

No. 757,402.

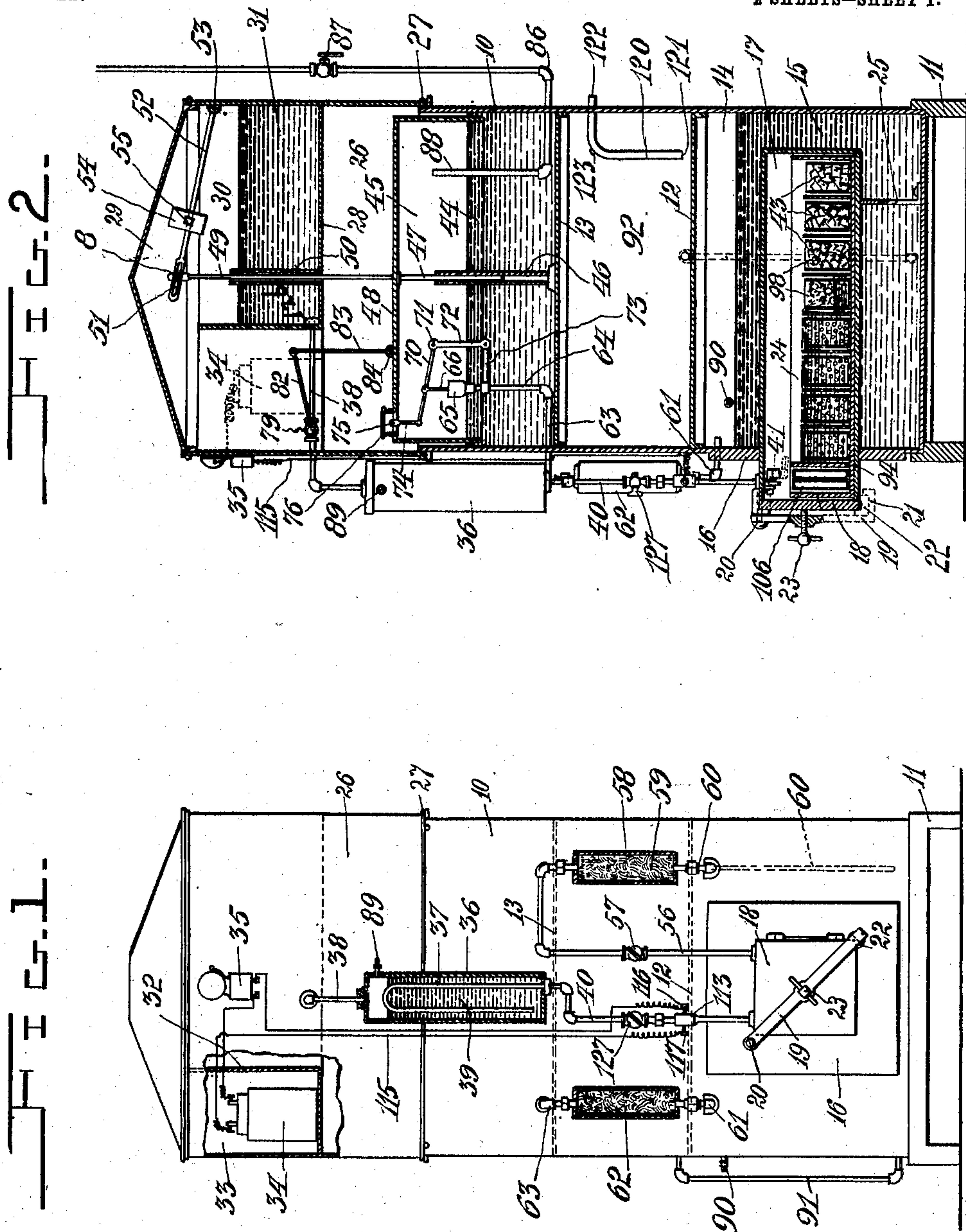
PATENTED APR. 12, 1904.

G. LAPORTE.  
ACETYLENE GAS GENERATOR.

APPLICATION FILED MAR. 26, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

*John F. Deffenhard*  
*J. D. Rimmer*

*George Laporte*, Inventor,

By

*Marion Marion*

Attorneys

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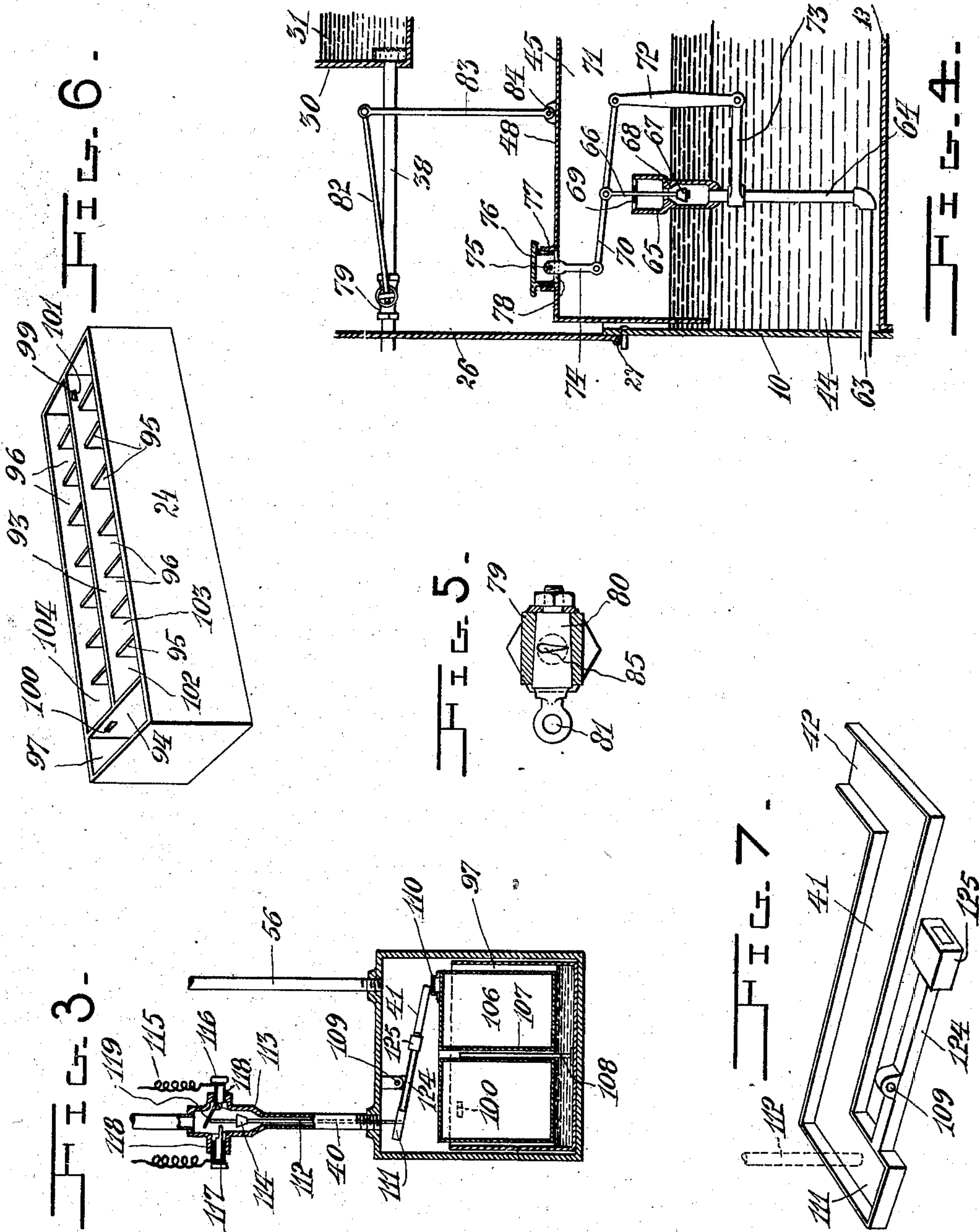
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# UNITED STATES PATENT OFFICE.

GEORGE LAPORTE, OF ST. FÉLIX DE VALOIS, CANADA.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 757,402, dated April 12, 1904.

Application filed March 26, 1903. Serial No. 149,740. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE LAPORTE, a subject of the King of Great Britain, residing at St. Félix de Valois, county of Joliette, Province of Quebec, Canada, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do hereby declare that the following is 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 relates to acetylene-gas generators, and it is especially adapted for supplying hotels, villas, residences, &c.

The object of the invention is to provide an improved arrangement whereby a series of cells containing the active gas-producing agent are brought successively into operation, provision being made for automatically giving an alarm when the materials of the last cell of the series have become exhausted.

The invention further consists in automatic arrangements for controlling the supply of the gas and water which produces the gas and for purifying the gas.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

In the drawings, which fully illustrate my invention, Figure 1 represents the generator generally in front elevation, certain parts being shown in section or broken away, as will appear. Fig. 2 represents the apparatus substantially in vertical cross-section, taken in a plane at right angles to the plane of Fig. 1, certain of the parts being shown in elevation, however. Fig. 3 represents, upon an enlarged scale, a vertical section illustrating a portion of the apparatus for automatically shutting down the gas-generation and for giving an alarm. Fig. 4, which is also upon an enlarged scale, represents a portion of the automatic valve mechanism which is shown in Fig. 2. Fig. 5, which is also upon an enlarged scale, is a longitudinal section of a water-supply cock. Fig. 6 is a perspective of the box or drawer which contains the aforesaid series of cells. Fig. 7 is a perspective showing a drip-trough, which is illustrated also in connection

with Fig. 3 and through which the gas-producing water passes.

Throughout the drawings and specification the same numerals of reference indicate like parts.

Referring more particularly to the parts, 10 represents the body of the generator, which consists of an upright cylindrical casing mounted upon a suitable base 11. As illustrated, this body is provided with a pair of transverse heads 12 and 13, the former of which incloses below it a chamber or compartment 14, which contains a quantity of water 15. The forward wall of this compartment is formed into a substantially square plate 16 of increased thickness, through which plate passes a generator-box 17, which projects well backwardly into the chamber, as indicated. It should appear that this generating-box consists, substantially, of an elongated receptacle or box which is substantially rectangular or square in cross-section and which is closed at the front by a removable plate or cover 18, the arrangement for this purpose including a diagonally-disposed bar 19, pivoted at 20 and having a hooked extremity 21, which lies behind a lug 22, carried by the generator-box, and which is provided with a clamping-screw 23 for the purpose of firmly clamping the cover 18 in position, as will be readily understood. Within this generator-box is provided a drawer 24, which is most clearly shown in Fig. 6 and which is intended to contain the active gas-producing agent. Its specific construction and the manner of using it will be more fully described hereinafter. For the purpose of making the generator-box additionally secure its rear portion may rest upon a support or bracket 25 of any suitable construction, as shown in Fig. 2.

It should appear that above the body 10 the generator-casing comprises a removable cap or bonnet 26, the lower edge of which overlaps the upper edge of the aforesaid body 10, to which it attaches in any suitable manner, as indicated at 27. This bonnet is formed with a transverse head 28 and a suitable top 29, so that it constitutes a supply tank or reservoir 30 for the water 31. A portion of this reservoir may be boxed off or separated by a par-



tition or wall 32 to form a compartment 33, in which may be placed a voltaic cell 34 or battery which is used in connection with a bell 35 for giving an alarm under certain circumstances, as will be described more fully hereinafter.

Preferably at the front of the generator there is provided a vessel 36, which consists of a closed cylinder, as indicated, in which there is mounted a siphon or pipe 37, substantially U-shaped inverted, so that this vessel constitutes a trap, as will appear more fully hereinafter. A pipe 38 conducts the water from the reservoir 30 through the upper head of this vessel 36, where a quantity 39 of the water accumulates. Water passes from the siphon through a pipe 40, which passes into the projecting outer extremity of the aforesaid generator-box 17, where it delivers the water into a drip-trough 41. The arrangement of this part is most clearly shown in Figs. 3 and 7, where it should appear that the drip-trough is provided with a spout or mouth 42, which is adapted to deliver the water into the drawer 24, which drawer contains some active gas-producing agent, such as calcium carbide 43.

Above the head 13 a quantity of water 44 is placed, in which there is immersed a bell 45, which is adapted to receive beneath it the gas which is generated in the generator-box 17. The head 13 is provided with a central tubular guide 46, which receives a guide-rod 47, which projects downwardly from the head 48 of the bell, as indicated. This rod 47 also projects upwardly, as indicated at 49, passing through a tubular guide 50 in the bonnet 26 aforesaid. Its upper extremity is provided with a cross head or pin 8, which pin lies in an elongated slot or opening 51, which is disposed in the extremity of a lever 52, which is pivoted at 53 to the side of the bonnet and which is weighted with an adjustable weight 54, the said weight being provided with a set-screw 55 for this purpose. From this arrangement it should appear that the position of the weight 54 may be adjusted so as to change the pressure which will support the bell. The gas which is generated in the aforesaid generator-box 17 passes upwardly through a pipe 56, which includes a suitable valve or stop-cock 57, and this pipe leads the gas through the upper head of a purifier 58, which consists, substantially, of a cylindrical vessel filled with a suitable absorbent material 59, such as sponges or charcoal. From this point the gas passes, by a pipe connection 60, into the body of the generator and is delivered near the bottom and below the level of the water 15 surrounding the generator-box. The sponges and charcoal in the purifier afford means for removing much of the impurity contained in the gas, such as grease and dirt. It will be understood that as the gas leaves the pipe 60 it passes upwardly through the water 15, and this operates to wash the gas, after which the

gas which has accumulated in the upper part of this chamber passes out through the pipe connection 61, which leads the gas through the purifier 62, which is substantially similar in construction to the purifier 58, already described. The gas leaves the purifier 62 by a pipe connection 63, which leads into the space below the bell 45, where it comprises an upward extension 64, to the upper end of which is attached a valve 65, which is shown more in detail in Fig. 4. Arrangement is made for automatically controlling this valve 65, so that as the bell 45 rises with accumulating unused gas the opening in the valve 65 becomes more and more restricted or closes altogether if the rise of the bell exceeds a certain amount. To this end a stem 66 is provided, which passes vertically into the valve from above, the lower extremity of which is provided with a taper plug 67, which is adapted to seat in a tapered opening 68 of the valve. The stem 66 may be guided through the perforated cap 69, which constitutes a cover for the valve, as will be readily understood, and through which the gas escapes into the surrounding space below the cover. This stem 66 attaches to a lever 70, one extremity of which lever is pivoted at 71 to an arm 72, the lower extremity of which arm is pivoted to a fixed arm 73, carried by the upright extension 64. The opposite extremity of the lever 70 is attached to a link 74, which link is pivoted at 75 to a cap 76, which is mounted in a threaded nipple 77, which projects upwardly about an opening 78, formed in the head 48 of the bell. From this arrangement it should appear that when the bell rises it operates to elevate the stem 66 and in this manner moving the valve in a direction to restrict or close the opening through the valve. The cap 76 affords means of adjustment, as will appear, which adjustment is effected by removing the pivot or pin 75 and turning the cap 76 in either direction to the desired amount necessary to effect the proper adjustment. The amount of this turning of the cap may be one hundred and eighty degrees, three hundred and sixty degrees, &c., after which the pin is replaced as before. The position of the bell 45 also affords means for automatically controlling the flow of water from the reservoir 30 to the trap 36. For this purpose the pipe connection 38 aforesaid includes a cock 79, which is illustrated in Fig. 5. It should appear that the plug 80 of this cock is provided with an eye 81 in its head, through which passes an operating-lever 82, to the extremity of which there is attached a link 83, which link is pivoted to an ear 84, carried by the upper side of the head 48 of the bell, as illustrated. From this arrangement it should appear that the descent or rise of the bell will effect a change of opening through the cock 79. From an inspection of Fig. 5 it should appear that the opening 85 through the plug 80 is elongated



and tapering in form, whereby a given angular movement of the lever 82 produces a further opening through the cock in an increased proportion or ratio, it being understood that  
 5 when the valve is nearly closed—as, for instance, where a small number of lamps or burners are being supplied with gas—the plug is in such a position that the water flows through the point or narrow portion of the  
 10 opening 85, as will be readily understood.

The service-pipe 86 is provided, having a stop-cock 87 for controlling the supply of gas delivered therethrough, and this pipe has an extension 88, which lies under the bell 45 and  
 15 receives the gas which accumulates beneath the same.

For the purpose of filling the trap 36 the same is provided with a removable plug 89, and a similar removable plug 90 is provided in  
 20 the body of the generator, leading into the chamber 14, the latter plug enabling the water 15 to be poured into the generator.

A riser-pipe 91 is provided, which leads from the chamber 14, near the bottom thereof, and  
 25 communicates with the chamber 92, which is formed between the aforesaid heads 12 and 13. This arrangement is for the purpose of enabling the upper portion of the chamber 14 to act as an efficient and extensible reservoir for the accumulating gas in case the gas  
 30 should be generated at too great a rate to be cared for by the possible rise of the bell. It should be understood that the accumulating gas in the chamber 14 displaces the water 15  
 35 within this chamber, which then rises through the aforesaid riser-pipe 91 and enters the chamber 92 aforesaid.

Referring especially to Figs. 2 and 6, it should appear that the aforesaid drawer 24  
 40 is provided with a longitudinally-disposed partition 93, which abuts at its extremity with a transverse partition 94. These partitions or divisions 93 and 94 are of substantially the same height as the sides of the drawer, as will  
 45 appear. A plurality of other partitions 95 are provided, which are transversely disposed on either side of the aforesaid partition 93 and the edges of which are at a lower level, as indicated. In this manner a portion of the  
 50 interior of the drawer is divided into a series of compartments or cells 96, and the outer extremity of the drawer is formed into a chamber 97 or float-compartment. Within the cells 96 there are placed the carbid-holders  
 55 98, which consist, substantially, of perforated receptacles adapted to receive the calcium carbid or a similar active gas-producing agent. Near its inner extremity the aforesaid partition 93 is provided with an opening 99, which  
 60 connects the two adjacent cells at this point. A similar opening 100 is provided in the transverse partition 94, which opens communication between one of the innermost cells 96 and the float-compartment 97, and it should ap-  
 65 pear that the lower edges 101 of these open-

ings are at substantially the same height as the upper edges of the partitions 95. The water from the drip-trough 41 is allowed to fall first into the cell 102, where a reaction is  
 70 set up between it and the calcium carbid contained therein, this action continuing uninterruptedly until the active ingredient of the calcium carbid is exhausted, whereupon an excess of water will accumulate in this cell,  
 75 and the level of this water will rise until it reaches the upper edge of the inclosing partition 95, at which time the water will run over into the next adjoining cell 103, and this cell then becomes active. In this manner the  
 80 action or reaction continues successively throughout the entire drawer of cells, the cells being thrown in in succession, as stated. The opening 99 is for the purpose of enabling the water to reach the cells on the opposite sides of  
 85 the longitudinal partition 93, as will be readily understood, after which the active point in the drawer returns toward the front of the drawer, finally reaching the cell 104. When this cell is reached and its contents finally exhausted,  
 90 the water within it passes through the opening 100 into the float-compartment 97 aforesaid, shutting off the further water-supply and giving an alarm in a manner which will be described. The mechanism in this connection  
 95 includes a float 106, which is received in the compartment 97, as illustrated, consisting of a hollow sheet-metal member, preferably provided with a central tubular guide or opening  
 100 107, into which passes a guide-stem 108, which guide-stem projects vertically from the bottom of the float-tank 105 in the manner shown. It should be observed that the aforesaid drip-trough 41 is pivoted at 109 to the upper wall  
 105 of the generator-box. Near its mouth 42 it is supported upon a rest or bracket 110, which is attached to the upper side of the float 106. The upper extremity 111 of this trough lies directly beneath and constitutes a support for  
 110 the stem 112 of a supply-valve 113, which valve is placed in the pipe connection 40, as illustrated. Near the upper portion of this stem there is provided a conical plug 114,  
 115 which may seat itself in the valve, so as to restrict or entirely close the passage there-through. It should appear that the stem 112 aforesaid passes downwardly through the bore  
 120 of the pipe 40. From this arrangement it should appear that if the float 106 should rise sufficiently it would allow the plug 114 of the valve to descend, and when seated this plug  
 125 would effectually close the valve and prevent further admission of water to the gas-generator box. In this manner when the succession of cells 96 have become exhausted the rising of the float, which is effected by the last cell  
 130 104 overflowing into the compartment 97, automatically shuts off the water-supply.

Arrangement is made whereby an alarm is given by means of the float 106. The apparatus for this purpose includes the aforesaid



battery 34 and bell 35, which are included in an electric circuit 115, which circuit comprises the terminals 116 and 117, surrounded by a suitable insulation 118. To the terminal 116  
 5 a contact-plate 119 is pivoted, which is normally supported upon the upper extremity of the valve-stem 112, as illustrated in Fig. 3. When the plug 114 descends in the manner suggested to close the valve, this contact-plate  
 10 119 rests against the terminal 117, thereby closing the electric circuit 115, causing the bell 35 to ring and giving an alarm.

It should appear that in connection with the chamber 92 aforesaid there is provided an  
 15 inverted vertical pipe 120, the mouth 121 of which is disposed near the bottom of the chamber, and which pipe is provided above with a laterally-disposed elbow 122, which passes through the wall of the chamber 92  
 20 and opens communication with the outer air. At the elbow 122 there is provided a small opening 123. From this arrangement when the water 15 from the chamber 14 passes up-  
 25 wardly from the riser-pipe 91 into the chamber 92 the air within this chamber is allowed to escape through the opening 123, though the level of the water within the said chamber may be at a height above that of the mouth 121.

30 Referring again to the drip-trough 41, it should appear that this trough comprises an arm 124, to which the trough is pivoted at 109, as aforesaid. As shown, the extremity of this arm is provided with a weight 125, which is  
 35 adapted to normally maintain the mouth 42 in a depressed position.

For the purpose of preventing the aforesaid supply-pipe 38 from becoming stopped up from the accumulation of sediment passing  
 40 into the same from the bottom of the supply-reservoir 30 near the entrance into the said pipe there is provided a suitable screen 126, which may be of fine wire-gauze or similar material.

45 The mode of operation of the apparatus will be now briefly outlined. The chamber 30, which constitutes a reservoir for containing the supply of water which is to be used as an active agent in producing the gas, is filled  
 50 or partially filled with water, as shown, and this water finds its way through a supply-pipe 38 to a trap 36, whence it passes by a pipe 40 to the generator-box 17, at which point it is received upon a drip-trough 41, which deliv-  
 55 ers the same into one of the cells 96, which are formed in the drawer 24 and which contain the calcium carbid. The first cell upon becoming inactive brings the second cell into action, and so on in the manner described un-  
 60 til the entire series of cells have been exhausted, whereupon the water reaches the float-tank and elevates the float 106 in the manner described, closing the valve 113 and ringing the bell 35, as stated. The gas formed in the  
 65 generator-box passes up through the pipe 56,

down through the purifier 58, whence it passes through a submerged pipe 60 and is delivered within the chamber 14, rising into the upper space thereof, from which it passes by the pipe 61 through a second purifier 62, after which  
 70 it passes into the space beneath the bell 45, at which point the parts constitute a gasometer adapted to receive the gas. Before passing into this space, however, the gas must pass through a valve 65, which valve is automatically con-  
 75 trolled by the position of the bell or gas holder, as stated. When the bell rises a sufficient amount, it closes this valve, and when the bell descends, due to the depletion of the gas-sup-  
 80 ply beneath the bell, its descent automatically opens the valve and allows its contents to be renewed from the chamber 14. If the pressure produced by the bell 45 is sufficient, the gas may accumulate in the upper portion  
 85 of the chamber 14 somewhat in the same manner in which it accumulates beneath the bell. When this occurs, the water 15 is forced around through the pipe 91 to the chamber 92, in this manner allowing the expansion of  
 90 the space for the gas. A valve 79, contained in the pipe connection 38, is automatically controlled by the descent or rising of the bell, so that when the bell is at a low position, indi-  
 95 cating a depletion of the supply of gas beneath it, the valve or cock 79 is thrown to an open position, allowing an increased quantity of gas-producing water to pass toward the box. In this manner the bell not only con-  
 100 trols the admission of gas beneath itself in the manner described before, but also controls the passage of gas-producing water to the cell. The weight 54 may be adjusted, of course, into different positions in the manner described, so as to vary the pressure which  
 105 the bell 45 will support.

When it is necessary to replenish the contents of the cells, this may be done without interrupting in any way the service of gas to the lights. This is accomplished by means  
 110 of cocks 57 and 127, which are first closed, so as to cut off communication with the generator-box, whereupon the drawer 24 may be withdrawn and the cell-compartment refilled, the gas contained below the bell and in the chamber 14 being sufficient to maintain the  
 115 gas-supply during this time.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the  
 120 details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following  
 125 claims or of mechanical equivalents to the structures set forth.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—  
 130



1. In a gas-generator, a receptacle having a main dividing-partition and a second dividing-partition disposed transversely with respect to the same, said second dividing-partition closing off a portion of said receptacle to form a float-compartment, a plurality of auxiliary dividing-partitions disposed transversely to said first main dividing-partition and forming a plurality of cell-compartments, the edges of said auxiliary partitions being depressed below the edges of said receptacle and said main partitions, and openings through said main partitions at substantially the height of the upper edges of said auxiliary partitions whereby a liquid reagent may pass successively through said cells and into said float-compartment.

2. In a gas-generator, in combination, a body comprising an upper supply-reservoir and a lower reservoir constituting a washer for the gas, a gas-holder formed between said reservoirs, generating apparatus, and means for passing the gas therefrom through said washer to said gas-holder.

3. In a gas-generator, a body comprising an upper supply-reservoir, a lower washing-reservoir, a gas-holder formed therebetween, in combination with generating apparatus, means for passing the gas from said generating apparatus through said washer and to said gas-holder, and automatic means for controlling the gas-supply to said gas-holder.

4. A gas-generator comprising a body having an upper reservoir, a lower washing-reservoir, and a gas-holder therebetween, in combination with gas-generating apparatus, means for passing the gas therefrom through said washing-reservoir and to said gas-holder, a pipe connection leading from said supply-reservoir to said generating apparatus, a valve in said pipe connection, a second valve through which the gas is delivered to said gas-holder, said gas-holder comprising a bell, and connections between said bell and said valves.

5. A gas-generator comprising a body having an upper supply-reservoir, a lower washing-reservoir, and a gas-holder disposed therebetween, said body including a compartment formed between said gas-holder and said lower

reservoir, a pipe opening communication between the lower portion of said lower reservoir and said compartment, in combination with a gas-generating apparatus, a supply-pipe leading thereto from said supply-reservoir and including a valve, a delivery-pipe leading from said generating apparatus to said gas-holder, said gas-holder including a bell, and connections between said bell and said valve.

6. In a gas-generator, in combination, a body having two transverse heads forming two lower compartments, and a water-tank thereabove, the lower of said compartments being adapted to contain water, and constituting a washer for the gas generated, a pipe connecting the lower portion of said lower compartment with the lower portion of the compartment above, a bell disposed within said water-tank, and constituting a holder for the gas generated, and a bonnet surmounting said body above said bell and constituting a supply-reservoir.

7. In a gas-generator, in combination, a body having a transverse lower head forming a lower water-compartment constituting a washer for the gas generated, an upper transverse head whereby a compartment is formed between said heads, a pipe connecting the lower portion of said water-compartment with the lower portion of said last compartment, said body above said upper head being adapted to contain water, a bell constituting a gas-holder and disposed in the upper portion of said body, a bonnet disposed above said body and constituting a supply-reservoir, there being a tubular member in connection with said bonnet constituting a guide, a rod carried by said bell and projecting upwardly through said tubular member, and a weighted arm attached to the side of said bonnet, and adapted to depress said bell.

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

GEORGE LAPORTE.

Witnesses:

J. A. MARION,  
V. COCHNE.