No. 860,011. PATENTED JULY 16, 1907.

F. P. CAVE.

ACETYLENE GAS GENERATOR.

APPLICATION FILED NOV. 12, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 4.

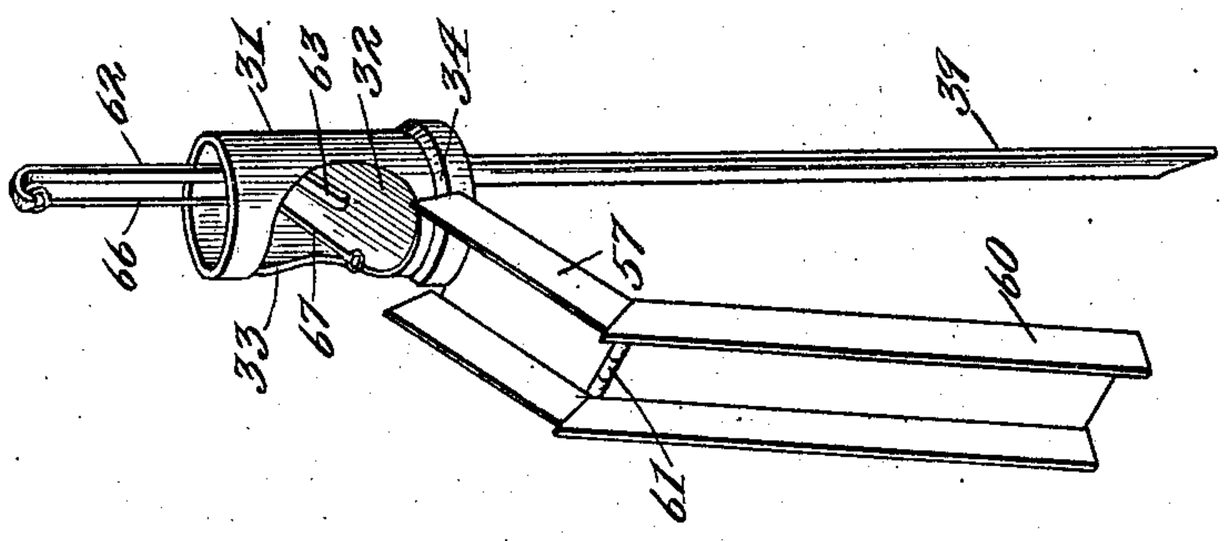


Fig. 3.

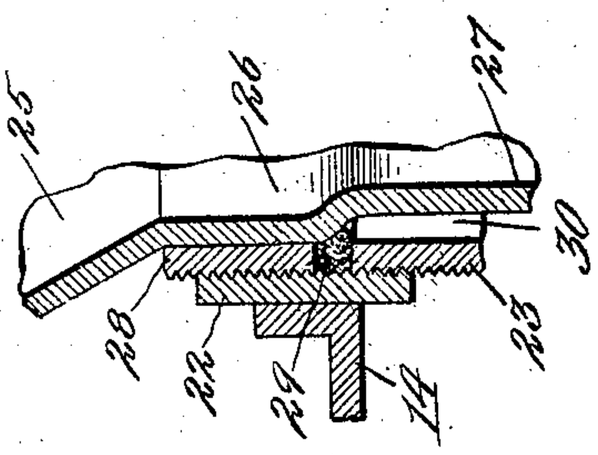
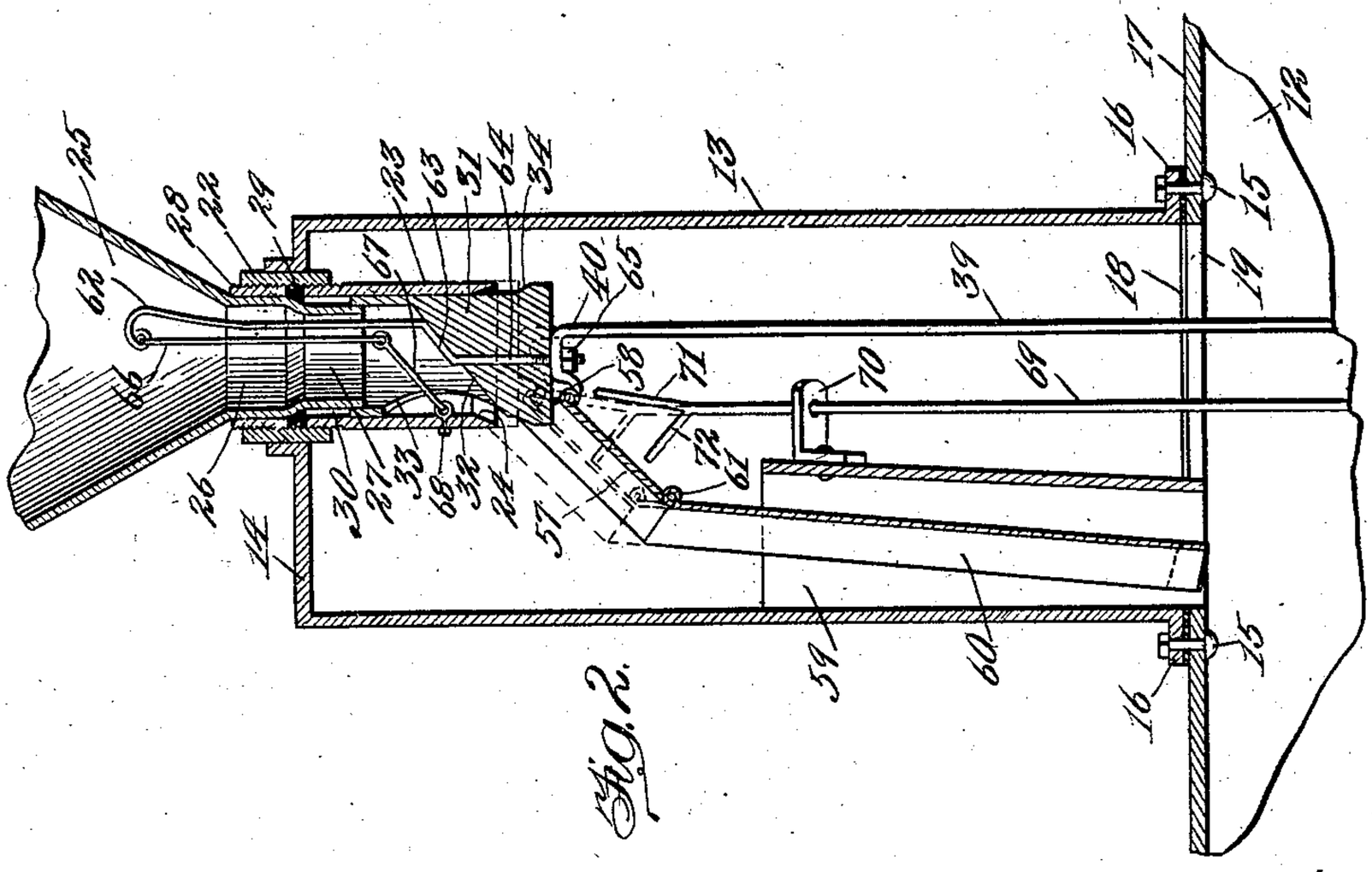


Fig. 2.



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UNITED STATES PATENT OFFICE.

FREDERICK P. CAVE, OF LOS ANGELES, CALIFORNIA.

ACETYLENE-GAS GENERATOR.

No. 860,011. Specification of Letters Patent. Patented July 16, 1907.

Application filed November 12, 1906. Serial No. 342,942.

To all whom it may concern:

Be it known that I, FREDERICK P. CAVE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a full, clear, and exact specification.

This invention relates to improvements in acetylene gas generators and the primary object of the same is to provide an improved means for uniformly feeding the carbid and to positively check the supply when the bell of the gasometer passes below a certain limit.

A further object is to provide improved means for preventing the carbid from being discharged directly under the feed.

A further object is to provide improved means for removing the loose particles of carbid from the parts after the supply of carbid has been checked.

A further object is to provide an improved machine of this character which will be simple and cheap in construction, and efficient and effective in operation, and which will at the same time comply with all the requirements necessary in machines of this character.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings, illustrating an exemplification of the invention and in which .

Figure 1 is a longitudinal sectional view of a machine constructed in accordance with the principles of this invention. Fig. 2 is a sectional view of a portion of the generator and the feeding mechanism taken on a line at right angles to the section illustrated in Fig. 1. Fig. 3 is an enlarged detail section of a portion of the hopper and generator showing the connecting coupling. Fig. 4 is a detail perspective view of the feeding valve.

In the exemplification of the invention, the numeral 10 designates a gasometer and condensation chamber of any approved style and configuration and which is provided with a movable bell 11, the movement of which is controlled by the amount of gas in the gasometer. A separate generating tank 12, adapted to contain water, is also provided and said tank is preferably provided with a reduced upper portion or chamber 13, which has a closed top 14 and an open bottom, the latter communicating with the tank 12. The chamber 13 is preferably constructed separately from the tank and is held in position in any suitable manner, preferably by means of bolts 15, which pass through a flanged portion 16 of chamber 13 and the top 17 of the tank 12. A gasket or suitable packing material 18 may be disposed between the top 17 of the tank and the flange 16 of the chamber 13 to form a fluid tight joint surrounding the opening 19 in the top of the tank. If desired, though, the chamber 13 and tank 12 may be formed integral. A suitable pipe 20 may be arranged to form communication between the top of the chamber 13 and the bottom of the gasometer 10 for conducting the generated gas into the gasometer, and within said pipe may be arranged a filter 21, of any approved construction.

The top 14 of the chamber 13 is provided with a suitable aperture, arranged within which is a collar or nipple 22. This collar or nipple is interiorly screw threaded and preferably projects beyond the upper and lower face of the top 14 and may be secured within the aperture in any suitable manner such as by brazing or soldering the same to the top.

A suitable tubular member 23 is provided on one end with exterior screw threads, and said threaded end is adapted to be inserted into the nipple or collar 22 from the inside of the chamber 13 so that the thread will engage the threads in the collar or nipple for holding the member in position. This member is preferably of a length to extend for some distance into the chamber and is provided with a beveled portion 24 adjacent its free extremity.

A carbid hopper 25 is provided with a discharge outlet 26 leading from the bottom thereof, the extremity of which is preferably reduced as at 27. An exteriorly threaded sleeve or collar 28 surrounds the outlet 26 of the hopper above the reduced portion 27 and may be secured thereto in any suitable manner such as by brazing or the like. The delivery end of the hopper is inserted into the collar or nipple 22 so that the threads on the sleeve or nipple 28 will engage the threads in the collar or nipple 22 for holding the hopper in position. If desired, a suitable gasket or packing 29 may be arranged in the space between the collar or nipple 22 and the discharge end of the hopper 25, and between the ends of the tubular member 23 and the sleeve or collar 28 to form a fluid tight joint.

The reduced portion 27 of the discharge end of the hopper extends for some distance into the tubular member 23 to form a space 30 for a purpose to be set forth, and the packing or gasket 29 is preferably arranged adjacent the reduced portion 27. Arranged for movement within the tubular member 23 is a tubular valve 31 which is provided with a bottom having an inclined upper face 32 arranged adjacent the bottom of an aperture or opening 33 in the wall thereof. This valve is of such a size as to substantially fill the tubular member 23 and is of a length that the top of the wall thereof will enter and move within the space 30 between the tubular member 23 and the reduced portion 27 of the discharge end of the hopper. The valve is also provided with a peripheral inclined shoulder 34 adjacent the lower extremity thereof which is adapted

to engage the beveled portion 24 of the tubular member 23 to form a tight joint. If desired the sleeve or collar 28 may be so adjusted with relation to the tubular member as to compress the packing or gasket 29 to cause the same to extend into the space 30, so as to be engaged by the upper end of the valve 31 when the latter is closed.

Spaced parallel members 35—36 are secured by their upper ends to suitable supports 37 projecting laterally from the tubular member 23. These members are located within the chamber 13 and extend through the opening 19 for some distance and into the chamber 12. A transverse member 38 connects these members adjacent their lower end and forms a suitable guide for a vertically movable rod or bar 39, located between the members 35—36.

The upper end of the rod or bar 39 is bent at a substantially right angle to the body portion as at 40 and said portion engages and is secured to the lower face of the valve 31 in a manner to be hereinafter more fully set forth.

The member 36 preferably extends below the transverse member 38 and fulcrumed to said extension is a lever 41, one end of which is pivotally connected to the rod or bar 39. A rod or bar 42 is pivotally connected to the free end of the lever 41 and extends through a tube 43, which passes through and depends from the top of the tank 12 and extends below the level of the water in the tank so that the water forms a seal for the tube.

Secured to the tank is a suitable bracket or support 44, which serves as a fulcrum for a lever 45, which latter is pivoted at a point between its ends to the support. One end of the lever 45 is pivotally connected to the free end of the rod or bar 42 and the other end preferably projects over the bell 11 of the gasometer and out of the range of the movement thereof, and journaled to said end is a suitable pulley or wheel 46.

A flexible member 47 such as a chain or the like is secured by one end to the bell 11 and passes over the wheel or pulley 46, and connected to the free end hereof is a suitable weight 48. Suitable arms or levers 49 are fulcrumed between their ends as at 50 to the members 35—36 and are pivotally connected as at 51 to the rod or member 39. The free ends of these arms or levers project for some distance beyond the members 35—36 and adjustably mounted on these ends are suitable weights 52. The object of said weights being to exert an upward strain on the rod or bar 39 for normally seating and holding the carbid feeding valve 31 closed to cut off the supply of carbid when the bell of the gasometer is raised. In this position the weight 48 will rest upon the top of the bell and the strain on the end of the lever 45 will be relieved, thereby permitting the weights 52 to close the valve 31. As the gas is consumed from the gasometer and the bell descends the valve will remain closed until the bell reaches a point that the weight 48 will be raised from the top thereof. In this position the power exerted upon the end of the lever 45 by the bell 11 and the weight 48 will be sufficient to overcome the weights 52 and the valve 31 through the medium of the rod or bar 42, lever 41 and rod or bar 39 will be opened to deliver a new charge into the tank.

If carbid should accumulate between the valve 31 and its seat, the weights may not be sufficient to close the valve when the bell passes below a certain point which would not arrest the flow of carbid. In order to overcome this difficulty, should the same arise, and to insure a positive means for closing the valve and checking the supply, under these conditions a suitable lever 53 may be provided which is pivoted between its ends to a suitable support 54, preferably secured to the gasometer 10. This lever is preferably provided with a bifurcated end 55 adapted to stand astride of the lever 45 adjacent its free end and a suitable flexible connection 56 is secured to the free end of this lever 53 and the bell 11 so that when the bell 11 descends below a certain point the lever 53 will, through the medium of the flexible member 56, raise the free end of the lever 45 and close the valve 31.

In order to prevent the carbid from being discharged directly into the tank below the valve, to meet certain requirements necessary in machines of this character, there is provided a chute 57. One end of this chute is pivotally connected to the extremity 58 of the portion 40 of the rod or bar 39, and said pivotal or hinged connection is located adjacent the lower face of the valve 31, remote from the edge thereof and adjacent the discharge opening 33 in the wall of the valve. A member 59 is arranged within the chamber 13, preferably to one side of the discharge opening of the valve 31 and in such a position with relation to the wall of the chamber to form an intervening space and a second trough or chute 60 is pivotally connected or hinged as at 61 to the free end of the trough or chute 57. This trough or chute 60 is adapted to move freely within the space formed by the member 59 and the wall of the chamber when the valve 31 is opened or closed, thereby directing or discharging the supply of carbid to one side at all times and limiting the swinging movement of the trough or chute 60. A suitable agitator, controlled and operated by the valve 31 may be provided, which extends into the hopper, for the purpose of breaking up the carbid and prevent arching or bridging of the material and to insure a free feeding of the carbid. This agitator is preferably located within the valve and comprises an upright portion 62 which extends above the top of the valve and into the hopper 25. The lower end of the upright is deflected or inclined as at 63 and rests upon the inclined face of 32 of the valve. The extremity 64 beyond the inclined or deflected portion 63 is preferably bent in a plane substantially parallel with the upper extremity of the upright 62 and passes through the bottom of the valve and the portion 40 of the rod or bar 39. This extremity preferably extends below the portion 40 and is provided with threads adapted to receive a suitable nut 65 by means of which the extremity of the rod or bar 39 will be secured to the valve 31.

A link 66 is pivotally connected by one end to the upper end of the upright or standard 62 and pivotally connected to the free end of said link is a second link 67. The free extremity of this second link 67 preferably passes through the discharge opening 33 of the valve and is removably secured to a suitable stationary support such as the tubular member 23, by means of a suitable eye bolt 68. Thus it will be seen that as the valve 31 is reciprocated the links 66—67 will be strained and moved about their pivots and will loosen the carbid in the hopper. If desired,

this agitator may be dispensed with, in which instance the end of the rod or bar 39 may be secured to the valve 31 in any suitable manner.

A bar or rod 69 is located within the tank and extends into the chamber 13. A suitable guide 70 may be provided for said bar or rod preferably located adjacent the free end thereof, which end is preferably bifurcated or provided with arms 71—72. These arms are located below and respectively in close proximity to and normally out of engagement with the bottom of the valve 31 and the trough or chute 57.

A rod or bar 73 is connected to the lower end of this rod or bar 69 and extends through and beyond the tube 43. A lever 74 is pivotally supported between the ends by the bracket or support 44, one end of which is pivotally connected to the rod or bar 73 and the other end is connected to the bell 11 by means of a suitable flexible member 75. When the bell 11 descends to a point sufficient to draw the free end of the lever 74 downward the arms 71—72 on the rod or bar 69 will engage the bottom of the valve and the chute or trough 57 and raise the same, tending to close the valve. If the bell does not descend far enough to cause the rod or bar 69 to close the valve, the flexible member 75 will remain loose and the free end of the lever 74 may be tapped with the hand, which will cause the ends of the arms 71—72 to strike or knock against the valve and trough so as to dislodge or remove any loose particles of carbid which may fall or tend to accumulate on the parts.

The upper end of the valve 31 being movable in the space 30, the carbid will be directed into the valve and will be discharged through the opening 33 when said opening passes below the lower end of the tubular member 23, which member serves as a closure for the opening when the valve is seated.

In order that the invention might be fully understood, the details of an embodiment thereof have been thus specifically described.

What I claim is:—

1. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube projecting into the tank, a tubular member within the tank surrounding the end of and spaced from said tube, a tubular valve movable within said member and communicating with the delivery tube, and means for moving said valve, the end of said valve being located and movable within the space between the delivery tube and the said member.

2. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube projecting into the tank, a tubular member within the tank surrounding the end of and spaced from the tube, a tubular valve movable within said member and communicating with the delivery tube, a gasometer containing a movable member, and an operative connection between the said movable member and the valve for moving the latter, the end of said valve being located and movable in the space between the delivery tube and the said member.

3. In an acetylene gas generator, the combination of a closed tank provided with an aperture, a tubular member surrounding the aperture, a tubular valve movable within the member and adapted to close one end thereof, said valve being provided with a discharge outlet, a carbid hopper having a delivery tube, the end of said delivery tube being located within the tubular member and projecting into the valve, and means for operating the valve.

4. In an acetylene gas generator, the combination of a closed tank provided with an aperture, a tubular member surrounding the aperture, a tubular valve movable within the member and adapted to form a closure therefor, said valve being provided with a discharge outlet, a carbid hopper having a delivery tube, the end of said tube being located within the tubular member and projecting into the valve to form a space between said tube and member in which the end of the valve moves, means for forming a fluid tight joint between the tube and member, and means for operating said valve.

5. In an acetylene gas generator, the combination of a closed tank provided with an aperture, a tubular member surrounding the aperture, a tubular valve movable within the member and adapted to form a closure therefor, said valve being provided with a discharge outlet, a carbid hopper having a delivery tube, said tube projecting into the member, the extremity of the said tube within the member being reduced and projecting into the valve, means forming a closure for the space formed between the tubular member and the said reduced portion, and means for causing the end of the valve to move in said space.

6. In an acetylene gas generator, the combination of a closed tank, provided with an aperture, a collar secured within the aperture, a tubular member within the tank removably connected to the collar, a carbid hopper provided with a delivery tube, means on the hopper adapted to removably engage the collar, packing disposed between the last said means and the tubular member, a hollow valve movable within the member and adapted to form a closure therefor, said valve being provided with a discharge outlet and adapted to receive a supply from the hopper, and means for moving the valve.

7. In an acetylene gas generator, the combination of a closed tank, provided with an aperture, a collar secured within the aperture, a tubular member within the tank, removably connected to the collar, a carbid hopper provided with a delivery tube, means on the hopper adapted to removably engage the collar, packing disposed between the last said means and the tubular member, a hollow valve movable within the member and adapted to form a closure therefor, said valve being provided with a discharge outlet, the end of said delivery tube being reduced and projecting into the valve, and means for moving the valve.

8. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube projecting into the tank, a tubular member within the tank surrounding the end of the delivery tube, a tubular valve within the member and adapted to telescope with the end of the delivery tube, an operating member connected to the valve, a supporting member, a weighted lever fulcrumed on the supporting member and having connection with the valve operating member, said lever being adapted to normally close the valve, and means for automatically opening said valve.

9. In an acetylence gas generator, the combination of a tank, a carbid hopper having a delivery tube projecting into the tank, a tubular member within the tank surrounding the end of the delivery tube, a tubular valve within the member and adapted to telescope with the end of the delivery tube, an operating member connected to the valve, a supporting member, a weighted lever fulcrumed on the supporting member and having connection with the valve operating member, said lever being adapted to normally close the valve, a gasometer containing a movable member, and an operative connection between said member and the valve operating member for opening said valve against the tension of said lever.

10. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube projecting into the tank, a tubular member within the tank surrounding the end of the delivery tube, a tubular valve within the member and adapted to telescope with the end of the delivery tube, an operating member connected to the valve, a supporting member, a weighted lever fulcrumed on the supporting member and having connection with the valve operating member, said lever being adapted to normally close the valve, a gasometer containing a movable member, and an operative connection between said member and the valve operating member for opening the valve when the said movable member passes a predetermined point, and means engaging said connection for assisting said lever in closing the valve.

11. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube projecting

into the tank, a tubular valve operatively related to the end of the delivery tube and telescoping therewith, an operating member for the valve, a weighted lever, a supporting member to which said lever is fulcrumed, a connection between the lever and the operating member, for normally closing the valve, a second lever pivotally supported between its ends, a connection between one end of the lever and the valve operating member, a gasometer having a movable member, and an operative connection between the last said member and the last said lever for automatically opening said valve.

12. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve within the tank for controlling the discharge, means for operating the valve, and means for dislodging the particles of carbid deposited upon the operating parts when the valve is closed.

13. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve within the tank for controlling the discharge, means for operating the valve, means within the tank adapted to engage one of the operating parts when the valve is closed for dislodging the accumulated particles of carbid, and means exterior of the tank for operating the last said means.

14. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve within the tank for controlling the discharge, means for operating the valve, means within the tank adapted to engage one of the operating parts when the valve is closed for dislodging the accumulated particles of carbid, means exterior of the tank for operating the last said means, and means whereby said dislodging means will close the valve.

15. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve within the tank for controlling the discharge, means for operating the valve, reciprocating means within the tank adapted to strike the mechanism for dislodging the accumulated particles of carbid, a guide for said means, and means for reciprocating the last said means.

16. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve within the tank for controlling the discharge, means for operating the valve, means operatively related to the valve and adapted to receive the carbid from the valve and direct the same to one side of the valve, a member adapted to form a space within which the free end of the last said means is adapted to move and means for operating the valve and the said last said means.

17. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve within the tank for controlling the discharge, a member pivotally connected to the valve for receiving and directing the carbid into the tank to one side of the valve, means adapted to engage the valve for closing the same, means for retaining the valve closed, said valve closing means normally standing out of engagement with the valve, and means for causing the valve closing means to strike the valve to dislodge the accumulated particles of carbid on the exposed surface thereof.

18. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube discharging into the tank, a valve for controlling the discharge, said valve being adapted to telescope with the delivery tube and having a discharge opening, a tubular member surrounding the valve and discharge tube for closing the discharge opening, and means for operating the valve for exposing the discharge opening.

19. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a valve for controlling the opening, means for operating the valve, a removable agitator controlled by the valve, said agitator comprising a rigid and a flexible section, and a single means for securing the agitator in position and the operating means to the valve.

20. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a movable valve for controlling the discharge, means for moving the valve, and an agitator comprising a rigid and a flexible section, one end of the rigid section passing through the valve and removably engaging the operating means for operatively connecting said means and valve.

21. In an acetylene gas generator, the combination of a tank, a carbid hopper discharging into the tank, a movable valve for controlling the discharge, means engaging said valve for operating the same, an agitator comprising a plurality of sections, one end of one of the sections projecting beyond the valve, the other end projecting through the valve, and the valve operating means to form a rigid section, and means removably engaging the last said end for securing the valve and operating means together, the other section of the agitator being flexible.

22. In an acetylene gas generator, the combination of a tank, a carbid hopper having a delivery tube discharging into the tank, a hollow valve telescoping with the tube for controlling the discharge, means engaging said valve for operating the same, said valve being provided with a discharge opening, an agitator comprising a member, one end of which projects beyond the valve and engages the operating means for securing said means and valve together, a pair of connected links, the end of one of the links being pivoted to the member, the end of the other link passing through the discharge opening in the valve, and a stationary support to which said end is pivoted.

23. In an acetylene gas generator, the combination of a generating chamber, a carbid holder provided with a discharge outlet communicating with the chamber, means for controlling the outlet, said means comprising spaced concentric members surrounding the said discharge outlet, a hollow valve movable within the space between the members and adapted to form a closure for the outlet, said valve being provided with a discharge outlet, means also within the space adapted to coöperate with the valve to form a fluid tight joint, and means for moving the valve.

24. In an acetylene gas generator, the combination of a generating chamber, a carbid holder provided with a discharge outlet communicating with the chamber, means for controlling the discharge outlet, said means comprising spaced concentric members surrounding the said discharge outlet, a hollow valve movable within the space between the members and adapted to form a closure for the outlet, said valve being provided with a discharge outlet and means for moving the valve.

25. In an acetylene gas generator, the combination of a generating tank provided with an inlet opening through which carbid is adapted to be supplied thereto, spaced concentric members surrounding the inlet, a gasket within the space, means for securing the gasket in position, a hollow valve movable within the space between the members and adapted to form a closure for the inlet, said valve being provided with a discharge opening, and means for moving the valve, the end of the valve being adapted to engage the gasket when the valve is closed to form a fluid tight joint.

26. In an acetylene gas generator, the combination of a generating chamber provided with a supply opening, a tubular member surrounding the opening, a hollow valve telescoping with the tubular member and adapted to control the opening, said valve being provided with a discharge opening, an agitator secured to the valve and projecting into the tubular member, and means for operating the valve.

27. In an acetylene gas generator, the combination of a generating chamber provided with a supply opening, a tubular member surrounding the opening, a hollow valve telescoping with the tubular member, and adapted to control the opening, said valve being provided with a discharge opening, an agitator projecting into the tubular member, mechanism for operating the valve, and means operatively related to the agitator for securing the agitator to the valve and for securing the valve to the operating mechanism.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 8th day of November A. D. 1906.

FREDERICK P. CAVE.

Witnesses:
J. H. JOCHUM, Jr.,
FRANCIS A. HOPKINS.