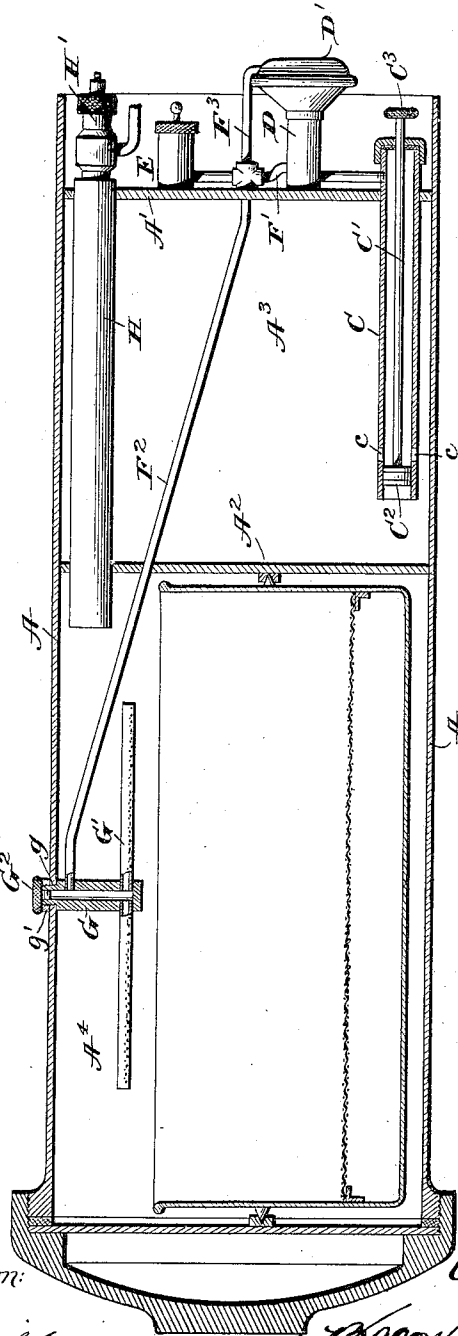


1,060,671.

Fig. 1.



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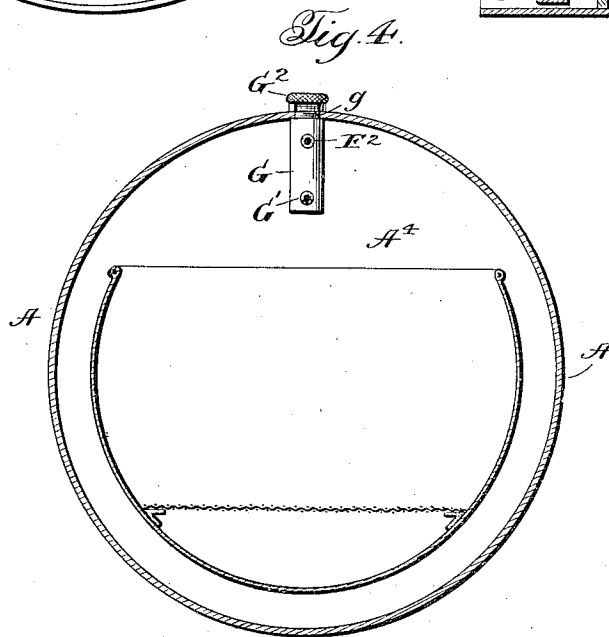
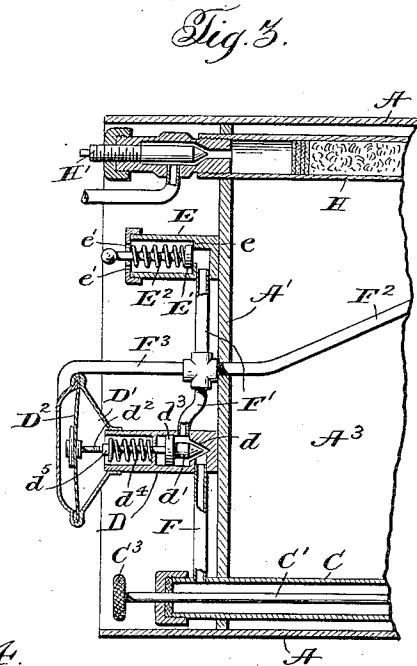
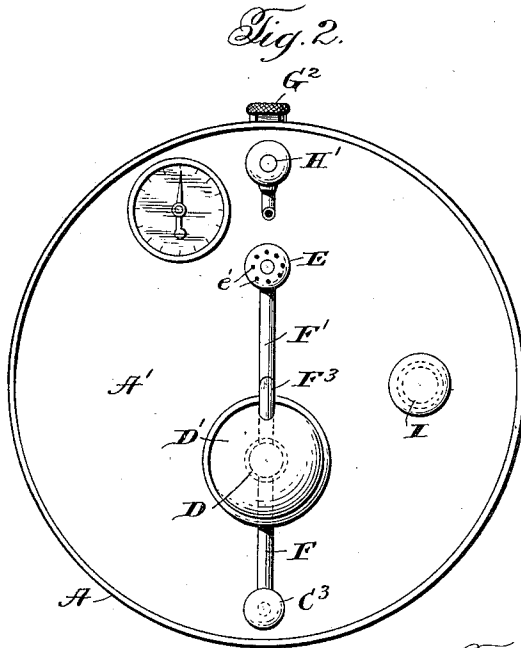
By Walter D. Milne Attorneys:

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

1,060,671.

Patented May 6, 1913.

2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE H. DAVIS, OF PORTLAND, MAINE.

ACETYLENE-GAS GENERATOR.

1,060,671.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed May 20, 1912. Serial No. 698,528.

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, launches, and the like.

One of the objects of the present invention is the provision of an improved gas generator of this character in which the gas in the gas storage chamber will be maintained at a constant uniform pressure regardless of the degree of pressure which may exist in the water chamber so that the gas will always pass to the burners at a uniform pressure and flickering of the lights will be prevented.

A further object of the present invention is the provision of a generator having the above named characteristics which is provided with means for initially starting the generation of the gas and which is so constructed that it will, when once started, automatically generate gas proportionately to its consumption at the burners.

Other objects of the invention will be apparent from the detailed description herein after when read in connection with the accompanying drawings forming a part hereof wherein a convenient embodiment of the invention is shown, 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, parts in elevation; Fig. 2 is a front elevation thereof; Fig. 3 is a longitudinal section through one end of the generator, and Fig. 4 is a cross section through the carbide chamber of the generator.

Referring now more particularly to the drawings, A designates the casing of the generator, which in the form of the invention illustrated is in the shape of an elongated metal cylinder, the forward end of which is closed by a suitable head A' and the rear end of which is provided with an

opening therein for a purpose to be herein after more particularly set forth.

Positioned within the casing A intermediate the ends thereof is a partition A² which serves to divide the casing into a water chamber A³ at the front end thereof, and a carbide chamber A⁴ at the rear end thereof. The open rear end of the casing A is normally closed by means of a cap which may be of any desired construction, and which is adapted to be removed when it is desired to charge the carbide chamber A⁴. Any suitable form of carbide receptacle may be placed in the carbide chamber A⁴ for the retention of carbide, and as such receptacle forms no part of the present invention, I have deemed it unnecessary to illustrate the same.

Secured within the lower portion of the front wall A' of the casing A and projecting within the water chamber A³ is a pump barrel C, the front end of which projects outwardly beyond the front wall A' of the casing and is closed by a cap which is provided with a suitable stuffing box. Working within said stuffing box is a plunger rod C', the inner end of which carries a piston C² which is adapted to slide within the pump cylinder C and the outer end of which is provided with a suitable operating handle C³ by means of which the plunger rod may be reciprocated. The pump cylinder or barrel C is provided with a plurality of openings c therein which are positioned in advance of the piston C² when the same is in its extreme innermost position in the pump cylinder, and which serves to establish communication between the water chamber A³ and the interior of the pump barrel or cylinder.

Secured to the front wall A' of the casing A adjacent the lower portion thereof and extending outwardly therefrom, is a tubular valve casing D the outer end of which is enlarged to provide a diaphragm chamber D', the interior of which is divided by a suitable diaphragm D². The valve casing D is provided adjacent the inner end thereof with an apertured valve seat d therein, with which valve seat a needle valve d' is adapted to cooperate said needle valve being carried by a valve rod d², the outer end of which is secured in any suitable manner to the diaphragm D². Carried by the valve

rod d^2 and positioned in rear of the needle valve d' is a piston d^3 which engages the interior of the cylindrical portion of the valve casing D with a sliding fit so as to form a substantially gas tight joint there-
 5 with. The needle valve d' is normally held out of engagement with its seat by means of a coil spring d^4 which encircles the valve rod d^2 and is interposed between a suitable fixed
 10 abutment in the interior of the valve casing D and an abutment d^5 which is mounted on the valve rod d^2 . The abutment d^5 is preferably adjustably supported on the valve rod d^2 so that the tension of the spring d^4 can
 15 be varied.

Secured to the front wall A' of the generator in any suitable manner is a safety valve casing E which is provided with an apertured valve seat e therein, said safety
 20 valve casing being provided in advance of the apertured valve seat e therein with suitable apertures e' therein opening to the atmosphere. The opening in the valve seat e is normally closed by a safety valve E' which is held to its seat by a suitable spring
 25 E² which may be of any desired construction. In practice it is desirable to provide means for adjusting the tension of the spring E² so that the safety valve may be set to open when any desired degree of pressure
 30 has been reached.

Connecting the forward end of the pump cylinder C with the valve casing D in rear of the apertured valve seat d^2 is a pipe F. Connecting the valve casing D immediately
 35 in front of the apertured seat d therein, with the safety valve casing E in rear of the apertured seat e therein is a pipe F'. Communicating with the pipe F' intermediate its connection with the valve casing D and
 40 the safety valve casing E is one end of a pipe F² which pipe extends upwardly from its connection with the pipe F' through the front wall A' of the generator casing, the
 45 partition A² in the casing, and to the upper portion of the carbid chamber A⁴ where it is connected to a tubular member G which is secured to the upper portion of the carbid chamber and extends downwardly there-
 50 from, the lower portion of said tubular member being provided with laterally disposed discharge pipes G'. The tubular member G is conveniently secured in position by providing the same with a reduced threaded
 55 portion g which projects through a suitable opening formed in the wall of the generator casing and upon which is threaded a suitable clamping nut g' for securing the tubular member in position. The upper end of
 60 the tubular member G is preferably provided with a removable closure G² so that when desired, said closure may be removed and a clean-out wire introduced into the pipe F². The pipe F' is also connected in-
 65 termediate its connection with the valve cas-

ing D and the safety valve casing E to the diaphragm chamber D' in front of the diaphragm D² therein by means of a pipe F³ which pipe is conveniently arranged in
 70 alinement with the pipe F².

Secured in the upper portion of the front wall of the casing A and extending rear-
 75 wardly therefrom, through the partition A² in the casing and into the carbid chamber A⁴ is a gas outlet tube H, the interior of which is conveniently provided with a suitable filter and the flow of gas from which
 80 is controlled by a reducing valve H' of any well known construction.

The water chamber A³ is provided with a suitable fill opening I enabling the same to
 85 be filled with water.

In the operation of the device, the water chamber A³ and the carbid chamber A⁴ are first charged respectively with carbid and water. The generator is then placed in a
 90 horizontal position. There being no pressure in either the water or carbid chambers the spring d^4 will hold the needle valve d' off its seat d . To start the generator the pump plunger c' is manipulated so as to
 95 force water from the water chamber through the pipe F, the apertured valve seat d , the pipe F', the pipe F², the tubular member G and from thence through the pipes G' onto the carbid in the carbid chamber A⁴. As the
 100 gas is generated in the carbid chamber A⁴ a portion of said gas will pass through the tubular member G, the pipe F², the pipe F', the pipe F, the pump cylinder C and from thence into the water chamber A³ so that
 105 gas under pressure will accumulate in the upper portion of said water chamber. As soon as the pressure in the carbid chamber A⁴ exceeds the pressure at which the diaphragm D² is set to close, said diaphragm
 110 will be moved inwardly by the gas which passes from the carbid chamber through the pipes F² and F³ and the needle valve d' will be moved into engagement with its seat d , thus cutting off the communication be-
 115 tween the water chamber and the carbid chamber. Upon a diminution of the pressure in the carbid chamber A⁴, however, the spring d^4 will move the needle valve d' off its seat, thus allowing the gas in the upper
 120 portion of the water chamber to force water into the carbid chamber and again bringing the pressure therein up to normal.

The safety valve E' is set to work at a pressure considerable in excess of the pressure
 125 at which the needle valve d' will be actuated. From the construction hereinbefore described, it will be seen that should an excessive pressure for any reason whatever accumulate in either the water or carbid chambers, the safety valve E' will be actuated to relieve such pressure.

I do not desire to claim herein broadly an acetylene gas generator comprising a water
 130

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 form and 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 and a gas generating chamber, said chambers being closed for the maintenance of a normally high pressure therein, a communication between the lower portion of 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 valve in said communication, means for normally holding said valve in its open position, and means actuated by the pressure in the generating chamber for closing said valve and means associated with said communication for positively forcing water from the water chamber through said communication into the generating chamber to prime the generator.

2. In an acetylene gas generator, a water chamber and a gas generating chamber, said chambers being closed for the maintenance of a normally high pressure therein, a communication between the lower portion of the water chamber and the 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 valve in said communication, means for normally holding said valve in its open position, a diaphragm chamber, a diaphragm therein, a connection between said diaphragm and said valve, and a connection between the diaphragm chamber and the generating chamber and means associated with said communication for positively forcing water from the water chamber through said communication into the generating chamber to prime the generator.

3. In an acetylene gas generator, a water

chamber and a gas generating chamber, said chambers being closed for the maintenance of a normally high pressure therein, a communication between the lower portion of 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 valve in said communication, a diaphragm chamber, a diaphragm therein, a valve rod connecting said diaphragm and said valve, a spring for normally holding said valve in its open position, and a pipe connecting the diaphragm chamber with the communication between the water chamber and the generating chamber above the valve therein and means associated with said communication for positively forcing water from the water chamber through said communication into the generating chamber to prime the generator.

4. In an acetylene gas generator, a water chamber and a gas generating chamber, said chambers being closed for the maintenance of a normally high pressure therein, a communication between the lower portion of the water chamber and the gas generating chamber, a normally open valve in said communication, means controlled by the pressure in the gas generating chamber for closing said valve, and means associated with said communication for forcing water from the water chamber through said communication into the generating chamber.

5. In an acetylene gas generator, a water chamber and a gas generating chamber, said chambers being closed for the maintenance therein of a normally high pressure, a communication between the lower portion of the water chamber and the gas generating chamber, a pressure actuated valve in said communication, and means associated with said communication for forcing water from the water chamber through said communication into the generating chamber.

6. In an acetylene gas generator, a water chamber and a gas generating chamber, said chambers being closed for the maintenance therein of a normally high pressure, a communication between the lower portion of the water chamber and the 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 valve in said communication, means for normally holding said valve in an open position, means controlled by the pressure in the generating chamber for closing said valve, and a safety valve casing connected to said communication and means associated with

said communication for positively forcing water from the water chamber through said communication into the generating chamber to prime the generator.

- 5 7. In an acetylene gas generator, a water chamber and a gas generating chamber, said chambers being closed for the maintenance
therein of a normally high pressure, a normally open communication between the lower
10 portion of the water chamber and the 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
15 diminution of the normal pressure in either of said chambers, means for obstructing said communication upon an abnormally high pressure in the generating chamber, a safety valve chamber in open communication with
20 said generating chamber at all times, and a safety valve in said safety valve chamber and means associated with said communication for positively forcing water from the water chamber through said communication

into the generating chamber to prime the generator. 25

8. In an acetylene gas generator, a horizontally disposed casing divided into a water chamber and a gas generating chamber, said chambers being closed for the maintenance therein of a normally high pressure, a communication between the lower portion of said water chamber and the gas generating chamber, said communication including a pump cylinder positioned within the water chamber, a normally open valve in said communication, means for closing said valve upon an abnormal pressure in the gas generating chamber, and a piston movable in said cylinder for initially forcing water from the water chamber to the generating chamber to start the generator. 30 35 40

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

GEORGE H. DAVIS.

Witnesses:

WARREN W. COLE,
A. L. T. CUMMINGS.

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