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F. L. H. SIMS.

ACETYLENE GAS GENERATOR.

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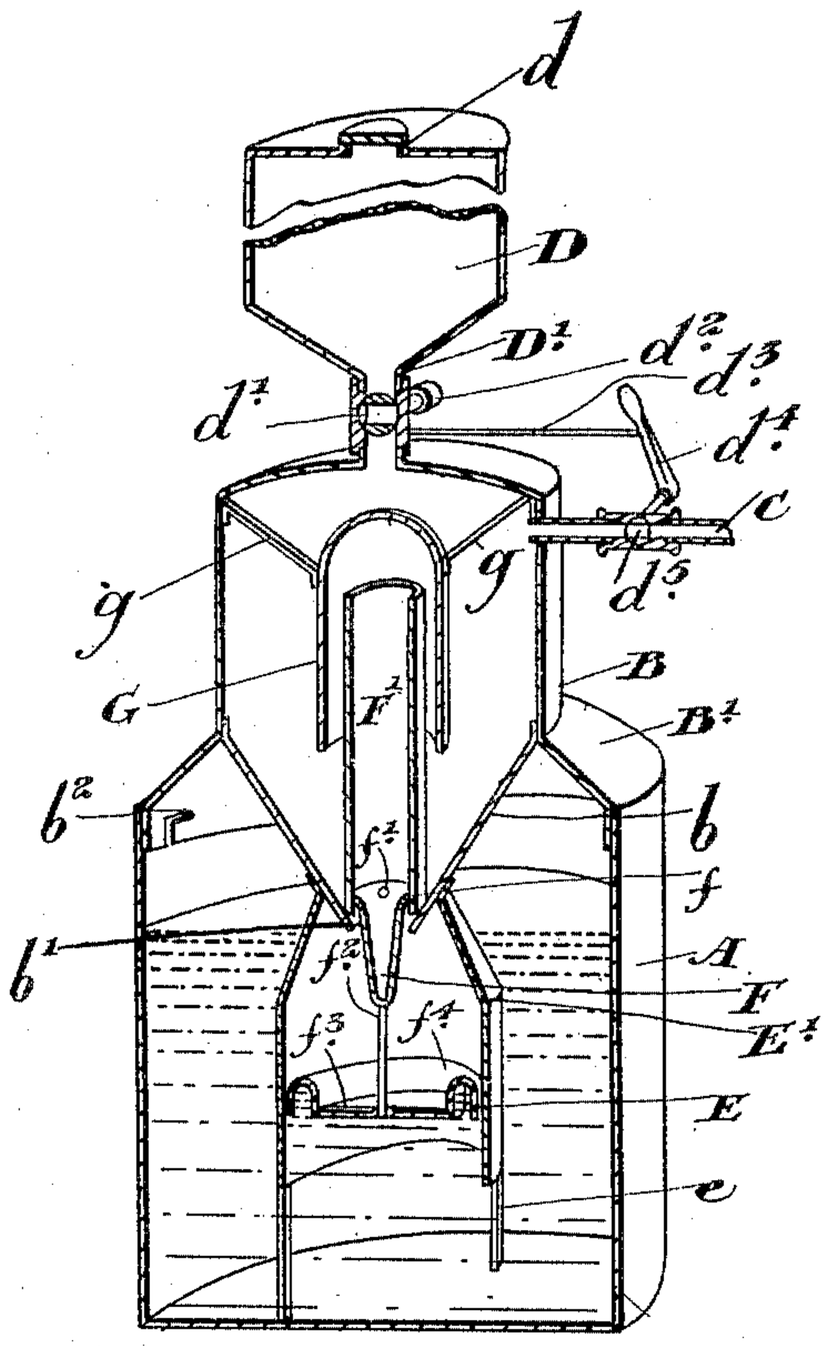

Witnesses.
H. T. S. Young.
L. C. Reynolds.

Inventor.
F. L. H. Sims.
by Fetherstonhaugh & Co
Attys.

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UNITED STATES PATENT OFFICE.

FREDERICK LINDLEY HUNT SIMS, OF TORONTO, CANADA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 780,134, dated January 17, 1905.

Application filed April 4, 1901. Serial No. 54,316.

To all whom it may concern:

Be it known that I, FREDERICK LINDLEY HUNT SIMS, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Acetylene-Gas Machines, of which the following is a specification.

My invention relates to improvements in acetylene-gas machines; and the object of the invention is to construct a machine of this class in which the gas may be generated in direct proportion to the rate of consumption, and thereby avoid the use of large gasometers and the danger incident to storage, and in which also the generation will be completely stopped as soon as the gas is turned off at the main or service-pipe, so that there will be no possibility of overgeneration.

The figure is a sectional elevation of my acetylene-gas-generating apparatus.

A is the main cylindrical casing, which is designed to be partially filled with water.

B is the carbid-casing, having a conical bottom b provided with an orifice b'. The casing B has an outwardly-extending flange B', which fits within the interior of the cylindrical casing A, being held therein on suitable pins b^2, which extend through bayonet-slots in the depending flange B'.

C is a service-pipe or main which leads from the upper portion of the carbid-casing B.

D is the carbid-reserve casing, which is provided with a suitable screw-cap d, which is removed in order to fill the casing. The lower end of the casing D is conical and communicates, by means of the neck D', with the upper end of the carbid-casing B. The neck D' is provided with a suitable valve d', intermediate of the length thereof, the stem of such valve being provided with an arm d^2, which is connected by a rod d^3 to a handle d^4 on the end of the stem of the valve d^5 of the service-pipe. It will be noticed that when the valve d' is closed the valve d^5 is open, so as to permit of the passage of the gas into the service-pipe or main. The valve d' is kept closed except when it is designed to refill the carbid-containing casing B, and the valve d^5 is under ordinary circumstances open.

E is the generating-casing, which is a bottomless chamber supported on the bottom of the casing E by legs e. The top of the generating-casing is suitably attached to the conical bottom of the carbid-casing.

F is the valve, which is preferably made conical in form and has connected to the flaring upper end f thereof the tubular extension F'. In the flaring upper end f are openings f' for the passage of the gas. The bottom of the conical valve F is provided with a stem f^2, which extends down to a cross-bar f^3, connected at each end to the ring-shaped float f^4. The float f^4 is substantially reverse-U shape in cross-section, so as to always leave a cushion of air above the water in the interior of the ring, so as to give it buoyancy.

G is a cover which is supported above the tubular extension F' by the wire stays g.

Having now described the principal parts involved in my invention, I shall briefly describe the manner of filling the carbid-holder and the casing preparatory to starting my machine in the generation of the gas.

The carbid-holder and the parts connected thereto are removed from the casing. The carbid is placed in the reserve-chamber D. The casing A is partially filled with water. The carbid-casing B and the portions connected thereto are then locked in the casings A and E so as to close the top of it, as indicated in the drawing, whereupon the handle d^4 is manipulated so as to close the valve d^5 and open the valve d', when the carbid will pass down into the carbid-casing B. When the carbid-holder is placed in position, the generating-casing and carbid-holder being closed to the service supply-pipe will preserve the air in the generating-casings A and E, and thereby not permit the water to pass upwardly into the same any more than is indicated in the drawing, the valve f remaining closed. When it is desired to light one or more burners, the handle d^4 may be then manipulated to open the valve d^5, and thus allow of the ready egress of the air from the generating-casing E through the orifice b' and carbid-casing B into and through the service-pipe. As the pressure of the air is thus relieved from the sur-

face of the water in the generating-casing E it will be seen that the float f^4 will rise, and thereby open the valve and let the carbid down through the orifice around the conical valve, thus allowing it to fall into the water, and thus generating gas within the casing E, which gas will pass up through the orifice f' in the flaring upper end of the valve F, through the tubular extension F′ of the valve, around the bottom of the cover G, and up through the carbid in the casing B into the service-pipe. The pressure of the gas, however, will of necessity force the water down, and thereby the float falling will close the valve by the edge of the tubular extension F′ coming against the seat of the conical valve immediately above the orifice as soon as enough gas has been generated for the number of burners which are being employed at the opposite end of the service-pipe. This continual rising and falling of the valve will occur very evenly and regularly, and the amount of gas supplied will thus be even and regular, or in direct proportion to the rate of consumption. Of course when once the machine has been started and the gas is in the service-pipe the valve d^5 would be left open except when it is necessary to supply more carbid from the reserve-receptacle into the carbid-casing. Under ordinary circumstances, however, when the valve of the carbid-reserve casing is closed it may be filled as required without interfering with the operation of my machine.

Another important desideratum which I obtain in my construction of acetylene-gas machine is that the gas passes through the carbid-chamber, which in the operation of the machine is from time to time charged with new carbid, thereby providing new carbid for the gas to pass through, so that without any attention from any one there is always fresh carbid to purify the gas in the ordinary operation of the machine, and thus deterioration of the carbid is counteracted.

Another advantage I obtain is in the form of the float which I use. It is particularly adapted for portable lamps, and for this reason in all other forms of floats of which I am aware which are used in connection with acetylene-generators the ring float is an inclosed or hollow ring. In my float the bottom is open. It will therefore be seen that in case the lamp is tilted by accident or otherwise as soon as such tilting takes place in the slightest degree the float is thrown out of operation, for the reason that the air escapes from underneath the edge of the float on that side remote from the side which dips into the water, and thus prevents any danger of the feed of the carbid from the float when ascending when the lamp is tilted. If the float were a hollow ring float, as hereinbefore premised, it will be very clearly seen that no such result could be obtained, as the float would rise, the water on the one side being sufficient to give its upward movement.

What I claim as my invention is—

1. In an acetylene-gas machine, the combination with the casing designed to be partially filled with water and the carbid-holder rigidly connected to the top of the same and provided with a central bottom orifice of the generating-casing connected to the bottom of the carbid-holder and surrounding the orifices at the bottom of the same, a valve controlling said orifice, a float within the generating-casing, said float projecting below the level of the water in the main casing, and a connection between the float and valve, said valve having an opening therein for communication between the generating-casing and the carbid-receptacle at all times, substantially as described.

2. In an acetylene-gas machine, the combination with the generator-casing and the carbid-holder above the same having a conical bottom with an orifice communicating with the generator-casing, and a service-pipe leading from the carbid-holder, of a reverse-cone-shaped valve extending through the orifice and provided with a flaring top having openings extending therethrough and a tubular extension having its bottom extending below the top of the conical valve and normally resting on this seat above the orifice and its top extending up into the carbid-casing and a float connected with this valve, substantially as described.

3. In an acetylene-gas machine, the combination with the casing designed to be partially filled with water and the carbid-holder suitably supported above the same and provided with a bottom orifice, of the bottomless generating-casing suitably connected to the bottom of the carbid-holder and surrounding the orifice at the bottom of the carbid-holder, a reverse-cone-shaped valve extending through the orifice and provided with a flaring top having openings extending therethrough and a tubular extension designed to have the bottom extending below the top of the conical portion and normally resting on the seat above the orifice and the top extending up into the carbid-casing and a float suitably connected to the bottom of the valve as and for the purpose specified.

4. In an acetylene-gas machine, the combination with the casing designed to be partially filled with water and the carbid-holder suitably supported above the same and provided with a bottom orifice, of the bottomless generator-casing suitably connected to the bottom of the carbid-holder, a reverse-cone-shaped valve extending through the orifice and provided with a flaring top having openings extending therethrough and a tubular extension designed to have the bottom extending below the top of the conical portion and nor-

mally resting on the seat above the orifice and the top extending up into the carbid-casing, a float suitably connected to the valve and a cover extending over the tubular extension of the valve suitably supported in the carbid-casing.

5. In a device of the class described, the combination with a generating-chamber, a carbid-chamber arranged above the same, a valve arranged centrally in respect to the carbid-chamber and controlling the flow of carbid to this generating-chamber, said valve having an aperture therethrough for the passage of the gas from the generating-chamber back to the central portion of the carbid-chamber whence the said gas is adapted to pass through the carbid to the point of discharge, substantially as described.

6. In a device of the class described, a carbid-chamber, having a central orifice in its bottom, a generating-chamber below the carbid-chamber and surrounding the orifice, a valve controlling said orifice, said valve having a tubular extension in said carbid-chamber, a hood in the carbid-chamber surrounding said extension, and means of communication between the extension and the generating-chamber through said valve so that the gas is introduced into the middle of the carbid-chamber.

7. In an apparatus for generating acetylene, the combination with the generating-chamber, a carbid-chamber provided with an aperture leading into the generating-chamber, of a valve substantially tubular in form and extending up to a point intermediate of the height of the carbid-chamber and constructed from time to time to close the carbid-feed in one direction and yet always allow the gas to feed in the opposite direction as specified.

8. In an apparatus for generating acetylene gas, the combination of a carbid-casing, a body of carbid contained in the said casing and a service-pipe communicating with the interior of the said casing above the carbid, a bottomless generating-chamber communicating with the lower end of the carbid-casing and operating means causing the gas on its way from the generating-chamber to the service-pipe to pass concentrically up through the said body of carbid in the carbid-casing without passing through the carbid at the point of communication between the generating-casing and the lower carbid-casing as specified.

9. In apparatus for generating acetylene, the combination of a generating-chamber having water therein, a carbid-containing chamber having a carbid-opening, a valve governing the carbid-opening having one or more openings forming an uninterrupted passage for gas through the valve and a cover extending over the valve and carbid-opening so shaped as to collect all the gas passing through the said openings and discharge it close to the central line of the carbid, substantially as described.

FREDERICK LINDLEY HUNT SIMS.

Witnesses:
H. I. S. YOUNG,
R. SHIELDS.