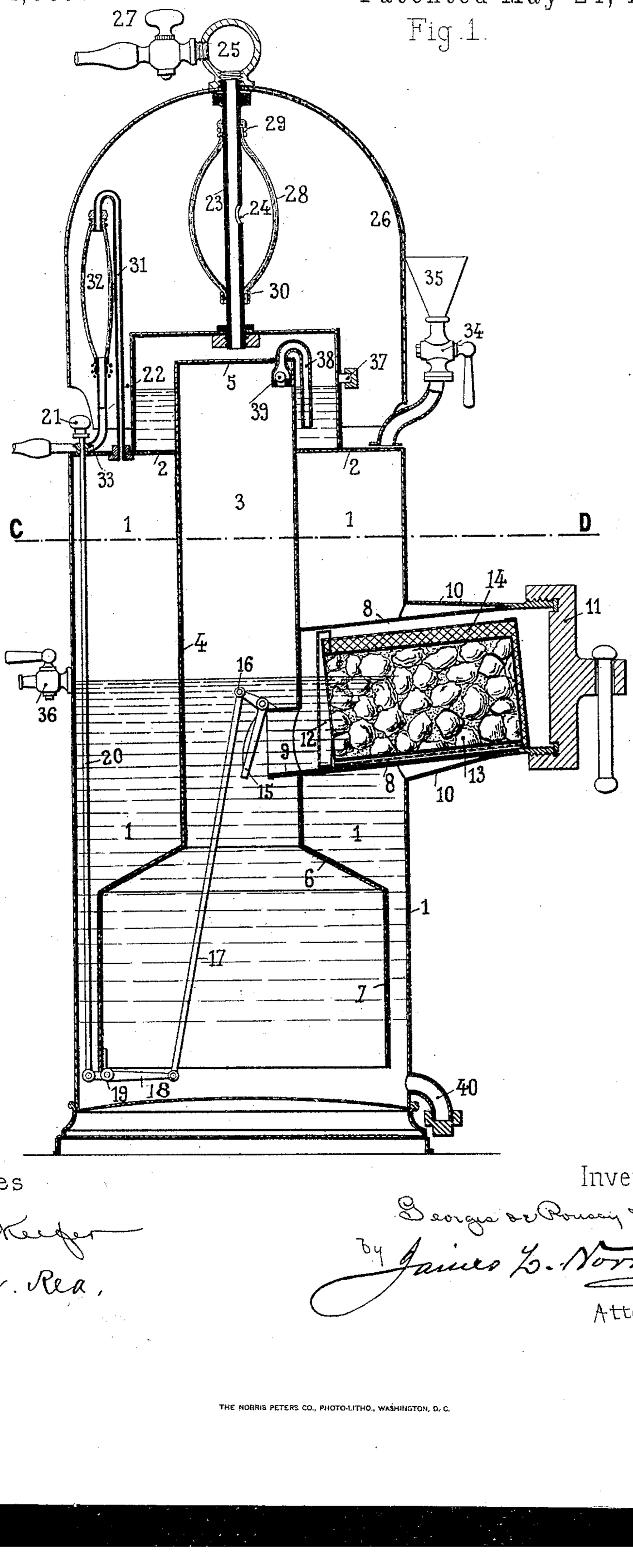
(No Model.) 2 Sheets—Sheet 1.

G. DE R. DE SALES.

APPARATUS FOR GENERATING ACETYLENE GAS.

No. 604,667. Patented May 24, 1898.

Fig. 1.



Witnesses

J. B. Keefer

Geo. W. Rea,

Inventor

Georges de Rouvroy de Sales

by James L. Norris.

Attorney

(No Model.) 2 Sheets—Sheet 2.

G. DE R. DE SALES.

APPARATUS FOR GENERATING ACETYLENE GAS.

No. 604,667. Patented May 24, 1898.

Fig. 3.

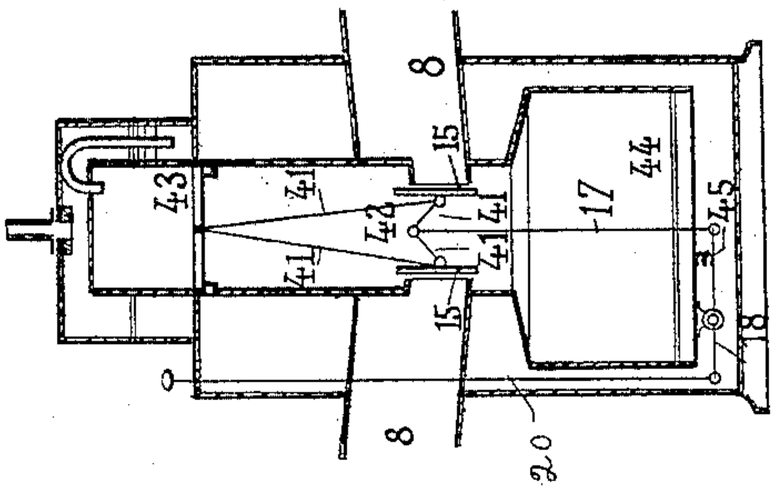


Fig. 4.

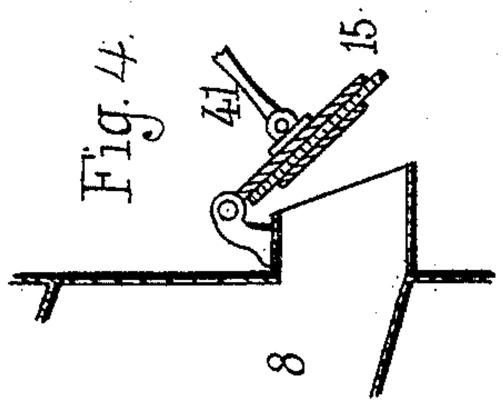
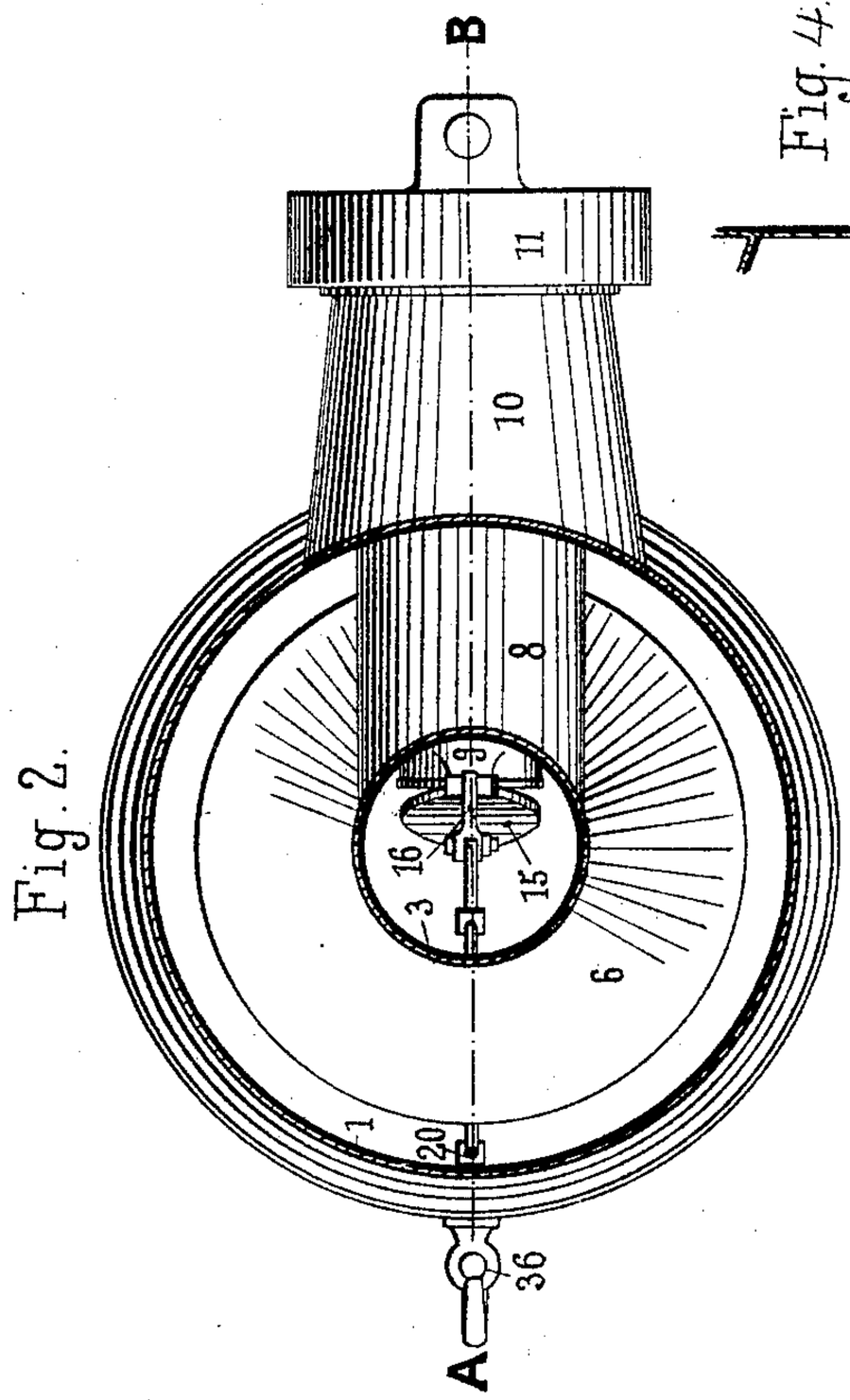


Fig. 2.



Witnesses

Jno. B. Keefer

Geo. W. Rea.

Inventor.

Georges de Romsay de Sales

by James L. Norris.

Attorney

UNITED STATES PATENT OFFICE.

GEORGES DE ROUSSY DE SALES, OF LYONS, FRANCE.

APPARATUS FOR GENERATING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 604,667, dated May 24, 1898.

Application filed February 15, 1897. Serial No. 623,459. (No model.) Patented in France October 24, 1896, No. 260,714; in Belgium January 23, 1897, No. 125,962; in Hungary January 25, 1897, No. 8,389; in Switzerland January 27, 1897, No. 13,991; in England January 28, 1897, No. 2,292; in Austria February 16, 1897, No. 505, and in Italy April 5, 1897, LXXXV, 402.

To all whom it may concern:

Be it known that I, GEORGES DE ROUSSY DE SALES, a citizen of France, and a resident of Lyons, in the Department of the Rhône, France, have invented a new and useful Improvement in Gas-Producing Apparatus, (for which I have obtained Letters Patent in Italy April 5, 1897, LXXXV, No. 402; in Hungary January 25, 1897, No. 8,389; in Austria February 16, 1897, No. 505; in Belgium January 23, 1897, No. 125,962; in Great Britain January 28, 1897, No. 2,292; in Switzerland January 27, 1897, No. 13,991, and in France October 24, 1896, No. 260,714,) of which the following is a specification.

My invention relates to a generating and storing apparatus for acetylene gas, which is illustrated, by way of example, in the accompanying drawings, in which—

Figure 1 is a vertical section of the apparatus, taken on the line A B of Fig. 2. Fig. 2 is a horizontal section of the same on the line C D of Fig. 1. Fig. 3 shows a diagrammatic view of a modified construction of the mechanism for operating the valves for starting the apparatus. Fig. 4 is a detail view showing the construction of the valves which close the inlets to the receiver.

The apparatus is constructed as follows:

A cylindrical vessel or reservoir 1, provided with a hermetically-closed cover 2, having a central circular opening in which is fixed a bell 3, formed by a cylinder 4, whose upper end is closed by the plate 5 and lower end by a truncated cone 6 and cylindrical part 7, of larger diameter, open at bottom.

To the sides of the cylindrical part 4 of the bell 3 are fixed one or more cylindrical receivers 8, (one only being shown in Figs. 1 and 2,) slightly inclined and communicating with the interior of the said bell by a smaller tube 9 and supported at their other ends in sockets 10, which inclose them and which are connected to the vessel 1. These receivers are strengthened at their outer ends by a collar on which is screwed an internally-screw-threaded cap 11, provided with a leather ring to form a tight joint. Each receiver has near its inner end a wire-netting 12, which forms a perforated cross-partition against which rest the carbid-cartridges 13. The latter consist, mainly, of a sheath or casing rendered impervious and split longitudinally and adapted to contain pieces of calcium carbid embedded in bitumen or sand. The cartridges are placed in small wire baskets 14.

To the mouth of the tube 9 is hinged a valve 15, of tin, which is provided with a lever-arm 16, by which it is pivotally connected to a rod 17, whose other extremity is similarly connected to the longest arm of a lever 18, turning on a pin 19. The short arm of such lever is connected to a vertical rod 20, provided at its upper extremity with a knob 21, the whole being so arranged as to close the valve 15 by pulling the knob 21.

On the vessel 1 is placed a cylindrical tank 22, in which the gas is washed. This tank is fixed by its lower rim to the cover of the vessel 1 and is provided at its upper part with a central tube 23, having an opening 24, leading at its upper end into a hollow sphere 25. This sphere is screwed to and forms a tight joint with the tube 23 and serves to retain in place the dome 26, which forms a cover for the parts mounted on the top of the vessel 1.

The hollow sphere is provided with one or more outlet-cocks 27 and pipe communications through which the gas is drawn off for use in various apparatus for lighting or other purposes, as may be desired.

The pipe 23 is surrounded by an india-rubber bag or pocket 28, firmly secured at 29 and 30.

On the top of the vessel 1 are also mounted, first, a small vertical tube 31, bent on itself at its upper part and carrying an india-rubber bag or pocket 32, whose lower extremity is in communication with a bent tube 33, secured to the vessel 1, and the purpose of which will be hereinafter explained; second, a cock 34, adapted to receive a funnel 35 for the purpose of admitting water into the vessel 1. A test or gage cock 36 enables one to ascertain when the maximum water-level has been reached and serves at the same time as an overflow-cock. The gas-washer 22 is provided with a short tube 37, ordinarily closed by a cap,

as shown, its purpose being the same as that just described. At the upper part of the bell 3 is arranged a siphon-tube 38, the longest branch of which dips into the water in the washer 22. A ball-valve 39 at the interior extremity of this siphon-tube prevents the water from the washer 22 flowing back into the bell 3 by rising in the tube 38. Lastly, the vessel 1 is provided at the bottom with an outlet-tube 40, closed by a screwed cap, for emptying and cleaning the apparatus.

The working is as follows: To set up the apparatus, the cock 27 is connected to the service-pipes and the tube 33 to a lead pipe leading to the exterior of the dwelling in which the apparatus is erected. In order to generate the gas, the vessel or reservoir 1 is filled with water to the required level by pouring the water through the funnel 35 and cock 34 (taking care at the same time to open the cocks 36 and 27 and pull the knob or knobs 21, so as to close the valve or valves 15) until it begins to flow from the gage-cock 36. The gas-washer 22 is then filled through the tube 37 by unscrewing the cap therefrom until the water reaches the level of said tube. All the openings are now closed. The filling operation is effected about once a week or once a fortnight. The cap 11 is opened to enable a carbid cartridge to be introduced into the wire basket 14 of the receiver or receivers 8, after which such cap is screwed on again. By now pressing down the knob 21 the valve 15 opens and enables the water to act on the carbid. The gas gradually fills the bell 3, then passes through the water in the washer 22, and thence into the bag 28, which it expands. When this bag is filled to a certain degree, it resists further expansion, and the water-level in the bell then sinks and the reaction quickly ceases on account of the small diameter of the bell at the part where the tube connection 9 is fixed. At the same time the water-level rises in the vessel or reservoir 1 and in the socket 10, and thus entirely surrounds the receiver 8, so that the latter, being completely immersed in water, is prevented from becoming heated by the reaction of the carbid on the water. If, notwithstanding this, the production of gas continues, the enlarged part of the bell becomes filled, and finally the gas escapes in bubbles into the vessel or reservoir 1 and passes up the tube 31 into the bag 32, and thence through the tube 33 and its connections into the outer air. This, however, is merely a safety arrangement which is not likely to be required.

If the gas is drawn off from the apparatus, the water rises in the bell 3 until it again comes into contact with the calcium carbid, whereupon the generation of gas recommences.

The gasometer or bell 3 does not really act as such—that is to say, it only becomes filled with gas when the consumption of the latter is stopped very suddenly. As it is not in communication with the outer air except through water, an explosion is rendered practically impossible; but if one did occur it could only take place in the bag or pocket 28, which, being made of india-rubber, presents no danger, as the washer 22 and tube 38 would prevent the explosion from reaching the bell 3. The bag 28 serves also to prevent flickering of the light.

In Fig. 3 is shown an arrangement for enabling the receivers 8 to be recharged during working. The principal parts and the general disposition are the same as in the apparatus hereinbefore described; but in addition to these there are four suspension-wires hung from a cross-bar 43 in the interior of the bell 3 and connected at their lower ends to the center of the valves 15. The latter are also connected by four short links $41^{\times}$ to a common point 42 on a vertical rod 17, and it will be obvious that by depressing the rod 17 the links $41^{\times}$ will spread out, and thereby press the suspended valves against the mouths of the pipes 9, so as to close the inlet to the receivers 8.

The valves 15 15 are constructed of india-rubber disks firmly pressed between two plates of zinc pivoted and suspended at their centers and so forming stoppers to the receivers 8.

The rod 17 is guided in a hole in a strip or bar of metal 44, fixed near the lower end across the bell 3 and forming at the same time a support or bracket to which is pivoted the lever 18, jointed, as in the previous case, to the rods 17 and 20 and provided with a spring 45 to restore it to position.

Whatever may be the arrangement adopted, my invention presents the following advantages:

First. The production of the gas takes place only in proportion to the consumption thereof, whereby overpressure is avoided, while the reserve is divided into two portions, one of which (the main portion) is protected against back-lighting and is isolated from the outer air by the water in the washer, and the other (the portion from which the immediate supply is drawn) is contained in an elastic bag which is capable of expanding and forming a safety device, which, if it should explode, would not cause any other accident nor allow the explosion to spread. The second portion or volume of gas communicates with the main portion only in the direction of the consumption through the water in the washer, while a ball-valve prevents the return of the gases and also limits the internal pressure in the bell, lifting only through overpressure.

Second. The arrangement of the valves as hereinbefore described enables the water to be cut off at any time and the apparatus to be recharged and used for any length of time.

I claim—

1. An apparatus for generating and storing acetylene gas consisting of a reservoir, a dome rising above the reservoir, a bell arranged within the reservoir, its lower open end lying

in water therein, a washer arranged in the dome above the reservoir and in which the upper end of the bell lies, a valved siphon-tube communicating with the bell and having one arm lying in a body of water in the washer, one or more receivers each having a pipe which opens into the bell, a valve to close the open end of said pipe, means for operating said valve from the exterior, a cap to close the receiver and separate it and the carbid-cartridge from the reservoir and atmosphere, a pipe communicating with the washer and with the exterior, and an elastic bag inclosing a part of said pipe in which is an opening for the gas, substantially as described.

2. An apparatus for generating and storing acetylene gas, consisting of a vessel or reservoir adapted to contain water, a bell whose mouth dips into the water and whose upper part is fitted with a siphon-tube provided internally with a ball-valve and with its exterior end dipping into the water contained in a washer mounted at and surrounding the upper part of said bell and fitted with a gas-outlet tube perforated so as to communicate with an elastic air-tight bag or pocket for storing a small volume of gas for immediate consumption, a receiver, (or receivers,) containing a carbid-cartridge and communicating with the interior of said bell by a tube fitted with a valve adapted to be operated by hand from the exterior of the apparatus so as to start or stop the generation of gas, a cap to inclose the receiver and separate the carbid-cartridge both from the atmosphere and from the vessel or reservoir, a safety device in connection with the upper part of said vessel or reservoir to prevent overpressure therein, and suitable inlet and outlet fittings, substantially as described and shown.

3. An apparatus for generating and storing acetylene gas, consisting of a reservoir containing a body of water, a bell arranged in said reservoir its lower end lying in the water, a dome on the upper end of the reservoir but separated from it by a hermetically-closed cover, a washer in the dome containing a body of water above which the upper, closed end of the bell rises, a siphon-tube having one valved end in the bell and the other open end in the water in the washer, a gas-pipe communicating with the washer and with the exterior, an elastic bag inclosing a part of said pipe in which is an opening permitting the gas to pass from said pipe into the bag, one or more receivers each lying in a socket projecting from the wall of the reservoir and closed by a cap, a valve to close and open a pipe leading from said receiver into the bell, means for operating said valve from outside, a pipe communicating at one end with the top of the reservoir and at the other end with an elastic bag in the dome, and a second pipe communicating with said bag and the exterior, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGES DE ROUSSY DE SALES.

Witnesses:

GEORGES DELOM,

HIPPOLYTE TASSE.