(No Model.)

J. C. PORTER.

ACETYLENE GAS GENERATOR

No. 562,911. Patented June 30, 1896.

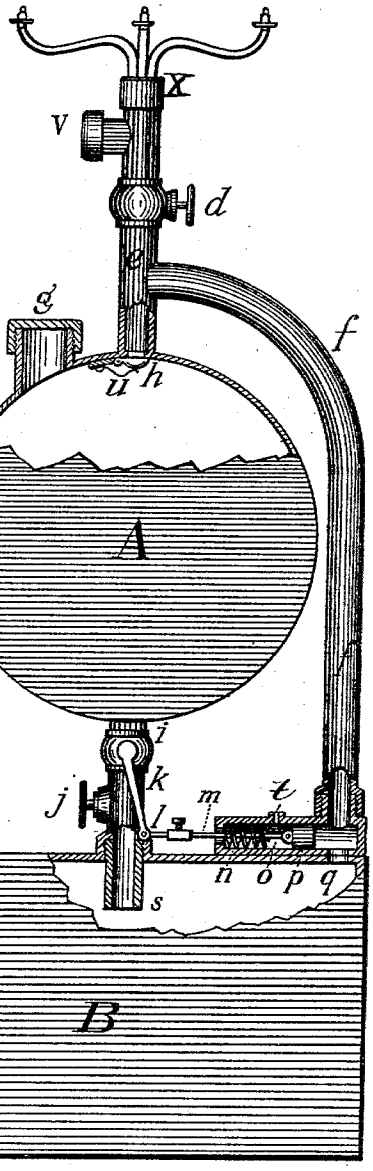

Fig. 1

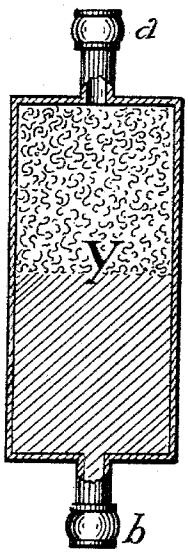

Fig. 2

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 562,911, dated June 30, 1896.

Application filed December 31, 1895. Serial No. 573,877. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. PORTER, a citizen of the United States, residing in the city of St. Louis, State of Missouri, have invented a new and useful Improvement in Gas-Generators, of which the following is a specification.

My invention relates to an improved method of constructing a gas-generator for the automatic admixture of fluids or materials that generate gas upon coming in contact and for drying, cooling, refining, or enriching such gas as generated in order to supply with safety a gas useful as a power or for fuel or lighting, to be produced in large quantities, or for use portably. The contact is effected and the gas produced in this generator by means of a large gas-generating or lower reservoir for holding gas-evolving fluids or materials and a reservoir (or more than one) upon a higher level, from which the gas-making fluids or materials can flow into the lower reservoir by reason of conducting the gas from the lower reservoir outside of the upper reservoir, over it, and down into the upper part of the upper reservoir to overcome the pressure in the lower reservoir and permit such downflow. The gas is at times so rapidly generated and the action so violent when the contact occurs that a safety-valve or safety-port for the escape of gas becomes necessary to avoid bursting the reservoirs, and an accurate adjustment of the flow or feed valve and its regulation is requisite. The contents of the upper reservoir require protection, so far as possible, from contact with the gas, although its pressure is also necessary, to prevent the gas from absorbing its moisture, to protect same from evaporation when the generator is not in use, to the injury of contents of both reservoirs, and to prevent escape of its contents if the generator should be upset. With some materials it is desirable that the gas should be cooled, dried, refined, or enriched.

The objects of my invention are to provide with few appliances a simple compact gas-generator by so placing one reservoir upon a higher level that its contents can slowly descend by gravity upon the materials in a lower reservoir, with pipe to conduct the gas outside the upper reservoir directly to driers or burners and to press down upon contents of upper reservoir without serious contact with same to contract moisture, and adjustable automatic regulator to govern the flow of upper-reservoir contents, a safety opening or valve for escape of gas when produced so rapidly or suddenly as to endanger bursting the reservoirs and to provide for drying, refining, or enriching the gas or to have absorbed by other substances the moisture taken up by the gas from entering the upper reservoir, though one of the especial objects of the arrangement of pipe and valve is to avoid contact of gas with fluids that may be in the upper reservoir and to prevent circulation of gas in that reservoir, and also to provide for retaining such fluids in the reservoir in case the generator should be upset and prevent their coming in contact with the more solid materials in lower reservoir and producing explosion when used as a portable generator. These objects are attained by the gas-generator illustrated in the accompanying drawings, in which—

Figure I represents the generator with the drying and enriching chamber detached and showing the operation of the generator when the gas can be burned as produced without drying. Fig. II represents the drying and enriching chamber, which can be attached to the pipe *e* at either *v* or *x* in place of the burners, when the consumption or burner attachments can be made at *a*.

The lower or gas-generating reservoir B, constructed of iron or any strong material, may be of any size desired, but must be air-tight, has an opening *r*, closed by a screw-cap *z*, through which the gas-producing fluids or materials are charged. It also has an opening *s*, through which the liquids or materials from the upper reservoir A are fed to cause the generation of gas, and has opening *q* to conduct the gas as generated to the cylinder *o* against the piston *p* to operate the regulating-valve *i*, and through the pipes *f* and *e* into the top of the upper reservoir A.

The upper reservoir A, also of strong material and air-tight, has an opening covered by the screw-cap *g*, through which the material to be fed to the lower reservoir is charged.

The upper reservoir A also has an opening into pipe *e*, closed by valve *h*, held by the slight spring *u*, through which gas enters over the fluid or materials charged in said reservoir A, producing a pressure which causes the contents to descend through the pipe *s* by gravity into the gas-evolving lower reservoir. The flow or descent of materials from the upper to the lower reservoir can be regulated or entirely shut off by the valve *j*, but it is more perfectly regulated by the valve *i*, governed by the lever *k*, which lever is connected with the piston-rod *m*, the length of the piston-rod being adjusted by the screw *l*.

The piston *p* is held back by the spring *n*, thus holding the valve *i* open for the passage of materials through the pipe *s*, but the gas as evolved forces the piston partly out, and by means of the lever *k* partially closing the valve *i*, or at times closing same entirely when the pressure becomes too great, and by lengthening or shortening the piston-rod at *l* the feed or flow of materials from the upper reservoir is more safely regulated, but to guard against the violent generation of gas, to which such materials are liable, a safety opening or port is made at *t*, and when the gas is produced so fast as to endanger bursting the reservoirs, it pushes the piston so far out as to permit escape of gas at *t*, the flow of material through the valve *i* being entirely shut off before the piston *p* reaches the point of discharge *t*, the safety-port.

The valve *h* in upper reservoir A is kept closed by the slight spring *u* to prevent as far as possible the contact with materials in that reservoir A of gas, to the injury of both, and to prevent evaporation therefrom, and also to prevent escape of contents if the apparatus should be upset, and so endanger an explosion from mixture of contents of both reservoirs; but the spring must not be sufficiently strong to prevent such entrance of gas as is requisite to permit the flow by gravity of the contents of the upper reservoir A into the lower B in the slow, regular manner necessary to produce continued generation of gas through pipe *s*.

The chamber *y* (represented at Fig. II to be attached to the pipe *e* at either *v* or *x*) is to contain drying substances to absorb the moisture as the gas is forced through same, or may be used for refining or enriching the gas.

The gas as generated is forced through the pipes *f* and *e*, and may be used either through the chamber *y*, or by direct attachment to pipes for consumption at *x* or *v*, and may be shut off by the stop *d*.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A gas-generator comprising a lower reservoir, a surmounting upper reservoir upon a short pipe which pipe forms a communication between said reservoirs, a regulating-valve in said pipe, a lever to operate said valve, a second or stop valve in said pipe, an opening with cover for charging said lower reservoir, an opening with cover for charging said upper reservoir, a cylinder having connection and communication with said lower reservoir, a piston, spring and escape-port in said cylinder, a piston-rod connecting said piston and valve-lever, a screw for adjusting the length of said piston-rod, a second pipe forming a communication from the lower reservoir outside the upper reservoir and into the upper reservoir on the upper side thereof, a spring and valve closing said last-mentioned communication, a pipe having opening, stop, and gas-burners, which pipe is connected with said second pipe and forms communication between said lower reservoir and said gas-burners, substantially as and for the purposes set forth.

2. In a gas-generator of the class described, the combination of a lower reservoir, an upper reservoir, a source of communication between said reservoirs, a valve located in said source of communication between said reservoirs, and means for automatically closing said valve through the medium of the pressure of gas in said lower reservoir, a piston and safety-opening for escape of gas also operated by means of the pressure of gas from said lower reservoir, a second source of communication leading from said lower reservoir outside of over and into the upper part of said upper reservoir, a valve closing said second source of communication, a source of communication between said lower reservoir and means for connecting the same with a purifier or gas-burners, substantially as and for the purposes set forth.

3. In a gas-generator of the class described the combination of, a lower reservoir, an upper reservoir, a pipe forming a communication from the lower interior part of said upper reservoir into the lower reservoir, a valve located in said pipe, a cylinder, a source of communication between said cylinder and said lower reservoir, a piston in said cylinder, an escape-port in said cylinder to be opened by said piston, a piston-rod carried by said piston, a connection from said piston-rod to said valve, a pipe forming a second communication between said lower reservoir and the said upper reservoir entering said upper reservoir from the upper side, a check-valve to close said last-mentioned pipe, substantially as described.

4. In a generator of the class described the combination of a lower reservoir, an upper reservoir, a source of communication between said lower reservoir and said upper reservoir, a valve located in said source of communication, means for automatically operating said valve by gas-pressure, a safety-port for escape of gas, a second source of communication leading from said lower reservoir exterior to said upper reservoir and entering said upper reservoir from the upper side of said upper reservoir, a valve located to close said last-mentioned source of communication, a

spring to hold said valve closed, a source of communication from said second source of communication to openings for connecting the same with gas purifiers or burners, a gas-purifier, means of connection attached to the said gas-purifier for connecting same with said last-mentioned source of communication to form a source of communication between said lower reservoir and said gas-purifier substantially as described.

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Witnesses:
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