

H. E. WHITCOMB & M. B. EATON. Patented May 15, 1900.
ACETYLENE GAS GENERATOR.

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(Application filed Dec. 9, 1898.)

Fig. 1.

Fig. 1 is a detailed cross-sectional view of a mechanical apparatus. It features a large vertical cylindrical chamber (10) with a piston (16) and a connecting rod (20) linked to a crank (22) on a shaft (23). A pressure gauge (36a) is connected to the top of the chamber via a pipe (38). A smaller vertical chamber (12) is connected to the main chamber via a pipe (14) and contains a bed of material (13). Various valves (31, 32, 33, 34, 35, 42, 45) and ports (40, 41, 43, 44, 47) are shown. A dashed line R2 indicates a reference level.

Fig. 2.

Fig. 2 shows two circular cross-sectional views of the apparatus. The left view shows the internal components of the main chamber (10), including the piston (16), connecting rod (20), and crank (22). The right view shows the internal components of the smaller chamber (12), including the bed of material (13) and the connecting pipe (14). Various valves (31, 32, 33, 34, 35, 42, 45) and ports (40, 41, 43, 44, 47) are labeled.

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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 649,560, dated May 15, 1900.

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To all whom it may concern:

Be it known that we, HARVEY E. WHITCOMB and MELVILLE B. EATON, citizens of the United States, residing at Morrisville, in the county of Lamoille and State of Vermont, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

Our invention relates to apparatus for generating and storing acetylene gas, the object being to provide a simple, compact, and easily-managed apparatus of this class which shall be automatic in its operation to a certain extent, whereby only a sufficient amount of water will be supplied to the carbid to generate sufficient gas for present consumption.

With this object in view our invention consists in an apparatus comprising a generator and a gasometer, consisting of a water-tank and a gas-tank, as is usual, having a double connection with the generator, whereby water from the water-tank of the gasometer is supplied to the generator and the gas from the generator passed into the gasometer, improved means being also provided, operated by the gasometer, whereby when the gas-tank has been raised to a certain predetermined height by the accumulation of gas therein the supply of water to the generator will be cut off and the generation of gas will cease.

Our invention further consists in providing the gasometer with improved constructions, arrangements, and combinations of devices for cooling the gas passing from the generator to the gasometer, automatically relieving any excess of pressure in the gas-tank, automatically regulating the height of water in the water-tank, and draining off any water of condensation either in the pipe or in the metallic cooling-chamber with which the gasometer is provided, all as will be hereinafter fully described and afterward specifically pointed out in the appended claims.

In order to enable others skilled in the art to which our invention most nearly appertains to make and use the same, we will now proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central section through the apparatus constructed in accordance with our invention. Fig. 2 is a horizontal sectional view through the same on the broken line 2 2 of Fig. 1 looking downward, as indicated by the arrows.

Like numerals of reference indicate the same parts on both the figures.

Referring to the drawings by numerals, 10 indicates the generator, which is provided with a cover 11, to which are hinged fastenings or hasps 12 to secure it in position.

13 indicates a wire cage or basket to receive the carbid.

14^a indicates a horizontal pipe provided with a plurality of discharge-spouts through which water may be sprayed upon the carbid in the cage, the water passing through pipe 14, leading from the gasometer, said pipe passing through the cover 11 of the generator.

15 indicates a water-tank, and 16 the gas-tank, of the gasometer, the latter being open at one end and inverted, as usual. Attached on each side of the water-tank are the uprights 17 and 18 of a bail-shaped frame, said uprights being connected by a cross-bar 19 at the top. A rod 20 projects upward from the top of the gas-tank 16 and is provided with a pin or projection 21, which when the gas-tank rises sufficiently high will contact with the cross-bar 19, before described. A lever 22 is pivoted at 23 to the upright of the bar 18 and is slotted at its inner end to slide on the rod 20, and between the end of the lever and top of tank is a spring 24. This spring when extended will permit the end of the lever to be raised when the gas-tank is but half-way up, and by compressing the same the tank can continue on up to the top of the yoke. The lever 22 projects beyond its pivot and at its outer end is pivotally connected to a link or connecting-rod 26, which is pivoted at its lower end to the operating-arm 27 of a valve 28 in the water-supply pipe 14.

28^a indicates a pipe leading from the mains or other source of water-supply, which enters the water-tank near the bottom and extends upward through the water in the water-tank and into the gas-tank, being provided at its upper end with a valve 29, operated by a float

30, by means of which the supply of water is cut off when it reaches a certain predetermined height in the water-tank.

31 indicates a pipe leading from the generator 10 into a cooling-chamber 32 beneath the water-tank, said pipe being connected with the generator by means of a union 33, which permits of the entire detachment of the generator from the gasometer and being provided with a valve 34 to cut off the supply of gas to the generator from the gasometer when desired. A pipe 35 leads from the cooling-chamber 32 through the water in the water-tank and discharges at its upper end into the gas-tank above the water-level. A pipe 36 leads from the gas-tank above the water-level down through the water in the water-tank, out at the side of the water-tank, and upward and outward to the service-pipe or burners, a gage 36^a being located in this pipe to indicate the pressure in the gasometer. A pipe 37, open at top and bottom, is secured in the top of the gas-tank 16, extending into the gas-tank a distance sufficient to bring its lower end above the regulated water when the gas-tank has received sufficient gas to raise it to the desired predetermined height. The upper end of this pipe 37 slides in a pipe 38, which leads into the outer air.

39 indicates a vessel to receive, through a pipe 40, any water of condensation which may accumulate in the generator 10, the discharge-pipe 40 being let below the level of water 41, which is placed in the vessel 39, so as to preserve the water seal and prevent leakage of gas from the generator. A similar discharge-pipe 42 leads from the cooling-chamber 32 into a body of water 43 in a vessel 44 to drain the cooling-chamber of any water of condensation. A valve 45 is provided in a position to drain into the same vessel 44 any water of condensation accumulating in the pipe 36.

The construction of our invention will be readily understood from the foregoing description, and its operation may be described as follows: The carbide having been placed in the cage 13, water is permitted to drop or be sprayed thereon through the pipe 14^a, which will generate gas, which will be permitted to pass through the pipe 31 into the cooling-chamber and thence through the pipe 35 into the gas-tank. As the gas-tank rises it will carry up the inner end of the lever 22, causing its outer end to be pressed downward and to move the valve-arm 27 downward until when the proper quantity of gas has been admitted into the gasometer the valve 28 will be closed and no more water be allowed to pass into the generator while the gas-tank remains thus elevated. Should an accident happen to the water-supply valve and an extra quantity of water be permitted to flow upon the carbide, the pin 21 on the upright rod 20 will strike the horizontal bar 19 of the yoke, and this bar being flexible will be raised, (first yielding slightly to prevent a jar when

the pin first strikes it,) as shown in dotted lines in Fig. 1, and will raise the lower end of the pipe 37 out of the water, permitting the surplus pressure of gas to pass out through the pipe 37 and pipe 38 to the outer air, thus relieving the pressure in the gasometer. When the water which flows into the pipe 28^a from the main or other source of supply has reached the proper height, the float 30 will raise and close the valve 29, thus preventing the water from rising up higher than it is desired. The gas stored in the gas-tank will pass off through the pipe 36 through the service-pipes and burners to be used as required, and the pressure in the pipe 36 of the gas-tank will be indicated on the pressure-gage 36^a. Any water of condensation which may accumulate in the cooling-chamber 32, the pipe 36, or the generator may be drained off in the vessels 44 and 39, as before described. The discharge-pipes 42 and 40 from the cooling-chamber and generator entering the water in the vessels 44 and 39 form the water seal and prevent the escape of gas with the water of condensation.

If desired, the cover of the generator may be provided with a water seal to prevent the escape of gas from the upper portion of the generator.

Air-valves 46 and 47 are provided in the top of the gasometer and the top of the generator to relieve the pressure of gas in this, when desired—as, for instance, if by accident or otherwise the automatic release mechanism should fail to act.

While we have illustrated and described the best means now known to us for carrying out our invention, we do not wish to be understood as restricting ourselves to the exact details of construction shown, but hold that any slight changes or variations therein, such as might suggest themselves to the ordinary mechanic, will properly fall within the limit and scope of our invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an acetylene-gas machine, the combination of a generator, and a gasometer consisting of a water-tank and gas-tank, with a water-pipe leading from the water-tank into the generator, a valve in said pipe, an upright bar rising from the top of the gas-tank, a pivoted lever connected, at its inner end, to said upright bar, and a link or rod connecting its outer end with the arm or lever of the water-valve, substantially as described.

2. In an acetylene-gas machine, the combination of the generator with the gasometer consisting of a water-tank and gas-tank, a water-supply pipe connecting the water-tank with the generator, a valve therein, connections between the gas-tank and the valve whereby the rise of the tank will close the valve, an open-ended relief-pipe extending through the top of the gas-tank into the water of the water-tank, and a yoke through

which the upper end of said pipe extends adapted to be bent upward by the rise of the gas-tank, whereby the lower end of the relief-pipe is lifted out of the water, substantially as described.

5 3. In an acetylene-gas machine, the combination with the generator and gasometer comprising the water-tank and gas-tank, of a water-supply pipe leading from the water-tank
10 into the generator, a valve thereon provided with a suitable arm or lever for operating, a yoke secured to the water-tank and passing above and across the diameter of the gas-tank, a rod projecting upward from the top of the
15 gas-tank through the horizontal arm of said yoke and provided with projections or pins below said yoke, a lever pivoted to one of the uprights of said yoke and provided, at its inner end, with a slot engaging a spring on the
20 upright rod, and a link connecting the outer

end of the lever with the water-valve-operating lever, substantially as described.

4. In an apparatus of the class described, the combination with the water-tank, a gas-bell, and a generator, of a vertical escape-
25 pipe carried by the bell, having its upper end normally open and located exteriorly of both the tank and the bell, and its open end normally submerged and thereby sealed beneath the surface of the water within the tank, and
30 a fixed upright pipe telescopically receiving the upper open end of the escape-pipe, permanently housing the latter, and forming a guide for the bell, substantially in the manner shown and described.

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Witnesses:

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