No. 612,242. Patented Oct. 11, 1898.

W. HOLT.

ACETYLENE GAS GENERATOR.

(Application filed Dec. 10, 1896.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

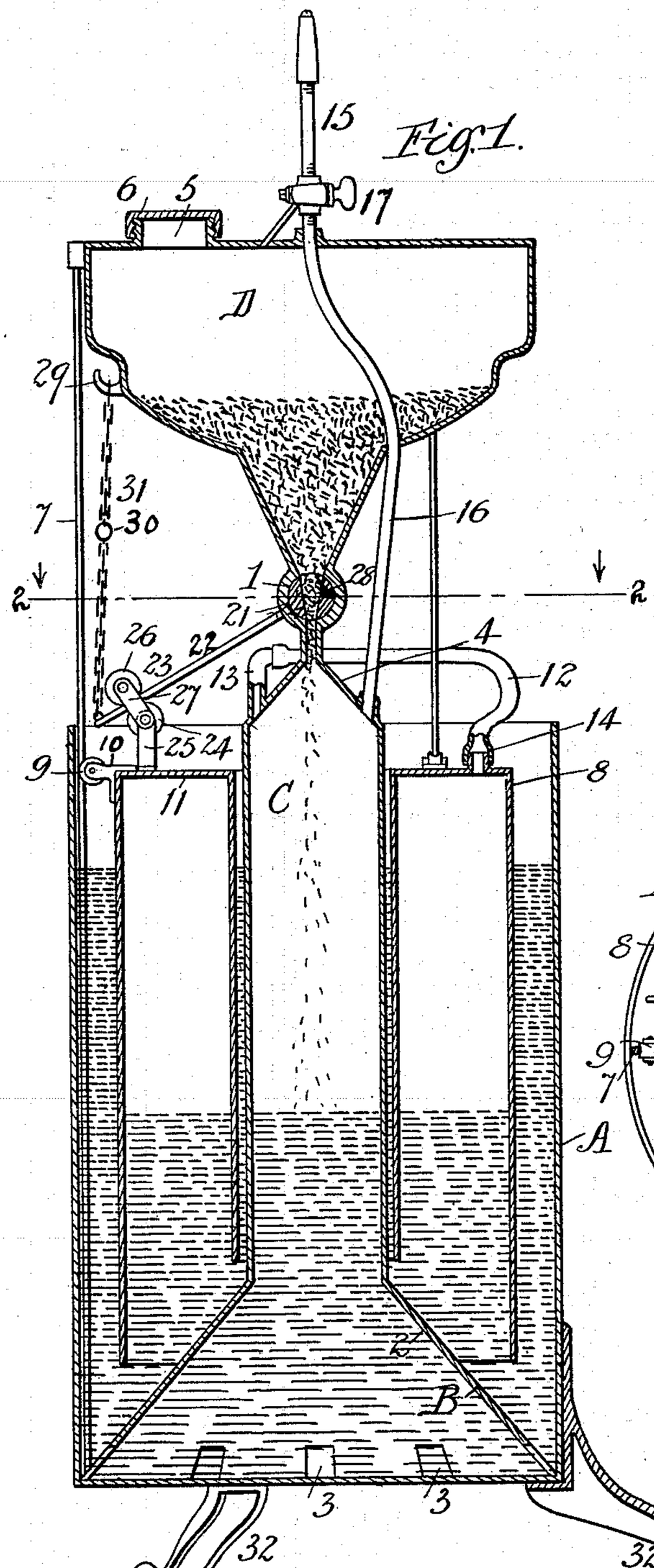


Fig. 3.

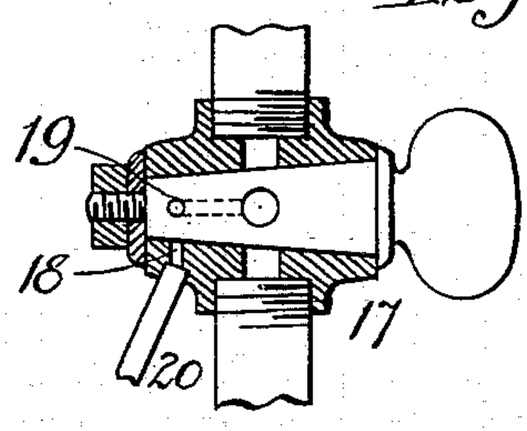
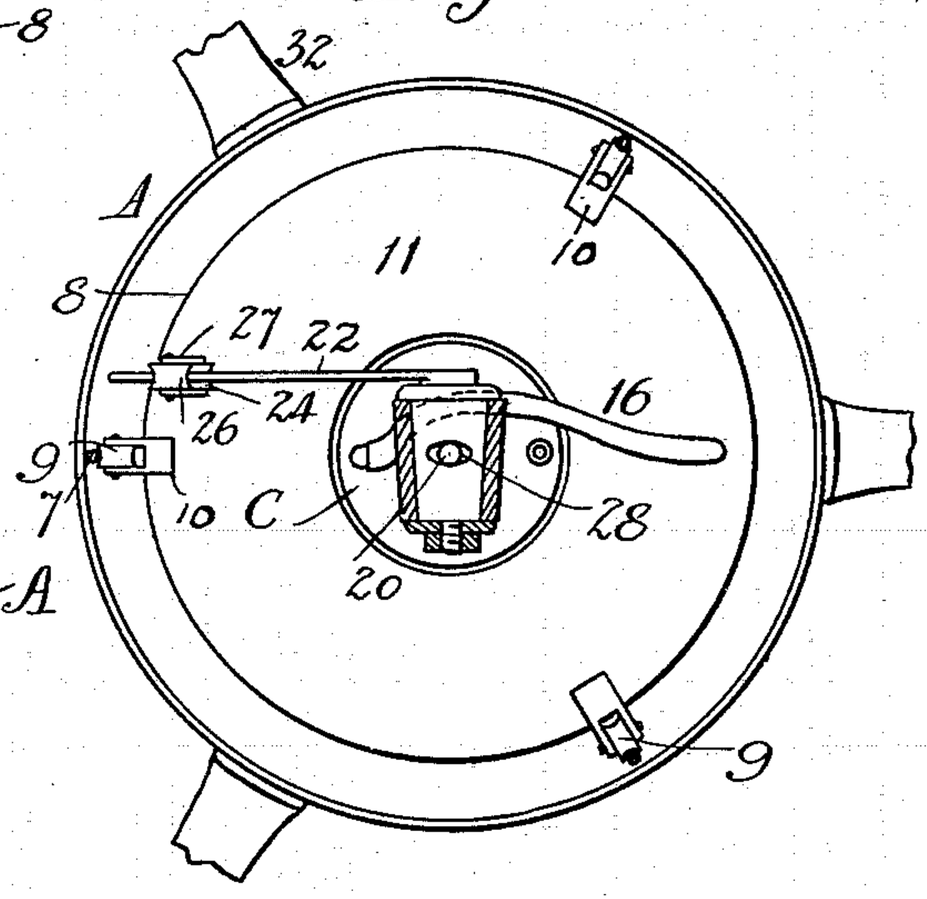


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

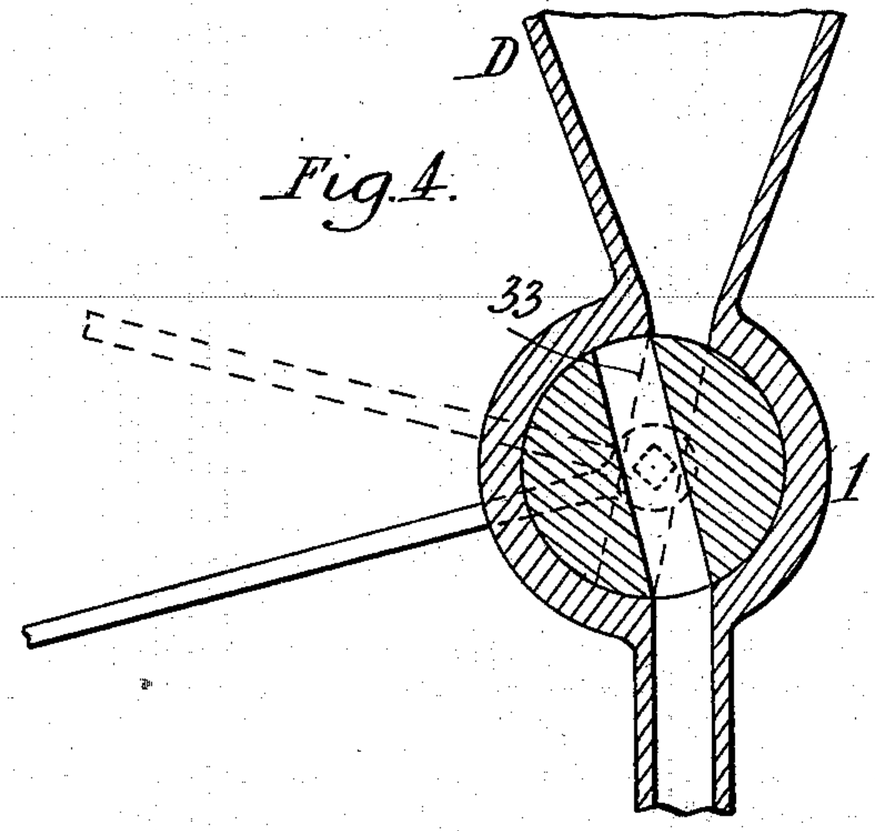
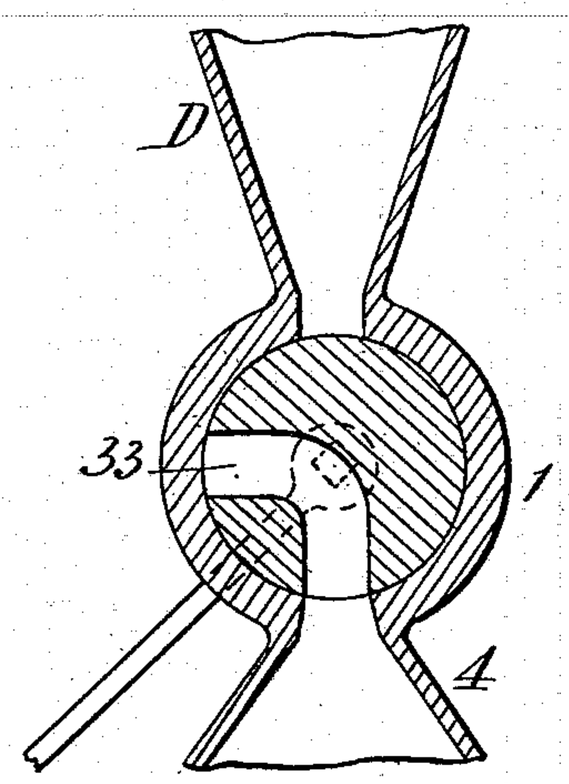


Fig. 5.



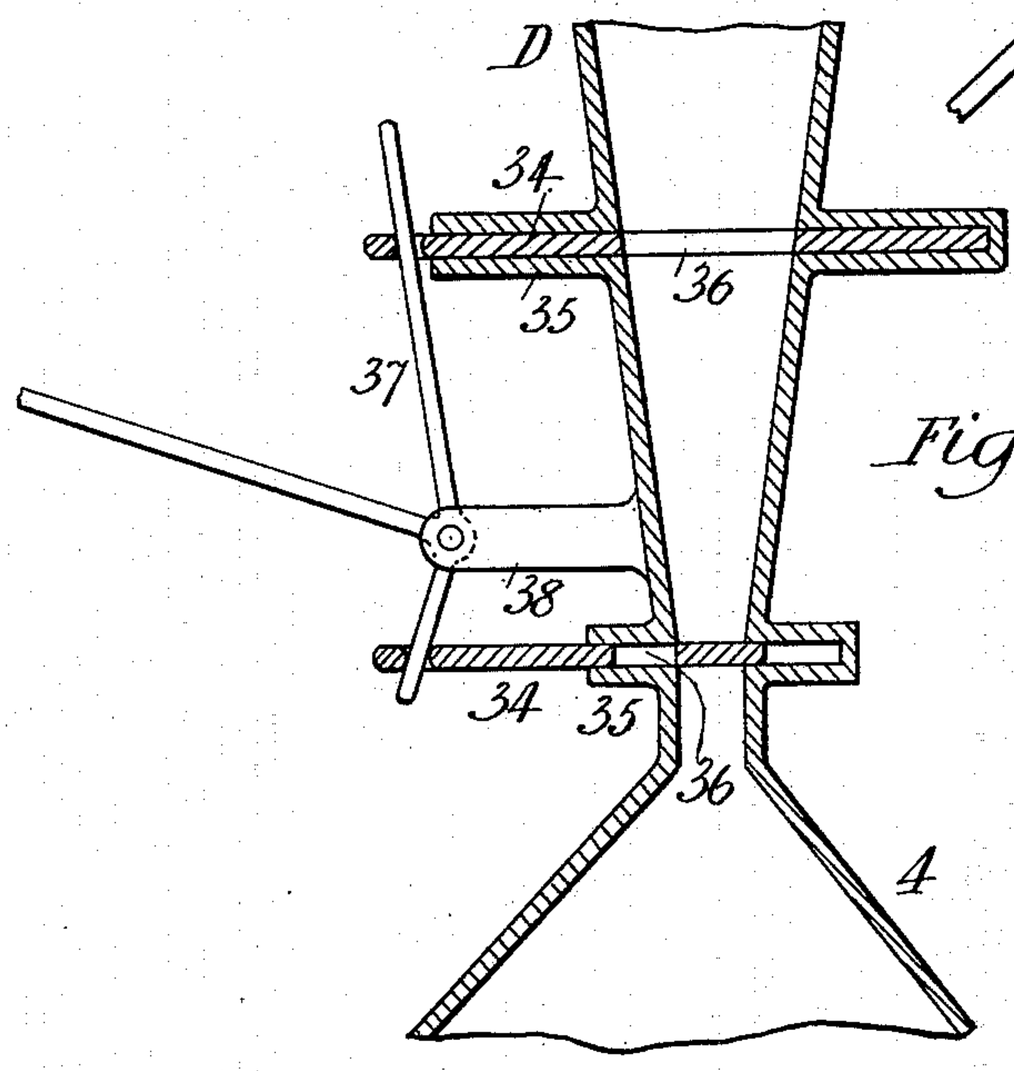


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM HOLT, OF CHICAGO, ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 612,242, dated October 11, 1898.

Application filed December 10, 1896. Serial No. 615,191. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HOLT, 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 Acetylene-Gas Generators; 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 relates to a novel construction in an acetylene-gas generator, the object being to provide a device of this description in which the calcium carbid is automatically fed to the water-bath in small quantities at frequent intervals at a determined pressure; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical section of an acetylene-gas generator constructed in accordance with my invention. Fig. 2 is a horizontal section of the same on the line 2 2 of Fig. 1. Fig. 3 is a detail sectional view of the outlet-valve I employ. Figs. 4, 5, and 6 are detail sectional views of modified forms of construction of valves to be interposed in the passage 1.

Referring now to said drawings, A indicates a tank adapted to contain water, in which a stand B is adapted to stand, which comprises a plurality of chambers—namely, a generating-chamber C and a calcium-carbid reservoir D, situated above said generating-chamber C and connected therewith by means of a valve-controlled passage 1. Said stand B is provided with a flaring bottom 2, provided with a plurality of openings 3, through which the water in which it is immersed is adapted to circulate when acted upon by the gas-pressure. Said generating-chamber C consists, preferably, of an upright cylinder covered by a hood 4 at its upper end and open at its lower end, where it is rigidly secured to the upper or contracted portion of the bottom 2. The passage 1 connects the upper or contracted end of the hood 4 with the lower funnel-shaped portion of the reservoir D, which closely resembles a lamp-bowl in shape and is provided with a feed-opening 5, adapted to be sealed by a cap 6. Said reservoir D is supported upon said pipe or passage 1 and upon guide rods 7, secured at their upper ends to said reservoir and at their lower ends to the outer edges of said bottom 2. A float 8 surrounds said generating-chamber C and is situated within said guide-rods 7, being provided with antifriction-rollers 9, mounted in lugs or projections 10 thereon, adapted to engage said guide-rods 7 to guide said float in its movements. Said float 8 consists of two concentric cylinders, on the upper edges of which a hood 11 is mounted, thus sealing the space between the same. The lower end of said float is open and is adapted to be sealed by the water in the tank A. The outer cylinder of said float is preferably somewhat longer than said inner cylinder to enable it to sink deeper in the water. This, however, is of practically no importance, as it does not affect the working of my device. Said float 8 is connected with said generating-chamber C by means of a flexible tube 12 fitting over the ends of nozzles 13 and 14 on said hoods 4 and 11, respectively, and passes partially around said chamber C, so as to afford it sufficient movement to adapt itself to the movements of said float 8. Said chamber C is connected with the burner 15 by means of the pipe 16 passing from said hood 4 upwardly through said reservoir D, a valve 17 being interposed below said burner 15 and immediately above said reservoir D. Said valve 17 is of the ordinary construction usually employed in gas-pipes and is provided with an additional opening 18, parallel and connected with the main opening by means of a passage 19. Said opening 18 is adapted to connect said pipe 16 with a pipe 20, leading from said valve 17 to the reservoir D, whenever said valve 17 is open, and is adapted to seal said pipe 20 when said valve is closed. A valve 21 is interposed in said pipe or passage 1 and is provided with a stem or lever 22, by means of which it is turned. The outer end of said lever 22 is adapted to be engaged by antifriction devices 23 on said float to turn said valve to open and close the same in accordance with the movements of said float 8. Said antifriction devices 23 consist of an antifriction-roller 24, mounted in the upper bifurcated end of a lug 25 on said float 8, and an antifriction-roller

26, mounted between the outer ends of two toggle-levers 27, whose inner ends are adapted to receive the shaft of the roller 24. Said lever 22 is held between said antifriction-rollers 24 and 26 and obviously moves freely therein. The opening 28 in said valve 21 is round at its lower end and elongated at its upper end, so that in turning the upper end will be adapted to receive the calcium carbid before the lower end is in alinement with the opening in said pipe or passage 1 to deliver it. In this manner I prevent choking of said valve to a large extent. Said valve 21 is so set that as said float 8 passes downwardly said valve opens.

Calcium carbid is very sensitive to atmospheric exposure and when exposed loses its efficiency in a short time and leaves a residuum of a fine white powder. For this reason it must be kept in a sealed receptacle, and to effect this in the reservoir D to prevent the possible opening of the valve 21 during the time that the calcium carbid is being introduced therein I have provided a hook 29 on said reservoir, which is adapted to engage a ring 30 on a chain 31, connected at its lower end with said lever 22. When said ring 30 is engaged by said hook 29, said lever 22 will obviously be held at the upper limit of its movement and the valve 21 thus kept closed.

The operation of my device is as follows: The calcium carbid having been introduced into the reservoir D in a granulated state and the stand B and float 8 immersed in the water in the tank A the ring 30 is disengaged from the hook 29 and the valve 17 opened. The float 8 will then immediately sink to the position shown in full lines in Fig. 1, thus opening the valve 21 and allowing a small portion of the calcium carbid to drop into the water in said chamber C. Immediately upon striking the water the said calcium carbid generates the acetylene gas, which fills said chamber C and passes through said flexible tube 12 into said float 8, thus causing pressure therein and raising said float. This movement of the float obviously closes said valve 21 and prevents a superfluous amount of the calcium carbid from dropping into said chamber C. The gas thus generated remains under pressure, according to the weight of the float, and slowly passes back from said float into said chamber C and through said pipe 16 to the burner 15. The float 8 thus gradually sinks again to the position shown in full lines in Fig. 1 and allows another portion of the calcium carbid to drop into said chamber C, thus repeating the operation. To prevent the pressure in said chamber C from forcing its way into the reservoir D and carrying an undue amount of moisture into the same directly through the pipe or passage, I have provided the pipe 20, through which the gas is adapted to pass into said reservoir D from the pipe 16, thus equalizing the pressure on both sides of the calcium carbid and preventing any disturbance of the same. This counter-pressure prevents moistening of the calcium carbid, and consequently caking and choking, which would immediately prevent the operation of the device.

It will be seen from the foregoing description that I obtain a device of perfect automatic action and in which the pressure, being regulated by the float, remains constant, thus obviating the necessity of using pressure-regulators and insuring an economical use of the material. In the drawings I have shown a portable device of this description, and in this construction I prefer to set the tank A in an ornamental stand 32 and give the whole an ornamental appearance. Obviously for use on a large scale the construction can be slightly modified to meet requirements without departing from the spirit of my invention.

It would obviously be very advantageous to regulate the exact amount of calcium carbid fed into the generating-chamber, and to this end I propose to employ valves of either of the constructions shown in Figs. 4, 5, and 6, the said valves shown in Figs. 4 and 5 each provided with a passage 33, which is adapted to be flush alternately with the upper and lower portions of the passage 1. When flush with the upper portion thereof, said passage 33 will obviously receive the calcium carbid from reservoir D and hold the same until it becomes flush, or nearly so, with the lower portion of said passage 1, when the load will be discharged into said chamber C. While said passage 33 is flush with either end of the passage 1, the other end thereof will obviously be sealed. Thus where I employ valves of this construction it will be unnecessary to provide a pipe leading from the gas-outlet pipe to the reservoir, and it will also be unnecessary to provide the chain for keeping the valve closed while feeding the reservoir, as the same will obviously always be sealed.

In Fig. 6 I have shown another form of a valve of this kind which consists in making the passage 1 preferably funnel-shaped and seating two gate-valves 34 in guides 35 on said passage. Each of said valves 34 is provided with an opening 36, through which the calcium carbid is adapted to pass. The said valves are so operated by means of the three-armed lever 37, pivoted to a projection 38 on said passage between said valves, that when the opening in one valve is flush with said passage 1 the other end of said passage is closed. In this manner it will be obvious that said passage between said valves will be alternately filled and emptied, while the reservoir will always remain sealed.

I claim as my invention—

1. In a device of the kind specified, a tank, a generating-chamber in said tank, having a flaring bottom, a calcium-carbid reservoir above said generating-chamber, a pipe or passage connecting said generating-chamber and said carbid-reservoir, a float surrounding said generating-chamber, a pipe or passage con-

necting said generating-chamber and said float, guide-rods extending between said flaring bottom of said generating-chamber and said reservoir, and antifriction-rollers on said float adapted to engage said guide-rods to guide said float in its vertical movements.

2. In a device of the kind specified, a calcium-carbid reservoir, a generating-chamber below the same, a float surrounding said generating-chamber and connected therewith, a passage between said reservoir and said generating-chamber, a valve in said passage having an opening contracted at its outlet end and enlarged at its inlet end, a stem on said valve, connection between said valve-stem and said float for operating said valve in accordance with the movements of said float, and a chain connected with said valve-stem and adapted to be engaged by a hook on the reservoir for holding said valve rigidly in its closed position.

3. In a device of the kind specified, a water-tank, a generating-chamber within said tank, a float surrounding said generating-chamber and having flexible pipe connection therewith, a carbid-reservoir above said generating-chamber sealed at its upper end and carrying a burner connected by a pipe with said generating-chamber, a valve in said pipe, an auxiliary passage leading from said valve to said carbid-reservoir for admitting gas to the latter, a valve-controlled passage between said carbid-reservoir and said generating-chamber, and devices for controlling said valve to admit carbid to said generating-chamber at intervals, substantially as described.

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

WILLIAM HOLT.

Witnesses:
E. J. BOILEAU,
RUDOLPH WM. LOTZ.