No. 808,650. PATENTED JAN. 2, 1906.

N. GOODYEAR.

GAS GENERATOR.

APPLICATION FILED JUNE 24, 1901.

5 SHEETS—SHEET 1.

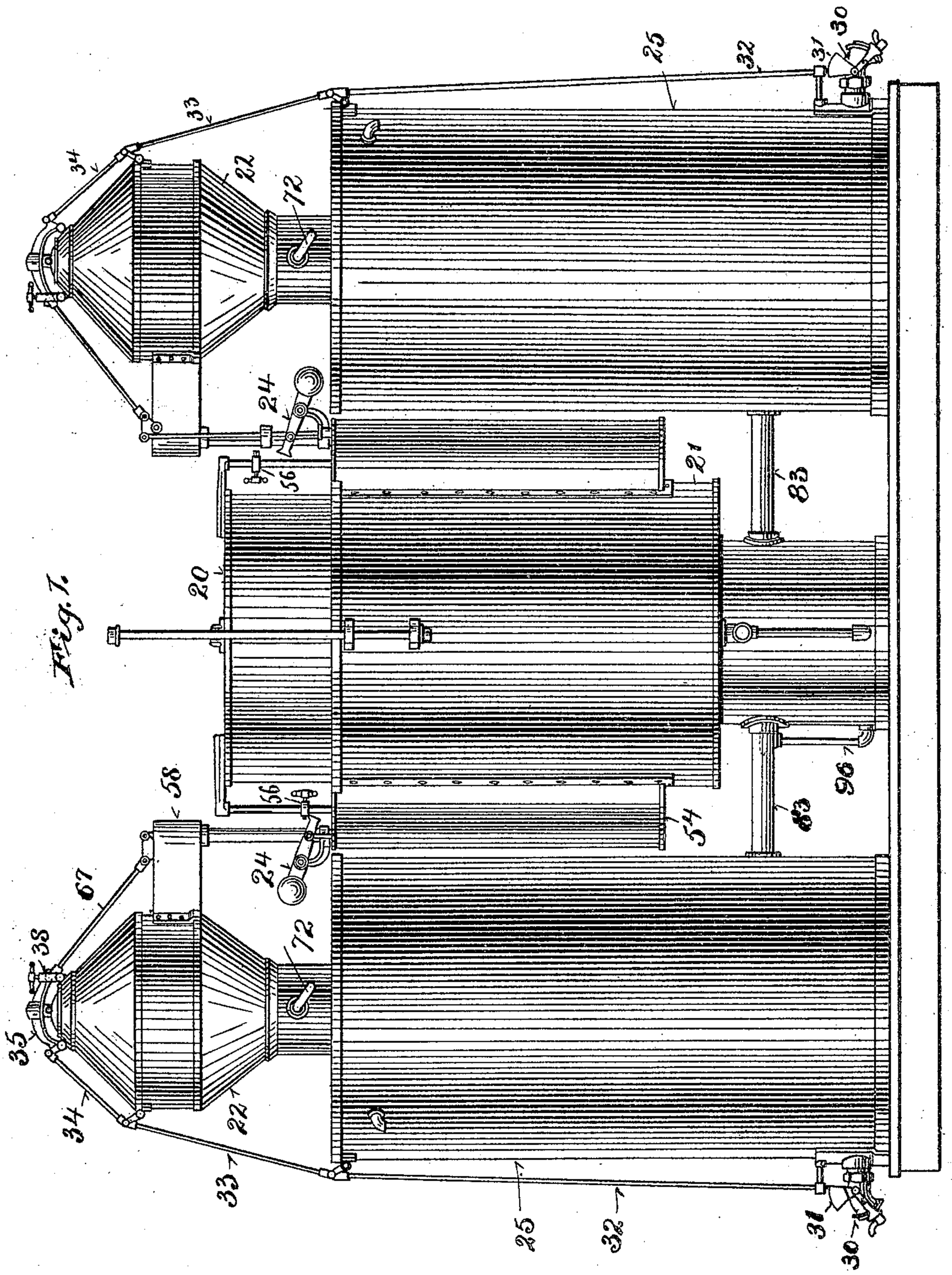

Fig. 1.

Witnesses;
C. W. Benjamin
Henry D. Morton.

Inventor;
Nelson Goodyear
by Church & Church
Attys

No. 808,650. PATENTED JAN. 2, 1906.

N. GOODYEAR.

GAS GENERATOR.

APPLICATION FILED JUNE 24, 1901.

5 SHEETS—SHEET 2.

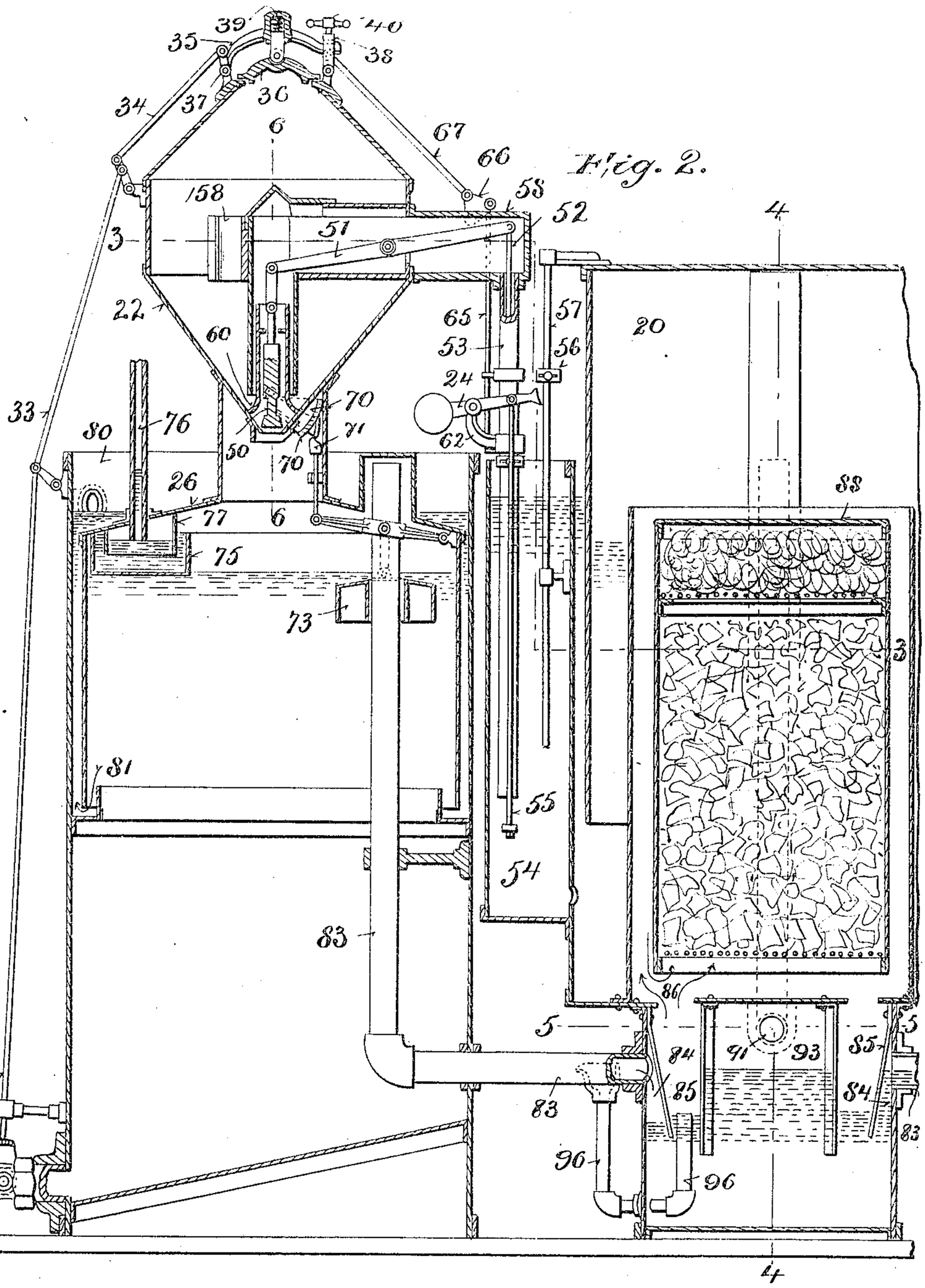

Fig. 2.

WITNESSES:
C. W. Benjamin
Henry S. Morton

INVENTOR
Nelson Goodyear
BY Harold B. Gurney
ATTORNEY

No. 808,650. PATENTED JAN. 2, 1906.

N. GOODYEAR.

GAS GENERATOR.

APPLICATION FILED JUNE 24, 1901.

5 SHEETS—SHEET 3.

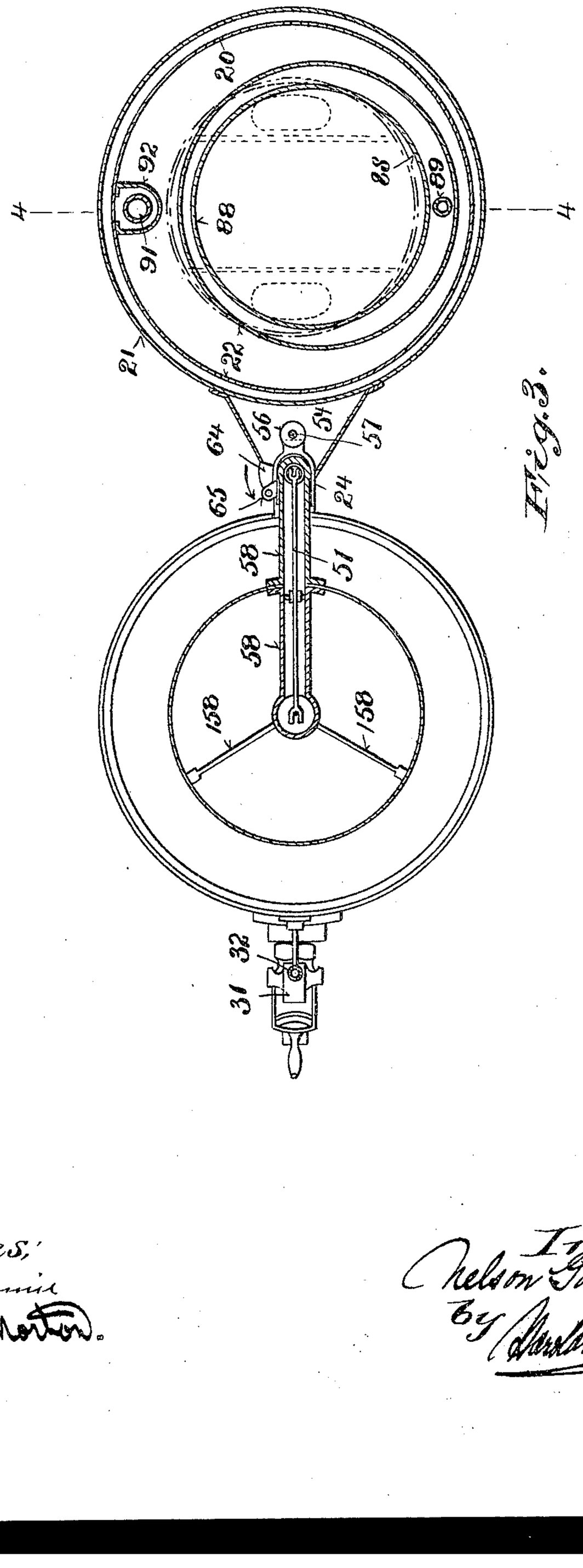

Fig. 3.

Witnesses:
C. W. Benjamin
Henry L. Morton.

Inventor:
Nelson Goodyear
by Church & Church
Attys

No. 808,650. PATENTED JAN. 2, 1906.

N. GOODYEAR.

GAS GENERATOR.

APPLICATION FILED JUNE 24, 1901.

5 SHEETS—SHEET 4.

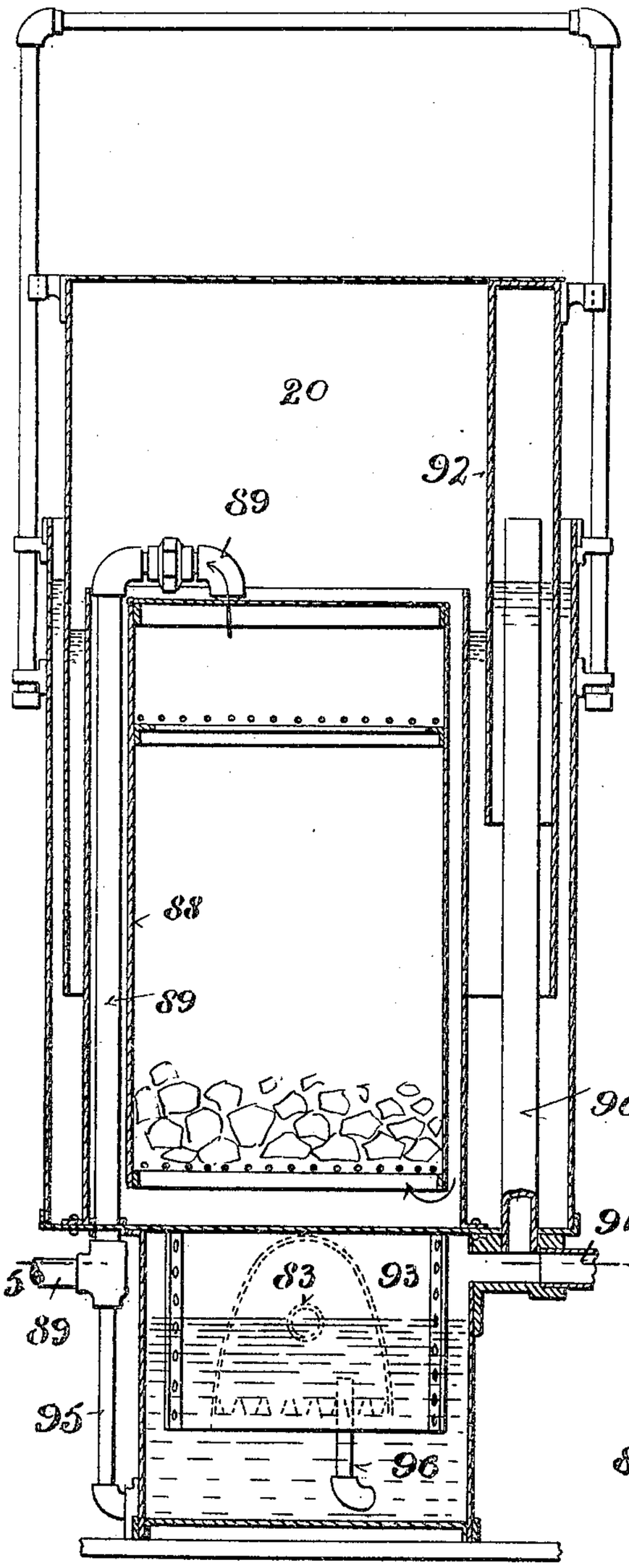

Fig. 4.

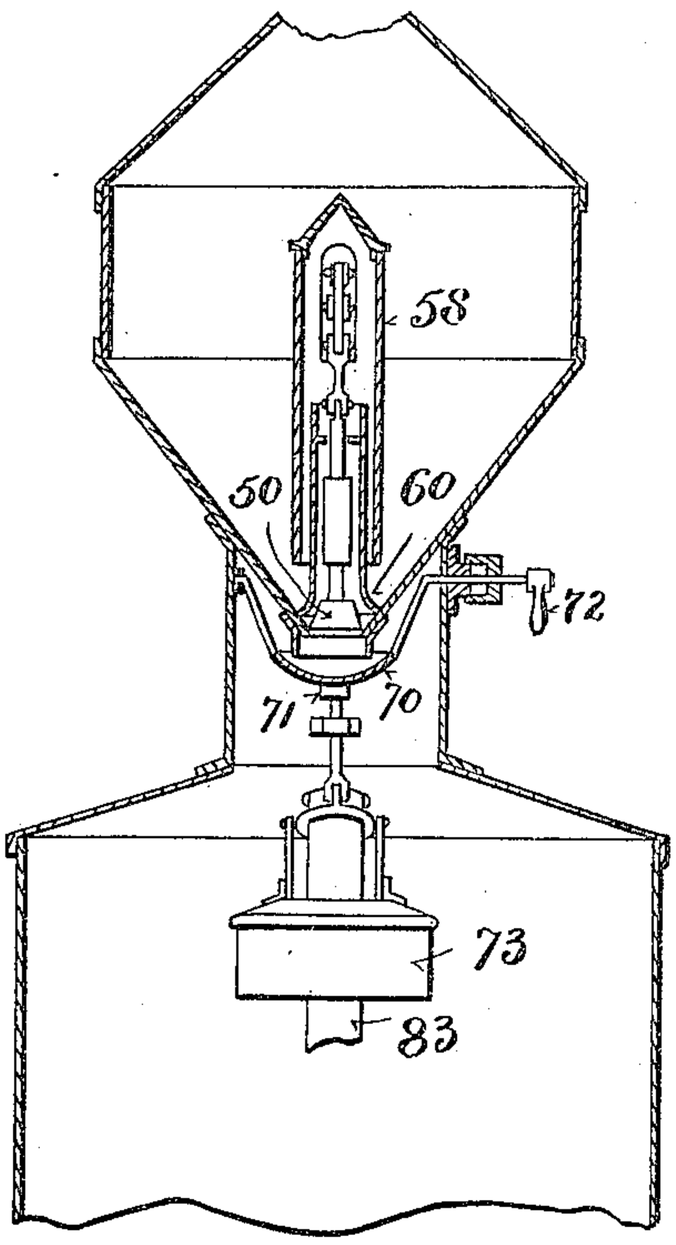

Fig. 6.

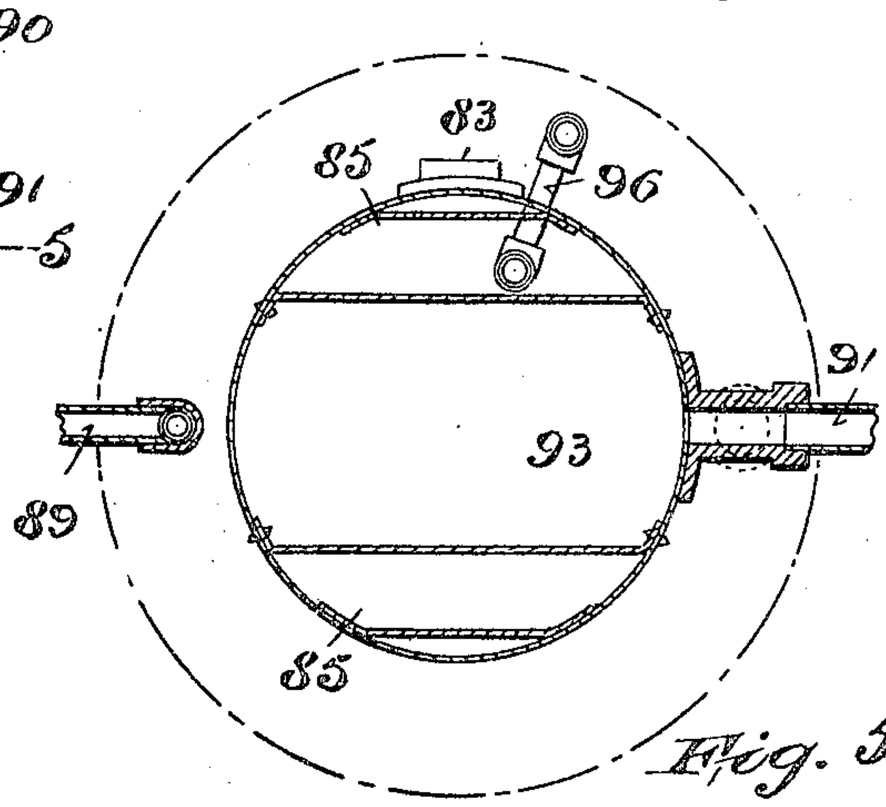

Fig. 5.

WITNESSES:

C. N. Benjamin

Henry S. Morton

INVENTOR

Nelson Goodyear

BY Howard B. Jones

ATTORNEY

No. 808,650. PATENTED JAN. 2, 1906.

N. GOODYEAR.

GAS GENERATOR.

APPLICATION FILED JUNE 24, 1901.

5 SHEETS—SHEET 5.

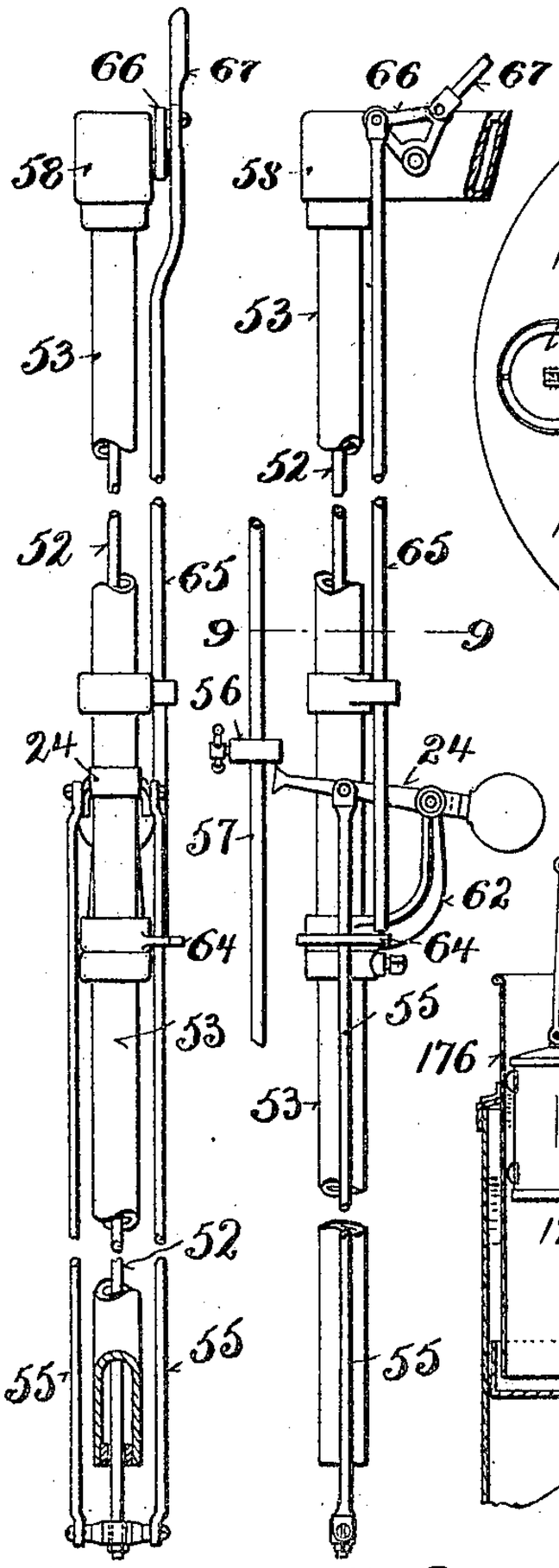

Fig. 1.

Fig. 8.

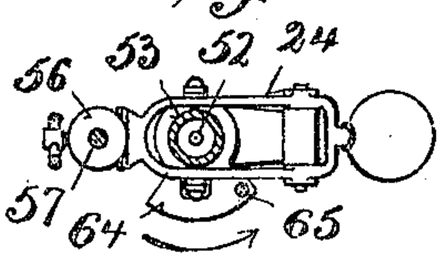

Fig. 9.

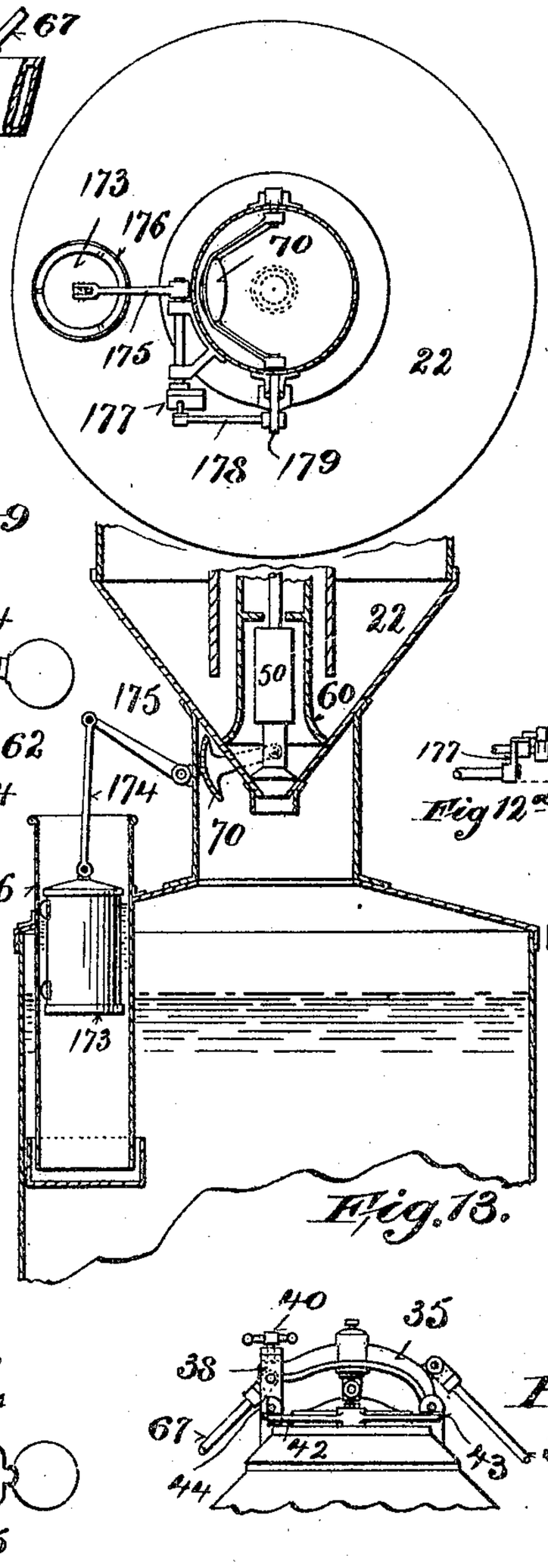

Fig. 13.

Fig. 14.

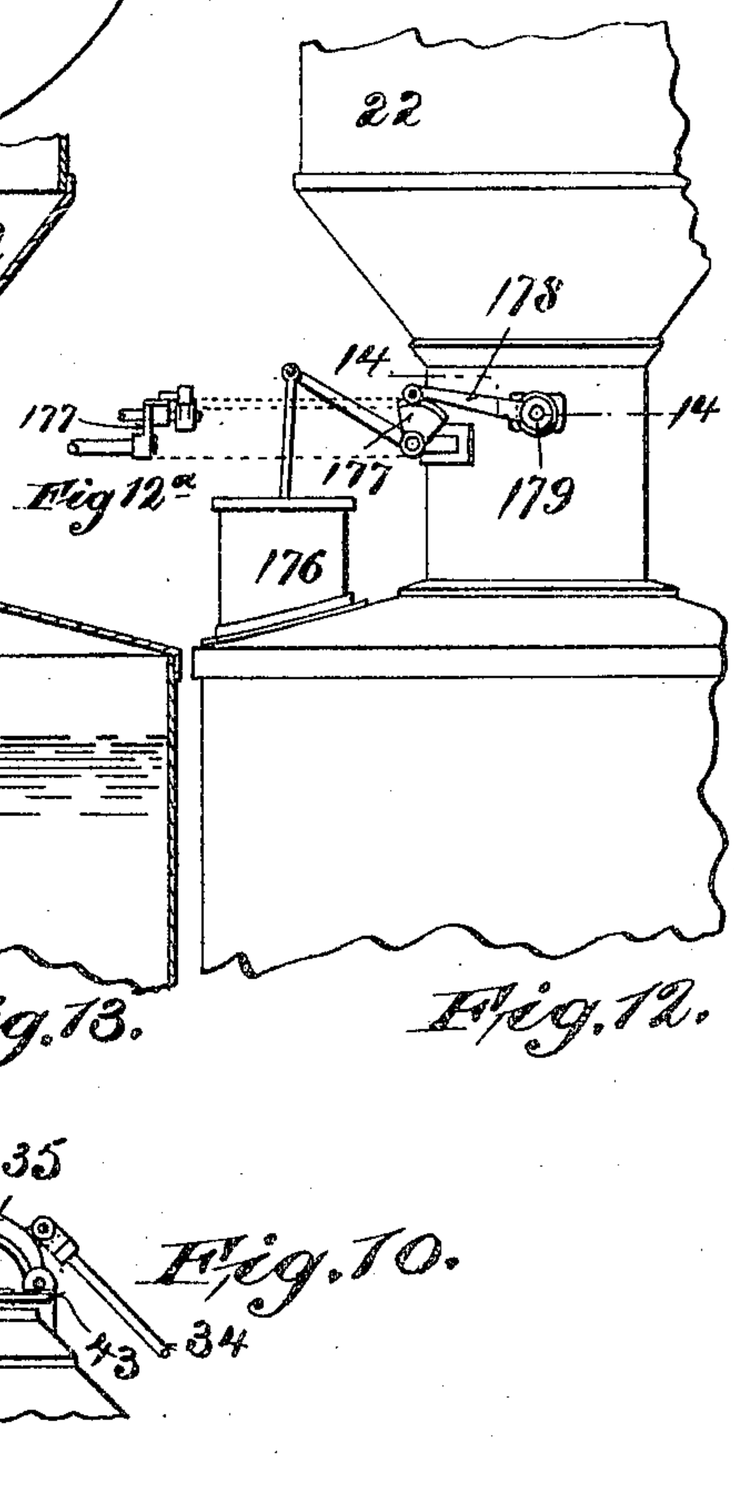

Fig 12a

Fig. 12.

Fig. 10.

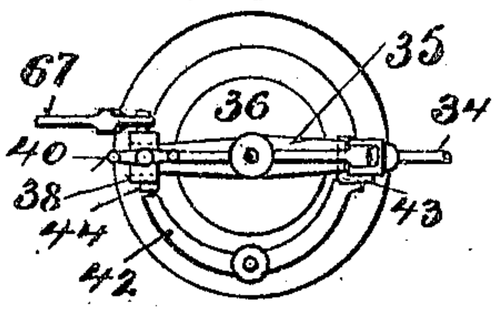

Fig. 11.

WITNESSES:

C. W. Benjamin

Henry S. Morton

INVENTOR

Nelson Goodyear

BY Harold B. Finney

ATTORNEY.

UNITED STATES PATENT OFFICE.

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

GAS-GENERATOR.

No. 808,650. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed June 24, 1901. Serial No. 65,811.

To all whom it may concern:

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

The object of the invention is to improve acetylene and similar generators and overcome the defects and disadvantages of many of the forms now in existence.

The precise nature of the several features that constitute the invention will be best understood from the following description and enumerated in the claims.

Among other features the improvements relate to interlocking connections between the charging cover or device and the flush-out, interlocking connections between the feeding mechanism and the charging device, carbid-feeding mechanism connections extending to atmospheric pressure and water-sealed, improvements in the carbid-feeding mechanism, safety devices therefore, means for admitting air when the water is being drawn off and for permitting the air to escape when the water is being introduced into the generator, pressure-regulating and relieving devices, and means for drying the gas.

In the drawings, Figure 1 is a side view of a double generator embodying the present improvements. Fig. 2 is a vertical cross-section through the gasometer and one generator member of the apparatus. Fig. 3 is a horizontal section on the planes 3 3 of Fig. 2, some parts being omitted for clearness. Fig. 4 is a vertical section on the plane 4 4 of Figs. 2 and 3 looking toward the left. Fig. 5 is a horizontal section on the plane 5 5 of Figs. 2 and 4. Fig. 6 is a sectional view of part of the apparatus on the plane 6 6 of Fig. 2 looking toward the right. Figs. 7 and 8 are detail views, in elevation, of a portion of the carbid-feed-operating mechanism. Fig. 9 is a cross-section of the same on the plane 9 9 of Fig. 8. Figs. 10 and 11 are side elevation and plan view in detail of parts of the interlocking mechanism of the carbid-charging cover. Figs. 12 and 13 are side view and vertical section of a modified form of the safety-stop for the carbid-feeding mechanism; Fig. 12[a], a detail view of some of the elements of Fig. 12 seen from the left hand of the figure. Fig. 14 is a plan view of the mechanism, the hopper being removed, as indicated by the section-lining.

It is sometimes convenient to have several generators arranged to successively supply gas to a single gasometer. Such an arrangement has been selected for illustration, two generating vessels of similar construction being used to supply a single central gasometer, as shown in Fig. 1. As shown, the left-hand generator is operating and the right-hand generator will come into use as soon as the left-hand generator is exhausted, the gasometer-bell then falling to a lower level, which causes it to coöperate with the weighted lever-arm which controls the feeding of carbid in the right-hand generator, as will be better understood from the following description of the details.

The gasometer-bell 20 rises and falls in a water-sealed gasometer vessel 21, as usual, and by means of adjustable stops 56 its movement actuates the lever-arms 24 of the respective generators. Each generator preferably combines an outer casing 25, within which is fitted a water-sealed bell 26, that carries the carbid-hopper 22. The water from the generating-chamber may be flushed out through any suitable flush-out mechanism—such, for instance, as the cock 30 shown. The cock carries a sector or stop 31, which in a closed position of the cock interferes with the descent of a rod 32, having connections 33 34 with the instrumentality 35 that serves to secure the carbid-feeding cover 36 when closed. This instrumentality preferably consists of a hinged lever or strap, which extends over the cover and is pivoted at one end 37 and engaged and held down at its other end by a pivotally-secured stirrup 38. A strong spring 39 may be provided to press the cover 36 against its seat, and a hand-screw 40 may be provided in the stirrup 38, which directly bears upon the end of the strap 35 and forces it downward to insure tight closure of the cover 36. By means of rods 33 34 when the strap 35 is raised and turned out of the way the rod 32 is forced downward. This can only occur when the cock 30 is opened and its sector 31 moved out of the way of the end of the rod 32. Conversely, when the rod 32 is down the flush-out cock cannot be closed. Consequently the charging-cover is locked against being

opened when the flush-out cock is closed and the flush-out cock is locked open when the charging-cover is open. The stirrup 38 and the carbid-feeding mechanism are also interlocked, as will be presently described, so that when the charging-cover is opened the carbid-feeding mechanism is necessarily locked shut.

The carbid-hopper has preferably a converging bottom, as shown. A duplex carbid-feeding valve is provided, the inner member 50 of which is operated by a lever 51, fulcrumed in the hopper. The other end of the lever 51 is actuated by a vertical rod 52, which extends downward in the water-sealed pipe 53 into the water-sealed chamber 54 and is secured to the pair of links 55, which extend up exteriorly to the pipe 53 and are pivoted to the operating-lever 24. All these moving parts are so weighted that the valve 50 tends to close by gravity. The lever 24 is actuated by an adjustable tappet-disk 56, carried on rod 57 on the gasometer-bell 20. The descent of the gasometer-bell causes the tappet 56 to depress the end of the lever 24 and raise the carbid-valve 50.

Surrounding the valve 50 is an annular valve or stop 60, which has a lost-motion connection with the valve 50, so that the rise of the latter beyond a small limit will raise the valve 60 and allow the carbid to feed, and, conversely, in closing the valve 60 will first seat itself and then the valve 50 will descend and seat itself. The object of this duplex form of valve with lost-motion between is to insure the complete closing of the chamber even if the valve 60 should be held up slightly by a large particle of carbid, allowing fine carbid to escape beneath it. In such event the inner valve 50 will complete the closing of the carbid-chamber. The valves and the lever 51 are inclosed within a casing, which is preferably roof-shaped above the lever 51, as shown in the figures, and which extends down around the valves in a way to prevent the entire mass of carbid pressing down upon the valves and interfering with their operation. Outside of the carbid-hopper 22 the gas-tight casing 58 and the water-sealed pipe 53 completely surround the projecting end of the lever 51 and the rod 52. In this manner the valve mechanism and connections extend from within the hopper out into the atmosphere without necessitating the use of stuffing-boxes or other friction-producing means of sealing the valve-operating connections.

The lever 24 is fulcrumed to an arm 62, that is mounted to turn upon the pipe 53, so that the entire system, comprising lever 24 and links 55, may be swung around the pipe 53 as a center, throwing the end of lever 24 out of alinement with tappet 56, and so rendering the gasometer inoperative when desired. Rigid with the arm 62 is a sector 64, which normally lies beneath the end of the rod 65 and prevents the descent of the rod when the lever-arm 24 is in operative relation to the tappet 56. The rod 65 is connected by bell-crank 66 and link 67 to the stirrup 38, which holds the strap 35 of the charging-cover 36. When the sector 64 is in position to prevent the descent of the rod 65, the stirrup 38 cannot be turned to release the strap 35. When, however, the lever 24 has been swung out of operative position, the sector 64 swings out of the way of the rod 65. Then if the stirrup 38 be turned down to release the strap 35, the consequent descent of the rod 65 locks the sector 64, with the arm 62 and lever 24, in their inoperative position. This mechanism therefore causes the carbid-charging cover to be locked shut when the carbid-feeding valve and its connections are in operative position, and, conversely, when the carbid-charging cover is open and the stirrup 38 turned down the carbid-feeding mechanism is locked in inoperative position.

In order to prevent the possible unlocking by raising the rod 65 and returning the stirrup 38 to its normal position without, however, bringing the strap 35 under it, a curved interlocking lever 42 is pivotally mounted at the side of the charging-cover 36, (see Figs. 10 and 11,) the respective ends of which lever can pass beneath the shoulders or into recesses 43 44 in the strap 35 and stirrup 38, respectively. When one end of the lever—as, for example, the right end, Fig. 11—is pressed into the recess within the strap 35, the other end of the lever is clear of the stirrup 38, so that the stirrup 38 may be moved; but the strap 35 cannot be moved. In order to raise the strap 35, it is necessary, therefore, not only to turn the stirrup 38 out of the way, but also to press the left-hand end of the lever 42 beneath the shoulder into the recess 44 of the stirrup 38, thereby locking the stirrup 38 and at the same time releasing the strap 35 from the other end of the lever. When the strap 35 is raised, the position of the lever 42 cannot be changed, and consequently the stirrup 38 cannot be brought to its normal position without first shutting down the strap 35 to the position shown in Figs. 10 and 11 and turning the lever 42 to the position shown in Fig. 11.

There is further provided a safety valve or stop 70, pivotally mounted to swing under and cut off the feeding of carbid from the hopper when free to move, but normally held in inoperative position, as shown in Fig. 2, by a detent 71, connected, as shown, to be supported by a float 73. If for any reason the water-level within the generator is forced down either by an excess of gas-pressure or the drawing off of the water, the fall of the float 73 draws down the detent 71 and re-

leases the safety valve or stop 70, causing it to swing beneath the valve-opening and prevent any feeding of carbid.

As a means of preventing the formation of a partial vacuum in the generator when drawing off the water a special automatic trap may be employed. A water-holding vessel 75 is supported somewhat above the normal water-level in the generator, and into this dips and is sealed an air-pipe 76, which communicates above with the atmosphere. Surrounding the lower end of the air-pipe 76 is a depending sleeve 77, which is also water-sealed in the receptacle 75 and which is closed gas-tight at its upper end. Assuming that the sleeve 77 extends, say, three inches down into the water within the vessel 75, air will be admitted freely to the interior of the generator as soon as the pressure within it is reduced to three inches less than atmospheric pressure. As, however, the horizontal section or water area within the sleeve 77 is large as compared to the annular space intervening between the sleeve and the walls of the vessel 75, the admission of air in carrying down the water-level within the sleeve 77 depletes the amount of water within the receptacle 75, so that the air may escape still more freely from the generating-chamber when the water is being introduced to refill the generator. As soon, however, as the water within the generator rises high enough to pour into and fill the vessel 75 it of course reestablishes the seal, because then the water will reach the foot of the air-pipe 76 and completely seal it against the escape of air or gas. Therefore it will be seen that this special trap admits air readily to the generator and also permits the escape of air while the generator is being filled with water; but as soon as the generator is filled it reëstablishes the complete sealing of gas within the generator.

My copending application, Serial No. 189,950, filed January 21, 1904, for a generator is a division of the present case.

In order to reduce the fluctuations of pressure which occur by the sudden feeding of carbid within the generator, an annular space 80 of large area is provided above the generating-chamber into which the water may be freely forced by an excess of pressure, as indicated by the arrow 81. The space 80 therefore forms an overflow-reservoir into which a considerable volume of water may be forced by an excess of pressure within the generator. The water flows back into the generating-chamber as the excess of pressure is relieved by the escape of gas into the gasometer.

The gas passes from the generating-chamber to the gasometer through gas-pipe 83, which terminates in a downward-opening water-sealed mouth 84, formed by a depending apron 85, secured in the base of the gasholder, as shown. The gas rising from beneath the apron 85 passes up, as indicated by the arrows 86, Fig. 2, into the expansible chamber of the gasometer. Within the expansible chamber is located a drying vessel 88, open at the bottom and closed above, except for the gas-service pipe 89, and filled with any suitable drying material supported on grids or screens, as shown. The gas passes up through the drying material to reach the gas-service pipe 89; but any excess of gas in expanding the holder may pass freely up around the drying-chamber 88 to raise the bell instead of having to force its way through the drying material. This is important, as it gives free opportunity to the gas generated in the generator to escape quickly into the gas-holder and to react upon the bell, so as to stop the feeding of the carbid.

A telescopic safety blow-off is provided, consisting of a fixed pipe 90, suitably connected at 91, to lead off the escaping gas, and of a depending sealing-sleeve 92, which rises and falls with the gas-bell 20.

Within the base of the gas-holder and in free communication with atmospheric pressure by the pipe 91 there is a water-sealed chamber 93, preferably of larger horizontal area than the water-holding spaces in communication with it that seal the mouths 84 of the gas-pipes 83. The water-sealed walls which divide the space 93 from the communicating chambers at either side of it project down beneath the normal level of the water beneath the space 93 sufficiently to insure the normal sealing of the gas; but an excess of pressure within the gasometer will force the water-levels outside of the chamber 93 down, so that the gas may escape freely into the chamber 93 and thence through the pipe 91 to the atmosphere. When, however, pressure is reduced in the generating-chamber by the drawing down of the water or otherwise, the water rises within the space 84, which forms the mouth of the gas-pipe 83, and completely seals the gasometer, preventing any flow of gas from the gasometer toward the generating-chamber. The relatively greater water area within the space 93 permits the water to rise to a considerable height in the gas-pipe 83 without depleting the seal of the gasometer. All the pipes 83 89 90 drain into the water seal at the base of the gasometer. An overflow in the form of a U-tube 96 allows the excess of water to flow out from the seal or trap.

In Figs. 12, 13, and 14 a modified form of the mechanism for controlling the auxiliary or safety valve 70 is shown. The float 173 instead of being within the generator is exposed and mounted in an air-pipe 176. A link 174, connected to the float 173, operates a lever-arm 175, which turns a sector 177. Sector 177 normally supports an arm 178, secured to and turning with the shaft 179 of the valve 70. The shaft 179 is suitably packed

where it extends through the wall of the hopper, as shown in Fig. 14. When the lever-arm 178 rests on the sector 177, the valve 70 is held in its inoperative position; but when the water-level in the pipe 176 falls, carrying down the float 173, the sector 177 turns, so as to allow the arm 178 to fall, letting the valve 70 swing beneath the carbid-feed opening, and thus preventing any further feeding of carbid until the parts are restored to their normal position.

The gas drier and trap beneath the gasometer form the subject of a divisional application filed October 10, 1901, Serial No. 77,349, and the air-trap 75 76 77 is also a separate invention.

I do not herein claim the hermetically-sealable cover and the operative devices disclosed in connection therewith, for I understand that this subject-matter is not properly claimable in this application together with the remaining claims therein; but I reserve the right to make a separate application at a future date for said invention.

My copending application, Serial No. 142,613, filed February 2, 1903, is in part a division of this application.

I do not herein claim in an acetylene-generating apparatus the combination with a gasometer of a plurality of carbid-feed generators connected thereto and gas-actuated means for automatically operating said generators successively to generate gas, but I reserve the right to make a separate application for said invention at a later date.

It will be seen that in accordance with this invention there are carbid-charging and flushing-out devices and operative connections so constructed that each of said devices controls some of the operations of the other in such manner that in certain positions of one device when said device is locked the other may be operated independently thereof without unlocking said first-named device. The operative connections of the carbid-charging and flushing-out devices, at least in part, reciprocally control each other in such manner that in certain positions of one device when said device is locked the other may be operated independently thereof without unlocking said first-named device. According to my construction the feed-actuating mechanism is movable independently of the carbid-charging device, and there are means controlled by the said charging device for preventing the engagement of the operative connections of the feed-actuating mechanism when the parts of the apparatus are in a position to permit the charging device to be opened and means for preventing the opening of the charging device without moving the connections of the feed-actuating mechanism out of operative engagement.

Having now set forth the improvements which constitute the present invention with sufficient detail to enable those skilled in the art to fully understand the same and without going further into details I claim as new, and desire to secure by these Letters Patent of the United States, the following several characteristic features:

1. In a carbid-feed generator, the combination with carbid-feeding mechanism for dropping the carbid into the water, of carbid-charging and flushing-out devices, and operative connections so constructed that each of said devices controls some of the operations of the other in such manner that in certain positions of one device when said device is locked, the other may be operated independently thereof, without unlocking said first-named device.

2. In a carbid-feed generator, the combination with carbid-feeding mechanism for dropping the carbid into the water, of carbid-charging and flushing-out devices, and operative connections so constructed that said devices, at least in part, reciprocally control each other in such manner that in certain positions of one device when said device is locked, the other may be operated independently thereof, without unlocking said first-named device.

3. In a carbid-feed generator, the combination with carbid-feeding mechanism for dropping the carbid into the water, of carbid-charging and flushing-out devices, and interlocking connections between the same, whereby movement of each controls some of the movements of the other in such manner that in certain positions of one device when said device is locked, the other may be operated independently thereof, without unlocking said first-named device, for substantially the purposes set forth.

4. In a carbid-feed generator, the combination of carbid-charging and flushing-out devices, and interlocking connections between the same for locking the carbid-charging device closed when the flush-out is closed and for locking the flush-out open when the carbid-charging device is opened, substantially for the purposes set forth.

5. In a carbid-feed generator, the combination of carbid-charging and flushing-out devices, and interlocking connections between the same, whereby the charging device cannot be opened except when the flush-out is open, and the flush-out cannot be closed except when the charging device is closed, substantially for the purposes set forth.

6. In a carbid-feed generator, the combination of carbid-charging and flushing-out devices, and interlocking connections between the same for preventing charging when the flush-out is closed, substantially for the purposes set forth.

7. In a generator, the combination of charging and flushing-out devices, and inter-

locking connections between the same for locking the flush-out open at all positions of the charging device between its open and closed positions, substantially for the purposes set forth.

8. In a generator, the combination of a hopper, a feeding mechanism therefor, provided with a pivoted operating-lever extending substantially horizontally within the hopper, and a casing within the hopper and extending over said pivoted lever thereby preventing the contents of the hopper from interfering with said mechanism, substantially for the purposes set forth.

9. In a generator, the combination of a hopper, a feeding mechanism extending within the hopper and having a rocking lever, and means for preventing the contents of said hopper from interfering with the feeding mechanism, substantially for the purposes set forth.

10. In a feeding mechanism for a generator, the combination of a hopper, a movable valve or stop, a valve-rod connected thereto, a lever connected to the valve-rod, a gas-tight tubular extension external to the hopper and extending outwardly from the walls of the hopper continuous therewith and arranged outside of said hopper and water-sealed at its outward end, said tubular extension communicating freely with the hopper, an actuating-rod connected to the said lever and extending through said gas-tight extension, and gas-actuated means arranged externally to the hopper and gas-tight and water-sealed extension, and connected to operate the rod extending through the water-sealed tube, for operating the said actuating connections to control the valve or stop.

11. The combination with the feeding mechanism of a generator, of a passage-way through which the material is fed, an auxiliary valve or stop therefor normally inactive, and means for holding said stop and releasing it when the gas pressure or volume exceeds a predetermined amount, substantially for the purposes set forth.

12. The combination with the feeding mechanism of a generator, of a passage-way through which the material is fed, an auxiliary valve or stop therefor normally inactive, and means for holding the said stop and releasing it when the water-level falls in the generator, said means comprising a float and connections between said float and said auxiliary valve or stop, substantially for the purposes set forth.

13. The combination with the hopper, the feeding mechanism, and the passage-way through which the material is fed, of means additional to the feeding mechanism for stopping the feeding of material when the water-level falls, substantially for the purposes set forth.

14. In a generator, the combination with the feeding mechanism, of an auxiliary valve adapted to be released when the gas pressure or volume exceeds a predetermined amount, substantially for the purposes set forth.

15. In a generator, the combination with the feeding mechanism, of feed-actuating mechanism having coöperating members forming a part thereof, a charging device movable independently of said members, and means for locking the coöperating members of the feed-actuating mechanism out of operative relation except when the charging device is shut, and for locking the charging device except when the said members of the feed-actuating mechanism are out of operative relation, for substantially the purposes set forth.

16. In an acetylene-generator, the combination with the feeding mechanism, of a charging device, feed-actuating mechanism movable independently of the charging device, means controlled by the charging device for preventing the engagement of the operative connections of the feed-actuating mechanism when the parts of the apparatus are in a position to permit the charging device to be opened, and means for preventing the opening of the charging device without moving the connections of the feed-actuating mechanism out of operative engagement.

17. In a generator, the combination with the feeding mechanism, of feed-actuating mechanism having coöperating connections forming a part thereof, a charging device movable independently of said connections, and means for preventing the opening of the charging device until the said coöperating connections of the feed-actuating mechanism are out of operative relation, for substantially the purposes set forth.

18. In a generator, the combination with the feeding mechanism, of feed-actuating mechanism having coöperating connections forming a part thereof, a charging device movable independently of said connections, and means for preventing the movement of the coöperating connections into operative relation as long as the charging device is in a position to permit charging, for substantially the purposes set forth.

19. In a generator, the combination with the feeding mechanism, of feed-actuating mechanism having coöperating connections forming a part thereof, a charging device movable independently of said connections, provision for permitting the opening and closing of the charging device as long as the coöperating connections of the feed-actuating mechanism are out of operative relation, and provision for preventing the charging of carbid except when said connections are out of operative relation, for substantially the purposes set forth.

20. In a generator, the combination with the feeding mechanism, of feed-actuating

mechanism having coöperating members forming a part thereof, a charging device having a member coöperating with said first-named members, with provision for locking the first-named coöperating members of the feed-actuating mechanism out of operative relation except when the charging device is shut, and for locking the charging device except when the said members of the feed-actuating mechanism are out of operative relation, for substantially the purposes set forth.

21. In an acetylene-generator, the combination with the feeding mechanism, of a charging device, means for causing the lowering of the water-level when the charging device is opened, and means controlled by the water-level for preventing the feeding of carbid, whereby when the charging device is opened, feeding of carbid is prevented.

22. In an acetylene-generator, the combination with the feeding mechanism, of a charging device, means for varying the water-level when the charging device is opened, and means operated by the water-level for controlling the feeding of carbid, whereby when the charging device is opened, the feeding of carbid is prevented.

23. In a carbid-feeding mechanism for an acetylene-generator, the combination with a hopper, of a feed-valve and a protective casing over said valve movable therewith, the said casing being adapted to agitate the carbid around the valve on rising and thereby start the flow of carbid from the hopper.

24. In a carbid-feeding mechanism for an acetylene-generator, the combination with a hopper, of a feed-valve and a protective casing over said valve movable therewith, the said casing being provided with a flaring lower edge for agitating the carbid around the valve on rising and thereby starting the flow of carbid from the hopper.

25. In an acetylene-gas generator, the combination of a carbid-hopper and removable cover, a generating-chamber, means for feeding the carbid to the generating-chamber, operative means between the carbid-feeding means and the gasometer for automatically controlling the feeding of carbid, means for disconnecting said automatic controlling means from the feeding means, and means between the cover of the hopper and said automatic controlling means for maintaining said disconnection as long as the cover is open.

26. A gas-generator comprising a generating-chamber, a movable gas-holder, means for introducing water into the generating-chamber, a valve for controlling the admission of carbid to the said generating-chamber, and a safety means for closing said valve, the said means being operable by the water in the generating-chamber.

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

NELSON GOODYEAR.

Witnesses:
E. Van Zandt,
H. G. Morton.