No. 688,366. Patented Dec. 10, 1901.

E. S. TITUS.

ACETYLENE GAS GENERATOR.

(Application filed Mar. 19, 1901.)

(No Model.)

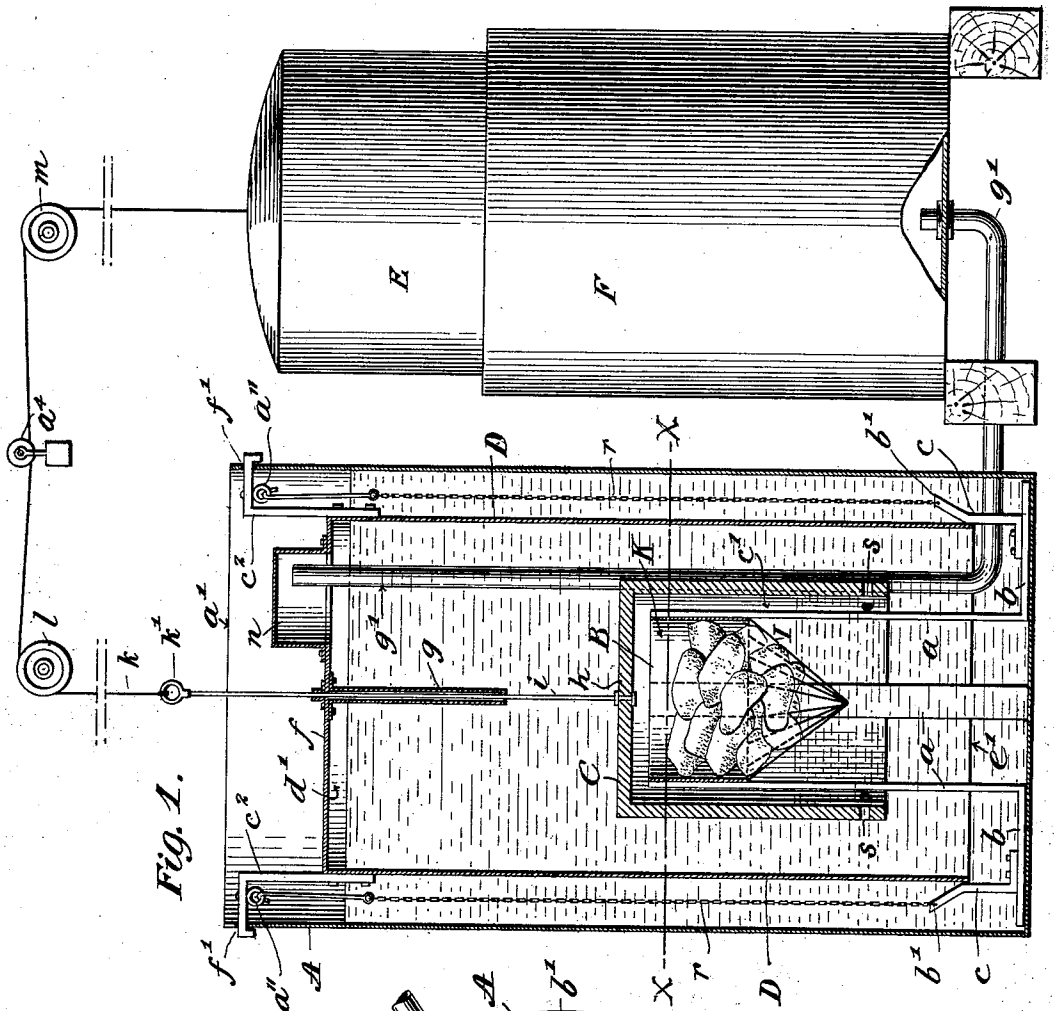

Fig. 1.

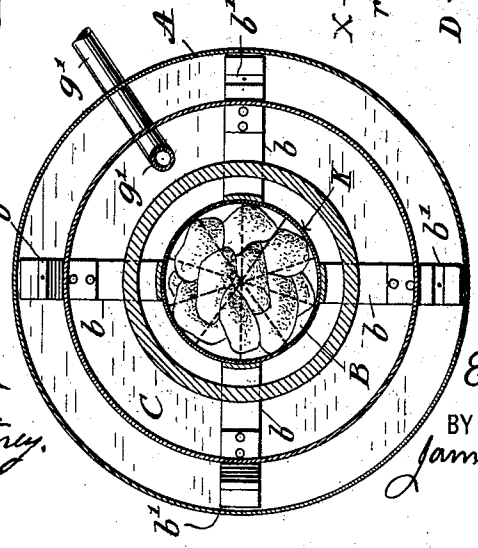

Fig. 2.

WITNESSES:

Frank A. Olson

Amariah Whitney.

INVENTOR

Edward S. Titus

BY James A. Whitney

ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD S. TITUS, OF HEMPSTEAD, NEW YORK.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 688,366, dated December 10, 1901.

Application filed March 19, 1901. Serial No. 51,889. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. TITUS, a citizen of the United States, and a resident of Hempstead, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Acetylene-Gas Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal sectional view of an acetylene-gas machine made according to my invention. Fig. 2 is a horizontal sectional view of a portion thereof, taken in the line x x of Fig. 1.

This invention is designed to provide an acetylene-gas machine of simple, strong, and durable construction capable of convenient manipulation and wherein provision is made for effectually segregating the carbid from the water in the apparatus at such times as the machine is required to be idle.

To these ends my invention comprises certain new and useful combinations of instrumentalities, hereinafter fully set forth and described.

A is an outside shell which constitutes the water-tank of the apparatus and which itself is open at the top, as at a'. Arranged centrally or thereabout in this shell is a carbid-holder B. This is normally stationary and is supported on legs a, attached thereto and resting on the bottom b' of the tank A. To enable the carbid-holder to be properly centered in the shell A, the legs a have radial feet b of such length that when the carbid-holder and its legs are inserted in the shell the ends of the feet bear against the inner wall of the shell, and this brings the holder to its central position and holds it there against any tendency to lateral displacement. Fixed to the feet b are guides c, which flare outward at their upper parts b', as shown in Fig. 1. Surrounding the carbid-holder is a bell C, which is capable of vertical movement, as and for a purpose herein presently explained. There is a space c' between the carbid-holder and the bell sufficient to prevent them from coming in contact with each other. Between the outer circumference of the bell C and the inner circumference of the shell A is an unsealed water-shell D, which is closed at its top d' and open at its bottom, as at e'. This water-shell D is normally stationary in its just-described position, but is on occasion vertically removable therefrom. To provide for holding the water-shell D in place and at the same time provide for its removal when required, hooks c^2 are provided to its upper part. These hooks catch over and upon the upper edge of the tank A, as shown in Fig. 1, and thus suspend the inserted water-shell in position. To prevent an accidental displacement of these hooks, they fit into the slots or bayonet-joints f', so that by dropping the hooks into the openings of the joints and giving a slight axial turn to the water-shell the latter is held detachably but securely in place. In the top f of the water-shell D is a vertical tubular guide g. Extended upward through this tube g from the crown h of the bell C is a rod i, from the upper end of which a strap or cord k extends over suitable guide-pulleys e, l, and m to the bell E of a gasometer, the body or shell of which is shown at F, so that the rise and fall of the gasometer will afford a vertical movement to the bell E with reference to the stationary carbid-holder B. To take up any slack of the cord k, an idler-pulley a^4 may be placed thereon. The bell C rises as the gasometer-bell descends, and vice versa. At the upper part of the water-shell D is a gas-outlet chamber n, into which extends the upper or inlet end of an outlet-pipe g', which latter extends to and within the gasometer-shell to supply the gasometer with the gas generated from the contents of the carbid-holder, as herein presently explained. Extended upward from the lower part of the legs a of the carbid-holder, preferably from the guides b' on the feet b thereof, are lifting-chains r, the upper ends of which are detachably connected with the upper part of the water-shell D, as at a''. This attachment may be provided for by hooks on the ends of the chains, which hook into rings or staples provided to the upper part of the water-shell. To the rod i may be provided a ring k', into which the ends of the lifting-chains aforesaid may be hooked when detached from their fastenings a'', as when the water-shell is raised,

as presently set forth. In the lower part of the bell C, a short space above the lower edge thereof, as shown in Fig. 1, are any desired number of gas-exit holes or openings *s*.

In assembling the parts into the relation hereinbefore described the carbid-holder is first inserted in the tank A, being guided to its desired position therein by the contact of its feet *b* with the walls of the tank. The water-shell D is then inserted, being guided to its place by the inclines *b'* of the guides *c*, the rod *i* of the bell C being passed through the tubular guide *g* in the top of the water-shell and the hooks c^2 being hung upon the upper edge of the shell A to suspend the water-shell in place and position.

The carbid-holder for the purposes of my present invention claimed herein may be of any desired structure or character, it being within the scope of my present invention so long as a supply of carbid of calcium is duly provided within the bell C. An advantageous structure of carbid-holder for the purpose is, however, that shown in Fig. 1 herein, but described, shown, and claimed in another and separate application for Letters Patent heretofore filed by me on March 13, 1901, Serial No. 51,002. The said carbid-holder is composed of wires *r*, arranged to provide an inverted skeleton cone I, above which is a barrel K, carbid from the barrel descending into and supplying the cone as the carbid in the latter is exhausted by the action of water at the bottom of its mass in the production of acetylene gas during the operation of the machine.

In the use and operation of the apparatus the water-shell D and the space between it and the outer shell A are filled with water to or about the top *f* of the water-shell, the water between the tank A and the water-shell D serving to lute or seal the joint between the said parts, while that within the water-shell serves a purpose in the production of gas from the carbid and in the washing of the gas thus produced. In the operation of the apparatus there is a sufficient quantity of gas derived from the carbid to prevent the water in the water-shell from reaching the carbid, except when the bell C is lifted to relieve the pressure upon the water below, and thus permit the water to ascend in contact with the carbid to an extent proportioned to the upward or downward movement, as the case may be, of the said bell, these movements being produced and determined by those of the gasometer-bell E, with which the bell C is connected, as hereinbefore explained. As the water rises into contact with the carbid, gas is of course generated, and the bell C, being closed at its top, the gas as generated passes out under the lower part of said bell into the volume of water below and around the latter and thence, rising through the water above and being washed or purified thereby, enters the chamber *n*, and from thence passes through the pipe G to the gasometer. When desired the openings *s* of the bell C may be dispensed with; but in such case the exit of gas from the bell is less uniformly distributed around its circumference. By providing the bell with holes or openings *s*, the outflow of gas is equalized around the circumference of the bell, and the gas is not only more uniformly distributed to and through the superincumbent volume of water, but liability of tilting of the bell C from an irregular outflow of gas at different parts of its circumference is avoided.

To refill the carbid-holder—in other words, to supply carbid in proper position within the bell C—the chains *r* are drawn upward, thereby lifting the carbid-holder, with its legs *a* and feet *b*, until the top of the carbid-holder comes in contact with the top of the bell C, and, the upward movement being continued, lifts the bell C bodily until it comes against the tube *i* of the water-shell D, a further upward movement lifting the water-shell D from the tank, the parts just mentioned being thus withdrawn together, and thereby affording easy access to the interior of each.

When it is desired that the operation of the machine should cease—in other words, to secure a more or less temporary cessation in the production of the gas from the carbid—the chains *r* are lifted to raise the carbid-holder to the top of the bell C, and then the carbid-holder and the bell together until the latter reaches the tube *g* of the water-shell D, as hereinbefore explained, which done, the chains are attached to the ring *k'* to hold the parts suspended in the upper part of the water-shell. This change of location of the parts within the water-shell displaces the water from the upper part of the latter and causes it to pass to the bottom thereof, thereby being brought entirely out of contact with the carbid of calcium in the carbid-holder and causing the production of acetylene-gas therefrom to cease forthwith.

It will be observed that the tube *g* is not only a guide for the rod *i*, but also provides a water seal around the said rod; also, that the bell C should be of sufficient weight to sink in the water. When the bell itself is not sufficiently heavy for this, it may be loaded by any suitable means.

What I claim as my invention is—

1. The combination with a water-receptacle and a relatively fixed carbid-holder therein, of a vertically-movable bell closed at its top and placed above and around the carbid-holder, a gasometer and means for transmitting motion from the gasometer to the bell to regulate admission of water to the carbid, as described.

2. The combination with a tank and a water-shell within said tank of a vertically-movable carbid-holder, a vertically-movable bell placed above and around said carbid-holder, means for lifting the carbid-holder against the bell, for lifting the bell and the carbid-holder together to the upper part of the water-shell and for retaining them there as oc-

casion requires whereby the water of the water-shell is shifted to the bottom thereof with the carbid raised out of contact with the water, as described.

3. The combination with a water shell or tank, a carbid-holder normally stationary therein and a gasometer of a vertically-movable bell closed at its top and placed over and around the carbid-holder and means for actuating the said bell from the vertical motions of the gasometer-bell, whereby water is repelled by gas in said bell from contact with the water in the water shell or tank when the bell is lowered, and permitted to come in contact with the carbid when the bell is raised, as herein described.

4. The combination with an outer shell, a removable water-shell closed at the top and open at the bottom and placed in the outer shell, and a vertically-movable carbid-holder normally fixed in the lower part of the water-shell, of a vertically-movable bell which is closed at its top, and which surrounds said carbid-holder of a gasometer, and means for automatically raising and lowering the said bell from the movements of the gasometer-bell, as described.

5. The combination with an outer shell, a water-shell closed at its top and open at bottom and placed in the outer shell, of a carbid-holder, legs for supporting said holder, feet laterally extended from said legs to the wall of the shell to retain the carbid-holder in place, a bell closed at its top and arranged over and around the carbid-holder and connecting devices extended from the top of said bell through the top of the water-shell to the gasometer-bell, to operate the bell from the movements of the gasometer-bell, as described.

6. The combination with an outer shell, a water-shell closed at top open at bottom, and placed in the outer shell, and hooks which extend over the upper edge of the outer shell to suspend the water-shell therefrom, of a carbid-holder arranged at the lower part of the water-shell and having feet which are provided with upwardly-inclined guides which guide and retain in position the lower part of the water-shell, and a vertically-movable bell arranged above and around the carbid-holder, as described.

7. The combination with a fixed water-shell, a water-shell closed at top, open at bottom, and suspended within said outer shell, a vertically-movable carbid-holder placed at the lower part of the water-shell, and means for lifting the carbid-holder to the top of the bell, and the latter to the top of the water-shell whereby the carbid-holder may be brought clear of the water in the apparatus and when it is desired to cease the operation of the latter, as described.

8. The combination with a fixed outer shell, a removable water-shell closed at top, open at bottom, and suspended within said outer shell, a vertically-movable carbid-holder placed at the lower part of the water-shell, a bell surrounding the same, supports for retaining the carbid-holder in position, and detachable lifting devices fastened to said supports and extended from said supports upward between the outer shell and the water-shell and attached to the top of said water-shell, whereby the carbid-holder, the bell, and the water-shell may be lifted bodily and together from the outer shell, as described.

9. The combination with a fixed outer shell, a removable water-shell closed at top, open at bottom, and suspended within said outer shell, a vertically-movable carbid-holder placed at the lower part of the water-shell, legs for supporting the carbid-holder, feet extended outward from said legs to the wall of the outer shell to hold the carbid-holder against lateral displacement, inclined guides provided on said feet to guide the lower part of the water-shell to its place, a bell placed over and around the carbid-holder and chains extended upward from the guides between the water-shell and the outer shell for lifting the legs, the carbid-holder, the bell, and the water-shell as described.

EDWARD S. TITUS.

Witnesses:
A. D. MOORE,
AMAZIAH WHITNEY.