

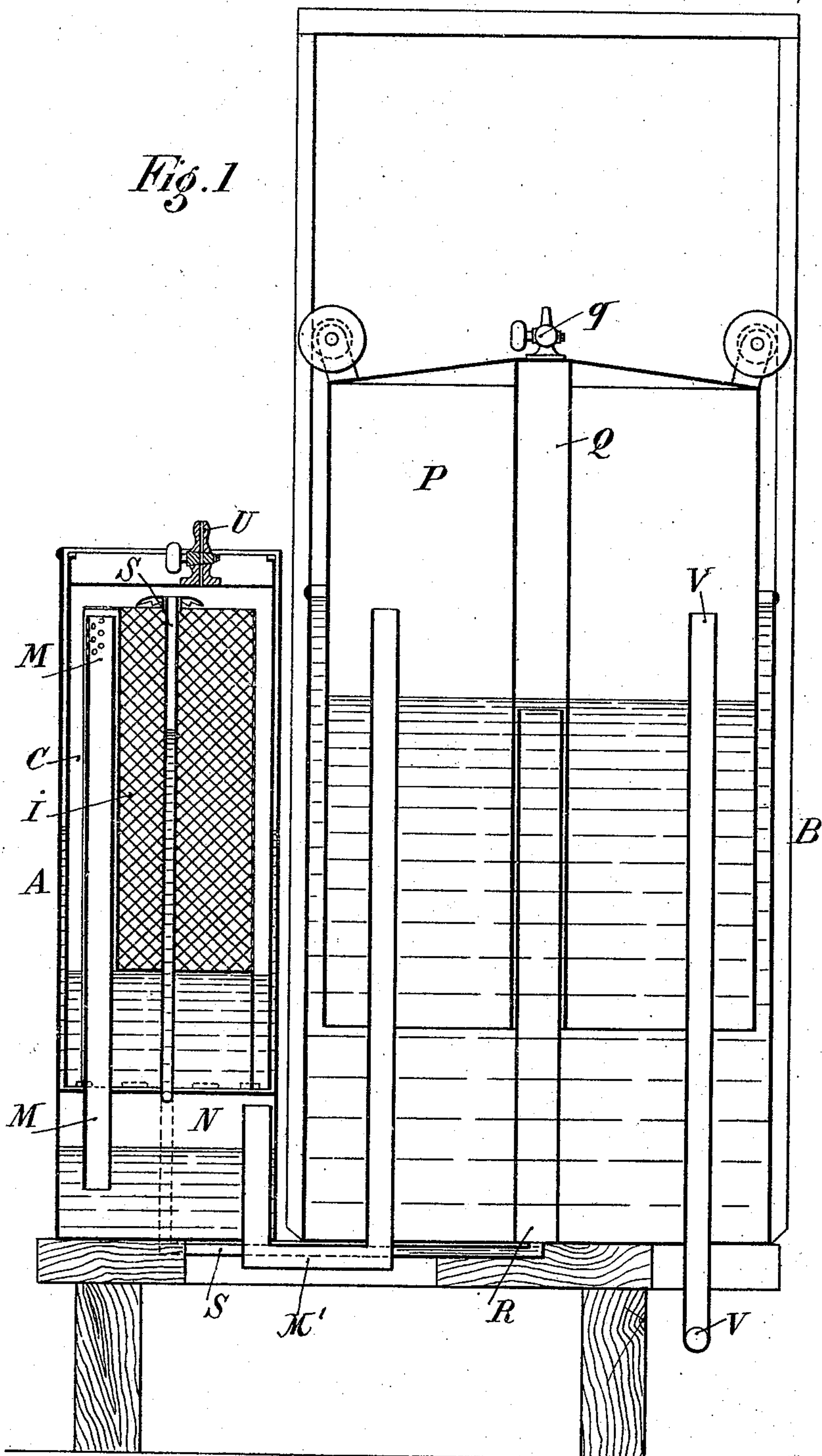
(No Model.)

2 Sheets—Sheet 1.

M. C. A. FOURCHOTTE.
APPARATUS FOR PRODUCING ACETYLENE GAS.

No. 575,885.

Patented Jan. 26, 1897.



Witnesses:-
Fred Hammer
George Barry Jr.

Inventor:-
Maurice Charles Alfrède Fourchette
by attorneys
Brown & Howard

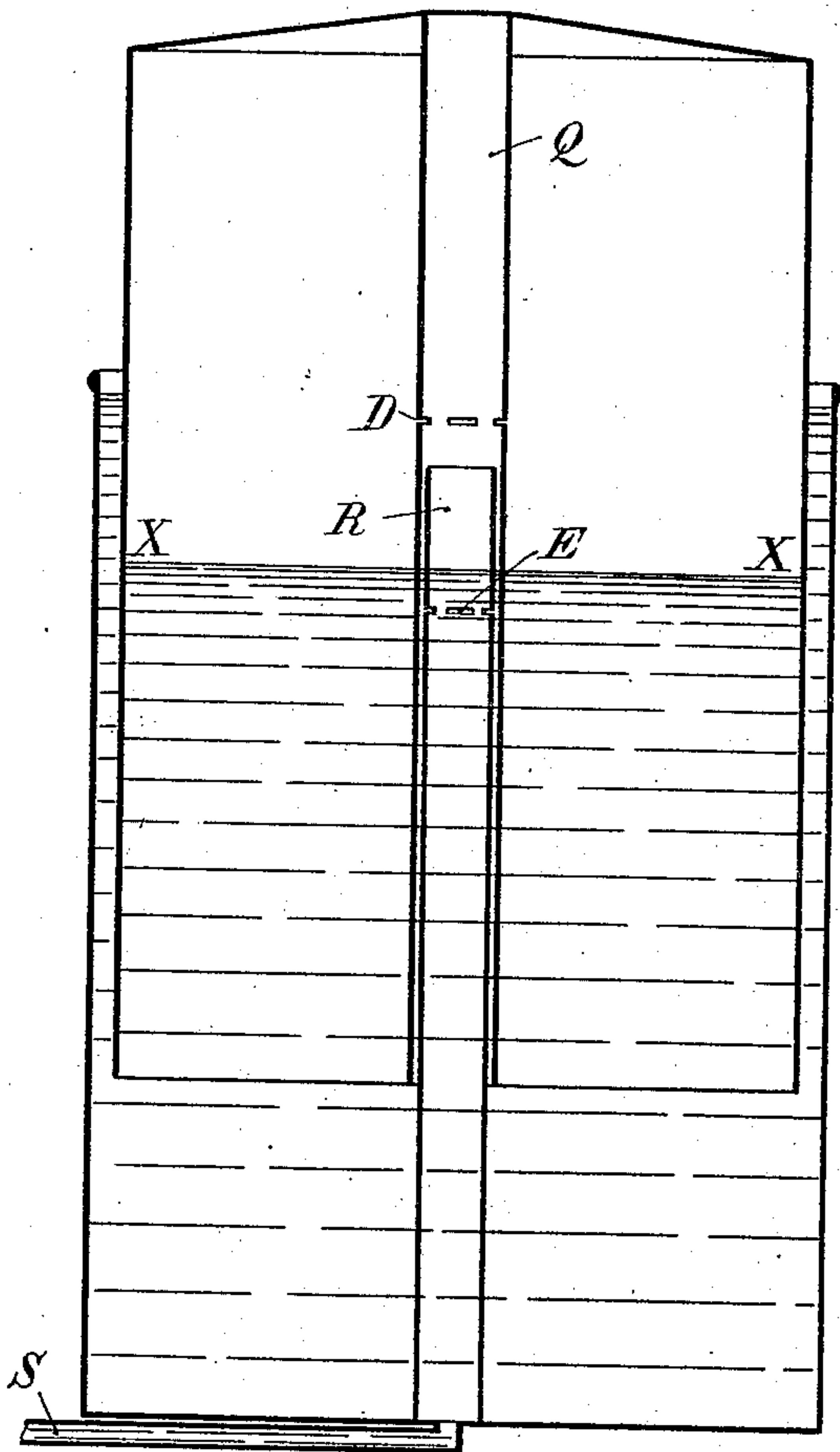
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Fig. 2



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UNITED STATES PATENT OFFICE.

MAURICE CHARLES ALFRÈDE FOURCHOTTE, OF PARIS, FRANCE.

APPARATUS FOR PRODUCING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 575,885, dated January 26, 1897.

Application filed June 27, 1896. Serial No. 597,115. (No model.)

To all whom it may concern:

Be it known that I, MAURICE CHARLES ALFRÈDE FOURCHOTTE, a citizen of the Republic of France, residing at Paris, in said Republic, have invented a new and useful Improvement in Self-Regulating Apparatus for the Production of Acetylene Gas, of which the following is a specification.

The apparatus which forms the subject of this invention is intended to produce acetylene gas as fast as required for consumption by the decomposition by water of carbide of calcium or other suitable acetylene-containing substance.

The invention is essentially characterized by the means employed to utilize the movements of the bell of a gasometer for the purpose of regulating the arrival of water upon the carbide in proportion to the needs. It is characterized, moreover, by the organization of its different parts and notably by the construction of the "generator" properly so called, as well as by a special disposition of hydraulic seal, preventing the return to the generator of the gas already stored in the gasometer and consequently permitting the recharging without interrupting the consumption.

To utilize the movements of the gasometer-bell to regulate the arrival of water on the carbide, I fix in the line of the center of the bell a vertical tube capable of telescoping upon another tube, which is elevated almost up to the level of the water in the center of the tank of the gasometer and which communicates with the generator, wherein it debouches above a basket which contains the carbide. The tube of the tank is filled with water. As the latter and the tube affixed to the bell imprison above this water a certain volume of air or of acetylene or some other gas, it results from this that when the bell descends the gas becomes compressed and by producing pressure upon the water which is contained in the tube of the tank it forces this water upon the carbide. The acetylene is then disengaged, the bell rises, the pressure of the gas diminishes in the central tube, the water rises in the tube of the tank, and ceases to be thrown upon the carbide. This arrangement of tubes is illustrated by the two examples shown in the accompanying drawings, in which—

Figure 1 represents in central vertical section a complete apparatus constructed according to my invention. Fig. 2 represents a vertical section of a gasometer, showing a modification of the arrangement of the tubes, the bell, and the gasometer-tank.

As may be seen in Fig. 1, the apparatus comprises the "generator," properly so called, A and the regulating-gasometer B P, arranged in proximity to each other and connected as I will hereinafter explain. In the example represented the generator is constituted by a tank A, open at the top, but in which is inverted a bell C, heavy enough to sink in the sealing-water contained in the tank A and not to be elevated under the influence of the pressure of the acetylene at the moment of its formation.

In the upper part of the tank A, under the bell C and above the water, is arranged a basket I, intended to receive the carbide of calcium. A tube M, which debouches under the bell C, passes through the bottom of the tank A and enters into the water in a reservoir N below. This tube M forms a passage for the acetylene produced, which is delivered into the regulating-gasometer B P through a tube M' after having passed through the water in the reservoir N, which serves as a hydraulic seal.

In the center of the bell P of the gasometer there is affixed a tube Q, which is open at the bottom but closed at the top and which as the bell rises and descends slides without friction upon another tube R, affixed to the bottom of the water tank or reservoir B of the gasometer. This tube R has connected with it a tube S for the purpose of delivering water from the tank of the gasometer P into contact with the carbide contained in the basket I. A tube V conducts the acetylene to the apparatus where it is to be used. The tubes R S form practically a single tube, which will be hereinafter termed the "U-tube," one of the branches of which debouches in the generator and the other is immersed in the water of the gasometer-reservoir.

The operation is as follows: The bell P of the gasometer is represented as about half filled with water. In the tube Q some air is imprisoned and retained by the water in the

tank. The petcock *q* in the top of the tube *Q* permits the regulation at will of the pressure of this air. To charge the generating apparatus, the bell *C* is raised after having
 5 opened the cock *U* in its head in order to allow the entrance of air. Then the carbid is placed in the receiver or basket *I*, the level of water in the tank *A* being maintained constant below the bottom of this basket.
 10 Afterward the bell *C* is allowed to redescend in the tank to obtain a hydraulic seal. Then the air-cock *U* is closed. At this time the pressure in the generator is equal to the pressure of the atmosphere. The water cannot
 15 rise in the branch *S* of the *U*-tube to a greater height than the exterior level of the water in the tank of the gasometer, and if the upper end of the branch *S* stands at this level the water in the tank of the gasometer cannot
 20 arrive in contact with the carbid. The acetylene will not then be produced. This condition will continue while the bell of the gasometer remains in the same position; but if acetylene be withdrawn from the gasometer
 25 its bell will descend, the air contained in the tube *Q* will be compressed, will press upon the water in the branch *R* of the *U*-tube, and will cause the said water to arrive through the branch *S* in contact with the carbid.
 30 The acetylene will then be disengaged, will arrive in the gasometer of which the bell will rise, the pressure of the air will diminish in the tube *Q*, and the water pressed by the acetylene in the generator will be depressed in *S*,
 35 thus stopping the production of gas until a new descent of the bell of the gasometer by reason of some consumption. In these conditions the production of the acetylene will only take place while there is any consumption and will be automatically regulated according to this consumption. The sections
 40 of the tube *Q* and of the bell of the gasometer are determined in such manner that the quantity of water which arrives in contact
 45 with the carbid gives a volume of acetylene sufficient to raise the bell of the gasometer to such a height that the water in the tank of the gasometer rises sufficiently in the tube *Q* to fill the branch *R* of the *U*-tube at each rising
 50 of the bell.

It may be understood that the reservoir *N* serves as a hydraulic seal and prevents the gas from escaping from the gasometer by the tube *M* when the generator is opened to the
 55 air for recharging it with carbid.

Instead of employing for the tubes *Q* and *R* the arrangement shown in Fig. 1, it is preferable to substitute acetylene gas for the air in the tube *Q* and to arrange the two tubes *Q*
 60 and *R* in such manner as to permit the acetylene within them to be maintained at a pressure either equal or superior to but never lower than that in the gasometer. As may be seen in Fig. 2, to obtain these results the tube
 65 *Q* has provided in it, at a suitable point in its height, openings *D*, and the branch *R* of the *U*-tube has provided in it openings *E*, situated

below the level *X* of the water under the bell. Under these conditions the gas contained in the tube *Q* will remain at the same pressure
 70 as the gas in the bell, and the water contained in *R* will be at the same level as that which is under the bell while the openings *D* do not descend below the level *X X*. The
 75 water will then only pass by the branch *S* to the carbid when the openings *D* descend below the level *X X* and the openings *E*. When the bell rises again under the influence of the acetylene produced, as soon as the openings
 80 *D* return to the level *X* the gas contained in the tube *Q* will retake the pressure of the gas in the bell.

It being understood that I reserve to myself the right to vary the form, dimensions, proportions, and accessory parts of this apparatus and to employ for the construction
 85 such metals and materials as I may judge suitable,

What I claim as my invention is—

1. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from said generator is delivered, of a *U*-tube of which one of the branches debouches in the generator and the other is immersed in the
 90 water of the reservoir, and a tube having a closed upper end and affixed to the bell and inclosing the open upper end of the latter branch in such manner as to confine above the water in the said branch a volume of air
 95 or of gas which will be compressed and expanded respectively during the descent and ascent of the bell to produce or stop the flow of water from the *U*-tube into the generator, substantially as herein described.
 100

2. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from said generator is delivered, of a *U*-tube of which one of the branches debouches in the
 105 generator and the other branch rises through the water in the reservoir and is pierced with holes above the level of said water, and a tube having a closed upper end and affixed to the bell and inclosing the upper end of the latter
 110 branch in such manner as to confine above the water in the said branch a volume of air or of gas which will be compressed and expanded respectively during the descent and ascent of the bell to produce and stop the flow of water
 115 from the *U*-tube into the generator; substantially as herein described.
 120

3. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from said generator is delivered, of a *U*-tube of which one of the branches debouches in the
 125 generator and the other branch is immersed in the water of the reservoir, and a tube attached to the bell and having holes at a suitable point in its height and covering the upper end of the latter branch in such manner
 130 as to confine and compress above the water in said branch during the descent of the bell

a volume of air or of gas for the purpose of producing the flow of water from the U-tube into the generator; substantially as herein described.

5 4. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from said generator is delivered, of a U-tube of which one of the branches debouches in the generator and the other branch rises through the water of the reservoir and is pierced with holes below the level of said water and a tube attached to the bell having holes at a suitable point in its height and covering the upper end of the latter branch in such manner as to confine and compress above the water in said branch during the descent of the bell a volume of air or of gas for the purpose of producing the flow of the water from the U-tube into the generator; substantially as herein described.

5 5. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell for the reception of the gas from said generator, of a U-tube of which one of the branches debouches in the generator and the other branch is immersed in the water of the reservoir, and a tube fixed in the interior of the bell to cover the upper end of the latter branch and having its own upper end closed but provided with an escape-cock for confining above the water in the latter branch a regulated volume of air or of gas which will be compressed and expanded respectively during the descent and ascent of the bell to produce and stop the flow of the water from the U-tube into the generator; substantially as herein described.

40 6. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from said generator is delivered, of a U-tube of which one of the branches debouches in the generator while the other branch rises through the water of the reservoir and is pierced with holes below the level of the said water, and a tube affixed in the interior of the bell to cover the upper end of said branch and having its

own upper end closed but provided with an escape-cock for confining above the water in the latter branch a regulated volume of air or of gas which will be compressed or expanded respectively during the descent and ascent of the bell to produce and stop the flow of water from the U-tube into the generator; substantially as herein described.

7. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from said generator is delivered, of a U-tube of which one of its branches debouches in the generator and the other branch of which is immersed in the water of the reservoir and a tube fixed to the interior of the bell and having holes in its sides and covering the latter branch in such manner as to confine and compress above the water in that branch during the descent of the bell a volume of gas for the purpose of producing the flow of the water from the tube into the generator; substantially as herein described.

8. The combination with an acetylene-gas generator and a gasometer consisting of a water-reservoir and a bell to which the gas from the generator is delivered, of a U-tube of which one of the branches debouches in the generator and the other branch rises through the water of the reservoir and has lateral openings below the level of the water therein, and a tube with lateral openings in its upper part fixed to the interior of the bell of the gasometer and covering the upper end of said branch in such manner as to confine and compress above the water of the U-tube during the descent of the bell a volume of gas for the purpose of producing the flow of the water from the tube into the generator, substantially as herein described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

MAURICE CHARLES ALFRÈDE FOURCHOTTE.

Witnesses:

EDWARD P. MACLEAN,
ALCIDE FABE.