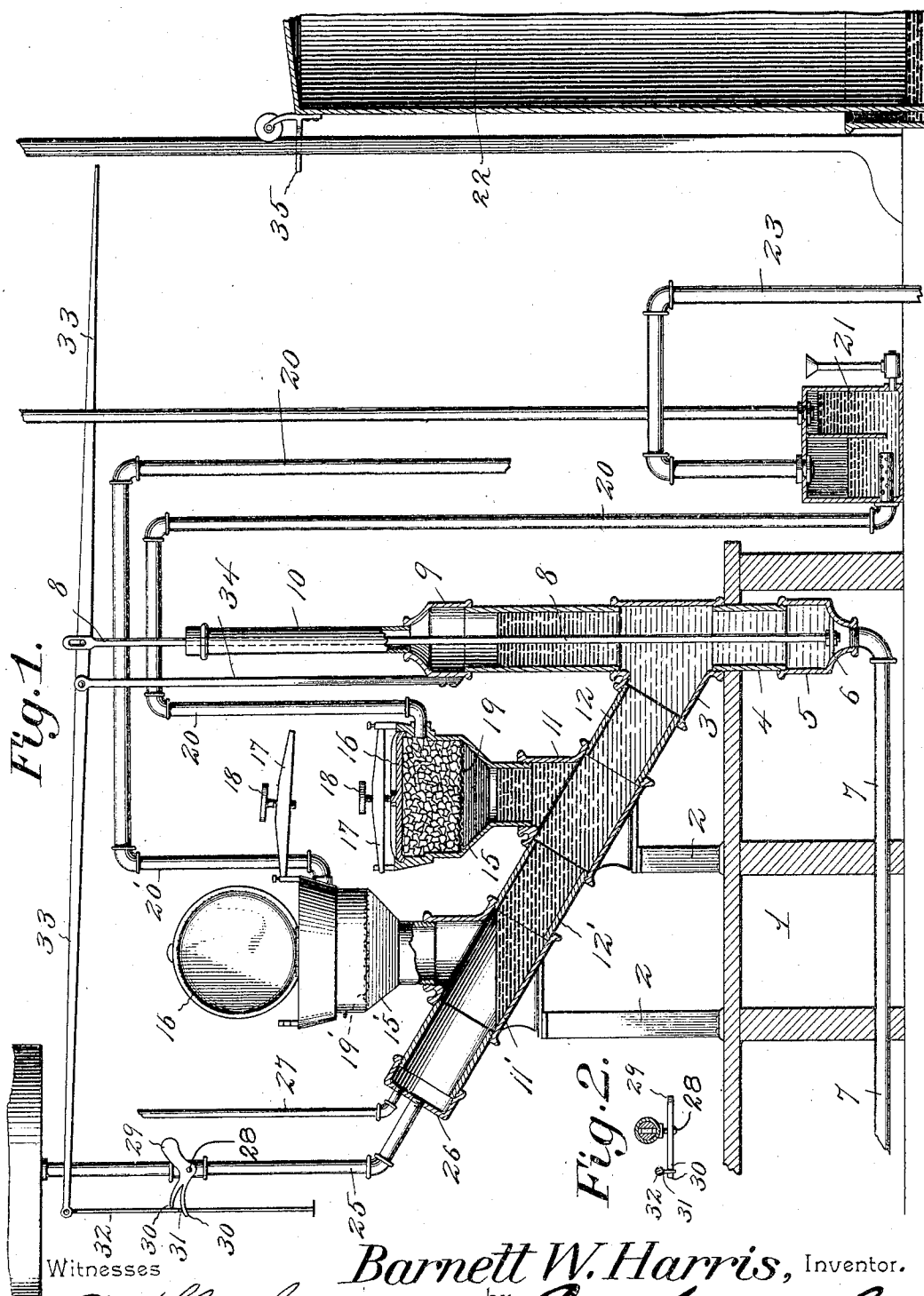


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PATENTED JUNE 20, 1905.

B. W. HARRIS,  
ACETYLENE GAS GENERATOR.  
APPLICATION FILED MAR. 17, 1904.



# UNITED STATES PATENT OFFICE.

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## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 792,654, dated June 20, 1905.

Application filed March 17, 1904. Serial No. 198,643.

*To all whom it may concern:*

Be it known that I, BARNETT W. HARRIS, a citizen of the United States, residing at Waveland, in the county of Montgomery and State of Indiana, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

This invention relates to improvements in acetylene-gas generators.

One of the principal objects of the invention is to provide a generating apparatus which may be either automatic or non-automatic in its operation, provision being made for any desired increase in the capacity of the plant or for decrease in the capacity in accordance with the requirements without the necessity of the removal of a generator of one size and the introduction of a generating apparatus of either larger or smaller capacity.

A further object of the invention is to provide a generating apparatus in which the various generating-chambers are made in the form of interchangeable sections, which may be added one after another when the demand for gas increases.

A further object of the invention is to provide an apparatus of this class in which the supply of water is under the control of the gasometer, so that when a large quantity of gas has been made and stored the supply of water may be automatically cut off.

A still further object of the invention is to provide an apparatus of this class in which provision is made for the periodic discharge of the carbid slush or residuum from the generating-chambers.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1

is a side elevation, partly in section, of an acetylene-gas-generating plant constructed in accordance with the invention. Fig. 2 is a detail sectional view of the water-controlling valve.

Similar numerals of reference are employed to indicate corresponding parts throughout both figures of the drawings.

The main parts of the generating apparatus are supported on a suitable base 1 and standards 2, which may be of any desired height. The discharge or exhaust end of the apparatus is a Y 3, the lower flange of which is shown in the present instance as resting on the base-plate, and coupled to the lower flange is a tube-section 4, carrying a cup 5, provided with a valve-seat for the reception of a valve 6, which when open permits the outflow of the carbid slush or residuum through a pipe 7 to any suitable point of discharge. The valve-stem 8 extends upward through the Y and through an upper casing 9, having an extension 10, which may be provided at its upper end with a stuffing-box, if desired, although this is not in all cases necessary.

Connected to the joint 3 is a Y 11, the connection being made by an intermediate tube-section 12, and to the upper branch of the Y 11 is connected a generating-chamber 15, which may be tightly closed by a cap or covering 16, that is confined in place by a cross-bar 17 and a locking-screw 18. The generating-chamber 15 is provided with a flanged portion which supports a screen 19, on which may be placed the carbid from which the gas is to be produced, and in this connection it may be observed that the largest lump carbid may be employed instead of the finely granulated or powdered form sometimes employed.

From the top of the generating-chamber 15 leads a gas-discharge pipe 20 to a tank or seal 21, the gas escaping below the water-line of the seal through suitable perforations formed in the end of the tube 20 and passing thence to a holder or gasometer 22 by way of a pipe 23.

In the present instance a second generating-chamber 15' is arranged above the gen-

erating-chamber 15, and its supporting-Y 11' is coupled to the Y 11 by means of a tube-section 12'. The construction of this second generator is the same as that previously described, and the number of generators is limited only by the gas production desired, section after section being added as the demand for gas increases, and as all of the parts are interchangeable and all of the joints in connecting tubes of the same size the plant may be built up to any desired capacity without removing the first generator or the strengthening of the supports, each added generator being provided with its own supporting standard or standards, and it may be further observed that the connecting-Y 3 at the base may be provided with other branches, so that there may be one or more batteries or generators coupled to the same outlet or settling-cup 5.

The necessary water is admitted through a supply-pipe 25, the pipe being connected to a cap 26, which is disposed above the uppermost Y, and to this cap is also connected a vent 27, leading to the outer air. In the pipe 25 is a valve having a stem 28, on which is a lever 29, having a pair of arms 30 for the reception of a pin 31, that projects laterally from a rod 32, and this rod is connected to one end of a lever 33, pivoted at a point intermediate of its length to a standard 34. The opposite end of the lever 33 is arranged within the path of movement of an arm 35 projecting from the gasometer-bell 22, and an intermediate portion of the lever is also connected to the valve-rod 8, so that when the gas-bell is raised the arm 35 will come into contact with the lever 33 and the supply of water will be cut off and the valve-stem raised to open the valve 6, and when lowered the parts will resume initial position, the valve 6 closing and the water-supply valve being opened.

In the operation of the apparatus carbide is supplied to the several generators and the covers 16 are firmly locked in place. The gas-bell being empty, valve 6 is closed and water flows through pipe 25, filling the various connections from the cup 5 until the water comes into contact with the carbide carried by the screen 19 of the lowermost generating-chamber, whereupon gas is formed and escapes through the pipe 20 and seal 21 to the gas-bell. The gas-bell will be raised and when nearing the limit of its upward movement will strike the lever 33 and cause closing movement of the water-supply valve and opening of the slush-valve 6, whereupon the residuum carried down by the water through the screen 19 will flow out through the discharge-pipe 7 and a fresh surface of carbide will be exposed at the screen. The gas-bell 22 will gradually descend, owing to the consumption of gas, and as soon as the arm 35 leaves the le-

ver 33 the valve 6 will close by gravity and the water-supply valve will be opened by contact of pin 31 with the upper arm or pin 30, thus again permitting fresh water to attack the carbide in the lowermost generating-chamber. This operation is kept up until the supply of carbide in the lowermost generating-tank is wholly exhausted, and at the next operation the water will continue to flow until it reaches the screen 19' of the second generator 15', thereby flooding the lower chamber 15 and effectually washing out all the carbide slush from the screen 19 and permitting it to settle in the cup 5 while gas is formed in the generator-tank 15' in the manner previously described with reference to the tank 15 and passes out through a discharge-pipe 20' to the seal. In this manner any desired number of generating-tanks may be connected in series for successive operation and will only be operated when the gas in the lowermost chamber is exhausted, and flooding of the lowermost compartments each time the water-level raises for the generation of gas in a higher compartment will effectually remove all the carbide slush, and thus avoid one of the principal disadvantages in the operation of acetylene-gas plants.

While it is preferred that the operation of the apparatus be automatically controlled by the rise and fall of the belt of the gasometer, it is to be understood that the invention in this particular is not to be limited and that the apparatus may be used in connection with controlling mechanism of any desired character or may be manipulated by hand without departing from the invention.

While the apparatus has been described for use in connection with the manufacture of acetylene gas from calcic carbide, it is to be understood that it may be used in connection with any other apparatus where gas is manufactured as the result of the union of a solid and a liquid.

Having thus fully described my invention, what is claimed is—

1. In acetylene-gas apparatus, a series of generating-tanks, disposed in successively-higher horizontal planes, and an inclined water-supply tube with which the bottom of each tank is independently connected, whereby on the supply of water to a higher tank for gas-generating purposes, the lower tanks will be flooded to wash out the slush, and a slush-chamber to which the lower end of the tube is connected.

2. In the combination of an acetylene-gas apparatus, a valved slush-collecting chamber, an inclined tube connected thereto and formed of a plurality of interchangeable sections, a water-supply pipe connected to the upper end of the tube, a plurality of independent interchangeable gas-generating tanks connected to the several sections and dis-

posed at successively-higher levels, and a holder to which all of said generating-tanks are independently connected.

3. In an acetylene-gas apparatus, a plurality of generating-tanks arranged at successively-higher levels, an inclined tube formed of interchangeable sections carrying said tanks, an independent support for each of the sections, a valved slush-collecting chamber to which the lower end of the tube is connected, a water-supply pipe connected to the upper end of the tube, a valve in the water-supply pipe, a pivoted lever having connection with both valves, and a gasometer having a projecting portion disposed in the path of movement of the lever.

4. In a gas-generating apparatus, a plurality of generating-chambers at successively-higher levels, screens in said chambers form-

ing carbid-supports, an inclined water-tube to which the lower portion of each of said chambers is independently connected, an independent gas-discharge leading from each chamber, and means for supplying water to the tube, whereby on the exhaustion of the carbid in the lower chamber, said lower chamber will be flooded to remove its slush through the water-supply tube, while gas is being formed by contact of the water with the carbid in a chamber of higher level.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

BARNETT W. HARRIS.

Witnesses:

H. A. ALLEN,

E. D. STEPHENSON.