

No. 735,502.

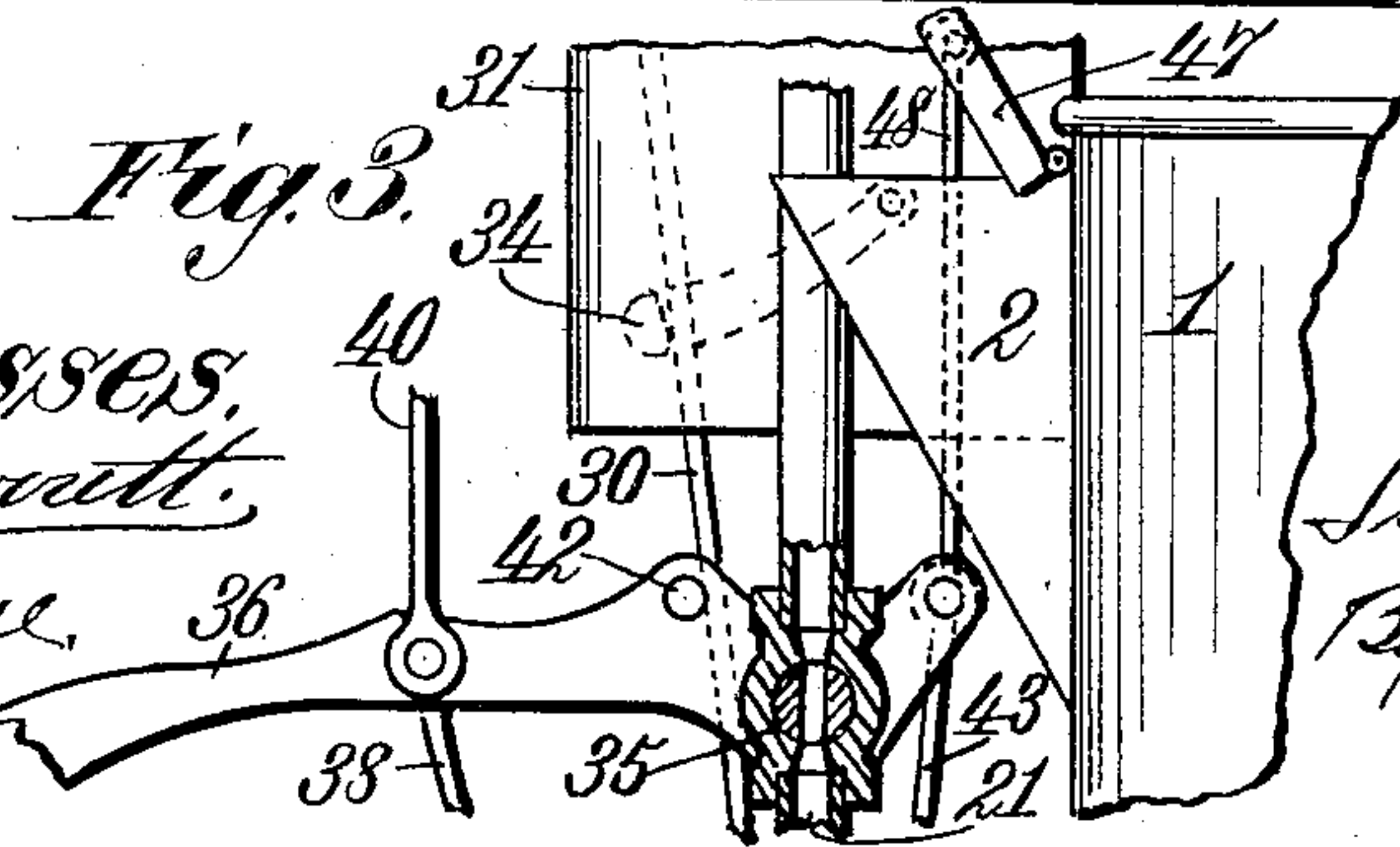
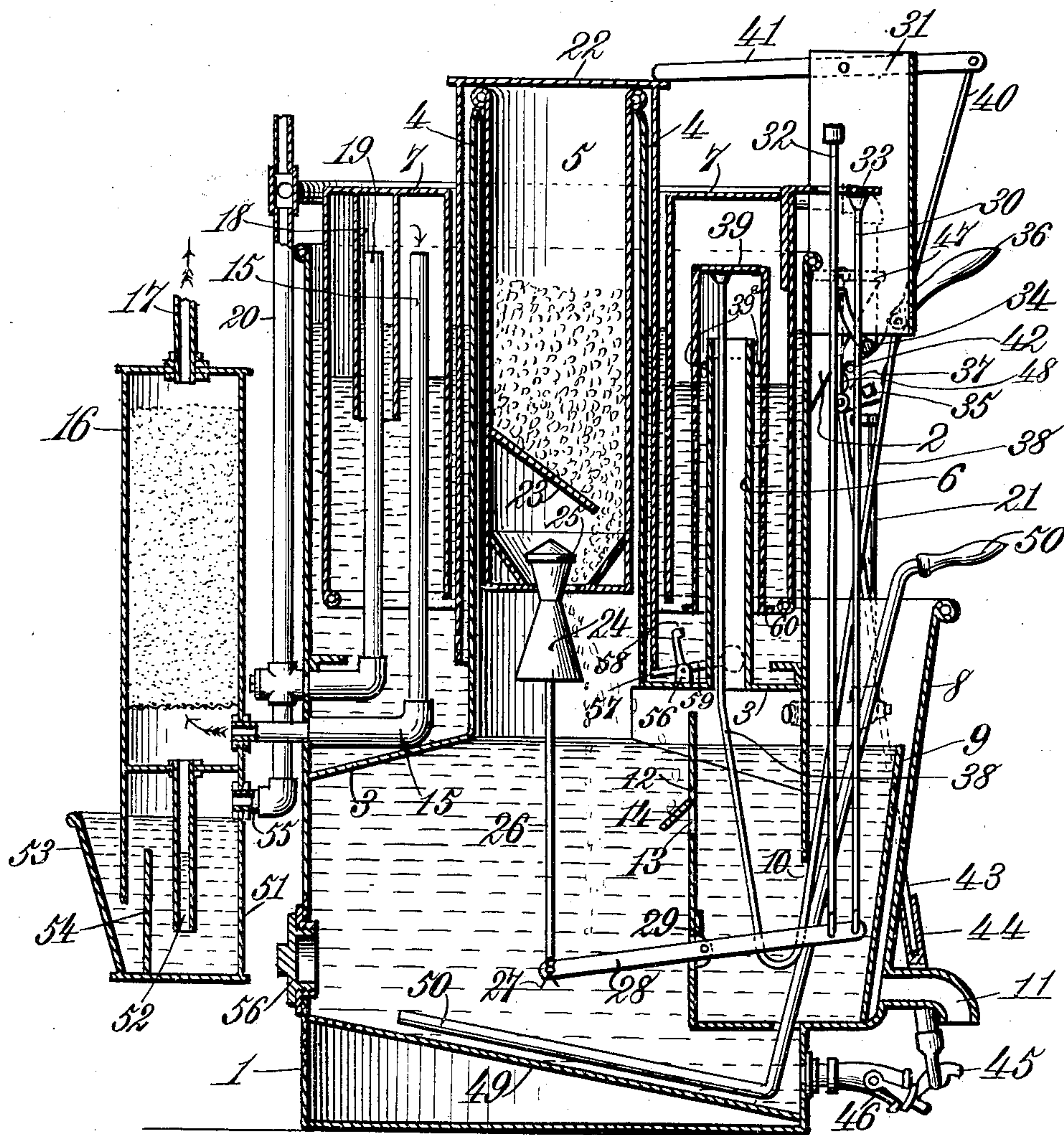
PATENTED AUG. 4, 1903.

I. L. HARRIS.
ACETYLENE GAS GENERATOR.
APPLICATION FILED FEB. 6, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.

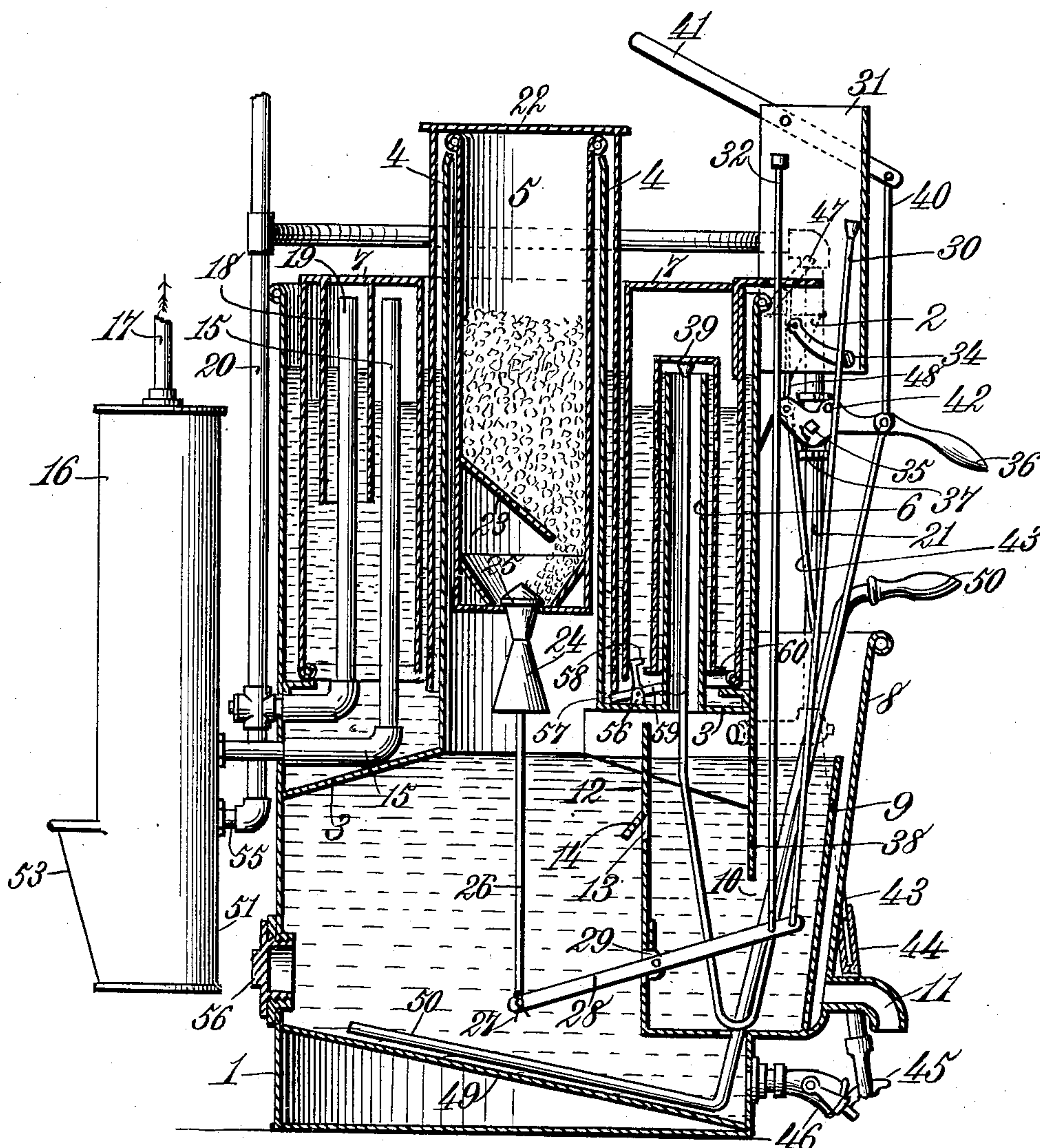
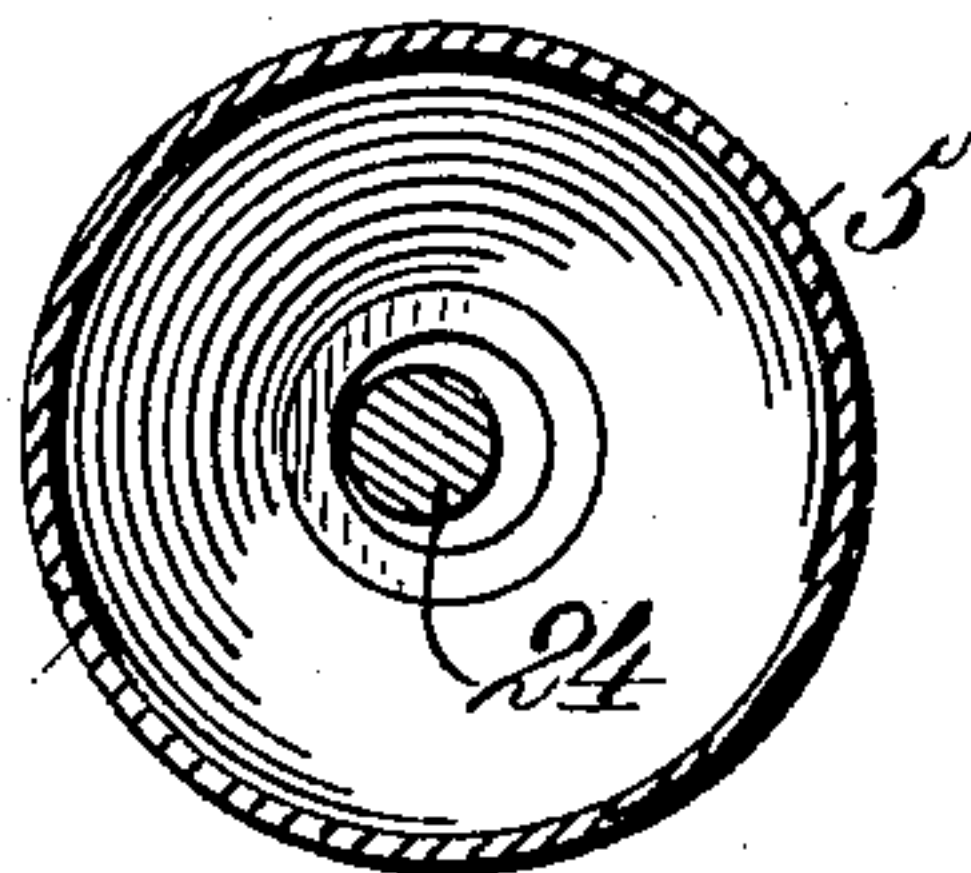


Fig. 4



Witnesses,
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UNITED STATES PATENT OFFICE.

ISAAC LEONARD HARRIS, OF JACKSONVILLE, FLORIDA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 735,502, dated August 4, 1903.

Application filed February 6, 1903. Serial No. 142,204. (No model.)

To all whom it may concern:

Be it known that I, ISAAC LEONARD HARRIS, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

My invention relates to improvements in acetylene-gas generators of that type where- in the carbid is automatically fed into a satu- rating-chamber in small graduated quanti- ties, and has for its objects certain improve- ments in the construction of the same, as will be hereinafter more specifically pointed out and claimed, reference being had to the ac- companying drawings, in which—

Figure 1 is a vertical sectional view of the generator, the parts being shown in operative position for generating gas. Fig. 2 is a simi- lar view showing the same in inoperative po- sition. Fig. 3 is a detail view showing the fun- nel-spout, its lid, and connections for con- trolling the movement of said lid. Fig. 4 is an enlarged detail sectional view of the lower part of the carbid-chamber and its valve.

Similar numerals of reference denote corre- sponding parts in the several views.

In the said drawings the reference-numeral 1 denotes the outer casing, at the top of which on one side is located a funnel-spout 2 for filling the same with water. Said casing is divided into an upper or gas chamber and a lower or generating chamber by a partition 3, formed into a central neck 4, open at its top for the reception of the carbid-chamber 5, hereinafter described. At one side said partition 3 has tapped into it a pipe 6, the same extending upwardly and open at top and bot- tom for the purpose of affording communica- tion between the lower and upper chambers. An annular gas-holder 7 is located in the up- per chamber and is centrally open to accom- modate the vertical neck 4, formed by the partition 3, for receiving the carbid-chamber 5, as shown.

The casing 1 has located on one side oppo- site the lower or generating chamber a pocket 8, the same having an inner vertical parti- tion 9 extending upward from the bottom thereof to near the top of said pocket and forming, in conjunction with a lower-disposed opening 10 in the side of the casing 1, a wa-

ter-sealed overflow to limit the water-level in the lower or generating chamber, as will be readily understood, a spout or outlet 11, lo- cated at the bottom of said pocket 8, serving for the discharge of any overflow. Extend- ing inwardly and then upwardly within the generating-chamber and forming practically a continuation of the pocket 8 is a partition 12, the same terminating a little below the par- tition 3 to permit free passage of the gener- ated gas thereover and being apertured at 13 to permit free passage of water, a hood 14 being provided for said aperture, the func- tion of said partition being to prevent any particles of the carbid dropped into the gen- erating-chamber from passing through the aperture 10, which might otherwise cause an escape of generated gas from pocket 8.

Tapped through the side of the casing 1 is the gas-delivery pipe 15, the same terminat- ing at its inner end within the gas-holder 7 near its upper end and extending outwardly and into a purifying-chamber 16, filled with cotton or other suitable material, through which the gas passes upwardly and into the service-pipe 17 and from thence to the burn- ers. Also tapped through the side of the cas- ing 1 and also terminating within the gas- holder 7 near its upper end, but within a sur- rounding tube 18, depending from the inner surface of said holder, is a blow-off pipe 19, the tube 18 serving as a water seal therefor under normal conditions, said pipe 19 con- necting with a blow-off pipe 20, leading to at- mosphere. Another pipe 21, tapped into the generating-chamber above the water-level, also communicates with pipe 20 and is for a purpose hereinafter to be described.

The carbid-chamber 5, which is provided with a cover 22, projecting into the water in the upper chamber between gas-holder 7 and chamber 4, thus forming a water seal, is pro- vided near its lower end with an inclined par- tition or deflector 23, the same being open at one side, as shown. The bottom of said cham- ber is preferably inclined to prevent an accu- mulation of carbid in a dead-space and is centrally apertured to receive the upper end of a substantially hour-glass valve 24, the same being provided at its upper end with an annular horizontal lip 25, slightly larger than the aperture in said chamber, as more

clearly shown in Figs. 1 and 2. Extending downwardly from said valve is a rod 26, connected, by means of a cotter-pin 27, with a lever 28, pivoted intermediate its length at 29 in the partition 12, the other end of said lever having extending upwardly therefrom an operating-rod 30, whose upper headed end lies in a guide 31. Also having its upper headed end lying in said guide is a second rod 32, connected to the outer end of lever 28 and passing through a slot in a tappet-arm 33, fixed to the gas-holder 7. A U-shaped weighted yoke-link 34, pivoted to guide 31, encircles rod 30 and tends to force its upper end inward beneath tappet-arm 33.

The pipe 21 is provided with a shut-off valve 35, operated by means of a handle 36, formed integral with a projection 37 on the other side of the valve 35. Connected to said handle 36 is a U-shaped rod 38, extending downwardly therefrom into pocket 8 and then upwardly through aperture 10 and through pipe 6, contacting at its upper inner end with an inverted cup 39, having apertures 39^a in the sides thereof and surrounding the upper end of pipe 6 and for a purpose hereinafter to be described. Also connected to handle 36, by means of a rod 40, is a lock-lever 41, pivoted intermediate its length to guide 31 and acting to prevent the removal of the cover 22 of the carbid-chamber 5 when handle 36 is thrown upward, as shown in Fig. 1. A pin 42 on handle 36 serves to engage rod 30 and carry it outward from beneath tappet-arm 33 when said handle is thrown downward, as shown in Fig. 2.

Pivoted to the projection 37 of handle 36 is a rod 43, telescoping in rod 44, that is in turn connected to the operating-arm 45 of a valve in a sludge-spout 46, tapped into the bottom of the generating-chamber, the operation of the telescoping rods 43 and 44 being such that when handle 36 is in the position shown in Fig. 1 said valve cannot be opened, but can be opened when the handle is in the position shown in Fig. 2.

The funnel-spout 2 is provided with a hinged cover 47, to which is attached a rod 48, extending and attached at its lower end to projection 37 of handle 36, the result being that said cover is opened when handle 36 is in the position shown in Figs. 2 and 3, but is closed and cannot be opened when said handle is in the position shown in Fig. 1.

The bottom 49 of the generating-chamber is inclined downwardly toward sludge-spout 46, and a suitable agitator 50 is provided for stirring up the sludge prior to the discharge thereof through spout 46.

The chamber 16 is provided at its lower end with a chamber 51, communicating with chamber 16 by means of pipe 52, projecting downwardly into chamber 51. An inlet-funnel 53 provides means for filling said chamber with water, while an upwardly-extending partition 54 effectually prevents the complete blowing out of the water due to excess gas-pres-

sure and a consequent unsealing at this point. A pipe 55 connects said chamber with blow-off pipe 20, as shown, whereby a gas-pressure sufficient to force down through pipe 52 will escape to atmosphere, said pipe 52 being shorter than any of the other water seals in the apparatus, so that when excess pressure occurs there will be an initial relief at this point.

I have shown in Figs. 1 and 2 a novel locking device controlled in its operation by the cover 22 of the carbid-chamber 5, the same consisting of a bell-crank lever pivoted at 56 on the partition 3 and having a long horizontal arm 57 and a shorter vertical hooked arm 58, an extension 59 opposite the long arm 57 being weighted. The lower end of cup 39 is flanged horizontally at 60 to be engaged by the hooked arm 58.

From the above description the operation of my improved construction will be understood, as follows: With the handle 36 in the position shown in Fig. 1 and the gasometer 7 raised by the contained gas to bring the tappet-arm 33 above the upper end of rod 30 the latter will be forced beneath the former by the yoke-link 34, and as the gas is exhausted from gas-holder 7 by use the latter and tappet-arm 33 will descend until said tappet-arm contacts with and forces down rod 30, thus lifting valve 24 and supplying carbid to the generating-chamber, the operation being thus rendered automatic. If through any cause a great excess of gas should be generated, the consequent abnormal lifting of gas-holder 7 will cause the tappet-arm 33 to contact with the headed end of rod 32, and thus positively close valve 24. The pipe 19 acts as a safety-discharge, for if the gas-holder 7 is lifted sufficiently to unseal said pipe the gas will immediately escape to atmosphere through said pipe 19 and pipe 20, said operation being supplemented by a safety-discharge through pipe 52, chamber 51, and pipes 55 and 20 if the gasometer 7 is in any way prevented from rising and excess gas-pressure consequently ensues.

It will be understood that when the handle 36 is in the upward position shown in Fig. 1 the valve 35 is closed, and it will be seen that as a result of the raising of said handle the following conditions ensue: The lever 41 falls in the path of cover 22, preventing it being raised. The rod 30 is no longer forced outward by pin 42 and is carried inward beneath tappet-arm 33 by the weight of yoke-link 34. The cup 39 is lifted on pipe 6, so that the apertures 39^a therein are above the water-level, thus permitting the flow of gas from the generating-chamber into the gas-holder 7. The cover 47 of funnel-spout 2 is maintained closed and cannot be opened, and the valve of the sludge-spout 46 is locked against opening. The bringing down of handle 36 to the position shown in Fig. 2 lowers cup 39 to seal pipe 6; opens valve 36, thus establishing atmospheric pressure in the generating-cham-

ber through vent-pipe 20 and pipe 21; opens cover 47 of funnel-spout 2; throws rod 30 out of automatic operation, thus permitting valve 24 to seat by its own weight, and thus cut off the carbide-supply; permits the cover 22 to be removed, and permits the valve of sludge-spout 46 to be opened to withdraw the water and sludge from the generating-chamber. It will thus be seen that in this condition the gas in gasometer 7 may continue to supply the lights while the generating-chamber is emptied, cleaned, and refilled and the carbide-chamber replenished. In fact, if desired, the carbide-chamber 5 and its valve 24 may be removed when the water is withdrawn from the generating-chamber by removing cover 56 of the hand-hole shown and through said hole removing cotter-pin 27, connecting-rod 26, and lever 28. In filling the apparatus with water the same is poured in through funnel-spout 2, thus first filling the gas-chamber to the level of the upper end of pipe 6, through which it then overflows into the generating-chamber, the opening 13 in the partition 12 therein establishing communication between the two parts thereof. The top edge of partition 9 determines the water-level in the generating-chamber, and a discharge at spout 11 will indicate that the apparatus is filled. I have shown in Fig. 4 an enlarged detail view of the valve 24 and the lower portion of the carbide-chamber 5, and the operation of the same will now be described as follows: The inclined partition or deflector 23 causes the carbide to pass down past the same at one side and to form a piling-angle pressing against valve 24 at an angle, the result being that as the latter is lifted it is forced to one side to the extent that its tapering construction will permit, thus permitting the discharge of the carbide practically at one side only of said valve. The deflector 23 also performs the highly important function of providing an air-space beneath the same and just above the valve 24, in which the latter may rise when lifted without lifting the dead-weight of the whole column of carbide in chamber 5. The main function of the enlarged lower portion of valve 24 is to act as a safety-closure for the valve-opening under the following circumstances: Should the handle 36 be thrown up while the cover 22 of the carbide-chamber 5 is removed, the pipe 6 would be unsealed, thus permitting the escape of the gas in gas-holder 7 through carbide-chamber 5. Now if the gas-holder 7 at this time were raised high enough to permit rod 30 to pass beneath tappet 33 the consequent sinking of gas-holder 7 due to the escape of the gas therein would carry down rod 30, and thus open valve 24 and permit the discharge of carbide; but inasmuch as the gas-holder 7 would at once fall to its lowermost position the rod 30 would be forced down far enough to cause the enlarged lower portion of valve 24 to rise into and close the valve-opening, thus shutting off the carbide-dis-

charge. The said enlarged lower portion of valve 24 also performs the double function of spreading the carbide over a wide surface of the water in the generator-chamber as the same impinges thereon in falling through the opening in the carbide-chamber and of protecting the underlying rod 26 from an accumulation of the same.

The operation of the locking mechanism shown in Figs. 1 and 2 is as follows: With the cover 22 of the carbide-chamber 5 in position thereon its lower edge rests on the long arm 57 of the bell-crank lever, thus rocking the hooked arm 58 thereof away from engagement with the flange 60 of cup 39, thus permitting the latter to be raised. When, however, the cover 22 is removed, the weighted extension 59 rocks said bell-crank lever to the position shown in dotted lines, thus causing hooked arm 58 to engage flange 60 of cup 39 and preventing the latter from being lifted, thus effectually preventing the lifting of handle 36 so long as the cover 22 is removed. It will thus be seen that the handle 36 and cover 22 act as counter-locks on each other, it being impossible to remove cover 22 while the handle 36 is up and the machine in operative position, whereas when said handle is turned down to bring the parts into inoperative position said cover 22 may be removed, its removal, however, releasing long arm 57 and causing hooked arm 58 to engage flange 60, thus preventing the raising of handle 36 as long as cover 22 is removed.

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

1. In an acetylene-gas generator, the combination with the carbide-chamber, and a valve in the lower end thereof, of a deflector in said chamber above said valve for diverting the carbide to one side only before reaching said valve.

2. In an acetylene-gas generator, the combination with the carbide-chamber, and a valve in the lower end thereof, of a deflector within and carried by said chamber for diverting the carbide to one side only before reaching said valve.

3. In an acetylene-gas generator, the combination with the carbide-chamber, and a valve in the lower end thereof, of an inclined deflector carried by the said chamber above said valve for diverting the carbide to one side only and for leaving a partial air-space above said valve for facilitating the movement of said valve by taking therefrom a part of the weight of the carbide.

4. In an acetylene-gas generator, the combination with the carbide-chamber, of a valve in the lower end thereof having an upward and a lateral movement in its seat.

5. In an acetylene-gas generator, the combination with the carbide-chamber, of a valve in the lower end thereof having an upward and a lateral movement in its seat, and a deflector in said chamber above said valve for

diverting the carbid to one side only before reaching said valve.

6. In an acetylene-gas generator, the combination with the carbid-chamber having an opening in its lower end, an upwardly-moving valve therefor consisting of a flat annular lip normally closing said opening and a tapered body portion, said valve being capable of a lateral as well as an upward movement to uncover one side of said opening.

7. In an acetylene-gas generator, the combination with the carbid-chamber having an opening in its lower end, of a deflector above said opening for diverting the carbid to one side in its downward passage through the carbid-chamber, and an upwardly-opening valve in the lower end of the carbid-chamber capable of lateral movement when lifted to uncover the valve-opening at one side, said valve being shifted laterally when lifted by the piling-angle of the carbid formed by the superposed deflector.

8. In an acetylene-gas generator, the combination with a gas-holder, a carbid-chamber, a carbid-feed valve for the same, a rod connected to said valve, and a tappet on said holder adapted to depress said rod when the holder descends and thereby open the valve, of a second rod also connected to said valve and adapted to be engaged and lifted by said tappet during abnormal lifting of the gas-holder, thereby closing said valve.

9. In an acetylene-gas generator, a water-sealed chamber, a pipe depending into the water therein and communicating with the gas-delivery side of the apparatus, a vent-pipe communicating with said chamber above the water therein, and a partition in said chamber for preventing the complete discharge of water therefrom and consequent unsealing of said chamber due to excess gas-pressure.

10. In an acetylene-gas generator, means for sealing the carbid-chamber, means for controlling the position of the various parts to render the same operative or inoperative, and means operated by the unsealing of the carbid-chamber to lock the parts in the inoperative position.

11. In an acetylene-gas generator, means for sealing the carbid-chamber, means for controlling the position of the various parts to render the same operative or inoperative, the movement to the operative position lock-

ing the carbid-chamber seal, and means operated by the unsealing of the carbid-chamber when the parts are in their inoperative position to lock said parts in said inoperative position.

12. In an acetylene-gas generator, the combination with a cover for sealing the carbid-chamber, and means for controlling the position of the various parts to render the same operative or inoperative, the movement to the operative position locking the carbid-chamber cover against removal, of a lock within the generator adapted when released to engage one of the movable parts to retain the same, and through it the other parts, in inoperative position, said lock being engaged by said cover when the latter is in operative position to disengage it from and thus release the movable parts.

13. In an acetylene-gas generator, the combination with a cover for sealing the carbid-chamber, and means for controlling the position of the various parts to render the same operative or inoperative, the movement to the operative position locking the carbid-chamber cover against removal, of a bell-crank lever in said generator having one hooked arm thereof lying normally in position to engage and retain one of the movable parts, and through it the other parts, when moved to its inoperative position, the other arm of said bell-crank lever adapted to be engaged by the carbid-chamber cover when in operative position to rock said bell-crank lever away from engagement with said movable part and thus release the latter.

14. In an acetylene-gas generator, a generating-tank having an overflow for limiting the water-level therein, a water seal for said overflow, operating means entering said generator through said overflow and water seal, and a partition in said generator extending above the water-level therein, but permitting passage of gas and water, for preventing access of carbid discharged into said generator to said water-sealed overflow.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ISAAC LEONARD HARRIS.

Witnesses:

PERCY B. HILLS,
C. A. BALL.