No. 649,947. Patented May 22, 1900.

C. W. NICKOLS.

ACETYLENE GAS GENERATOR.

(Application filed Mar. 17, 1899.)

(No Model.)

Fig. 1.

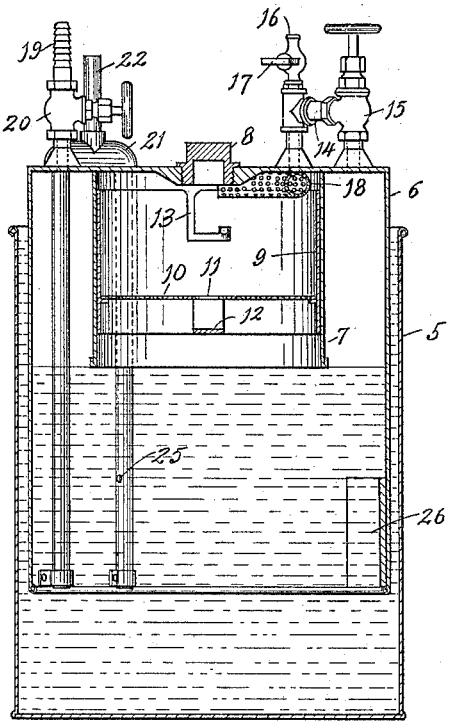


Fig. 2.

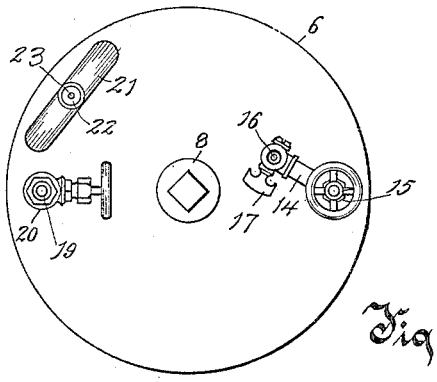


Fig. 3.

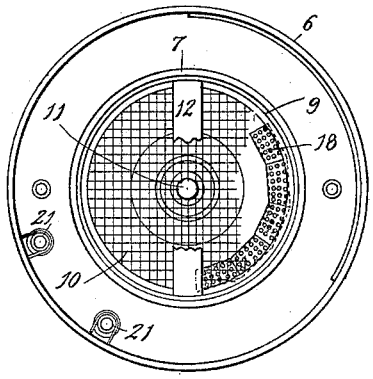
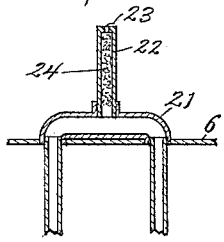


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES W. NICKOLS, OF REEDSBURG, WISCONSIN.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 649,947, dated May 22, 1900.

Application filed March 17, 1899. Serial No. 709,397. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. NICKOLS, of Reedsburg, in the county of Sauk and State of Wisconsin, have invented a new and useful Improvement in Acetylene-Gas Generators, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention relates to improvements in machines or apparatuses adapted for generating acetylene gas from carbid; and the invention has for its object the production of a more convenient, satisfactory, and generally-useful apparatus than has heretofore been in use. An apparatus of this character is very desirable for use by traveling circuses, shows, and street-stands, and with reference to such use I have shown in the drawings herewith a portable apparatus of a form, size, and construction that is especially adapted for such employment as just suggested. The adoption of this form in this application is not intended to suggest that the apparatus is to be limited in use to such purposes, for in this or similar forms and in the same or larger sizes it is adapted for use in buildings or elsewhere either as a portable or a permanent construction.

The invention consists of the apparatus, its parts and combinations of parts, as herein described and claimed, or their equivalents.

In the drawings, Figure 1 is a vertical section centrally of my improved apparatus. Fig. 2 is a top plan view of the gas-holder. Fig. 3 is an under side view of the gas-holder, parts being broken away for convenience of illustration. Fig. 4 is a detail of a fragment of the relief device in section.

In the drawings, 5 is an open-topped water-tank, shown in this instance as cylindrical in form and as constructed of sheet metal and of such size as to be conveniently portable.

6 is a gas-holder with a closed top and open bottom conveniently made of sheet metal in cylindrical form and of such size diametrically as to readily and loosely fit movable vertically in the water-tank 5. A gas-generating chamber 7 is formed by a sheet-metal cylinder secured permanently at its upper end to the under side of the top of the gas-holder 6, preferably centrally thereof, and from which it projects downwardly a less distance than the height of the gas-holder 6. This gas-chamber 7 is considerably less in diameter than the gas-holder 6, is open at its lower end, and its top or cover is provided with an aperture conveniently closed by the screw-threaded cap 8, turning by its thread into the cover of the gas-chamber 7, which is also the cover of the gas-holder 6. A carbid-holding basket 9, fitting releasably in the gas-chamber 7, is constructed with sheet-metal cylindrical walls and a reticulated or perforated bottom 10, preferably located at a little distance above the lower end of the side walls of the basket. The bottom 10 is provided with an aperture 11, preferably centrally thereof, and a transverse bar 12, secured at its ends to the walls of the basket, extends across the basket diametrically below the aperture 11. The basket 9 is insertible in and removable from the chamber 7 through the open bottom of the chamber and is secured releasably in the chamber by bayonet-joints 13 (one only of which is shown) near the upper extremity of the basket.

The gas-chamber 7 is connected with the space in the gas-holder 6, exterior to the gas-chamber, by tubing 14, forming a duct or passage for the free flow of gas therethrough. This tubing is provided with a shut-off valve at 15, adapted to close the passage from the gas-chamber to the gas-holder. The tubing 14 is also advisably provided with a vent-nozzle 16, provided with a stop-cock 17. The duct formed by the tubing 14 originates in the gas-chamber 7 in a strainer-chamber 18, conveniently constructed in cylindrical form by perforated sheet metal and attached to the under surface of the top of the gas-chamber 7 about and adjacent to the aperture through the cover into the tubing 14. A supply-nozzle 19 is secured to the exterior surface of the top of the gas-holder 6, and the passage therethrough opens through the top of the gas-holder into its interior. The nozzle is provided with a shut-off valve therein at 20.

A relief-pipe 21, preferably made bifurcate, extends from near the lower extremity of the gas-holder 6, on the inside thereof, upwardly through the top of the gas-holder and is provided with a hollow screw-threaded plug 22. The elongated plug 22 is advisably provided with a small aperture 23 and is provided with

a supply of filtering material 24 in its chamber. This filtering material may be fine wire and sieve-like in character. The relief-pipe is also preferably provided with a vent 25 at a little distance above the bottom edge of the gas-holder 6, so as to provide for the escape of gas therethrough to a certain extent before the gas is forced down to the bottom of the tubes, through which it can escape more freely. These relief-pipes 21 being located at one side of the gas-holder 6 it is desirable to have them counterbalanced by a weight 26, secured to the wall of the gas-holder, at the opposite side thereof. When excess of gas in the gas-holder seeks relief through the pipes 21 and apertured plug 22, the gas rising in one of the pipes 21 is liable to carry some water with it upwardly, but this water being carried up in one of the pipes 21 will at their junction run over into and down the other pipe, so that escape of water from the gas-holder is thereby prevented, and also such noise is obviated as would be made by the escape of gas and water if there were only one pipe.

To prepare the apparatus for generating gas, lift the gas-holder 6 out of the tank 5 and fill the tank with water to within a few inches of the top. Release and remove the basket 9 from the gas-chamber 7 and put a supply of carbid in the basket and replace it in the gas-chamber. Then replace the gas-holder 6 in the tank, closing the shut-off valve at 15 and the vent-cock 17 and opening the valve at 20 for the escape of air, and let the gas-holder sink in the water nearly or quite to the bottom of the tank. Then close the valve at 20, slightly open the valve at 15, and open wide the vent-cock 17 for a few seconds to allow the air to escape from the gas-generating chamber. The apparatus is then ready for use, and a flexible tube may be attached to the nozzle 19 to convey the gas to a burner or burners. The water in contact with the carbid in the basket will quickly generate a quantity of gas, which rising to the top of gas-chamber will overflow through the tubing 14 into the gas-holder and cause it to rise in the water until the carbid is lifted out of the water, thereby stopping the generation of gas until the gas-supply being drawn off for use or otherwise the gas-holder again sinks in the tank until the water comes in contact with the carbid, renewing the generation of gas thereby.

If large apparatuses are constructed in this general form or if for any other reason the apparatus is so constructed or located that it will be impossible or inconvenient to lift the gas-holder from the tank, then the apparatus may be put in condition for generating gas as follows: The basket 9 being in the gas-chamber and the gas-holder 6 being in the tank 5, remove the plug 8, open the valves at 15 and 20 and the vent-cock 17, and then fill the tank with water until it covers the gas-holder. This excludes all the air from the gas-holder and from the gas-generating chamber. Now close the valves 15 and 20 and insert the tube of a suction-pump through the aperture in the top of the gas-chamber and down through the aperture 11 until it rests on the bar 12. Pump the water out of the gas-chamber down to the bar 12 and remove the pump. Put a supply of carbid in the basket and close the aperture with its plug 8. Water will still remain in the gas-holder outside the gas-chamber up to the top; but the gas-holder by its buoyancy will have been raised in the tank, so that water therein outside the gas-holder will be only at about a level with the bottom of the gas-holder or a little above. Open valve 15 slightly and open vent-cock 17 for a few seconds, just long enough to let the air in the gas-chamber escape. Then close the cock 17 and open wide the valve 15. Now connect the nozzle 19 up to a burner, and the apparatus is ready for use.

What I claim as my invention is—

1. An acetylene-gas-generating apparatus, comprising an open-top water-tank, an open-bottom gas-holder telescopable freely in the water-tank, an open-bottom gas-chamber within the gas-holder of less diameter and height than the gas-holder, the gas-chamber being located at and secured permanently to the top of the gas-holder, tubing at and above the top of the gas-holder connecting the gas-generating chamber with the gas-holder chamber outside of the gas-generating chamber, a cut-off valve in the tubing, a vent-nozzle with a valve discharging from the tubing, a supply-nozzle leading from the top of the gas-holder, a detachable basket in the gas-generating chamber removable therefrom through the bottom, and a gas-relief consisting of two-leg pipes in the gas-holder, each extending upwardly from near the bottom of the holder, and uniting at the top of the holder above the water in the gas-holder and extending upwardly therefrom in a single discharge-pipe, one of said legs being provided with an aperture at a distance upwardly from its lower extremity.

2. The combination with an open-bottom gas-holder, and an open-bottom gas-generating chamber of less diameter and height than the gas-holder located in and secured to the top of the gas-holder and provided with a capped aperture in the top, of a basket in the gas-generating chamber secured thereto and provided with a perforated bottom having an enlarged central aperture, and a transverse bar secured to the basket below the enlarged aperture in the perforated bottom thereof, the bar being adapted to support the end of a suction-pipe inserted through the unclosed aperture in the top and through the enlarged aperture in the perforated bottom, for withdrawing water from within the gas-holder.

3. In a gas-generator, a water-tank, a closed-top gas-holder in the water-tank provided with a relief-pipe open at the lower ends near

the bottom of the gas-holder normally in the water in the tank and gas-holder and extending upward through the top of the holder and partially closed at the top by a removable hollow plug, the pipe being furcate from its lower extremities to above the top of the gas-holder and above the surface of the water and one leg having an aperture medially, the device being adapted to permit water raised by escaping gas in one leg of the pipe to run down the other leg thereof.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. NICKOLS.

Witnesses:
JOHN D. DOVER,
FRED. W. ELLENBERG.