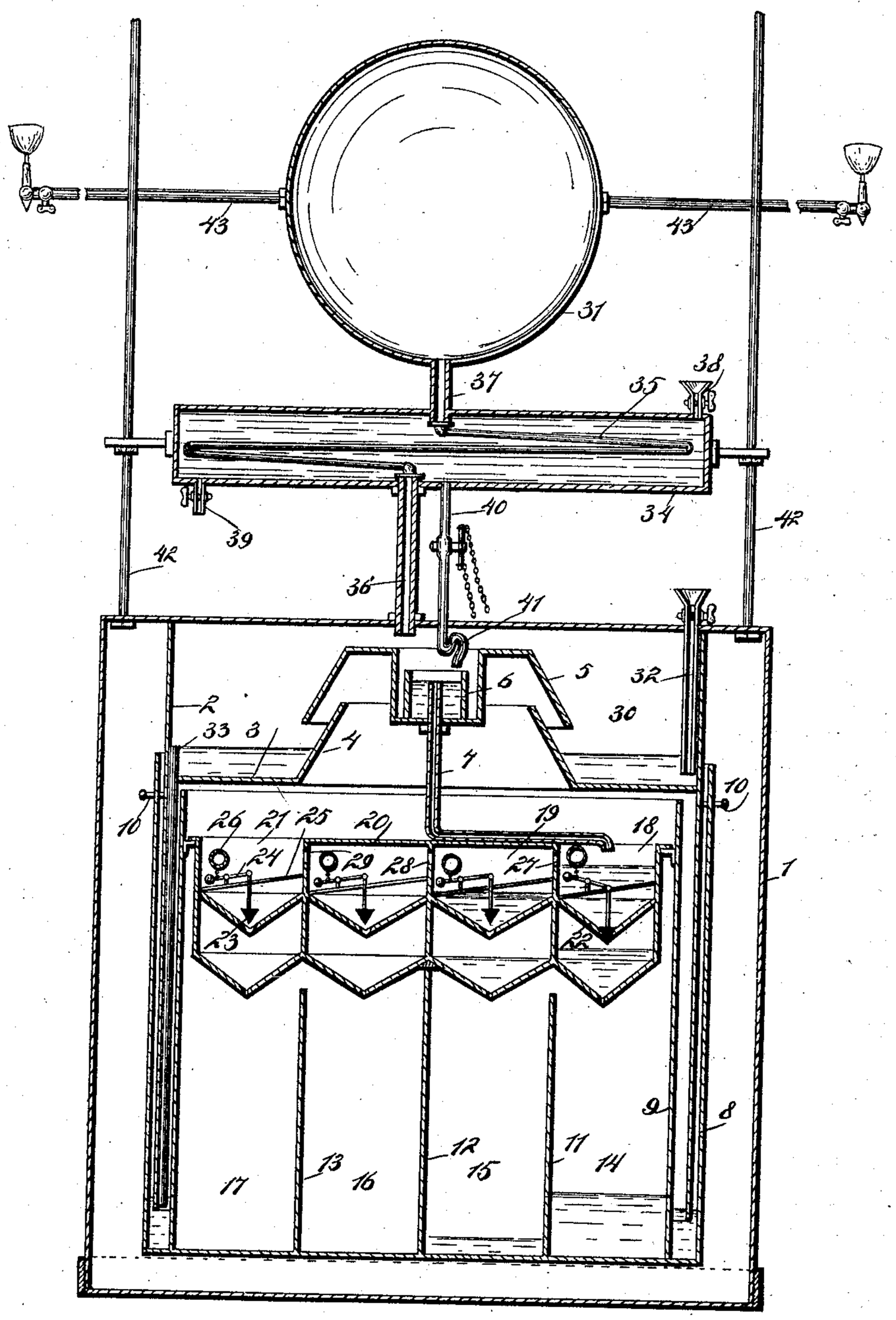
(No Model.)

W. McGRAW.

ACETYLENE GAS GENERATOR.

No. 603,535. Patented May 3, 1898.



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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 603,535, dated May 3, 1898.

Application filed June 25, 1897. Serial No. 642,279. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM McGRAW, of Mount Airy, in the county of Hamilton and State of Ohio, have invented a new and Improved Acetylene-Gas Generator, of which the following is a full, clear, and exact description.

My invention relates to apparatus for manufacturing gas produced from calcium carbid, which product is known as "acetylene gas;" and the object is to provide a light and yet strong generator of this character that may be portable or suspended from a fixed support in the manner of a chandelier.

I will describe a generator embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a vertical section of a generator embodying my invention.

The generator comprises a casing 1, of any suitable material and of any desired configuration. From the upper wall of the casing an inner wall 2 extends downward nearly to the bottom of the casing, there being a space between said depending wall and the side wall of the casing. Near its upper portion the inner shell or depending wall is provided with a transverse partition 3, having an opening at its center, to the wall of which is affixed a trap-section 4. The wall of this trap-section is inclined upward and inward, and held above this trap-section 4 and spaced therefrom is a trap-section 5.

The upper trap-section 5 supports a water-supply cup 6, and through the bottom of this water-supply cup the water-charging pipe 7 is extended. This water-charging pipe 7 has its upper end extended nearly to the top of the cup 6, and the lower portion of said pipe 7 is extended horizontally and designed to rest upon water-cells, as will be hereinafter described.

The carbid-container is suspended from the casing or wall 2. As here shown, this carbid-container has an outer side wall 8 and an inner wall 9, the two walls being concentric and spaced one from the other, so as to hold water in the lower part, providing a water seal at the bottom of the partition 2, which extends between said walls and nearly to the bottom of the container. As here shown, the container is removably suspended on the wall 2 by means of pins 10. The lower portion of the container is provided with vertical partitions 11, 12, and 13, forming the side walls of carbid-chambers 14, 15, 16, and 17, the other walls of these chambers being formed by the inner wall of the container 9.

Supported within the container above the carbid-chambers is a series of water-cells 18, 19, 20, and 21. Each water-cell consists of two chambers divided by a funnel-shaped partition 22, having a valve-controlled opening at its apex, and the bottoms of the lower chambers are also made funnel-shaped and are provided with outlet-ports at their apexes for discharging water into the carbid cells or chambers. The openings through the partitions 22 are controlled by conical plug-valves 23. The stems of these valves 23 are suspended from levers 24, fulcrumed on rods 25, extended across the upper chambers of the water-cells. The opposite ends of the levers 24 are slightly weighted to overbalance the valves and are also provided with floats 26. The cells are open at the top, and on the cells 19 and 20 is a rest-bar for the pipe 7. Communication between the cell 18 and cell 19 is provided through an opening 27 in the separating-walls between said cells 18 and 19. Communication is provided between the cells 19 and 20 through an opening 28 in the upper portion of the dividing-wall, and communication is provided between the cells 20 and 21 through an opening 29 in the upper portion of the dividing-wall.

The bottom of the casing 1 may be made detachable from the body portion, so that the carbid-container and the water-cells may be removed for the purpose of cleaning, recharging, or for other purposes. When these parts are so removed, the upper section 5 of the trap within the gas-receiving chamber 30 will move downward into water in the lower portion of said gas-chamber, thus preventing the back passage of gas from the gas-cylinder 31. Water may be poured into the chamber 30 through a valve-controlled pipe 32, and any overflow will discharge through an overflow-pipe 33, extended downward along

the inner side of the wall 2 to nearly the bottom of the space between the walls 8 and 9 of the carbid-container.

Supported above the casing 1 is a condensing-box 34, within which is arranged a condensing-coil 35, one end of which communicates with a pipe 36, leading into the gas-receiving chamber 30, and the other end connects with a pipe 37, leading into the gas-cylinder 31. The condensing-box 34 has a valve-controlled inlet 38 and a valve-controlled outlet 39. From the condensing-box 34 a valve-controlled tube 40 extends through the top wall of the casing 1, and at its inner end this pipe 40 is provided with a water-trap crook 41. The pipe 40 has its outlet directly over the water-cup 6. Therefore it will be seen that the box 34 serves two purposes—that is, for containing water to be supplied to the carbid and also for condensing the gas as it passes through the coil 35. The box 34 has arms extended from its ends engaging with rods 42, which project upward from the casing 1. These rods may be employed for suspending the device from a ceiling or similar support. From the gas-cylinder 31 any desired number of burner-pipes 43 may be extended and of course provided with suitable gas-burners.

In operation a suitable amount of calcium carbid will be placed in the cells or chambers 14, 15, 16, and 17. Then water admitted from the box 34 will discharge through the pipe 40 into the cup 6 and overflow into the pipe 7, from which it will discharge into one of the outer water-cells. As here shown, the water will discharge into the cell 18 and will flow through the perforations in the bottoms of said cells and into the first carbid-cell 14. Of course at this time the valve 23 will be held upward by the counterweight on the opposite end of its supporting-lever. The water will flow quite slowly into the carbid-cell 14, and immediately upon the contact of the water and carbid acetylene gas will be formed. This acetylene gas will pass upward between the outer surface of the water-cells, which, it may be here stated, are supported upon suitable brackets on the inner wall 9 of the container, and are also centrally supported by the partition 12. The gas will continue upward through the trap-sections 4 and 5, and thence through the pipe 36 and the condenser-pipe into the cylinder 31, from which it is taken to the burners.

The valve in the pipe 40 is so constructed that when entirely open water passes through it into the trap 6, and thence into pipe 7, three times faster than it can pass through the valve-controlled orifice in the bottom of chamber 18 and into the lower chamber. The opening in the bottom of chamber 18 is so small that only one-third the quantity of water passes through it that passes into the chamber 18 in a given time. The opening through the bottom of the lower chamber is made in the form of a slot, the length of which is nearly equal to the width of the carbid-cell under it, or a series of perforations may be employed. By thus making the opening the water will be distributed on the carbid, which would not be the case were the lower chamber omitted and the water discharged directly from the chamber 18 onto the carbid. The distributing of the water is of importance, and it is discharged from the lower chamber nearly as quick as it enters.

It is obvious that the several cells may be made of any desired size to suit the length of time that may be required for the burning of the lamp.

After the carbid shall have been consumed the parts may be separated, cleaned, and again put in condition for generating gas.

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

1. An acetylene-gas generator comprising a casing, a carbid-container therein and having a series of cells, water-cells above the carbid-cells and designed to discharge water therein, the said water-cells communicating one with another, means for automatically governing the flow of water through the bottom openings of the cells, a cylinder for receiving the generated gas, and a burner-pipe extended from said receiver substantially as specified.

2. An acetylene-gas generator comprising a casing, a carbid-container supported from said casing and having a number of carbid-cells, water-cells supported in the container and adapted to overflow one into another, the said cells having funnel-shaped bottom walls provided with an outlet at the apex for discharging water into the carbid-cells, means for automatically closing said outlets, a gas-receiving cylinder, a pipe connection between said cylinder and the casing, and a condensing-coil in said connection, substantially as specified.

3. An acetylene-gas generator comprising a casing, a double-walled carbid-container, a wall suspended from the upper wall of the casing and extended between the walls of the container and supporting the same, carbid-cells in the container, water-cells supported in the container and having outlets for discharging water into the carbid-container, means for automatically closing said outlets, a horizontal partition at the upper portion of the supporting-wall, a trap-section in said partition, another trap-section above the first-named trap-section, a water-cup supported by said other section, a pipe extended from the upper portion of said cup downward through its bottom and discharging into one of the water-cells, a condensing-box supported above the casing, a valve-controlled tube extended from said box through the top wall of the casing and having a trap-curve at its inner end discharging into the water-cup, a condensing-coil in the condensing-box and having communication with the interior of the

casing, a gas-cylinder having communication with said condensing-coil, and a gas-burner pipe or pipes also having connection with said cylinder, substantially as specified.

4. An acetylene-gas generator, comprising a series of carbid-containers, water-cells above the containers and adapted to discharge therein, means for automatically closing said discharge and connections between the cells whereby water may flow from one cell into another, substantially as specified.

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Witnesses:
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