

No. 617,320.

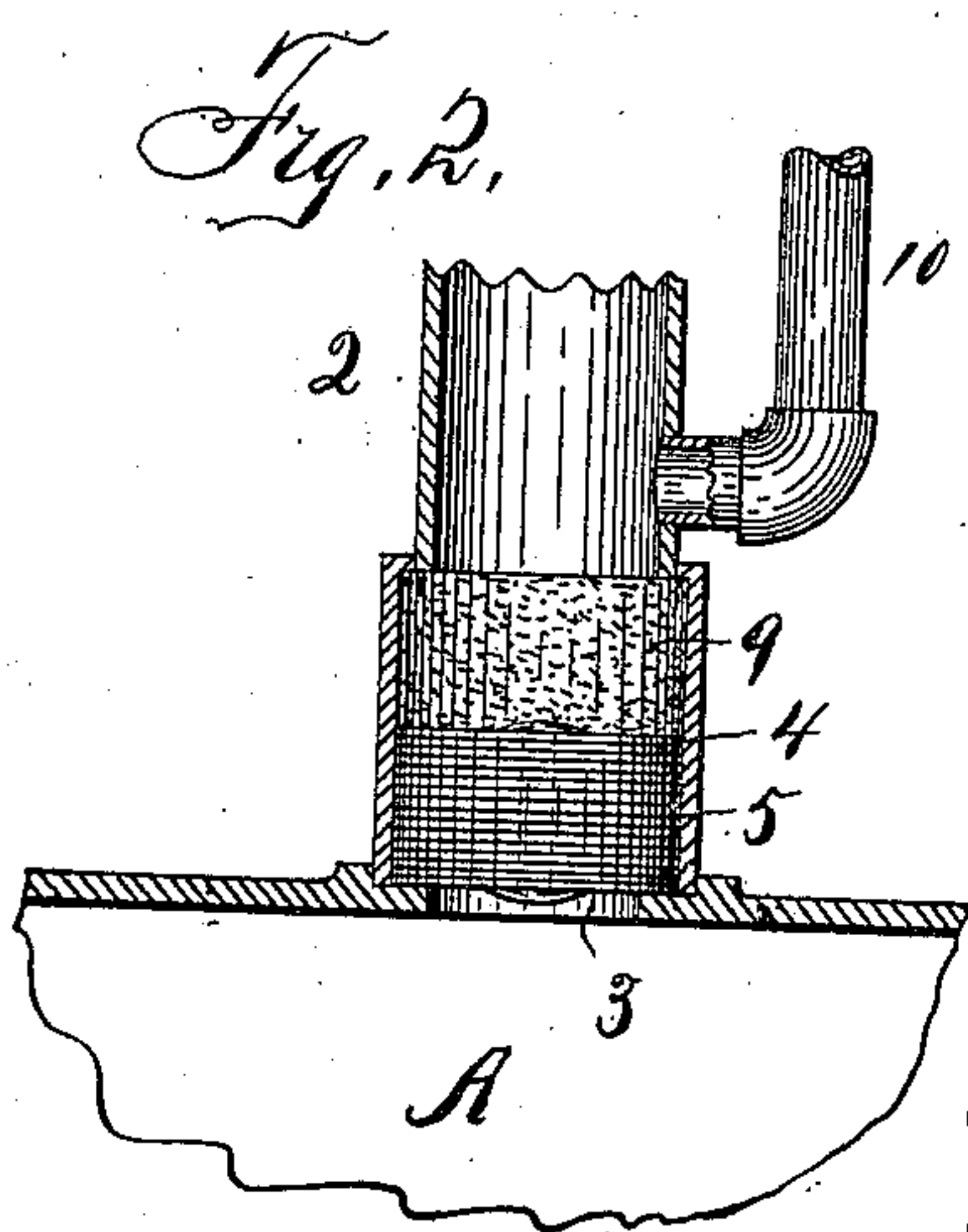
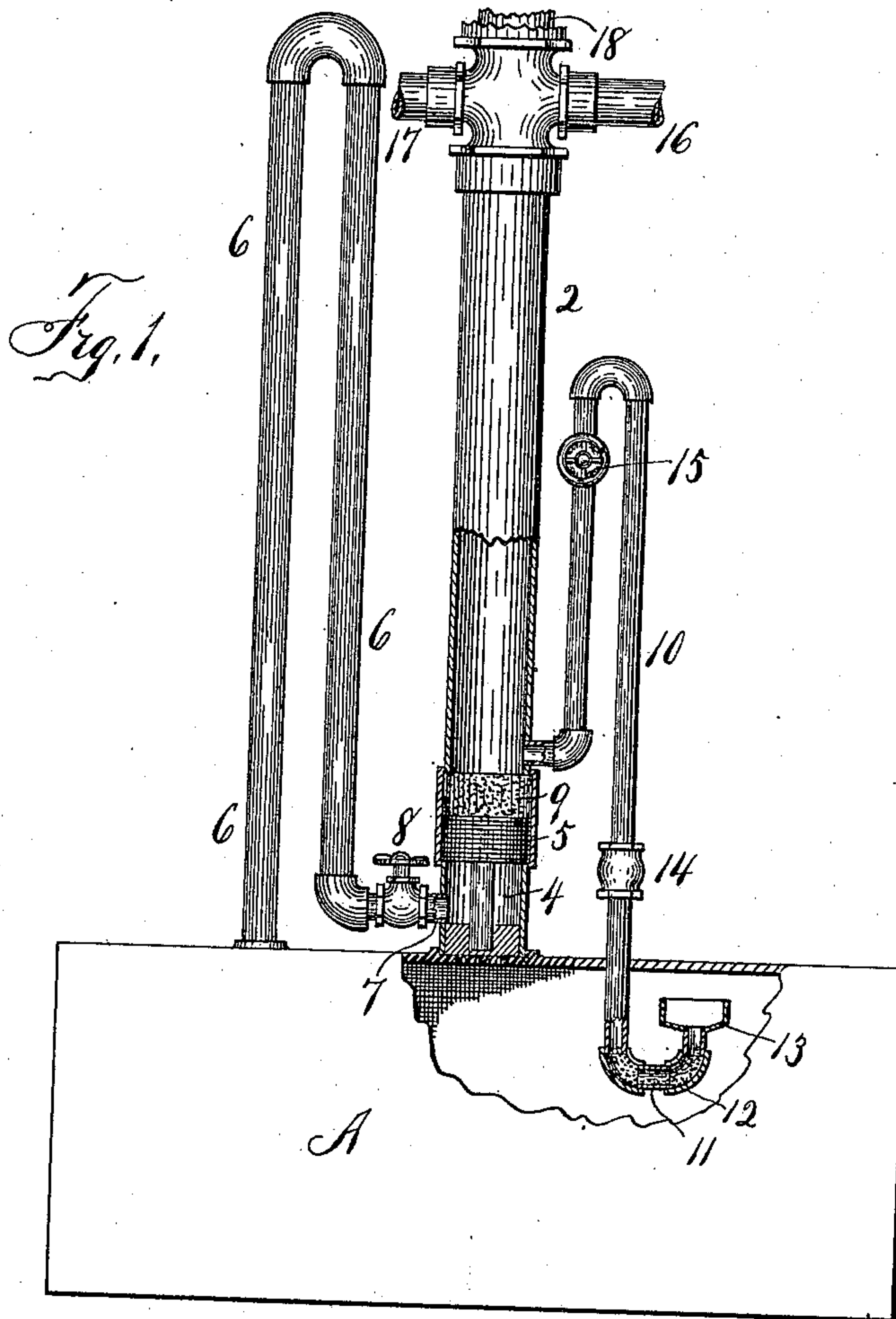
Patented Jan. 10, 1899.

I. C. CURTIS.

FEED WATER REGULATOR FOR ACETYLENE GAS GENERATORS.

(Application filed Mar. 8, 1898.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

IRA C. CURTIS, OF FULTON, NEW YORK.

## FEED-WATER REGULATOR FOR ACETYLENE-GAS GENERATORS.

SPECIFICATION forming part of Letters Patent No. 617,320, dated January 10, 1899.

Application filed March 8, 1898. Serial No. 673,108. (No model.)

*To all whom it may concern:*

Be it known that I, IRA C. CURTIS, of Fulton, in the county of Oswego, in the State of New York, have invented new and useful Improvements in Gas-Generator Feed-Water Regulators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates generally to processes of and apparatus for the manufacture or generation of combustible gas by bringing together two materials or substances which by their chemical action or reaction produce, generate, or release the gas, such as that which is known as "acetylene" gas, by the action of water upon calcium carbid, and particularly to means and appliances for automatically feeding the water to the carbid or governing the feed thereof.

The object of my invention is to provide a "generator" with means for automatically governing, regulating, and controlling the feed of a liquid agent, as water, into the generator to combine with the other agent therein, as calcium carbid, to produce, create, or generate the gas, as acetylene gas, and in which the pressure of the gas in the generator or in a suitable gasometer or holder connected to the generator operates the governor to vary and regulate such feed or shut it off entirely, the feed of the water being regulated according to the amount of gas necessary to bring the pressure up to a predetermined point or to maintain it there while gas is being used and which will automatically stop the feed of the water entirely, and thus stop or substantially stop the generation of gas so long as it is shut off and according to the variation of the quantity of water fed, so the amount of gas produced varies.

It is a fact that as long as even dampness exists in the gas or carbid holder or gas-generator so long will gas be generated, and it is an object of my invention to prevent any inflow or access of dampness into the generator after the water is shut off, and then when the then-remaining dampness is absorbed by or combined with the carbid thereafter no more gas will be generated until water is again fed into the generator or into or onto the carbid therein.

It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional elevation of the governor applied to a generator. Fig. 2 is a vertical section of a construction omitting some parts shown in Fig. 1.

A is a suitable generator, which when used in connection with a separate gasometer is suitably connected thereto, and the pressures are substantially alike except when a pressure-reducer is employed. Upon this a water-column 2 is suitably erected. (Shown in Fig. 1 as not directly connected to the interior of the generator and in Fig. 2 as directly connected thereto by the opening 3.) The lower part of said column is sometimes enlarged to create a piston-chamber 4, or the base can be uniform throughout. A piston 5, of suitable material, is suitably mounted in said column in such manner that its lower face is exposed to the pressure of the gas either through the opening 3 or through the gas-column 6, consisting of a U-shaped pipe having one arm suitably connected to said generator and the other to the column, as by means of a lateral pipe 7, which can be provided with a suitable valve, as 8. This gas-column extends above the normal water-level of the water-column to prevent any accidental flowing of water through it into the generator. This piston is usually composed of material of that class which is not attacked by, does not amalgamate with, and is impervious to mercury or quicksilver, of which a suitable amount is placed upon the piston as a packing 9, the inner walls of this part of the water-column or the column itself being of any suitable material which does not amalgamate with or is not in any manner affected by quicksilver. Any other suitable substance or material or liquid can be used which is of sufficient density to be impenetrable to or impervious to or not affected by or will not mix nor commingle with water and will be a suitable packing.

A water-feed pipe 10 is suitably connected to the column adjacent to the top of the column of mercury and extends into the generator, within which it is suitably constructed to receive an auxiliary packing-column of mercury 11, as by a bend 12, in which the



mercury is in a substantially horizontal plane, the free end of said pipe being provided with an expansion-chamber or enlargement 13. This feed-pipe is also provided with an enlarged bulb or chamber 14 at a suitable point and also with a shut-off valve 15.

At the top of the water-column pipe a four-way coupling is shown, to one arm of which an induction water-pipe 16 is suitably connected, to another the overflow-pipe 17 is coupled, and to the upper arm a suitable safety or vent pipe 18 is coupled to extend upward through the roof of the building or out of doors.

The calcium carbide is placed in the generator in any suitable manner not necessary to be here shown or described, as it is not a part of this invention, but which will bring or locate it in proper position with relation to the feed-pipe. The induction-valve is then opened, the parts being in the position shown in Fig. 1, and the water flows from the column into the feed-pipe, its head forcing the mercury up into the expansion-chamber 13, where it spreads out and is reduced in density sufficiently to permit the water to percolate or flow through or around it and overflow into the generator to combine with the carbide and produce gas. At this time the combined weight of the columns of mercury and water has forced the piston down into substantially the position shown, overcoming the gas-pressure then existing. Then as the gas-pressure increases it exerts an increased force upon the piston and raises the mercury column until it closes the feed-pipe and flowing into it also shuts off the feed-water and stops the feed to the carbide and the further generation of gas, and the gas-pressure will also then force the mercury in the chamber 13 back into the feed-pipe. In some cases such pressure may be enough to force it up into the bulb, where it will spread out so that the gas can pass through or around it and bubbling through the water therein and passing through or around the mercury column will bubble up through the water-column and pass off out of doors, thus operating as a safety-valve to let off surplus pressure. In case it is desired to stop the generation entirely or to put in fresh carbide the valve 15 is closed. I thus provide the feed-pipe with a flowable medium of a normal density to prevent the inflow of water or the outflow of gas and means whereby when it is automatically diffused or spread out its density will be reduced to permit the passage of either pressure agent, water or gas.

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

1. The combination with a gas-generator,

of a feed-water pipe open terminal enlargement within it, and a flowable medium within the pipe of a density to prevent the passage of water through it while in the normal bore of said pipe, but permitting such passage when spread out in said enlargement.

2. The combination with a gas-generator, of a pipe connected thereto and enlarged both interiorly and exteriorly, and a flowable medium between said enlargements and exposed to the pressure of two opposing agents, whereby the excess of pressure of one agent will force it into one of said enlargements to permit the passage of such agent through it.

3. The combination with a gas-generator, of a water-column a vertically-reciprocated piston and packing therein, a feed-pipe enlarged exteriorly and interiorly to said generator, and an intermediate liquid packing medium under pressure of the water and gas as opposing agents whereby the excess of pressure of one agent will force it into one of said enlargements to permit the passage of such agent through it.

4. The combination with a gas-generator, of a feed-pipe, a water-column, a reciprocating piston and packing therein, and a gas-pipe connecting said generator to said piston-chamber and projecting upward to a height greater than that of the column of water, to prevent water entering said gas-pipe.

5. The combination with a gas-generator, a water-column, a piston and column of mercury in a chamber therein exposed to the pressure of the gas therein, of a feed-water pipe connecting said water-column to said generator and a mercury column in said pipe adapted to be reciprocated therein by the variation of the pressure upon it.

6. The combination with a gas-generator, a water-column pipe and a feed-water pipe connecting it to said generator, of a four-way coupling mounted upon said column and comprising a water-inlet connection, an overflow connection, and a vent.

7. The combination with a gas-generator, a water-column and a feed-pipe connecting them, of a column of mercury in said feed-pipe adapted to be shifted in one direction by the water-pressure to permit the passage of water, and in the opposite direction when the gas-pressure exerts the greater force, to permit the escape of the surplus gas through the feed-pipe and water-column.

In witness whereof I have hereunto set my hand this 2d day of March, 1898.

IRA C. CURTIS.

In presence of—

O. C. BREED,  
C. R. DINES.