

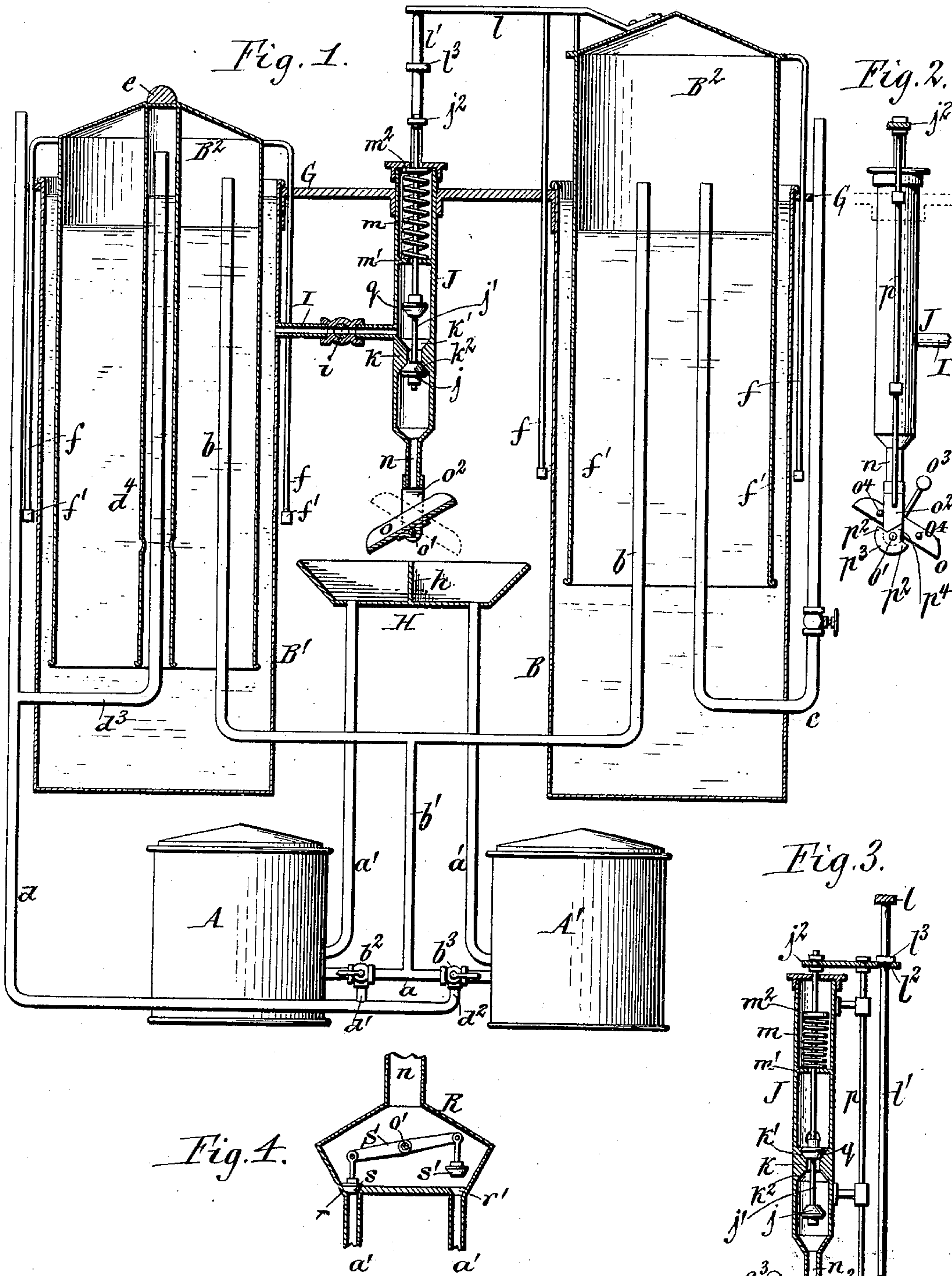
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Patented July 25, 1899.

H. J. VOLZ.
ACETYLENE GAS GENERATOR.

(Application filed Feb. 13, 1899.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 629,481, dated July 25, 1899.

Application filed February 13, 1899. Serial No. 705,411. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. VOLZ, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

This invention relates to that class of acetylene-gas generators in which the supply of water to the generating-chamber is automatically controlled by the movements of the dome or movable part of the gas-holder, and more especially to an apparatus of this character in which a number of generators are employed, so that one may be recharged with carbide while the other is in operation, for maintaining a practically continuous supply of gas.

The object of my invention is to improve the construction of the valve mechanism which governs the supply of water to the gas-generators and the means for feeding the water to the same.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved apparatus. Fig. 2 is a detached side elevation, partly in section, of the devices which control the passage of the water to the gas-generators. Fig. 3 is a longitudinal section thereof at right angles to Figs. 1 and 2. Fig. 4 is a longitudinal section of a modified construction of said controlling devices.

Like letters of reference refer to like parts in the several figures.

A A' represent two gas-generators of any ordinary construction, which are adapted to be charged with a suitable quantity of carbide. These generators are connected by a horizontal gas-pipe *a*, and each is provided with a water-supply pipe or branch *a'*.

B B' represent a pair of gas-holders of any well-known construction, and *b b* are gas-delivery pipes terminating in the domes B² above the water-level therein and both connected with the connecting-pipe *a* of the generators by a vertical pipe *b'*. This connecting-pipe is provided on opposite sides of the vertical pipe *b'* with valves *b² b³*, whereby communication between the generators and the gas-holders may be shut off.

c is the usual service-pipe, connected with one of the gas-holders—say the holder B.

d is a main vent-pipe, which is connected with the casings of the valves *b² b³* by branches *d' d²*. The valves *b² b³* are three-way valves of any ordinary construction, and their passages are so arranged that when they are turned to cut off connection between the generators and the gas-holders the generators are placed in communication with the vent-pipe *d* for allowing any gas remaining in the same to escape into the atmosphere, while when the valves are turned in the opposite direction the vent-pipe is cut off from the generators and the gas is caused to flow into the gas-holders.

d³ is a branch vent-pipe leading from the upper portion of the dome of the gas-holder B' to the main vent-pipe *d* and inclosed by the customary perforated safety-tube *d⁴*, which extends downwardly from the top of the dome and is open at its lower end, so that when the dome under an abnormal gas-pressure rises to such a height that the perforations of said pipe are brought above the liquid-level in the dome the surplus gas escapes through said perforations into the vent-pipe. The dome having this perforated pipe is preferably weighted or otherwise rendered heavier than the dome of the other gas-holder, as shown at *e*, so that the heavier dome is not elevated until after the light dome has been raised to its limit. The upward movement of each dome is limited by vertical rods *f*, connected with the top thereof and passing through openings formed in a support G of the gas-holders, these rods being provided at their lower ends with stops or enlargements *f'*, which strike the under side of said support when the dome is raised to its greatest height.

H is a water receptacle or chamber arranged above the level of the gas-generators and with which the upwardly-extending supply branches *a'* thereof are connected. This receptacle is divided centrally into two compartments or chambers by a transverse partition *h*.

I is a main water-pipe which is connected with any suitable source or supply, preferably

the water-tank of one of the gas-holders, as shown, and from which the water is delivered to the receptacle H.

J is a valve-case connected with the outer end of the main supply-pipe I and arranged above the water-receptacle H and containing an automatic valve j , which controls the delivery of the water into said receptacle. This case is provided below the water-pipe I with a diaphragm k , having a longitudinal passage which is provided at its upper and lower ends with valve-seats k' k^2 , against the lower one of which the valve j closes. The stem j' of this valve extends upwardly through a cap or stuffing-box at the upper end of the valve-case and is secured at its upper end to a cross-head j^2 , as shown in Figs. 1 and 3.

l is an arm extending laterally from the top of the lighter dome B^2 and having a depending rod l' , which passes loosely through an opening l^2 , formed in the cross-head j^2 , and is provided with a fixed collar l^3 , which is adapted to strike the cross head and depress the automatic valve j when the dome descends below its normal height, so as to open said valve and allow the water to flow into the receptacle H.

m is a spring tending to hold the automatic valve against its seat and surrounding the stem thereof between a perforated diaphragm m' of the valve-case and a collar m^2 , secured to the stem.

The outlet or discharge nozzle n of the valve-case J is arranged directly in line with the partition of the receptacle H, and below the nozzle is arranged a reversible or rocking trough o , which is adapted to direct the water into one or the other of the compartments of the receptacle, according to the direction in which the trough is tilted, so as to supply water to one or the other of the gas-generators. This trough, which is open-ended, is arranged lengthwise of the receptacle H and mounted centrally on a transverse shaft o' , journaled in a hanger o^2 , which is secured to the discharge-nozzle of the valve-case. The shaft is preferably provided at one end with an upwardly-projecting weighted arm o^3 , arranged at right angles to the trough and tending to tilt the trough upon passing the dead-center in either direction. The trough is provided on opposite sides of its center with stops o^4 , which limit its rocking movement by striking against the adjacent side of the hanger o^2 , as shown in Fig. 2.

p is a vertically-movable rod or tappet secured at its upper end to the cross-head j^2 of the valve-stem j' , so as to move with the latter, and guided in bearings secured to the side of the valve-case J, as shown in Figs. 2 and 3. This tappet is provided at its lower end with a toe p' , which is adapted to strike against one of a pair of lugs or shoulders p^2 , formed on a segment p^3 , which latter is secured to the trough-shaft, so that the trough is reversed when the tappet is depressed sufficiently by the abnormal descent of the light dome B^2 .

p^4 is a pivoted or V-shaped projection arranged centrally on the upper side of said segment, presenting in either position of the trough a cam or incline which directs the lower end of the descending tappet-rod p toward the higher lug of the segment p^3 for tilting the trough. The tappet-rod is arranged in line with the trough-shaft and is sufficiently elastic to permit the requisite lateral deflection of the lower end of the rod upon shifting the beveled projection p^4 .

q is an auxiliary valve mounted on the valve-stem j' and adapted to close against the upper valve-seat k' of the casing J when the gas-domes descend to their lowest position, thereby preventing the water from overflowing the gas-generators and flooding the apparatus and the apartment in which the same is located, which would occur in the absence of such a cut-off.

The supply-pipe I is provided with a hand-valve i for cutting off the water-supply from the generators, if desired.

The operation of my improved apparatus is as follows: The generators are intended to supply gas to the holders alternately, one generator being in use while the other is charged with carbid and held in reserve until the charge in the other is exhausted. In the condition of the apparatus shown in Fig. 1 of the drawings the light dome is raised to such a height as to close the automatic valve j , preventing the supply of water to both generators and stopping the formation of gas. Both generators are assumed to be charged with carbid, and the gas-cocks b^2 b^3 of both are shown in their open position, so that gas is evolved in either as soon as water is delivered into the same. The directing-trough o is shown as being tilted toward that compartment of the receptacle H which feeds the left-hand generator. Assuming now that the gas-pressure in the holders falls below the normal, the lighter elevated dome descends sufficiently to cause its trip-collar l^3 to strike the cross-head j^2 and open the supply-valve j against the pressure of the spring m , thus allowing the water to flow from the main supply-pipe through the valve-case J and upon the trough o , which latter directs the same into the left-hand compartment of the receptacle H, when it descends through the pipe a' into the left-hand generator. The gas evolved in this generator passes into the gas-holders through pipes b , as hereinbefore described. The tappet-rod p is of such a length that it does not reach and trip the segment of the trough-shaft o' under such ordinary fluctuations as are sufficient to open the water-supply valve j . When the carbid in the last-named generator becomes exhausted, the light gas-dome descends sufficiently to cause the tappet-rod p to trip the segment of the trough-shaft, thereby reversing the directing-trough to the position shown by dotted lines in Fig. 1 and feeding water into the right-hand gas-generator, which latter now supplies gas to

the holders. It will now be understood that in the ordinary operation of the apparatus the automatic supply-valve *j* is opened and closed more or less by the fluctuations of the gas-pressure within normal limits, so as to supply water intermittently to the active generator in batches of greater or less volume, and that the water-supply is automatically reversed and directed into the other generator only when the carbid in the first-named generator is exhausted. When the carbid in both generators becomes exhausted from failure to recharge the same, the light dome descends to its lowest position and causes the upper valve *g* to be closed, thereby preventing flooding of the apparatus, as hereinbefore described.

By employing two gas-holders and making the dome of one of the holders heavier than the other only the light dome responds to the normal fluctuations of the gas-pressure, and by operating the water-supply valve from this lighter dome a more satisfactory and reliable control of the water-supply is obtained than when the valve-operating devices are under the control of one of a number of connected domes of equal weight.

The reversible feed-trough or directing device *o* may be modified without departing from my invention. For example, the receptacle *H* and the trough may be replaced by a closed delivery head or chamber *R*, connected with the lower end of the valve-case *J* and having separate outlets *r r'*, with which the branch pipes *a'* of the gas-generators connect and which are alternately opened and closed by a pair of valves *s s'*, mounted, respectively, on the arms of a vertically-swinging rock-lever *S*, as shown in Fig. 4. In this case the pivot of the lever would be provided with a reversing-segment *p⁴* and an overhanging weighted arm like the trough-shaft *o'* of the first-described construction.

I claim as my invention—

1. The combination with a gas-holder and a pair of gas-generators connected therewith,

of independent water chambers or receptacles connected with said generators, respectively, a water-supply pipe having a valve-case arranged above said chambers and provided with a valve which controls the flow of water through the same, an actuating device whereby said valve is operated from the dome of the gas-holder, a reversible feed-trough arranged between the outlet of said valve-case and said water-chambers, and a reversing device for said trough which is operated by the dome of the gas-holder, substantially as set forth.

2. The combination with a gas-holder and a pair of gas-generators connected therewith, of independent water chambers or receptacles connected with said generators, respectively, a water-supply arranged above said chambers, a reversible feed-trough arranged between said water-supply and said chambers and mounted on a rock-shaft provided with reversing-lugs, and a tappet connected with the dome of the gas-holder and arranged to engage against either of said lugs, substantially as set forth.

3. The combination with a gas-holder and a pair of gas-generators connected therewith, of independent water chambers or receptacles connected with said generators, respectively, a water-supply arranged above said chambers, a rock-shaft arranged between said water-supply and said chambers and provided with a reversing-segment having a central V-shaped projection, a feed-trough mounted centrally on said rock-shaft, and a trip-rod connected with the dome of the gas-holder and arranged to engage against said segment on either side of said rock-shaft, substantially as set forth.

Witness my hand this 4th day of February, 1899.

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Witnesses:

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