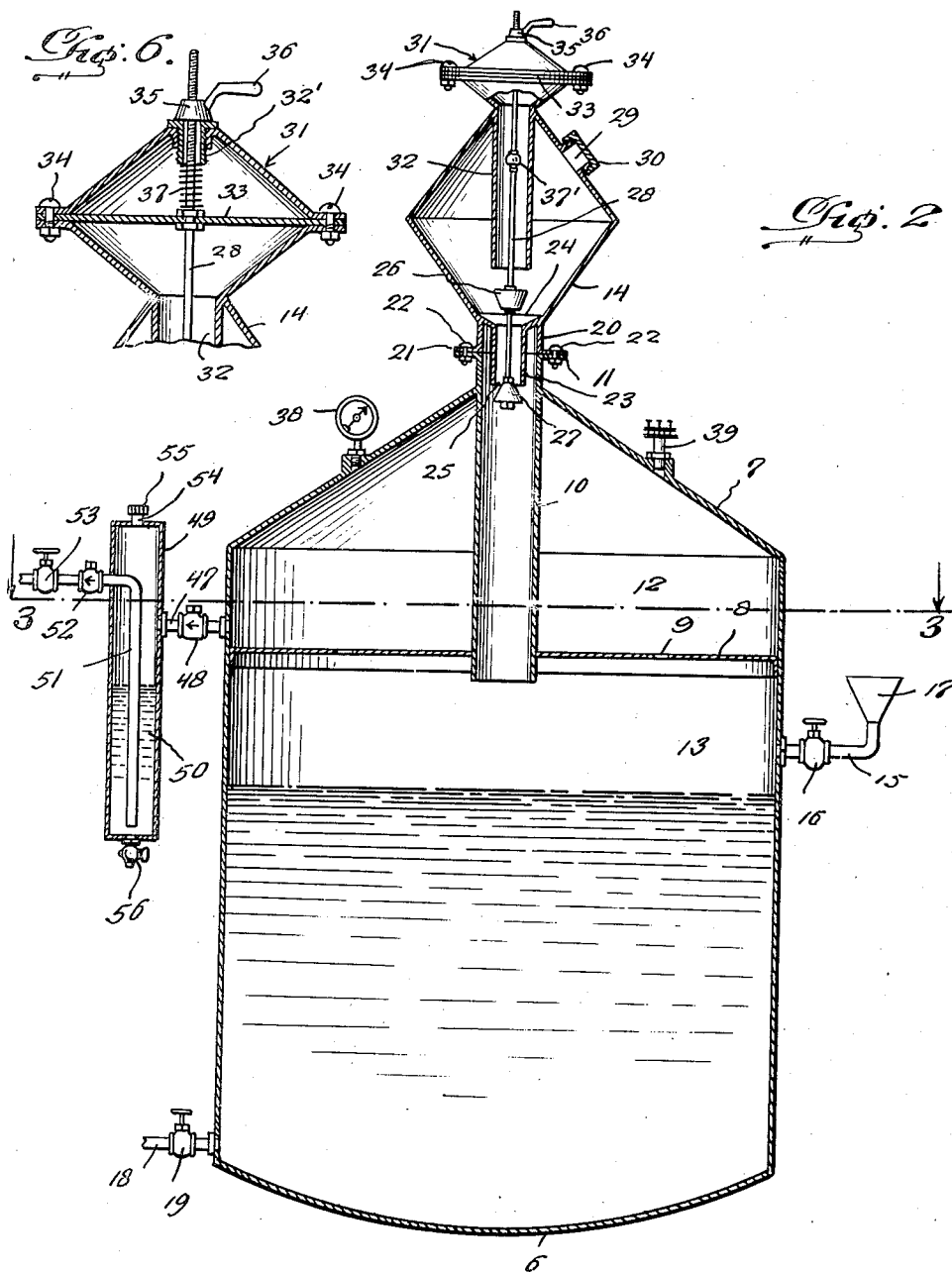
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UNITED STATES PATENT OFFICE

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GAS GENERATOR

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1 Claim. (Cl. 48—53.3)

This invention relates to an acetylene gas generator especially adapted for supplying acetylene gas for welding purposes, and has for the primary object the provision of a device of this character which will automatically replenish the supply of gas as used and may be rendered inoperative when desired.

Another object of this invention is the provision of a construction which will permit various parts of the device to be easily adjusted, examined and repaired when need therefor may occur, the construction being compact permits the device to be handled and moved from place to place with ease. With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a side elevation illustrating a gas generator constructed in accordance with my invention.

Figure 2 is a vertical sectional view illustrating the device.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a detail sectional view illustrating a ball and socket connection employed in a valve rod of the device.

Figure 5 is a fragmentary vertical sectional view illustrating a construction of a safety device employed on the device.

Figure 6 is a fragmentary vertical sectional view, illustrating the diaphragm and its housing.

Referring in detail to the drawings, the numeral 5 indicates a substantially cylindrical tank including a concave bottom wall 6 and a substantially conical shaped upper end portion 7. The tank 5 has a partition 8 therein separating the upper and lower interior portions of the tank from each other except for gas openings 9. A tube 10 extends through the apex of the substantially conical shaped upper end of the tank and is integral therewith. The tube 10 depends downwardly in the tank and through a centrally arranged opening provided in the partition 8 and terminates a short distance below the partition. The upper end of the tube 10 outwardly of the tank is flared to form an attaching flange 11. The partition 8 divides the tank into a gas chamber 12 and a liquid chamber 13, the tube 10 having direct communication with the liquid

chamber for discharging therein carbide or equivalent material supplied from a hopper 14.

The carbide or similar material discharged into the liquid will generate gas which may readily pass to the gas chamber 12 by way of the gas openings 9. Water or similar liquid may be dispensed into the liquid chamber 13 by way of a filling spout 15 provided with a cutoff valve 16 and a funnel shaped liquid receiving end 17.

For carrying off sludge and other material from the liquid chamber an outlet pipe 18 connects with said liquid chamber adjacent the bottom wall 6 and is provided with a cutoff valve 19.

The hopper 14 is provided with a discharge neck 20 of a diameter corresponding to the diameter of the tube 10 and is provided with an attaching flange 21 which rests on the flange 11 and is detachably secured thereto by fasteners 22.

Provided in the hopper 14 and extending into the discharge neck thereof and also into the tube 10 is a sleeve 23, the upper end of which is flared to form a valve seat 24 and the lower end forms a valve seat 25. By having the upper end flared it will permit carbide to readily pass through the sleeve 23 when the seats 24 and 25 are disengaged by valve elements 26 and 27 connected together by a valve rod 28. The valve elements 26 and 27 are of substantially conical shape and are arranged in opposed relation to alternately engage the seats. Either of the valve elements 26 or 27 will act to cut off the supply of carbide to the liquid chamber 13 when engaged with their respective seats.

The hopper 14 may be supplied with carbide through a neck 29 normally closed by a removable cap 30.

A sectional diaphragm housing 31 is mounted on the hopper and is in direct communication therewith by a sleeve 32 which terminates a limited distance above the valve seat 24. A diaphragm 33 is mounted in the housing 31 and is held in place by the fastener 34 employed for securing the sections of the diaphragm housing together.

The valve rod 28 extends through the sleeve 32 and is secured to the diaphragm and outwardly through a sleeve 32' threaded in the diaphragm housing 31 and is provided with screw threads to receive a nut 35 provided with a finger piece 36. Interposed between the sleeve 32' and the diaphragm is a coil spring 37 to resist the movement of the diaphragm against gas pressure. The tension of the spring may be varied by adjusting the sleeve 32' in the housing 31 and consequently regulate the action of the diaphragm under the

influence of gas pressure. By adjusting the nut 35 on the rod 28 the valve element 27 may be moved into a seated position to render the device inoperative by completely cutting off the supply of carbide to the liquid chamber 13.

The valve rod 28 is composed of sections connected by a ball and socket joint 37, the purpose of which is to allow the lower section carrying the valve element to move relative to the upper section and thus permit the valve element to readily adjust itself to the seat. The tube 32 extending downwardly over a major portion of the valve rod 28 relieves the latter from the weight of the carbide in the hopper thereon.

The gas chamber of the tank 5 is equipped with a pressure gauge 38 and a safety valve 39. The safety valve 39 includes a seat 40 engaged by a plate 41 under the influence of springs 42 mounted on rods 44 carried by a flange 45 of the attaching neck of the valve. The rods 44 have threaded thereon nuts 46 for the purpose of varying the action of the springs on the valve plate 41 and thereby provide an adjustment for the safety valve to operate under different gas pressures.

An outlet gas pipe 47 provided with a check valve 48 is connected with the gas chamber 12 and with an auxiliary chamber or tank 49 in which is located water or some other liquid, as shown at 50. The gas pipe 47 connects with the chamber 49 above the liquid. A gas feed pipe 51 extends into the chamber 49 and terminates below the liquid and is equipped with a check valve 52 and a cutoff valve 53. Liquid may be placed in the chamber 49 by way of a neck 54 when a cap 55 thereof is removed. The liquid may be drained from the chamber 49 by a valve 56. The gas used from this device must pass through the liquid 50 and should a backfire occur in the pipe 51 from the device to which the outlet pipe 51 is connected, the flame will be extinguished by the liquid 50 and be prevented from reaching the gas chamber 12. Also the check valves 52 and 48 will prevent back pressure that may be created by a backfire or flash from reaching the gas chamber 12.

To render the device inoperative or the movement of carbide from the hopper 14 into the gas generating chamber 13, the nut 35 may be turned on the valve rod to seat the valve element 27 against the valve seat 25. With the device thus adjusted it may be carried from one place to another without danger of having gas generated therein. To render the device operative, the nut 35 is adjusted on the valve rod 28 so that the valves 26 and 27 become positioned, as shown in Figure 2, the carbide may then flow into the generating chamber 13 and contact the liquid therein turning into gas which rises into the gas chamber as well as the tube 10 and acts on the diaphragm. When the gas pressure is strong enough to move the diaphragm upwardly it brings about seating of the valve element 27 with the seat 25 and cuts

off the flow of carbide to the liquid, thereby stopping the generation of gas. However, when the pressure of the gas falls the diaphragm under the action of the spring 37 unseats the valve element 27, again allowing carbide to flow into the liquid for the generation of further gas.

Should the valve rod 28 break or the diaphragm, the valve 26 will gravitate into engagement with the seat 24 and cut off communication of the hopper 14 with the gas generating chamber, thereby rendering the device inoperative should a defect occur.

It will be seen from the foregoing that the device is extremely compact so that it may be conveniently handled for movement from one place to another and that the various parts can be separated for inspection and adjustment and repairs when necessary. Also, it will be seen that the cleaning of the device may be readily carried out.

Should the device be moved while in operation of generating gas, the tube 10 will act to prevent the liquid from splashing against the valve seat and reaching carbide within the hopper.

While I have shown and described the preferred embodiment of my invention, it will be understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope of the invention as claimed.

Having thus described the invention, what I claim is:

In a gas generator, a fluid tank, a tube extending into the tank and forming an integral part thereof, the upper end of the tube projecting above the tank and formed with a flange a material hopper including oppositely arranged integrally connected conical shaped portions and a discharge neck integral with one of said portions and having a flange detachably connected to the flange of the tube, a sleeve extending through the other portion of the hopper and secured thereto, a second sleeve in the neck of the hopper aligning with the first sleeve and extending into the tube and having a flared upper end formed on the hopper and providing a valve seat, a valve for said seat and including a threaded stem, a second valve on the lower end of the stem and adapted for seating against the lower end of said second sleeve a sectional diaphragm housing forming an integral part of the hopper and the second sleeve and having the stem extending therethrough, a diaphragm secured to the housing and to the stem, a bushing receiving the stem and threaded in the housing, a coil spring on the stem and bearing against the diaphragm and the bushing, said bushing providing an adjusting medium for the spring to vary its action on the diaphragm, and a manually operated nut engaging the bushing and threaded on said stem exteriorly of the housing.

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