





# UNITED STATES PATENT OFFICE.

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## CARBURETER.

SPECIFICATION forming part of Letters Patent No. 646,780, dated April 3, 1900.

Application filed July 18, 1899. Serial No. 724,267. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HENRY WOOD, of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Gas Apparatus, of which the following is a full, clear, and exact description.

The invention relates to apparatus for generating illuminating and fuel gas for heating and lighting purposes.

The object of the invention is to provide a new and improved gas apparatus which is simple and durable in construction and arranged to insure a uniform and quick generation of a gas having the desired proportions of inflammable matter and air, according to the purpose for which the gas is intended to be used.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 in Fig. 2. Fig. 2 is a sectional plan view of the same on the line 2 2 in Fig. 1, and Fig. 3 is an enlarged sectional side elevation of part of the vaporizer.

The improved gas apparatus consists, essentially, of two generators A A' alike in construction and of an auxiliary air-supply reservoir B for furnishing the necessary air to either of the generators A or A' without stopping the generation of gas in either of said generators A or A'. As the generators are both alike in construction, it suffices to describe but one in detail.

Each generator is provided with a tank C, having an inner concentric wall C' to form a space for containing water, a bell D extending with its sides in the space between the inner and outer walls of the tank, the sides of the bell moving in the liquid contained between the walls. The bell D is provided at its upper end with a suitable air-inlet valve D', and said bell is connected with a rope E, passing over pulleys, to permit of lifting the

bell D into an uppermost position, as shown at the left in Fig. 1, and to thus allow the bell to descend by its own weight, for the purpose hereinafter more fully described. When the bell D is lifted by power, the valve D' opens, so that the interior of the bell fills with air; but when the bell descends the valve D' closes and the air confined in the bell is forced into the vaporizer, as hereinafter more fully described.

On the inside of the bell D is secured the plunger F of a pump, said plunger passing through a stuffing-box G into a pump barrel or cylinder H, held centrally on the bottom of a tank C, as shown, the lower end of the barrel extending a short distance below the bottom of the tank into the circular base C<sup>2</sup> of the tank. The lower end of the barrel or cylinder H of the pump is connected with a suction-pipe I, containing a suction-valve J, having its outer end I' connected with a liquid-supply to conduct the liquid to be vaporized into the vaporizer for the generation of gas, as hereinafter more fully described.

The upper end of the barrel H is steadied by a spider H', carried by the wall C' of the tank C, and the extreme lower end of the barrel H is provided with a discharge-pipe K, having a discharge-valve L and extending upwardly through the bottom of the tank C within the latter and over the top of the vaporizer N, formed or set on the bottom of the tank within the latter, as is plainly shown in Figs. 1 and 2. The upper end of the discharge-pipe K is provided with a downwardly-extending nozzle K', opening into the upper end of the vaporizer directly over the uppermost of a series of vaporizing-disks O, located one above the other and spaced a suitable distance apart by washers P, having legs P' resting on the preceding disk, as will be readily understood by reference to Fig. 3. The vaporizer N has a central tube N', through which extends loosely the barrel H, and on which tube are centered the disks O, the outer edges of which extend to within a short distance of the circular wall of the generator N. Each vaporizing-disk O consists of a metal ring O', covered on the top and bottom with a fabric material O<sup>2</sup>, made in two pieces sewed together near their outer edges beyond the outer edge of the ring, as indicated in Fig. 3,



and each disk is preferably provided with perforations, as shown in said figures.

In the upper end of the vaporizer N above the uppermost disk O is arranged an air-inlet valve Q for connecting the interior of the tank and bell with the interior of said vaporizer, so that air can pass from the bell and the tank upon the descent of the bell into the said vaporizer to supply the latter with the necessary air to be mixed with the vapors arising from the liquid vaporized on the disks O.

Each vaporizer N is provided with a suitable outlet-pipe N<sup>2</sup> for carrying the generated gas to the heating, cooking, or lighting apparatus in which the gas is to be burned for its particular purpose. The bottom of the vaporizer N is provided with a suitable drain-cock R, and a similar drain-cock R' is arranged in the bottom of the tank to draw off any liquids that may accumulate in said vaporizer and said tank. The lower end of the barrel H is also connected by a valved bypass I<sup>2</sup> with the supply-pipe I' for the pump to regulate the amount of liquid to be pumped through the pipe K into the vaporizer.

The auxiliary air-reservoir B is provided with a tank B', similar to the tank C, and with a bell B<sup>2</sup>, having in its upper end an air-inlet valve D<sup>2</sup>, similar to the valve D', and the upper end of said bell is connected with a rope E' for lifting the bell by power to fill the bell with air by way of the valve D<sup>2</sup>. When the bell is lifted and released, the air confined in the bell is forced out of the same by pipes S S' into the upper ends of the vaporizers N in the two generators A A', respectively, each pipe S and S' being provided with a suitable valve S<sup>2</sup> to open or close said pipe to and from the vaporizer. Thus normally the valves S<sup>2</sup> are closed; but when the bell D of the generator A or A' has passed into a lowermost position, as shown at the right in Fig. 1, and it is desired to keep on generating gas in this generator A' while raising the bell D' it is only necessary for the operator to open the valve S<sup>2</sup> in the pipe S' to admit air to the vaporizer N of the generator A' while the bell thereof is moved into an uppermost position. In a similar manner when the bell D of the generator A is in a lowermost position the vaporizer N of this generator can be charged with air from the auxiliary reservoir B by the operator opening the valve S<sup>2</sup> in the pipe S.

The operation is as follows: When the several parts of the generator are in the position shown in Fig. 1, the bell D in descending causes the plunger F to force the previously-drawn-in liquid in the cylinder H out of the same by way of the pipe K and its valve L and through the nozzle K' into the vaporizer N, so that the liquid passes upon the fabric material of the uppermost disk to be vaporized thereon and to mix with the air passing at the same time with the liquid into the vaporizer by way of the valve Q, it being understood that as the bell D descends both

liquid and air are forced into the vaporizers by the action of the bell, the latter being balanced to give the needed pressure. In case the uppermost disk gets oversaturated with liquid such surplus liquid will drop upon the next following disk, and so on, so that it is possible that all the disks may be charged with liquid to be evaporated or vaporized in the vaporizer. The gas thus generated is drawn off to the apparatus in which it is to be used for heating, lighting, and other purposes. It is understood that when the bell D is lifted by power and air is admitted to the vaporizer from the auxiliary reservoir B then sufficient liquid is in the vaporizer—that is, on the saturated disks thereof—to insure a continuous generation of gas during the lifting of the bell for the purpose mentioned.

In order to tighten the stuffing-box G, I provide the gland thereof with apertures or slots for the reception of pins D<sup>3</sup> on the underside of the top of the bell D, so that when the bell is in a lowermost position the pins engage the gland-apertures, and by now turning the bell the gland is turned and screwed inward to tighten it and prevent leakage at the pump-plunger.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A gas apparatus, comprising a tank, a bell adapted to be lifted therein by separate power and adapted to descend therein by its own gravity, the bell being provided with an air-inlet valve to admit air upon lifting the bell, a liquid-pump actuated by said bell, and a vaporizer having a valved connection with the interior of the bell to charge the vaporizer with air from said bell, said pump also discharging into said vaporizer, to vaporize the liquid and to mix the vapors with the air to form the desired gas, substantially as shown and described.

2. A gas apparatus, comprising a plurality of generators each having an air-supply tank and a vaporizer, a liquid-supply for each vaporizer, and an auxiliary air-supply reservoir having a valved connection with each of the vaporizers in the generators, substantially as shown and described.

3. A gas apparatus, comprising a tank, a gravity-bell for the tank and having an air-inlet valve, a liquid-pump controlled by said bell, and a vaporizer having a valved connection with the said bell to admit air from the bell to the vaporizer, said pump discharging into the vaporizer, as set forth.

4. A gas apparatus, comprising a tank, a gravity-bell for the tank and having an air-inlet valve, a liquid-pump controlled by said bell, and a vaporizer having a valved connection with said bell to admit air from the bell to the vaporizer, said pump discharging into the vaporizer, and said pump and vaporizer being located inside the tank and bell, as set forth.



5. A gas apparatus, comprising a tank, a bell movable therein, a vaporizer located in the tank and provided with a valve for allowing air to pass from the tank into the vaporizer, and a liquid-pump operated by the movement of the bell and connected with the vaporizer.

6. A gas apparatus comprising two tanks, a bell movable in each tank, a vaporizer located in each tank and provided with a valve for allowing air to pass from the tank into the vaporizer, an auxiliary air-supply reservoir, valved pipes leading from said reservoir to each of the vaporizers, and a liquid-pump connected with each vaporizer.

7. A gas apparatus, comprising a tank, a bell movable therein and having an air-inlet valve, a pump having its plunger attached to the bell, a valved suction-pipe for the pump, a valved discharge-pipe for the pump, a valved by-pass from the pump-cylinder to said suction-pipe, a vaporizer into which discharges the said discharge-pipe, and an air-inlet valve for the vaporizer to allow air to pass from the tank and bell to the said vaporizer, as set forth.

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Witnesses:

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