

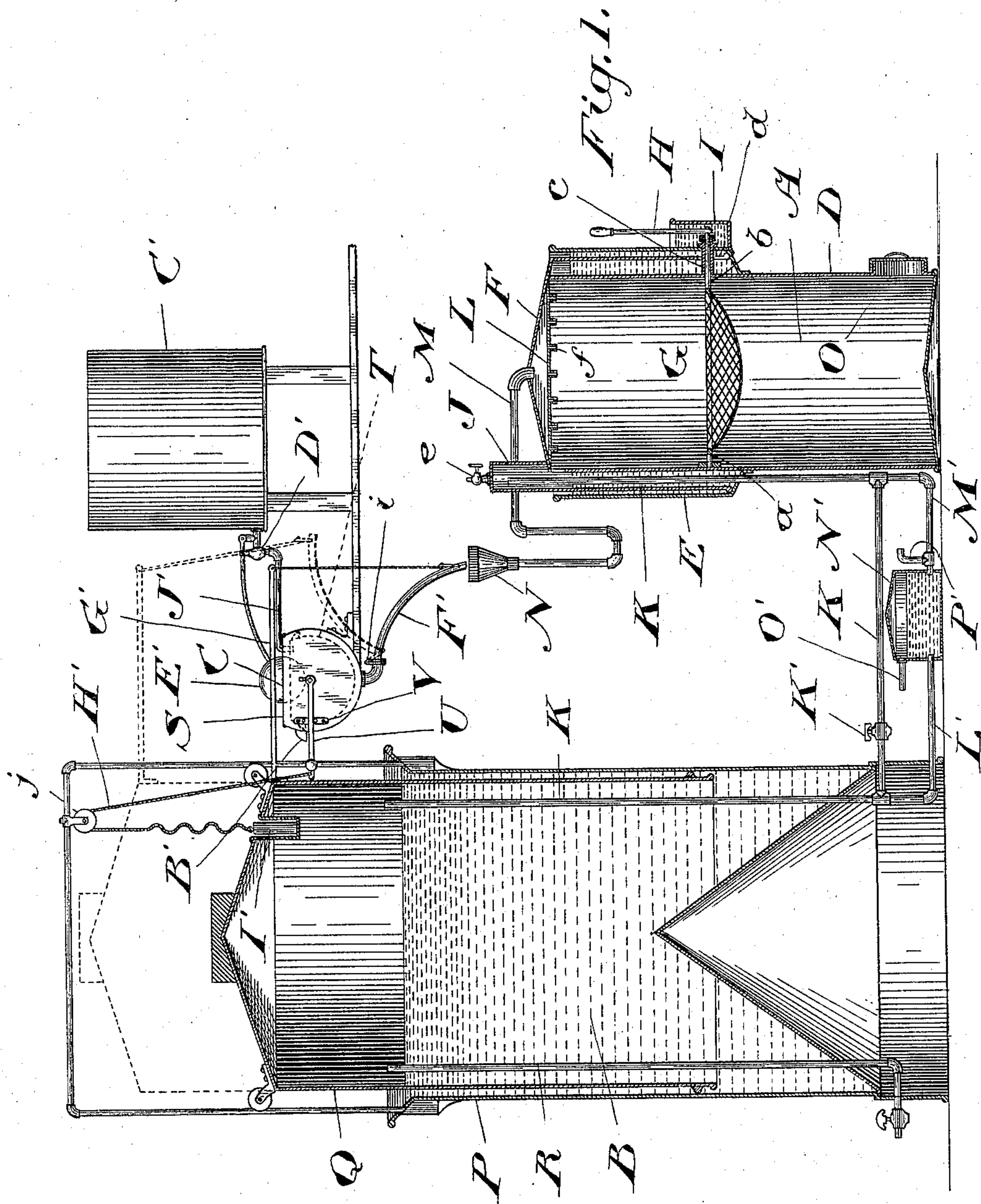
(No Model.)

2 Sheets—Sheet 1.

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APPARATUS FOR PRODUCING ACETYLENE GAS.

No. 598,767.

Patented Feb. 8, 1898.



Witnesses

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Inventor

Richard F. Carter  
by  
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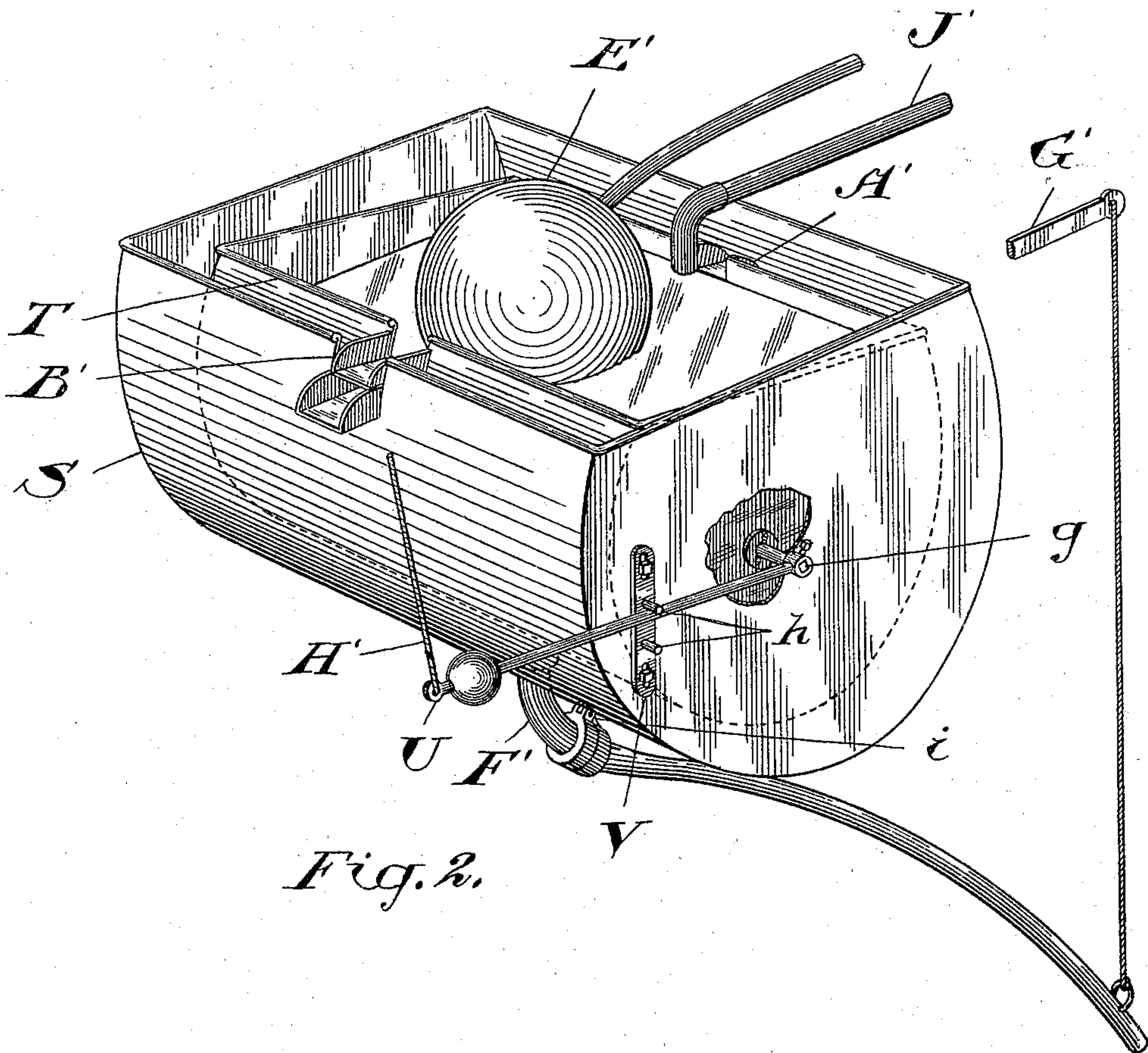
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# UNITED STATES PATENT OFFICE.

RICHARD F. CARTER, OF NIAGARA, CANADA.

## APPARATUS FOR PRODUCING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 598,767, dated February 8, 1898.

Application filed July 16, 1897. Serial No. 644,782. (No model.) Patented in England January 28, 1897, No. 2,284.

*To all whom it may concern:*

Be it known that I, RICHARD FREDERICK CARTER, master mariner, of the town of Niagara, in the county of Welland and Province of Ontario, Canada, have invented a certain new and Improved Apparatus for the Production and Storage of Acetylene Gas, of which the following is a specification.

The object of my invention is to devise certain improvements and modifications of the acetylene-gas apparatus described in United States application, Serial No. 619,447, for which I have obtained an English Patent, No. 2,284, of January 28, 1897; and it consists, essentially, of a new water-measuring device from which the water is discharged by the tipping of the containing-tank, of an improved condensation-chamber and safety-valve adapted to relieve undue pressure and collect the condensation from both the generator and gas-holder, and of such details of construction as are hereinafter more specifically described and then definitely claimed.

Figure 1 is a sectional elevation of my apparatus. Fig. 2 is a perspective detail of the tip-tank.

In the drawings like letters of reference indicate corresponding parts in both figures.

A is the generator, B the gas-holder, and C the tip-tank for measuring and feeding the water.

In the generator D is a cylindrical chamber having a water seal formed around its upper end by the cylindrical casing E.

F is the cover of the generator, having a cylindrical wall extending down within the water seal of the casing E.

G is the carbid grate, preferably formed with suitable openings for the ashes and slightly dished or concaved. This grate is provided with trunnions *a b*. The trunnion *a* is journaled in a bearing formed on or connected to the wall of the cylindrical chamber D. The trunnion *b* extends through the side of the chamber through the cylindrical casing E and has its outer end adapted to receive a lever H, by means of which the grate may be rocked.

*c* is a sleeve surrounding the trunnion *b* and connected to the wall of the chamber D and the cylindrical casing E, so as to prevent the water from the seal leaking through the

bearing into the cylindrical chamber. The outer end of the sleeve may be provided with a suitable gland or stuffing-box, if desired.

I is a small tank surrounding the end of the trunnion *b*. This tank is kept filled with water and completely prevents the escape of any gas from around the trunnion.

It will be noticed that the wall of the cover F is slotted at *d* to permit it fitting over the sleeve *c*.

J is a small gas-dome extending upwardly from the cover F and provided with a small cock *e*.

K is the gas-exit pipe, which extends from within the gas-dome J down through the water seal within the cover F, through the bottom of the cylindrical casing E, and thence to the gas-holder. The gas-dome J of the generator enables the gas to be drawn off at the highest point possible above the point of generation, where it is likely to be driest.

L is a water-distributing plate suitably supported within the upper end of the cover F. This plate has a number of perforated teats *f* depending therefrom.

M is the water-supply pipe, extending through the top of the cover and terminating in the funnel N. Below the funnel the pipe is made U-shaped to provide an effective water seal, the bottom of the U extending well below the point of delivery in the generator.

O is an opening in the bottom of the cylindrical chamber, through which the lime or ashes may be removed, and is provided with a suitable cover.

The gas-holder B comprises the usual water chamber or tank P and the gas-dome Q, provided with guide-wheels, which run on suitable guides connected to the walls of the chamber P. The gas-exit pipe K from the generator extends up through the bottom of the water-chamber P a suitable distance above the level of the water contained therein.

R is the gas-supply pipe to the burners, extending from above the water-space in the chamber through its bottom and thence to the line-pipes. The water measuring and feeding device C is constructed substantially as follows:

S is an outer tank, within the ends of which are journaled the trunnions *g* of the inner



tip-tank T. Only one of these trunnions is seen in the drawings.

U is a lever rigidly secured to one of the trunnions *g* outside the tank S. This lever is preferably weighted, so as to tend to retain the tank in a normal untipped position.

V is a stop adjustably secured to the end of the tank and provided with two pins *h*, between which the lever may play, the upper pin serving to limit the degree to which the tank is tipped, as shown in Fig. 2. The tip-tank T is preferably provided with an outlet-spout A', located close to its upper edge, and an overflow-spout B', slightly below the level of the spout A'.

The spout B' extends beyond the edge of the tank S, so as to discharge any overflow outside the said tank. Unless the upper edge of the inner tank is above the edge of the outer tank a notch, either with or without a lip or spout, must be cut in the edge of the outer tank. If the parts be so proportioned that the overflow-spout B' rests upon the edge of the outer tank or the bottom of the notch when the tank is in its normal position, the lower pin *h* may be dispensed with.

C' is a water-tank or other source of water-supply. A pipe J' extends from the bottom of this tank to a point just above the tip-tank T.

D' is a valve formed therein, such as is used for an ordinary flushing-tank.

E' is a float, the lever of which is suitably pivoted and adapted to operate the valve D' in the ordinary manner.

F' is the outlet-pipe from the bottom of the tank S. This pipe is preferably divided and hinged at *i*, so that when the parts are in the position shown in Fig. 2 a continuous water-way is formed from the bottom of the tank S to the end of the pipe. When, on the contrary, the lower portion of the pipe is raised, as shown in dotted lines in Fig. 1, the water flows from the joint and runs to waste. When the pipe is in the position shown in full lines in Figs. 1 and 2, the end of the pipe F' is over the funnel N and water flowing through it passes to the generator.

G' is an arm connected to the gas-dome of the holder and provided with a cord attached to the lower end of the hinged outlet-pipe F'. The parts are so proportioned that the hinged pipe F' is not lowered to discharge into the funnel N till the gas-dome is nearly exhausted. When the gas-dome is up, the arm is raised, as shown in dotted lines, and any overflow or leakage from the tank falls to the ground and undue generation of gas in the generator, owing to an excess of water, is rendered impossible.

The lever U is connected by a cord H', passing over the guide-pulley *j*, to the weight I', which either rests upon the top of the gas-dome or is inserted in a depression therein. The operation of this portion of the device is substantially as follows: Supposing the tip-tank T to be full of water, the float E' is lifted

and the valve D' closed. As the gas-dome Q sinks it gradually takes up the slack in the cord H' till when the gaseous contents are nearly exhausted the dome, moving away from the weight I', allows the latter to draw upon the lever U till it comes in contact with the upper pin *h* on the adjustable stop V. A portion of the contents of the tank will thus be discharged into the outer tank. As the falling of the gas-dome has lowered the hinged outlet-pipe F' the water tipped from the tank goes straight to the generator and a new supply of gas is generated, which raises the gas-dome Q, which immediately raises the hinged outlet-pipe F' and allows any further water spilling from the tank to run to waste. The raising of the tank also takes the strain of the weight I' off the cord H', and the weighted lever U returns the tank to its normal position. The spilling of a portion of the contents of the tank allows the float E' to sink, and a further supply of water slowly trickles in through the valve D' till the normal level of the water in the tip-tank has been reached, when the supply is cut off. In case the valve leaks any surplus flows off through the overflow-spout B'.

It will be seen that the pipe J', tanks S T, and the hinged pipe F' form a water-channel between the source of water-supply and the funnel or opening of the pipe M to the generator, and these parts are referred to in the claims under this name. The object of making the tip-tank of considerable size and then limiting the amount of its tip, so that a considerable portion of its contents still remains, is this: Less than half a pint of water is sufficient to generate enough gas to fill an ordinary small holder. Such a quantity of water would be insufficient to operate the float E'. The difficulty can only be overcome with the tip-tank by making the tank of sufficient capacity to lift the float and then discharging merely a small portion of its contents. By moving the adjustable stop V any desired tip may be given to the tank and any desired quantity of water obtained.

In the gas-exit pipe J, I preferably locate a stop-cock K' between the generator and the gas-dome, so that communication between them may be cut off when recharging the generator. To the horizontal portion of the pipe K, I connect the pipes L' M', one on each side of the stop-cock K'. These pipes enter a closed chamber N', preferably filled with water and provided with an outlet-pipe O' near its upper end, which may be led to the outer air. This chamber N' acts as a condensation-chamber and also as a safety-valve, any water forming in the pipe K on either side of the stop-cock running down to join the water in the chamber. In case of an excessive pressure in either the generator or the gas-holder, a portion of the gas bubbles up through the water in the chamber and passes to the outer air, thus insuring perfect safety to the apparatus.



P' is an overflow-pipe connected to the pipe M'. Any excess of water flows out through the top of this pipe, which thus establishes the level of the water within the chamber N'.

5 When it is necessary to recharge the generator, the stop-cock K' is shut and most of the gas within the generator is exhausted by opening the cock e and lighting the outflowing gas. The cover F may then be removed  
10 and a fresh charge of carbid placed on the grate G. This grate may be operated at any time to remove the lime from the lumps of carbid by placing the lever H upon the suitably-shaped end of the trunnion b and rocking  
15 it backward and forward for a few minutes.

What I claim as my invention is—

1. In apparatus of the class described, a source of water-supply; a generator and a water-channel between the source of water-  
20 supply and the generator having as a member a journaled tip-tank adapted when tipped to discharge a portion of its contents into the lower part of the channel; in combination with a float within the tank adapted to control the water-supply to the upper part of the  
25 said channel; mechanism controlled by the gas-supply for tipping the said tank, and a stop to limit the amount of tip, substantially as and for the purpose specified.

30 2. In apparatus of the class described, a source of water-supply; a generator; a gas-holder; a gas-pipe connecting the holder and generator, and a water-channel between the source of water-supply and the generator having  
35 as a member a journaled tip-tank adapted when tipped to discharge a portion of its contents into the lower part of the channel; in combination with a float within the tank adapted to control the water-supply to the  
40 upper part of the said channel; mechanism operated by the fall of the dome of the gas-holder for tipping the said tank and a stop to limit the amount of tip, substantially as and for the purpose specified.

45 3. In apparatus of the class described, a source of water-supply; a generator; a suitably-journaled tip-tank; a pipe adapted to carry water from the source of supply to the tip-tank, and a valve in said pipe, in combination  
50 with a float within the tank adapted to control the said valve; mechanism controlled by the gas-supply for tipping the said tank; and a water-channel adapted to receive the water tipped from the tank and convey it  
55 to the generator, substantially as and for the purpose specified.

4. In apparatus of the class described, a source of water-supply; a generator; a suitably-journaled tip-tank; a pipe adapted to  
60 convey water from the source of supply to the tip-tank, and a valve in said pipe, in combination with a float within the tank adapted to control the said valve; mechanism controlled by the gas-supply for tipping the said  
65 tank; a stop to limit the amount of tip; and a water-channel adapted to receive the water tipped from the tank and convey it to the

generator, substantially as and for the purpose specified.

5. In apparatus of the class described, a 70 source of water-supply; a generator; a gas-holder; a gas-pipe connecting the holder and generator and a water-channel between the source of water-supply and the generator, having as a member a journaled tip-tank 75 adapted when tipped to discharge a portion of its contents into the lower part of the channel; in combination with a float within the tank adapted to control the water-supply to the upper part of the said channel; mechanism 80 operated by the fall of the dome of the gas-holder for tipping the said tank; a stop to limit the amount of tip; and an overflow-spout for the tank located below the normal level of the discharge-point of the tank and 85 adapted to convey surplus water to waste, substantially as and for the purpose specified.

6. In apparatus of the class described, a source of water-supply; a generator; a suitably-journaled tip-tank; a pipe adapted to 90 convey water from the source of supply to the tip-tank, and a valve in said pipe, in combination with a float within the tank adapted to control the said valve; mechanism controlled by the gas-supply for tipping the said 95 tank; a water-channel adapted to receive the water tipped from the tank and convey it to the generator; and an overflow-spout for the tank located below the normal level of the discharge-point of the tank and adapted to 100 convey surplus water to waste, substantially as and for the purpose specified.

7. In apparatus of the class described, a source of water-supply; a generator; a gas-holder; a gas-pipe connecting the holder and 105 generator; a tip-tank; an outer tank in which the said tip-tank is journaled; a pipe adapted to convey water from the source of supply to the tip-tank; and a valve in said pipe; in combination with a float within the tank adapted 110 to control the said valve; a lever-arm connected to the tip-tank; an adjustable stop to limit the movements of the said lever; a cord connected to the lever passing around a suitable guide or guides to the gas-dome of the 115 holder; and a pipe connecting the outer tank with the water-inlet of the generator, substantially as and for the purpose specified.

8. In apparatus of the class described, a generator; the water-supply pipe thereof provided with a suitable funnel or opening; a 120 gas-holder and a pipe connecting the generator with the holder; in combination with a source of water-supply; a passage-way for water between the said source and the funnel 125 or opening provided with a hinged member which may be moved to discharge the water into the said funnel or opening or moved to allow the water to escape at the hinge; and means for so moving the said member by the 130 rise and fall of the gas-dome, substantially as and for the purpose specified.

9. In apparatus of the class described, a generator and the water-supply pipe thereof



provided with a suitable funnel or opening; in combination with a source of water-supply; a passage-way for water between said source and the funnel or opening, provided with a hinged member which may be moved to discharge the water into said funnel or opening or moved to allow the water to escape at the hinge, and automatic means for so moving the said member, substantially as and for the purpose specified.

10. In apparatus of the class described, a generator and the water-supply pipe thereof provided with a suitable funnel or opening; a gas-holder and a pipe connecting the generator with the holder, in combination with a source of water-supply; a divided hinged water-pipe connected with said water-supply and adapted normally to discharge into the said funnel; and a cord connected to the gas-dome and adapted when the dome rises, to lift the hinged pipe and allow surplus water to flow from the hinged joint, substantially as and for the purpose specified.

11. In an apparatus of the class described, the combination of a generator and gas-holder having a gas-exit pipe connecting them, a stop-cock inserted in said pipe between said generator and holder and arranged to close communication between them, pipes connected with said gas-exit pipe, one on each side of said stop-cock, and a water-chamber in which each of the last-mentioned pipes enters, substantially as and for the purpose specified.

12. In an apparatus of the class described, the combination of a generator and gas-holder having a gas-exit pipe connecting them, a stop-cock inserted in said pipe between said generator and holder and arranged to close communication between them, pipes connected with said gas-exit pipe, one on each side of said stop-cock, and a closed water-chamber provided with a gas-outlet pipe near its upper end, each of the said last-mentioned pipes entering the lower part of the said water-chamber, substantially as and for the purpose specified.

13. In an apparatus of the class described, the combination of a generator and gas-holder having a gas-exit pipe connecting them, a stop-cock inserted in said pipe between said generator and holder and arranged to close communication between them, a closed water-chamber provided with a gas-outlet pipe near its upper end, pipes connected to the said water-chamber near its bottom and to said gas-exit pipe one on each side of said stop-cock, and an overflow-pipe connected with the water-space of the said chamber and open at its upper end below the level of the gas-outlet pipe of the water-chamber, substantially as and for the purpose specified.

Niagara, June 14, 1897.

RICHARD F. CARTER.

In presence of—

ALEX. FRAZER,  
W. J. SEYMOUR.