No. 734,412. PATENTED JULY 21, 1903.

W. A. FEURT & H. H. MARTIN.

ACETYLENE GAS GENERATOR.

APPLICATION FILED MAY 31, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

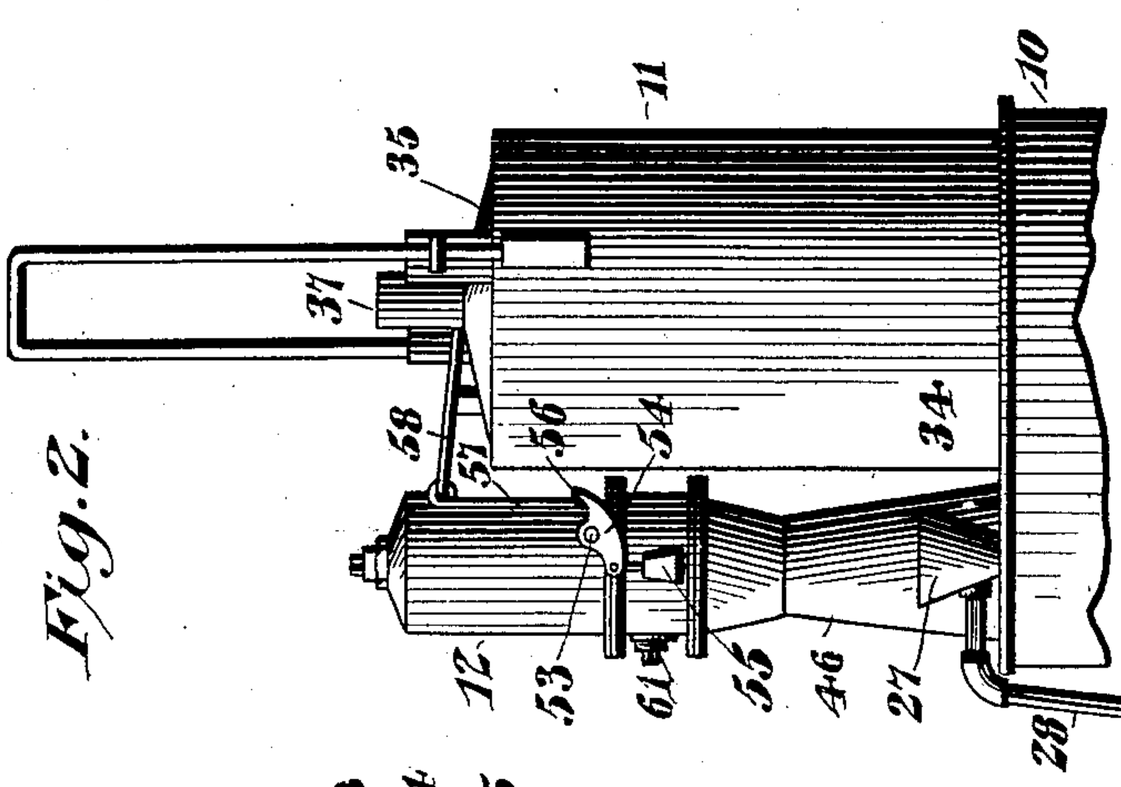

Fig. 2.

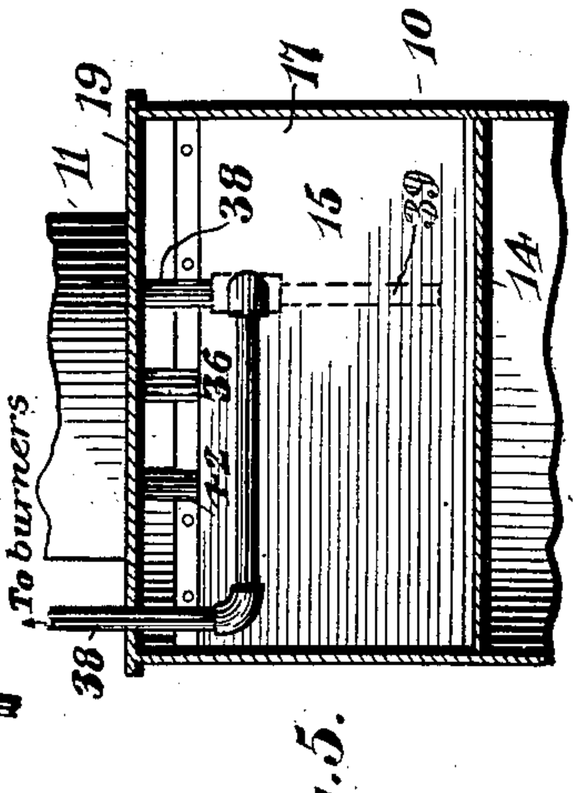

Fig. 5.

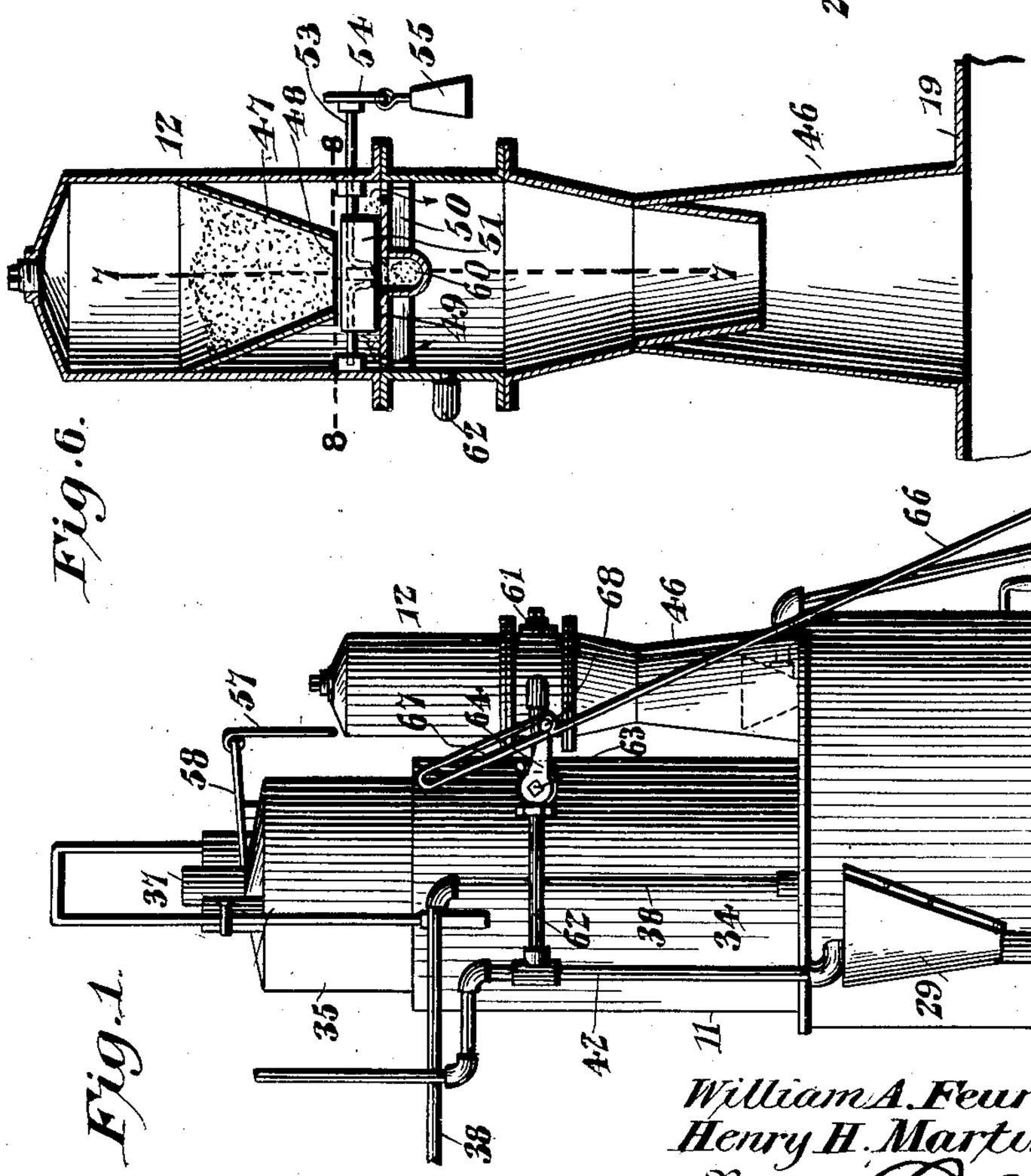

Fig. 6.

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

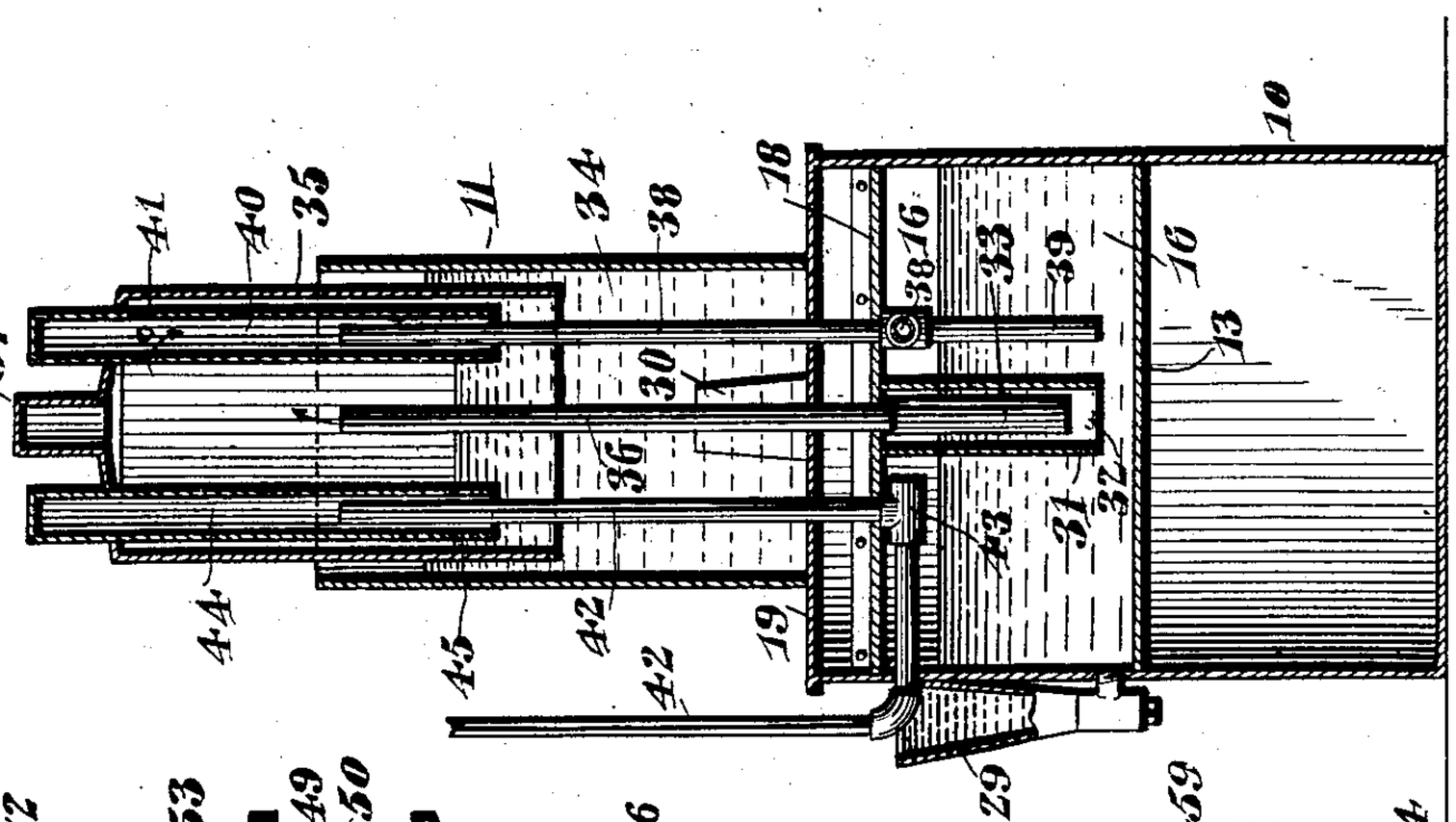
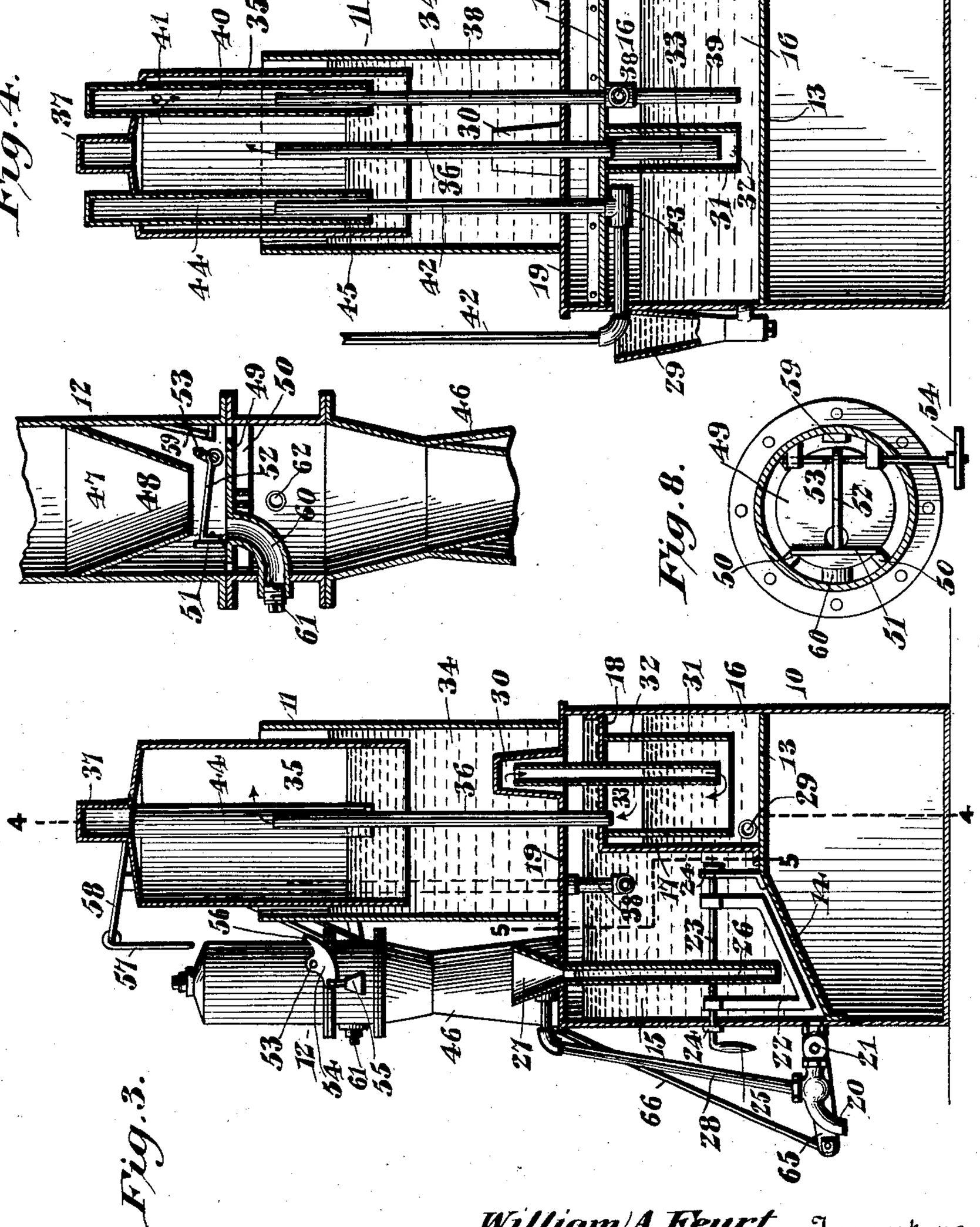


Fig. 7.

Fig. 8.

Fig. 3.



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No. 734,412. Patented July 21, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM A. FEURT AND HENRY H. MARTIN, OF MARYVILLE, MISSOURI.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 734,412, dated July 21, 1903.

Application filed May 31, 1902. Serial No. 109,734. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. FEURT and HENRY H. MARTIN, citizens of the United States, residing at Maryville, in the county of Nodaway and State of Missouri, have invented a new and useful Gas-Generator, of which the following is a specification.

The present invention relates to acetylene-gas generators, and while particularly relating to that class known as "carbid-feed machines" it will be evident that certain portions of the invention may be employed in connection with generators of other characters.

One of the objects of the invention is to provide a machine in which the air-space is reduced to a minimum and in which a novel seal is employed to prevent the return of gas from the gasometer to the generating-chamber, said seal acting as a purifier and a cooler for the gas during its passage through the same to the gasometer.

Another object is to provide a novel form of drip-chamber in which the water of condensation is received, said chamber acting as a cooler for the gas.

Still another object is to improve the carbid-feeding mechanism by making it positive and steady in operation and at the same time inexpensive in structure.

Other features of invention relate to means for preventing the siphoning of the water from one chamber to the other during the removal of the residue from the generator and in an overflow device which prevents the spilling of the surplus water employed in filling the generator.

The preferred embodiment of the invention is fully illustrated in the accompanying drawings and is described in the following specification, though it will be understood that various changes may be made from the structure shown and described.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a view in elevation of the opposite side of the upper portion of the machine. Fig. 3 is a longitudinal sectional view through the machine. Fig. 4 is another longitudinal sectional view taken on the line 4 4 of Fig. 3. Fig. 5 is a detail sectional view taken on the line 5 5 of Fig. 3. Fig. 6 is a vertical sectional view through the carbid-reservoir. Fig. 7 is a detail vertical sectional view on the line 7 7 of Fig. 6. Fig. 8 is a horizontal sectional view taken on the line 8 8 of Fig. 6.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention shown in the accompanying drawings three general elements are employed—a generating vessel 10, a gasometer 11, and a carbid-reservoir 12, containing the feeding mechanism.

The generating vessel 10 is preferably in the form of a cylindrical casing having a bottom 13 extending across the same some distance above its lower edge, said bottom being provided with an inclined portion 14, the space above the bottom constituting the generating-chamber 15. Within this generating-chamber is located a drip-chamber 16, formed by means of a vertical transverse partition 17 and a top 18, connecting the upper edge of the partition 17 and one wall of the generating-chamber, said top being spaced from the top 19, that covers the generating-chamber. The drip-chamber 16 is sealed from the generating-chamber and is located on the horizontal portion of the bottom 13, as clearly shown in Fig. 3. A vent-pipe 20 leads from the lower end of the generating-chamber, the passage-way through said pipe being controlled by a suitable rotary valve 21, and within the lower portion of the chamber is arranged an agitator 22, secured to a rock-shaft 23, that is journaled in suitable bearings 24, said rock-shaft extending through the wall of the chamber and being provided with an exterior handle 25. This agitator can therefore be moved back and forth through the lower portion of the generating-chamber and across the inlet-opening to the residue-discharge pipe. A filler-tube 26 depends within the generating-chamber, said tube extending through the top 19 and having at its upper end an exposed funnel 27. An overflow-pipe 28 leads from the exposed end of the filler-tube and is connected to the residue-discharge pipe 20, outside of the valve thereof. A separate filler 29, secured to the exterior of the generating vessel, has communication with the drip-chamber 16, as shown in Figs. 3 and 4. The top 19 of the generating-chamber is provided with a dome 30, that is located

directly over the generating-chamber, and a depending hood 31 is located within the drip-chamber 16, being secured to the top 18 thereof and terminating short of the lower end, said hood forming therein a sealing-compartment 32. A vertically-disposed gas-conveyer pipe 33 leads from the dome 30, through the top 18, into the lower portion of the hood 31, well below the water-level thereof.

The gasometer 11 is located directly upon the top 19 of the generating vessel and includes the usual water-tank 34, which surrounds the hood 30, as shown, so that the water therein completely envelops the same. Within this tank is mounted the vertically-movable gas-bell 35, the lower end of which is arranged below the water-level. A gas-conducting pipe 36 leads from the upper portion of the hood 31 to the center of the gas-bell, said bell being provided in its top with a socket 37, which fits over the upper end of the gas-conducting pipe 36 when the bell is in its lowest position. A gas-supply pipe 38 extends from the bell through the upper end of the generating-chamber and into the drip-chamber 16, being provided with a depending open-ended portion 39, that communicates with the lower portion of the drip-chamber, below the water-line thereof. From the upper portion of the drip-chamber the gas-supply pipe 38 extends through the partition 17 and thence through the top 19 of the generating vessel, where it may be attached to the usual gas-main. A depending hood 40, secured within the gas-bell, is located over the upper end of the supply-pipe 38, said hood being provided at its upper end with openings 41, through which the gas may pass, the lower end of the hood being immersed within the water. As a result the gas must necessarily pass from the upper portion of the gas-bell, and the driest is thereby obtained. A blow-off pipe 42 also extends from the gasometer through the drip-chamber 16 and thence through the side wall of the generating vessel to a suitable exterior point, the portion located within the drip-chamber being provided with an escape-orifice in the form of an open-ended coupling 43, that permits the escape of any waters of condensation. The upper end of this pipe 42 is also incased by a depending hood 44, secured to the top of the gas-bell and having orifices 45 in its lower end, said orifices being normally sealed by the water within the water-tank.

The carbid-reservoir 12 is supported a considerable distance above the generating-chamber by means of a cylindrical casing 46, that affords communication between said reservoir and said chamber. This reservoir is located in the upper end of the casing 46 and has a hopper-bottom 47, the lower portion of which has a feed-opening 48. Directly beneath this feed-opening and in spaced relation thereto is arranged a horizontal carbid-receiving platform 49, supported on cross-pieces 50 and having its edges arranged in spaced relation to the walls of the casing. Upon this platform is slidably mounted a scraper 51, to which is secured an arm 52, that has an eccentric connection with a rock-shaft 53, journaled in the casing and extending through one of the walls of the same, said shaft carrying on its exposed end a trip 54. This trip extends on opposite sides of the rock-shaft, one end being weighted, as at 55, the other constituting a finger 56, arranged to be engaged by a depending stirrup 57, pivotally hung to a bracket 58, that is secured to the top of the gas-bell. The movement of the rock-shaft is limited by a stop 59, that engages the offset portion of the same at its connection with the arm 52. A draw-off tube 60 extends from an intermediate portion of the platform below the feed-opening 52 to the exterior of the casing, as shown in Fig. 7, said tube being closed at its outer end by a screw-plug 61.

From the blow-off pipe 42 a vent-pipe 62 extends to the casing 46 and communicates therewith below the carbid-feeding mechanism, the passage-way through said pipe being controlled by a rotary valve 63, having a crank-arm 64. The valve 21, controlling the residue discharge, is also provided with a crank-arm 65, and these two arms are connected so that they may be moved simultaneously in one direction and independently in opposite directions. To this end a link 66 is pivoted to the crank-arm 65 and is provided at its opposite end with a slot 67, in which a pin 68, carried by the crank-arm 64, is slidably mounted, one end wall of the slot constituting a shoulder which engages the pin when the link is moved upwardly, as will be readily understood.

In first filling the machine with water the valve 63 in the vent-pipe 62 is open, while the residue-discharge valve 21 is closed. The water-tank 34 is filled and the gas-bell is placed in its lowest position therein. This can be readily accomplished, as the air can escape through the several pipes and out of the vent-pipe, there being no water in the other chambers. When this bell is in its lowest position, there is practically no air therein, as the upper ends of the several pipes are located in the upstanding portions of the several hoods, as will be readily understood. Water is next introduced into the drip-chamber 16, which is nearly filled, and finally the generating-chamber is entirely filled. The air-vent is first closed, and carbid having been placed within the reservoir is fed into the generating-chamber, whereupon the resulting gas will pass into the dome 30 through the conveyer-pipe 33, into the sealing-chamber 32, bubbling through the water therein, and finally passing through the gas-conductor pipe 36 into the gas-bell. This causes said bell to rise, the stirrup 57 passing the finger 56 of the rock-shaft. Upon the first generation of gas the surplus water within the generating-chamber will be forced by the pressure up the filler-tube 26, whereupon it will flow into the overflow-pipe 28 and pass through the discharge-

pipe and will be conveyed into a suitable receptacle or to the sewer, as the case may be.

When gas is used, it will flow through the supply-pipe 38 to the burners, and any water of condensation in said pipe will pass through the depending end 39 into the drip-chamber. In case of abnormal pressure the bell will rise high enough to expose the lower openings 45 of the hood 44, and thereupon gas can pass into the blow-off pipe 42. When the bell lowers because of the removal of gas therefrom, the stirrup 57 will be likewise lowered into engagement with the trip, thereby actuating the rock-shaft, and consequently the scraper, so that the carbid located on the platform will be pushed over the edge of the same and drop through the casing into the generating-chamber. As a result more gas will be evolved, which, passing into the gasometer, as already described, will again raise the bell.

When it becomes necessary or desirable to remove the residue from the bottom of the generating-chamber, it is only necessary to open the valve 21, and by actuating the agitator it will pass freely through the discharge-spout. Because of the connection between the discharge-valve 21 and the vent-valve 63 these valves will be opened simultaneously, so that air can pass into the upper portion of the generating-chamber and take the place of the water flowing therefrom. This is an important feature, as it prevents the siphoning of the water from the other chambers. Upon closing the residue-discharge pipe, however, the air-vent still remains open, so that when water is again poured into the filling-tube the air displaced thereby can pass freely from the machine.

Should it become necessary for any reason to remove the carbid from the reservoir, it is only necessary to open the draw-off tube 61, whereupon said carbid will flow through the same to the exterior of the casing.

By this construction it will be seen that a comparatively simple machine is provided in which the gas cannot pass back from the gasometer to the generating-chamber when the pressure in the latter is reduced during the cleansing of the same. Furthermore, during such cleansing action no siphoning can take place, as air is freely admitted to take the place of the water discharged, this air being afterward again displaced by a fresh supply of water. The amount of air finally remaining within the machine is therefore reduced to a minimum, and as the commingling of acetylene gas and air is very objectionable it will be seen that this objection is practically eliminated by the present structure. The carbid-feeding mechanism is also an important feature, as it is positive and steady in its action, a small amount of carbid being fed to a large body of water, so that no unnecessary heating results therefrom. Furthermore, the gas during its passage from the generator to the gasometer is at all times surrounded with water, so that it is cooled and purified. The several conveyer-pipes are all provided with open drip-outlets which obviate the necessity of expensive and objectionable valves of all kinds.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a gas-generator, the combination with a generating vessel having a dome, of a gas-bell including a water-tank placed upon the generating vessel and surrounding the dome, said dome being submerged in the water of the bell, a separate drip-chamber located within the generating vessel and below the dome thereof, a gas-conducting pipe leading from the dome of the generating vessel to the lower portion of the drip-chamber, and a gas-conducting pipe leading from the upper portion of the drip-chamber to the gasometer.

2. In a gas-generator, the combination with a generating vessel and a gasometer, of a drip-chamber arranged within the generating vessel, a depending hood suspended from the top of the drip-chamber and spaced from all the side walls thereof, said hood having its lower end open and terminating short of the bottom of the drip-chamber, a gas-conveyer pipe leading from the upper portion of the generating vessel to the lower portion of the hood, a gas-conducting pipe leading from the upper portion of the hood to the gasometer, and a gas-discharge pipe leading from the gasometer through the drip-chamber at one side of the hood and having a drip-escape located in the chamber.

3. In a gas-generator, the combination with a generating vessel, of a drip-chamber arranged wholly within the generating vessel and terminating short of the top thereof, said vessel having a dome located directly above an intermediate portion of the drip-chamber, a gasometer located upon the top of the generating vessel and having a water-tank that surrounds the dome, a depending hood suspended from the top of the drip-chamber, said hood having its lower end open and terminating short of the bottom of the drip-chamber, a vertical gas-conveyer pipe leading from the dome of the generating vessel to the lower portion of the hood, a vertically-disposed gas-conducting pipe extending from the upper portion of the hood through the top of the generating vessel into the gasometer, a gas-discharge pipe leading from the gasometer through the drip-chamber at one side of the hood and having a drip-escape located in said chamber, and a blow-off pipe extend-

ing from the gasometer through the drip-chamber on the side of the hood opposite the discharge-pipe, said blow-off pipe also having a drip-escape located in the chamber.

4. In a gas-generator, the combination with a generating vessel, of a filling-tube passing through the top of the vessel and depending within the same, said tube having an exposed funnel at its upper end, a residue-discharge pipe communicating with the lower portion of the generating vessel, and an overflow-pipe connected to the upper portion of the filling-tube above the tube of the generating vessel and attached to the residue-discharge pipe outside said generating vessel.

5. In a gas-generator, the combination with a generating vessel having an upper vent-inlet and a lower residue-discharge, of valves controlling the vent-inlet and residue-discharge, crank-arms connected to the valves, and a connection pivoted to one of the arms and having a shoulder that detachably engages the other arm, whereby said arms are simultaneously movable in one direction and independently movable in an opposite direction.

6. In a gas-generator, the combination with a generating vessel having an upper air-inlet and a lower residue-discharge, of rotary valves controlling the inlet and discharge and having crank-arms, and a link connecting the crank-arms, said link being pivoted to one and having a slidable engagement with the other.

7. In a gas-generator, the combination with a generating vessel having an upper vent-inlet and a lower residue-discharge, of valves controlling the vent and residue-discharge, and a connection between the valves, said connection being arranged to simultaneously actuate both valves when moved in one direction and actuate only one valve when moved in a reverse direction.

8. In a gas-generator, the combination with a generating vessel having an upper vent-inlet and a lower residue-discharge, of valves controlling the vent-inlet and residue-discharge, said valves being connected to movable crank-arms, and a connection between the arms, said connection being attached to and movable with one of the crank-arms and having a portion that detachably engages the other crank-arm to move the same in one direction.

9. In a gas-generator, the combination with a carbid-reservoir having a feed-opening, of a stationary platform located beneath the feed-opening, a scraper movable across the upper face of the platform, a gasometer, and actuating mechanism connected with the gasometer and actuated thereby for moving the scraper upon the movement of said gasometer.

10. In a gas-generator, the combination with a carbid-reservoir having a feed-opening, of a stationary platform located beneath the feed-opening, a scraper movable over the platform beneath the opening, a gasometer including a movable bell, actuating mechanism connected with the bell for moving the scraper in one direction upon the downward movement of said bell, and separate means for moving the scraper in an opposite direction when the bell is raised.

11. In a gas-generator, the combination with a generating-chamber, of a gasometer having a movable bell, a carbid-reservoir located above the generating-chamber and in communication therewith, a carbid-receiving platform interposed between the generating-chamber and reservoir, a scraper slidable upon the platform, a rock-shaft having connection with the scraper, said rock-shaft having one of its ends exposed, and coacting actuating mechanism for the scraper carried by the rock-shaft and the bell respectively.

12. In a gas-generator, the combination with a generating-chamber, of a carbid-reservoir located above the generating-chamber and having a depending hopper, a carbid-receiving platform located below the hopper and having its edges spaced from the walls of the reservoir, a scraper slidable upon the platform, a rock-shaft journaled upon the reservoir, a link secured to the scraper and having an eccentric connection with the rock-shaft, and means for actuating the rock-shaft.

13. In a gas-generator, the combination with a generating-chamber, of a gasometer having a movable bell, a carbid-reservoir located above the generating-chamber and in communication therewith, a carbid-receiving platform interposed between the generating-chamber and reservoir, a scraper slidable upon the platform, a rock-shaft having an eccentric connection with the scraper said rock-shaft being journaled upon the reservoir and having one of its ends exposed, a weighted trip secured to the exposed end of the rock-shaft, and means carried by the gas-bell and arranged to engage the trip to actuate the rock-shaft.

14. In a gas-generator, the combination with a generating-chamber, of a carbid-reservoir having a feed-opening communicating with the generating-chamber, a platform interposed between the generating-chamber and the feed-opening of the carbid-reservoir, a scraper movable over the platform, a draw-off tube extending from the portion of the platform below the feed-opening to the exterior of the reservoir, and a closure for the tube.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM A. FEURT.
HENRY H. MARTIN.

Witnesses:
H. D. SNYDER,
H. S. FORD.