



No. 633,545.

Patented Sept. 19, 1899.

H. BRYANT.  
ACETYLENE GAS GENERATOR.

(Application filed Sept. 10, 1898.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.

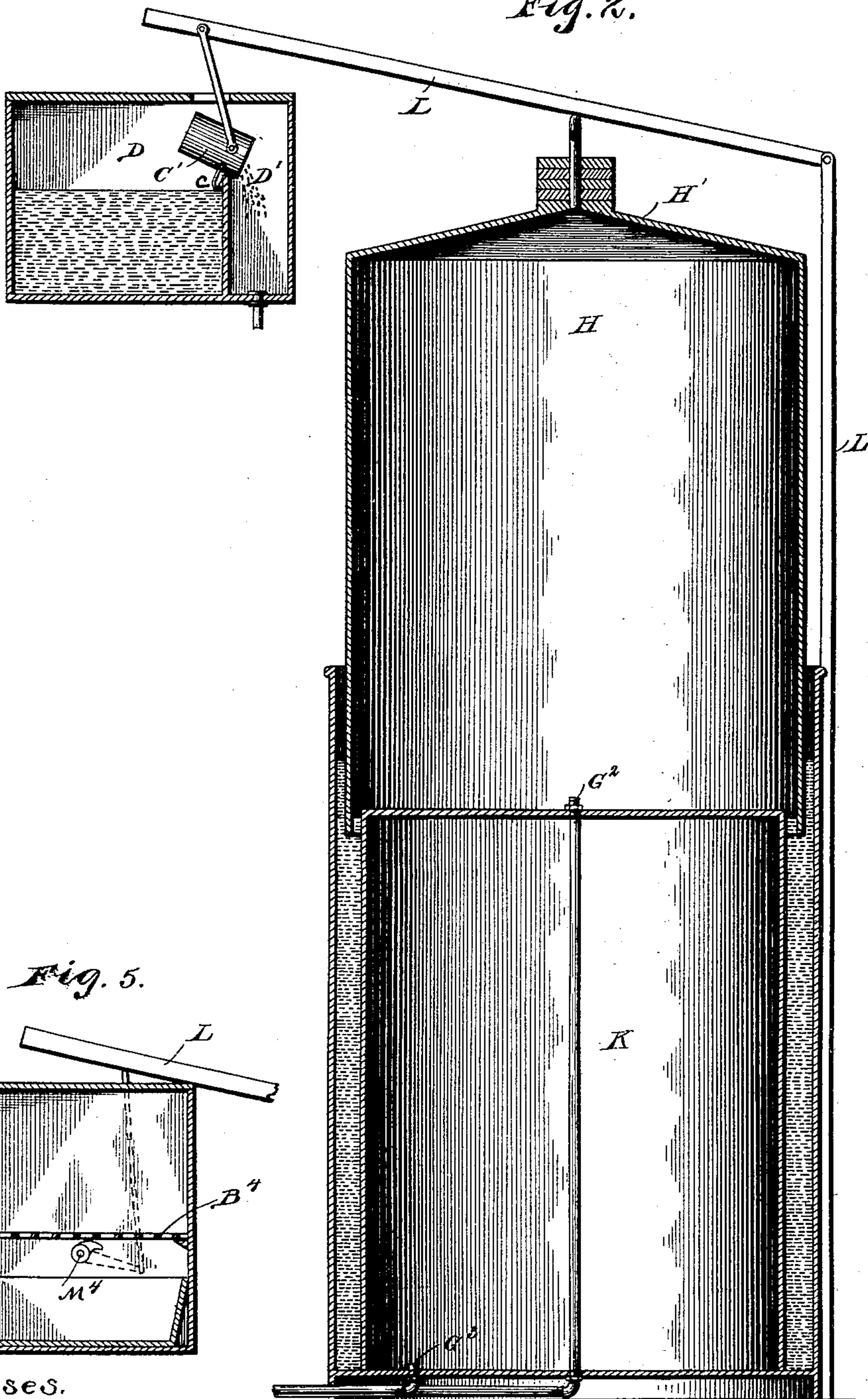
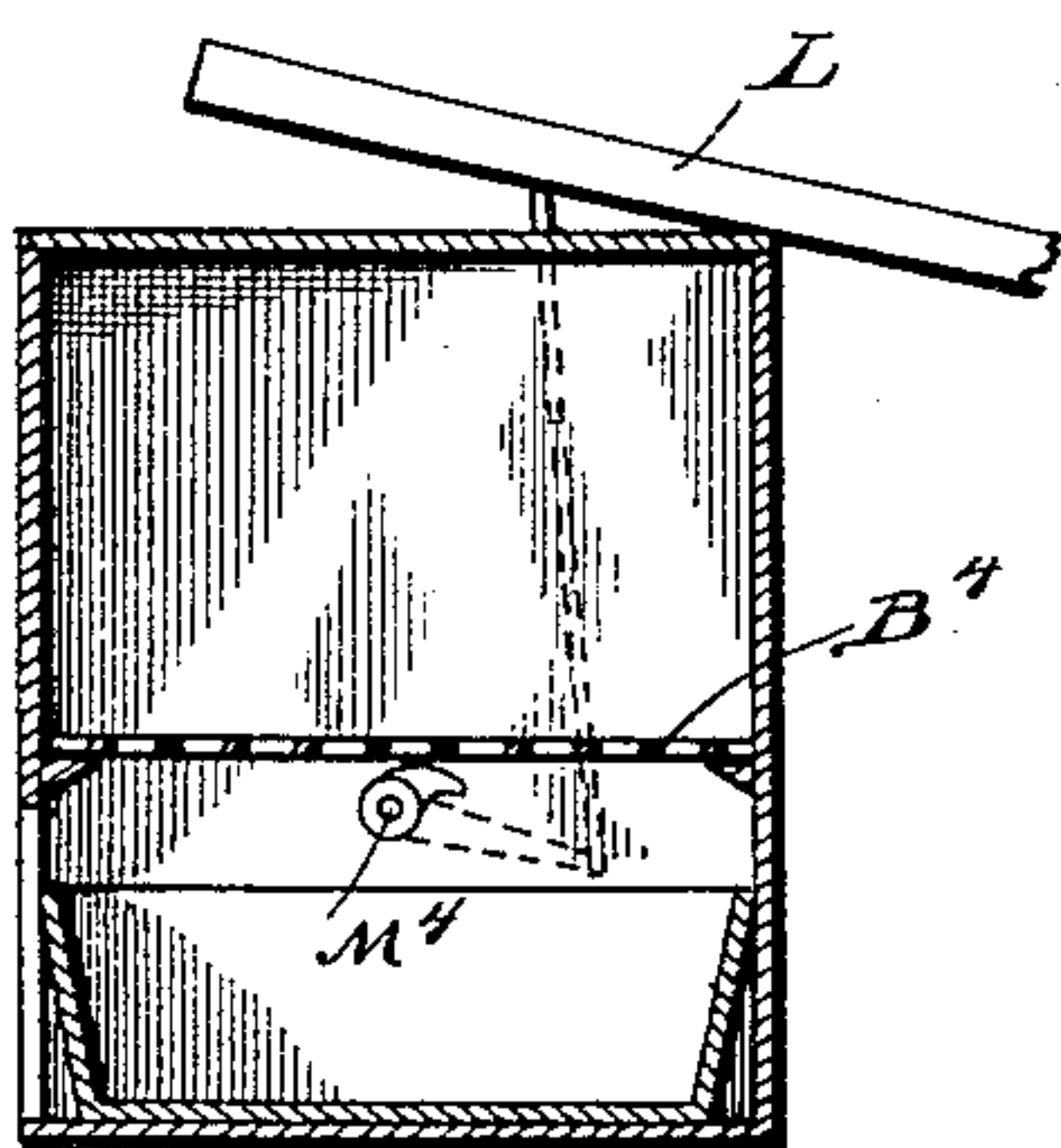


Fig. 5.



Witnesses.

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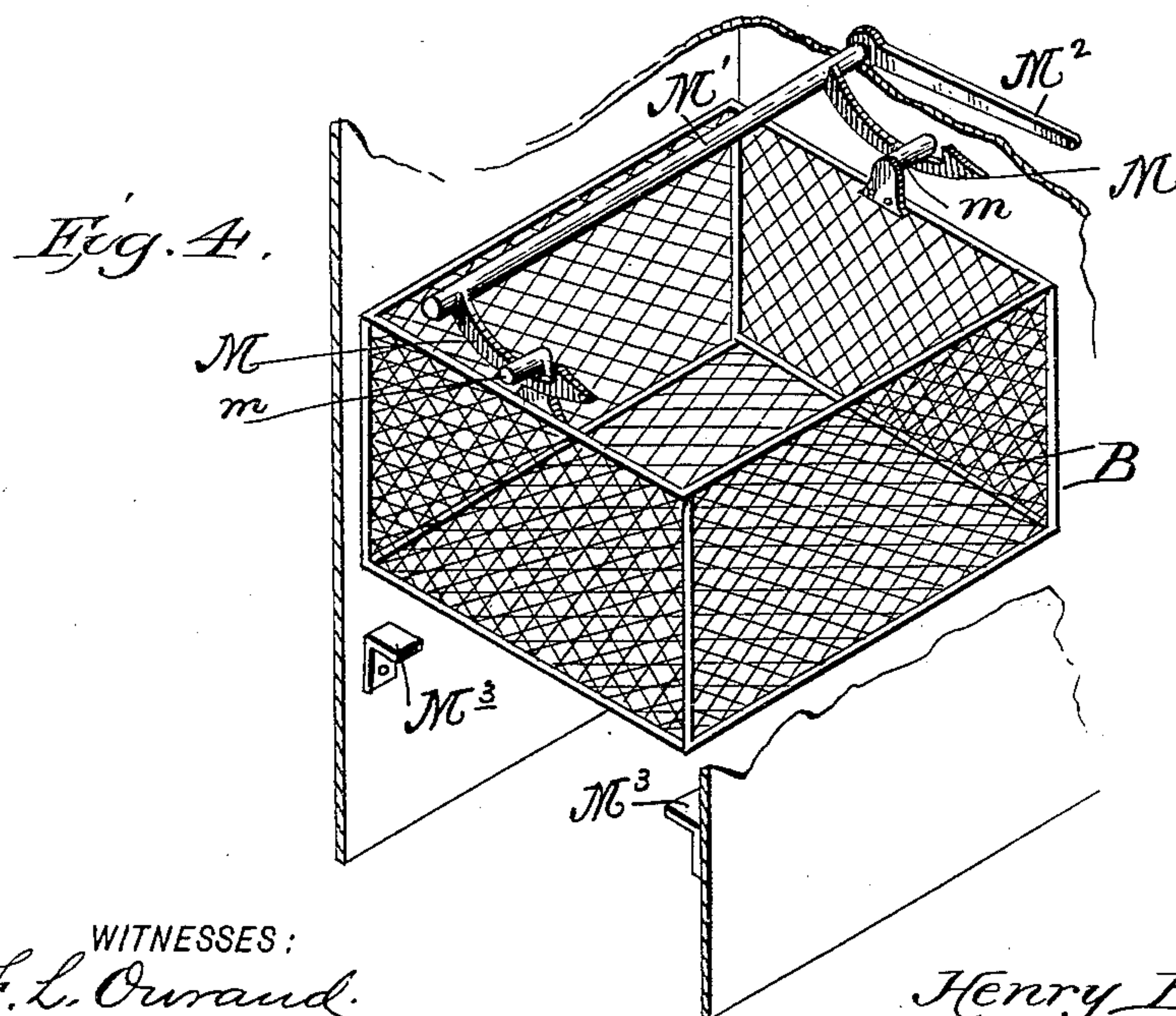
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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

HENRY BRYANT, OF ARANSAS PASS, TEXAS.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 633,545, dated September 19, 1899.

Application filed September 10, 1898. Serial No. 690,693. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY BRYANT, a citizen of the United States, residing at Aransas Pass, in the county of San Patricio and State of Texas, have invented a new and useful Improvement in Acetylene-Gas-Generating Apparatus, which is made and used substantially as hereinafter set forth and as shown in the accompanying drawings.

10 This invention relates to acetylene-gas generating and storing apparatus; and its object is to provide a simple, compact, and economical means for automatically generating said gas.

15 The invention consists in the combination of a generator of approved construction, a water-supply tank, means connecting said tank and generator, a gas-holder, an independent gas-reservoir, and means for automatically controlling the generation of the gas by the action of the holder, all as hereinafter fully described, and illustrated in the accompanying drawings, in which—

25 Figure 1 is an elevation, partly in section, showing my generating apparatus in its almost normal position. Fig. 2 is a sectional elevation when the gas-holder is filled with gas. Fig. 3 is a vertical section of the generator. Fig. 4 is a detail showing arrangement of spring-fingers for lifting, and Fig. 5 shows a modification of the generator.

Referring to the accompanying drawings, A designates the generator, which may be square or of any other shape, constructed of metal or any other suitable material and resting upon legs. The generator at its top is provided with a central opening having a suitable closure A', and at or near the bottom and to one side is also a suitable opening and a door A<sup>2</sup> for closing the same, said door being securely hinged to the casing, a cotter-bar and screw A<sup>3</sup>, together with a suitable catch and packing means, being employed for fastening the door in position and effecting a gas-tight joint.

45 Midway the generator and supported upon ledges secured to the walls of the generator is located an open carbid-basket B, formed of some reticulated material having a mesh sufficient to allow the passage of the hydrate of lime and of a size to hold a suitable charge of carbid. Above this basket, beneath the

central opening and within the generator, is located a spray-pipe B<sup>2</sup>, provided with openings for directing a spray of water upon the carbid contained within the basket. Beneath the basket and resting upon the bottom of the generator is located an ash-pan B' for the reception of the hydrate of lime resulting from the decomposition of the carbid and water.

60 The basket B at its ends is provided with hook-ears *m* for lifting it. M' represents a rock-shaft located within the generator, to one side thereof, and journaled with packing in the walls of the same, one end of said shaft extending entirely through said generator-casing to the outside. To each end of said rock-shaft and within the generator are secured spring-arms M, arranged so as to engage with the hook-ears *m*. To the outer end of the shaft, which extends entirely through the casing, is secured a long lever M<sup>2</sup>, the object of which, together with the rock-shaft and spring-arms, is to agitate the carbid-basket either by hand or automatically by means hereinafter described.

80 The letter H designates a gas-holder consisting of an open-topped tank having located centrally therein a closed high-pressure gas-reservoir K, which, together with the tank, forms an annular chamber or seal for the bell H'. As shown, the outer wall of the tank extends to some distance above the top of the gas-reservoir, whereby said reservoir may be practically surrounded by water and protected thereby, at the same time acting as a wind-break for the rising-and-falling bell. Said bell may be constructed to receive suitable weights, as shown.

90 D designates a water-tank which is divided into two compartments D' D<sup>2</sup> by means of a suitable transverse partition somewhat lower than the walls of the tank. To the said transverse partition and within the compartment D<sup>2</sup> is secured a trip *d*. Secured to the tank D by any suitable means is a water-supply pipe C, leading downwardly and connected to the spray-pipe B<sup>2</sup>. Said pipe C is provided with a check-valve C<sup>2</sup>, constructed in a well-known manner, so as to allow the water from the tank D' to pass to the generator and prevent the passage of gas in case the pressure of the gas in the generator exceeds the hydrostatic pressure of the water in the pipe C.



I<sup>3</sup> designates a valve located in the pipe C and is shown closed, whereby the water in the tank D' is prevented from flooding the generator when the carbid has become exhausted and the bell H' passed below the normal line.

G' designates the gas-outlet pipe leading from the generator to the pipe G and the burner E. The pipe G' connects the generator at a point midway or below the carbid-basket, whereby the gas in passing from the generator is caused to pass downwardly through the carbid, and thereby be more or less dehydrated. The pipe G' is provided with the usual check-valve g, which allows the gas to pass from the generator to the pipe G', but prevents the return of the gas when the generator is opened for recharging or cleaning.

G<sup>4</sup> represents a purifying-chamber located within the pipe G' and filled with cotton, cloth, sand, or similar material dampened with some non-volatile hydrocarbon, so as to catch and retain atoms of heavy hydrocarbon in the fresh gas, to which are attributed the tendency to form specks of soot in burning and clog up the burner-tip in use.

G<sup>2</sup> designates a pipe connecting the pipe G and leading to the interior of the gas-holder or bell, and it also acts as a tie-rod for securing the heads of the tank K against internal pressure within the outer tank of the gas-holder, as clearly shown. G<sup>3</sup> designates a pipe connecting the pipe C with the interior of the gas-reservoir K for conducting the high-pressure gas to the said reservoir hereinafter described.

F<sup>2</sup> designates an escape-pipe which leads to the external air, a chimney, or other place of safety and is connected to the pipe G<sup>3</sup> and provided with a weighted safety-valve F'.

F designates an internally-weighted valve and is located in a branch pipe connecting the pipes F<sup>2</sup> and G<sup>2</sup>. The object of the safety-valves F F' is, the first, to relieve excess of pressure in the holder H, and, the second, to relieve excess of pressure in the reservoir K.

I designates a turning plug located in the water-supply pipe C and gas-supply pipe G and is used for regulating the supply of water from the tank D' to the generator and for regulating the passage of gas from the generator to the burner and gas-holder. The valve I is provided with lever-arms I' I<sup>2</sup>, to one end of which the chain i is attached, the opposite end being weighted by any suitable means in a well-known way, whereby the valve is normally held open.

L' designates an upright post which may or not be secured to the gas-holder tank. To the upper end of this upright is hinged a lever-arm L, carrying intermediate its ends idle-wheels l' l<sup>2</sup>, over which passes a chain i, which is secured at one end to the bell H' and at its opposite end to one end of the lever-arm of the valve I, whereby the rise and fall of the bell automatically controls

the valve I and correspondingly regulates the supply of water to the generator and the passage of the gas therefrom to the burner. 70

At or near the end of the lever L is secured a chain i<sup>2</sup>, passing down and connected to the lever M<sup>2</sup>. A bucket C', provided with a bail c, is also connected to the lever L and dips into the tank D<sup>2</sup>. A chain i' also connects the lever L and arm I<sup>4</sup> of the valve I<sup>3</sup> to limit the downward movement of said arm and at the same time assure the closure of the valve I<sup>3</sup>. 75

Operation: In the operation of my apparatus as above described the generator having been charged with carbid and the tank D with water, the bell H' being in its lowermost position and the valve I turned to open both pipes C and G, the valve I<sup>3</sup> is manually operated by the lever I<sup>4</sup> to permit water to pass to the generator through the valve I and spray-pipe B<sup>2</sup>, whereupon acetylene gas is instantly generated and conducted to the burner E and burned, the excess gas passing to the gas-holder H through the pipe G<sup>2</sup> and stored therein until said holder is raised sufficiently high to close the valve I, when the supply of water to the generator and the passage of the gas from the generator direct to the burner through pipe G will be cut off. The gas for the burner or burners, more or less, as found wanting, will then be taken from the holder until said holder descends sufficiently to again open said valve I to supply more water to the generating-chamber. Thus it will be seen that the generation of gas is continuous and automatically regulated. The valve I<sup>3</sup> is maintained in an open position by the bell and only closed when the bell passes to its lowest position, thus preventing the flooding of the generator. 80 85 90 95 100 105

It is a well-known fact that in this class of gas-generators gas will continue to be generated for some time after the water-supply to the generator has been cut off. This is due largely to the hygroscopic character of the carbid and the excess of water admitted to the generator in the first instance and retained by the hydrate in contact with the carbid. In order to make provision for the storage of gas so generated, a reservoir K has been provided, to which such gas is conducted through the pipe G<sup>3</sup>, which gas upon the opening of the valve I passes to the burners and holder H. 110 115 120

As shown in the drawings, Fig. 1, the bucket C' is in its lowermost position in the water-tank D. Upon the rise of the bell the dome thereof coming in contact with the lever L raises said lever and with it the bucket C', which latter in rising is caught by the trip d and bail c and emptied in chamber D', thus supplying said chamber with the necessary water for the generation of gas. At the same time and through the chain i<sup>2</sup> the lever M<sup>2</sup> is raised and by it a rocking motion imparted to the rock-shaft M', and the basket containing the carbid is agitated to free the carbid 125 130



of any adhering ash, which is precipitated and collected in the pan B', to be removed upon recharging the generating-chamber.

In the modification shown in Fig. 4, B<sup>1</sup> represents a screen, and M<sup>1</sup> an eccentric or cam for agitating the screen by means of suitable connections with the lever L. It will be understood that this form of device can be readily substituted for the basket shown in Fig. 1 without departing from the spirit of my invention.

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

1. In an apparatus for generating acetylene gas, in combination with the generating-chamber, a carbid-basket located therein and constructed to receive a vertically-reciprocating motion, a gas-holder communicating with the generator lever mechanism and a rock-shaft intermediate said gas-holder, generator, and carbid-basket and operated upon by the gas-holder; whereby said rock-shaft is operated to raise and lower said carbid-basket, substantially as described.

2. In an apparatus for generating acetylene gas, in combination with the generating-chamber a carbid-basket therein constructed to receive a vertical reciprocating motion, a rock-shaft located within the generator and having fingers to engage the carbid-basket, a gas-holder in communication with the generator and means intermediate the holder and generator and connecting the rock-shaft whereby the rise and fall of the holder will raise and lower the carbid-basket to agitate the carbid therein substantially as described.

3. In an apparatus for generating acetylene gas, in combination with the generating-chamber having a basket therein for supporting a body of carbid and constructed to receive a vertical reciprocating motion, a rock-shaft located within the generator and engaging the carbid-basket, a lever attached to one end of the rock-shaft, a gas-holder in communication with the generator, a frame located over the holder and carrying a chain connected to said lever whereby the rise and fall of the bell will rock the shaft to raise and lower the carbid-basket, substantially as described.

4. In an apparatus for generating acetylene gas, in combination with the generating-chamber having means for supporting a body of carbid therein, a pipe for supplying water thereto, a gas-holder, a gas-outlet pipe leading from said generator, a cock common to the water and gas pipes, a connection between the bell of the gas-holder and the cock and an independently-actuated cock I<sup>3</sup> normally open in the water-pipe, whereby the supply of water to the generator and gas to the holder is automatically regulated and whereby on the descent of the bell below normal the valve I<sup>3</sup> will be closed and the flooding of the generator prevented substantially as described.

5. In an apparatus for generating acetylene gas, in combination a generating-chamber, a water-supply tank, a pipe for connecting the tank and generator, a gas-holder, pipe connections between the gas-holder and the generator, a bucket located in the water-tank and means disconnected from and located over said holder whereby on the rise of the bell of the gas-holder said bucket is raised and emptied into said pipe connecting the generator substantially as described.

6. In an apparatus for generating acetylene gas, in combination a generating-chamber, a water-supply tank, a pipe for connecting the tank and generator, a gas-holder, pipe connections between the gas-holder and the generator, a bucket located in the water-tank and means located over the holder and connected to the bucket whereby on the rise of the bell of the gas-holder said bucket is raised and emptied into said pipe leading to the generator substantially as described.

7. In an apparatus for generating acetylene gas, in combination a generating-chamber, a gas-holder, an independent gas-reservoir, pipes connecting the generator with the holder and the reservoir, waste-escape pipes leading respectively from the holder and the reservoir to the external air and separately-weighted safety-valves located in said waste-pipes substantially as described.

HENRY BRYANT.

In presence of—

GEORGE MONSON,  
ALPHONSO WATSON.