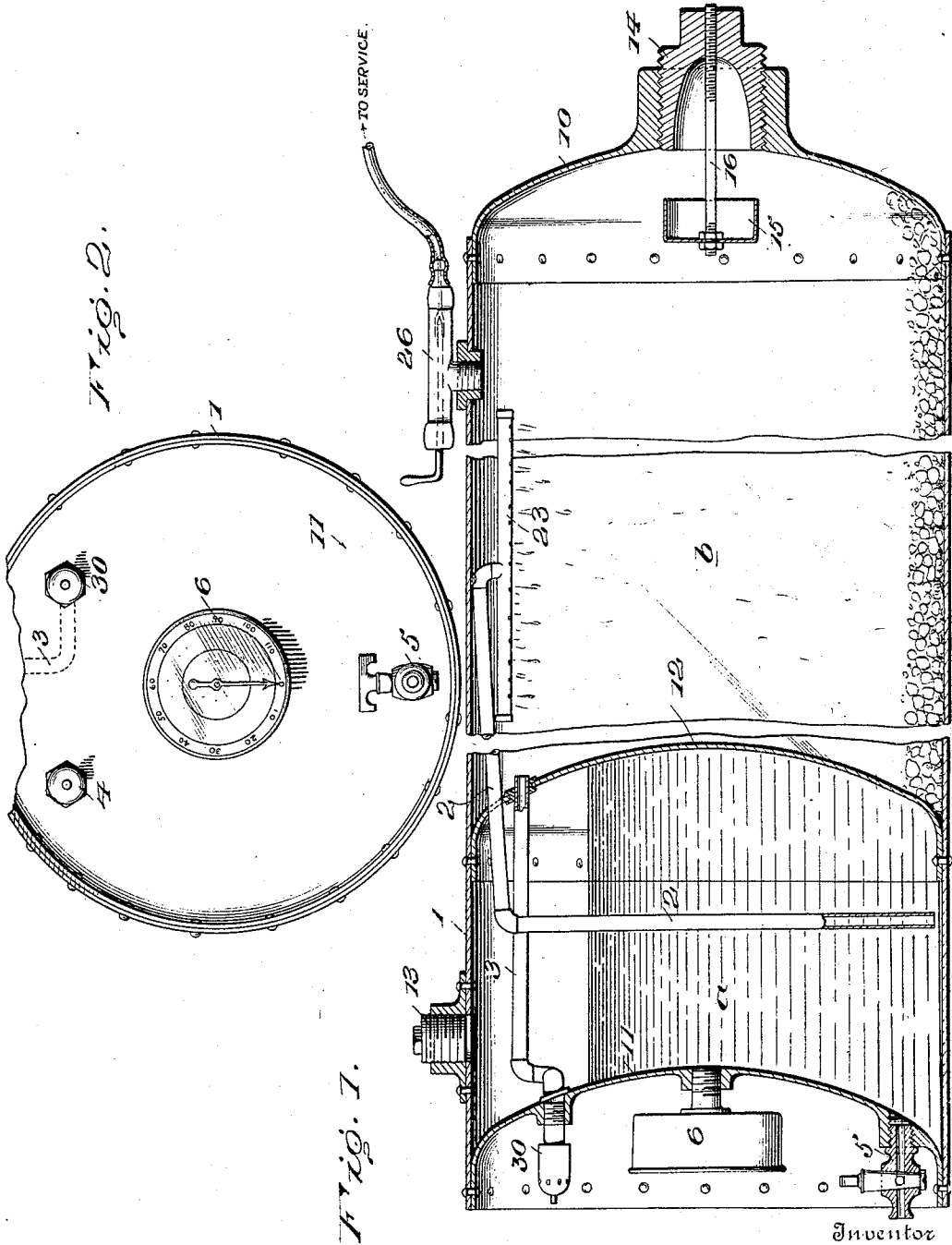


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ACETYLENE GAS GENERATOR.
APPLICATION FILED FEB. 6, 1911.

1,008,049.

Patented Nov. 7, 1911.



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ACETYLENE-GAS GENERATOR.

1,008,049.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed February 6, 1911. Serial No. 606,991.

To all whom it may concern.

Be it known that I, CLAIR A. NICKLES, a citizen of the United States, residing at Ponca, Kay county, Oklahoma, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in acetylene gas generators; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following description of the accompanying drawings illustrating what I now consider to be the preferred embodiment from among other formations and arrangements within the spirit and scope of my invention.

An object of the invention is to provide a compact, comparatively simple, durable, exceedingly safe and easily manipulated acetylene gas generator wherein water and generating or carbid chambers are employed with means whereby pressure is automatically maintained in both chambers due to the generation of gas, and whereby water is automatically fed to the carbid chamber whenever the pressure therein drops and whereby the feed of water thereto is stopped whenever the pressure in said carbid chamber exceeds that in the water chamber, and whereby the pressure in said chambers can be built up and equalized to the safety or maximum pressure.

A further object of the invention is to provide certain improvements in details and arrangements whereby a highly efficient automatic generator of acetylene or other gas will be produced.

The invention consists in certain novel features in construction and arrangements, and in combinations as more fully and particularly set forth hereinafter.

Referring to the accompanying drawings, Figure 1, is a longitudinal section of a generator constructed in accordance with my invention. Fig. 2, is a rear end view thereof partially broken away.

In the drawings, 1, is a strong usually elongated tank closed at one end by head 10, and at the opposite end closed by head 11, the last named head being usually dished

inwardly and inset in the tank head. A fixed closed partition 12, (usually arranged between the center of the length of the tank and the head 11) divides the interior of the tank into a water chamber *a*, and a carbid or generating chamber *b*. The tank at its top is provided with a filling opening into the water chamber *a*, and this opening is normally tightly closed by a removable screw plug 13. The end head 10, is provided with a filling opening through which carbid can be introduced into chamber *b*, and this opening is normally tightly closed by screw plug 14. In the specific example illustrated, I show the plug 14, provided with a cup 15, for supplying water for initial generation. This cup is carried by a stem 16, secured to the plug and projecting inwardly therefrom and holding the cup spaced therefrom with its open side toward the plug. When the generator is in its normal horizontal generating position, this cup is in water discharging position, so that the contents thereof will discharge into chamber *b*. An open passage is provided between the lower portion of chamber *a*, and the upper portion of chamber *b*, for the equalization of pressure in said chambers by the back and forth flow of liquid and gaseous fluid between the chambers. As a convenient means for constituting this passage, I provide an internally open or unobstructed pipe or tube 2, arranged vertically in the chamber *a*, and extending from the upper portion thereof to the bottom thereof with its lower open end near the floor of said chamber. This pipe passes through the upper part of the partition 12 and is soldered or otherwise fixed thereto to form a tight joint therewith, and extends along the top of chamber *b*, and opens into a distributing pipe 23, closed at the ends and perforated along its bottom side to discharge water into the carbid chamber. The distributing pipe is centrally and longitudinally arranged in the top of the carbid chamber and is usually rigidly fixed and supported as by being soldered to the inner depending end of pipe 2, which can be soldered to the inner surface of the top of the tank, although I do not wish to limit my invention to such specific arrangements for dropping and distributing the water in the carbid chamber.

26, is any suitable valve-controlled gas off-take or service pipe connection from

chamber *b*, preferably secured by screw thread connection in an opening through the tank top.

3, is a pipe extending through and fixed in the upper part of partition 12, and opening into the upper part of the carbid chamber and from thence extending through the upper part of the water chamber and at its outer end fixed to the head 11, in communication with a bushing fixed in said head. A pop valve 30, is arranged at the exterior of the head 11, and its casing is screwed into said bushing into communication with pipe 3, so that the valve of said pop valve is held closed by its spring against the pressure in the carbid chamber. This pop valve is set to blow off or open say at about fifty pounds pressure, or at a pressure in excess of the maximum operating pressure of the generator. The pipe 3, is closed from communication with the interior of the water chamber. Another pop valve 4, is arranged at the exterior of the head 11, and is screwed into an opening therein above the water line in the water chamber *a*, and opening into said chamber, and the spring of said valve holds the same closed against the pressure in said water chamber and is usually set to blow off or open at about forty pounds pressure or at the maximum working pressure of the generator.

5, is a drain or pet cock arranged at the exterior of the head 11, and secured therein and opening into the lower portion of the water chamber for draining the same when desired.

6, is a pressure gage arranged at the exterior of the head 11, and secured to said head in communication with the water chamber to indicate the pressure therein.

In charging the tank for operation, the plug 13, is removed and the chamber *a*, is charged with water, until about two thirds full, and said plug is then applied and screwed up tightly. The tank is then placed in a vertical position with the chamber *b*, at the upper end thereof, and the plug 14, is removed and a sufficient charge of carbid is placed in chamber *b*, the gas take off valve 26, having been adjusted to closed position. The cup 15, is then filled with water, and the plug 14, is inserted in the opening therefor and screwed up tight. The generator is then placed on its side in horizontal position which is its normal position during operation and can be secured to an automobile or wherever it is to be employed. The water in cup 15, is thus discharged onto the carbid and is sufficient to provide for the initial generation to produce the necessary working pressure for the automatic operation of the generator. The gas under pressure produced in chamber *b*, by the initial generation, flows through the open passage 23, 2, into the

chamber *a*, until the pressure in both chambers is equalized. As the gas is used from chamber *b*, so that the pressure therein drops below that in chamber *a*, water will be forced through the communicating passage and sprinkled on the carbid to again start generation and build up the pressure, and as the pressure rises in chamber *b*, above that in chamber *a*, equalization will be automatically attained through gas (pressure) backing up through the communicating passage and passing up into chamber *a*, through the water therein. The pressure in the tank cannot exceed the maximum working pressure, inasmuch as pop valve 4, is set to blow off at the working pressure, say at forty pounds. This pop valve opens into chamber *a*, and when it blows off, the pressure will be reduced in the water chamber and hence the pressure will immediately flow thereinto from the generating chamber, and thus stop generation and reduce the pressure in both chambers.

The pop valve 30, from the generating chamber is set to blow off at a pressure considerably above the maximum working pressure; for instance, if the maximum working pressure is about forty pounds, the pop 30, could be set to blow off at about fifty pounds. This pop 30, constitutes an emergency safety device to meet abnormal conditions that might arise. For instance, should passage 2, 23, become clogged while generation of gas is taking place in chamber *b*, and thereby close communication with chamber *a*, and trap the increasing pressure in chamber *b*, the pop 30, would blow off when the pressure reached a dangerous point and relieve the pressure.

It is evident that various changes, variations and modifications might be resorted to without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact disclosures hereof.

What I claim is;—

1. An acetylene gas generator comprising a tank containing a water chamber and a carbid chamber, means placing the carbid and water chambers in open communication for the free flow of gas under pressure from the carbid chamber to the water chamber and alternately for feeding water from the water chamber to the carbid chamber, a pop valve in communication with the water chamber set to blow off about at the maximum working pressure of the generator, and a pop valve in communication with the carbid chamber set to blow off at a pressure greater than said maximum working pressure.

2. An acetylene gas generator comprising a horizontally disposed tank internally formed with a water chamber and with a carbid chamber, both chambers normally

closed for the maintenance of pressure therein, a service gas off-take from the carbide chamber, an open unobstructed pipe connection from the interior of the lower portion of the water chamber to the upper portion of the carbide chamber and there provided with means for distributing water on the carbide in the carbide chamber, said pipe connection formed and arranged for the free back flow of gas under pressure from the carbide chamber to the water chamber and alternately for the flow of water from the water chamber to the carbide chamber, substantially as described.

3. An acetylene gas generator operated by the pressure of the gas generated therein and comprising means providing a water chamber and a carbide chamber, both normally closed for the maintenance of the maximum uniform working pressure therein, and means placing said chambers in free unobstructed open communication for equalizing the pressure therein by automatically and alternatively passing gas from the carbide chamber to the water chamber and water from the water chamber to the carbide chamber when the normal high pressure in either chamber drops below that in the other, substantially as described.

4. An acetylene gas generator comprising a tank internally divided to form a water chamber and a carbide chamber, said tank being provided with a service gas off-take from the carbide chamber, a pop valve in open communication with the water chamber for maintaining the maximum working pressure therein, and an open unobstructed pipe connection from a point below the water line in the water chamber and extending to and opening into the carbide chamber for distributing water to the carbide and for conveying gas under pressure from the carbide chamber to the water chamber.

5. An acetylene gas generator comprising a horizontally disposed tank having end heads, one of said heads being dished inwardly, said tank being provided with a vertically disposed partition dividing the interior of the tank into a water chamber and a carbide chamber, said tank provided with normally closed charging openings into said chambers, a service gas off-take from said carbide chamber, said dished head being provided with a pressure gage in open communication with said water chamber, a pop valve carried by said dished head and in open communication with said water chamber, a pipe extending through the water chamber and opening into the carbide chamber and through said dished head, a pop valve carried by said dished head and in open communication with said pipe, means for starting initial generation of pressure in

the carbide chamber, and a pipe connection opening into the water chamber at a point below the water line and extending therefrom to the upper portion of the carbide chamber and there provided with means for distributing water on the carbide.

6. An acetylene gas generator comprising a horizontally disposed tank internally divided vertically to provide a water chamber and a carbide chamber, said tank having a normally closed charging opening into the water chamber, and having a charging opening into the carbide chamber, means for closing said opening into the carbide chamber provided with a water cup, a service gas off-take from the carbide chamber, safety means for relieving the pressure in said chambers when the same rises above the maximum working pressure, and a water distributor in the upper portion of the carbide chamber in open communication with the water chamber below the water line therein.

7. An acetylene gas generator comprising a movable tank having an internal partition dividing the same into a water chamber and a carbide chamber, said tank being provided with means for taking off the gas from the carbide chamber and with an opening into the carbide chamber, a removable closure for said opening provided with and carrying a water-cup arranged in said carbide chamber in water discharging position when the tank is in operative position and in water retaining position when the tank is in abnormal position, and means for feeding water from said water chamber to the carbide in said carbide chamber.

8. An acetylene gas generator comprising an elongated portable tank arranged horizontally when in operative position and having a base on which the same can be arranged in upright abnormal position, said tank having an opening, a removable closure for said opening provided with a water cup arranged inwardly beyond the closure and having means fixing the same thereto and so arranged that the cup is in water holding position when the tank is in upright position and is in water discharging position when the tank is in operative position, said tank being internally divided into a water chamber and a carbide chamber, said cup being arranged in said carbide chamber, water distributing means in the carbide chamber, and a pipe connection from said means opening into the water chamber below the water line.

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

CLAIR ARTHUR NICKLES.

Witnesses:

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