No. 649,596. Patented May 15. 1900.

T. C. BUDDINGTON.

ACETYLENE GAS GENERATOR.

(Application filed Mar. 28, 1899.)

(No Model.)

Fig. 3.

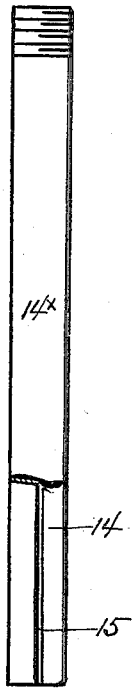


Fig. 1.

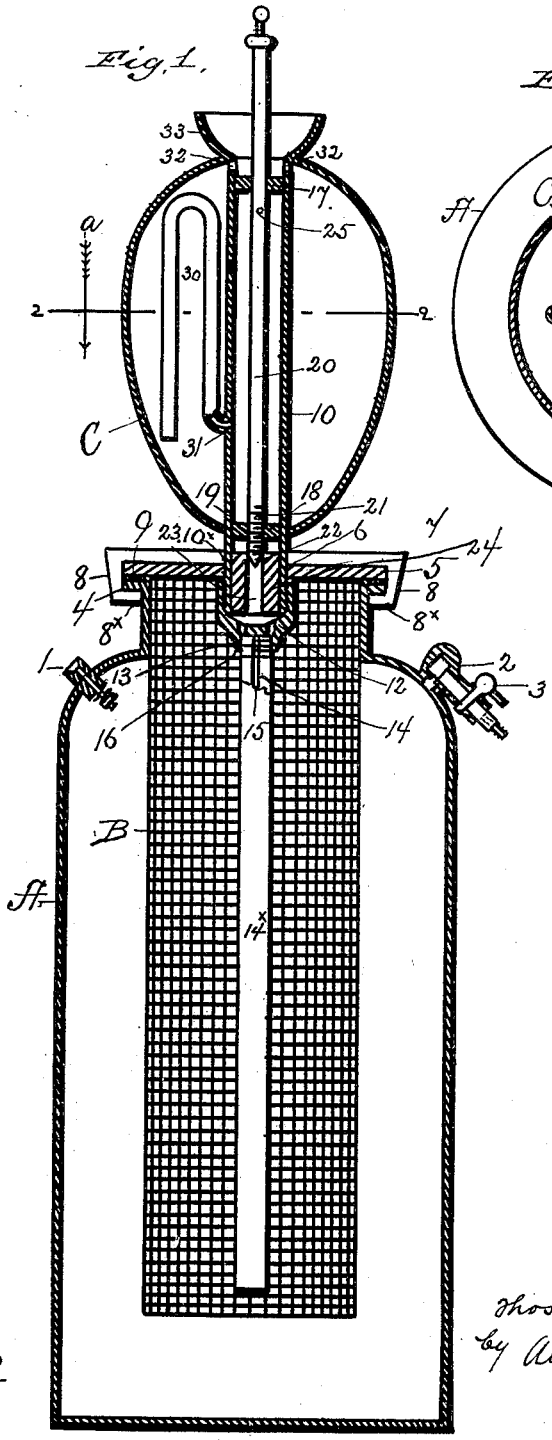
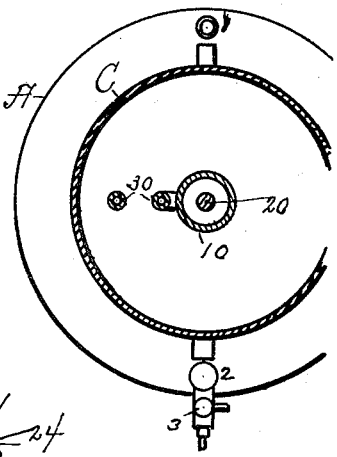


Fig. 2.



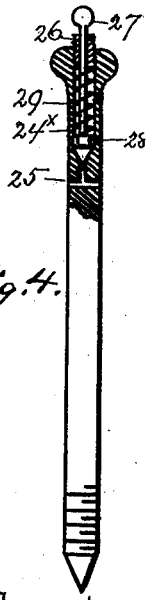


Fig. 4.

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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 649,596, dated May 15, 1900.

Application filed March 28, 1899. Serial No. 710,851. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. BUDDINGTON, a citizen of the United States of America, residing at Springfield, in the county of Hampden, in the State of Massachusetts, have invented a new and useful Acetylene-Gas-Generating Apparatus, of which the following is a specification.

My invention relates to improvements in acetylene-gas generators; and the object is to provide an apparatus of the kind named and for the purpose intended which is simplified in construction and certain and efficient in operation; and with these ends in view the invention consists in the novel construction, arrangement, and combination of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

I have fully and clearly illustrated the invention in the accompanying drawings, wherein—

Figure 1 is a central vertical section of the complete apparatus, showing the parts operatively assembled. Fig. 2 is a transverse section through the water vessel or receptacle and the central tube and the siphon on the line 2 2 of Fig. 1 looking in the direction of the arrow *a*. Fig. 3 is a detail view of the depending tube or bar with capillary covering. Fig. 4 is a detail view, partly in section, of the valve-rod in the feed-tube, showing the valve in the upper end.

Referring to the drawings, A designates a suitable vessel, constituting the gas-generating chamber and gas-holder, made of an impervious material and of such size and capacity as to adapt it to the uses and purposes intended. At a convenient point in the upper portion of the gas-generator is arranged a relief-valve 1, whereby any excess of gas-pressure may have automatic relief and escape. A gas-conduit nozzle 2 is suitably secured in the gas-generator, to which the gas-pipe leading to the burners may be attached, the passage of the gas being controlled and regulated by a proper valve or turning plug, as 3, interposed in the pipe. About the upper extremity of the generator A is formed an annular shoulder 4, and a cap or cover 5, having a central screw-threaded opening 6, is fitted to the top of the generator and secured by a bar 7, having downward-bent ends 8 8, formed with inturned ends $8^{\times}$, which take under the annular shoulder 4 and lock the cover to the generator. A packing or sealing ring 9 is interposed between the cover and the annular shoulder to seal the parts against the escape of gas.

In the neck $4^{\times}$ of the generator gas-chamber is fitted and properly secured the upper portion of a foraminated or reticulated carbid-chamber B, which reaches or extends down into the gas-chamber, substantially as shown in the drawings. The carbid-holder B is preferably made of a wire-netting of suitable metallic material of such capacity as may be desired and requisite.

C designates the water vessel, provided with a central vertical tube 10, the lower end portion $10^{\times}$ of which tube projects below the bottom of the water vessel, as shown, and is provided with exterior screw-threads, which engage in the central screw-threaded opening in the cover of the gas-chamber, the threaded end of the tube extending into the gas-chamber, as shown, and has fitted thereto a cup 12, in the bottom of which is formed a threaded socket 13, in which engages and is held the upper end of a vertically-depending rod 14, formed with shallow vertical grooves 15, with which ports or openings 16 through the bottom of the cup communicate. The bar or rod 14 extends well down into the carbid-holder and is covered with a suitable absorbent material, as asbestos cloth $14^{\times}$, so that water delivered to the cup finds its way through the openings in the bottom thereof down the shallow grooves in the rod and saturates the covering of the rod, and the water will be delivered to the carbid and effect the disintegration of the carbid and produce the gas, which finds its course through the openings of the reticulated holder into the gas-chamber.

In the tube 10, adjacent to the upper end, is fixed a partition-nut 17, having a central opening, and at the lower portion of said tube is fitted a second partition-nut 18, having a central screw-threaded opening 19. A valve-rod 20 is passed snugly through the upper nut 17 and has its lower portion screw-threaded, as at 21, to engage in the threads of the lower

nut 18. The lower end of the valve rod or stem 20 is made conical, as at 22, to set in and close a passage 23, formed in a plug 24, fitted in the end of the tube, the passage 23 communicating with the cup on the upper end of the bar 14. In the upper end portion of the valve-rod 20 is formed a socket 24×, communicating at its lower end into the tube 10 through a port 25, and in the upper end of the socket is fitted a nut 26, having a central passage, in which is slidingly and loosely fitted the stem 27 of a valve 28. In the socket about the valve-stem is arranged a spiral spring 29, the force of which holds the valve down in its seat, and which valve is lifted and the air permitted to escape when the water rises in the tube during the operation of filling the water vessel.

In the water-chamber is a siphon 30, the inner leg of which opens into the tube 10, as at 31, so that when the water-chamber is supplied with water, which finds ingress through openings 32 or through an annular space at the end of the tube, as indicated in the drawings, and the water rises through the siphon and up in the tube the valve in the upper end of the valve-rod 20 is eventually lifted to let the air in the tube escape.

On the top of the water-chamber C is a funnel or filling-cup 33, having communication with the water-chamber by means of the space or openings 32.

The operation is as follows: Carbid being supplied to the basket and the parts or elements then assembled and secured together, as indicated in Fig. 1 of the drawings, water is supplied to the water-chamber through the funnel at the top. As the water rises in the water-chamber it rises in the siphon and finds its course into the central feed-tube 10, rising therein, in its upward movement displacing and discharging the air in the tube through the valve in the upper end of the main-valve stem or rod. When the water-chamber has received its complement of water, the apparatus is ready for practical use and operation, which is accomplished by lifting the main-valve rod and opening the valve-duct communicating with the generator. The water in the tube 10 now runs down into the cup on the grooved rod in the carbid-holder and escapes into the grooves of the rod, in its course saturating the capillary covering and carrying moisture to the carbid, whereupon the carbid is dissolved and the gas generated in a well-known manner. As the water is lowered in the tube a vacuum is formed in that portion of the tube above the water and when the water in the tube is further exhausted, so as to come below the port of the siphon, the atmospheric pressure on the water in the water-chamber predominates, causing the discharge through the siphon, which action continues as long as the main valve remains open. When the supply of water to the carbid is all that is wanted, the valve is closed.

Having thus described my invention, what I claim is—

1. In an acetylene-gas generator, the combination of a suitable vessel, constituting a gas-chamber, open at its upper end, a gas-discharge pipe leading from the vessel, a reticulated carbid-holder secured in the open end of the vessel, a closure on the top of the vessel, a grooved rod depending into the carbid-holder, a capillary covering on the said rod, and means to deliver water to the rod and covering through the closure.

2. In an acetylene-gas generator, the combination of a suitable vessel, constituting a gas-chamber, open at its top, a gas-discharge pipe leading from the vessel, an automatic relief-valve in the upper portion of the gas-chamber, a reticulated carbid-holder secured in the open end of the vessel and extending down into it, a closure on the top of the vessel, and over the carbid-holder, a grooved rod depending vertically into the carbid-holder, a capillary covering on the rod, and means to deliver water to the rod and covering through the closure.

3. In an acetylene-gas generator, the combination with a suitable gas-generating chamber, having an open upper end, a reticulated carbid-holder secured in the open end of the generator, and a closure to cover the open end of the generator and carbid-holder, having a threaded opening therein, of a water-receptacle, a central vertical tube fixed in the water-receptacle with its lower end projecting below the bottom of the receptacle and provided with screw-threads to engage in the threads of the said closure, a siphon in the water-receptacle having one leg opening into the tube, a valve in the lower end of the tube, a vertically-depending rod secured to the lower end of said tube within the carbid-holder, and a capillary covering on the said rod, substantially as described.

4. In an acetylene-gas generator, the combination with the gas-generator and the carbid-holder, of a water vessel, a vertical tube in the vessel and opening into the carbid-holder, a valve in the tube to regulate the supply of water to the carbid-holder, and a siphon in the water vessel having one leg opening into the tube, substantially as described.

5. In an acetylene-gas generator, the combination with the gas-generator and the carbid-holder, of a water vessel, a vertical tube in the water vessel and opening into the carbid-holder, a valve in the tube to regulate the supply of water to the carbid-holder and having an air-escape passage in its stem, a valve to control the escape-passage, and a siphon in the water vessel having one leg opening into the tube, substantially as described.

6. An acetylene-gas apparatus comprising a generating-chamber having an open upper end, a relief-valve and a gas-outlet, a reticulated carbid-holder secured in the upper end of the generating-chamber, a closure having

a central screw-threaded opening and closing the generator and carbid-holder, a water vessel, a central tube fixed in the water vessel with its lower end extended below the bottom of the vessel and screw-threaded to engage the threads of the closure, a valve in the tube the stem of which projects above the tube and provided with an air-escape passage, a valve in the stem to control said air-passage, a siphon in the water vessel having one leg opening into the said tube, a cup secured to the lower end of the tube within the carbid-holder and provided with ports, a rod secured to the cup and depending into the carbid-holder, and a capillary covering on the rod, substantially as shown and described.

7. The combination in a gas-generator, of a tube, a perforated stem in said tube opening into and outside of the latter, and a spring-actuated valve for normally closing a passage in said stem, substantially as set forth.

8. The combination in a gas-generator, of a connected siphon and tube in a reservoir, a perforated stem in said tube opening into and outside of the latter, and a spring-actuated valve for normally closing a passage in said stem, substantially as set forth.

9. The combination in a gas-generator, of a connected siphon and tube within a reservoir, and a filling-cup surmounted on the latter, sufficient space being left between said tube and the junction of said cup with the reservoir for liquid to pass from the former into the latter, substantially as set forth.

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