

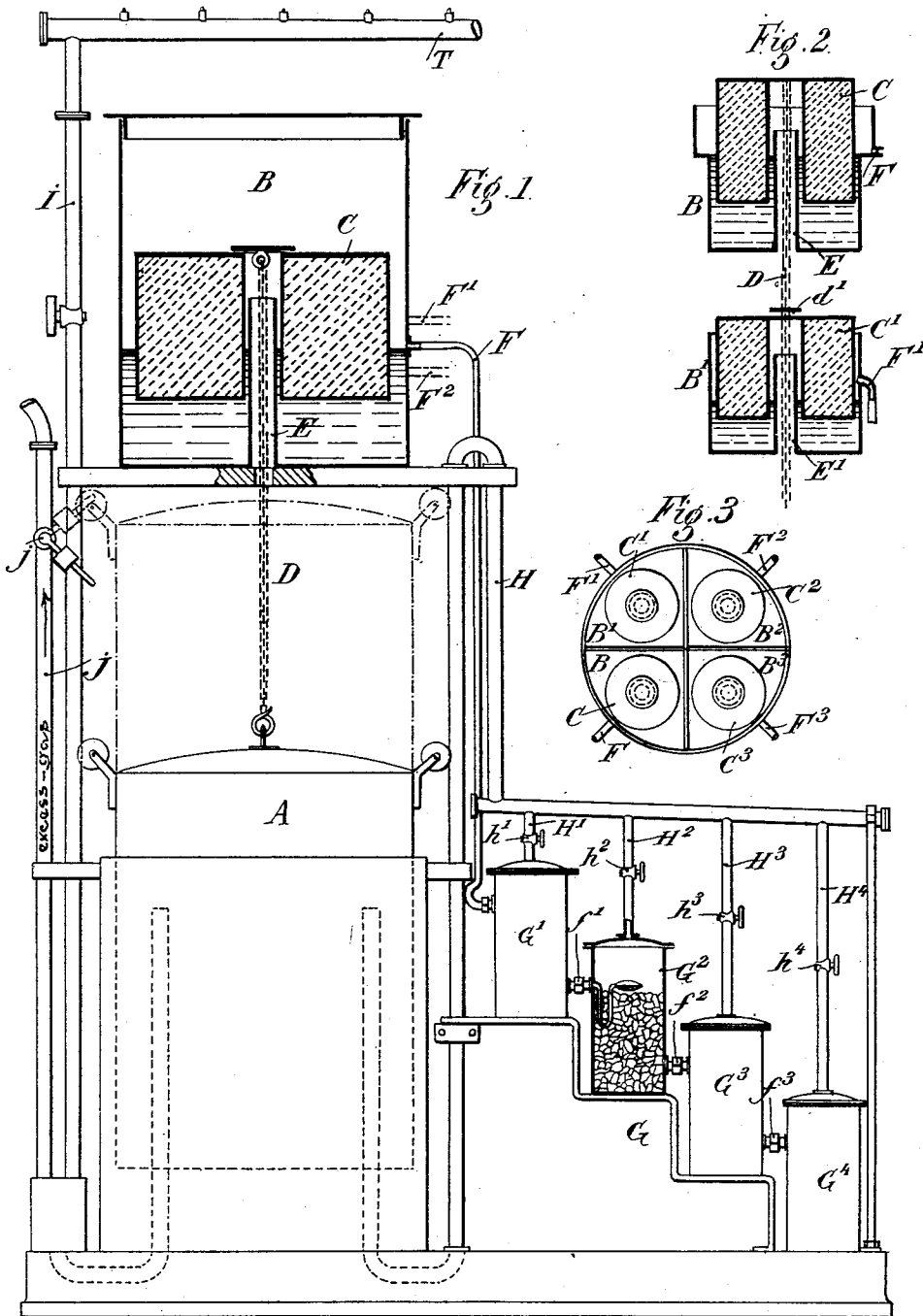
(No Model.)

2 Sheets—Sheet 1.

C. F. J. B. BECHEREL.
APPARATUS FOR PRODUCING ACETYLENE GAS.

No. 587,914.

Patented Aug. 10, 1897.



Witnesses:-

Edward Ciesel.

George Barry Jr.

Inventor-
Charles François Jean Baptiste Becherel
by attorneys
Firm A. Veuve

(No Model.)

2 Sheets—Sheet 2.

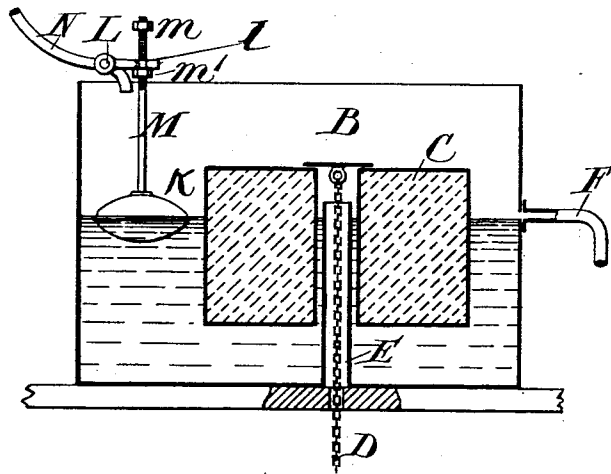
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Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES FRANÇOIS JEAN BAPTISTE BECHEREL, OF PARIS, FRANCE, AS-
SIGNOR TO THE COMPAGNIE DU GAZ NOUVEAU, OF SAME PLACE.

APPARATUS FOR PRODUCING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 587,914, dated August 10, 1897.

Application filed October 31, 1896. Serial No. 610,674. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FRANÇOIS JEAN BAPTISTE BECHEREL, a citizen of the Republic of France, and a resident of Paris, in said Republic, have invented a new and useful Improvement in Apparatus for the Production of Acetylene Gas, of which the following is a specification, reference being had to the accompanying drawings.

10 The apparatus for the production of acetylene gas which is the subject of this invention consists, essentially, first, of a "generator," properly so called, simple or multiple, containing the carbide of calcium, the decomposition of which by water produces the gas which it is desired to obtain; second, of one or more reservoirs intended to contain the water necessary for the decomposition; third, of an extensible gas-receiver—such, for example, as
15 an ordinary gasometer—an india-rubber bellows-like pocket, &c.

The characteristic point of the apparatus consists in the combination of these organs, as hereinafter described and claimed, for the purpose of regulating the quantity of water which falls upon the carbide to effect its decomposition. This regulation is produced by the displacement of a float of convenient volume which is placed in the water of the reservoir and rises or descends under the action of the movements of the movable part of the gas-receiver. When the volume of gas or the pressure diminishes in this receiver, the bell is lowered or the extensible pocket is contracted, and this movement increases the depth of immersion of the float in the water. Consequently the level of the water rises and reaches the orifice of the tube which conducts it into the generator, and a new quantity of
25 gas immediately produced causes the rising of the bell or the distention of the pocket.

Figure 1 of the accompanying drawings represents an elevation, partly in section, of one example of my invention. Fig. 2 is a vertical sectional view illustrating a modification of the water-reservoir and floats. Fig. 3 is a plan view illustrating another modification of the reservoir and floats. Fig. 4 represents a vertical section of means for preserving the level of the water in the reservoir.

Similar letters of reference designate corresponding parts in all the figures.

In the example of the invention represented in Fig. 1 the gas-receiver is constituted by an ordinary bell-gasometer A, and the water-reservoir B is placed above this gasometer. In this water-reservoir moves a float C, attached directly to the bell of the gasometer by a rod or a chain D in such manner as to be compelled to descend with the latter. A central tube arranged in the reservoir serves for the passage of the rod or chain D and obviates the necessity of any joint or fitting between the said rod or chain and the bottom of the reservoir which it passes through. These parts being thus arranged, it will be seen that if the volume of gas diminishes in the gasometer A the bell will be lowered and carry with it the float C. The latter immediately displaces the level of the water in the reservoir B and causes it to rise up to the orifice of the pipe F. A certain quantity of water then flows into the gas-generator G until the gas produced by this arrival of water, entering the gasometer by the delivery-pipe H, causes the rising of the bell and thus leaves the float C free to rise, at the same time permitting the level of the water to redescend below the orifice of the pipe F.

As to the gas-generator it may be arranged in any appropriate manner. It may be simple or multiple, but I prefer the latter arrangement, because by employing many small generators arranged in such manner that one is exhausted and then another, and so on, of the carbide which it contained the recharging may be effected without interfering with the operation in the others, the attack of the water taking place only on a small part of the carbide at a time.

In the example shown in Fig. 1 the generator is quadruple. It is composed of four receivers G¹ G² G³ G⁴ for carbide arranged in steps. When the bell of the gasometer is lowered, it brings down the float C by means of the chain D, which causes the water to rise in the reservoir B. The water then flows through pipe F and exhausts first the uppermost receiver G. Then as soon as it reaches in this receiver a level above the mass of car- 100

bid it passes by a siphon-pipe f' into the second receiver G^2 , which it exhausts in its turn, and so on through the series. The acetylene disengaged is delivered by the pipes $H^1 H^2 H^3$ 5 H^4 into the collecting-pipe H , which conducts it to the gasometer. From the latter it passes by a service-pipe I to the place where it is to be consumed—for example, to a row of gas-burners T . If accidentally the bell A becomes 10 completely full, at the end of its ascent it opens a cock j upon an auxiliary conduit J , by which the excess of gas may then escape.

The gas-pipes $H^1 H^2 H^3 H^4$ being furnished with cocks $h^1 h^2 h^3 h^4$ and the carbide-receivers 15 $G^1 G^2 G^3 G^4$ being connected by union-couplings in the siphon-pipes, either one of the receivers $G^1 G^2 G^3 G^4$ may be easily withdrawn to be recharged while the apparatus is in full operation. When one receiver is so with- 20 drawn, it may be temporarily replaced by a pipe, making the necessary connections for supplying the water to the next one. This replacement is, however, generally unnecessary, the gasometer generally containing a 25 sufficient reserve of gas to keep up the supply during the time of recharging one of the generators. To prevent the gas from escaping by the siphon-pipes, they may be closed by means of a cork. The same result may be 30 obtained by furnishing these pipes with a check-valve or other suitable organ which effects the closing automatically when two adjacent receivers are separated. These carbide-receivers instead of being arranged in a 35 straight line, as represented in the drawings, may be arranged in a circle around the gasometer, but it may be understood that their dimensions are variable at will.

It is very desirable for good operation to 40 prevent the level of the water from descending below a determined limit in the reservoir B . This I effect, for example, as illustrated in Fig. 4, by furnishing the reservoir with a small auxiliary float K , which controls a cock 45 L in the pipe N by which the reservoir is supplied with water, the said float being attached to a rod M , which passes freely through a hole in the lever l , affixed to the key of the cock and which is provided with collars $m m'$ 50 above and below the said lever. When the water is at a proper level in the reservoir, the auxiliary float K , acting through the shoulder m' on its rod, keeps the cock L closed; but when the water descends below a given level 55 the descent of the float brings the upper collar m into action on the cock and opens it. The reservoir then fills up until the lower shoulder m' again acts on the cock and closes it.

60 Instead of arranging the generators in steps, as has been hereinabove described, I may employ for the same purpose independent generators fed successively with water either by a common water-reservoir or each by a corre- 65 sponding reservoir furnished with a float, all the floats being connected with the gasometer-bell in such manner as to act successively.

In cases where but a single water-reservoir is used to feed several generators this reservoir is connected with the generators by pipes F 70 $F^1 F^2$, Fig. 1, which debouch from the reservoir B at different levels in such manner that one of these generators is first exhausted, and then another, and so on through the series. At the level shown in the drawings the gen- 75 erator (not shown) corresponding to the pipe F^2 is already exhausted, the generator corresponding to the pipe F is in operation, while the generator (not shown) corresponding with the pipe F^1 is not yet in operation. 80

When the generator in operation shall have been exhausted in its turn, the ascent of the liquid to the orifice of the pipe F will have no other effect but to refill with water this 85 pipe and the corresponding generator without producing any gas. Consequently the pressure will continue to diminish in the gasometer, and the float C will descend lower with the bell A until the water rises to the orifice of the upper pipe F^1 . At this moment the 90 generator corresponding with this pipe will enter into operation and a new quantity of gas will be produced, it being well understood the reserve of gas in the gasometer is so much that this substitution of one generator for another produces no interruption in the service. 95

In a case where as many water-reservoirs as generators are employed these reservoirs may be superposed, as in Fig. 2. In this example it is the upper reservoir which first sends the 100 water to the corresponding generator. When the latter is exhausted, the bell of the gasometer, by descending sufficiently, pulls down the chain D low enough for the tappet d' , with which it is furnished, to press down 105 upon the float C' , in order that it may act in its turn for the purpose of sending the water into the corresponding generator.

The arrangement may be reversed—that is to say, the chain D may be fixed to the lower 110 float C' in such manner that it operates first. This float will be then attached to the upper float C by a chain so loose that the latter float will not commence to be drawn down until the bell of the gasometer descends very low, 115 which can only take place when the first generator is exhausted.

It is evident that in either case in place of two superposed reservoirs of water there may be any number whatever operating suc- 120 cessively.

Instead of superposing the reservoirs they may be arranged side by side and attached to the bell by chains of unequal length. Fig. 3 represents an example of this arrangement 125 a water-reservoir divided into four compartments $B B^1 B^2 B^3$, furnished with floats $C C^1 C^2 C^3$, which are attached to the gasometer in such manner as to act successively. This arrangement may be combined with that of the 130 superposed generators in case the apparatus is furnished with a large number of generators, it being well understood that whatever be the arrangement adopted the level of the

water may be prevented from descending in the water-reservoirs below a given limit in the same manner as when the apparatus comprises but a single water-reservoir.

5 It may be understood that the respective positions of the several organs may be different from that in which they are represented in Fig. 1. Thus the water-reservoir B instead of being placed above the gas-receiver
10 may be placed at the side of or even below it, provided that appropriate connections assure always the ascension of the liquid in the water-reservoir when the pressure diminishes in the gas-receiver and that arrangement
15 may be made to assure in this case the arrival of the liquid in the "generator," properly so called.

It is moreover evident that the apparatus is to be furnished with cocks and other accessory organs, pressure-gages, valves, &c., for assuring the regularity and certainty of the operation.

What I claim as my invention is—

25 1. An acetylene-gas apparatus comprising in combination a gas-generator, an extensible gas-receiver, a water-reservoir, a pipe leading from said reservoir to said generator, and a float contained in the said reservoir and attached to the movable part of the gas-
30 receiver in such manner that when the float descends with the said movable part it will cause the rise of the level of the water in the said reservoir to the orifice of the said pipe, substantially as herein set forth.

35 2. An acetylene-gas apparatus comprising in combination a gas-generator composed of several carbid-receivers arranged in steps and connected by siphon-pipes having detachable couplings, an extensible gas-receiver, a water-reservoir, a pipe between the
40 said reservoir and the first carbid-receiver, and a float contained in said reservoir and connected with the movable part of the gas-receiver in such manner that when said float
45 descends with said movable part it causes the level of the water in the reservoir to rise to the orifice of the said pipe, substantially as herein set forth.

50 3. An acetylene-gas apparatus comprising in combination a gas-generator composed of several carbid-receivers, an extensible gas-

receiver, a water-reservoir and pipes connecting the several carbid-receivers with the said water-reservoir at different levels, and a float contained in the said reservoir and
55 attached to the movable part of the gas-receiver in such manner that when the float descends with the said movable part it causes the rise of the water in the reservoir up to the orifices of one after another of the said
60 pipes in succession and so conducts the water successively into the corresponding carbid-receivers, substantially as herein set forth.

4. An acetylene-gas apparatus comprising 65 in combination a gas-generator composed of several carbid-receivers, an extensible gas-receiver, water-reservoirs in number equal to the carbid-receivers, pipes connecting the said receivers with the said reservoirs at different levels, and a float in each water-reservoir, all the floats being connected with the
70 movable part of the gas-receiver in such manner as to be successively depressed during the descent of the latter to produce the rise of the levels of the water in the several reservoirs successively up to the openings of the pipes which conduct it to the corresponding carbid-receivers, substantially as herein
75 set forth. 80

5. An acetylene-gas apparatus comprising 85 in combination a gas-generator simple or multiple, an extensible gas-receiver, one or more water-reservoirs, one or more pipes between the said reservoir or reservoirs and the said gas-generator, means for preventing the level of the water from descending below a certain limit in said reservoir or reservoirs, and a float in each reservoir attached to the movable part of the gas-receiver in such manner
90 that when the float descends with the said movable part it produces the rise of the level of the water in one reservoir up to the orifice of its respective pipe, substantially as herein set forth. 95

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

CHARLES FRANÇOIS JEAN BAPTISTE BECHEREL.

Witnesses:

EDWARD P. MACLEAN,
ALCIDE FABE.