M. L. & G. W. RICE.

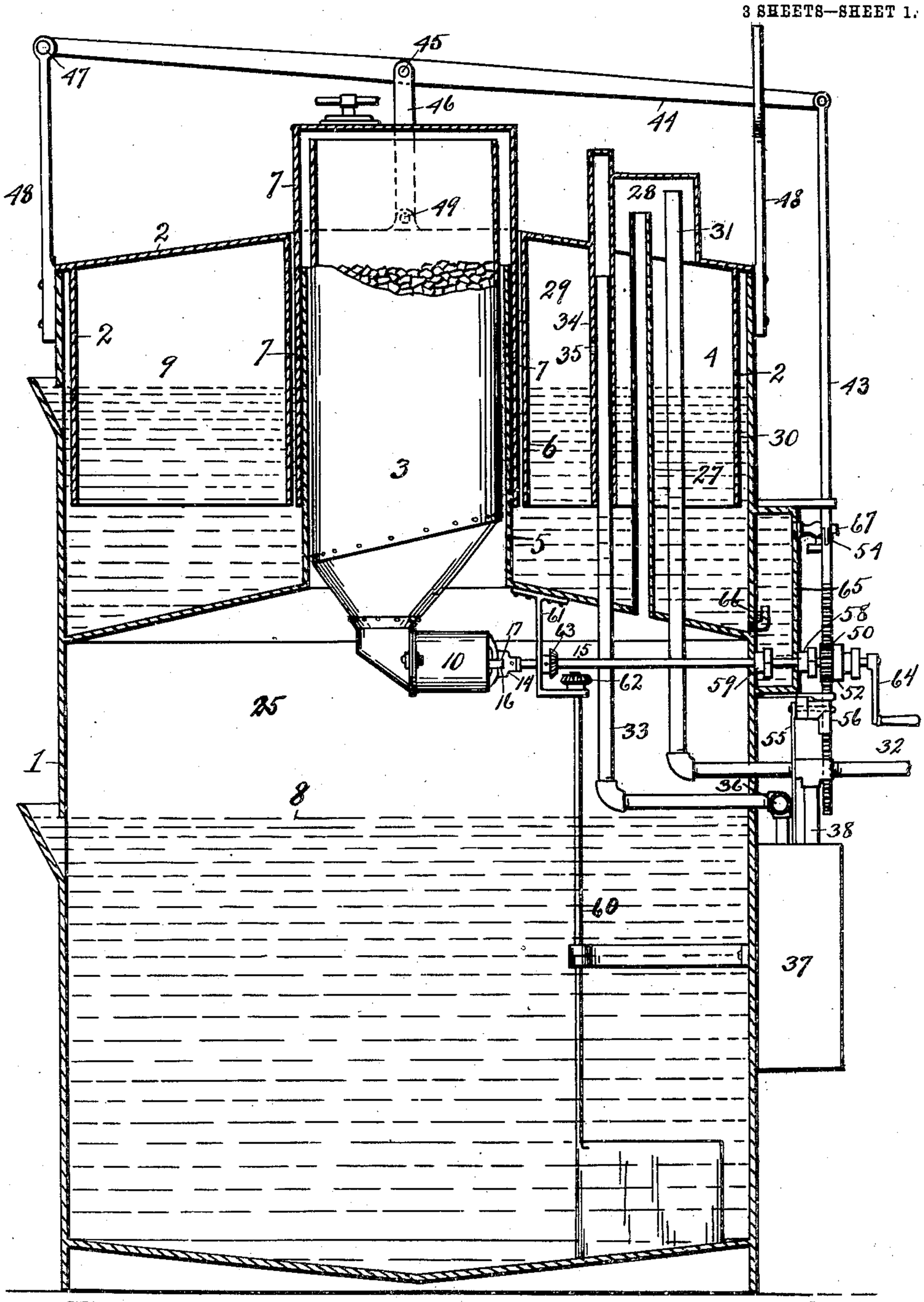
ACETYLENE GAS GENERATOR.

APPLICATION FILED JUNE 3, 1908.

908,610.

Patented Jan. 5, 1909.

3 SHEETS—SHEET 1.



Witnesses

C. B. Benziger.

G. E. McGrann

Fig. 1.

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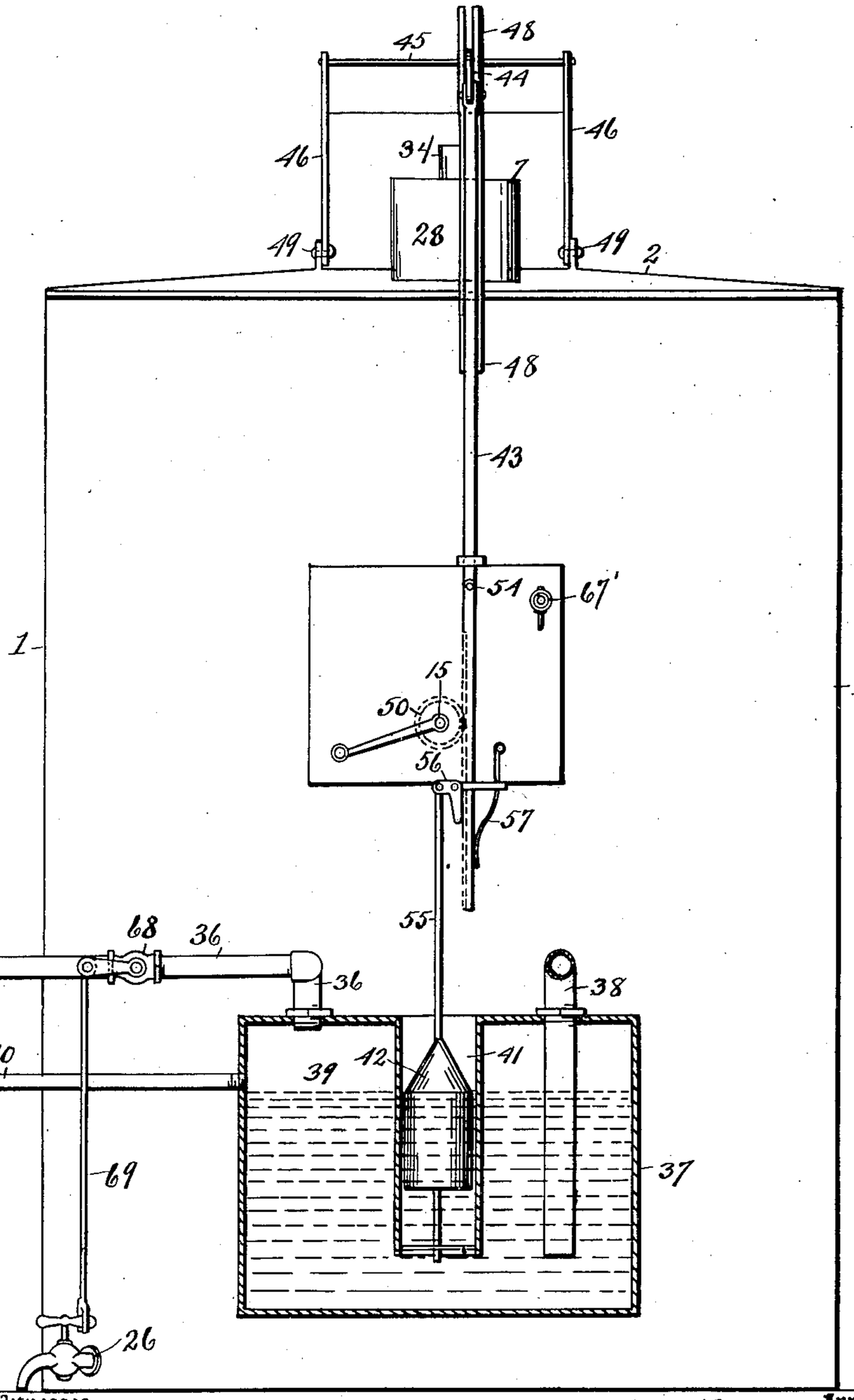

Witnesses

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Fig. 2.

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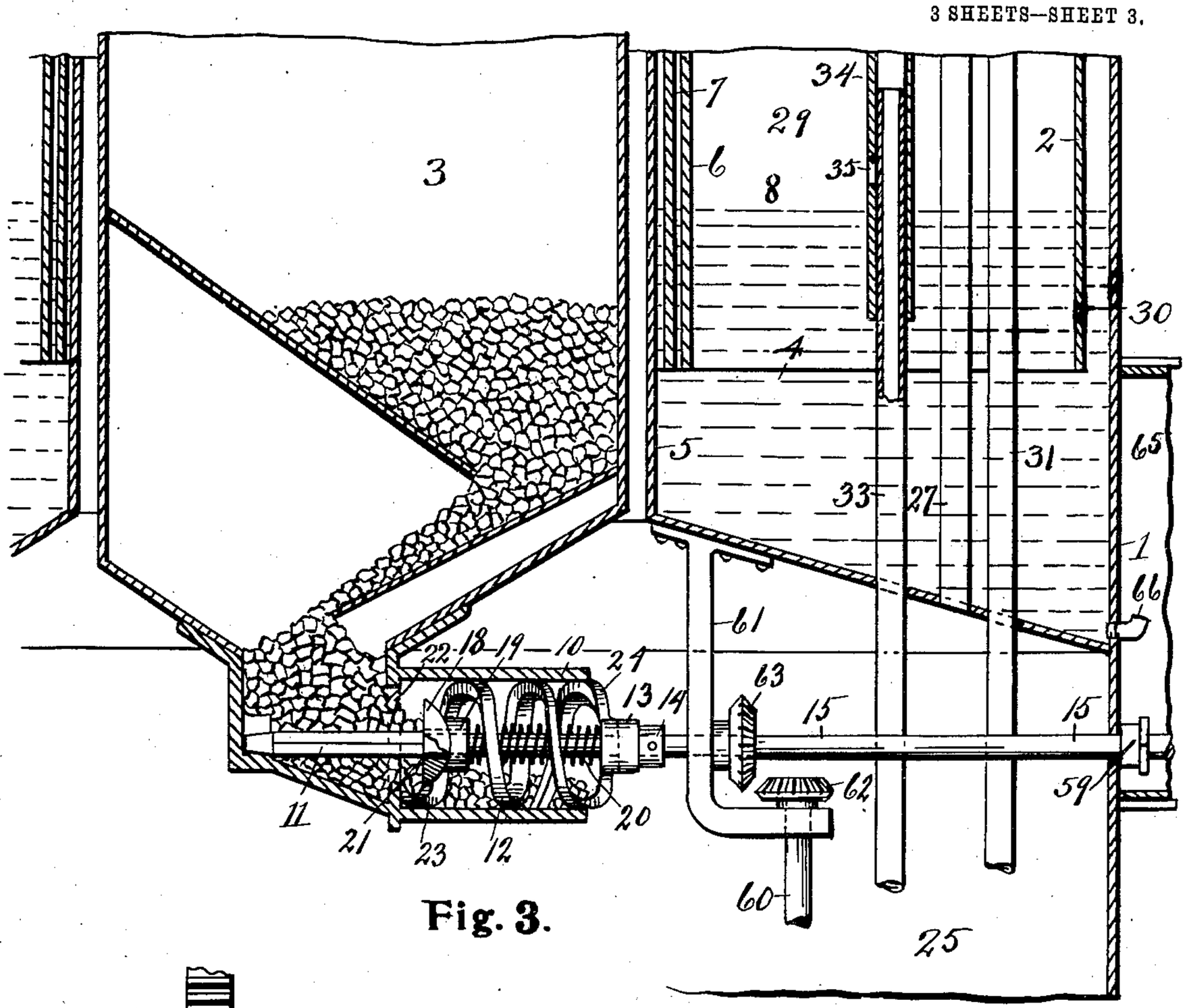

Fig. 3.

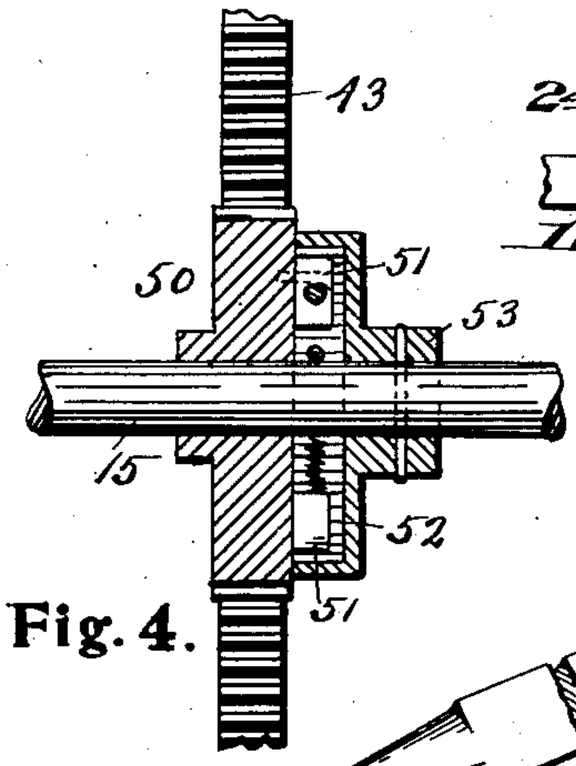

Fig. 4.

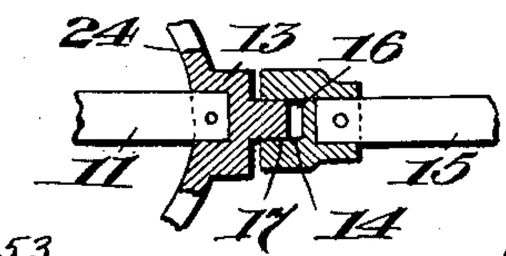

Fig. 7.

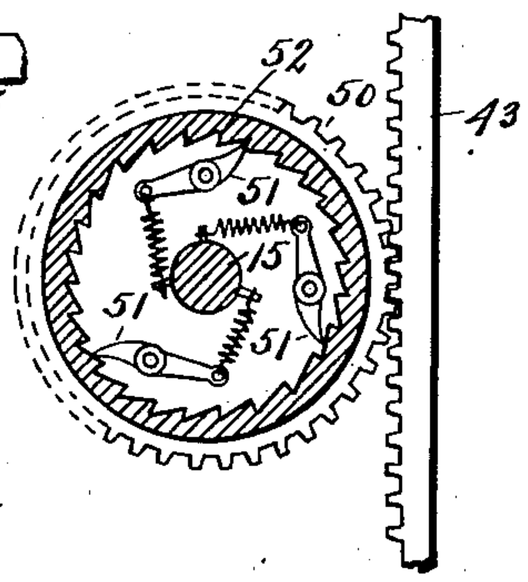

Fig. 5.

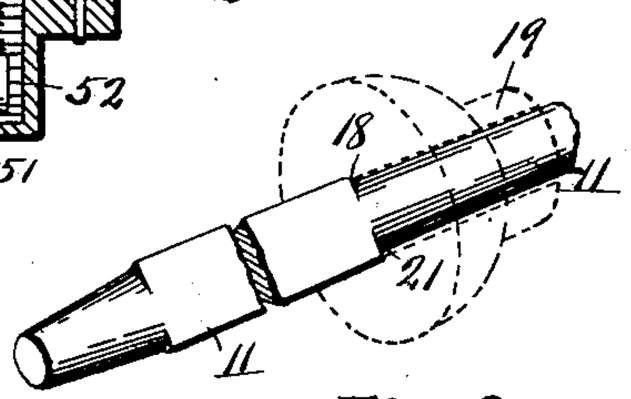

Fig. 6.

Witnesses

O. B. Baenziger.

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UNITED STATES PATENT OFFICE.

MILTON L. RICE AND GEORGE W. RICE, OF PARKLAKE, MICHIGAN.

ACETYLENE-GAS GENERATOR.

No. 908,610. Specification of Letters Patent. Patented Jan. 5, 1909.

Application filed June 3, 1908. Serial No. 436,379.

To all whom it may concern:

Be it known that we, MILTON L. RICE and GEORGE W. RICE, citizens of the United States, residing at Parklake, in the county of Osceola and State of Michigan, have invented certain new and useful Improvements in an Acetylene-Gas Generator, of which the following is a specification.

Our invention is designed to provide an improved acetylene gas generator, and it consists of the construction, combination and arrangement of devices hereinafter described and claimed and illustrated in the accompanying drawings in which,

Figure 1 is a view in vertical section showing parts in elevation. Fig. 2 is a view showing parts in elevation and parts in section. Fig. 3 is a view in section showing features of the invention. Fig. 4 is a view in section through the pinion driven by the rack bar, and related parts. Fig. 5 is a view in section at right angles to that disclosed in Fig. 4. Fig. 6 is a detail view of the shaft 11 showing the distributer thereupon. Fig. 7 is a detail view showing the detachable arrangement of the hub 14 and shoulder 17.

More particularly our invention is designed to provide improved means for feeding the carbid, and also for providing safety mechanism, together with other general features of construction hereinafter set forth.

Heretofore difficulty has been found in feeding the carbid, especially to feed coarse carbid, the feeding mechanism heretofore employed having been found unsatisfactory and liable to get out of order. It is one aim of our invention to provide superior means for feeding the carbid by which the difficulties heretofore experienced will be effectually overcome. Heretofore, also, in case of certain difficulties and liabilities there has been found danger of the gas escaping, from which serious results have arisen. Our safety mechanism aims also to overcome all difficulties of this nature.

We carry out our invention as follows: In the drawings submitted herewith the numeral 1 indicates the case, and 2 a cylinder within the upper portion of the case forming a gasometer or reservoir. Within the case is a hopper 3 to contain the carbid, and about said hopper is located a water chamber 4 provided with a central cylinder 5 within which the hopper is located, and with a depending cylinder 6 spaced from the cylinder 5 to permit a cylindrical cap or cover 7 for the hopper to be extended downward into the water chamber so that an effectual water seal will be provided about the cap or cover of the hopper, as shown in Figs. 1 and 3. The lower end of the case is filled with water to a desired height, as to the water line indicated at 8. The water in the chamber 4 rises to a desired height, as indicated by the water line at 9.

At the base of the hopper is located a casing or cylinder 10 within which is extended a rotatable shaft 11, said shaft projecting into the lower end of the hopper. Upon said shaft is a corkscrew or spiral conveyer 12 turning with the shaft 11, said shaft provided with a hub 13 removably engageable with the hub 14 upon a driving shaft 15. The hub 13 may be removably engaged with the hub 14 in any desired manner. As shown in Fig. 1, the hub 14 is shown constructed with a groove or recess 16, the hub 13 being provided with a shoulder 17 which, when the two hubs are in proper position may be lifted out from said groove or recess of the hub 14. Upon the shaft 11 is a bell shaped device 18 provided with a hub 19 which may have an oscillation upon the shaft 11, which may readily be accomplished by simply making the bore of the hub 19 of larger diameter than that of the shaft, 11, so that the hub may have a desired vertical movement upon said shaft. A spring 20 exerts its tension upon the hub 19 permitting the device 18 to yield lengthwise of the shaft, its forward movement being limited in any suitable manner. As shown the end of the shaft projecting into the lower end of the hopper is preferably made triangular in cross section forming a shoulder at 21 to limit the device 18 in its movement toward the hopper. The hopper is provided with an opening 22 through which the carbid may pass into the cylinder 10. Our invention contemplates so arranging the shaft 11 that it may have a yielding movement within the hopper permitted by the construction and arrangement of the hubs 13 and 14, so that in case there should be any tendency for the carbid to clog in passing from the hopper into the cylinder

10, the adjacent end of the shaft might yield to permit the passage of the carbid. So also, it will be evident that the construction and arrangement of the device 18 permits the same to move upon the shaft and along the shaft in case of any liability of clogging, the yielding movement of the shaft and of the device 18 thus permitting the passage of the carbid so as effectually to prevent its clogging in passing from the hopper to the cylinder. This mechanism makes a positive feed, the device 18 being in the nature of a distributer to check the flow of the carbid into the cylinder and to distribute the carbid about the circumference thereof. One lip 23 of the spiral conveyer, as shown, extends the whole length of the cylinder 10 while another lip 24 extends about half way around the inner circumference of the cylinder 10. By this construction, it will be evident that the charge of carbid which is being moved forward in the cylinder 10 is divided by the lip 24, half of the charge being taken out by one lip of the conveyer, and the other lip taking the other half of a given charge, to remove the same from the cylinder 10. This is a special advantage secured by the use of a spiral conveyer.

It will be understood that as a given charge of carbid falls from the cylinder 10, it drops from the conveyer into the water at the base of the case, whereby the gas is formed, the gas arising upward through the water at the base of the case into a gas chamber 25 above the water line 8 within the case. The base of the case may be provided with a spigot 26. It will be evident that the hopper is effectually water sealed. From the gas chamber 25 the gas passes upward through the pipe 27 through the water chamber 4 by which it is effectually water sealed, said pipe opening into a dome 28 from which it descends into a gas chamber 29 above the water line 9 in the cylinder 2. It will be evident that the cylinder 2 is effectually water sealed by water rising about the lower extremity thereof as indicated at 30. From the dome 28 of the gas chamber 29 the gas passes downward through a pipe 31 extending through the water chamber 4, by which it is effectually water sealed, to a system pipe indicated at 32 connected therewith, the pipes 31 and 32 forming a combined system pipe.

To relieve any undue pressure within the cylinder 4 we provide a relief pipe 33 projecting upward within the water sealed chamber 4, and a telescoping pipe 34 supported by the top of the cylinder 4 and movable therewith, the pipe 34 being provided with an opening as at 35, whereby, when the cylinder 4 rises a sufficient height, to bring the opening 35 above the upper end of the relief pipe 33, the gas in the chamber 29 will find its way to the pipe 33 so as to relieve the pressure. The pipe 33 enters a blow off pipe indicated at 36.

To provide an effectual safety mechanism our invention contemplates, furthermore, the use of a by-pass water chamber indicated at 37 which may be secured upon the side of the case, into which a branch 38 of the system pipe 32 extends, the chamber 37 being filled with water to a desired height as indicated by the water line 39, the chamber being provided with a water overflow pipe 40. Within the chamber 37 is a float chamber 41 provided with a vertically movable float 42 to throw the driving mechanism for the shaft 15 out of operation.

We do not limit ourselves to any particular mechanism for operating the conveyer. That shown consists of a rack bar 43 having its upper end engaged with a rocking lever 44 jointedly connected at 45 upon a yoke 46 mounted upon the movable cylinder 2, said lever being fulcrumed as at 47 upon one of the guides 48 secured to the case 1, the guides 48 guiding the movement of the cylinder 2. The yoke 46 has a jointed engagement at its lower end with the cylinder 2 as indicated at 49. By this construction, it will be evident that when the cylinder 2 rises the lever 44 would be correspondingly lifted, thereby elevating the rack bar 43. The downward movement of the cylinder 2 within the case will obviously give an opposite movement to the rack bar, that is, when gas is being discharged through the system pipe. The rack bar meshes with a pinion 50 upon the shaft 15. Said pinion is provided with pawls 51 engaging an internally toothed drum 52, fastened to the shaft 15, as indicated at 53. It will be understood that the pawl mechanism is so arranged that upon the upward movement of the rack bar, the pawls will ride freely upon the teeth of the drum, and so that upon the downward movement of the rack bar the pawls will engage the toothed drum to actuate the shaft 15 and the conveyer. The lower end of the rack bar is shown having a jointed connection at 54 with the upper portion of the rack bar so that the lower extremity thereof may be swung out of engagement with the pinion. This may be accomplished by the lowering of the float 42, the stem 55 of said float engaging a bell crank 56 which may have a bearing against the rack bar to throw the rack bar out of engagement with the pinion when the float 42 descends. A spring 57 is shown to hold the rack bar in normal engagement with the pinion. It will be understood that the shaft 15 will be provided with suitable stuffing boxes indicated at 58 and 59. It will be understood also that the float chamber is open at its upper and lower

extremities so that the height of water in the chamber 37 may readily be observed.

In cleaning out the base of the case 1, the sediment accumulating in the bottom thereof needs to be agitated or stirred so as to flow from the spigot 26. To accomplish this result we provide a stirrer shaft 60 having a bearing in an arm 61 secured upon the base of the water seal chamber 4 which arm also forms a bearing for the shaft 15, the stirrer shaft 60 being provided with a gear 62 normally out of engagement with a gear 63 upon the shaft 15. From the manner of engaging the hub 14 with the hub 13, it will be evident that the shaft 15 may be moved longitudinally to bring the gear 63 into engagement with the gear 62, said hubs being then disengaged, and whereby, by means of a crank arm 64, the shaft 15 may be rotated to actuate the stirrer shaft 60.

In order to water seal the stuffing box 59 we employ a water chamber 65 in which said stuffing box is located and through which passes the shaft 15. For convenience the water chamber 65 may communicate with the water chamber 4 as through a pipe 66; the water chamber 65 is shown provided with an air cock 67′.

As a safety precaution in opening the valve 68 in the blow off pipe 36, the spigot 26 will always be closed, said valve 68 and spigot, the one always being closed when the other is opened. We therefore prefer to connect the valve 68 by a rod 69 with the spigot, said rod preferably resting upon the spigot, and it must be disengaged from the spigot before the spigot can be opened.

What we claim as our invention is:

1. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a rotatable spiral conveyer within said cylinder, and a distributer between the base of the hopper and the adjacent end of the conveyer.

2. In an acetylene gas generator a hopper provided with a lateral opening at its base, a cylinder communicating through said opening into the base of the hopper, a rotatable spiral conveyer within said cylinder, the end of the conveyer adjacent to the hopper terminating within the cylinder adjacent to said opening, and a shaft to carry said conveyer, one end of said shaft extending through the base of the hopper, the end of the conveyer adjacent to the hopper terminating within the cylinder adjacent to said opening, and outside of the base of the hopper, the inner end of said shaft having a yielding movement at the base of the hopper.

3. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a rotatable spiral conveyer, a shaft to carry said conveyer, said shaft having a yielding movement at the base of the hopper, and a distributer located upon said shaft within said cylinder between the base of the hopper and the adjacent end of the conveyer.

4. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a rotatable spiral conveyer, a shaft to carry said conveyer, said shaft being movable at the base of the hopper, and a distributer upon the shaft toward the base of the hopper, said distributer made movable upon the shaft.

5. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a rotatable spiral conveyer, a shaft to carry said conveyer, said shaft being movable at the base of the hopper and a distributer upon the shaft toward the base of the hopper, said distributer having a yielding movement longitudinally of the shaft.

6. In an acetylene gas generator a hopper, provided with a lateral opening at its base, a cylinder communicating through said opening into the base of the hopper, a rotatable spiral conveyer within said cylinder, the end of the conveyer adjacent to the hopper terminating within the cylinder adjacent to said opening outside of the base of the hopper, a conveyer shaft to carry the conveyer projecting through the base of the hopper and having a yielding movement at the inner extremity thereof at the base of the hopper, and a driving shaft having a separable engagement with the conveyer shaft.

7. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a rotatable spiral conveyer within said cylinder, one arm of said conveyer extending lengthwise of the cylinder to the base of the hopper, the other arm of the conveyer extending partially about the inner circumference of the cylinder at the opposite end thereof.

8. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a spiral conveyer within the cylinder a driving shaft to actuate the conveyer, driving mechanism to actuate the driving shaft, a water sealed by-pass chamber provided with a float chamber therewithin, a system pipe communicating with the by-pass chamber, an overflow pipe leading from the by-pass chamber, a float within the float chamber, and means whereby the float will throw the driving mechanism out of action with the driving shaft.

9. In an acetylene gas generator a hopper, a cylinder opening into the base of the hopper, a conveyer within the cylinder, a shaft for said conveyer projecting into the base of the hopper and having a yielding movement therein, a longitudinally movable driving shaft to actuate the conveyer, a stirrer, and means to connect the stirrer with the driving

shaft upon the corresponding movement of the driving shaft.

10. In an acetylene gas generator a case, a hopper, a cylinder opening into the base of the hopper, a spiral conveyer within the cylinder, a driving shaft to actuate the conveyer, a vertically movable cylinder at the top of the case, mechanism actuated by the vertical movement of the cylinder, a rack bar actuated by said mechanism, and means actuated by the rack bar to actuate the driving shaft when the rack bar moves in one direction.

In testimony whereof we have signed this specification in presence of two witnesses.

MILTON L. RICE.
GEORGE W. RICE.

Witnesses:
LEWIS C. NOULEN,
WM. F. WEST.