No. 618,734. Patented Jan. 31, 1899.

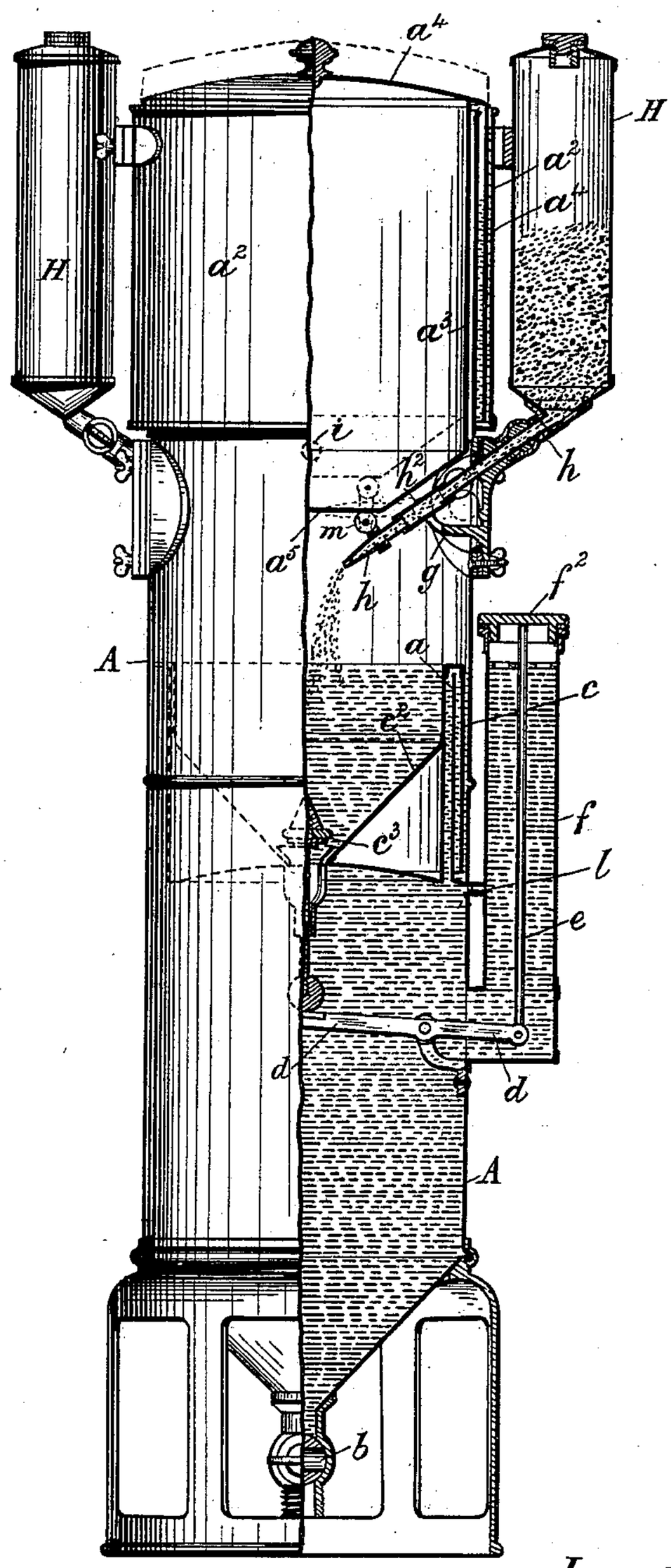
J. H. ROSS.

APPARATUS FOR GENERATING ACETYLENE.

(Application filed Aug. 25, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:—

Richard Skerrett

Arthur John Powell

Inventor:—

John Howard Ross

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Fig. 2.

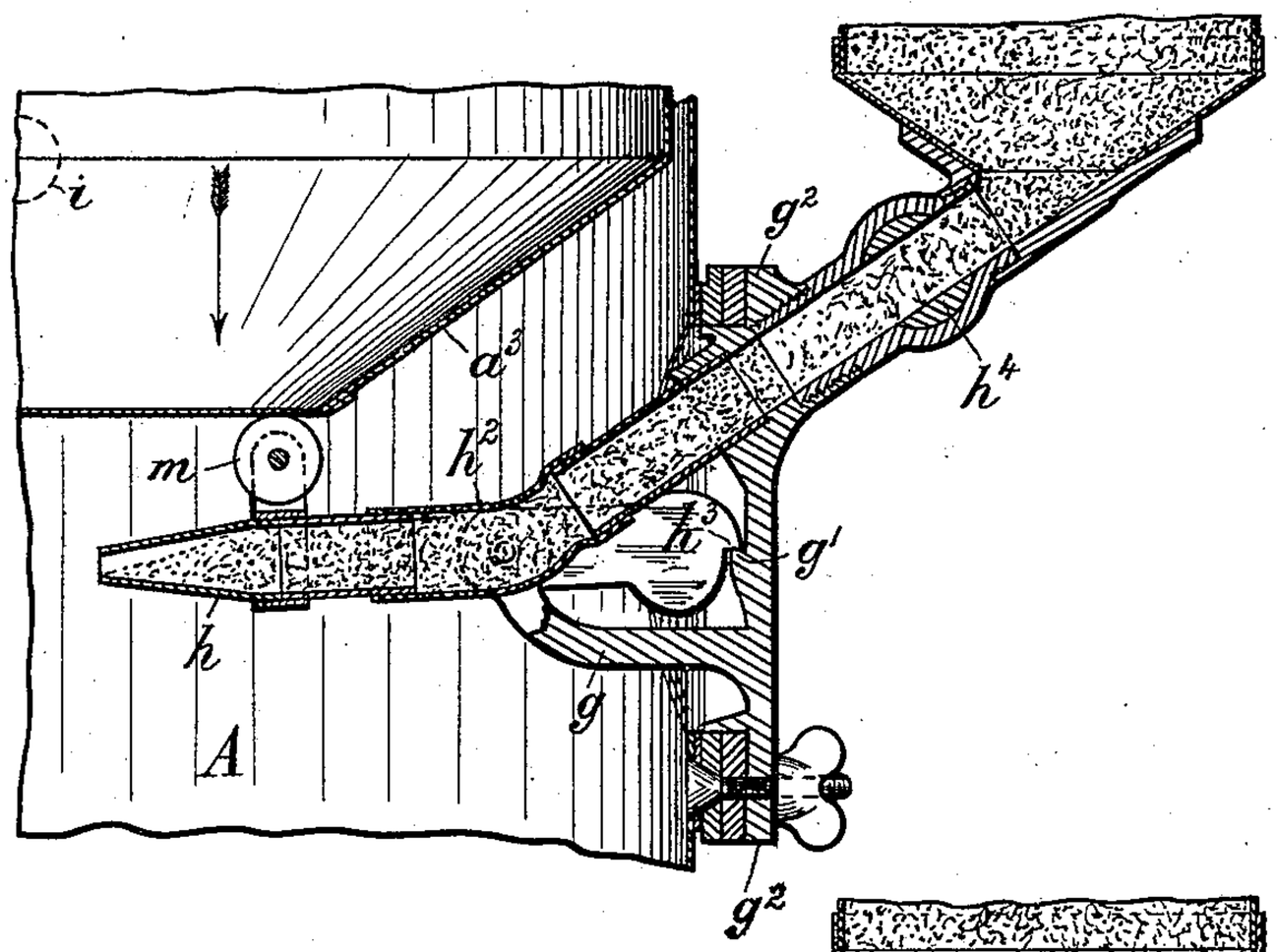


Fig. 3.

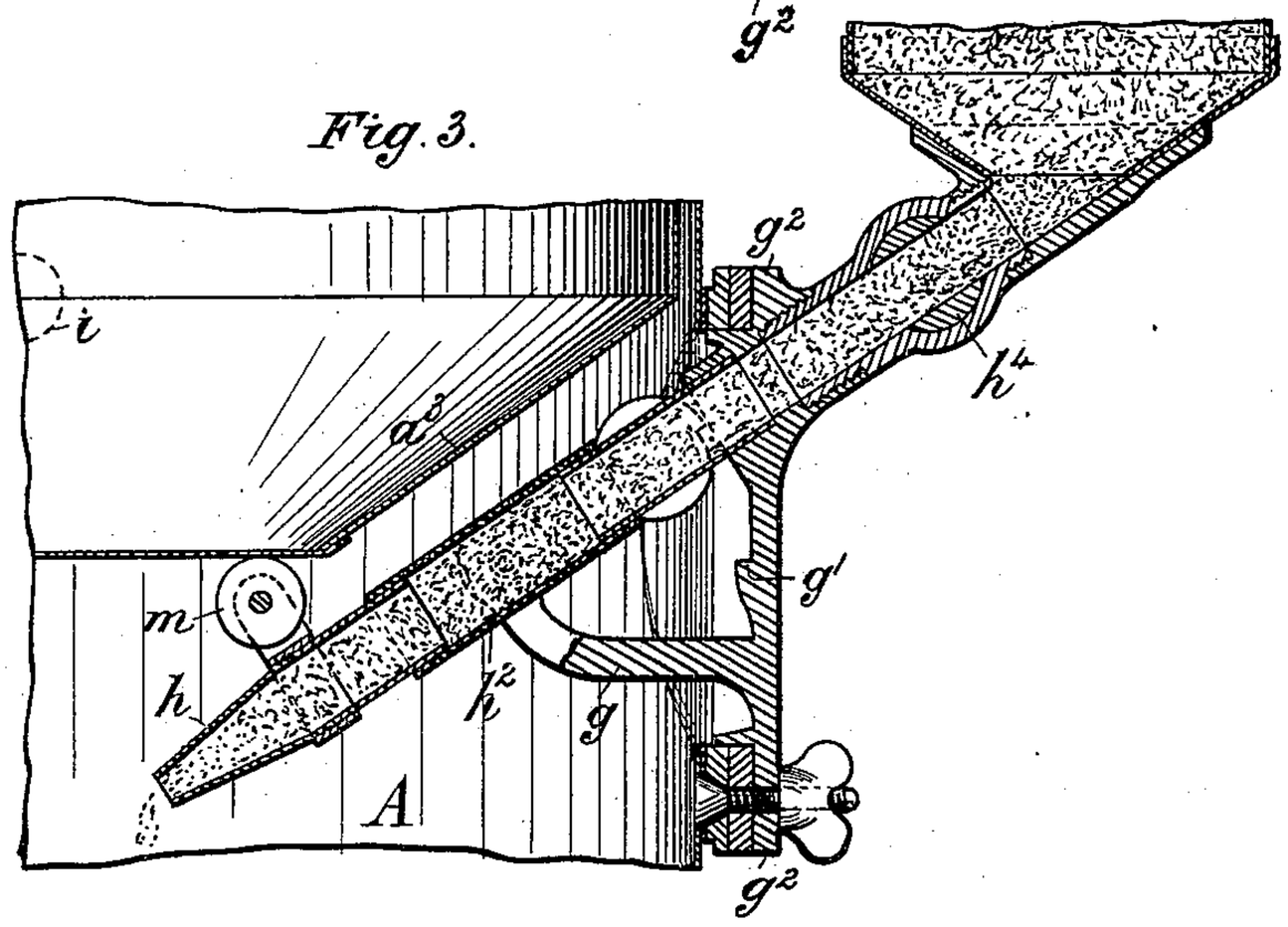
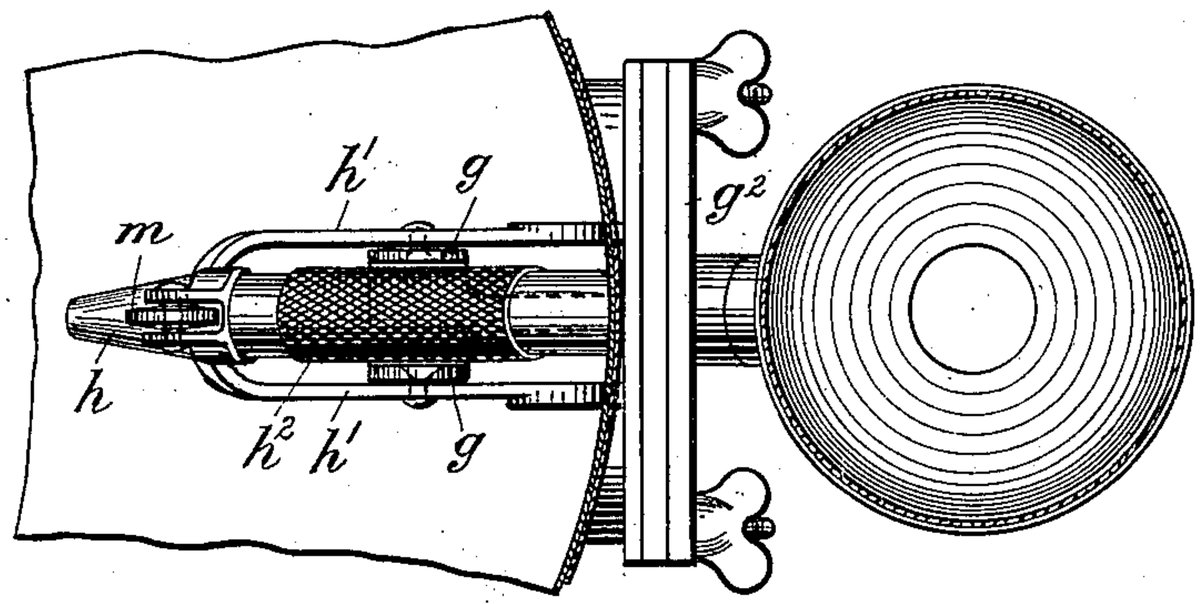


Fig. 4.



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John Howard Ross

UNITED STATES PATENT OFFICE.

JOHN HOWARD ROSS, OF ASTON, ENGLAND.

APPARATUS FOR GENERATING ACETYLENE.

SPECIFICATION forming part of Letters Patent No. 618,734, dated January 31, 1899.

Application filed August 25, 1898. Serial No. 689,519. (No model.)

To all whom it may concern:

Be it known that I, JOHN HOWARD ROSS, a subject of the Queen of Great Britain, residing at Aston, near Birmingham, England, have invented new and useful Improvements in Apparatus for Generating Acetylene, of which the following is a specification.

My invention has for its objects to simplify the construction and working of apparatus for generating acetylene and to facilitate the separation and putting together of the parts of the apparatus for cleaning or repair; and my invention consists of the improvements hereinafter described for effecting these objects.

I will describe my invention in connection with the accompanying drawings, of which—

Figure 1 represents, half in elevation and half in section, apparatus for generating acetylene constructed according to my invention. Figs. 2 and 3 represent a portion of the same in section drawn to a larger scale than Fig. 1. Fig. 4 represents in plan the part represented in section in Figs. 2 and 3.

The same letters of reference indicate the same parts in the several figures of the drawings.

The apparatus constituting my invention consists of a vertical cylinder A, the bottom of which is conical and provided with a tap or stop-cock *b* for emptying the same from time to time of water and mud (calcium hydrate) produced in the working of the apparatus.

At or about the middle of the cylinder A is a short concentric inner cylinder *a*, joined at its bottom edge to the outer cylinder A, the space between which inner cylinder *a* and outer cylinder A is filled with water for the reception of the outer shell or wall *c* of a double-walled diaphragm c^2, which divides the cylinder A into two parts, a lower part, constituting the water-reservoir, and an upper part, constituting the gas-generating chamber and gas-holder. The diaphragm c^2 is dish-shaped or of the form of an inverted cone, and at its bottom it is provided with a valve c^3, and the stem of said valve drops downward below the diaphragm and depends in the water-reservoir and rests on one end of a lever *d*, to the other end of which is connected a vertical rod *e*, occupying the axis of a smaller side cylinder *f*, by which water is introduced into the large cylinder A. The lever *d* has its fulcrum *d'* upon a bracket d^2, projecting from the inner face of the cylinder A. When the screw closing-cap f^2 of the small cylinder *f* is in place, the rod *e* is pressed down into the position represented in Fig. 1 and through the lever *d* raises the valve c^3 and establishes communication between the water in the dished diaphragm c^2 and the water-reservoir. When the water in the reservoir requires to be renewed, it is only necessary to unscrew the closing-cap f^2 of the smaller cylinder *f*, when the weight of the valve and its valve rod or stem, the latter being preferably provided with a weight c^4, causes the said valve c^3 to descend, and thereby isolate the gas-generating chamber and gas-holder from the water-reservoir. The rod *e* is provided with a guide *e'* near the upper end of the side cylinder *f*. The water in the water-reservoir can consequently be drawn off without loss of gas and without disturbing the working of the apparatus. A small pipe or passage *l* is provided, by which air may escape from the cylinder A into the small cylinder *f* on the filling of the water-reservoir.

At the top of the cylinder A is an outer concentric cylinder a^2, the space between which and the cylinder A is nearly filled with water, which forms when the inverted cylinder a^4, which closes the top of the apparatus, is put in position a gas seal for the apparatus. The top of the inverted cylinder a^4 carries a hollow drum or displacer a^3, which reduces the capacity of the gas-generating chamber and effects automatically the operation of the calcium-carbid-discharging tubes or spouts in the manner hereinafter described.

The calcium carbid is stored in containers H H, (preferably two,) situated at opposite sides of the cylinder A and detachably connected thereto. Each container H has a delivery-spout *h*, the part h^2 of which is of india-rubber or other flexible material. The extreme or delivery end of the spout *h* is carried by a forked weighted lever *h'*, supported by a bracket *g*, which weighted lever in the normal position of the parts—that is, when the gas-generating chamber or holder is full or partially filled with gas—preserves the delivery end of the spout *h* in the horizontal

position indicated in dotted lines in Fig. 1 and represented in full lines in Fig. 2, the stops h^3 of the weighted ends of the levers engaging with the catches g' on the bracket-plate g^2. To permit the attachment of the bracket g and its supporting-plate g^2, an offset g^4 is formed upon the side of the cylinder A, as shown most clearly in Fig. 4. This offset is circular, and against its outer edge is laid an annulus g^5, then a ring g^6 of any suitable packing, upon which is placed the flange g^7 of the bracket-plate g^2, the whole being secured by bolts g^8, having conical heads g^9, their outer ends receiving thumb-nuts g^{10}. This forms a gas-tight joint. The delivery end of the spout h is preferably provided with a roller m for bearing on the bottom of the displacer a^3 when the said displacer is in its lowest or nearly its lowest position. The delivery-spout h is provided with a stop-cock h^4.

Gas passes from the gas-generating chamber or holder by a pipe i. (Indicated in dotted lines in Figs. 1, 2, and 3.)

The working of the gas-generating chamber of the apparatus is as follows: The spout h being in the position Figs. 1 and 3, calcium carbid descends by gravity in the said spout and falls into the water in the dish-shaped diaphragm c^2. By the action of the water on the calcium carbid acetylene gas is generated and the cylindrical closing-top a^4 rises, the delivery-spout h being turned by the weighted lever h' from its delivery position, Figs. 1 and 3, into its non-delivery position, Fig. 2. When by the withdrawal of the gas the rising and falling cylinder a^4 has descended to the position indicated in dotted lines in Fig. 1 and represented in full lines in Fig. 2, the bottom of the displacer a^3 comes in contact with the roller m, and the continued descent of the rising and falling cylinder a^4 and displacer a^3 effects the depression of the delivery-spout h into the delivery position represented in Figs. 1 and 3.

Although I have represented and prefer to employ two carbid-containers H H in connection with the gas-generating chamber, yet I wish it to be understood that one carbid-container only may be employed, or where thought necessary or desirable more than two may be employed.

In practice the apparatus is used as follows: The chamber or cylinder A is first filled with water, and during this operation the taps h^4, by which the carbid is admitted, are shut off. When a suitable quantity of water has been admitted to the cylinder A, said taps h^4 are opened and the air in the gas-holding chamber above the water is drawn off through the gas-delivery pipe i, thereby allowing the displacer a^3 to descend, thereby carrying the carbid-discharging spouts h down to the inclined position shown in Figs. 1 and 3. Carbid then flows from the containers H through the spouts h into the diaphragm c^2 until the resulting evolution of gas raises the displacer a^3, causing the spouts to assume the position shown in Fig. 2, by which the discharge of carbid is arrested until the flow of gas from the gas-chamber beneath the displacer allows the latter to again descend.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for generating acetylene gas from calcium carbid, the combination with a cylinder containing water in its lower part, of a diaphragm above the water-level, a valve in said diaphragm having a weighted stem, a lever fulcrumed in the cylinder below the diaphragm and supporting the valve-stem on its end, a rod connected to the other end of said lever and lying in a side cylinder, and a cover for the latter to hold the rod down and keep the valve in the diaphragm open, substantially as described.

2. In an apparatus for generating acetylene gas, the combination with a cylinder having a generating-chamber, of one or more carbid-containers having flexibly-jointed tubes which pass from their lower ends into said chamber, a lever fulcrumed on a bracket in said chamber and having one end weighted and the other end connected to the tube of a container between the exit end of the latter, and the flexible joint, and a displacer operated by the gas in the gas-holder, the lower end of said displacer controlling the position of the exit end of each of said tubes, substantially as described.

3. In an apparatus for generating acetylene gas, the combination with a cylinder of a diaphragm dividing it into an upper and lower part, a valve having a weighted stem to close an opening in the diaphragm, a lever to sustain said valve and stem, means for operating said lever from the exterior, one or more carbid-containers having flexibly-jointed tubes entering the cylinder above the diaphragm, a weighted lever for each container, one end of said lever being connected to the end of the tube of a container, and a displacer operated by the gas in the gas-holder, each weighted lever being provided with a roller which is in contact with said displacer, the rise and fall of the latter by the accumulation and withdrawal of gas from the holder controlling the position of the exit end of each container-tube and regulating thereby the supply of carbid, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

JOHN HOWARD ROSS.

Witnesses:

RICHARD SKERRETT,

ARTHUR JOHN POWELL.