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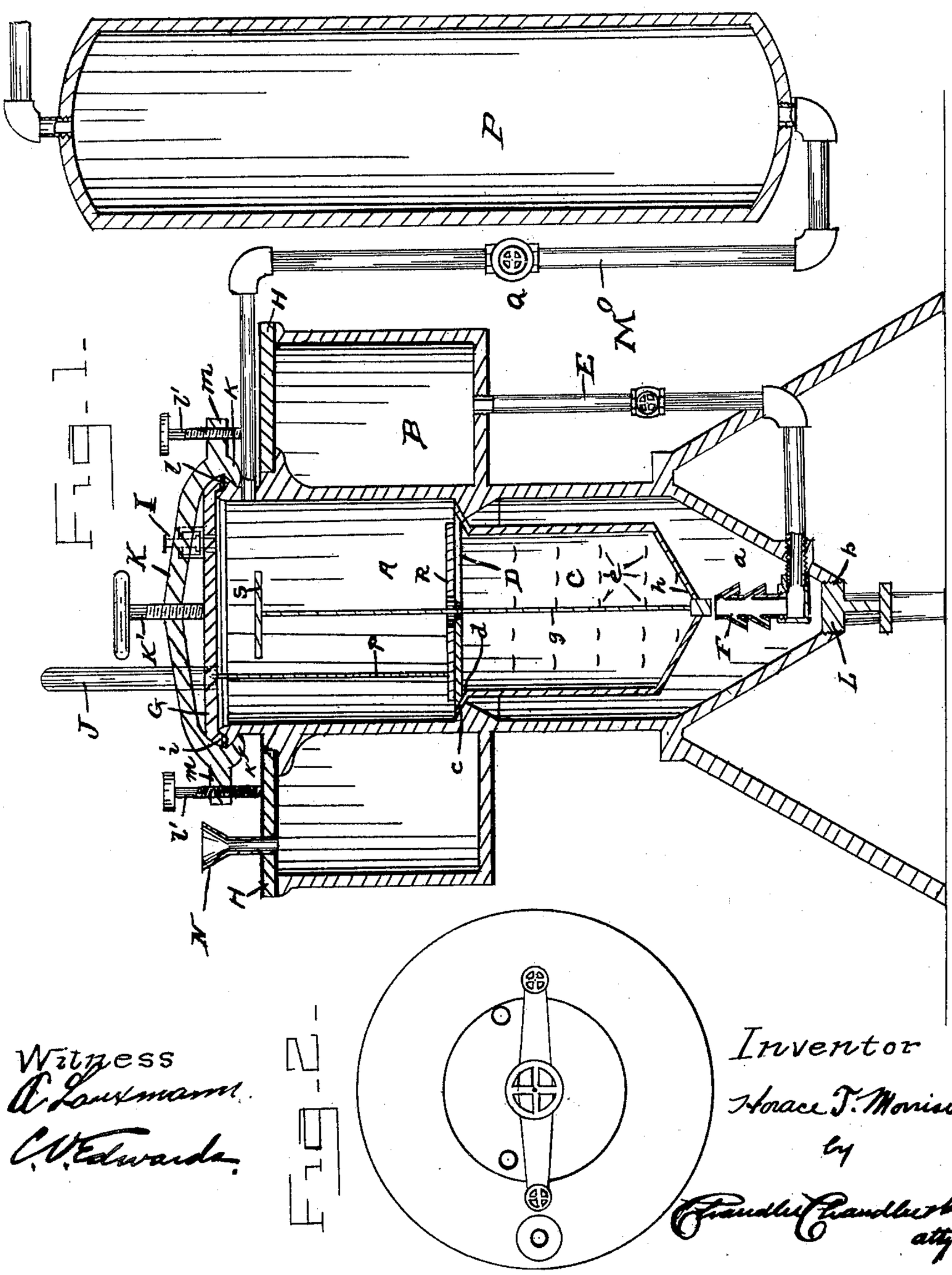
H. T. MORRISON.

ACETYLENE GAS GENERATOR.

(Application filed Oct. 23, 1897.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 630,066, dated August 1, 1899.

Application filed October 23, 1897. Serial No. 656,144. (No model.)

To all whom it may concern:

Be it known that I, HORACE T. MORRISON, a citizen of the United States, residing at Atlanta, in the county of Fulton, State of Georgia, have invented certain new and useful Improvements in Acetylene-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 machines for generating acetylene gas, and has for its object to provide a device of this nature presenting a cheap and concise construction which will be proof against freezing and explosion and which, moreover, may be cleaned and reloaded with ease and dispatch.

A further object of my invention is to so construct the machine that it will be automatic in its operation, the supply of water to the generating-chamber being regulated by the pressure within said chamber.

In the drawings forming a part of this specification and in which like letters of reference indicate similar parts in the several views, Figure 1 is a vertical section of my complete plant, and Fig. 2 is a plan view of the generating portion of the plant.

Referring now to the drawings, in operating in accordance with my invention I provide a chamber A, preferably cylindrical in form and having a converging conical base *a*, provided with a central opening *b*, forming a hand-hole, through the medium of which access to the lower portion of chamber A may be had while the mechanism thereof is yet in place. A plug L, fitting the hole *b*, serves to close the latter, said plug and opening being preferably threaded to insure the closure under pressure within the chamber.

The chamber A, which is termed the "carbid-chamber" because of receiving the calcium carbid, which is combined with water to form the gas, is divided into upper and lower compartments by means of an annular flange *c*, resting upon which flange is the outturned edge *d* of the refuse can or basket C, termed the "carbid-basket." The carbid-basket is serrated or perforated at *e*, so that it may act to drain the water from its contents as it is lifted from the carbid-chamber. A grate D, fitted upon the outturned edge or flange *d* of the carbid-basket, serves as a support for the calcium carbid, which is deposited thereon in the form of lumps. A central opening communicating with a radial passage in the grate allows the passage of a rod *g* into the basket C, and to the apex of the convergent base *h* of which basket it is attached. The rod *g* extends to a point near the top of the chamber A and is provided at its upper end with a handle S, through the medium of which the basket and its grate may be withdrawn for cleaning, as will be hereinafter described.

The carbid-chamber A is provided with a cover G, which is held upon a compressible gasket *i* through the medium of a clamp K, which latter, extending across the cover, has its inwardly-turned fingers *k* in engagement with the under surface of an annular flange *l*, projecting outwardly from the upper edge of the chamber. A screw K′, passing through a threaded perforation in clamp K, engages the cover G, through the medium of which the cover is pressed upon the chamber.

Surrounding the chamber A is a water-chamber B, extending from a point below the upper edge of the chamber A downwardly approximately half its length. This chamber B may be formed integral with or fitted upon chamber A, and extending from its base is a pipe E, entering the convergent base of chamber A, and having at its end within said chamber an upwardly-extending trap-pipe F, having downwardly-projecting openings, through the medium of which pipes water may be delivered in a downward direction into the base of the chamber A from chamber B. A valve M in the pipe F controls the passage of water from one chamber to the other.

The chamber B is provided with an annular cover H, fitting tightly thereon and held in place through the medium of clamping-screws *l′*, passed through perforations in projections *m* of clamp K and bearing upon the cover. A funnel N, entering the chamber B through the cover H, provides a means for filling the chamber, though, as will be readily understood, said funnel may enter at any other point.

In connection with my generator I employ

a reservoir P, consisting of a metallic chamber of suitable strength and having connection with the chamber A through the medium of a pipe O, provided with a regulating-valve Q, said pipe entering the chamber A near its top, as shown.

To prevent loss of heat, the chambers A and B and their connecting-pipe are provided with a coating of asbestos or other suitable non-conducting material.

In order to indicate the amount of unconverted carbid upon the grate D, I employ a gage-plate R, which rests upon the carbid on the grate, as shown in Fig. 1, and is provided with an indicating-rod *p*, extending upwardly through the cover G and into a transparent tube J, whereby the rod may be visible and at the same time escape of gas may be prevented.

The operation of my device is as follows: In loading the machine the valves M and Q are first closed in order to prevent the escape of gas from reservoir P and water from the chamber B, the latter having been previously filled with water. The clamp K being then loosened, the cover G is removed and, through the medium of handle S and rod *g*, the basket C is lifted from the chamber A and is cleansed of any residue of a previous operation, the plate R and grate D being removed for this purpose. The basket is then returned to the chamber A and the grate D put in place. Upon the grate is then placed such an amount of calcium carbid as may be deemed sufficient, after which plate R is put in position, resting upon the upper surface of the carbid, and the cover is then put on, with the rod P within the tube J. Through the medium of the clamp K and its screw K′ and screws *l*′ the covers G and H are then fastened in place and the device is ready for action. The valves Q and M are then opened, allowing water to flow from chamber B to chamber A and the gas to pass into the reservoir, the water within chamber A being allowed to stand about two inches above the grate D. As soon as the water comes into contact with the carbid the latter begins to decompose, generating acetylene gas, which latter passes out through pipe O and into the reservoir P. When the reservoir or accumulator P has become filled, a further generation of gas within the chamber A causes the pressure therein to rise, forcing the water within the chamber back toward the receptacle B through the connecting-pipe E and trap-pipe F. At the beginning of the operation the pressure may rise sufficiently to drive all of the water back and, in fact, rise so high as to cause the gas to bubble up into the receptacle B, from which it would, of course, pass out through the funnel in the cover. As the gas is used from the reservoir the pressure within chamber A decreases, allowing the water to return to the chamber A, and as the pressure further decreases under consumption or from other cause the water rises in chamber A to a sufficient height to wet the carbid, and the generation of gas begins again to compensate for that used or withdrawn.

In this way there is established a balance between the gas-pressure and the consumption of the carbid, and as a result in the use of my device there is maintained a constant pressure with the advantages incident thereto.

As above stated, the presence of the opening of the funnel H affords a means of egress of surplus gas should the generation continue after the water has passed back.

As a further preventive against explosion of the chamber A and reservoir P, I arrange in the cover of said chamber a safety-valve I, although, as will be readily understood, such valve may be placed in the pipe O or any other desired position. The particular advantage of the valve I is to allow escape of gas at such a time as there might be generation when the valve M is closed.

As the carbid is disintegrated under the action of water it will drop through the openings in the grate D and into the basket C, the consumption of carbid being indicated by the gage-rod *p* within the glass J.

When the indicator shows the entire consumption of the carbid, the cover G is removed, and by means of handle S and rod *g* the basket is lifted from chamber A, the liquid in the basket draining out through the openings therein. The grate D is then removed, the plate R having been previously lifted off, and the contents of basket C are dumped out. The parts of the apparatus are then reassembled and charged as above noted and the machine is again ready for operation.

At the time of disintegration the carbid of course gives off heat, which being absorbed by the water within the chamber or receptacle B such water is prevented from freezing. This action may be further insured by covering all parts of the mechanism with a heavy coating of asbestos or other suitable non-conducting material.

It will be of course understood that I may construct my device of whatever material may be deemed proper and that I may also depart from the specific form and construction herein set forth without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. In an acetylene-generator, the combination of a carbid-chamber having a convergent base, a water vessel surrounding the chamber, a pipe connecting the water vessel with the base of the chamber, a discharge-nozzle for said pipe within the convergent base and having downwardly-ranging discharge-orifices, a carbid-basket suspended within the chamber, a grate carried by the basket and detachable therefrom, and means for removing the basket and grate simultaneously.

2. In an acetylene-generator, the combination of a carbid-chamber having a convergent

base, a water vessel surrounding the chamber, a pipe connecting the water vessel with the base of the chamber, a discharge-nozzle for said pipe within the convergent base of the chamber and having downwardly-ranging discharge-orifices, a carbid-basket suspended within the chamber and having a convergent base, openings in said basket, a grate carried by the basket and detachable therefrom, covers for the chamber and vessel, a common clamp for said covers, a vertically-adjustable plate supported from the grate, a rod attached to said plate and entering a transparent inclosure on the chamber-cover, an opening in the base of the chamber and a plug in said opening whereby access to the interior of the chamber may be had.

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

HORACE T. MORRISON.

Witnesses:
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