No. 754,808. PATENTED MAR. 15, 1904.

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ACETYLENE GAS GENERATOR.

APPLICATION FILED AUG. 18, 1902. RENEWED SEPT. 19, 1903.

NO MODEL.

Fig. 1.

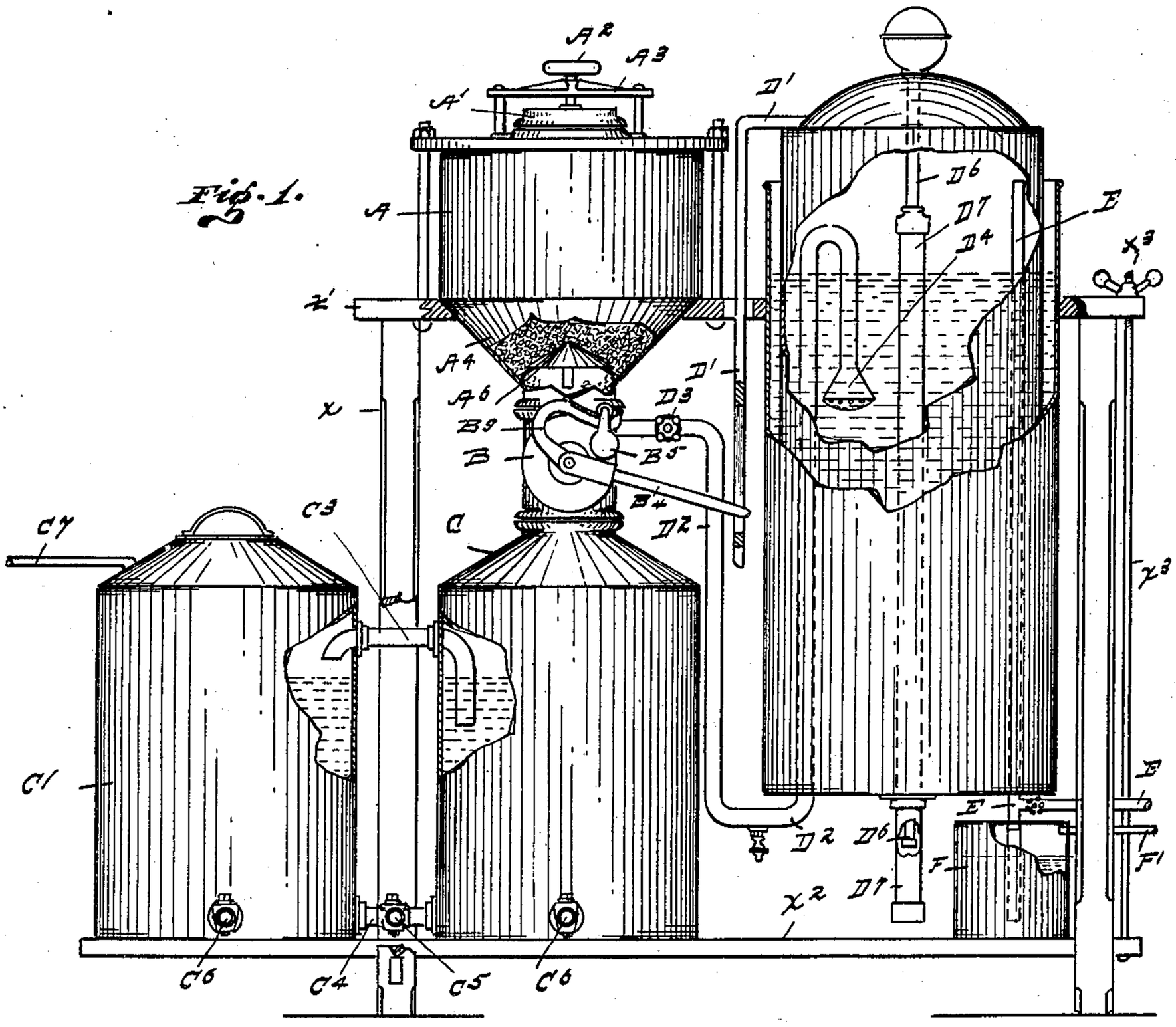
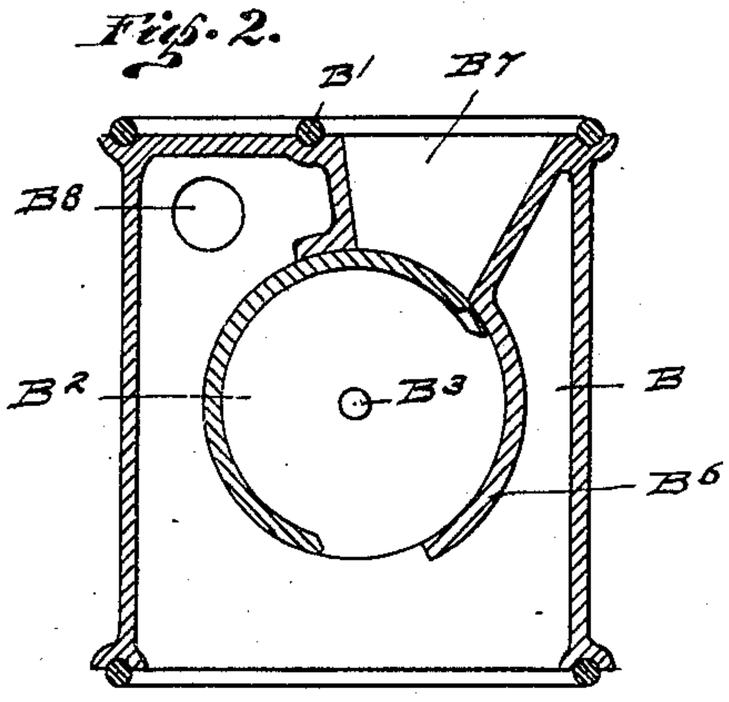


Fig. 2.



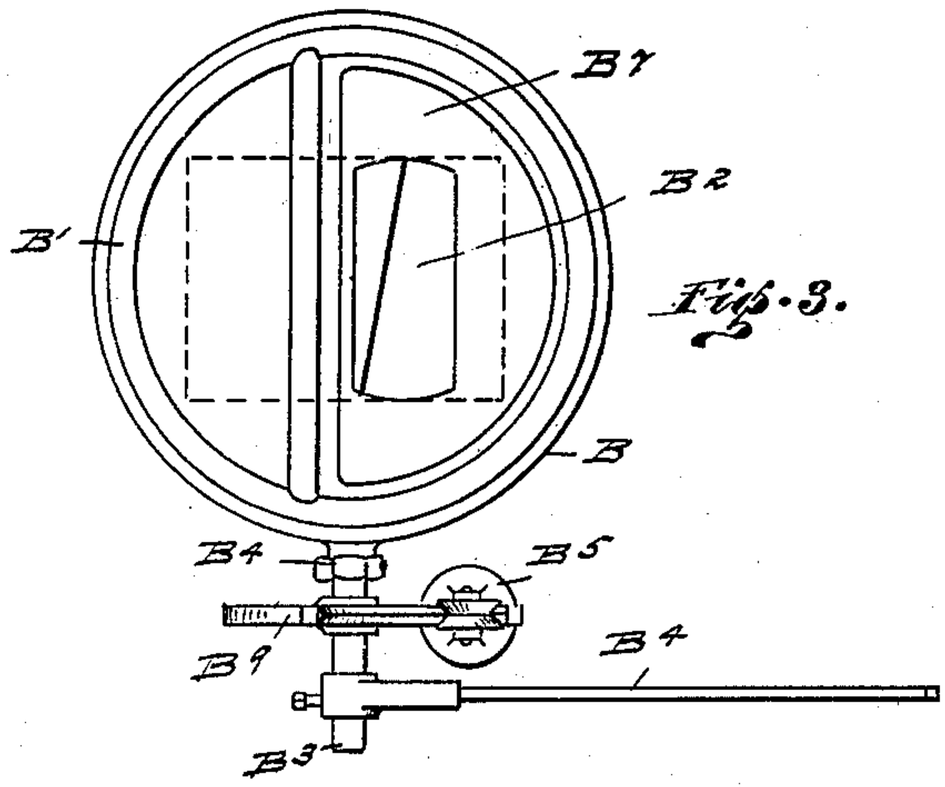


Fig. 3.

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No. 754,808. Patented March 15, 1904

UNITED STATES PATENT OFFICE.

WILLIAM A. ROBERTSON, OF ALAMEDA, AND DAVID P. HEAP, OF SAN FRANCISCO, CALIFORNIA; SAID HEAP ASSIGNOR TO SAID ROBERTSON.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 754,808, dated March 15, 1904.

Application filed August 18, 1902. Renewed September 19, 1903. Serial No. 173,783. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. ROBERTSON, residing at and whose post-office address is 2110 Alameda avenue, in the city of Alameda, county of Alameda, and DAVID P. HEAP, residing at 2410 Steine street, in the city of San Francisco, county of San Francisco, State of California, citizens of the United States, have invented certain new and useful Improvements in Acetylene-Gas Generators; and we do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in acetylene-gas generators, and particularly to the carbid-feed mechanisms and the generator.

The invention consists, primarily, of a carbid-storage receptacle from which the granulated carbid gravitates through a measuring feed-box to the generator containing water. The generator consists of a hermetically-sealed tank having an overflow and a direct connection with a circulating-tank so arranged that the pressure due to each generation will cause the water to circulate between the two tanks. From the generator the gas is piped into the water-sealed gas-holder through a pipe having a return-bend into the body of water seal to wash the gas before liberation into the gas-holder. In the event of overgeneration the excess pressure is blown off to the atmosphere through the safety-valve, consisting of a small sealed tank partially filled with water, from below the level of which a pipe communicates with the gas-holder and from above the level of which a pipe connects with the outer air. Thus any pressure above the loaded capacity of the gas-holder would overcome and escape through the safety blow-off, maintaining a constant pressure in the gas-service and avoiding dangers of explosion, &c. The carbid-feed is automatically operated by the rise and fall of the gas-holder. The carbid-receptacle and the gas-holder extend downwardly through a table-top and are securely fixed thereto. The generators rest upon a hanging shelf under the table-top in line with the carbid-receptacle in such a manner that the feed-box setting between the main generator and the carbid-receptacle may be securely held between them by lifting the said shelf by the threaded tie-rod connecting the said table-top and shelf.

The objects of the invention are disclosed, broadly, in the above statement and are, first, to combine simplicity and efficiency in a machine within the minimum of space; second, to provide a positive carbid-feed mechanism delivering a predetermined quantity of carbid at every charge of the generator; third, to render generation cool and thorough by providing a large circulating body of water; fourth, to deliver to the service a clean washed gas free from lime; fifth, to provide a safety blow-off for excess pressure in the gas-holder.

In the drawings, Figure 1 is a front elevation, partially in section, to show internal constructions of a machine constructed in accordance with this invention. Fig. 2 is a vertical cross-section of the feeder-box, showing the carbid-measuring drum in the delivering position. Fig. 3 is a plan of the top of the same.

The construction in detail consists of the carbid-receptable A, having the removable cover A′, held down by the hand-screw A^2, threaded in the beam A^3, removably attached to the top of the receptacle, by means of a gasket rendering the opening in the receptacle hermetically sealed. The conical bottom A^4 of the receptacle extends through the top x' of the table X, to which the receptacle is rigidly secured by the bolts A^5. The measuring feed-box B is situated immediately under the carbid-receptable, being joined thereto by a joint formed by suitable grooves in the abutting surfaces, having a gasket B′ between. The carbid-measuring device within the box B consists of the measuring-drum B^2, mounted upon the shaft B^3, extending through the stuffing-box B^4 on the side of the box B to prevent the escape of gas therefrom. The shaft is oscillated by the lever B^4, fixed thereon and extending into the path of the trip D′,

affixed to the rising and falling gas-holder. The action of the shaft is accelerated by the shifting weight B^5, hung on the curved runway B^9, fixed to the shaft above and across the center of action. Before the shaft approaches the center of its throw the weight B^5 rolls across the center, causing the shaft to swing violently over, the slot in the trip D′ permitting the lever B^4 to swing free.

The gage B^2 consists of the segment of a cylinder with closed ends, centered and fixed upon the shaft B^3. The peripheral gap in the measuring-drum is closed by the lip B^6 as the gap approaches the opening of the chute B^7, down which the granules of carbid flow into the measuring-drum. Being fixed upon the shaft, the measuring-drum is alternately opened and closed by the rise and fall of the gas-holder and is at all times practically gas-tight. The capacity of the measuring-drum is calculated to the capacity of the gas-holder to insure a uniform production of gas. The possibility of inserting a filler to reduce the capacity of the measuring-drum is obvious.

The generator C on the shelf X^2 is immediately under and connected to the feeder-box by a joint similar to that between the feeder-box and the carbid-receptacle. These joints are compressed by the lifting of the shelf by the threaded tie-bolt X^3, or suitable means may be provided for tightening each separately. The generator C consists of a closed tank partialy filled with water, upon the surface of which the carbid falls. The circulating-tank C′ is similar to generator and is connected thereto by the overflow C^3, extending downward into the body of C, and by the direct connection C^4, having the interposed three-way cleaning-valve C^5. The generator and the circulating-tank are both provided with the fresh-water inlets C^6 C^6. The circulating-tank has an outlet C^7 to a vent (outside the building) to carry off any gas that may arise therein. This latter is practically *nil*, but reduces the danger of gas accumulating within the building.

From the generator the gas rising into the feeder-box is led through the outlet B^8 to the pipe D^2 and valve D^3 up through the body of water forming the seal of the gas-holder to above the surface thereof, reënters and delivers the gas below the surface of the water through the perforated head D^4, which divides the gas, causing it to bubble up through the water, thoroughly washing it free of impurities.

The gas-holder is of the usual type, consisting of a cylindrical tank inverted in a tank of water and adapted to rise and fall therein under the influence of the gas-pressure and is centered, guided, and stopped by the rod D^6 telescoping into the pipe D^7. From the gas-holder the service-pipe E leads downward and out of the machine to the house-service. A continuation of the pipe E leads into the safety blow-off F, terminating below the water-level therein. It is obvious that the service-pipe being the line of least resistance the gas will naturally flow therethrough until an excess pressure would cause it to overcome the resistance of the safety blow-off and the overplus escape through the vent F′ to the atmosphere.

The operation of the machine is as follows: The carbid-receptacle is filled with a prepared granulated carbid and sealed. The hood A^6 over the exit of the receptacle keeps the pressure of the main body of carbid off the measuring-drum. The first charge of carbid falling into the generator disintegrates, forming a gas-pressure against the surface of the water therein, causing it to flow into the circulating-tank through the overflow and connection C^4, from whence it flows back as the volume of gas passes into the gas-holder. The rise of the gas-holder throws the measuring-drum into position for a recharge. The fall of the gas-holder tips the rolling weight over the center, cutting off the measure of carbid, to facilitate which the opening in the gage is oblique to the opening in the feeder-box. This gives a shearing action as the gage closes, as shown in Figs. 2 and 3, sufficiently powerful under the action of the weight to break any interposed granules. The poise of the measuring-drum under the counterbalance of the shifting weight renders its action very sensitive, at the same time very powerful. The agitation of the water in the generators at every charge prevents the formation of crusts upon the surface thereof and also provides a large volume of water to be acted upon, insuring a cool disintegration of the carbid and a more uniform generation and quality of gas.

Having thus described this invention, what we claim, and desire to secure by Letters Patent, is—

1. In an acetylene-gas generator, the combination with a carbid-receptacle, a generator removably connected to said carbid-receptacle, of a measuring-drum between the generator and the carbid-receptacle, a lever attached to said measuring-drum for operating the same, a curved arm connected to said measuring-drum and a weight operating on said curved arm which assists the lever in opening and closing the measuring-drum.

2. In an acetylene-gas generator, the combination with a carbid-receptacle, a generator, a measuring-drum between the carbid-receptacle and the generator, of a gasometer-bell, a rod secured to and adapted to be raised and lowered by said gasometer-bell, a lever secured to the shaft of the measuring-drum and adapted to be operated by said rod, a curved arm attached to the shaft of the measuring-drum, and a weight adapted to work backward and forward over said arm.

3. In an acetylene-gas generator, the combi-

nation with a carbid-receptacle, a generator below said receptacle, of a measuring device between said carbid-receptacle and the generator consisting of a hollow drum, a peripheral opening in its side, said opening being oblique to the opening in the bottom of the carbid-receptacle, a seat for said drum having a depending lip adapted to hold the contents of the drum until turned in dumping position, and means for operating said drum.

4. In an acetylene-gas generator, the combination with a carbid-receptacle, of a measuring-box removably connected thereto and having a depending hopper therein, a measuring-drum within said box and seated against said depending hopper, an oblique opening in said measuring-drum, the edge of said opening causing a shearing action between itself and the edge of the depending hopper in the measuring-box.

In testimony whereof we have hereunto set our hands this 7th day of August, 1902.

WILLIAM A. ROBERTSON.
DAVID P. HEAP.

Witnesses:
BALDWIN VALE,
A. J. HENRY.