No. 801,061. PATENTED OCT. 3, 1905.

E. A. CHAMBERLIN.

ACETYLENE GAS GENERATOR.

APPLICATION FILED NOV. 23, 1904.

2 SHEETS—SHEET 1.

Fig. 1

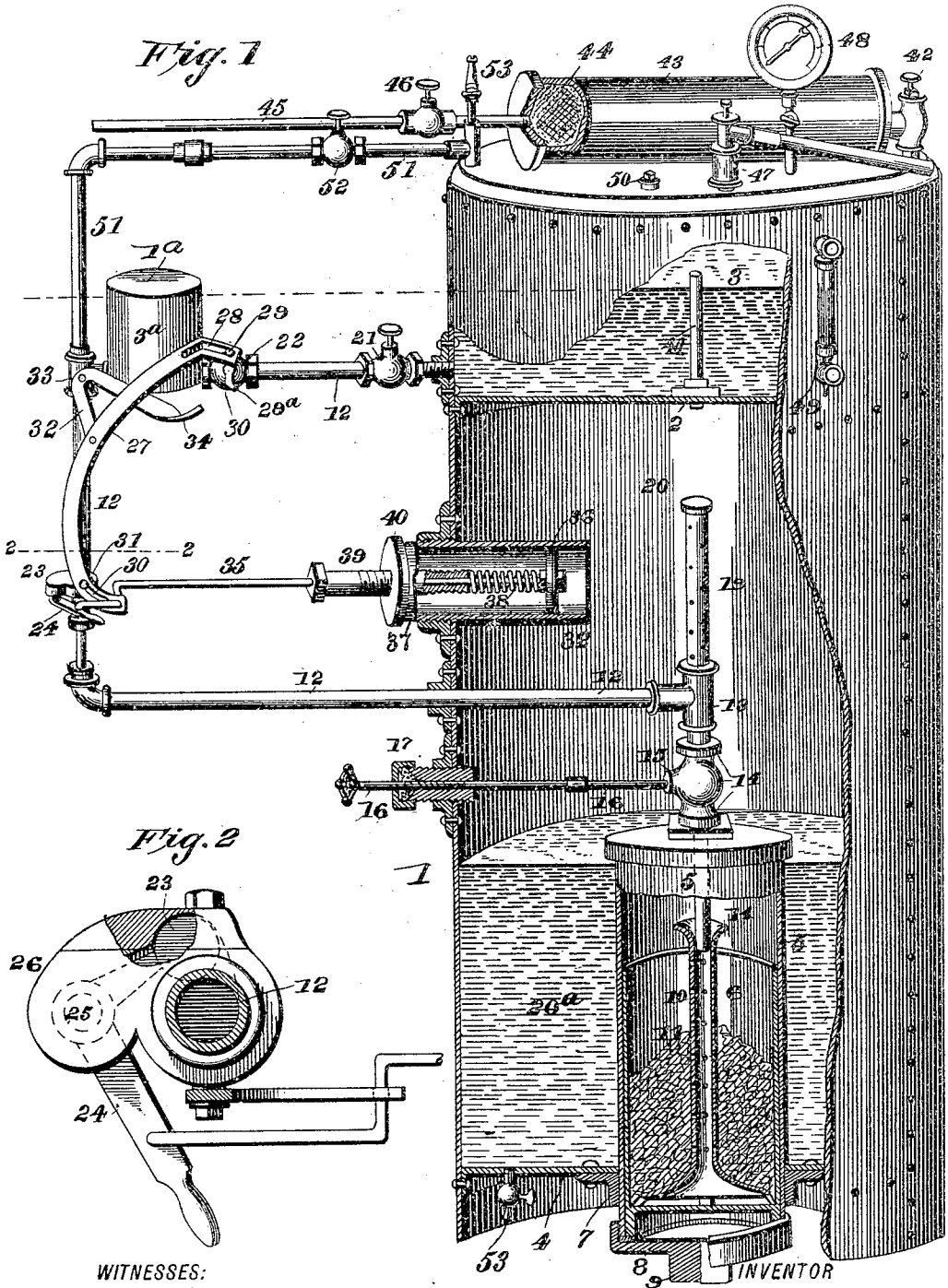


Fig. 2

WITNESSES:

C. E. Duffey

Anna M. Hark.

INVENTOR

Edwin A. Chamberlin

BY Munn & Co.

ATTORNEYS

No. 801,061. PATENTED OCT. 3, 1905.

E. A. CHAMBERLIN.

ACETYLENE GAS GENERATOR.

APPLICATION FILED NOV. 23, 1904.

2 SHEETS—SHEET 2.

Fig. 3

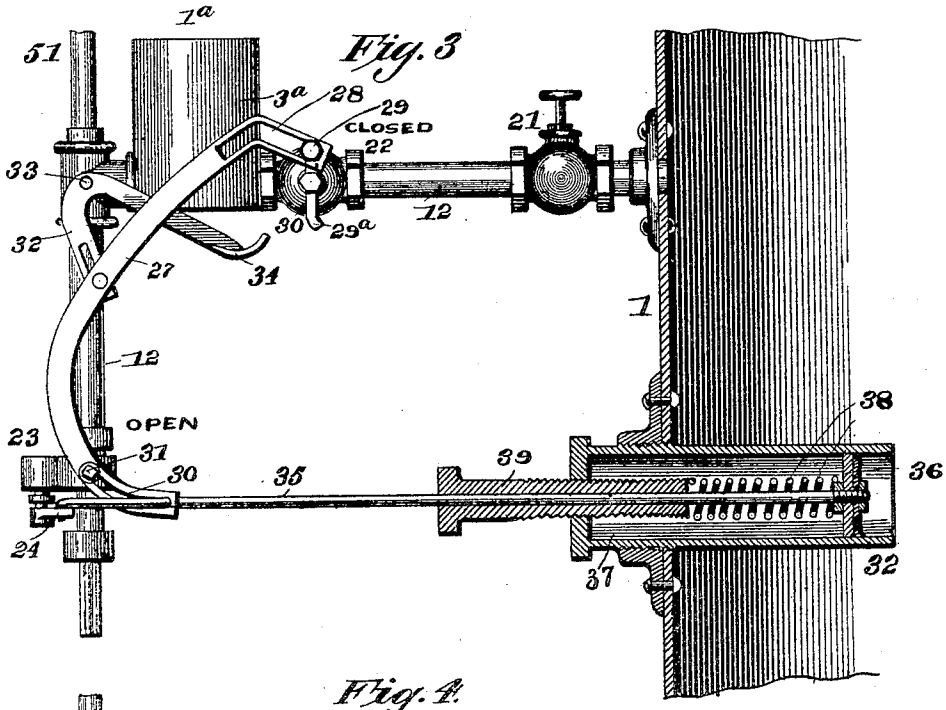
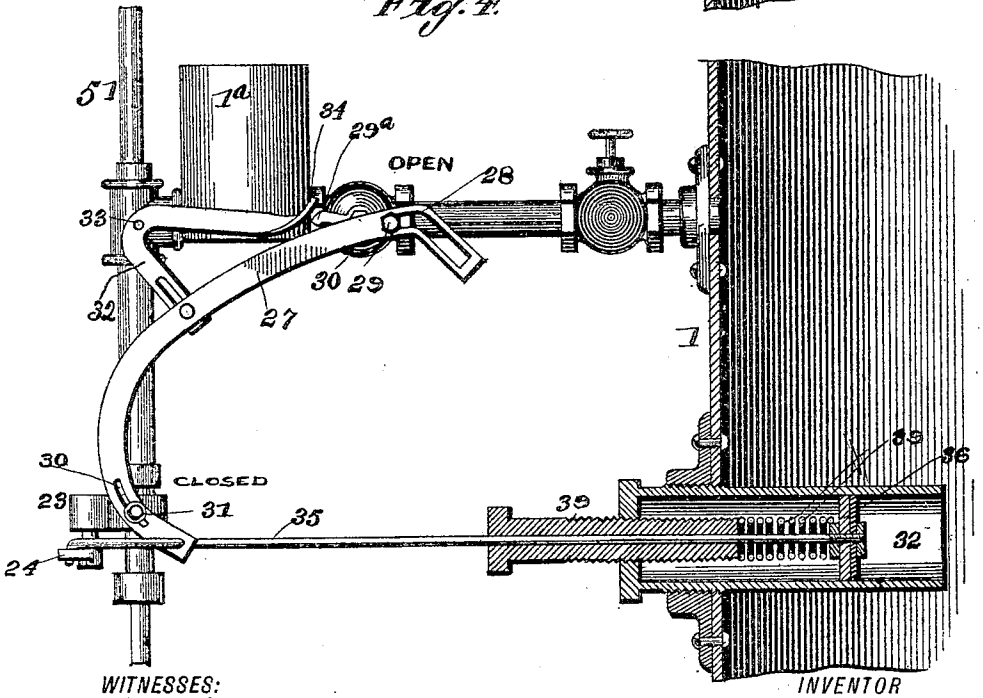


Fig. 4.



WITNESSES:

C. C. Duffey

Amos W. Hart

INVENTOR

Edwin A. Chamberlin

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWIN ARTHUR CHAMBERLIN, OF LOS ANGELES, CALIFORNIA.

ACETYLENE-GAS GENERATOR.

No. 801,061. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed November 23, 1904. Serial No. 233,967.

To all whom it may concern:

Be it known that I, EDWIN ARTHUR CHAMBERLIN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have made a new and Improved Acetylene-Gas Generator, of which the following is a specification.

My invention is an improvement in that class of acetylene-gas generators in which means are provided for automatically regulating the supply of water to the carbid, in accordance with the pressure of gas required.

The invention is embodied in the novel construction and arrangement of parts hereinafter described and claimed, the same being illustrated in the accompanying drawings, in which—

Figure 1 is in part a side elevation and in part a vertical section of the machine as a whole. Fig. 2 is an enlarged horizontal section on the line 2 2 of Fig. 1. Figs. 3 and 4 are views, partly sectional and partly in elevation, illustrating different positions of the valve mechanism and the piston operating the same, according to the pressure of gas in the tank whereby the supply of water to the carbid is regulated automatically.

The tank 1 is constructed of galvanized boiler-plate and is provided in its upper portion with a transverse partition 2, whereby a water and gas chamber 3 is formed above the same. The bottom 4 of the tank is provided with a central opening for reception of a carbid-holder comprising an outer cylinder 5 and an inner detachable cup or carbid-receptacle proper, 6. The flanged collar 7 is riveted to the tank-bottom 4 and soldered to the cylinder 5, whereby the latter forms a rigid attachment of the tank. A removable cap 8 is screwed on the lower end of the cylinder 5 and provided with a polygonal wrench-head 9 for convenience of use in screwing the cap on and off. The carbid-holder proper, 6, is closed at the bottom, but open at the top, and rests or is supported upon the cap 8. Within this carbid-holder 6 is arranged a tube 10, having a flared top and a series of perforations, its bottom portion being flared widely and provided with projections or legs that support it upon the bottom of the carbid-holder and also space it therefrom. The carbid 11 is placed in this receptacle 6 and covers the flaring base of the perforated tube 10. The water-space 3 in the upper portion of the tank is connected by a pipe 12, a T 13, and valve-pipe 14 with the carbid-cylinder 5. The pipe 14 has a portion which is pendent within the cylinder 5 and enters the flared mouth of the pipe 10. A valve is located at 15 and provided with a rod 16, that extends through a stuffing-box and gland 17 to the outside of the tank, where it is provided with a head adapted for manual manipulation. By adjusting this valve 15 admission of water to the carbid may be cut off at will. A perforated gas-exit pipe 19 is screwed into the T 13 and extends upward in the gas-space 20 of the tank. The pipe 12 is provided with a stop-cock 21 and valves 22 and 23, which are operated automatically, as will be presently described. The valve 22 may be constructed in any suitable manner so that when rotated a quarter round it will allow or cut off the flow of water from the chamber 3, according to its position. Adjacent and exterior to this valve is arranged a supplemental water-holder 3^a, which is suitably applied to the pipe 12 and communicates therewith. It is normally filled with water to the same height as the chamber 3, and its use is to supply more quickly than would be otherwise practicable a quantity or volume of water for discharge upon the carbid. The valve 23, which is illustrated more fully in Fig. 2, is in disk form and attached to one arm of an elbow-lever 24, that is pivoted at 25 in a housing 26, forming an attachment of the pipe 12. A curved push bar or lever 27 connects the two valves 22 and 23, as shown—that is to say, the upper end of said bar or lever is provided with an obtuse-angled longitudinal slot that receives a pin 29, forming a lateral projection of the valve-lever 30. The lower end of said bar or lever 27 is provided with a curved lengthwise slot 30, through which projects a pin 31, that is fixed on the housing 26 of the lower valve. Intermediately of the two valves the bar 27 is pivoted to the shorter arm of an elbow-lever 32, whose fulcrum is at 33 on a union forming part of the pipe 12. The longer arm of this lever 32 is curved outward at its end 34 and is adapted to come in contact with one of the arms 29^a of the valve-levers, as will be presently described. The bar 27 is connected with the angular end of a rod 35, which is connected with a piston 36, working in a horizontal cylinder 37, that projects through the side of the tank, as shown. The said rod is also connected adjacently with the lever-arm 24 of the valve 23, so that when the rod reciprocates it operates simultaneously the said bar and the valve. The cylin-

der 37 is open at its inner end and closed at its outer end, so that gas is free to act on the piston. The pressure of gas is resisted by a spiral spring 38, which is applied to the piston-rod at a point between the piston and an elongated and adjustable stuffing-box 39, that screws through the head 40 of the cylinder. The said stuffing-box is provided with a polygonal head for convenience of application of a wrench-head, which may be operated for regulating the tension of the spring 38 to any required degree. It will be understood that the tension of the spring will correspond to whatever pressure of gas may be required in use.

A gas-exit pipe 41 passes up through the partition 2 in the tank and extends above the water in the chamber 3. From the gas-space in this chamber the gas passes through a valved passage 42 into a horizontal cylinder 43, which contains some absorbent material 44, that serves to remove moisture from the gas in passing through it. For this purpose I preferably employ cotton. A gas service-pipe 45 is connected with the left-hand end of the cylinder 43 and provided with a stop-cock 46. An automatic safety gas-escape valve 47 is connected with the top of the tank, and the latter is also provided with a gas-pressure gage 48 and a water-glass 49, also with a removable plug 50, which closes an opening through which water may be introduced into the chamber 3. A gas-pipe 51 connects the chamber 3 with the water-pipe 12, as shown, and it is provided with a stop-cock 52. It is apparent that this pipe will contain a pressure of gas the same as within the tank and will destroy any tendency to the creation of a vacuum between the valves 22 and 23, so that the supplemental water-tank 3^a will discharge automatically without impediment. A test-burner 53, provided with a stop-cock, is applied to the pipe 51, as shown. The lower portion of the tank surrounding the carbid-receptacle is filled with water 20^a to a point near the top of the cylinder 5. The chamber 3 at the top of the tank is to be filled with water to the top of the water-glass 49. In charging the apparatus with carbid for the first time the cap 8 of the cylinder 5 is unscrewed and the carbid-holder 6 is removed, together with the perforated funnel-shaped tube 10, supported therein. Carbid is then filled into the receptacle 6 so as to cover the flared bottom of the tube 10 and extending upward therefrom to, say, half the height of the receptacle. The latter is then replaced in the cylinder 5 and the head 8 screwed on. It will be noted that in this operation the pendent tube or pipe 14 again enters the flared mouth of the tube 10. The valve 15 is now opened and also valves 21, (in pipe 12,) 52, (in pipe 51,) and 42. The valves 22 and 46 (in the service-pipe) remaining closed. It will be understood that at this time the lower valve 23 in pipe 12 is held open by the action of the spring 38. The operator now pulls back the valve-lever 24 to the position indicated in Fig. 4, whereby through the connection of said lever with the curved push bar or lever 27 the latter moves forward and upward, so that the pin of the valve-lever slides to the rear end of the slot and the lever is rotated to the horizontal position, (see Fig. 4,) whereby the valve 22 is opened. Water from the supplemental water-tank 3^a will fill the pipe 12 down to the valve 23 at this time, and the tank 3^a will be resupplied from the chamber 3. The water in pipe 12 between the valves 22 23 constitutes a charge which is now to be transferred to the carbid-receptacle. It will be observed that in this operation the valve 22 is only opened upon the complete closing of the valve 23. It will be noted (see Fig. 4) that the described movement of the push-bar 27 has carried the longer arm of the elbow-lever 32 up into horizontal position, and that now upon release of the valve-lever 24 the expansion of the spring 38 in cylinder 36 will operate to restore the parts to their former position, and that the first effect of this movement as regards valve 23 will be the contact of the longer arm of lever 32 with the end 29^a of the valve-lever, so that the valve is quickly closed and the further flow of water in pipe 12 is cut off. The valve 23 being also opened at this time by the same movement, the water which fills the pipe 12 above it discharges through the pipe 14 into the bottom of the carbid-receptacle 6, where it flows out beneath the flared base of the tube 10 and mingles with the lower stratum of the carbid, thereby causing generation of the acetylene gas. The gas passes up through the tube 10 into the tube 14 and escapes from the tube 19 into the chamber 20 of the tank, whence it passes through tube 41 and valved pipe 42 into the drying-cylinder 43, and thus to the service-pipe 45.

When the carbid surrounding the base of the tube 10 has resolved itself into residue, the water rises in the tube 10 and passes through the perforations therein and into contact with the carbid above.

It will be seen that in all the space intended for gas the latter will now be under pressure and acting upon the piston 36 in the cylinder 37 compresses the spring 38 to a corresponding degree, which under ordinary conditions suffices to close the valve 23, the valve 22 being at the same time opened. As the gas-pressure is reduced by use the spring 38 will obviously expand to a corresponding degree, and thus when the pressure has fallen too low the valves 22 and 23 will be respectively closed and opened, as before described, for admitting a new charge of water to the carbid-receptacle. When it is desired to renew the charge of calcium carbid without affecting the flow of gas to the burners, the

valve 15 is closed, and then the cap 8 of the cylinder 5 may be unscrewed without danger of escape of gas.

When it is desired to renew the supply of water in the chamber 3, the plug 50 is suitably manipulated for the purpose. In practice this will be provided with a valve and the water-supply pipe will be attached before the plug is opened, and the latter will be closed before the water-supply pipe is disconnected. The bottom of the tank 1 is provided with a water-discharge cock 53.

It is apparent that any desired pressure of gas may be maintained automatically by the simple manipulation and adjustment of the screw-threaded stuffing-box 39, whereby the tension of the spiral spring 38 is varied correspondingly.

The apparatus is compact, strong, and durable in construction, economical in the consumption of water and carbid, simple in action, not liable to get out of order, and can be easily and quickly cleaned and recharged with carbid and water. There is no liability of overheating in the generation of the carbid, and the apparatus is self-regulating for the automatic generation of gas at high or low pressure, and a high pressure may be maintained with safety.

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

1. The combination, with the tank having a water-chamber and carbid-receptacle and a pipe connecting them, of two valves provided with levers and applied to said pipe for controlling the flow of water through the same, a push-bar connected with the levers of both valves, and a lever to which it is pivoted, the same serving to coact with the lever of the upper valve to assist in closing it, and a cylinder communicating with the gas-space of the tank, a piston which is slidable therein, its rod being connected with the lower valve and the push-bar, and means for holding the piston elastically against the pressure of gas, substantially as described.

2. The combination, with the tank having a water-chamber in its upper portion and a carbid-holder in its lower portion, and a pipe which connects them, of two valves provided with levers and applied to said pipe and spaced apart, a push-bar having a longitudinal slot in its upper portion which receives a pin of the upper valve-lever, and provided in its lower portion with a longitudinal guide-slot which receives a fixed pin, a cylinder connected with the gas-space of the tank, a piston slidable in said cylinder, its rod being connected with the push-bar and lower valve-lever, and a spring applied between the piston and head of the cylinder, whereby, when the pressure of gas in the tank overcomes the tension of the spring, the lower valve is opened and the push-bar projected upward to close the upper valve, substantially as described.

EDWIN ARTHUR CHAMBERLIN.

Witnesses:
JAMES C. PEACOCK,
E. P. CONRAD.