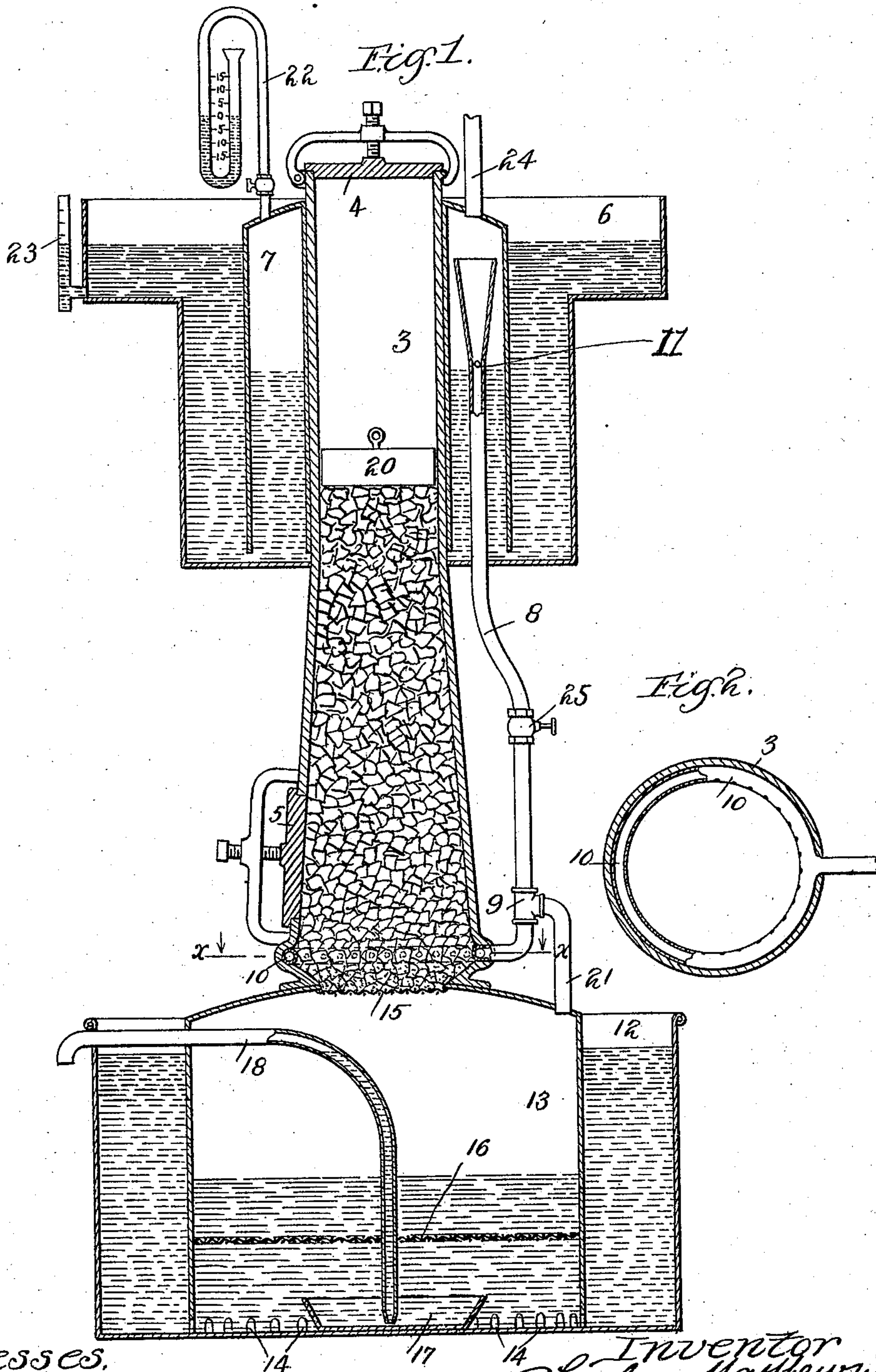


(No Model.)

C. MATTHEWS, Jr.
ACETYLENE GAS GENERATOR.

No. 577,051.

Patented Feb. 16, 1897.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES MATTHEWS, JR., OF CHICAGO, ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 577,051, dated February 16, 1897.

Application filed October 14, 1896. Serial No. 608,807. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MATTHEWS, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section; and Fig. 2 is a cross-section at the line $x x$ of Fig. 1, the circular water-pipe therein shown being partly broken away.

This invention relates to gas-generators and is designed, primarily, for the production of acetylene gas from calcium carbid by the application of water thereto, but may be advantageously employed for the production of gas that is formed by the union of other solids with a liquid.

It has for its object to provide a cheap, simple, and effective form of apparatus for generating gas in which the quantity generated will automatically be regulated to correspond with the amount of gas consumed.

It has for a further object to provide a construction whereby the refuse matter or lime will be automatically discharged from the machine, thus obviating the necessity of providing devices within the apparatus for receiving such refuse and of removing the same at stated intervals.

It has also for an object the simplification of machines of this class as a whole.

I accomplish these stated objects by the means shown in the drawings and hereinafter fully described.

That which I regard as new will be set forth in the claims.

In the drawings, 3 indicates a receiver or holder for the calcium carbid, the lower portion of which is preferably wider than the upper portion, as shown, to facilitate the downward feeding of the carbid.

4 indicates a cover for the receiver, which is securely held in place by a bridge and screw, as shown, or by any other suitable fastening that will permit the cover to be readily removed for the purpose of renewing from time to time the calcium carbid. As shown, near the lower end of the receiver there is an

opening tightly closed by a cover 5, through which opening access can be had to the interior of the receiver for the purpose of cleaning the same when necessary. This cover is also held in place by any suitable means, the means shown being of the same character as those employed for securing the cover 4.

6 indicates a water-tank which in the construction shown surrounds the upper portion of the receiver 3 and which may be of any desired shape and is to be secured in place in any suitable manner.

7 indicates an inverted water-receptacle within the tank 6, and, as shown, it surrounds the carbid-receiver 3. By means of openings in the lower edge of this water-receptacle 7, or by so securing it that, as shown in the drawings, its lower edge does not quite come to the bottom of the tank 6, communication is established between the tank 6 and receptacle 7.

8 is a pipe the upper end of which projects into the inverted water-receptacle 7, the pipe passing through a hole made for it in the bottom of the tank 6. The lower end of this pipe, as shown, is connected to a union 9, to which union is also connected an annular pipe 10, that is located within the carbid-receiver 3 near its lower end, said receiver being sufficiently enlarged at this point, as shown, to so receive the pipe as to prevent the pipe from in any manner obstructing the downward progress of the calcium carbid. The inner face of this annular ring is provided with small holes for the escape of water that is carried down by the pipe 8 to the calcium carbid. The water enters the pipe from the receptacle 7 through one or more openings 11 near the upper end of the pipe. This pipe 8 has, as shown, its upper end enlarged or of funnel shape, the object of such construction being to facilitate the catching of such condensation as may have occurred by reason of the cooling of the gas as it passes up such pipe, as hereinafter explained.

12 indicates a water-tank, and 13 an inverted receptacle within the tank 12, the two having communication by means of openings 14, formed in the lower portion of the receptacle 13. The upper end of the receptacle 13 is provided with an opening through which

the refuse or lime formed by the action of the water upon the calcium carbid in the carbid-receiver 3 can pass into the receptacle 13, such refuse or lime being divided into small particles before entering the receptacle 13 by being forced through a sieve 15, interposed between the receiver 3 and receptacle 13.

16 indicates another sieve located within the receptacle 13 and designed to still further reduce the size of the refuse or particles of lime before the same settles to the bottom.

17 indicates a pan in the bottom of the receptacle 13 and intended to receive the refuse referred to. Within this pan there projects one end of a tube 18, the other end of which is carried outside of the tank 12 a short distance below the upper edge thereof.

20 indicates a weight placed within the receiver 3 and on top of the calcium carbid therein to keep the mass moving downward to insure fresh carbid being brought opposite the annular pipe 10 to take the place of that which has been acted upon by the water issuing from the holes in said annular pipe 10.

21 indicates a short pipe communicating at its upper end with the pipe 8 through the medium of the union 9, to which it is joined, and communicating at its lower end with the interior of the receptacle 13, into which it passes through a hole in the upper end of such receptacle.

22 indicates a pressure-gage communicating with the receptacle 7, and 23 indicates another gage communicating with the tank 6, from which can be determined the amount of water required in the tank.

The operation is as follows: The receiver 3 is filled with calcium carbid through the opening at its upper end, the weight 20 placed on the mass, and the cover secured tightly in place. The tank 12 is partially filled with water, as is also the tank 6, the latter to such a height that a small amount of water will enter the pipe 8 through the openings 11. This water passing down the pipe will enter the annular pipe 10 and through the small openings therein be directed against the carbid, which causes the generation of the acetylené gas. Such gas will collect in the receptacle 13 and will pass up through the pipes 21 and 8 to the receptacle 7 and out through a service-pipe 24. As the volume of gas is increased it will by its pressure lower the water in the receptacles 7 and 13 and correspondingly raise it in the tanks 6 and 12, and when this has been done more water is to be placed in the tank 6. A sufficient volume of gas having been produced, the water in the two tanks will be substantially in the positions shown in the drawings, and as such gas passes off through the service-pipe 24 for consumption the pressure on the water in the two receptacles is of course reduced, allowing it to rise, the effect of the rising in the receptacle 7 being to allow more water to pass through the openings 11, down the pipe 8, and onto the calcium car-

bid, the effect of which is to instantly generate more gas, the pressure of which will at once lower again the water in the receptacles. This action is repeated again and again, and it will be seen that the effect of it is to permit water to escape to the carbid only as needed, so that an unnecessary amount of gas is not generated. The flow of the gas can be shut off as desired by the valve 25 in the pipe 8.

One effect of the rising and lowering of the water in the receptacle 13 is to force the refuse or lime that drops through the sieve 15 through the second sieve 16, and thus further reduce the size of its particles. In this finely-divided state it settles in the pan 17, and as the level of the water in the pipe 18 rises this refuse lime matter is carried along with the water in the pipe, and whenever the water therein is raised high enough and agitated a portion of this refuse is carried out and may be caught in any suitable receptacle. By the use of an apparatus such as shown I have ascertained that the agitation of the water is sufficient to cause a very large percentage of said refuse to be carried off by this pipe as the water rises from time to time high enough to escape in small quantities from the pipe.

I contemplate supplying water to the tanks as needed automatically by the employment of a float-cock or similar device, which device, however, I have not shown, as it forms no part of my invention, and its application for the purpose will be readily understood by all skilled in the art to which such a device pertains.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. In an apparatus for forming gas by the union of a solid and a liquid, the combination of a receiver for the solid, a liquid-supply tank, an inverted receptacle within the tank and communicating at or near its lower end with the tank, a supply-pipe projecting into said receptacle and communicating also with the said receiver near the lower end thereof, and means for holding and conducting the gas formed by the union of the liquid and solid, substantially as specified.

2. In an apparatus for forming gas by the union of a solid and a liquid, the combination of a receiver for the solid, a liquid-supply tank, an inverted receptacle within the tank that communicates at or near its lower end with the tank, a supply-pipe opening into said receptacle, and a perforated, annular, pipe within the lower end of said receiver and communicating with said supply-pipe, substantially as specified.

3. In an apparatus for forming gas by the union of a solid and a liquid, the combination of a receiver for the solid, said receiver being enlarged at or near its lower end to receive a pipe, a perforated pipe arranged within such enlarged portion so as to offer no obstruction to the downward movement of the

solid within the receiver, and means for feeding a liquid to said pipe for delivery onto the solid, substantially as specified.

4. In an apparatus for forming gas by the union of a solid and a liquid, the combination of a receiver for the solid, a liquid-supply tank, a pipe for conducting the liquid to the solid in the receiver, a water-containing receptacle communicating with the lower end of said receiver and adapted to receive and hold the gas that is generated, and a pipe connecting said last-named receptacle with the water-supply pipe, whereby the gas may be conducted away for use, substantially as specified.

5. In an apparatus for forming gas by the union of a solid and a liquid, the receiver 3, tank 6, receptacle 7 within and communicating with said tank 6, pipe 8 leading from said receptacle 7 and connecting with the annular 20 perforated pipe 10 in the lower end of said receiver, in combination with the tank 12, receptacle 13 within and communicating with the tank 12, and pipe 21 connecting the pipe 8 and receptacle 13, substantially as and for 25 the purpose specified.

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Witnesses:

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