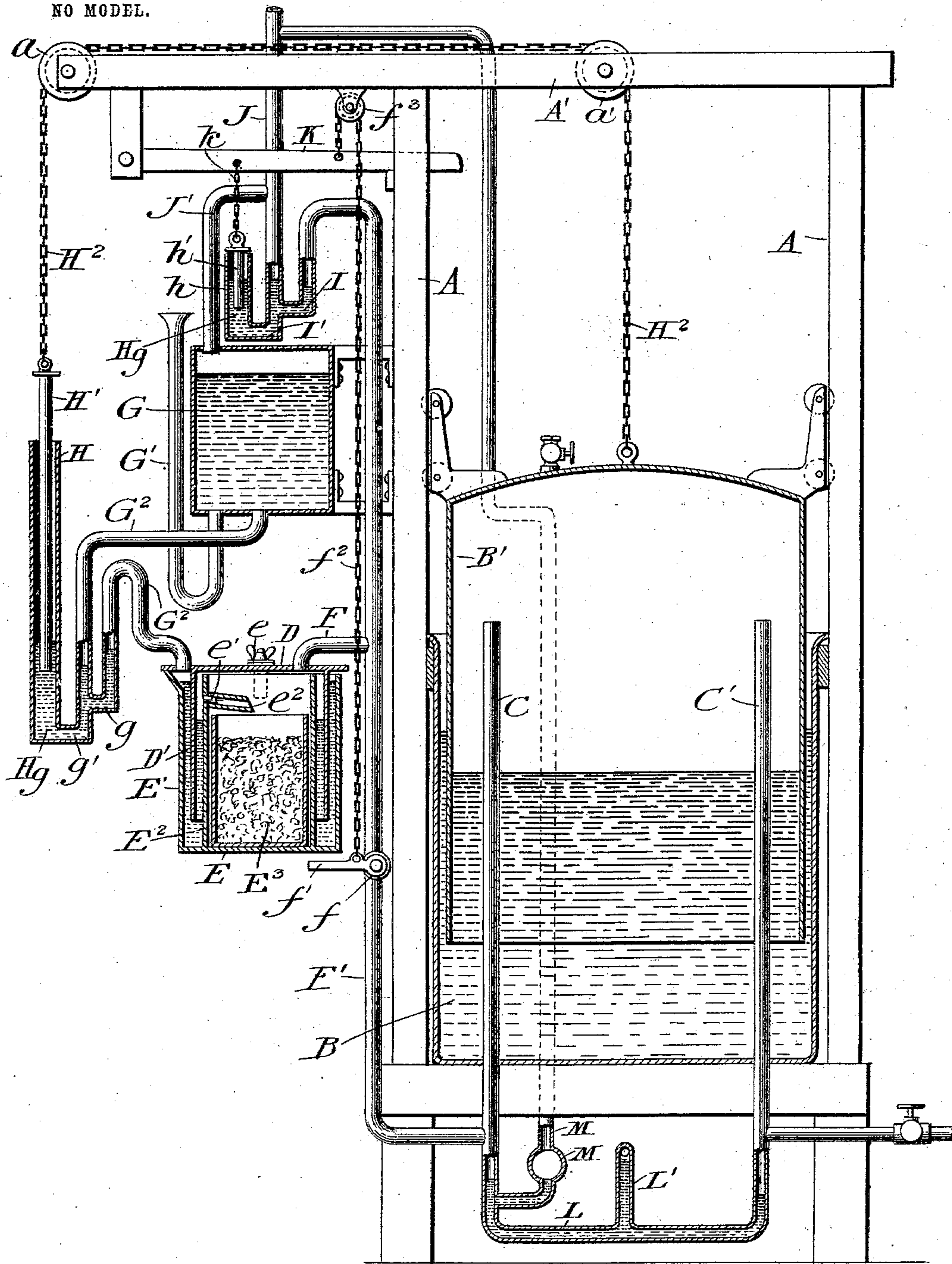


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PATENTED OCT. 13, 1903.

E. R. ANGELL.
ACETYLENE GAS GENERATOR.
APPLICATION FILED OCT. 23, 1899.

NO MODEL.



Witnesses:
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EDMUND R. ANGELL, OF DERRY, NEW HAMPSHIRE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 741,006, dated October 13, 1903.

Application filed October 23, 1899. Serial No. 734,596. (No model.)

To all whom it may concern:

Be it known that I, EDMUND R. ANGELL, of Derry, in the county of Rockingham and State of New Hampshire, have invented a new and Improved Acetylene-Gas Apparatus, of which the following is a full, clear, and exact description.

My invention relates to an improvement in acetylene-gas apparatus of that class in which water is admitted in limited quantities to an excess of carbid.

My invention comprises a novel form of valve which acts upon the principle of a trap or seal containing mercury and located in the water-feeding pipe, said trap having a plunger operating automatically by the generation of gas to displace a sufficient amount of mercury to cause a rise in its level, whereby the feeding of the water is cut off.

My invention also comprises certain novel features of construction, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is an elevation of my device, the upper part being in section.

My device is used in connection with a gasometer of ordinary construction consisting of an outer tank B and a bell B', movable therein, the outer tank being supplied with water to form a water seal. This gasometer moves within a framework A, which supports the mechanism of the device. The gas is introduced to the gasometer through the pipe C, extending upward from its bottom, and is conducted from the gasometer by a similar pipe C'. The generator is secured alongside of the gasometer and is supplied with water from the tank G, located above the generator. The generator consists of a tank E, formed of two cylinders E' and E², one placed within the other and both secured at their lower ends to a common bottom, thus forming an annular space between them adapted to receive water to form a water seal. The cover of this generator consists of a plate D, which has a depending flange D', adapted to enter the annular space between the two cylindrical portions E' and E² of the generator. The cover and generator-tank are secured to each other by means of a clamp e.

Within the generator is placed a receiver

or vessel E³, which receives the carbid. By removing this vessel the residue left after the carbid has been decomposed may be quickly removed.

The cover D may be fixedly secured to the supporting-frame A by any convenient means. A pipe F leads from the cover D and conveys the gas away as generated. This pipe F is connected to a vertical pipe F', which extends both above and below the generator, and at its lower end the pipe F' connects with the pipe C, through which the gas is conducted to the gasometer. Between the generator and the gasometer a valve f is placed within the pipe F'. A second or water-supply pipe G² is connected with the cover D of the generator. This pipe discharges outside of the cylindrical flange D', so that the water for generating gas passes through the seal, thus insuring the integrity of the water seal, so that it is not lowered by evaporation.

The inner cylinder E² has a small hole through one side near its upper end, and a short tube e' is inserted therein. A short tube e² is provided, which is adapted to slip over the inner projecting portion of the tube e', and thus to convey the water to the center of the carbid-holder E³. The tube e' is short enough to permit of the carbid-holder being inserted in the generator when the tube e² is removed. By these means the water for the generation of gas passes through the water seal and insures the seal being kept supplied with water.

The pipe G² leads to the water-reservoir G and has a trap g formed therein by extending the pipe downward in a loop. To the lower portion of this pipe a pipe H is connected, so as to form a second trap g' at a lower level than the trap g. These traps and the lower portions of the pipes connected therewith have a quantity of mercury (Hg) placed therein in such quantity that it fails to close the trap g entirely except when a portion of the mercury has been displaced by a plunger used for that purpose. This plunger H' enters the open upper end of the pipe H, and when it is dropped downward, so as to displace a portion of the mercury in the pipe H, the level of the mercury in the two branches of the pipe G² is raised, so as to close entirely the trap g and prevent the water from the tank G running

into the generator. When the plunger H' is raised clear of the mercury in the pipe H, the level of the mercury within the pipes H and G² drops, so that the trap *g* is open, and the water is permitted to flow into the generator. The plunger H' is connected by a chain H² with the gasometer-bell B', the chain passing over guide-pulleys *a* and *a'*, supported upon a cross-bar A', attached to the upper end of the frame A.

The water reservoir or tank G is filled through a pipe G', which enters the tank from the bottom and extends upward to a point above the top of the tank and has a flared upper end. A seal is thus formed to prevent the possibility of the gas blowing off through the pipe G', and at the same time the pipe acts as a filling-pipe.

A blow-off pipe J' is attached to the upper end of the tank or reservoir G and connects with a pipe J, which is conducted to any convenient point, so that the gas which escapes therefrom will do no damage.

The pipe F', which conveys the gas from the generator to the gasometer, extends upward and is connected with pipes forming two traps I and I', similar in their construction to the traps *g* and *g'* previously described and also containing mercury (Hg.) The pipe *h*, which corresponds in function with the pipe H, previously described, has a plunger *h'*, connected by a chain *k* with a lever K, pivoted upon the framework A and having one end extending to a point where it will be engaged either by the gasometer or by an object connected with the gasometer-bell, so as to be raised when the gasometer-bell reaches a certain point in its upward travel. When the plunger *h'* is thus raised, the seal in the trap I is broken, and the gas is permitted to escape from the pipe F' into the pipe J and is conveyed to a point where it is harmless. This prevents an excess of pressure in the gasometer-bell, which would cause the gas to blow out from around the bottom of the same and escape where it would do damage. The valve *f*, which is placed within the pipe F' between the generator and gasometer, has an arm *f'* projecting beneath the generator, so that the generator cannot be opened for recharging without closing the valve. This prevents the possibility of opening the generator, while it has free connection with the gasometer. The arm *f'* is also connected, by means of a chain *f*², with the lever K, by which the blow-off valve is operated, said chain passing over a guide-pulley *f*³, supported upon the frame A. When the generator is opened for recharging, the valve *f* is closed and at the same time the blow-off is opened. This permits the gas which occupies that portion of the pipe F' above the valve *f* and also the gas which is contained within the generator to escape freely into the outer air, and thus prevents its escape into the room which contains the generator. It also admits of the ingress of air, so that the generator

can be lowered from its water seal more easily than would otherwise be the case.

The supply-pipe C and the discharge-pipe C' of the gasometer are connected beneath the gasometer by a common pipe L, which is located some distance below the bend in the supply and discharge pipes. The pipe L has an upwardly-extending branch L', whose open end constitutes an overflow, and it (the pipe L) and the lower ends of the pipes C and C' are filled with water, forming a drip or water seal through which water condensed in the pipes may be conveyed away.

An additional blow-off or safety device is provided in the shape of the pipe M, which is connected with one of the pipes of the drip just described. This connection is a little below the connection of the pipe C with the pipe F'. In the pipe M is a globe or chamber M'. When the pressure in the gasometer becomes sufficient to lower the level of the water in the drip and permit the gas to reach the pipe M, the gas will blow through the upper end of the pipe M, which connects with the blow-off pipe J. When the pressure falls, the seal will be restored.

The mercury-valve described is one which is very reliable in its operation, and as it includes no moving parts except the plunger H' and the mercury it is impossible for it to become clogged by rusting or by any ordinary means. It is also extremely sensitive in its adjustment and will close the valve quickly upon a rise of pressure. It will thus operate to maintain a constant pressure in the gasometer.

It is obvious that the construction of the valve may be varied considerably from that described. The principle of the valve is to have a mercury seal, the level of the mercury being caused to rise and fall by the insertion or withdrawal of a plunger, said plunger being controlled by the rise and fall of the pressure of gas. I do not, therefore, wish to be limited to the exact construction herein shown.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In acetylene-gas generators, the combination of a generator adapted to contain carbide, a water-tank above the generator, and a gasometer connected with the generator, with a valve for controlling the admission of water to the generator, comprising two connected upwardly-extending pipe-sections communicating respectively with the water-tank and the generator, a third pipe-section connecting with the bottom of the others by a trap or seal and open to the air at its top, said pipes being adapted to receive mercury to form a seal, and a plunger within the third pipe and connected with the gasometer-bell to rise and fall therewith, substantially as described.

2. A water-feed valve comprising a water-

conveying pipe having a trap or downward bend therein, a controlling-pipe connected to the bottom of the above trap by a second trap, mercury in said pipes sufficient normally to close the lower trap and partially to close the upper trap, and a plunger in the controlling-pipe, adapted to enter the mercury and raise its level so as to close both traps, substantially as described.

3. A water-feed valve, comprising a trap formed in a water-conveying pipe, a chamber connected to the bottom thereof, a plunger adapted to enter said chamber, said chamber and trap having mercury therein sufficient to seal the trap when the plunger is in, and to open it when the plunger is out, and means for automatically operating the plunger, substantially as described.

4. In an acetylene-gas apparatus, the combination of a generator, a fixed cover for the same, means by which the tank is compelled to move in a definite path when separated from the cover, a gas-conveying pipe leading from the generator, a valve therein having a handle projecting beneath the generator-tank and into the path of movement of said tank, whereby when the tank is separated from the cover, the valve is closed, a blow-off valve connected with the gas-conveying pipe, and connections between the said valves whereby when one of the valves is closed the other is opened, substantially as described.

5. A liquid seal or trap for gas-pipes having a supply of sealing liquid insufficient of itself to form a complete seal, and a plunger adapted to enter the liquid and raise its level to close the seal, and means for automatically controlling the position of said plunger, substantially as described.

6. A liquid seal or trap for gas-pipes having a supply of sealing liquid insufficient of itself to form a complete seal, and a plunger adapted to enter the liquid and raise its level to close the seal, substantially as described.

7. In an acetylene-gas apparatus, the combination of a generator comprising a tank having an outer and an inner wall adapted to receive water between them, a fixed cover having a depending flange extending into the space between the walls of the tank, whereby the tank is compelled to move in a definite path when separated from the cover, a gas-conveying pipe leading from the generator-cover, and a valve in said pipe having a handle projecting beneath the generator-tank and into the path of movement of said tank, whereby when the tank is separated from the cover, the valve is closed by engagement with the tank, substantially as described.

8. In an acetylene-gas generator, the combination of a vessel having an outer and an inner wall forming a water seal, the inner wall having an opening near its top, a removable tube leading from said opening to convey the water to the center of the inner chamber, a removable carbid-holder adapted to be

inserted in the central chamber, a cover for the generator having a depending flange adapted to enter the water seal, and a water-feed pipe discharging through the cover into the water-space outside of the depending flange of the cover, whereby the water for generating gas passes through the seal, substantially as set forth.

9. An acetylene-gas apparatus, comprising a generator, a gas-discharge pipe leading therefrom, a valve in the discharge-pipe, a blow-off pipe connected with the discharge-pipe, a liquid seal or trap connected with the blow-off pipe, a plunger adapted to break the liquid seal to permit the gas to escape, and connections between the valve in the discharge-pipe and the said plunger whereby when the valve is closed the plunger is operated to break the liquid seal and permit the gas to escape through the blow-off pipe, substantially as set forth.

10. In an acetylene-gas apparatus, the combination of a generator adapted to contain carbid, a gasometer connected with the generator, a water-conveying pipe leading to the generator, a trap or liquid seal in said pipe and a plunger adapted to raise the level of the liquid to close the seal, the said plunger being connected with the gasometer-bell to rise and fall therewith, substantially as described.

11. In an acetylene-gas apparatus a water-feed pipe provided with a trap having a mercury seal, and a plunger operated to cause a rise or fall in the level of the mercury to control the feeding of the water, the said plunger being actuated by the rise and fall of the pressure of the generated gas, substantially as described.

12. In an acetylene-gas generator, the combination of a generator-chamber, composed of a vessel having an inner partition forming a water seal about its open end, and provided with an overflow into the central or carbid-holding chamber, with a cover for the generator having a flange entering the water seal, and a water-feed pipe discharging through the cover-flange, whereby the water for generation of gas passes through the seal.

13. In an acetylene-gas apparatus, the combination of a generator, a gasometer, a gas-conveying pipe leading from the generator to the gasometer, a blow-off pipe connected with the gas-conveying pipe, a liquid seal or trap connected with the said blow-off pipe, a plunger adapted to break the liquid seal to permit the gas to escape and means for operating said plunger by the movement of the gasometer-bell substantially as described.

14. In an acetylene-gas apparatus, the combination of a generator, a cover for the same, means by which the parts are compelled to move in a certain path when separated, a gas-conveying pipe leading from the generator, a valve in said pipe arranged to be closed by the movement of the generator

parts when separated, a blow-off pipe connected with the gas-conveying pipe, a liquid seal or trap connected with the blow-off pipe, a plunger adapted to break the liquid seal to
5 permit the gas to escape, and connections between the valve in the gas-conveying pipe and the said plunger, whereby when the valve is closed the plunger is operated to break the liquid seal and permit the gas to escape through the blow-off pipe, substantially as described.

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