

(No Model.)

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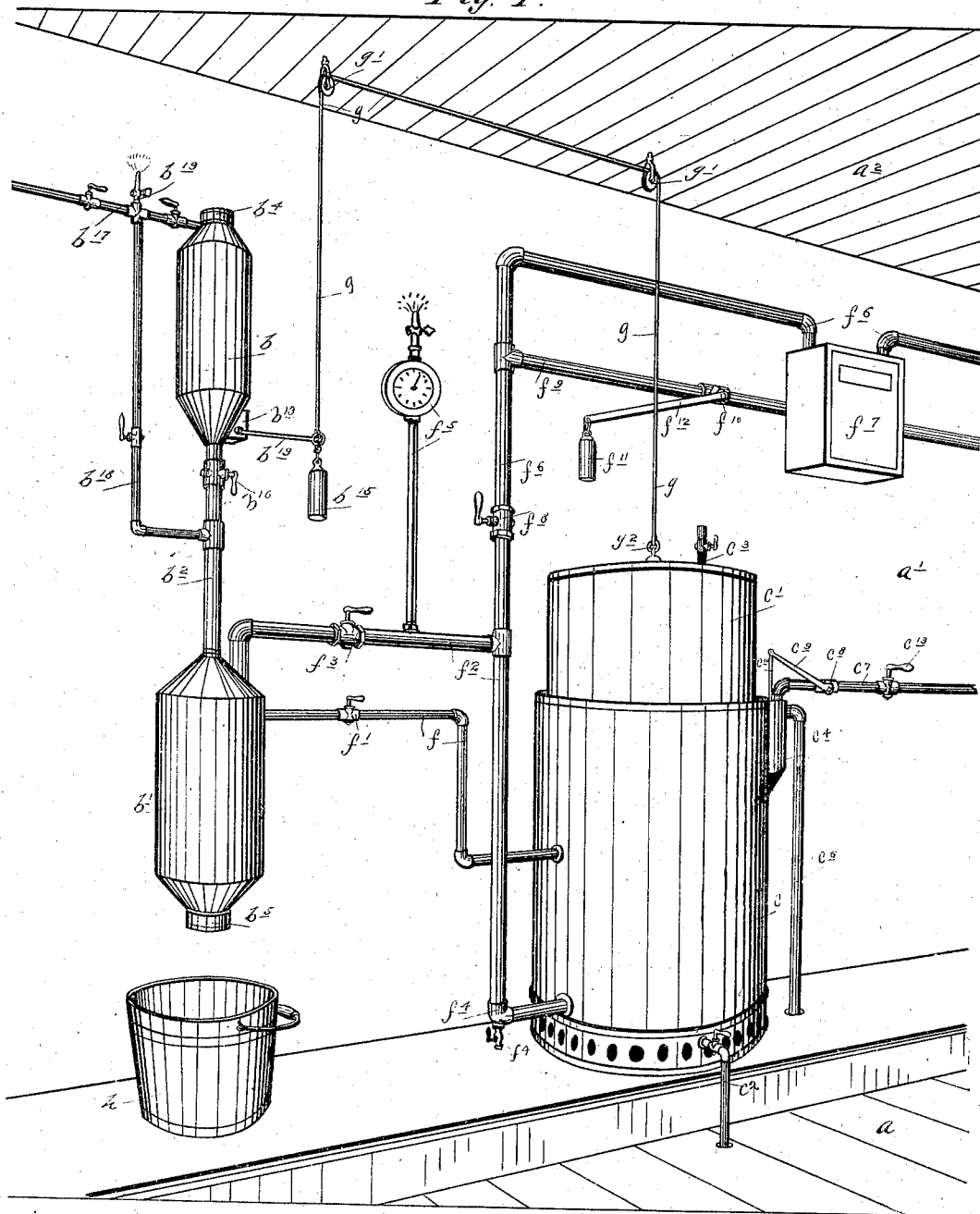
L. S. BUFFINGTON.

APPARATUS FOR GENERATING ACETYLENE GAS.

No. 575,281.

Patented Jan. 12, 1897.

Fig. 1.



Witnesses.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

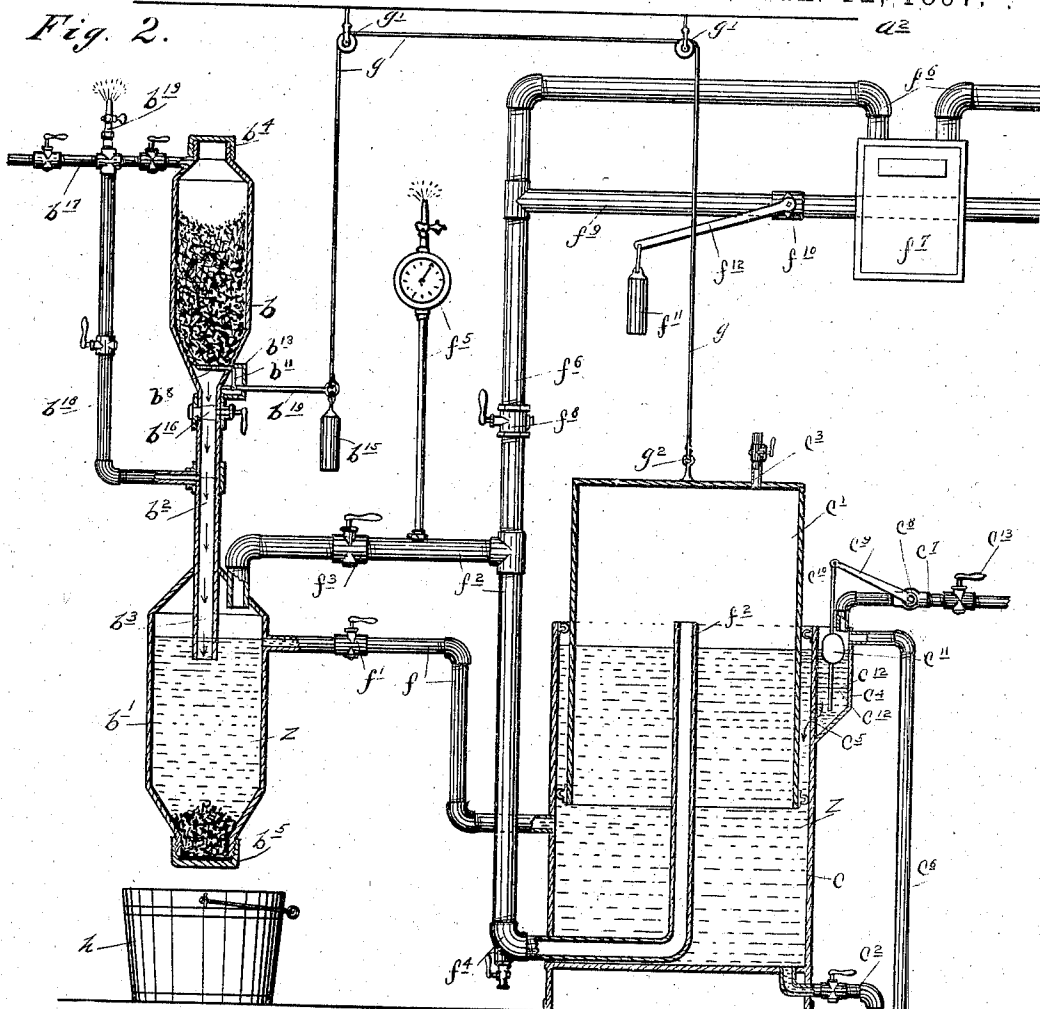


Fig. 5.

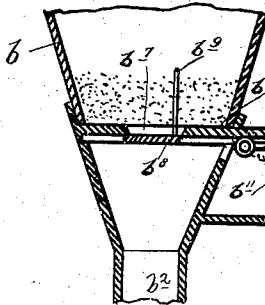


Fig. 4.

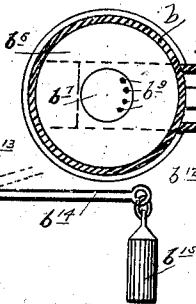
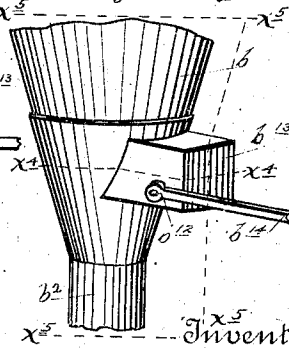


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEROY S. BUFFINGTON, OF MINNEAPOLIS, MINNESOTA.

APPARATUS FOR GENERATING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 575,281, dated January 12, 1897.

Application filed February 21, 1896. Serial No. 580,182. (No model.)

To all whom it may concern:

Be it known that I, LEROY S. BUFFINGTON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Apparatus for Generating Acetylene Gas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its especial object to provide an improved apparatus for generating acetylene gas.

To this end my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

My improved apparatus is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout the several views—

Figure 1 is a perspective view showing the preferred form of my improved apparatus, comprising both a generator and a holder or storage-tank. Fig. 2 is a view, partly in side elevation and partly in vertical central section, showing the apparatus illustrated in Fig. 1. Fig. 3 is a perspective view of a portion of one of the receptacles of the generator, some parts being broken away. Fig. 4 is a horizontal section taken on the line $x^4 x^4$ of Fig. 3. Fig. 5 is a vertical section taken on the line $x^5 x^5$ of Fig. 3.

It may be here remarked that the apparatus shown in the accompanying drawings are illustrated as designed especially for domestic purposes, and are adapted to be located in a basement or other convenient room adapted for connection with the house.

Referring to the drawings, a a' a'' represent, respectively, the floor, the side wall, and the ceiling of a room in which the apparatus is located.

Referring first to the details of the generator, b and b' indicate a pair of receptacles located one above the other and in communication with each other through a communicating pipe or neck portion b^2 , the lower end b^3 of which depends downward into the interior of the lower receptacle b' for a purpose which will later appear. As shown, the receptacles b and b' are in the form of drums with hopper-like ends, the upper end of the

upper receptacle b and the lower end of the lower receptacle b' being closed, respectively, by removable caps b^4 and b^5 , secured in position by screw-threaded engagements. The upper receptacle b is adapted to contain the finely-divided or granulated calcic carbide, while the lower receptacle b' is adapted to contain the water.

The automatic feed of the calcic carbide from the receptacles b through the passage b^2 b^3 into the receptacle b' is controlled by suitable automatic valve mechanism, which, as shown, is arranged as follows:

The receptacle b is provided at a point just above its junction with the pipe b^2 with a bottom plate b^6 , having a central opening b^7 .

b^8 indicates a slide valve, which is mounted in suitable guideways to work on the under side of the bottom plate b^6 and in its normal position is adapted to close said opening b^7 . As will later appear, this valve b^8 will be self-seated to form an air-tight joint with the bottom of the plate b^6 by the pressure of the generated gas from a receptacle b' . If desired, this valve b^8 may be provided with one or more agitating-pins b^9 , which work upward through the opening b^7 and under the reciprocating movement of the valve b^8 keep the contents of the receptacle b loose and free to flow. The right end of the valve b^8 is connected by means of a link b^{10} to the free end of a short lever b^{11} , secured on a shaft b^{12} . The parts just described are all secured within a box-like projection b^{13} of the receptacle b . The rear end of the shaft b^{12} projects through the box b^{13} and has secured to its projecting end a lever b^{14} , to the free end of which is secured a weight b^{15} , which tends to keep the valve b^8 in its closed position, as shown.

As will later appear, the automatic controller for the valve b^8 is also applied to the free end of the lever b^{14} . The communicating pipe b^2 is also shown as provided with hand-operated stop-cock b^{16} .

b^{17} indicates a valved draw-off pipe which extends from the upper portion of the receptacle b , and b^{18} indicates another valved draw-off pipe, which taps the pipe b^2 and the pipe b^{17} . These pipes b^{17} and b^{18} serve to draw off the gas from the receptacles b and b' , respectively, just before the time said receptacles are to be refilled or cleaned, as the case may be.

b^{19} indicates a burner applied at the junc-

tion of the pipes b^1 and b^4 . This burner may be used to indicate whether or not there is any gas in the receptacles b or b' .

The gas-holder or storage-tank which I prefer to use in connection with the generator is located a short distance therefrom and connected therewith by suitable pipe connections. As shown, this gas-holder comprises a pair of telescoping water-seated sections, the lower section c of which is fixed and is adapted to contain the water, while the upper section c' moves vertically with its lower and open end within said section c .

f indicates a water-conducting pipe connecting the lower receptacle b' of the generator with the lower section c of the gas-holder. This pipe f serves to keep the water-levels of said receptacle b' and holder-section c at the same altitude. z indicates the water in said receptacle b' and tank-section c . The pipe f may be provided with stop-cock f' .

It will be here noted that the lower end b^3 of a pipe or neck section b^3 projects below the water-level in said receptacle b' . In virtue of this arrangement only that amount of water-surface represented by the area of the cross-section of the interior of the pipe b^3 is exposed to the upper receptacle b , and hence the evaporating-surface exposed to said receptacle b is reduced to a minimum.

f^2 indicates a zigzag conveying-pipe, one end of which projects centrally up through the holder or tank-section c to a point above the water-level of the same and the other end of which pipe f^2 taps the lower receptacle b' of the generator at a point above its water-level. As shown, this pipe f^2 is provided with a stop-cock f^3 and a draw-off cock f^4 , and is tapped by the stem of a pressure-gage f^5 .

The upper elbow of the pipe f^2 is tapped by the main conveyer-pipe f^6 , which, as shown, extends through a gas-meter f^7 , and thence to distant points where it is to be used. As shown, this pipe f^6 is also provided with a stop-cock f^8 .

f^9 indicates an exhaust-pipe, which, as shown, taps the main conveyer-pipe f^6 at a point inward of the meter f^7 and extends to some distant point, where it opens to the atmosphere. This exhaust-pipe f^9 is provided with a valve or stop-cock f^{10} , which is normally held closed by means of a weight f^{11} on the free end of the lever f^{12} , secured to said valve f^{10} . The weight f^{11} hangs immediately over and in position to be struck and raised by the head of the movable holder or tank-section c' when said section c' is moved upward beyond its proper zone of operation. When thus engaged, the valve b^{10} will be opened, and the gas in the holder or tank will be discharged through the pipe f^9 until the relieved pressure permits said tank-section c' and weight f^{11} to again fall and the valve f^{10} to be again closed. It will thus be seen that the device just described serves as a safety or emergency device and prevents the tank-section c' from being thrown out of posi-

tion by sudden accumulations of gas in the holder or even by explosions of the gas. This device is therefore a very important adjunct to the apparatus.

The automatic-controller connections for the valve b^8 of the generator, as shown, comprise simply a flexible connection g , which is attached at one end to the free end of the lever b^{14} , as already indicated, passes over a pair of guide-sheaves g' , suspended from the ceiling a^2 , and has its other end connected to a lug g^2 on the upper head of the movable tank-section c' .

The weight of the tank-section c' is of course sufficient to overcome the weight b^{14} and operate the valve b^8 whenever it is allowed to lower beyond a fixed limit by the gas-pressure in the holder. By the means of any ordinary weights (not shown) it is obvious that the amount of gas which would be automatically contained in said tank and the pressure at which it will be held may be varied at will.

c^2 indicates a valved draw-off pipe extending from the bottom of the stationary tank-section c to some suitable point of discharge.

c^3 indicates a valved exhaust-nozzle in the head or upper end of the tank-section c' .

c^4 indicates a pocket-like extension forming part of the fixed tank-section c and in communication therewith through an opening c^5 .

c^6 indicates an overflow-pipe extending from the upper portion of the pocket c^4 to some suitable discharging-point.

c^7 indicates an inflow or water-supply pipe connected with some suitable source of water-supply and discharging into the pocket c^4 . This pipe c^7 is provided with a valve c^8 , the stem of which is provided with an extended lever or arm c^9 . To the free end of this lever c^9 is secured the upper end of a stem c^{10} of a float or air-bulb c^{11} . The lower end of the stem c^{10} works through a seat or perforation of a cross-bracket c^{12} , secured between the side of the section c and the side of the pocket c^4 . By this means the bulb c^{11} is held to a true-line vertical movement.

The weight of the stem c^{10} and float or bulb c^{11} are sufficient when suspended in the air to move and open the valve c^8 in the inflow-pipe c^7 . The buoyancy of the float c^{11} is, however, such that when the water is at its proper altitude and surrounds the same it will raise the arm c^9 and turn and hold the valve c^8 in its closed position. It will thus be seen that the altitude or level of the column of water in the gas-holder or storage-tank and in the lower receptacle b' of the generator will be automatically maintained. In other words, whenever the column of water begins to lower the float c^{11} will fall and the valve c^8 will be opened to let in a fresh supply of water, and as soon as the column is restored to its normal altitude said float c^{11} will be again raised, the valve c^8 closed, and the inflow of water stopped.

Inasmuch as the decomposition of the water in the lower receptacle b' of the generator

in the gas-generating action rapidly decreases the volume of water therein, and as it is extremely desirable that the amount and level of the water column should be maintained uniform, it must be obvious that the automatic device for controlling the inflow of the water-supply is also an extremely valuable adjunct to the apparatus.

^{c13} indicates a hand-operated stop-cock in the inflow-pipe ^{c7}.

^h indicates an ordinary bucket, which is shown in position under the lowermost generating-receptacle ^{b'} and adapted to catch the accumulations of lime, which may be removed from said receptacles ^{b'} by first removing the screw-cap ^{b6}. As is evident, by removing the cap ^{b4} from the upper end of the receptacle ^b a fresh supply of the granulated calcic carbide may be introduced into said receptacle ^b.

The operation of the apparatus, briefly summarized, is as follows: The movable tank-section ^{c'} being in a lowered position will, through the intermediate controlling connection, hold the slide-valve ^{b8} in its open position, thus allowing particles of the granulated calcic carbide to fall from the receptacle ^b into the receptacle ^{b'}, where its contact with the water will cause the decompositions and the generation of acetylene gas, as already described. The gas generated in the receptacle ^{b'} will flow through the pipe ^{f2} and be discharged into the holder or storage-tank ^{c c'}. Whenever the pressure in this storage-tank is raised by the inflow of generated gas to the determined degree, it will raise the movable section ^{c'} and slacken the flexible connection ^g sufficiently to permit the weight ^{b15} on the free end of the lever ^{b14} to become effective to close the slide-valve ^{b8} and stop the precipitation of the calcic-carbide particles from the receptacle ^b into the receptacle ^{b'}. By this means the granulated calcic carbide will be automatically fed in very small quantities, the fine particles of calcic carbide will be instantly decomposed on touching the water, and hence the very instant the supply of the fine particles of calcic carbide is shut off the generation of gas will cease. In virtue of the above action of the granulated calcic carbide the apparatus may be made extremely sensitive in its action.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a gas generator and holder, the combination with a pair of receptacles located one above the other, a communicating passage between said receptacles, a valve in said passage, a storage-tank in communication with the lower member of the said receptacles, through a pair of fluid-passages which connect the same at points, one above the other, the lower serving to convey the liquid and the upper serving to convey the gas, and an automatic controller applied to said valve, operated directly or indirectly by the pressure of the generated gas stored in said storage-tank, substantially as described.

2. In a gas generator and holder, the combination with the pair of receptacles ^b and ^{b'} in communication through the neck-like passage ^{b2}, of the slide-valve ^{b8} cooperating with an opening in the bottom of the receptacle ^b, the lever ^{b14} with connections to said slide-valve ^{b8}, the weight ^{b15} at the free end of the lever ^{b14}, the holder or storage-tank comprising the telescopic fixed and movable sections ^c and ^{c'}, the pair of fluid passages or pipes ^f and ^{f2} connecting the receptacle ^{b'} with said holder and serving to convey respectively the liquid and the gas, and the flexible connection ^g guided by sheaves ^{g'} and secured at one end to the free end of the lever ^{b14} and at its other end to the head of the movable tank-section ^{c'}, substantially as described.

3. In a gas generator and holder, the combination with a pair of receptacles located one above the other, of a communicating passage between said receptacles, a valve in said passage, a two-part telescopic storage-tank in communication with the lower member of said receptacles, through a pair of fluid-pipes which connect the same at points one above the other, the lower serving to convey the liquid and the upper to convey the gas, and an automatic controller applied to said valve and connected to the movable section of said storage-tank, substantially as described.

4. A gas-generator, comprising an upper and a lower receptacle, the former located entirely above the latter and adapted to contain, respectively, a dry and a liquid gas-producing substance, a valved communicating passage extending from said upper receptacle and terminating at its lower open end within said lower receptacle, at a point below the liquid-level of the same, and a storage-tank in communication with said lower member of the receptacles, through a pair of fluid-passages which connect the same at points, one above the other, the lower serving to convey the liquid, and the upper to convey the gas, substantially as described.

5. In a gas generator and holder, the combination of the pair of receptacles, located one entirely above the other, of a communicating pipe extending from said upper receptacle and terminating in said lower receptacle at a point below its liquid-level, a valve in said communicating pipe, a two-part telescopic storage-tank connected with the lower member of said receptacles through a pair of fluid-passages, one serving to convey the liquid and the other the gas, and an automatic controller applied to said valve and connected to the movable section of said storage-tank, substantially as described.

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

LEROY S. BUFFINGTON.

Witnesses:

LILLIAN C. ELMORE,
JAS. F. WILLIAMSON.