No. 724,280. PATENTED MAR. 31, 1903.

N. GOODYEAR.

ACETYLENE GAS GENERATOR.

APPLICATION FILED JUNE 24, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

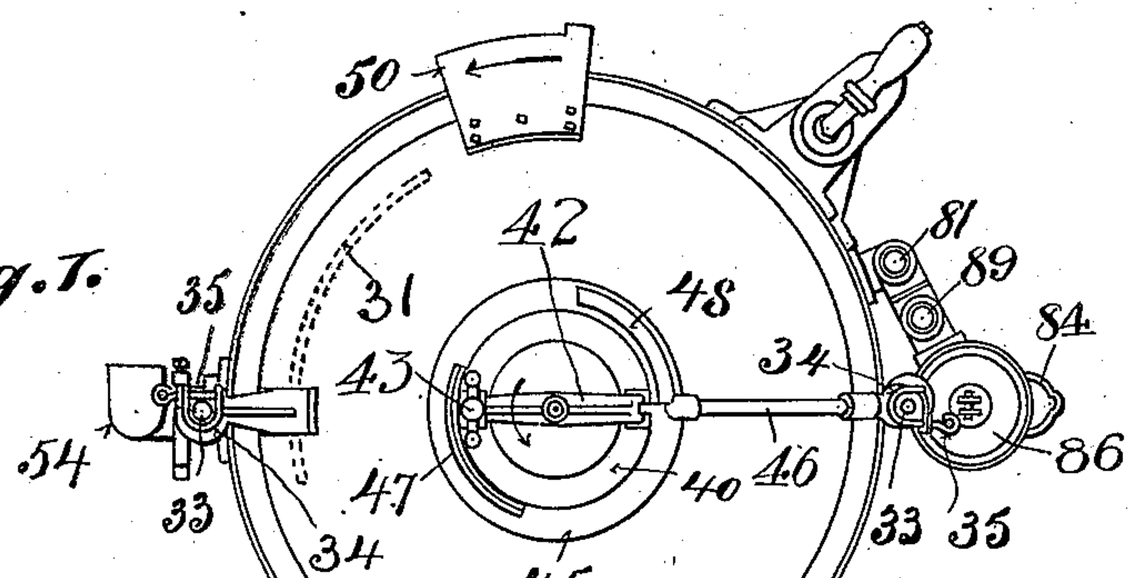
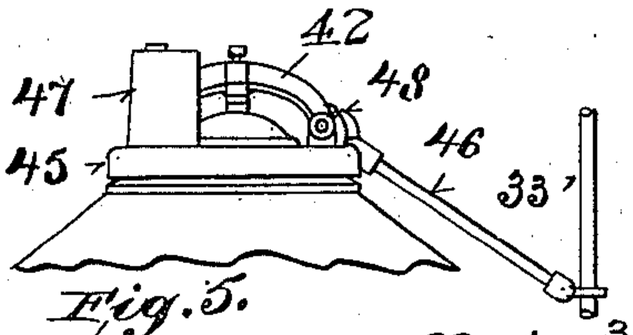


Fig. 5.



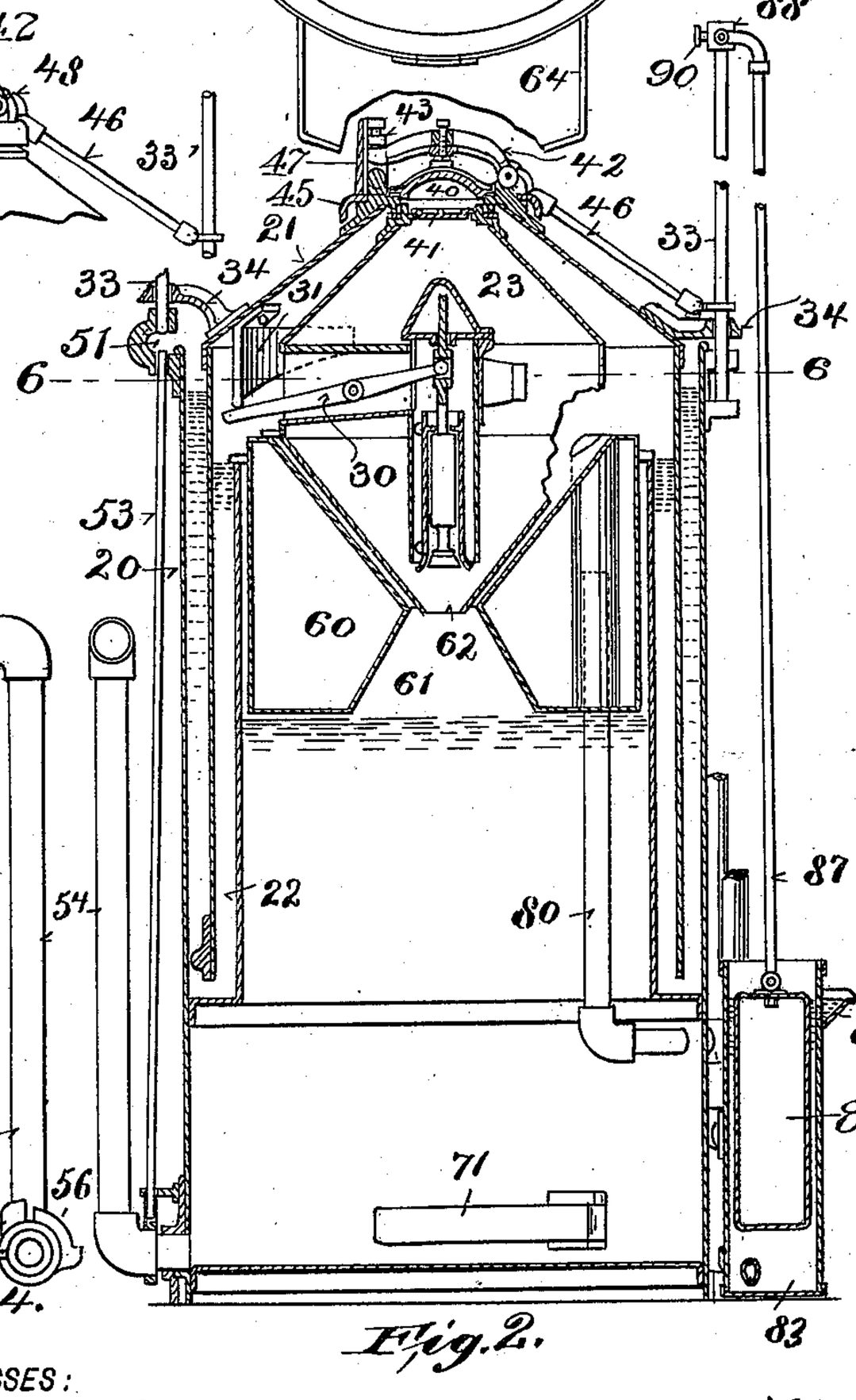


Fig. 4.

Fig. 2.

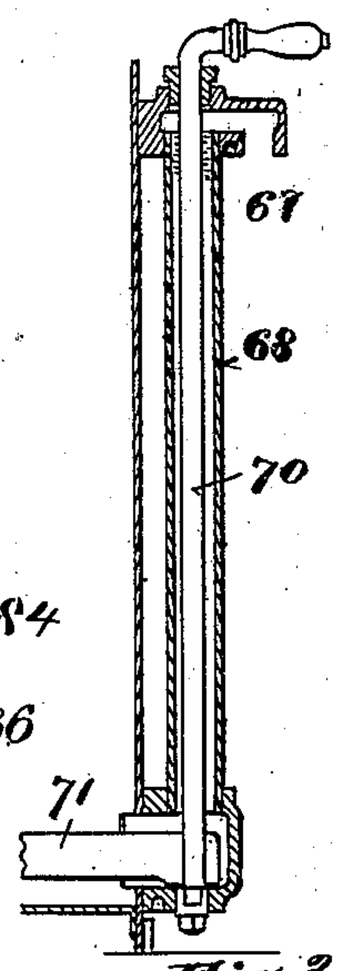


Fig. 3.

WITNESSES:

C. F. Benjamin

Henry S. Morton

INVENTOR

Nelson Goodyear.

BY Howard Thomas

ATTORNEYS

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NO MODEL. 2 SHEETS—SHEET 2.

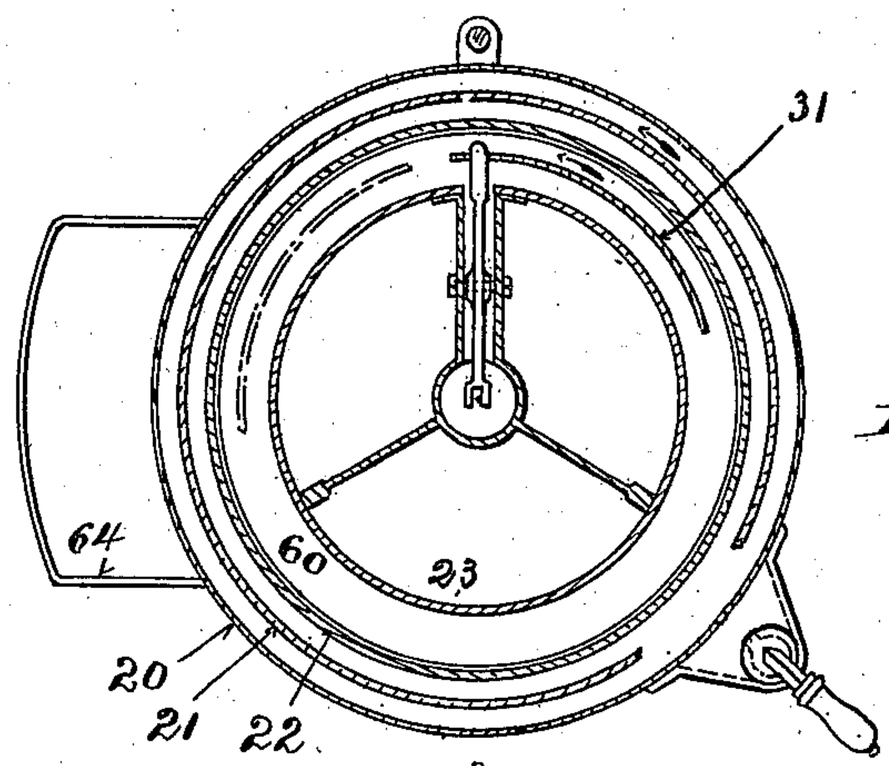

Fig. 6.

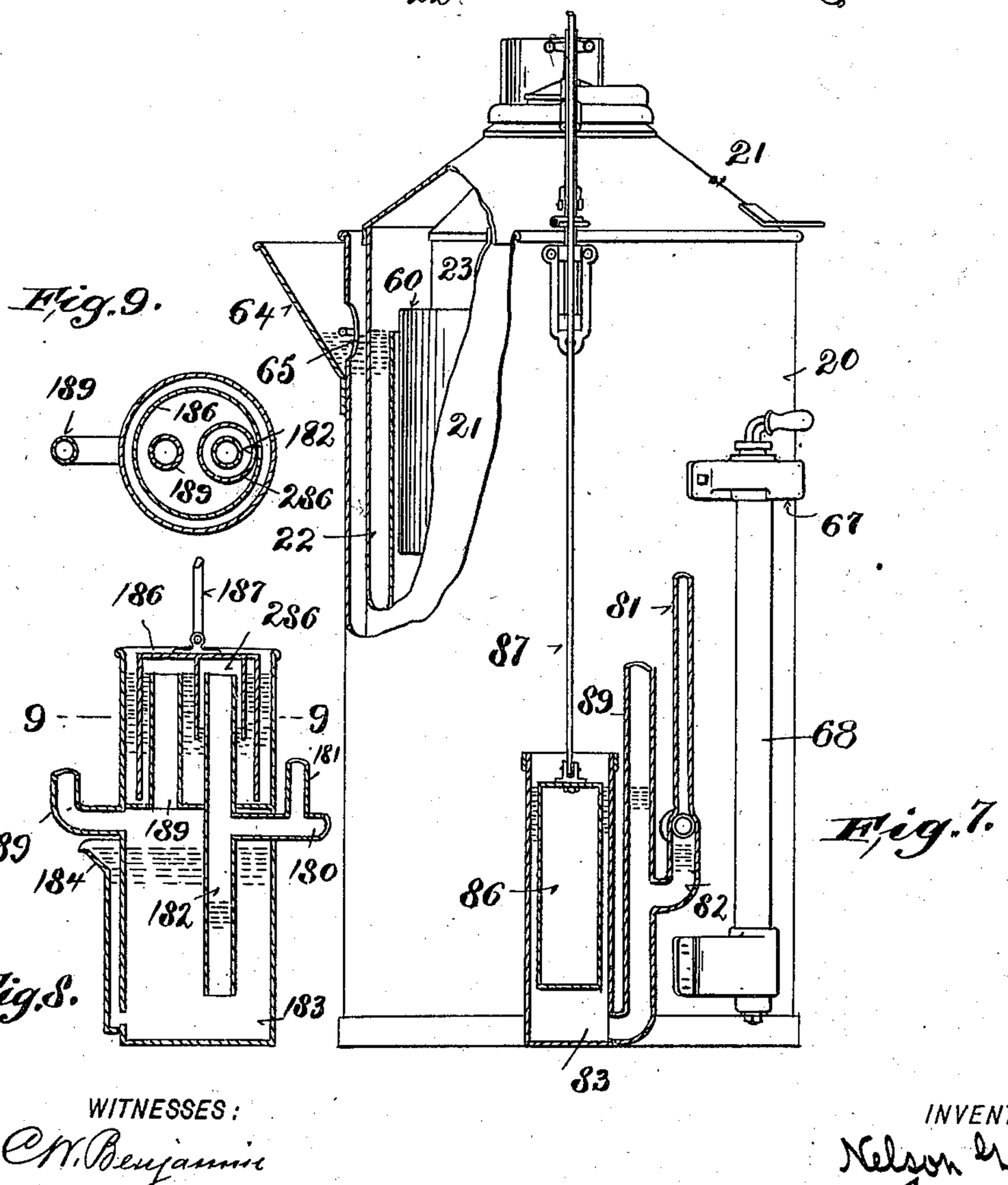

Fig. 7.

Fig. 9.

Fig. 8.

WITNESSES:

C. W. Benjamin

Henry S. Morrison.

INVENTOR

Nelson Goodyear.

BY Edward W. Byrn

ATTORNEY

UNITED STATES PATENT OFFICE.

NELSON GOODYEAR, OF FLUSHING, NEW YORK, ASSIGNOR TO J. B. COLT COMPANY, A CORPORATION OF NEW YORK.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 724,280, dated March 31, 1903.

Application filed June 24, 1901. Serial No. 65,813. (No model.)

To all whom it may concern:

Be it known that I, NELSON GOODYEAR, having my residence and post-office address at Flushing, Long Island, in the State of New York, have invented certain new and useful Improvements in Gas-Generators, (Case C,) of which the following is a specification illustrated by drawings.

The object of the invention is to perfect and improve the construction and operation of generators, especially that class of generators used for generating acetylene gas by means of carbid and water.

The improvements relate particularly to the means for preventing the opening of the carbid-charging device when the flushing-out device is open, means for preventing the opening of the flushing-out device when the carbid-charging cover is open, means for rendering the feeding mechanism inoperative when desired, means for reducing the waste gas-space and preventing the entrance of a dangerous quantity of air when the charging-cover is open, and certain combinations, all of which will be fully set forth and enumerated in the claims which follow this specification.

The drawings illustrate one preferred embodiment of the invention.

Figure 1 is a plan view; Fig. 2, a central vertical section; Fig. 3, a detailed section of the stirring device and overflow; Fig. 4, a view of the flush-out pipe detached and seen from the right of Fig. 2; Fig. 5, a detailed elevation of the locking mechanism for the carbid-charging cover; Fig. 6, a horizontal section on the plane 6 6 of Fig. 2. Fig. 7 is an elevation, partly in section, seen from the right hand of Fig. 2. Fig. 8 is a section of a modified form of drain-trap and blow-off, and Fig. 9 is a cross-section of the same on the plane 9 9 of Fig. 8.

In the form of the generator shown an outer water-holding tank or vessel 20 is provided, within which rises and falls the gas-holding bell 21, which is water-sealed in the channel or sealing-space 22. The carbid-hopper 23 is mounted, preferably stationary, within the gas-holding space beneath the bell. The carbid-feeding mechanism, of suitable type, such as that shown, is controlled by a lever 30, the actuated end of which is in position to be engaged by the inclined surface of a member 31, which rises and falls with the bell. By rotating the bell the incline or member 31 may be turned aside from the path of engagement with the lever 30, so as to render the carbid-feeding mechanism inoperative. The inclined under surface of the member 31 allows the bell to be turned back to the operative position, the lever end 30 being gradually depressed by the incline, causing the feeding of carbid and consequent rise of the bell by the gas generated. Normally the rise and fall of the bell is guided by rigid guides 33 and movable guides on the bell 34, provided with detachable pins 35, so that they may be released from the guides 33 when it is desired to turn the bell to render the carbid-feeding mechanism inoperative.

The form of carbid valve or stop is not of the essence of this present invention; but I have selected for illustration a simple carbid stop-valve hung from the lever 30 and provided with the fixed protecting shell or casing within which the lever and valve may work freely without interference from the carbid. The valve may be provided, if desired, with the annular sleeve, formingan auxiliary valve; but these details and certain others are contained in my other applications of even date herewith, numbered 65,811, 65,812, and 65,814.

The charging device or charging-cover 40 of the gas-bell comes directly above the charging-cover 41 of the hopper 23 when the bell is depressed to its lowest position. In order to lock the cover 40 closed and insure its remaining closed except when the flush-out is closed and the carbid-feeding mechanism is inoperative, the following means are provided: The cover is secured by a strap 42, one end of which may be hinged to the gas-bell 21 and the other end secured by a pivoted bail or stirrup 43, which may have a screw for forcing the strap 42 downward. To insure perfect locking of this mechanism, it is desirable not only that the stirrup 43 may not be moved out of its closed position, but also that the strap 42 must be in place beneath the stirrup 43 whenever the bell is turned to the operative position. This is ac-

complished by a ring 45, secured free to turn upon the bell 21, but held from turning with the bell by a connection 46, which slides upon the guide-rod 33 as the bell rises and falls. When the bell is in its operative position in respect to the carbid-feeding mechanism, a wall-like section of a flange 47, with which the ring 45 is provided, absolutely prevents the opening movement of the stirrup 43, and a smaller obstructing flanged section 48 on the other side of the ring interferes with and prevents the turning up of the strap 42 to open the cover. When, however, the bell is turned left-handedly (as seen in Fig. 1) ninety degrees, the stirrup and the strap both clear the flanged sections 47 and 48. If when so turned the strap 42 is thrown back, it prevents the bell being turned back to the operative position, because it interferes with the end of the flanged section 48. The bell itself is provided with an ear or flanged section 50, which when the bell is in its depressed position and turned to allow the opening of the cover 40 passes into the interval 51, Fig. 2, beneath one of the guides 33, as shown, and subserves two purposes: First, it prevents the bell being turned to open the cover except when the bell is so depressed that the ear 50 can enter the space 51; secondly, when in the space 51 it prevents the raising of the rod 53, which locks the flush-out device 54 in its closed position. The flush-out pipe 54, which is shown as a hinged pipe closed by the water seal within it when raised vertically, although it may manifestly be of any suitable type, is provided with a recessed member 55, the recess of which receives and is locked by the rod 53 when the flush-out device 54 is in its closed position. Consequently when the ear 50 prevents the raising of the rod 53 the flush-out cannot be opened. When the flush-out is opened and the rod 53 raised, the rod is prevented from dropping by means of the cam-like surface 56 of the member 55 until the flush-out is again closed. Such raising of the rod 53 blocks the interval 51 and interferes with the turning of the bell to open the charging-cover. Therefore the charging-cover is locked shut when the flush-out is open, and when the charging-cover is open the flush-out is locked shut.

In order to reduce the waste gas-space in the generating-chamber beneath the conical bottom of the carbid-hopper, a gas-space-occupying body 60, preferably hollow, is located, as shown, beneath the hopper, substantially fitting and filling the annular gas-space above the water-level, but provided with a flaring central opening 61, through which the carbid can fall freely from the carbid-opening 62. The water is poured into the generator through the mouth or lip 64 and opening 65 in the wall of the vessel 20, and after the water has filled up the sealing-space 22 it fills up the generating-chamber until it overflows at the overflow 67. The overflow-pipe 68, rising from the level of the bottom of the vessel 20, is utilized as a water seal for the shaft 70 of a stirring mechanism, the blade of which, 71, has an arc-shaped movement over the bottom of the generating-chamber to stir up the residuum and force it toward the flush-out, as will be understood from Figs. 2, 3, and 7. The gas is educted from the generating-chamber through the pipe 80, which extends from above the water-level down to and beneath the bottom of the sealing-space 22 and passes thence through the wall of the vessel 20 to connect externally with a service-pipe 81. This connection is drained by a downward-extending pipe 82, connecting with the drain-trap 83, the overflow of which is shown at 84. This trap is also made to act as an automatic safety blow-off for the generator by causing the depth of seal for the connection 82 to be depleted when the gas-bell rises beyond a safe limit. This depleting is accomplished by means of a movable body 86, which displaces, or rather occupies, a large part of the total capacity of the drain-trap 83 and is connected by a rod 87 with a slide 88 upon one of the guides 33. When the bell rises beyond the desired limit, it engages and carries up the guide 33, thereby raising the displacing body 86 from the drain-trap and causing the water-level in the trap to be lowered and to permit the gas to escape through the passage 82 and pipe 89 to any desired point of blow-off. A set-screw 90 may be provided for the slide 88, so that it may be raised and secured in raised position manually when desired.

The upper end of the gas-pipe 80 extends upward into a tubular chamber in the space-occupying body 60, as shown in Fig. 2.

The operation of the devices which form the present improvement as described should be readily understood by those skilled in the art. For example, in cleaning and recharging the generator it will be seen that the flush-out 54 may first be lowered and the stirring device 70 71 agitated while allowing gas to be generated to occupy the water-chamber as the water is drawn off; but it is preferable first of all to recharge the carbid-chamber while the generator is full of water and the flush-out 54 is locked shut. Then when the cover has been closed and locked and the bell turned back to its normal position, rendering the valve or carbid-feeding mechanism again operative and unlocking the flush-out, the flush-out may be opened and the agitating device 70 71 used to stir up the sediment while the flushing out of the water has occurred. During the drawing down of the water gas will of course be generated, and consequently no air will be drawn into the generator. As soon as the flush-out is again closed, clean water is poured in through the funnel-shaped mouth 64, causing the bell to rise as the gas within it is forced up with the water until finally the water overflows at the overflow-mouth 67.

A modification of the drain-trap and the automatic blow-off is shown in Figs. 8 and 9.

This differs in principle from that shown in the other figures in replacing the body 86, which depletes the seal by a rising-and-falling sealing-bell 186, operated by a rod 187. The parts 183 and 184 correspond to 83 and 84 of Figs. 1 and 2. The gas-outlet pipe 180 and service-pipe 181 are drained through the pipe 182. The pipe 182 is open at its upper end, but covered and sealed by a cap 286, dipping into a body of water, as shown, and moving with the bell 186. When the bell 186 is raised sufficiently, the gas can blow off under the cap or bell 286 and thence through the blow-off 189, as clearly seen in Fig. 8.

Some features shown and not claimed in this application are claimed in copending applications of my own. The improvements relating to the agitator and water-overflow are claimed in application, Serial No. 86,198, filed December 17, 1901; certain improvements relating to charging and flushing-out devices are claimed in application, Serial No. 65,811, filed June 24, 1901, and certain other improvements in carbid-feeding mechanism are claimed in application, Serial No. 65,812, filed June 24, 1901.

What I claim as new, and desire to secure by these Letters Patent, are the following novel and characteristic features:

1. In a gas-generator in which solid and a liquid material are fed together to generate gas, the combination with the solid-holding receptacle and the liquid-holding vessel, of a rising-and-falling gasometer-bell therefor inclosing the solid-holding receptacle, a feeding mechanism therefor having an actuating part in position to be actuated by an engaging member or portion moving with the said bell, the said bell being rotatable to displace the said member and prevent said engagement.

2. In a gas-generator in which solid and a liquid material are fed together to generate gas, the combination with the solid-holding receptacle and the liquid-holding vessel, of a rising-and-falling gasometer-bell therefor inclosing the solid-holding receptacle, a feeding mechanism therefor having an actuating part in position to be actuated by an engaging member or portion moving with the said bell, the said bell being rotatable to displace the said member and prevent said engagement, guiding means for normally guiding the rise and fall of the bell, and means for releasing the bell from the said guiding means to permit the rotation of the bell.

3. In a gas-generator in which a solid and a liquid material are fed together to generate gas, the combination of a rotatable rising-and-falling gasometer-bell, guiding means for guiding the bell throughout its normal rise and fall, means for releasing the guiding means to permit the bell to be turned, and a feeding device for one of the materials provided with actuating connections for actuating it by the rise and fall of the bell when the bell is turned to its operative position, for the purposes set forth.

4. In a gas-generator in which a solid and a liquid material are fed together to generate gas, the combination of a rotatable rising-and-falling gasometer-bell, a feeding mechanism for one of the materials mounted within the said bell, said bell having an interior member that actuates the feeding mechanism when the bell rises and falls in its normal angular position but is removed from such engagement by the turning of the said bell.

5. In a gas-generator in which a solid and a liquid material are fed together to generate gas, the combination of a rotatable rising-and-falling gasometer-bell, a feeding mechanism for one of the materials, and an inclined member moving with the said bell to operate the feeding mechanism only when the bell is turned into certain positions, the direction of inclination of said member being such that it is gradually engaged with and disengaged from the feeding mechanism by turning the said bell, for the purposes set forth.

6. In a gas-generator in which carbid is fed to water to generate gas, the combination with a carbid-hopper, carbid-feeding means, and a water-holding chamber, of a flush-out pipe normally liquid-sealed and pivotally connected to the liquid-holding chamber, a locking device therefor, a charging-cover for the carbid, a locking device therefor, and means for preventing the unlocking of both said locking devices at the same time.

7. In a gas-generator in which carbid is fed to water to generate gas, the combination with the carbid-receptacle of a rising-and-falling gas-holding bell adapted to be turned, a carbid-charging device and a locking device therefor, and means for controlling and operating the locking device by turning the said bell.

8. In a gas-generator in which carbid is fed to water to generate gas, the combination with the carbid-receptacle of a rising-and-falling gas-holding bell adapted to be turned, a carbid-charging device and a locking device therefor, and means for controlling and operating the locking device by turning the said bell, and a flushing-out device having means for locking it closed when the bell is turned to unlock the said cover.

9. In a gas-generator, in which solid and a liquid material are fed together to generate gas, the combination of an outer liquid-holding tank or vessel, a solid-holding receptacle or carbid-hopper within said vessel, a rotatable rising-and-falling gasometer-bell inclosing the solid-holding receptacle, a feeding mechanism therefor having an actuating part in position to be actuated when the bell is in a given position, by an engaging member or portion rising and falling with said bell, and means for rotating said bell, whereby said member or portion rising and falling therewith may be displaced horizontally relatively

to the actuating part of the falling mechanism and prevented from actuating the same in the movements of the bell, substantially as and for the purposes set forth.

10. In a gas-generator in which carbid is fed to water to generate gas, the combination with the carbid-receptacle of a rising-and-falling gas-holding bell adapted to be turned, a carbid-charging device and a locking device therefor, and means for controlling and operating the locking device by turning the said bell, and a flushing-out device having means for preventing the turning of the bell and unlocking the charging device when the flushing-out device is open.

11. In a gas-generator in which carbid is fed to water to generate gas, the combination with the rising-and-falling gas-holding bell adapted to be turned, a carbid-charging cover provided with means for securing it shut, a locking member therefor and connections therefor, for preventing it turning with the bell, said locking member being of shape to unlock the said securing means at certain positions of the bell, substantially as set forth.

12. In a gas-generator in which carbid is fed to water to generate gas, the combination with the rising-and-falling gas-holding bell adapted to be turned, a carbid-charging cover, means for locking the carbid-charging cover when shut, actuated by the turning of said bell, and means for preventing the turning of the bell to unlock the said cover at all positions of the bell except when depressed, substantially as set forth.

Signed this 19th day of June, 1901, at New York.

NELSON GOODYEAR.

Witnesses:
E. VAN ZANDT,
H. S. MORTON.