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CARBID FEED ACETYLENE GENERATOR.

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1,019,140. Patented Mar. 5, 1912.

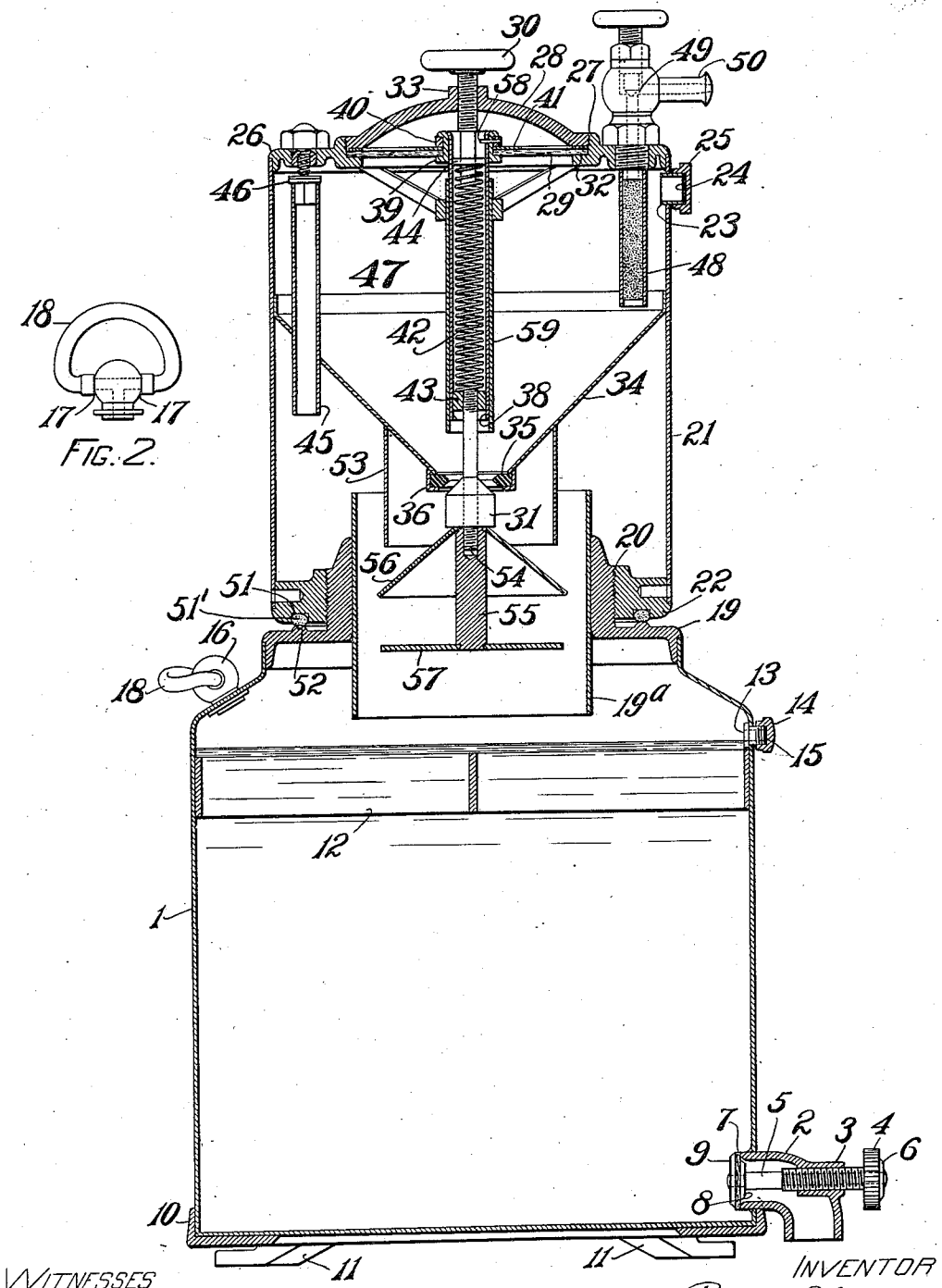

FIG. 2.

FIG. 1.

WITNESSES

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CARBID-FEED ACETYLENE-GENERATOR.

1,019,140. Specification of Letters Patent. Patented Mar. 5, 1912.

Application filed March 6, 1909. Serial No. 481,798.

To all whom it may concern:

Be it known that I, RICHARD P. ELLIOTT, a citizen of the United States, residing in Boston, county of Suffolk, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Carbid-Feed Acetylene-Generators, of which the following is a specification, reference being had to the drawings accompanying the same and forming a part thereof.

My invention relates to carbid-feed acetylene generators of the type wherein the gas is generated by feeding the carbid through a valve into water.

The objects of my invention are to provide a carbid-feed acetylene generator that may be used on automobiles, motor boats, and the like, by providing a device to prevent the water splashing on the feed valve to clog it, and to so construct the carbid-feed mechanism that the feed-valve will be normally closed when the generator is not in operation.

A further object of my invention is to provide means for hermetically sealing the carbid-chamber when the generator is not in use; for drying the gas, and to provide a safety device that will prevent the accumulation of excessive pressure in the generator.

In the drawings accompanying this specification and forming a part thereof—Figure 1 is a sectional elevation of my improved generator; and Fig. 2 is an elevation of a safety device attached to the generator.

My improved generator consists of the water-tank 1, provided with a draw-off valve 2 secured near the bottom of the water-tank for the purpose of drawing off the sludge or accumulation of lime and water in the water-tank when the generator is to be charged. The valve 2 is preferably in the form of an elbow provided with a boss 3 having a threaded hole and a thumb-screw 4 threaded on its outside, screwed into the boss 3. The thumb-screw 4 is provided with a hole longitudinally to receive the spindle 5, which is designed to be revolubly mounted therein, and is prevented from coming out by having a washer 6 fitted on its end and riveted thereon. The inner end of the spindle 5 has mounted upon it a rubber disk 7 held between two metal disks 8 and 9 which fit upon a neck portion of the spindle 5 and are held preferably by being screw threaded, and the outer end of the spindle expanded or riveted over. The bottom of the water-tank is provided with a casing 10 which has four feet, 11, 11, etc., two of which are not shown, designed to secure the generator upon brackets or to the running-board of an automobile when it is to be used in connection with such vehicle.

The top of the water-tank is preferably provided with thin strips of metal 12 placed at right angles to each other, their ends being secured to the sides of the tank, which strips of metal are located slightly below the normal water level of the generator, their purpose being to retard the tendency of the water in the water-tank to splash upwardly. The nipple 13 is secured in the side of the water-tank near the top; this nipple has a hole through it and a cap 14 threaded upon its outer end with a disk of rubber 15 in the cap designed to come against the end of the nipple 13 to seal it gas and water-tight. The purpose of this nipple or tube is to indicate the proper water level. To do this, the cap 14 is removed from the nipple and the tank filled until the water runs out through the nipple; the cap is then screwed on tightly.

16 represents a safety device which consists of a ball-shaped nipple secured preferably in the inclined top of the water-tank. The nipple is provided with a hose extending from the inside of the tank outwardly, and short hose ends secured in opposite sides with holes in them; as indicated by reference numerals 17, 17, a short piece of hose 18 may be shoved upon the nipples from each side, thus making a gas and water-tight closure, until the gas pressure in the water-tank has reached a point where the frictional resistance of the hose upon the hose ends will be overcome by the gas pressure and the hose blown off. The resistance of the hose to being blown off by the gas pressure is proportionate to the thickness of its walls.

19 represents a casting which is secured to the top of the water-tank and has a threaded portion 20.

The carbid-tank 21 has a casting 22 secured to its lower end with an internal threaded hole designed to fit upon the threaded portion 20 of the casting. A tube of sheet metal designated by the numeral

19ª is secured in the casting 19 and is designed to guide the carbid as it falls through the valve into the water-tank and to assist in preventing the splashing of the water in the water-tank 1 upon the feed-valve 31.

23 is a nipple secured in the side of the top of the carbid-tank through which the carbid may be poured into the carbid-tank. The nipple 23 is provided with a screw-threaded cap screwed upon its outer surface, having a disk of rubber 24 secured in the cap designed to bear against the end of the nipple 23 to produce a gas and water-tight closure of the carbid-tank.

26 is a casting secured in the upper end of the carbid-tank 21. This casting has an opening 27, the opening having an upward projection which is screw-threaded to receive a cap 28 screw threaded on its periphery. The cap 28 is so arranged that it will screw down upon a diaphragm 29 and pinch it between the cap 28 and the upper surface of the horizontal ledge 32, the holding force of the cap upon the diaphragm being sufficient to make a gas-tight closure. The cap 28 has a boss 33 screw threaded to receive a screw 30, the purpose of which will be explained more fully hereafter.

The tank 21 is provided with an inclined inverted cone 34 secured to its walls, which serves as the bottom of the carbid chamber. A rubber valve seat 35 is held by the ring 36 around the hole at the apex of the cone 34. This rubber valve 35 has a hole in its center with a more or less sharp edge, and is designed to permit the valve 31 to slide vertically in and out the hole. The valve 31 is attached to a plug secured in the end of a tube 38, and is secured in such way as to form a gas-tight closure. The upper end of the tube 38 has secured to it the ring 39 upon which rests the diaphragm 29. Another ring 40 and a metal disk 41 is secured to the tube 38 in such way as to be firmly riveted upon the upper end of the ring 39 so as to pinch the diaphragm 29 between the disk 41 and the horizontal projecting portion of the ring 39 to make a gas-tight closure. Inside the tube 38 is mounted a compressible spring 42, its lower end bearing upon the plug 43 to which the valve 31 is secured. Its upper end has a washer 44 bearing upon it, which washer is secured to the lower end of the feeding-screw 30. By screwing down the feeding-screw 30 the spring 42 is compressed, causing the tube 38 to move down and the valve 31 to which it is attached, so that the valve is opened as shown in Fig. 1 by the pressure of the spring, but when carbid is fed through said valve and into the water-tank 1 and gas generated, the pressure of the gas will act upon the diaphragm 29, pushing it outward and drawing the valve 31 into the valve-seat 35. As the gas is generated it passes up through an outlet tube 45, pushes the check-valve 46 upward against the tension of a very flexible spring, and allows the gas to escape into the carbid-chamber 47. The gas then passes down through the carbid up through the tube 48 and the filter therein, and out through the valve-seat 49 and the hose connection 50 to suitable tubing, and thence to the lamps.

In order to make a gas-tight closure between the casting 22 and the casting 19, a groove 51 is made in the bottom of the casting 22 into which a ring of packing is securely inserted. Concentric and of the same diameter with the center of the groove 51 is a ridge 52 formed upon the casting 19. This ridge is formed with a more or less pointed upper surface so that it will contact with the packing 51′ and make a smooth seat therein and thus form a gas-tight closure between the water-tank and the carbid tank.

In designing a carbid-feed generator for automobiles wherein there is not only horizontal but vertical movement, it is necessary of course to provide means whereby the carbid can get to the water without obstruction and yet to prevent water from splashing upwardly from the water-tank upon the carbid feeding valve, for water splashing upon the valve will moisten it so that the carbid when fed down will stick upon the wet surface, slack, and practically glue itself to the feeding mechanism. To prevent water from splashing on the valve 31 the ring 53 is secured to the inverted cone 34 to surround the valve 31, and a threaded portion 54 projects below the valve 31 a sufficient distance so that a stud 55 can be screwed upon it. This stud carries a thin sheet metal cone 56 upon its upper end which flares outwardly to protect the valve, and is so arranged that when gas pressure is generated and the valve 31 fully closed the surface of the cone will move upwardly and substantially cover the lower end of the tube 53, thus making a chamber in which the valve 31 and the rubber valve seat 35 are inclosed. To still further baffle the water from splashing upward, a disk 57 may be mounted upon the lower end of the stud 55 so that any considerable volume of water will strike against the disk 57 and be deflected downwardly. By this arrangement a narrow passage is provided through which the carbid is free to drop, but through which it is impossible for the water to splash upwardly upon the valve 31 and the seat 35.

Pins 58 are inserted through the ring 40 and the tube 38 to project slightly inward from the inner wall of said tube 38 so that when the button 44 on the lower end of the screw 30 moves upwardly by unscrewing

said screw, it will contact with the inner ends of the pins 58 and mechanically draw the valve 31 upwardly through the seat 35, thus to positively hold the valve in a closed position against any accidental displacement.

The tube 38 is surrounded by a tube 59 which serves the double purpose of holding said tube 38 centrally in alinement with the rubber valve-seat 35, as well as to prevent the carbid from packing around and in contact with the tube 38 as it would from the jar of a vehicle, and prevent the free longitudinal movement of said tube 38 and the valve to which it is attached. By so alining and guiding the tube 38 I am enabled to so accurately and delicately feed the carbid as to maintain a practically constant pressure of gas in the generator while it is in operation.

I do not confine myself to the exact form of the parts shown or to the precise arrangement shown, as they may be considerably varied without departing from the spirit of my invention.

What I claim is—

1. In an acetylene generator, a carbid chamber; a water chamber beneath said carbid chamber; a carbid feeding valve located in the passage between said chambers; a diaphragm operated upon by gas pressure for closing the valve; manually operated means for mechanically closing the valve; a spring for opening the valve to feed the carbid into the water chamber; a tube extending from the space above the water chamber through and to near the top of the carbid chamber; and a check valve having a flexible member arranged to form a gas and a water-tight closure of the upper end of said tube when the generator is not in operation, and arranged to but slightly impede the flow of gas therethrough.

2. In an acetylene generator, a carbid chamber; a water chamber beneath said carbid chamber; a carbid feeding valve to close the passage between said chambers; means for mechanically closing said valve; means for closing said valve by gas pressure; spring operated means for opening the valve to feed the carbid into the water chamber; a tube extending from the space above the water chamber through and to near the top of the carbid chamber; a check valve having a flexible member arranged to form a gas and water tight closure of the upper end of said tube when the generator is not in operation; a very flexible spring to maintain said check valve normally seated upon the upper end of the tube, arranged to but slightly impede the flow of gas through said tube.

3. In an acetylene generator, a carbid chamber; a water chamber beneath said carbid chamber; a carbid feeding valve located in the passage between said chambers; means for closing said valve; means for opening the valve to feed the carbid into the water chamber; a tube extending from the space above the water chamber through and to near the top of the carbid chamber; spring operated means so arranged as to be capable of making a water tight and gas-tight closure at the upper end of said tube; and a gas outlet extending through the top of said chamber and projecting downwardly in said chamber to approximately the mid-portion thereof provided with a fibrous filter to prevent the escape of dust and moisture.

4. In an acetylene generator, the combination of a water chamber; a carbid chamber above said water chamber; a carbid feeding valve located in the passage between said chambers; spring and pressure controlled means for opening and closing said feeding valve; means for positively closing said feeding valve; a protecting ring surrounding said feeding valve; and a cone secured to the under side of said feeding valve for preventing water from splashing upon said valve.

5. In a carbid feed generator, a carbid chamber and a water chamber; a carbid feeding valve in the passage between said chambers; means for opening and closing said carbid feeding valve to start and stop the feeding of carbid; a ring surrounding said valve and projecting downward therefrom; a cone secured to the bottom of said carbid feeding valve arranged to prevent the upward splashing of water upon the feeding valve and at the same time permit a passage through which the carbid can fall to the water; and a vertical tube secured in the top of the water chamber extending upwardly into the space below the carbid chamber and downwardly into the water chamber to within a short distance of the determined water level.

6. In an acetylene gas generator, the combination with a carbid-container provided with a carbid outlet, of a distendible diaphragm arranged within said carbid-container, a centrally disposed spring-actuated tubular portion connected with said diaphragm, a gate-stem secured to the lower end of said tubular portion, a valve-seat arranged beneath said carbid-outlet, a cylindrical apron surrounding said valve-seat, a gate or closure for closing said carbid-outlet connected with said gate-stem, a valve-member adapted to be seated upon said valve-seat, said gate or closure and said valve-member being operated simultaneously in their opening and closing movements by the operation of said distendible diaphragm, and means for draw-

ing and retaining said gate or closure and said valve-member in their closed relations respectively with said carbid-outlet and said valve-seat, substantially as and for the purposes set forth.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses, this the 4th day of March, A. D. 1909.

RICHARD P. ELLIOTT.

Witnesses:
A. H. SPENCER,
H. M. KELSO.