

No. 723,138.

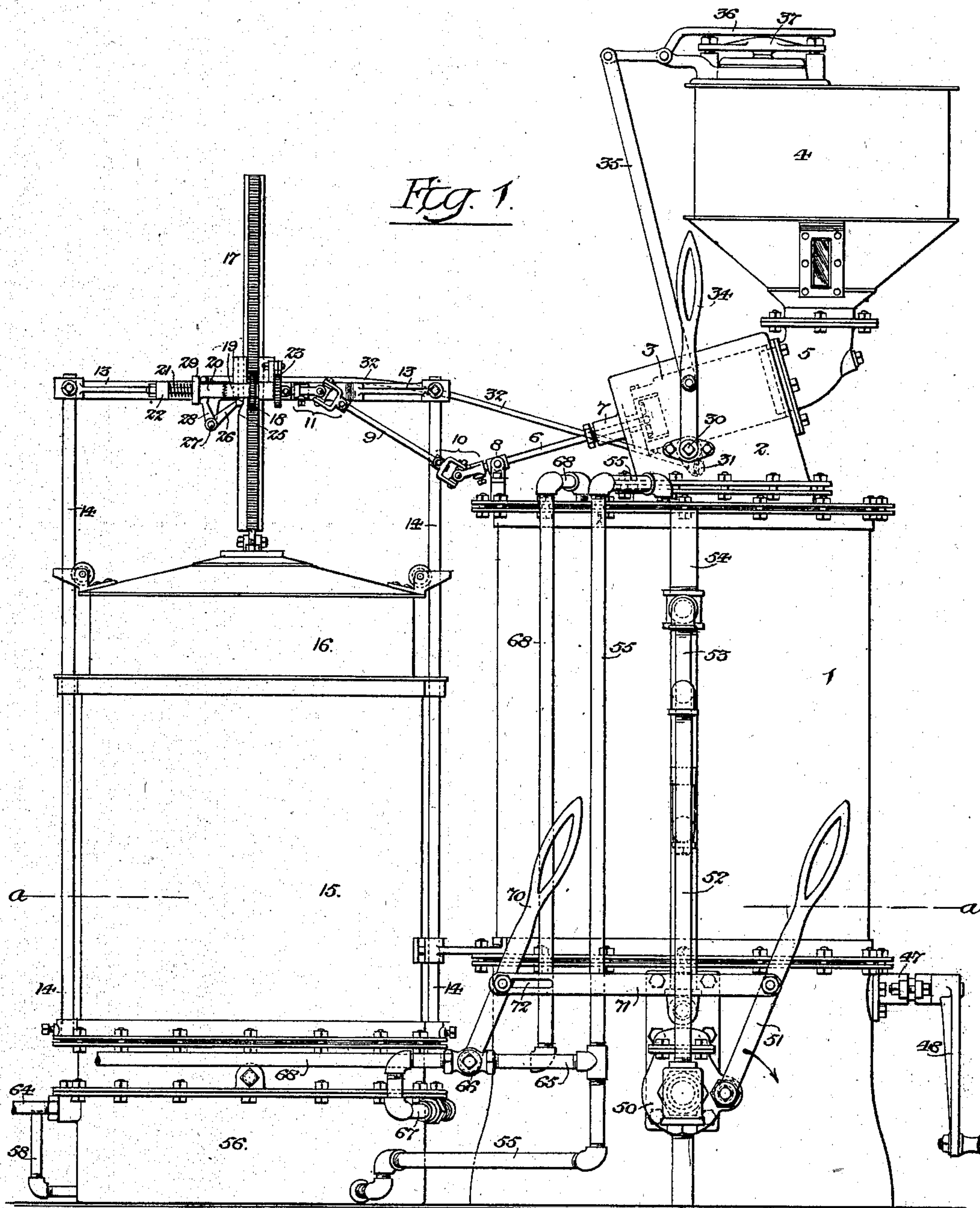
PATENTED MAR. 17, 1903.

J. CONDON.
ACETYLENE GAS GENERATOR.

APPLICATION FILED DEC. 5, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:
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Titus H. Irons

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4 SHEETS—SHEET 2.

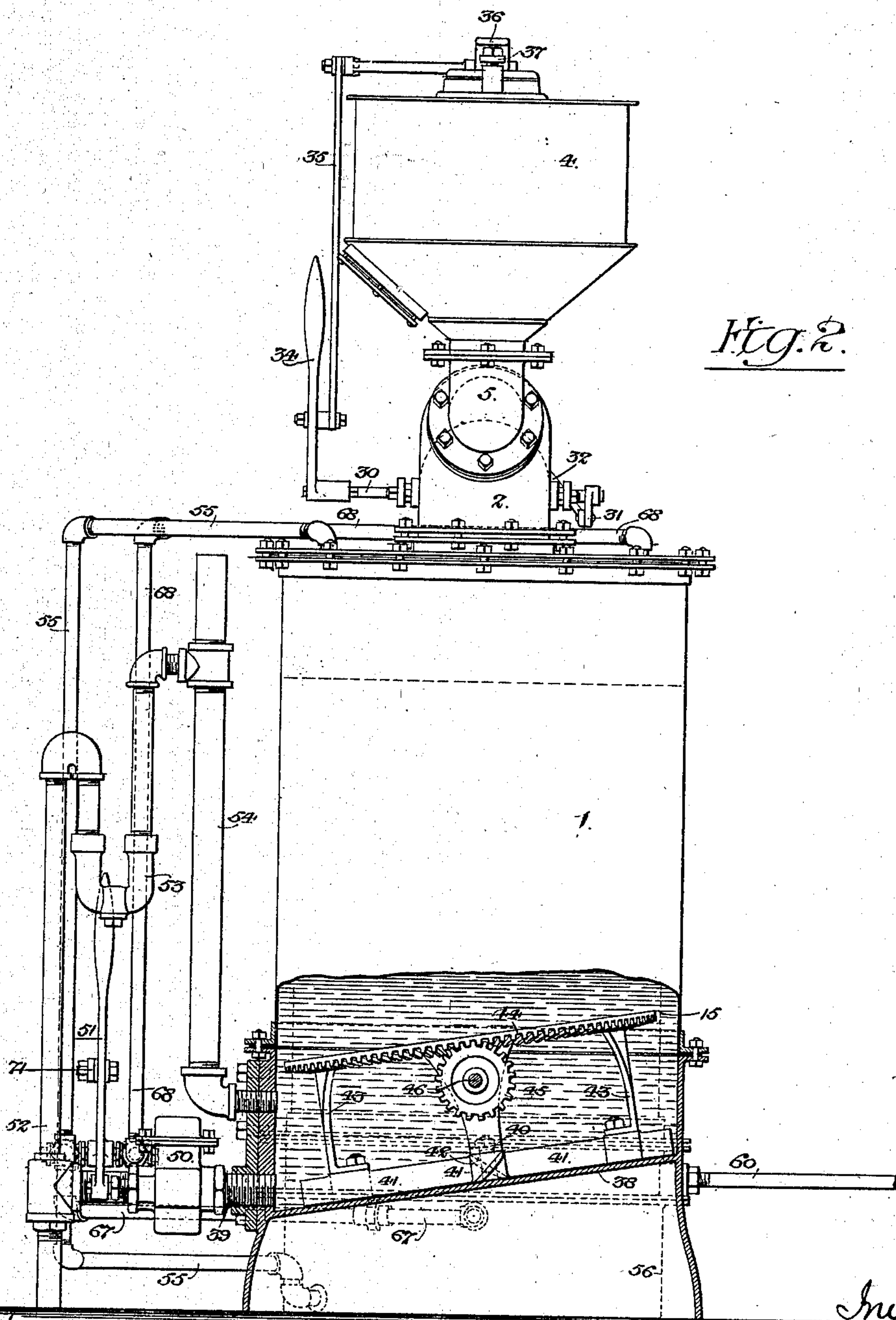


Fig. 2.

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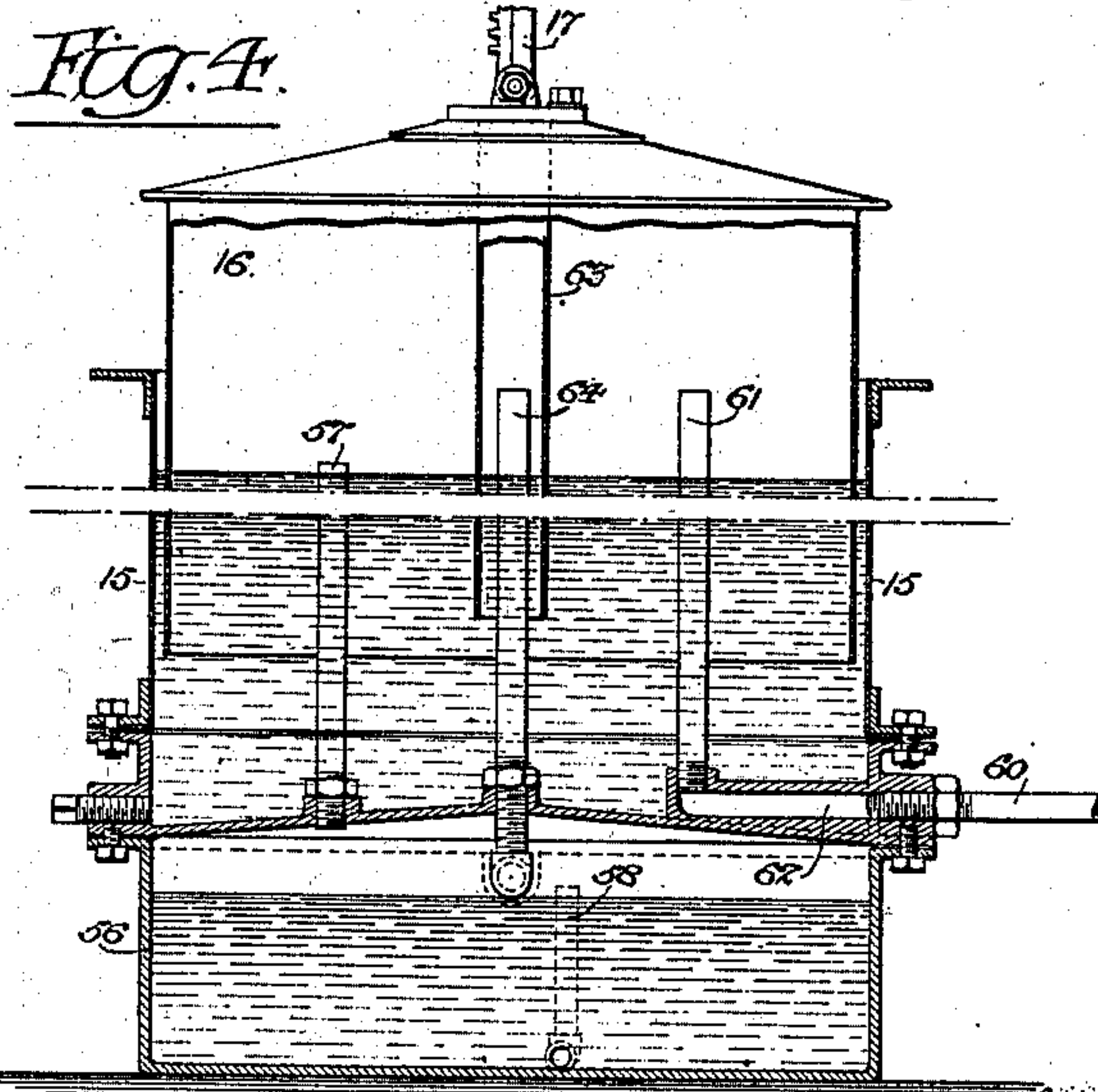
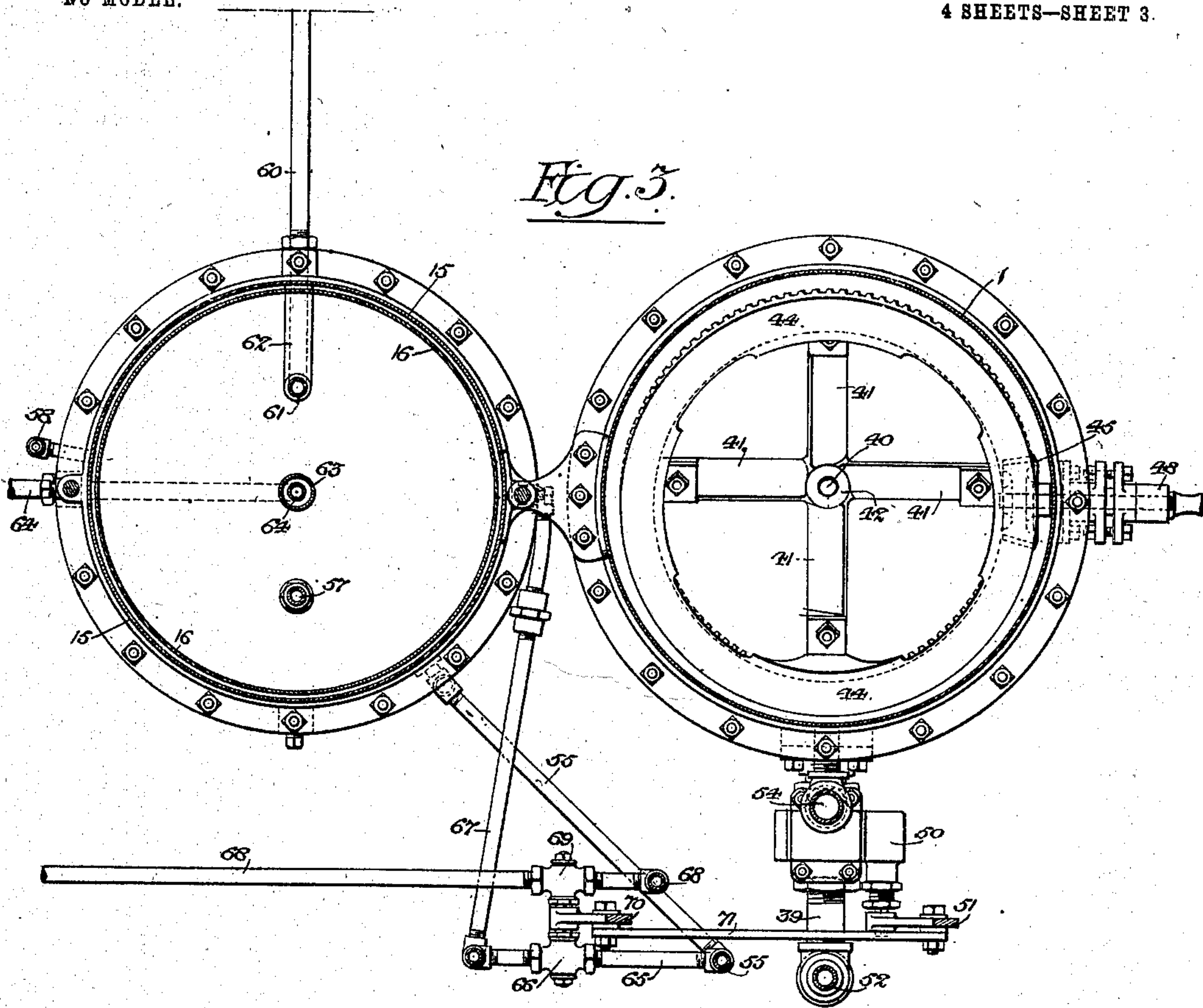
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 5.

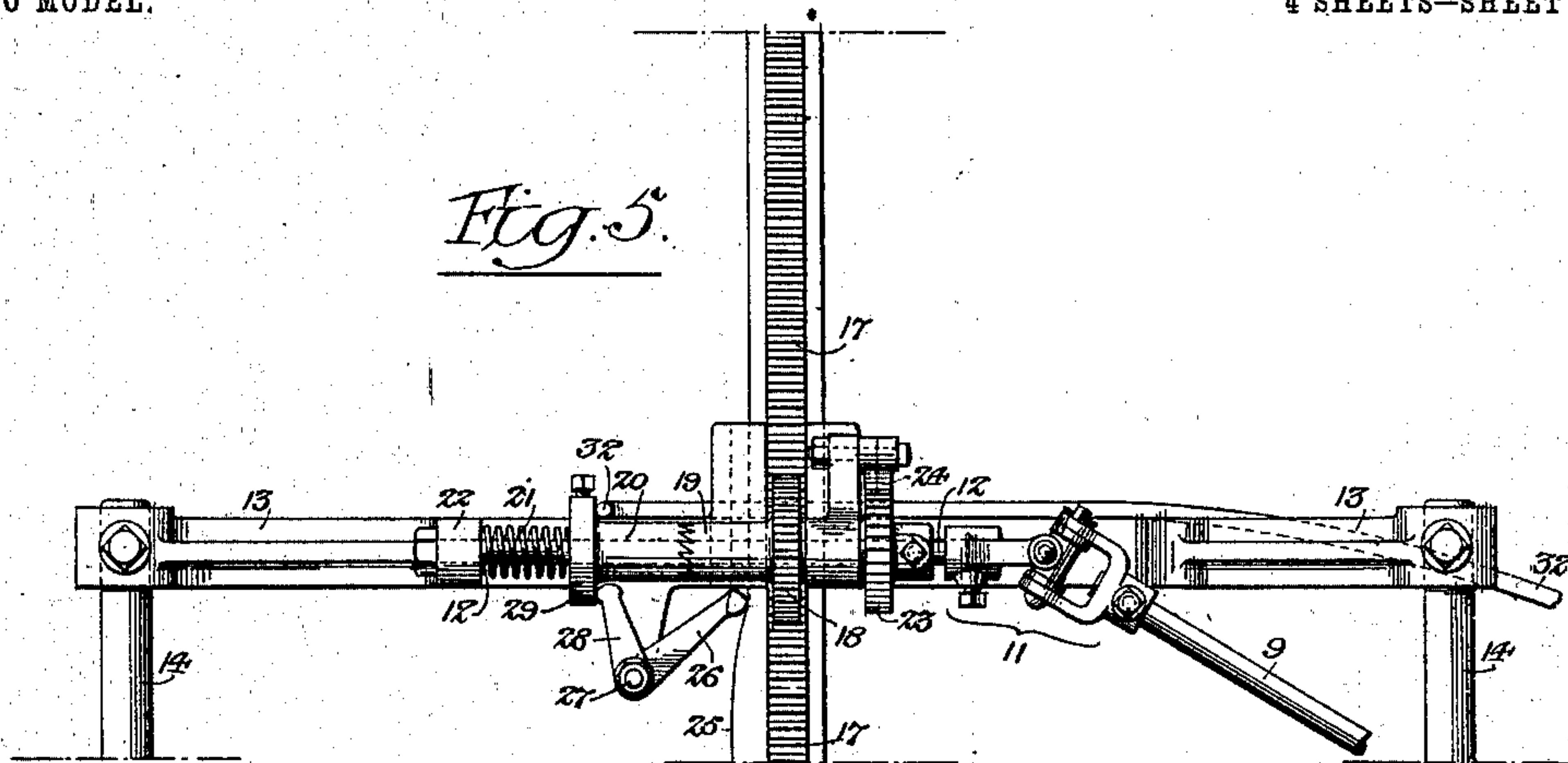
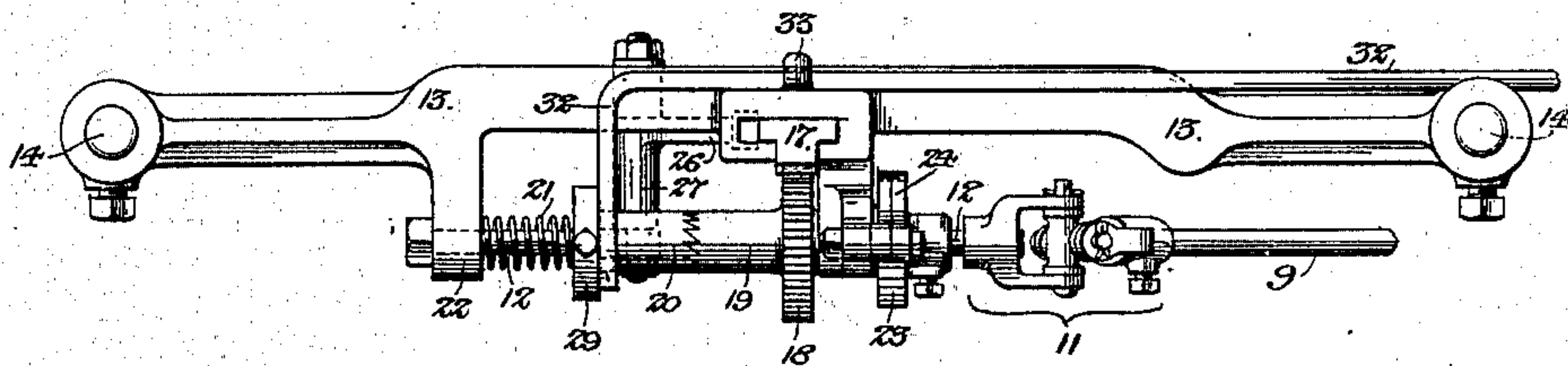


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN CONDON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SUN-LIGHT BY NIGHT ACETYLENE GAS COMPANY, OF CHARLESTON, WEST VIRGINIA, AND PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF WEST VIRGINIA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 723,138, dated March 17, 1903.

Application filed December 5, 1901. Serial No. 84,765. (No model.)

To all whom it may concern:

Be it known that I, JOHN CONDON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Acetylene-Gas-Generating Apparatus, of which the following is a specification.

My invention consists of certain improvements in the acetylene-gas generator for
10 which Letters Patent of the United States, numbered 642,003, were granted to me on the 23d day of January, 1900, as assignee of Robert Reid, the objects of my present improvements being to simplify the mechanism where-
15 by the carbide-feeder is operated by reason of the rise and fall of the bell of the gas-holder; to disconnect said bell from the feeding mechanism when the generator is being re-
charged with carbide; to provide such a bearing for the shaft of the carbide-feeding drum
20 as to maintain the latter always in proper alinement and prevent the same from becoming jammed so as to interfere with its free rotation; to provide for the agitation of the
25 spent lime in the generator, so that the same can be readily discharged in a semiliquid state through a suitable valve; to prevent any indraft of the air into the generator during the discharge of the spent lime therefrom;
30 to maintain a constant level of water in the generator, and to prevent the escape of gas from the gas-holder under the edge of the bell in case of an excessive generation of gas.

In the accompanying drawings, Figure 1 is
35 a front elevation of acetylene-gas apparatus constructed in accordance with my invention. Fig. 2 is a side elevation of the same partly broken away to show some internal parts of the generator. Fig. 3 is a sectional plan view
40 on the line *a a*, Fig. 1. Fig. 4 is a sectional view of the gas-holder. Fig. 5 is an enlarged elevation of the mechanism whereby the movement of the bell of the gas-holder is caused to effect rotation of the shaft of the
45 carbide-feeding drum, and Fig. 6 is a plan view of the mechanism shown in Fig. 5.

1 represents the casing of the generator, and 2 the hood at the top of the same, which

contains the rotating carbide-feeding drum 3, the latter being shown by dotted lines in Fig. 50 1. The carbide is supplied to the upper end of the drum from the vessel 4 through an elbow 5, and the drum is rotated by connection with the bell of the gas-holder as the latter falls, no movement being imparted to the
55 drum by the rising of said bell.

The shaft 6 of the feed-drum is adapted to a stuffing-box 7 at the lower end of the hood 2 and also to a bearing 8, mounted upon the top of the generator-casing at some distance
60 from the stuffing-box 7, so that the shaft 6 is supported at two points in line with each other, but longitudinally separated for a considerable distance, whereby the shaft is rigidly held in its proper axial plane, and the
65 drum 3 is mounted in proper alinement and prevented from jamming against its bearing on the neck 5, thus preventing any interference with the free rotation of the drum, which might result from such cause.

The shaft 6 is connected by a shaft 9 and
70 a pair of universal couplings 10 and 11 to a shaft 12, which is mounted in suitable bearings projecting from a cross-bar 13, carried by the upper ends of standards 14, which
75 project from the gas-holder 15 and serve to guide the bell 16 of said gas-holder in its vertical movements. The bell has a projecting rack 17, which engages with a pinion 18,
80 mounted so as to turn loosely on the shaft 12, but having a toothed clutch-hub 19, which is adapted to engage with a correspondingly-toothed clutch-sleeve 20, splined or otherwise mounted upon the shaft 12 so that it can
85 be moved longitudinally thereon but cannot turn independently thereof, a spring 21, interposed between the end of the clutch-sleeve 20 and a lug 22 on the cross-bar 13, tending
90 to maintain said clutch-sleeve 20 in engagement with the clutch-hub 19. The teeth of the clutch hub and sleeve are beveled on one side, so that rising movement of the bell 16 will cause such movement of the pinion 18 and clutch-hub 19 as will result in the beveled faces of the teeth acting upon each other.
95 Hence the clutch-sleeve 20 will yield longi-

tudinally, and no rotating movement will be imparted to the shaft 12, a ratchet-wheel 23 on said shaft engaging with pawls 24, hung to a fixed bearing on the cross-bar 13 and serving to prevent any rotation of the shaft 12 by reason of frictional contact between the same and the hub of the pinion 18 and clutch-sleeve 19 on the rise of the bell 16. When, however, the bell falls, the pinion 18 is turned in the opposite direction and the abrupt faces of the teeth of the clutch-hub 19 and sleeve 20 engage with each other, movement being thereby imparted to the shaft 12 and from it to the shaft 6 of the carbid-feeding drum, so as to feed the carbid into the water contained in the generator-casing 1, and thus continue the generation of gas. When the bell 16 reaches a certain height in the gas-holder, however, a cam 25 on the side of the rack 17 acts upon an arm 26 on a rock-shaft 27, mounted in a hanger depending from the cross-bar 13, and said rock-shaft has another arm 28, which presses upon a collar 29 on the clutch-sleeve 20, so as to move said sleeve out of engagement with the clutch-hub 19, thereby after the bell has risen to a predetermined point in the gas-holder preventing any feed of carbid into the generator by downward movement of the bell until the latter has again descended to such predetermined limit.

As in the patented apparatus, I employ a catch-pan carried by a rock-shaft 30, mounted in bearings in the hood 2 and intended to be moved under the delivery end of the carbid-feeding drum to prevent any feeding of the carbid into the water vessel of the generator during the time that the carbid-reservoir is being recharged. It is advisable to prevent any rotation of the carbid-feeding drum during this time, and yet permit the bell of the gas-holder to descend freely during such time in order that gas may be withdrawn from the holder while the recharging of the generator is being effected. For this purpose I provide the rock-shaft 30 with an arm 31, to which is connected a rod 32, guided in a loop 33 on the back of the cross-bar 13 and having a bent end adapted to engage with the collar 29 on the clutch-sleeve 20. Hence when the rock-shaft 30 is operated, so as to throw its catch-pan up into the retaining position at the lower end of the carbid-feeding drum 3, the clutch-sleeve 20 will be moved out of engagement with the clutch-hub 19, and the free descent of the bell 16 of the gas-holder will be permitted without any operation of the mechanism whereby rotating movement is imparted to the feed-drum 3. The rock-shaft 30 has an operating-handle 34, connected, by means of a link 35, to a lever 36, which normally prevents the removal of the cap or cover 37, closing the feed-opening in the carbid-reservoir 4, the lever 36, however, being raised out of retaining position when the handle 34 is moved so as to throw the catch-pan into re-

taining position at the discharge end of the feed-drum 3.

The bottom 38 of the generator-casing 1 is inclined downwardly toward the outlet-pipe 39 and has a central pin 40, projecting at right angles to the plane of the bottom and serving as a pivot for a scraper, whereby the spent lime upon the bottom of the generator may be stirred up and mixed with the water in the generator in order to form a fluid or semifluid mixture which will readily flow through the discharge-pipe 39, the discharge of the spent lime being thereby effected without the necessity of opening the generator-casing or removing said spent lime in solid or plastic form.

The scraper consists of a series of blades 41, projecting from a central hub 42, which is mounted upon the pin 40, and said blades support, by means of brackets 43, an annular bevel-wheel 44, with which meshes a bevel-pinion 45, carried by a shaft 46, which passes through a stuffing-box 47 on the casing 1 and is provided with a handle 48, whereby it may be turned so as to rotate the scraper.

The discharge from the generator through the pipe 39 is regulated by any ordinary form of gate-valve contained in a casing 50 and operated by a lever 51, the pipe 39 joining a vertical pipe 52, which communicates through a trap 53 with a stand-pipe 54, located at one side of the generator-casing 1 and communicating with the lower portion of the water-chamber therein, as shown in Fig. 2.

The upper end of the stand-pipe 54 is open to prevent siphoning, and the level of water in the generator-casing 1 cannot rise above the level of the top of that leg of the trap 53 which communicates with the stand-pipe. Hence a constant level of water in the generator is maintained and a correspondingly uniform gas-chamber is preserved above the same. When the valve in the casing 50 is opened, the sludge, consisting of the spent lime mixed with water, flows through the pipe 39 to its junction with the pipe 52, and thence downwardly through the latter to any suitable point of discharge, that portion of the pipe 52 above its junction with the pipe 39 serving as a trapped overflow for the stand-pipe 54.

The gas flows from the generator through a pipe 55, which communicates with the lower portion of a water vessel 56 beneath the gas-holder 15. Hence the gas is compelled to pass through the water in this vessel before it can pass through the pipe 57 and enter the bell 16 of the gas-holder, the gas being thereby washed and deprived of any particles of carbid or other foreign impurities which it may have carried over from the generator. A stand-pipe 58 projects from one side of the vessel 56 and communicates with the water-chamber of said vessel near the bottom of the same, said stand-pipe 58 being open at the top, so as to maintain a

level of water in the vessel 57 even with said top, the level being regulated by the turning of the pipe 58 to any desired angle, so as to raise or lower the top of the same. This stand-pipe serves to prevent an undue accumulation of water in the vessel 56, due to condensation.

The gas passes from the bell 16 of the holder to a service-pipe 60 through a pipe 61 and a branch 62, formed on the lower section of the gas-holder, as shown in Fig. 4.

In order to prevent escape of gas under the edge of the bell 16 and into the room or apartment in which the apparatus is located, I provide said bell with an inner bell 63 of contracted diameter, which serves as a trap for a relief-pipe 64, projecting upwardly from the bottom section of the holder, said inner bell terminating some distance above the lower edge of the bell 16, as shown in Fig. 4, so that it will unseal the relief-pipe 64 before the bell 16 is unsealed, thereby permitting the escape of gas through the relief-pipe 64 to a point outside of the building in the event of the generation of an excessive volume of gas, which would otherwise unseal the bell 16 and escape into the room or apartment containing the generator, with attendant disagreeable odor and the possibility of forming an explosive mixture with the air in said apartment.

When the discharge-valve in the casing 50 is opened to permit of the outflow of the water and spent lime from the generator-casing 1, provision must be made to prevent the formation of a partial vacuum in the upper portion of said generator-casing 1, due to the withdrawal of the water therefrom, and I provide for supplying this partial vacuum by means of a backflow of gas, which is accomplished in the following manner: From the pipe 55 extends a branch 65, Fig. 1, containing a valve 66 and communicating through another branch 67 with the gas-chamber above the level of the water in the vessel 56. With the top of the generator also communicates a water-supply pipe 68, Fig. 1, having a valve 69, Fig. 3, and both this valve and the valve 66 in the gas-pipe 65 are controlled by a single lever 70, which is connected by means of a link 71 to the lever 51, which operates the discharge-valve in the casing 50, said link 71 having a slot 72, which permits a certain movement of the levers 51 and 70 independent of each other.

As shown in Fig. 1, all the valves are closed; but when the lever 51 is moved in the direction of the arrow, so as to open the discharge-valve in the casing 50, there will be a corresponding movement of the lever 70, which will effect the opening of both of the valves 66 and 69. Hence as the water and spent lime flow out of the generator-casing 1 a fresh supply of water and a supply of gas will flow into the upper end of the same, the supply of gas being necessary in order to prevent the formation of a partial vacuum in the upper

end of the generator, because the incoming supply of water through the pipe 68 does not equal in volume the outflow through the discharge-pipe.

When the generator has been freed from the spent lime, the discharge-valve in the casing 50 is closed by movement of the lever 51 in a direction the reverse of that indicated by the arrow, Fig. 1, but this does not cause corresponding movement of the lever 70, because of the slot 72 in the connecting-lever 71. Hence the valves 66 and 68 remain open and the gas and water connection with the upper end of the generator is maintained until the water in the generator has risen to the proper level, whereupon both of the valves 66 and 68 can be simultaneously closed by proper movement of the lever 70. By this means the drawing of air into the generator during the operation of discharging the spent lime therefrom is effectually prevented and no explosive mixture of gas and air in the generator can be produced.

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

1. In acetylene-gas-generating apparatus, the combination of a generator, a carbid-reservoir, a feed-drum, a catch-pan for preventing delivery of the carbid by said feed-drum during the recharging operation, a shaft operatively connected with the feed-drum, clutch mechanism whereby said shaft is operated by the descent of the bell of the gas-holder, and means whereby the movement of the catch-pan shaft is caused to release said clutch mechanism and thus permit movement of the bell of the gas-holder without imparting movement to the feed-drum, substantially as described.

2. The combination of an acetylene-gas generator having a plane inclined bottom, a discharge-pipe at the lowest portion of the bottom, a stirrer mounted upon the bottom, standards projecting from the stirrer, an annular rack carried by the standards, and means engaging said rack for operating said stirrer from the outside of the generator, substantially as described.

3. The combination of an acetylene-gas generator, having a discharge-pipe at its lower portion, a stirrer at the bottom of the generator, an annular rack carried by said stirrer, a wheel engaging said rack, and a shaft carrying said wheel and extending to the outside of the generator, substantially as described.

4. The combination of an acetylene-gas generator having an inclined bottom, with a central pivot-pin at right angles to the plane of said bottom, a stirrer consisting of a hub mounted on said pivot and having projecting blades, standards carried by the blades, an annular rack supported on the standards, a gear-wheel meshing with the rack and a shaft for said wheel, said shaft extending through the side of the generator, substantially as described.

5. The combination of an acetylene-gas gen-

erator, a gas-holder, a vessel containing water through which the gas passes on its way from the generator to the gas-holder, a valved water-outlet from the generator, and a valved connection between the gas-chamber of the gas-holder and the space above the water in the generator, whereby gas can flow back into the latter as the level of the water falls therein when the discharge-valve is opened, substantially as described.

6. The combination in acetylene-gas-generating apparatus, of the generator, a valved water-discharge pipe therefor, a gas-holder, a water seal or trap through which the generator communicates with said gas-holder, a valved pipe through which gas may flow back into the generator, and connections between said valved gas-pipe and the discharge-valve of the generator, whereby both may be simultaneously opened, substantially as described.

7. The combination in acetylene-gas-generating apparatus, of the generator, a valved water-discharge pipe therefor, the gas-holder, a water sealed or trapped communication between the generator and the gas-holder, a valved pipe providing for a backflow of gas into the generator, and a lost-motion connection between the valve of the gas-pipe and the discharge-valve of the generator, whereby the valves may be closed independently of each other, substantially as described.

8. The combination in acetylene-gas-gener-

ating apparatus, of the generator, a valved water-discharge pipe therefor, a gas-holder, a water sealed or trapped communication between said generator and the gas-holder, valved pipes providing a backflow of gas and a flow of water into the upper portion of the generator, and a connection between the discharge-valve in the generator and the valves in the gas and water pipes, whereby all three of said valves may be simultaneously opened, substantially as described.

9. The combination in acetylene-gas-generating apparatus, of the generator, a valved discharge-pipe therefor, a gas-holder, a water sealed or trapped communication between the generator and the gas-holder, a valved pipe providing for backflow of gas into the generator, a valved pipe for supplying water to the generator, and a lost-motion connection between the discharge-valve of the generator and the gas and water controlling valves, whereby said supply and discharge valves may be closed independently of each other, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN CONDON.

Witnesses:

F. E. BECHTOLD,
JOS. H. KLEIN.