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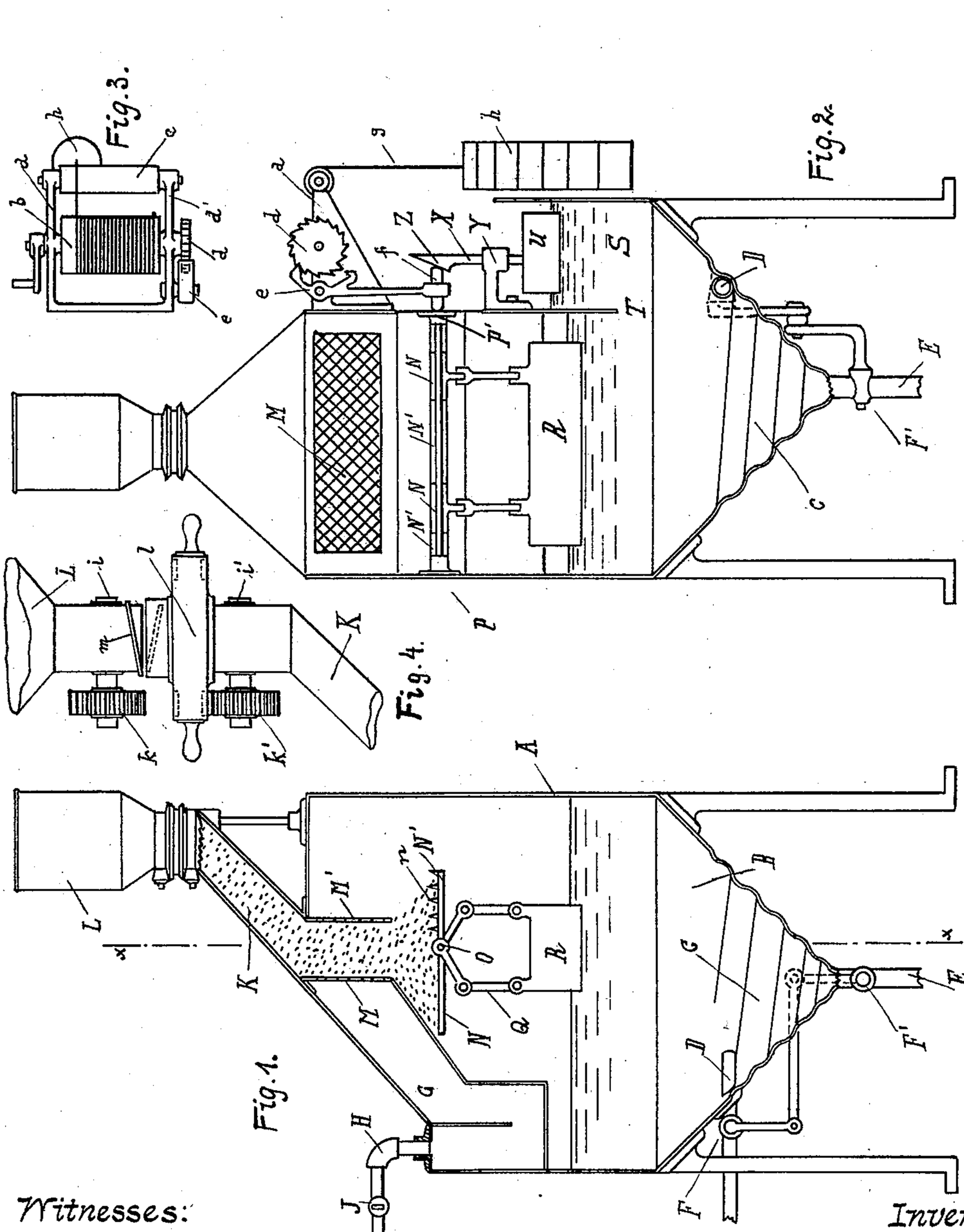
J. A. WETMORE.

ACETYLENE GAS GENERATOR.

(Application filed Apr. 6, 1899.)

(No Model.)



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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 636,370, dated November 7, 1899.

Application filed April 6, 1899. Serial No. 711,919. (No model.)

To all whom it may concern:

Be it known that I, JEAN A. WETMORE, a citizen of the United States, residing at the borough of Brooklyn, in the city of New York, in the county of New York and State of New York, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

The improvements of my present invention refer to a feeding device for the carbid into the generator, to removing impurities and precipitates from the generator, and to drying and purifying the gas produced.

I attain the objects of my first improvement by a peculiarly-constructed chute in connection with a double-valve system at one end of the chute and a platform for supporting the carbid at the other end of the tube. The removal of the impurities and precipitations in the generator due to the decomposition of carbid and water into acetylene and calcium oxid is accomplished by the location and construction of the water-inlet and water-exit and the stop-cocks closing the same. The purifying of the gas results by means of a system of screens, through which and through ever-changing portions of solid carbid the gas produced has to pass before it reaches its efflux-valve.

In the accompanying drawings, forming a part of the present application, Figure 1 is a vertical cross-section of the apparatus in its preferred form. Fig. 2 is a vertical cross-section in the line *x x* of Fig. 1. Fig. 3 is a detail of the feeding device, and Fig. 4 is a detailed drawing of the carbid-receptacle.

Referring to Fig. 1, A is a generating tank or chamber made of any suitable material—for instance, sheet-iron, zinc, copper, &c. The lower end of chamber A is funnel-shaped or tapered, as at B, and the walls of this funnel show spiral corrugations C. At the uppermost of these corrugations there is a water-inlet D, placed tangentially in relation to the walls of the vessel. At the lower end of B there is a water-exit E, and both the inlet and exit are provided with stop-cocks F and F′, which are connected by means of a system of cranks and connecting-rods, whereby the same may be opened or closed simultaneously. The upper end of A is provided with a gas-chamber G, which leads to an efflux-pipe H, having a stop-cock J. Chamber A is connected with carbid-receptacle L by means of a chute K. The vertical portion of tube K is constructed of a system of screens M M′, through which the gas produced must pass before it reaches its efflux-pipe H.

Underneath the lower opening of chute K and at a distance from it there is placed a platform consisting of two parts N N′, which are hinged upon a common shaft O, resting in bearings P P′, connected to the walls of chamber A. The sections N N′ of the carbid-support may be provided with projections *n* or corrugations or other suitable means for retarding the sliding off of the carbid from the support. The shaft O is connected by means of rods or toggle-links Q to a float R, which rests upon and is controlled by the surface of the water within the generator A.

In a separate compartment S of chamber A and connected with the same by means of a port T there is a smaller float U, which controls the vertical rod X, sliding in the bracket Y. The upper end of rod X is wedge-shaped, as at Z.

In a convenient position at the upper part of chamber A there is a system of brackets *a a′*, which carry in appropriate bearings two rollers *b* and *c*. The shaft of roller *b* is provided with a ratchet-wheel *d*, the teeth of which are engaged by a ratchet *e*. The ratchet-bar is provided with a hammer-like device *f*, which knocks against a thin portion of the wall of chamber A, and consequently against bearing P′. The movement of hammer *f* is limited by the position of wedge Z. Motion is imparted to roller *b* by means of a rope *g* and a weight *h*. I do not limit myself to the use of a weight and pulley; but any other means or substitutes may be used for the same purpose.

The carbid-receptacle L is provided with a throttle-valve *i*, having a gear-wheel *k* at the end of its axle. This gear-wheel *k* may be engaged by the upper face of a crown-wheel or face-gearings *l*, whereas the lower face of this crown-wheel *l* engages a gear-wheel *k′* of a second throttle-valve *i*. By turning crown-wheel *l* the same engages a single screw-thread *m*, whereby it becomes lifted and engages gear-wheel *k* without becoming disengaged from gear-wheel *k′*.

The working of my new gas-generating apparatus takes place as follows: Chamber A is filled with water, and calcium carbid descends by gravity from receptacle L into chute K and upon platform N N′. The carbid dropping into the water will combine with the same and produce acetylene and calcium oxid. The calcium oxid will remain as a precipitate in the water, the gas produced will fill the empty space above the water and will pass through screens M M′, thereby passing a portion of the solid carbid, and consequently giving off its moisture to the carbid, and the gas will reach chamber G, the efflux-pipe H, and the stop-cock J, from which it may be led to and connected with the pipe system of a building. As soon as gas is produced in chamber A the surface of the water of course will descend and the float R will act upon the platform N N′ in such a way as to form an upwardly-opening acute angle between the two halves of the platform. Dropping of carbid into the water will stop until some of the gas produced is again consumed and the water replaced by water from the communicating chamber S. As soon as this takes place, the float R will rise, the platform N N′ will become horizontal or even form an obtuse angle, and carbid will again drop into the water.

Although the operation of the carbid-support N N′, controlled by float R, may be entirely sufficient to provide for an automatic feeding of the carbid into the generating-chamber A, I have provided additional means for still further facilitating said feeding process. If gas is produced, water from A will pass through port T into compartment S and float U will rise. If gas is consumed, water from S will pass into A and float U will sink. In this case wedge Z will release hammer *f*, weight *h* will impart rotary motion to roller *d*, and consequently oscillatory motion to hammer *f*, and hammer *f* will knock against bearing P′ of axle O, which bearing is fastened to a thin partition of the wall of chamber A. Hammer *f* therefore will slightly shake the carbid-support, and the carbid will much easier drop off of the same into the water. The force of the stroke of hammer *f* will depend upon the position of wedge Z and the float U, supporting the same. The higher the float U is in compartment S the smaller will be the stroke of hammer *f*, and vice versa.

The cleaning of the lower part of A is accomplished by the peculiar location of water-inlet D in relation to the walls of B. The entering water will form a vortex motion or miniature whirlpool, whereby all sediment and impurities will be carried off toward the water-exit E. As the two stop-cocks F F′ can be opened simultaneously, all such impurities may be carried off into the waste-pipe.

The filling of the tank with water may be accomplished by disconnecting F from F′ and keeping F open and F′ closed until the water in the tank reaches its required height.

The carbid as bought in tin cans is put into receptacle L, the throttle-valve *i* is closed, and L is screwed onto the top of the upper end of chute K. Crown-wheel *l* is then turned, whereby the same engages into screw-thread *m*, and opens throttle-valve *i*′ by means of gear-wheel *k*′, simultaneously engaging gear-wheel *k* of throttle-valve *i*, and consequently opening the latter. Carbid may drop down into the chute; but no gas can escape on account of the gas-tight interlocking of receptacle L with the main machine.

It will be noticed that the apparatus is entirely automatic and does not possess a gasometer, whereby the storage of the gas is done away with and gas is produced only to the same extent as consumed.

The apparatus requires no special care, as there are hardly any parts to get out of order, and the use of the solid carbid as an absorbent of moisture of the gas and a purifying medium of the same, which is renewed continuously, is an especially advantageous feature of the machine.

I do not confine myself to the special design as shown and described in this my application, as the same may be changed without departing from the scope of my invention.

What I do claim as new and useful, and desire to secure by Letters Patent, is—

1. In a gas-generator, a support for the gas-producing carbid, consisting in combination of two flat surfaces hinged upon a shaft, said shaft being suitably operated upon by a float, so that said support may form an acute or an obtuse angle, and the carbid be kept there or slide off into the water, according to the height of the water in the tank, for the purpose as described.

2. In a gas-generator, a support for the gas-producing carbid, consisting in combination of several flat surfaces hinged upon a shaft, and having means for retarding the sliding off of the carbid, said shaft being operated upon by a float, so that said support may form an acute or an obtuse angle, and the carbid be kept there or slide off into the water, according to the height of the water in the tank, for the purpose as described.

3. In a gas-generator, the combination with a generating-chamber containing water, of a chute connecting said chamber with a carbid-receptacle, a carbid-receptacle, a platform consisting of a plurality of hinged sections opposite the lower opening of said chute, and being positively and directly acted upon by a float, so that said sections may form an acute or an obtuse angle and the carbid be retained there or slide off into the water of the generating-tank, as set forth.

4. In a gas-generator, the combination with a generating-tank, of a carbid-receptacle, of a chute, a platform consisting of a plurality of sections, one bearing of the axle of which is connected to a thin portion of the tank-wall, a ratchet knocking with its bar end against said thin partition, a ratchet-wheel, a roller on the same shaft, and acting upon said roller

means for rotating the same substantially as described and for the purpose as set forth.

5. In a gas-generator, the combination with a carbid-receptacle, of a generating-tank, a chute connecting the two, a plurality of hinged plates below said chute, toggle-links connecting the axle of said plates with a float, a ratchet, a ratchet-wheel, means for rotating the same, a second float having a vertical rod, the head of which being wedge-shaped and regulating the movement of the bar end of the ratchet and consequently the force with which the bar end knocks against a thin portion of the tank-wall, for the purposes as set forth.

6. In a gas-generator, the combination with a carbid-receptacle, of a generating-tank below said receptacle, a chute connecting said carbid-receptacle with the generating-tank, two opposite walls of said chute being perforated for the passage of the gas through said perforated portions and portions of the carbid into the gas-passage, and finally to the gas-efflux valve, substantially as described.

7. In a gas-generator, the combination with a tapered generating-tank, the walls of which are spirally corrugated, of a water-inlet located tangentially in relation to the uppermost winding of the corrugations, and of a water-exit located centrally at the lowest point of the tank, whereby the entering water will produce a vortex motion within the chamber, and thereby clean the walls of adhering impurities such as calcium oxid, for the purpose as set forth.

8. In a gas-generator, the combination with a carbid-receptacle and a generating-chamber, of an air-tight valve consisting of a plurality of throttle-valves, of one or more collars having face-gearings, and means for interlocking successively said face-gearings with gear-wheels located upon the shafts of said throttle-valves, whereby the same may be operated upon simultaneously, for the purposes set forth.

9. In a gas-generator, a water-inlet and a water-exit, both provided with stop-cocks, and means for opening and closing the stop-cocks simultaneously, whereby the water may enter into and be removed from the tank at the same time, and consequently will clean the same of all precipitated impurities, as set forth.

10. In a gas-generator, a tapered generating-tank, the walls of which are spirally corrugated, a water-inlet tangentially to the walls, a water-exit, each provided with a stop-cock, and means for opening said stop-cocks simultaneously, whereby the water will enter into the tank, by its vortex motion remove all the impurities from the tank, and simultaneously run out through the water-exit, substantially as described.

11. In a gas-generator, a carbid-receptacle, a chute connecting the same with a generating-tank, a support for the carbid below said chute and being acted upon by a float, a ratchet, a ratchet-wheel, means for rotating said ratchet-wheel, a second float having a vertical rod, the head of said rod being wedge-shaped for regulating the force of the stroke of the bar end of the ratchet against a thin portion of the tank-wall and consequently against the axle of the carbid-support, a water-inlet located tangentially in relation to the tapered wall of the generating-tank, a water-exit, both the water-inlet and the water-exit being provided with stop-cocks, and means for opening said stop-cocks simultaneously, whereby the water will enter into the tank and run out from the tank at the same time, substantially as described and for the purpose as set forth.

In testimony whereof I have hereunto set my hand, in the presence of subscribing witnesses, this 1st day of April, A. D. 1899.

JEAN A. WETMORE.

In presence of—

FLORENCE VAN NAME,

RALPH JULIAN SACHERS.