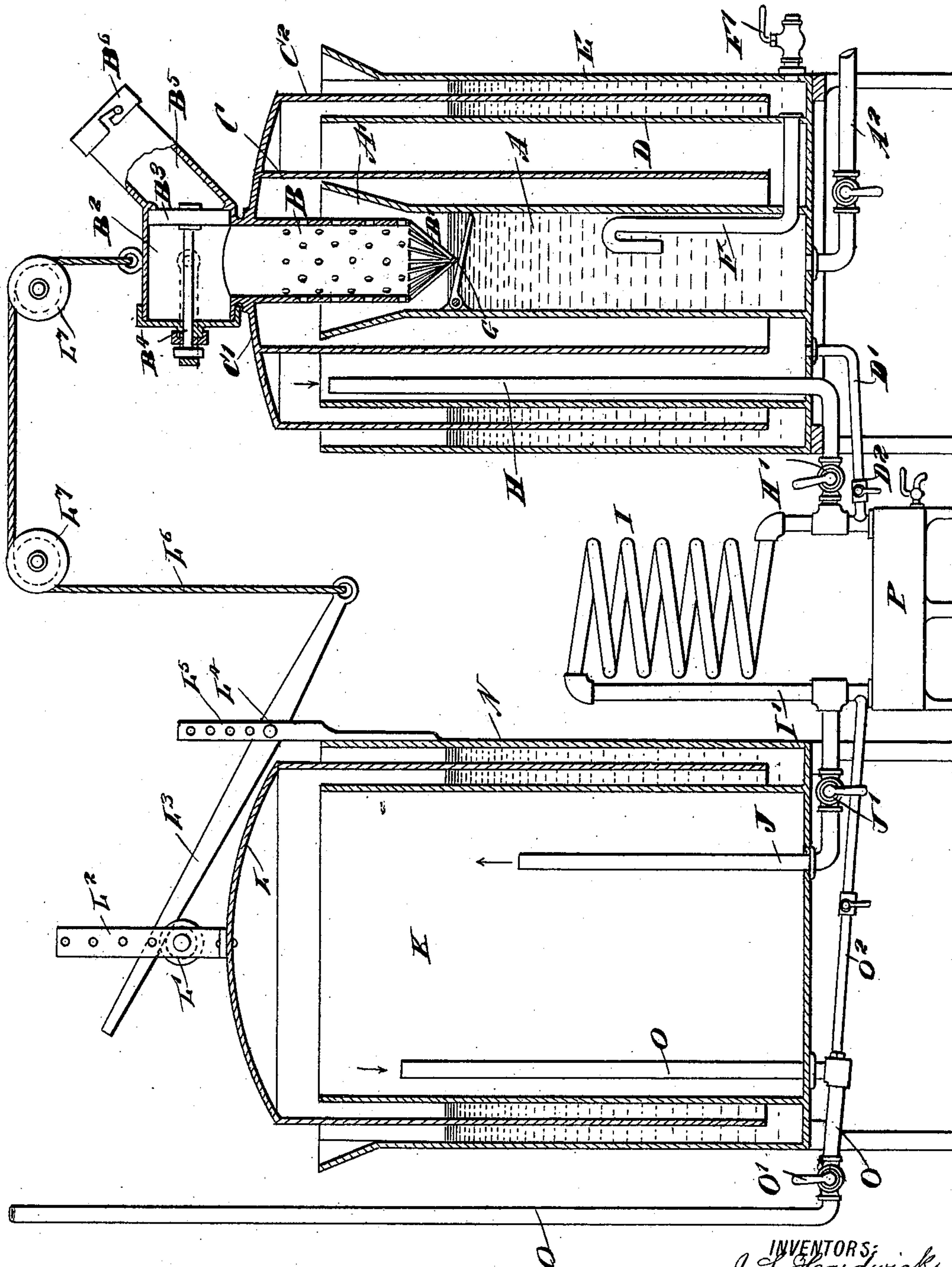


(No Model.)

J. L. HARDWICK & S. O. MANVILLE.
ACETYLENE GAS GENERATOR.

No. 598,868.

Patented Feb. 8, 1898.



WITNESSES:

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JAMES L. HARDWICK AND SIDNEY O. MANVILLE, OF CEDAR RAPIDS, IOWA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 598,868, dated February 8, 1898.

Application filed October 29, 1896. Serial No. 610,409. (No model.)

To all whom it may concern:

Be it known that we, JAMES L. HARDWICK and SIDNEY O. MANVILLE, of Cedar Rapids, in the county of Linn and State of Iowa, have
5 invented a new and Improved Acetylene-Gas Generator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved acetylene-gas generator
10 which is simple and durable in construction, very effective in operation, and arranged to produce a very dry gas in quantities as used.

The invention consists of certain parts and details and combinations of the same, as will
15 be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a sectional side elevation of the improvement.
20

The improved gas-generator is provided with a tank A, adapted to contain water or other gas-generating liquid, into which is immersed the calcium carbide contained in a
25 receiver B, preferably made in the shape of a perforated tube formed at its lower end with a basket B', as is plainly indicated in the drawing. The upper end of the receiver B connects with a horizontally-disposed cylinder B², in which operates a piston B³, held on
30 a piston-rod B⁴, extending through one end of the cylinder to the outside, so as to be under the control of the operator to move the piston B³ within the cylinder. Normally the piston B³ closes the lower end of a feed-tube B⁵, containing the calcium carbide and normally closed by a cap B⁶, which, when removed, permits of charging the tube B⁵ with the calcium carbide.
35

When it is desired to fill the receiver B with the calcium carbide, then the operator pulls on the piston-rod B⁴ to move the piston B³ from the end of the feed-tube B⁵, so as to permit the calcium carbide to pass from the feed-tube B⁵ into the receiver B. As the tube B⁵ is closed by its cap B⁶ no gas can escape from the receiver. When the latter is filled, the piston B³ is moved back to its former position, and the tube B⁵ is again filled with the
40 generating substance.
45

The tank A opens at its upper flaring end A' into a gas-holder C, carrying at its top C'

the receiver B and the parts connected therewith, as is plainly indicated in the drawing, the said gas-holder extending with its lower
55 open end into a vessel D, concentric to the tank A and concentric to the external shell E, forming an annular space or receptacle with the vessel D, said shell containing water and into which projects the lower open end
60 of a shell C², forming part of the holder C. The tank A is connected with the space between the shell E and the vessel D by a pipe F, so as to fill both parts with water or other generating liquid to a uniform level. An
65 outlet-valve F' is connected with the shell E, and a drainage-pipe A² is connected with the tank A.

Near the upper end of the tank A is arranged a hinged valve G, adapted to close
70 the said tank A to keep the moisture away from the carbide contained in the receiver B at the time the latter rises and moves the carbide out of the water.

Into the vessel D extends a pipe H for carrying off the generated gas, the said pipe passing through the bottom of the vessel D to connect with a coil of pipe I, discharging at its
75 upper end into a vertical pipe I', connected with a supply-pipe J, opening into the tank K of the gasometer, provided with a dome L, extending with its lower edge into a liquid contained in a shell N, surrounding the tank K. A service-pipe O leads from the upper end of the tank K to carry off the gas to the burn-
85 ers, the said pipe being provided with a suitable valve O' and with a drip-pipe O², leading to a drip-pan P, into which discharge the lower end of the pipe I' and the lower end of the pipe H, as well as the tank D, connected
90 by a pipe D' with the said pan. Thus all the drip-water passes into the said pan P. Suitable valves H', J', and D² are provided on the pipes H, J, and D' for controlling the flow of gas and water.
95

The top of the dome L of the gasometer is provided with a bracket L², in which is journaled a pulley L', engaging one end of a lever L³, having its fulcrum or pivot L⁴ adjustable in one of a series of apertures arranged in a
100 bracket L⁵, secured to the shell N. The other end of the lever L³ is connected with a rope L⁶, extending over pulleys L⁷ and connecting with the top of the cylinder B², so that the

movement of the dome L controls the movement of the cylinder B², the receiver B, and the holder C to move the calcium carbide contained in the receiver B in or out of the liquid in the tank A, according to the amount of gas contained in the gasometer.

It is understood that when the receiver B is in a lowermost position then the calcium carbide is in contact with the generating liquid contained in the tank A, and consequently a gas is generated which rises in the upper end of the tank A and passes from the latter into the holder C to pass down the wall thereof in the space between the holder and the tank to finally pass at the lower end of the holder into the vessel D to rise therein and to pass from the latter through the pipe H to the coil I and from the latter through the pipe J into the gasometer, from which the gas is drawn by the supply-pipe O for supplying the burners. It is evident that when more gas is generated than used at one time by the burners the dome L rises and imparts a swinging motion to the lever L³, so that a pull is exerted on the rope L⁶, whereby the cylinder B², the receiver B, and the holder C are raised and the carbide contained in the receiver B is lifted out of the generating liquid contained in the tank A, and consequently further generation of gas ceases. Thus it will be seen that only the required amount of gas is generated, and consequently no waste of gas can possibly take place.

It will be seen that by leading the gas after it is generated through the several vessels and pipes and the coil I before passing it into the gasometer a very dry gas is produced ready for immediate use.

A suitable locking device may be provided for the piston-rod B⁴, so as to lock the same in position during the time the piston B³ closes the end of the cylinder B², leading to the feed-tube B⁵. By having the fulcrum of the lever L³ and the pulley L' adjustable we are enabled to fill the gasometer with more or less gas before causing the dome L to act on the receiver B by the intermediate mechanism above described.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A gas-generator, comprising a rising-and-falling holder, a receiver supported by the said holder and adapted to carry the carbide in and out of the generating liquid, a gasometer connected with the said holder by a pipe for carrying the gas from the holder to the gasometer, and an intermediate mechanism between the dome of the said gasometer and the said holder, whereby the movement of the dome of the gasometer will act through the said intermediate mechanism to control the up-and-down movement of the said holder, substantially as shown and described.

2. A gas-generator, comprising a rising-and-falling holder, a receiver supported by the said holder and adapted to carry the carbide

in and out of the generating liquid, a gasometer connected with the said holder to receive the gas therefrom, a lever connected at one end with the said holder, and adapted to be moved by the movement of the dome of the gasometer, whereby the up-and-down movement of the said holder is controlled by the movement of the dome of the said gasometer, to regulate the amount of gas admitted to the gasometer, substantially as described.

3. A gas-generator, comprising a holder adapted to rise and fall and supporting a receiver adapted to carry the calcium carbide, a gasometer connected with the said holder by a pipe for carrying the gas from the holder to the gasometer, a lever adjustably fulcrumed to a fixed support and having one end connected with the said holder, and a pulley carried by the dome of the said gasometer and engaging the said lever, whereby the movement of the said dome will control the movement of the said holder, substantially as set forth.

4. A gas-generator, comprising a calcium-carbide receiver operated in conjunction with a generating liquid contained in a tank, a gasometer adapted to receive the generated gas, and intermediate mechanism connected with the said receiver and operated by the movement of the said gasometer to move the said carbide-receiver, the said intermediate mechanism being adjustable, whereby the gasometer may be more or less filled with gas as desired before acting on the said receiver, substantially as described.

5. A gas-generator, comprising a tank adapted to contain a generating liquid, a double-walled gas-holder surrounding the tank with its inner wall, and extending with its outer wall into a vessel in communication with the said tank, a receiver carried by the said holder and adapted to move the calcium carbide in and out of the liquid contained in the said tank, a feeding device for the said receiver, and means for connecting and disconnecting the said feeding device and receiver, substantially as set forth.

6. A gas-generator, comprising a tank adapted to contain a generating liquid, a double gas-holder surrounding the tank with its inner wall and extending with its outer wall into a vessel in communication with the said tank, a receiver carried by the said holder and adapted to move the calcium carbide in and out of the liquid contained in the tank, a pipe leading from the said vessel for carrying off the gas, a coil connected with the said pipe, a supply-pipe leading from the coil, a gasometer into which the said supply-pipe opens, a service-pipe leading from the gasometer, and a drip-pan connected with the vessel into which the gas-holder extends and with the pipe conducting the gas from said vessel, the said drip-pan being also connected with the supply-pipe leading from the coil to the gasometer, and with the service-pipe

leading from the gasometer, substantially as shown and described.

7. A gas-generator, comprising a tank adapted to contain a generating liquid, a double gas-holder surrounding the tank with its inner wall, and extending with its outer wall into a vessel in communication with the said tank, a receiver carried by the said holder and adapted to move the calcium carbid in and out of the liquid contained in the said tank, a pipe leading from the said vessel for carrying off the gas, a coil connected with the said pipe, a supply-pipe leading from the coil and opening into the gasometer to fill the latter with dry gas, and an intermediate mechanism between the dome of the said gasometer and the said holder, the said mechanism when operated by the movement of the dome of the gasometer serving to move the said holder and the carbid-receiver carried thereby, substantially as set forth.

8. A gas-generator, comprising a holder adapted to rise and fall, a receiver carried by the said holder and a feeding device consist-

ing of a cylinder connected with the said receiver, a feed-tube opening into the said cylinder at one end thereof, and a piston movable in the said cylinder and adapted to close the opening between the feed-tube and cylinder, substantially as shown and described.

9. A gas-generator, comprising a tank adapted to contain a generating liquid, a holder adapted to rise and fall, a receiver carried by the said holder and adapted to be moved into and out of the generating liquid, and a feeding device consisting of a cylinder connected with the top of the receiver, a feed-tube opening into the said cylinder at one end thereof, a piston movable in the said cylinder and adapted to close the said feed-tube at its inner end and a cap for closing the outer end of the feed-tube, as and for the purpose set forth.

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Witnesses:

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