No. 649,812. Patented May 15, 1900.

A. F. CHACE.

ACETYLENE GAS GENERATOR.

(Application filed May 26, 1899.)

(No Model.)

FIG. 1.

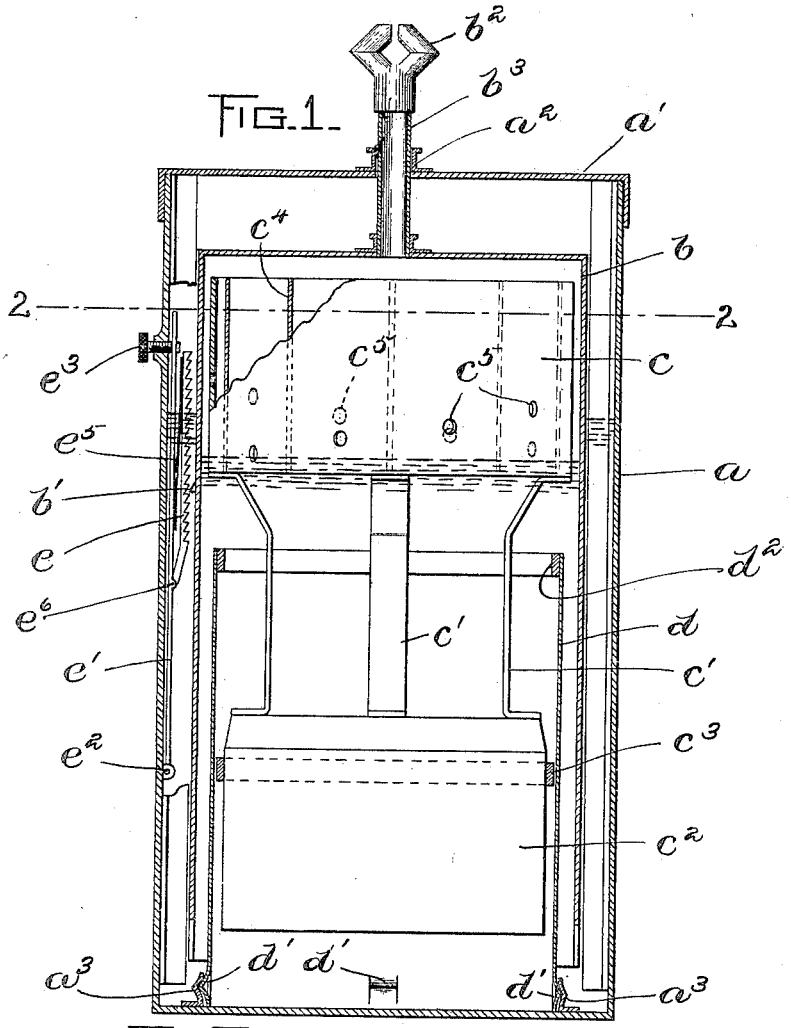
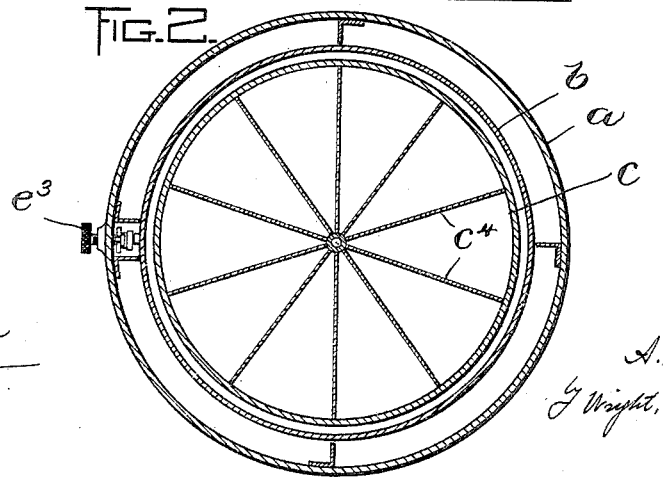


FIG. 2.



WITNESSES:
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UNITED STATES PATENT OFFICE.

ALBERT F. CHACE, OF BOSTON, MASSACHUSETTS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 649,812, dated May 15, 1900.

Application filed May 26, 1899. Serial No. 718,407. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. CHACE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Acetylene-Generators, of which the following is a specification.

This invention relates to apparatus for generating acetylene gas; and it has for one object to provide a holder for the carbid of an improved sectional construction having provisions for containing several separate bodies of carbid and means for introducing the water to the several carbid-sections in succession, whereby said several bodies are consumed one after the other.

The invention also has for its object to provide a construction whereby an improved water seal is obtained in operation.

The invention further has for its object to provide a generating apparatus of simple and compact construction particularly adapted for use as a lamp.

The invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a vertical sectional view of an acetylene-generator constructed in accordance with my invention. Fig. 2 represents a horizontal sectional view on line 2 2 of Fig. 1.

The same reference characters indicate the same parts in both the figures.

Referring to the drawings, a designates an outer cylindrical receptacle constructed to hold water and provided with a loose-fitting cover a', having a central aperture at a^2 for the reception of the stem or pipe b^3, which carries at its upper end a burner b^2 and is connected at its lower end with the inverted-tank-shaped gas-holder b, contained within the outer vessel a. Said holder b normally has its lower edges immersed in the water contained in the vessel a and is adapted to rise and fall with the varying gas-pressure. Inside of the gas-holder b is placed the carbid-holder c, supported on legs c' c', rising from an air-tight hollow float or buoy c^2, the said float and carbid-chamber being free to move up and down with the gas-holder b. Interposed between the gas-holder b and the float c^2 is a cylindrical sleeve d, held in engagement with the bottom of the outer vessel a by means of spring-clips a^3 a^3, attached to the bottom of said vessel and engaging projections d' d' on the lower edge of the sleeve. Around the inside of the upper edge of the sleeve d is placed a narrow packing-ring d^2, and surrounding the float c^2, near the upper edge of the latter, is a similar packing-ring c^3, adapted to come into engagement with the ring d^2 on the sleeve when the float c^2 is elevated a sufficient distance within said sleeve. When thus brought into engagement with the upper ring d^2, the lower ring c^3 is not permitted to pass said upper ring. Enough space is left between the lower ring c^3 and sleeve d to allow for the passage of the water past said ring between the float and sleeve.

By means of a number of radiating transverse partitions c^4 c^4, placed within the carbid-holder c and connected with each other and with the sides and bottom of said holder, the holder is divided into a series of separate and distinct compartments, each of which is provided with an inlet-aperture c^5 in its side for the admission of water into said compartment. The several inlets c^5 to the various compartments are positioned at different heights from the bottom or floor of the carbid-holder. The lowest inlet is placed at a short distance above the bottom of the holder. The next higher inlet, which is preferably located on the opposite side of the holder, is placed at a short distance above the first said inlet. The third inlet, which is preferably located next to the first said inlet, is placed at a slightly-higher distance, and so on.

On the outside of the gas-holder b is a projecting lug b', adapted to come into engagement when the holder rises with the teeth of a vertical ratchet-bar e, located on the inner side wall of the outermost vessel a. Said ratchet-bar is pivoted at its lower end to a bar e', which is in turn pivoted at e^2 between ears on the vessel a, and adjustment of said bar e' and the ratchet is effected by means of an adjusting thumb-screw e^3, screwing through a boss in the side of the vessel a and having a positive engagement at its inner end with the upper end of the bar e'. The bar e' and the ratchet-bar e are connected by a leaf-spring e^5, attached at its upper end to the ratchet-bar e and at its lower end to the bar

e', whereby said ratchet-bar is yieldingly projected inwardly toward the gas-holder b. The rotation of the screw e^3 causes the inward and outward movement of the bar e' and ratchet-bar e, whereby said ratchet-bar may be brought into or out of position to be engaged by the lug b' on the gas-holder b.

The operation is as follows: A sufficient quantity of water is introduced into the outer vessel a, and the carbid-holder c, which when fully loaded will have all of its compartments filled with calcic carbid, is placed within said outer vessel, its float c^2 being surrounded by the sleeve d, as before described, and the gas-holder b is placed in position, surrounding the carbid-holder and its float and the sleeve d. The buoyancy of the float c^2 is such as to normally hold all of the inlet-apertures c^5 of the carbid-holder c out of the water when said holder has its full load of carbid; but when the gas-holder b is superimposed on said carbid-holder the weight of the former is such as to normally depress the carbid-holder and its float to a position in which the highest one of the inlet-apertures c^5 is accessible to the water in the outer vessel a. The water upon reaching the lowermost inlet-aperture c^5 wets the carbid in the compartment to which the said aperture leads, and the generation of gas commences. The gas rises and fills the upper part of the holder b, elevating said holder and simultaneously depressing the level of the water within the holder and raising its level on the outside of the holder. Upon the attainment of a pressure sufficient to raise the holder a predetermined distance the inlet-aperture c^5, into which the water flowed, will be raised above the top of the water, and as soon as the water which entered the aforesaid compartment has been exhausted the generation of gas will cease. If the gas is being burned at the tip b^2, the pressure will then diminish and the holder b will sink and again immerse the lowermost inlet-aperture c^5. Water continues to be admitted into the first compartment in small quantities until the carbid in said compartment is exhausted, and as soon as this occurs the compartment having the next higher inlet-aperture will be called into operation, as will be readily understood. By locating the apertures in the order of their succession on opposite sides of the carbid-holder c, and thereby using first a compartment on one side of the holder and then one on the other side, I avoid overheating of the holder in any one place. During the up-and-down movement of the gas-holder b its outlet pipe or stem b^3 slides through the aperture a^2 in the cover a' of the outer vessel, and in case of an excessive upward movement of the gas-holder said cover, being loosely fitted in place, can be raised by the holder to accommodate such movement. When the apparatus is in use and the gas being burned at the tip b^2, the ratchet-bar e will be retracted, so that the lug b' cannot engage its teeth. When the light is extinguished, however, the screw e^3 is manipulated to move the ratchet-bar into operative position, and then upon the elevation of the gas-holder b, due to the pressure within it, the lug b' will engage tooth by tooth the ratchet e until the generation of gas ceases. The gas-holder will then be held at the topmost point which it reaches, and there can be no further generation of gas until the ratchet is withdrawn and the holder b allowed to descend and carry with it the carbid-holder c.

It will be readily understood that I may construct the carbid-holder c with only a single compartment, if desired, or I may employ any plural number of compartments in the manner indicated as occasion requires.

I claim—

1. In an acetylene-generating apparatus, an outer vessel constructed to contain water, a gas-holder within said vessel, a float, a carbid-holder supported thereby and normally engaged by said gas-holder, and means for limiting the upward movement of said float, substantially as set forth.

2. In an acetylene-generating apparatus, an outer vessel constructed to contain water, a gas-holder located therein, a float, a carbid-holder supported thereby, and a sealing-sleeve adapted to limit the movement of said float, substantially as set forth.

3. In an acetylene-generating apparatus, an outer vessel constructed to contain water, a gas-holder located therein, a float, a carbid-holder supported thereby, a sleeve located in said vessel having an annular ring or shoulder, and a ring secured to said float and designed to engage the ring of said sleeve, substantially as set forth.

4. In an acetylene-generating apparatus, an outer vessel constructed to contain water, a gas-holder located therein, a float, a carbid-holder supported thereby, spring-clips secured to the bottom of said outer vessel, and a sleeve having projections engaging said clips, said sleeve being adapted to limit the movement of said float, substantially as set forth.

5. In an acetylene-generating apparatus, an outer vessel constructed to contain water, a carbid-holder located therein, a gas-holder surrounding said carbid-holder, a bar pivoted to said outer vessel, a ratchet-bar pivoted to said latter bar, a thumb-screw working in the wall of said outer vessel and engaging said first-mentioned bar, a spring interposed between said bars, and a lug on the gas-holder adapted to engage the teeth of said rack-bar, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT F. CHACE.

Witnesses:
A. D. HARRISON,
C. F. BROWN.