No. 641,431. Patented Jan. 16, 1900.

G. S. BOWERS.

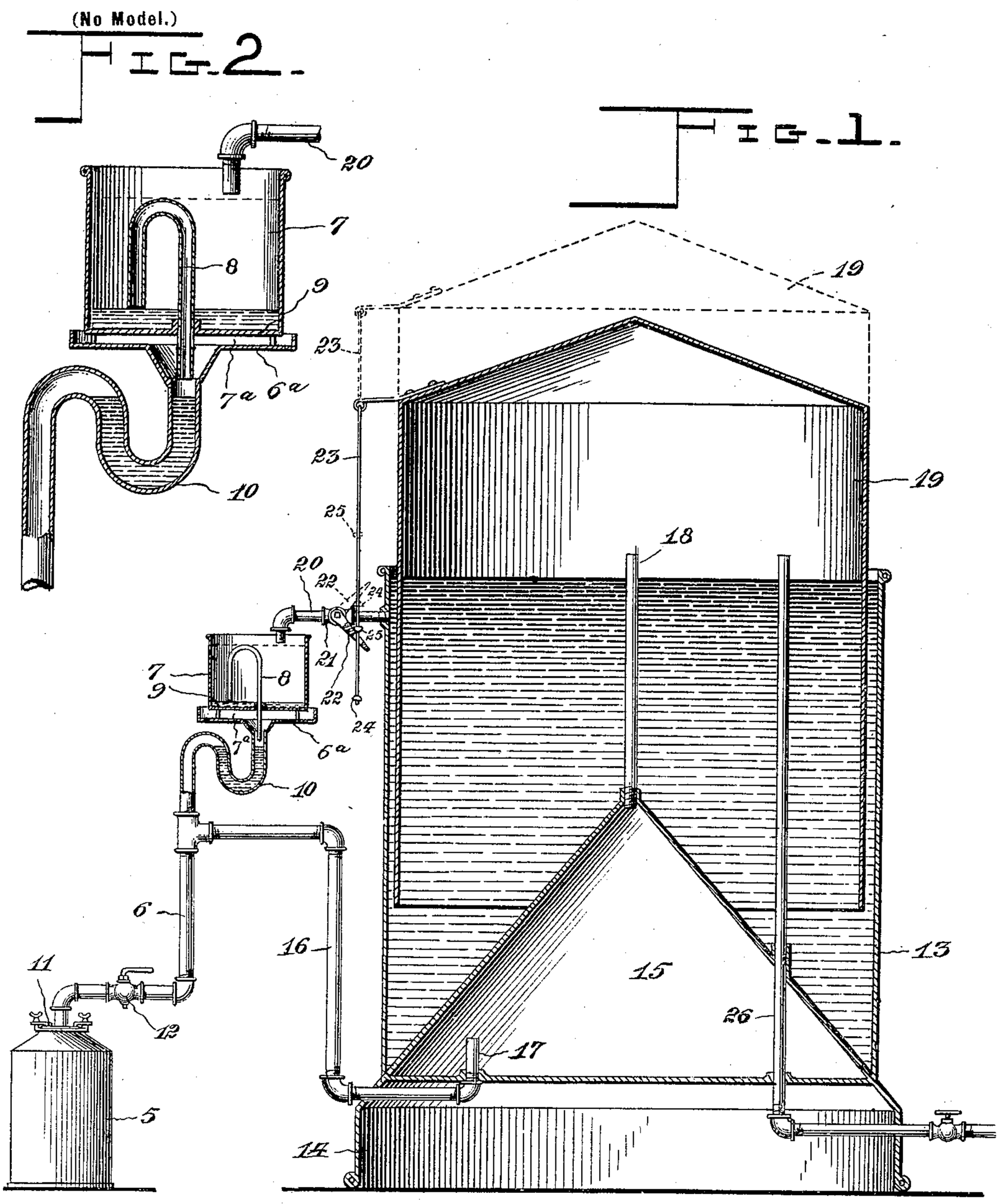
ACETYLENE GENERATOR.

(Application filed July 22, 1899.)

(No Model.)

FIG. 2.

FIG. 1.



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UNITED STATES PATENT OFFICE.

GEORGE SMITH BOWERS, OF SPRING GROVE, MINNESOTA.

ACETYLENE-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 641,431, dated January 16, 1900.

Application filed July 22, 1899. Serial No. 724,811. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SMITH BOWERS, a citizen of the United States, residing at Spring Grove, in the county of Houston and State of Minnesota, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

My invention relates to improvements in apparatus for the generation of acetylene gas, and the prime object in view is to provide improved means by which water in regulated volumes may be supplied automatically to the generator in such a manner that the increments of water will flood the carbid, thereby expelling all the gas from the generator and permitting the same to be removed and recharged without the possibility of the gas escaping into the room.

A further object is to provide an improved construction in which ready inspection of the parts is possible, so that stoppages in the operation can be corrected; also, to arrange the parts to overcome "air-locking" of the siphon, and also to prevent the escape of gas from the generator through the water-feed devices.

With these ends in view the invention consists in the combination, with a generator and a bell-controlled water-feed mechanism, of a trapped water-supply pipe connected to said generator, a head-plate fixed to the upper end of said trapped pipe, a reservoir supported on the head-plate in spaced relation thereto and to the receiving end of said trapped-pipe to leave an open space between said elements for the free circulation of air, and a siphon having its long leg extended through the bottom of said tank, across the air-space, and terminating in the trapped pipe, the short leg of the siphon terminating above the bottom of said reservoir.

To enable others to understand the invention, I have illustrated one embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a diagrammatic sectional elevation through an acetylene-gas apparatus having a water-feed mechanism for the generator constructed in accordance with this invention. Fig. 2 is an enlarged sectional view through the water-feed tank, a part of the generator-connecting pipe, and the siphon.

The same numerals of reference are used to indicate like and corresponding parts in both figures of the drawings.

5 designates a generator of any suitable type. 6 is a connecting pipe, and 7 is the water-feed tank. The pipe 6 does not have direct communication with the tank 7; but communication between the pipe and tank is established by the employment of a siphon 8, the latter operating under certain conditions to transfer the liquid contents of the tank 7 to the pipe 6, which conveys the water to the generator. This siphon is erected in a vertical position to lie within the limits of the tank 7, the curved end or bight of said siphon terminating on a plane below the open upper edge of said tank. The long leg of the siphon passes through the bottom 9 of the tank, said long leg being securely fastened to or supported in the tank bottom and extending below the same, so as to terminate in the upper part of the pipe 6. The short leg of the siphon terminates at a proper distance above the bottom of the tank, so as to permit a small quantity of water to remain in the bottom part of the tank 7. On the upper extremity of the pipe 6, above a trap 10, formed in said pipe, is a plate or head 6^a, which serves as a support for the tank 7. Said tank is supported on the plate by suitable means, such as lugs, to elevate the bottom of the tank above the plane of the plate, and thus an air-space 7^a is provided between the tank and the plate 6^a for the air to enter freely to the trap, thus overcoming any tendency of the siphon to become air-locked.

The pipe 6 is bent or otherwise constructed to form a trap 10, the latter being located in close relation to the bottom of the tank, and said pipe 6 has one end thereof connected detachably to the generator by a coupling 11 of any suitable style, thus permitting the generator to be removed from the apparatus subsequent to the exhaustion of the carbid charge therein for the purpose of renewing the charge in the generator with fresh active carbid. The pipe 6 is also provided at a point contiguous to the generator with a cock or valve 12, which may be of the ordinary stop-cock variety, or a three-way valve may be used, if desired.

It is to be observed that the reservoir is open at its upper end and that it is supported

on the head-plate in spaced relation to the same and to the receiving end of the trapped pipe. This arrangement of the parts is advantageous, because, first, the operation can be observed at any time; secondly, ready access to all the parts is possible, so that the location of stoppages can be ascertained and easily corrected, and, thirdly, the free-air-circulation space between the head-plate and the reservoir prevents the siphon from becoming air-locked.

The gasometer-tank 13 is provided with a base 14, having a conical condenser 15, which extends well up into the water-bath contained in said tank, thus exposing a large area of the condenser to the cooling action of the water in said tank. The gas-pipe 16 has one end thereof connected to the pipe 6 at a point between the trap 10 and the cock or valve 12, whereby the trap serves to prevent the gas from the generator or from the gasometer from passing through the siphon-pipe and finding its exit through the tank 7. The gas-pipe 16 has a branch 17, which extends into the condenser 15 in a manner to discharge the gas into the condenser-chamber for circulation therein and impingement against the cool walls of said chamber to effect the condensation of the aqueous vapors in the gas and the drying and cooling thereof. From the apex of the conical condenser extends a short pipe 18, which lies in a different vertical plane from the branch pipe 17 and extends through the liquid contents of the tank, so as to discharge the gas into the floatable bell 19.

As one means for supplying the water-feed tank 7 with a proper quantity of water and for regulating the supply of water to said tank 7 in unison with the vertical travel of the bell I contemplate the employment of means adapted to supply water to the tank 7 from the gasometer-tank 13. A water-pipe 20 is made fast with the gasometer-tank at a point below the normal water-line therein, one end of said pipe 20 extending over the tank 7, so as to discharge the water thereto. In this water-pipe is a regulating-valve 21, having an arm 22, provided with a slot through which passes a vertical trip-rod 23, the latter having its upper end attached in a suitable way to the gasometer-bell. Said trip-rod is provided with the buttons or other suitable projections 24 25, which are arranged on opposite sides of the valve-arm 22, one of said buttons serving to lift the valve-arm on the ascent of the bell under the accumulation of gas therein for the purpose of cutting off the flow of water to the tank 7, while the other button serves to depress the valve-arm on the descent of the bell and open the valve for the purpose of supplying water to the tank 7.

The operation is as follows: The several parts of the apparatus having been properly assembled and water having been supplied in any suitable way to the trap 10 to form a seal therein, the generator is charged with carbid and coupled to the pipe 6. The bell settles in the tank to open the valve 21 and permit the water to flow from the pipe 20 into the water-feed tank 7. The water accumulates in the tank 7 until it submerges the siphon 8 and rises to the dotted line indicated by the drawings. The short leg of the siphon thus becomes filled with water, so that the atmosphere-pressure on the liquid contents of the tank will set up siphonic action through the siphon 8, whereby the water will flow from the tank 7 through the siphon into the trap 10, overflow the latter, and pass through the pipe 6 into the generator. The water attacks the carbid and fills the generator to about one-half of its capacity, thus producing acetylene gas, which passes through the pipe 6, the pipes 16 17, the condenser, and the pipe 18. The accumulation of gas in the bell lifts the latter for the trip-rod to operate the valve and shut off the continued flow of water to the tank 7. The gas may be consumed at the burners by drawing it off through the service-pipe 26; but a reduction of the available gas-supply permits the bell to again descend for the trip-rod to open the cock 21 and the water to flow through the pipe 20 into the tank 7, whereby the siphon becomes active to supply a second increment of water to the generator. The tank 7 and the siphon 8 therein should be so proportioned as to supply two charges of water to the generator in such quantity as to flood the carbid in the generator when the second charge of water passes thereto, and thus the gas contained in the generator is expelled therefrom, so that the cock 12 may be closed to cut off communication between the generator and the gasometer. The coupling 11 may now be manipulated to detach the generator from the pipe 6, and the flooded generator may be carried out of doors without permitting the odor of the gas to contaminate the air in the room in which the apparatus is located.

Changes may be made in the form and proportion of some of the parts, while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

It will be understood that the water-feeding device which has been described is adapted for use in connection with a plurality of generators arranged in different planes, the operation thereof being identical with that above specified.

Having thus described the invention, what I claim is—

The combination with a generator, of a trapped water-supply pipe connected to said generator, a head-plate fixed to the upper end of said trapped pipe, a reservoir supported on the head-plate in spaced relation thereto and to the receiving end of said trapped pipe to leave an open space between said elements for the free circulation of air, a siphon having its long leg extended through the bottom

of said tank, across the air-space and terminating in the trapped pipe, the short leg of the siphon terminating above the bottom of said reservoir, and a bell-controlled water-feed mechanism for supplying water to the reservoir on the rise and fall of the gas-bell substantially as described.

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

GEORGE SMITH BOWERS.

Witnesses:

O. K. DAHLE,

H. NARVESON.