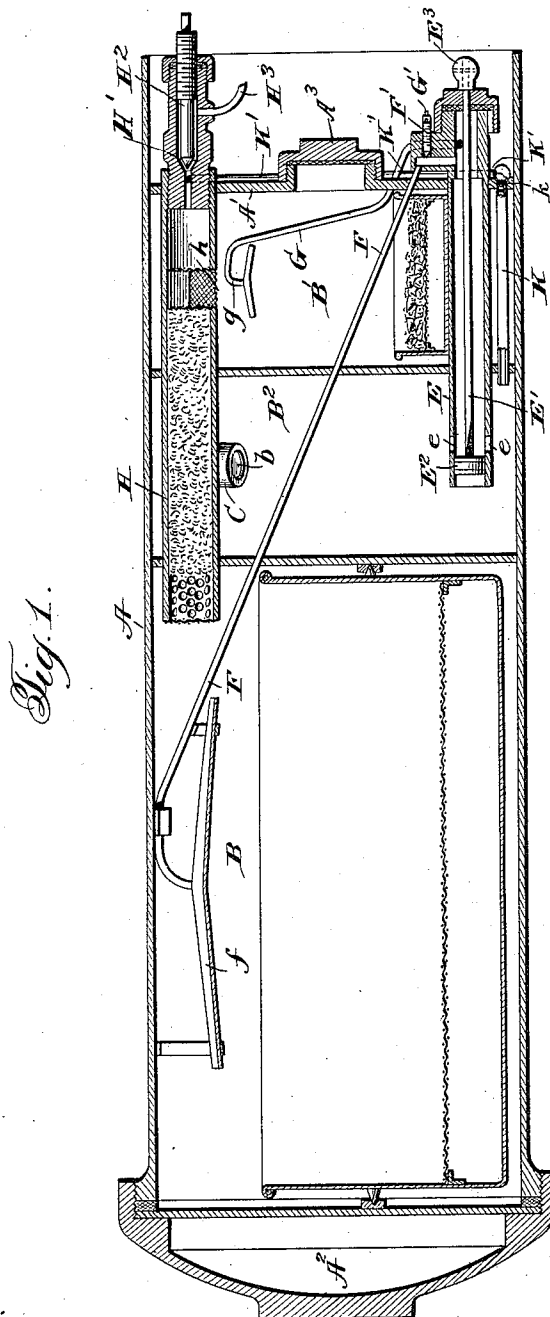


G. H. DAVIS.
ACETYLENE GAS GENERATOR.
APPLICATION FILED MAY 20, 1912.

1,060,670.

Patented May 6, 1913.
2 SHEETS—SHEET 1.



Witnesses:

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G. Wedemier.

Inventor:

George H. Davis,
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Fig. 2.

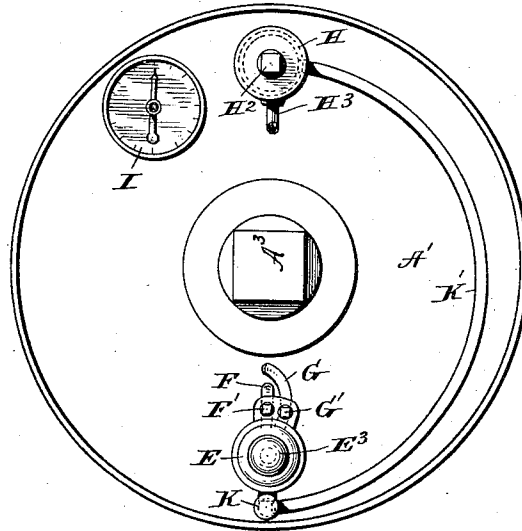


Fig. 3.

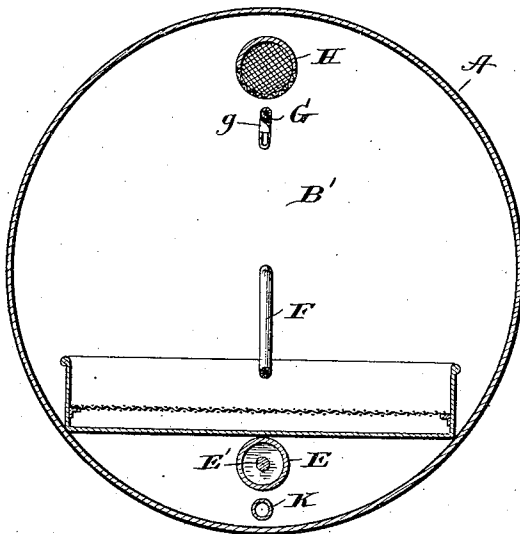
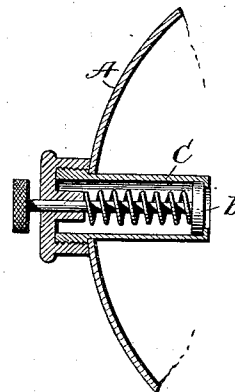


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE H. DAVIS, OF PORTLAND, MAINE.

ACETYLENE-GAS GENERATOR.

1,060,670.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed May 20, 1912. Serial No. 698,527.

To all whom it may concern:

Be it known that I, GEORGE H. DAVIS, citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an improvement in acetylene gas generators and more particularly to a portable generator of this character which is particularly adapted for use on automobiles and the like.

One of the primary objects of the present invention is the provision of a generator of this character which is provided with an auxiliary carbid chamber which may be readily brought into use should the carbid in the main carbid chamber become exhausted, thus enabling the generator to be used for a time without replenishing the carbid in the main carbid chamber.

A further object of the present invention is the provision of a device having these characteristics which is compact and of such a form that it may be readily secured to the running board or other part of a vehicle in the manner ordinarily adopted for prestolite or other gas storage tanks.

A further object of the present invention is the provision of a gas generator of the high pressure type, in which a single pipe is utilized for feeding water from the water chamber to the gas generator chamber and maintaining the gas at a uniform high pressure, in combination with means acting automatically should such single pipe become clogged, to prevent the formation of excessive pressures in any part of the generator.

Other objects of the invention will be apparent from the detailed description hereinafter when read in connection with the accompanying drawings forming a part hereof wherein a convenient embodiment of the invention is illustrated, and wherein like characters of reference refer to similar parts in the several views.

In the drawings: Figure 1 is a longitudinal section of the improved generator; Fig. 2 is a front elevation of the same; Fig. 3 is a cross section through the auxiliary car-

bid chamber, and Fig. 4 is a detail view of the safety valve.

Referring now more particularly to the drawings, A designates the casing of the generator which in the type of the invention illustrated, is in the form of an elongated cylinder, the forward end of which is conveniently closed by a head A' and the rear end of which is provided with a suitable opening therein which is adapted to be closed by a removable closure A² of any desired type. The interior of the chamber A is divided by suitable partitions into three compartments, an enlarged main carbid chamber and gas reservoir B, a smaller auxiliary carbid chamber and gas reservoir B', and a water chamber B².

In the particular embodiment of the invention illustrated, the enlarged carbid chamber and reservoir B is positioned at the rear end of the casing, the smaller auxiliary carbid chamber and reservoir at the front end of the casing, and the water chamber B² intermediate said carbid chamber and gas reservoirs. It will be understood, however, that the invention is not restricted to this particular arrangement of the compartments. The main carbid chamber B is charged with carbid through the opening in the end of the casing A which is closed by the closure A² and any suitable type of carbid receptacle may be positioned within the compartment B to receive and retain such carbid. The head A' of the casing A is provided with an opening therein through which carbid may be introduced into the auxiliary carbid chamber and gas reservoir, such opening being normally closed by a closure A³ of any desired type. Any suitable form of container may be positioned in the auxiliary carbid chamber and gas reservoir, for the retention of the carbid placed therein.

Secured to the casing A and projecting within the upper portion of the water reservoir B² is a safety valve casing C, in which is positioned a safety valve b which may be of any suitable type and is adapted, when open, to establish communication between the upper portion of the water reservoir and the atmosphere. The safety valve b is preferably of such a construction that it may be

adjusted to open when any desired degree of pressure has been reached in the water chamber. The safety valve casing C is removably secured in the casing A and the opening which receives said valve casing constitutes a fill opening for the water reservoir B², the safety valve casing being removed when it is desired to fill the water reservoir with water. Secured within the lower portion of the head A' at the front of the casing A and projecting through the auxiliary carbid chamber and gas reservoir B' and into the water chamber B² is a pump barrel E, the front end of which projects outwardly beyond the head A' of the casing and has connected thereto in any suitable manner a stuffing box within which a plunger rod works, the inner end of which carries a piston E² which is adapted to slide within the pump cylinder E. Secured to the outer end of the piston rod E' is a suitable handle E³ by means of which the piston rod may be reciprocated. The portion of the pump cylinder E which traverses the auxiliary carbid chamber and gas reservoir is imperforate and the portion of the pump cylinder which projects into the water reservoir B² is provided with a plurality of openings e therein which are positioned in advance of the piston E² when the same occupies its extreme rearward position and which serves to establish communication between the water chamber B² and the interior of the pump cylinder E.

Communicating with the portion of the pump barrel E which extends beyond the head A' of the casing, is one end of a pipe or tube F which pipe extends upwardly from its connection with the pump barrel through the front wall of the casing, the auxiliary carbid and gas reservoir B', the water reservoir B², and into the upper portion of the main carbid chamber and gas reservoir B. The portion of the pipe F which extends within the main carbid chamber and gas reservoir B is provided with a downwardly turned end below which is positioned a trough f which is adapted to receive water from the downwardly turned end portion of the pipe and direct the same onto the carbid contained in the chamber B, in a manner to be hereinafter more particularly set forth.

The communication through the pipe F may be closed when desired by means of a needle valve F', the operating handle of which is positioned outside of the casing so as to be readily accessible to the operator.

Communicating with the front portion of the pump barrel E which projects beyond the front wall A' of the casing, is one end of a pipe G, which pipe extends upwardly from its connection with the pump barrel through the front wall of the casing, and to

the upper portion of the auxiliary carbid chamber and gas reservoir B', the upper portion of said pipe being provided with a downwardly turned end g through which water is adapted to be directed onto the carbid contained in the auxiliary carbid chamber and gas reservoir, in a manner to be hereinafter more particularly set forth. The pipe G is provided with a needle valve G' by means of which communication through said pipe may be closed, the operating portion of said needle valve being positioned outside of the casing A so as to be readily accessible.

Secured in the upper portion of the head A' of the casing A and extending rearwardly therefrom, through the auxiliary carbid chamber and gas reservoir B', the water reservoir B² and into the main carbid chamber and gas reservoir B is an open ended tube H, to the front end of which is secured a suitable valve casing H' in which is mounted a reducing valve H² which serves to control the flow of gas to a gas outlet pipe H³, which is connected to the valve casing H'. The portion of the tube H which traverses the water chamber B² is imperforate so that the interior of said tube is not in communication with the water chamber. The portion of the tube H which traverses the auxiliary reservoir is, however, provided with a suitable opening or openings h therein, so that the interior of said tube is in communication with the portion of said auxiliary carbid chamber and gas reservoir. The open end of the tube H projects into the upper portion of the main carbid chamber and gas reservoir B so that such tube is also in communication with the main carbid chamber and gas reservoir. The openings in the tube H which serve to establish communication between the interior of said tube and the chambers B and B' are conveniently covered by screens of any suitable material and the interior of said tube may be if desired provided with any suitable filtering material.

Secured to the head A' of the casing A and in communication with the upper portion of the auxiliary carbid chamber and gas reservoir B, is a pressure gage I, which may be of any well known construction.

Having described the construction of the improved generator, I will now set forth the manner of using the same and the operation thereof. The main carbid chamber B and the auxiliary carbid chamber B' are first charged with carbid and the water chamber B² is filled with water. The generator is then secured in a horizontal position to the running board or other part of the vehicle. The needle valve F' is then adjusted to open the passage through the pipe F and the needle valve G' is adjusted to

close the passage through the pipe G. To start the generator the handle of the pump is manipulated to reciprocate the piston E² in the pump cylinder E which serves to force a portion of the water from the water chamber B² through the pipe F and onto the carbid in the main carbid chamber B. During this operation, the needle valve controlling the outlet of gas from the pipe H is kept closed so that as soon as the gas is generated in the main carbid chamber B, some of the gas will pass into the open end of the pipe F, through said pipe into the pump barrel or cylinder E, out through the opening e in said pump barrel cylinder and into the upper portion of the water chamber B², thus equalizing the pressure in the water and in the main carbid chambers. Gas will also pass from the pipe H, through the opening h therein into the auxiliary carbid chamber B' so that gas will be maintained at an equal pressure in the main carbid chamber B, the auxiliary carbid chamber B' and the water chamber B², the pressure at which the gas is maintained in these chambers being controlled by the safety valve b in the water chamber. After the desired pressure has been obtained in the compartments B, B' and B², the piston E² is moved to its extreme rear position and is no longer manipulated as the gas will then be automatically maintained, as used, at the desired pressure in the several compartments. The generator is now ready for use, and by opening the needle valve H² gas will pass through the pipe H to the gas outlet pipe and from thence to the burners. The generator will now act automatically to supply gas to the burners at substantially a constant pressure regardless of the fact whether the burners are adjusted to burn with a high or low flame. This result is obtained by reason of the fact that as soon as the pressure in the main carbid chamber B is diminished by the passage of some of the gas therein to the burners, the pressure of the gas in the water chamber will serve to force some of the water from the water chamber through the pipe F into the main carbid chamber B, thus generating a fresh supply of gas and immediately equalizing the pressure in the carbid chamber B and the water chamber B². Should the pressure for any reason become excessive, the safety valve b will open and allow a portion of the gas to escape to the atmosphere until the desired pressure has again been reached. Should the carbid in the main carbid chamber B become exhausted, it is only necessary in order to continue the use of the generator to adjust the valve F' to close the passage through the pipe F, and adjust the needle valve G' to open the passage through the pipe G. The pipe G will then act automatically to equal-

ize the pressure in the water chamber and the auxiliary carbid chamber and the gas will flow from the auxiliary carbid chamber through the pipe H to the burners, so that the generator may be used until the carbid in both the main and auxiliary chambers has been exhausted. In the event of either the pipe F or the pipe G becoming clogged, when the same is being used, there might be developed in the carbid chambers a pressure high enough to become dangerous. To avoid the accumulation of any such dangerous pressures, I have provided a pipe K which leads from the front of the casing A through the emergency carbid chamber B' and into the lower portion of the water chamber B², the forward end of which pipe is connected by a branch pipe K' to the forward portion of the pipe H. The pipe K and the branch pipe K' are somewhat larger in diameter than the pipes F and G and there is provided adjacent the connection of the pipe K with its branch pipe K' a check valve k which is normally held closed by the weight of the water in the water reservoir and the pressure of the gas on top of the water. Should a dangerous pressure accumulate in either of the carbid chambers, the same pressure would be maintained in the pipe H, which would cause the unseating of the check valve k and allow the gas to enter directly from the pipe H into the lower portion of the water reservoir where it would bubble up through the water to the top of the reservoir and escape to the atmosphere through the safety valve H. This would continue until the pressure again reached normal, when the valve k would again be seated and the communication between the pipe H and the water chamber B² closed.

It will be noted that the inclusion of the auxiliary carbid chamber does not in any way materially affect the compactness of the device and at the same time the inclusion of this feature improves the generator materially for automobile use, as it provides a positive safe-guard against the failure of the lights by reason of the exhaustion of the carbid which frequently occurs at a time when it is impracticable to secure a fresh supply.

I do not desire to claim herein broadly an acetylene gas generator comprising a water chamber, a gas generating chamber, a communication between the water chamber and gas generating chamber adapted to alternately feed water from the water chamber to the generating chamber and gas from the generating chamber to the water chamber, in combination with means for forcing water from the water chamber through said communication to the gas generating chamber to prime the generator, as I have described and

claimed this construction in my co-pending application Serial No. 678,929.

While I have illustrated a convenient embodiment of the invention in the accompanying drawings, it will be understood that many changes may be made to the particular construction therein shown without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:—

1. In an acetylene gas generator, a water chamber, a main gas generating chamber, an auxiliary gas generating chamber, all of said chambers being closed for the maintenance of a normally high pressure therein, a communication between the water chamber and the gas generating chamber adapted to alternately feed the water from the water chamber to the main generating chamber, and gas from the main generating chamber to the water chamber, upon a diminution of the normal pressure in either of said chambers, a valve for closing said communication, a communication between said water chamber and said auxiliary generating chamber adapted to alternately feed water from the water chamber to the auxiliary generating chamber, and gas from the auxiliary generating chamber to the water chamber upon a diminution of the normal pressure in either of said chambers, a valve for closing said last mentioned communication, and an outlet pipe connected to said main generating chamber and to said auxiliary generating chamber.

2. In an acetylene gas generator, a water chamber, a main gas generating chamber, an auxiliary gas generating chamber, all of said chambers being closed for the maintenance of a normally high pressure therein, a communication between the water chamber and the gas generating chamber adapted to alternately feed the water from the water chamber to the main generating chamber and gas from the main generating chamber to the water chamber upon a diminution of the normal pressure in either of said chambers, a valve for closing said communication, a communication between said water chamber and said auxiliary generating chamber adapted to alternately feed water from the water chamber to the auxiliary generating chamber and gas from the auxiliary chamber to the water chamber upon a diminution of the normal pressure in either of said chambers, a valve for closing said last mentioned communication, means associated with said communication for forcing water there-through from the water chamber, and an outlet pipe connected to said main generating chamber and to said auxiliary generating chamber.

3. In an acetylene gas generator, a water

chamber, a main gas generating chamber adapted to contain carbid, an auxiliary generating chamber adapted to contain carbid, all of said chambers being closed for the maintenance of a normally high pressure therein, a valved pipe extending from the lower portion of the water chamber to the upper portion of the main generating chamber, a valved pipe extending from the lower portion of the water chamber to the upper portion of the auxiliary generating chamber, a manually operable pump associated with said pipes for forcing water there-through from the water chamber, and a gas outlet pipe connected to both of said generating chambers.

4. In an acetylene gas generator of the character described, a water chamber, a main gas generating chamber adapted to contain carbid, an auxiliary generating chamber adapted to contain carbid, all of said chambers being closed for the maintenance of a normally high pressure therein, a pump cylinder in communication with the water chamber, a pipe connected at its lower end to said pump cylinder and extending into the upper portion of the main generating chamber, a valve in said pipe, a second pipe connected at its lower end to said pump cylinder and extending into the upper portion of said auxiliary generating chamber, a valve in said second pipe, a piston in said pump cylinder, means for actuating said piston, and an outlet pipe connected to said main generating chamber and to said auxiliary generating chamber.

5. In an acetylene gas generator, a water chamber, a gas generating chamber adapted to contain carbid, said chambers being closed for the maintenance of a normally high pressure therein, a communication between the water chamber and the gas generating chamber adapted to alternately feed water from the water chamber to the generating chamber, and gas from the generating chamber to the water chamber upon a diminution of the normal pressure in either of said chambers, a safety valve in the water chamber, a communication between the upper portion of the generating chamber and the lower portion of the water chamber, and a check valve in said communication normally held closed by the water in the water chamber.

6. In an acetylene gas generator of the character described, a water chamber, a main gas generating chamber adapted to contain carbid, an auxiliary gas generating chamber adapted to contain carbid, all of said chambers being closed for the maintenance of a normally high pressure therein, a pipe extending from the lower portion of the water chamber to the upper portion of the main generating chamber, a pipe ex-

tending from the lower portion of the water chamber to the upper portion of the auxiliary generating chamber, a safety valve for controlling the pressure in the water chamber, an outlet pipe in communication with both of said generating chambers, a connection between said outlet pipe and the lower portion of said water chamber, and a

check valve in said connection normally held closed by the water in the water chamber. 10

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

GEORGE H. DAVIS.

Witnesses:

ARTHUR B. BROWNELL,

CLINTON B. BURROWES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."