No. 608,541. Patented Aug. 2, 1898.

H. J. BELL.

ACETYLENE GAS GENERATOR.

(Application filed Mar. 5, 1898.)

(No Model.) 7 Sheets—Sheet 1.

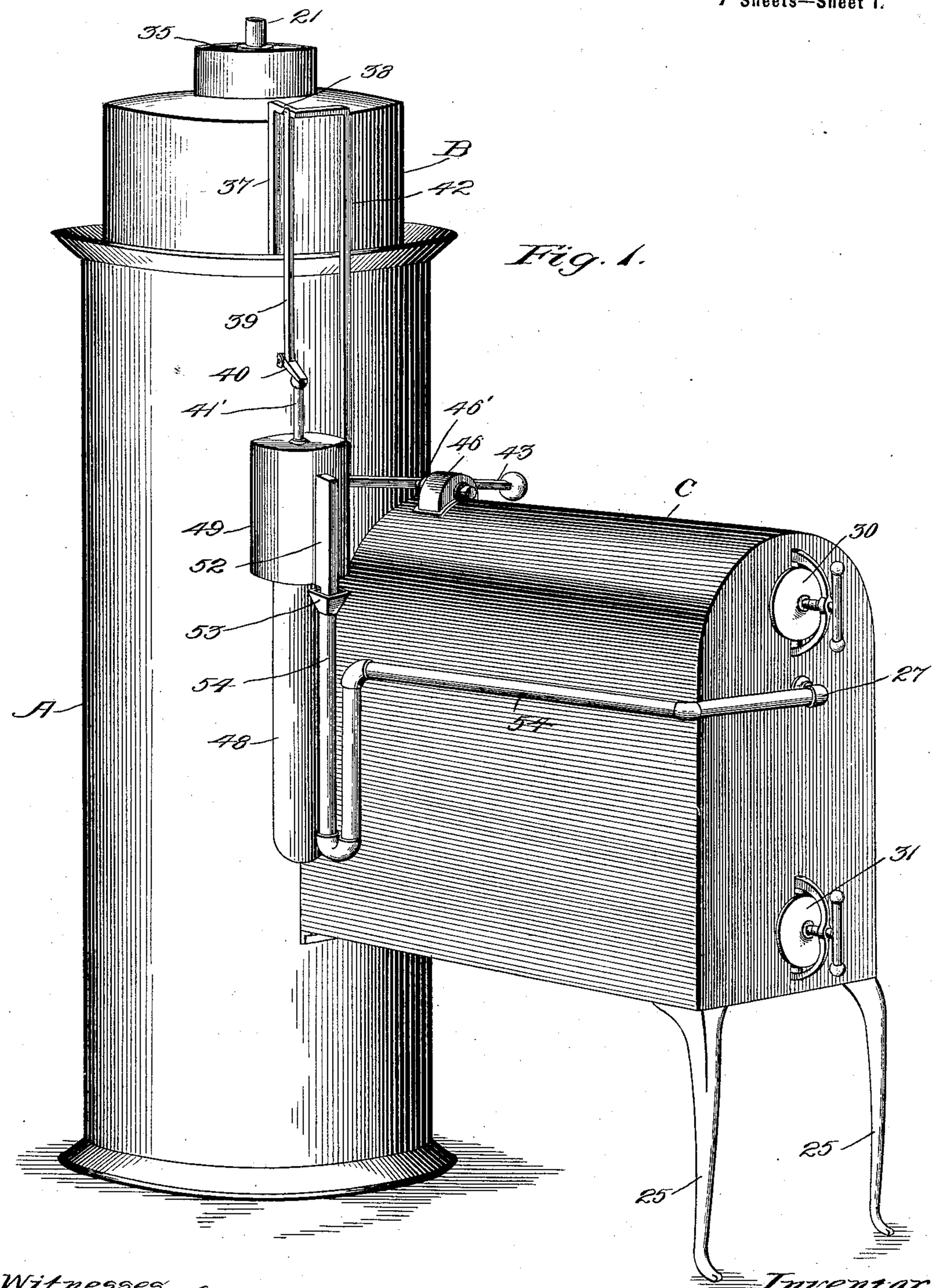

Fig. 1.

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(No Model.) 7 Sheets—Sheet 2.

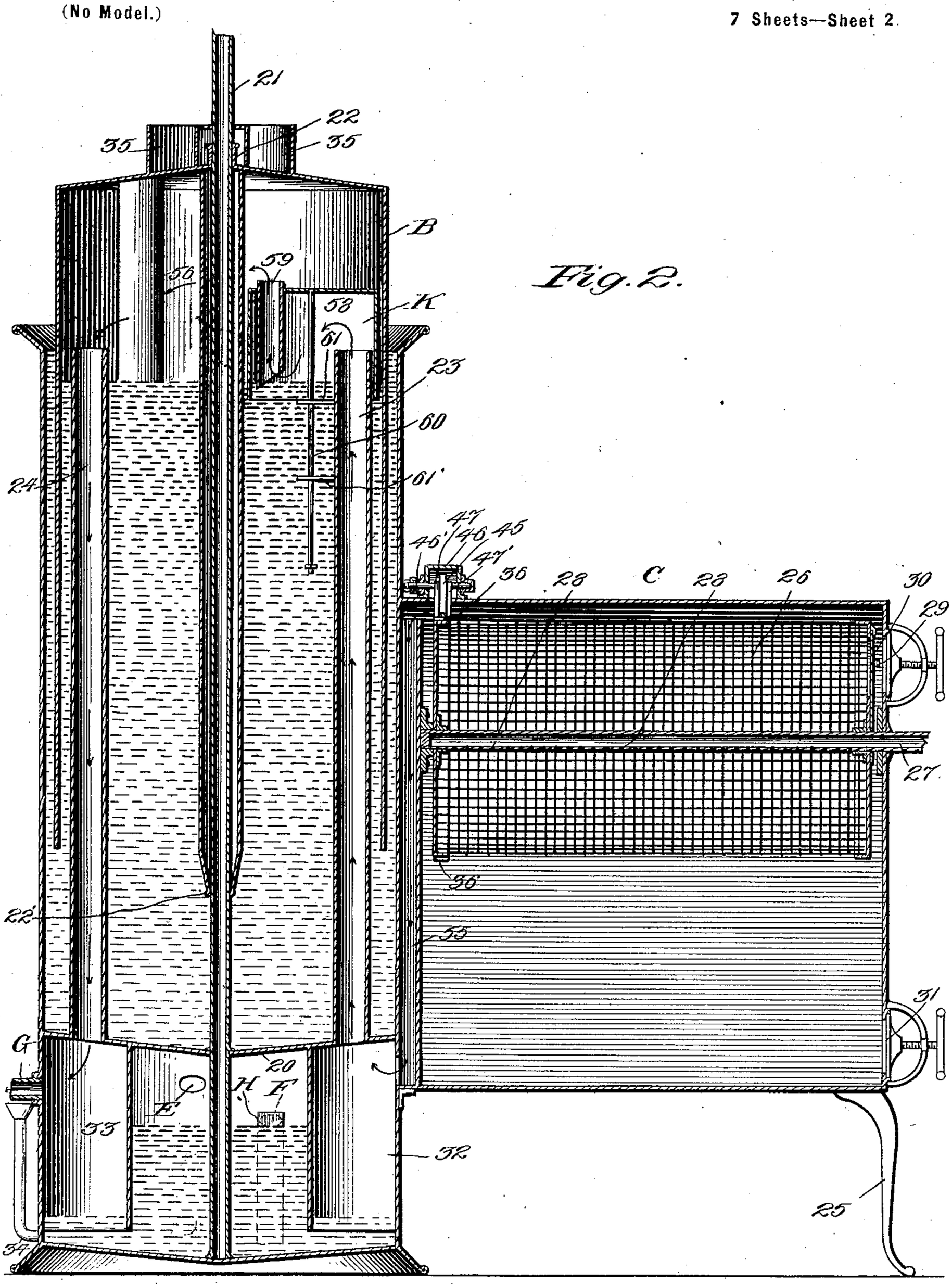

Fig. 2.

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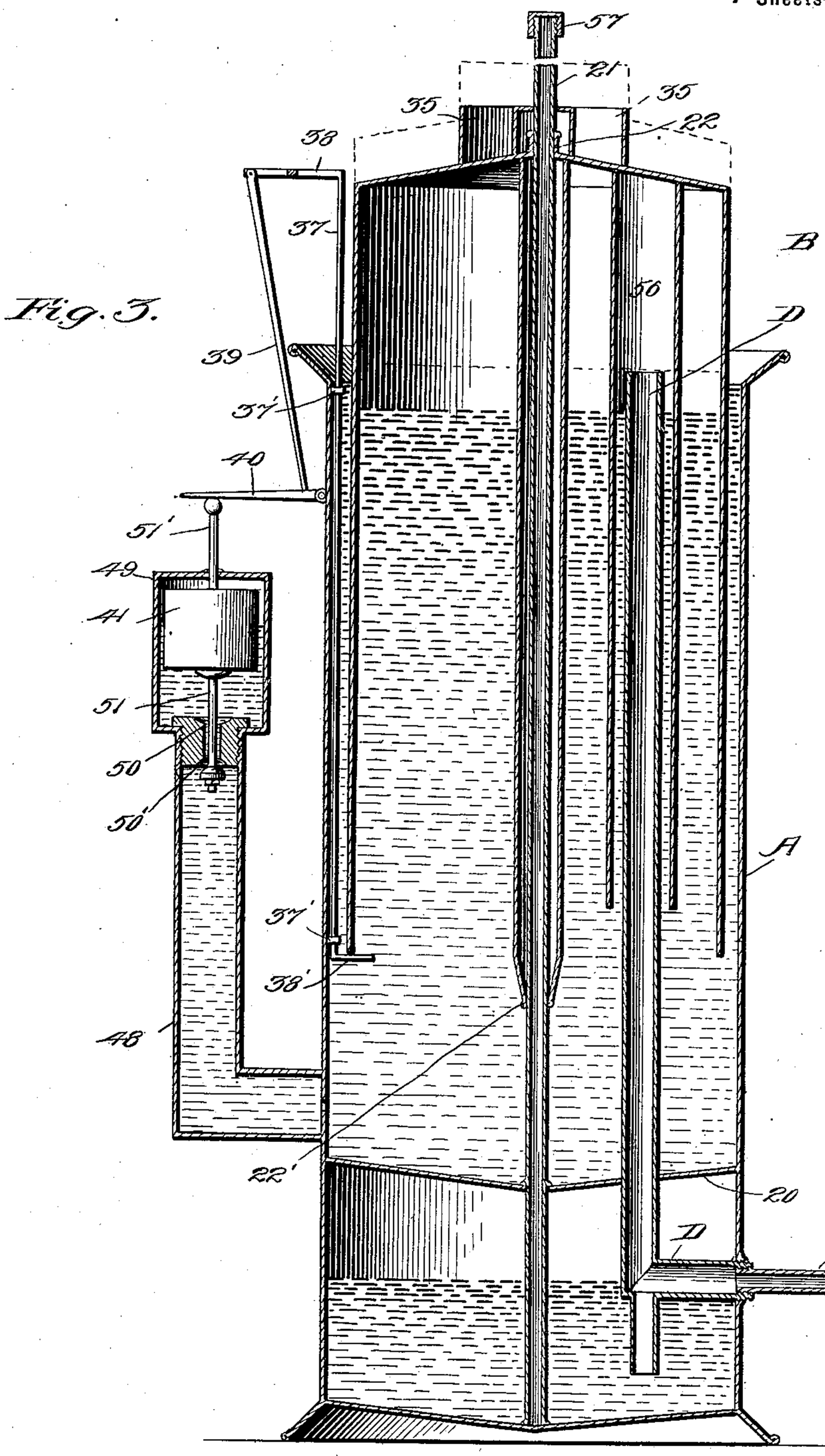
Fig. 3.



Witnesses
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Fig. 4.

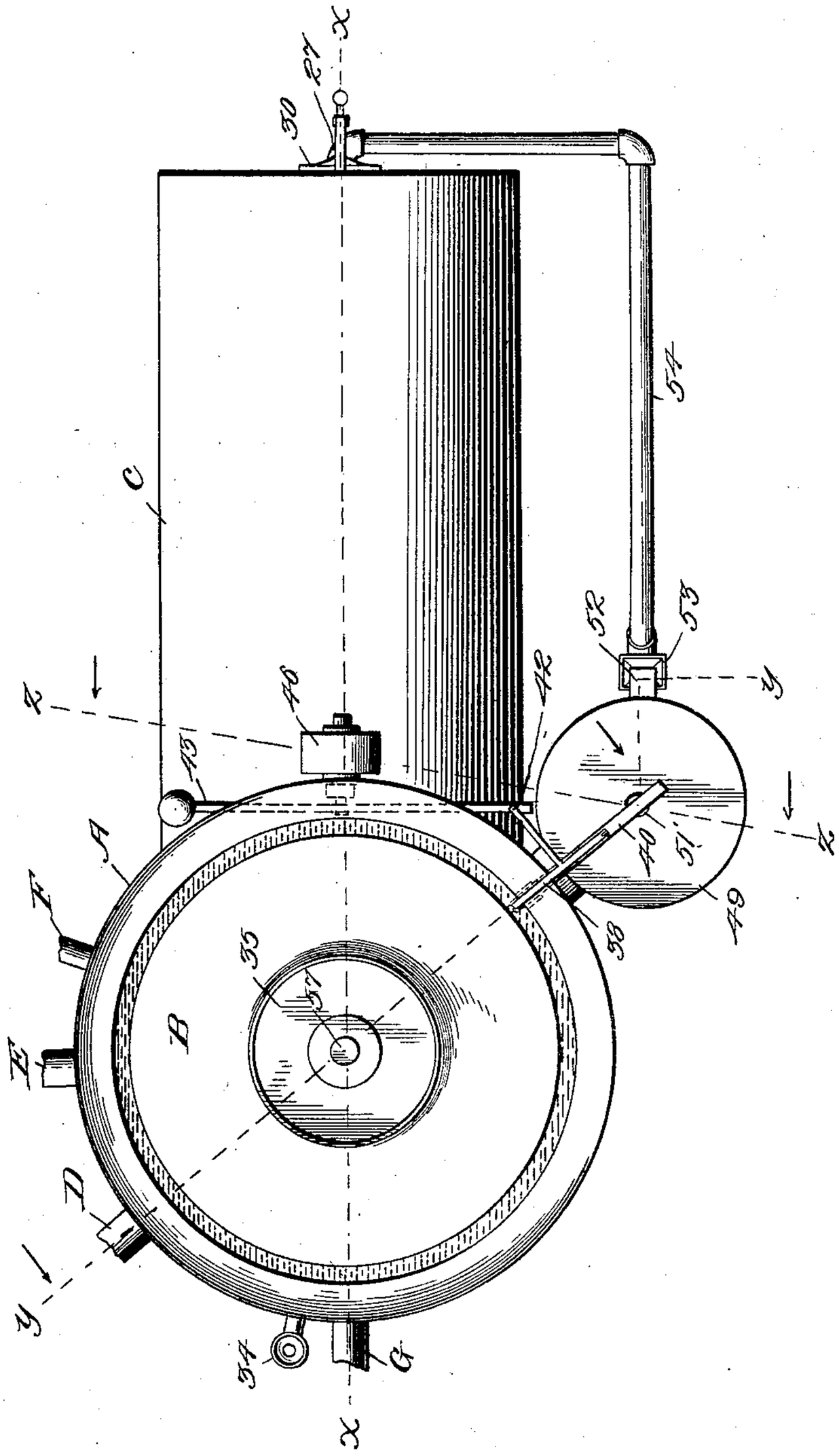

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Fig. 5.

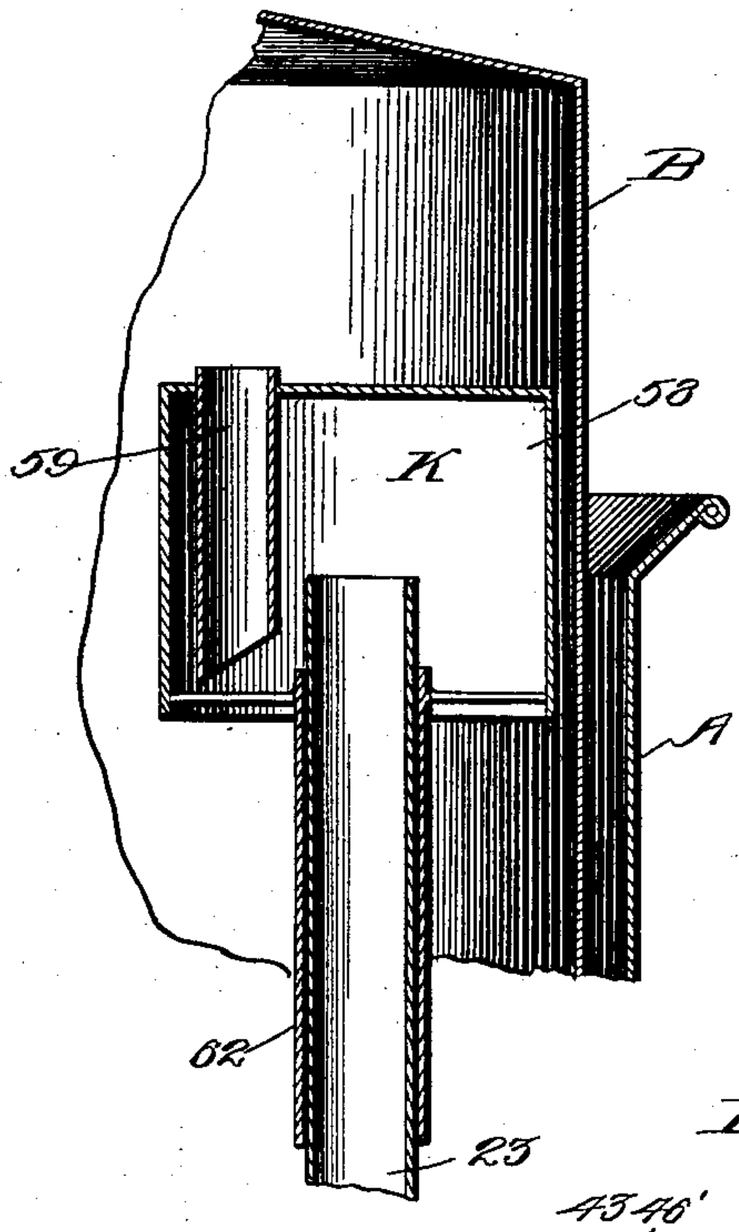

Fig. 6.

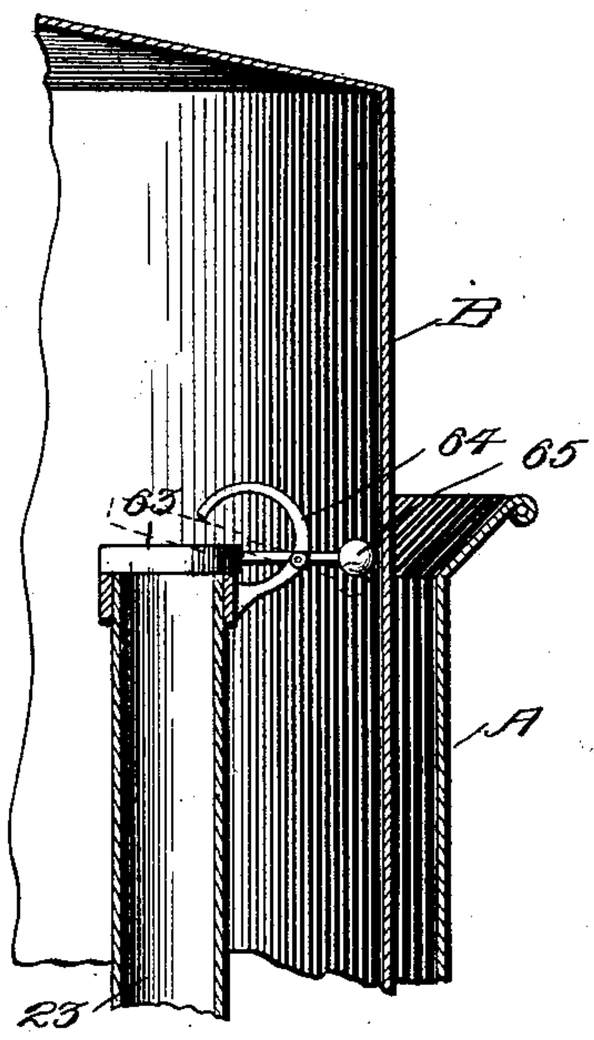

Fig. 7.

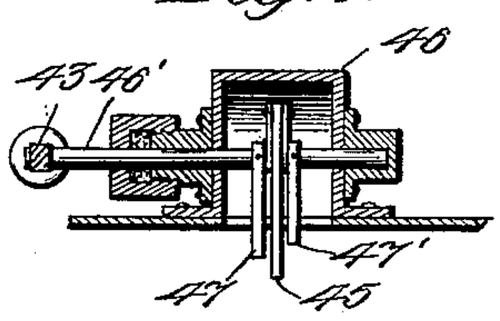

Fig. 8.

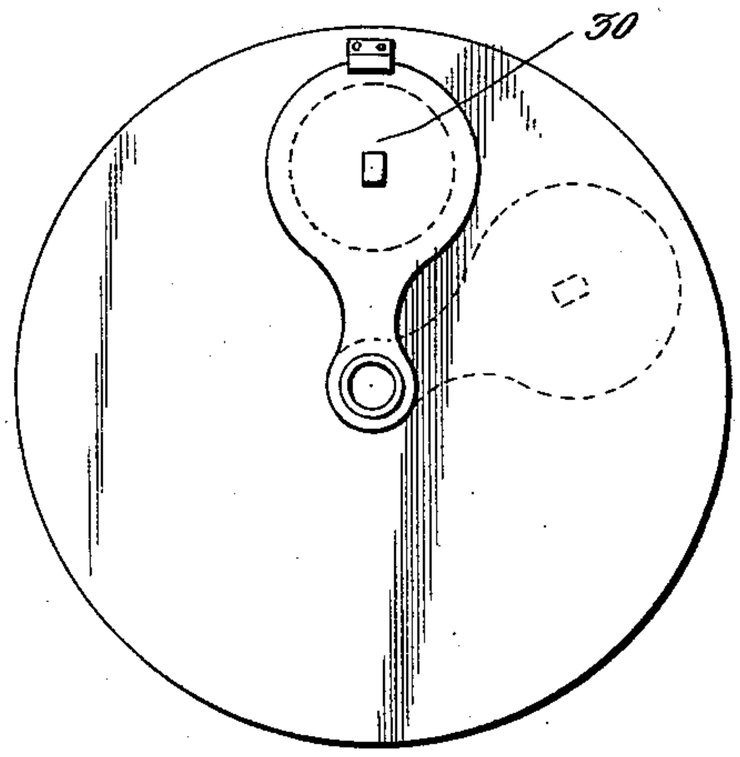

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Fig. 9.

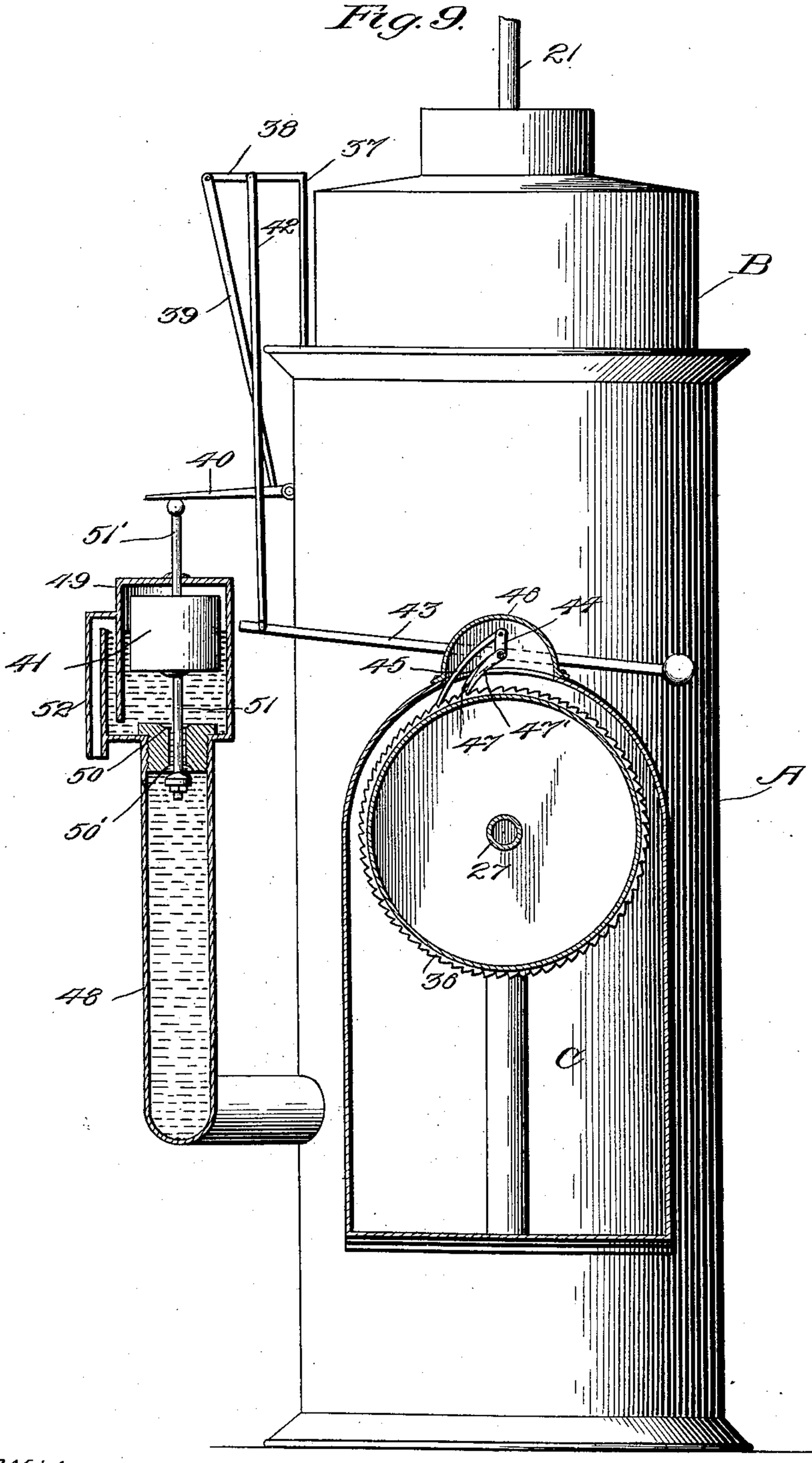

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Fig. 10.

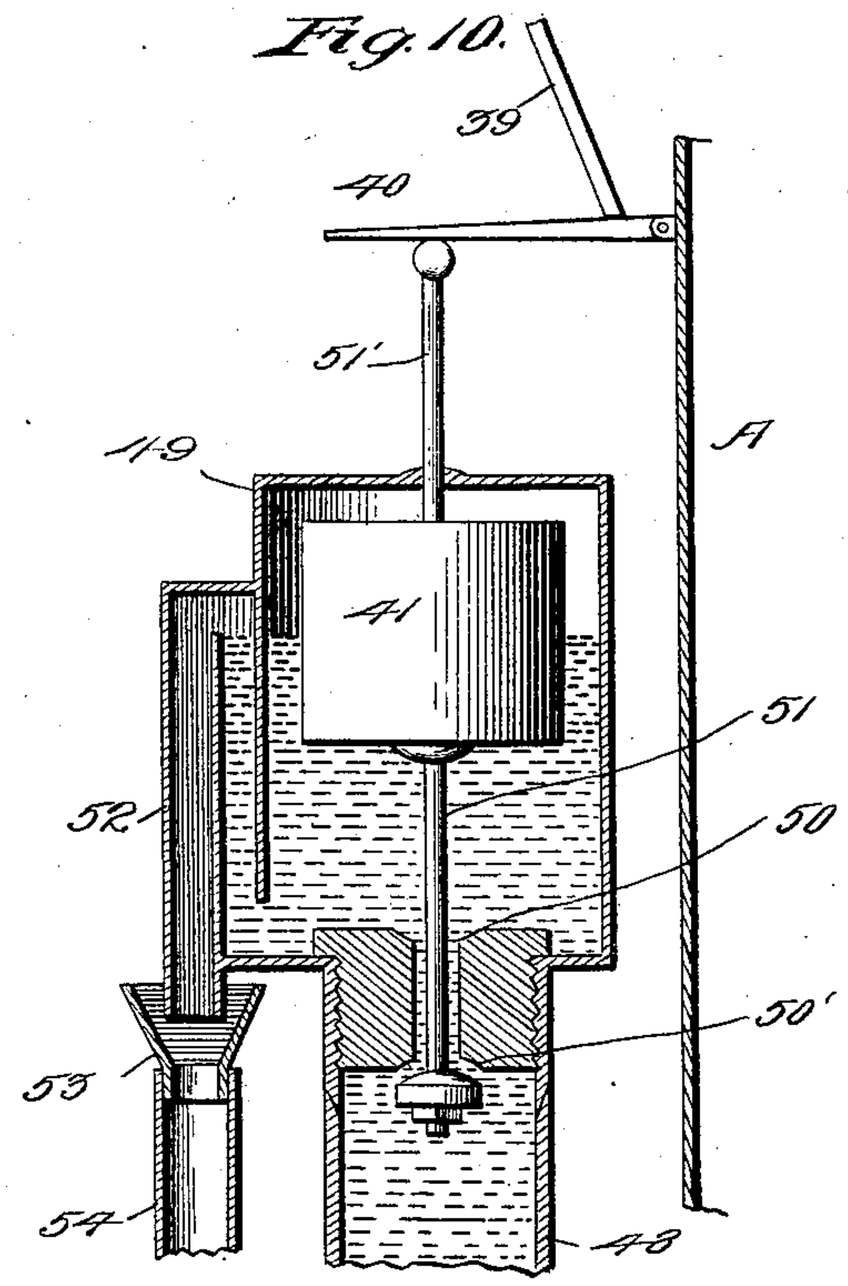
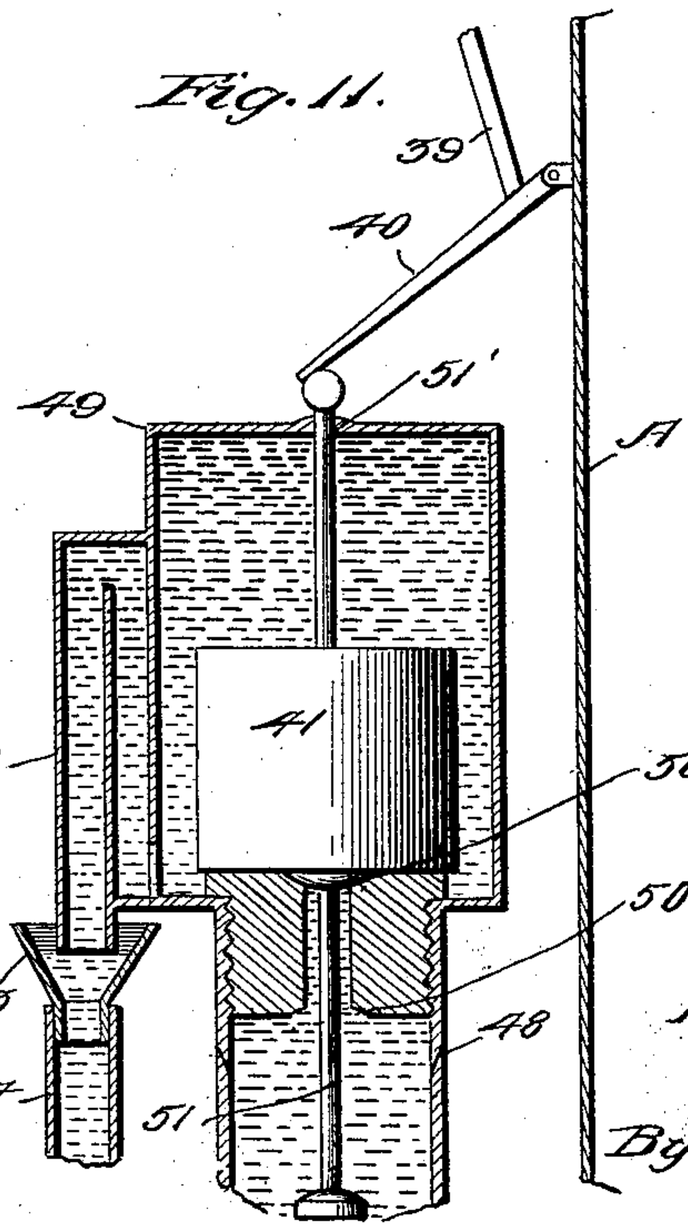


Fig. 11.



Witnesses
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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 608,541, dated August 2, 1898.

Application filed March 5, 1898. Serial No. 672,732. (No model.)

To all whom it may concern:

Be it known that I, HAROLD J. BELL, a citizen of the United States, formerly residing at Niagara Falls, county of Welland, Province of Ontario, Canada, now residing at the city of Rochester, county of Monroe, State of New York, have invented certain new and useful Improvements in Apparatus for the Production and Storage of Acetylene Gas, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of my invention is to provide a machine for generating and storing acetylene gas which will be simple in construction and effective in operation; and it consists more especially in an improvement in the means of feeding measured quantities of water to the center of the carbid and in such other details of construction as are hereinafter more particularly described and claimed.

In the drawings, Figure 1 is a perspective view of my device. Fig. 2 is a vertical section through the line *x x* of Fig. 4. Fig. 3 is a vertical section through the line *y y* of Fig. 4. Fig. 4 is a plan view. Fig. 5 is a modification of the guide in the automatic seating device. Fig. 6 is a detail of a modification of the seating device. Fig. 7 is a detail of the pawl and stops shown in connection with ratchet in Fig. 9. Fig. 8 is a detail of the end of the carbid-holder and means of closing the opening therein through which carbid is introduced. Fig. 9 is a view, partly in section, through the line *z z* of Fig. 4. Figs. 10 and 11 are details of the water-measuring device.

Like characters of reference indicate the same parts throughout the several views.

The tank A is constructed in two compartments divided by the septum 20, which forms the bottom of the water-tank proper, the lower portion H being a condensation-chamber. The top of the holder B is open at 35 for the reception of weights, which may be used to increase gas-pressure. The pipes 23 and 24, rising from the septum 20, are respectively provided for the inflow of the gas on its way from the generator C to the gas-holder B and for the outflow of gas from the gas-holder B to the service-pipe G, the gas following the direction indicated by the arrows. The pipe 23 terminates at the bottom thereof in the inflow gas-chamber 32. The pipe 24 terminates at the bottom thereof in the outflow gas-chamber 33. Both these chambers are open at the bottoms thereof for the admission of water supplied to the condensation-chamber H through the funnel 34 (shown in Figs. 2 and 4) for the purpose of sealing, as hereinafter described.

The gas-holder B, open at its bottom, is vertically movable upon the holder-guide 21, which rises from the base of the tank and extends through the condensation-chamber and tank to a sufficient height above the tank to receive nearly the whole vertical extent of the gas-holder and passes through a depending tube attached to the holder, which opening is contracted at 22 near the top of the holder and at 22′ near the bottom thereof to form close-fitting collars around the holder-guide 21.

The generator C is attached to the side of the tank A, being supported at its outer end by the feet 25. Within the generator C is the carbid-holder 26, constructed in its circumferential wall of any suitable material having openings or meshes through which the hydrated lime may escape from the carbid-holder 26 and be deposited by gravity in the generator C below the carbid-holder 26.

The end walls of the carbid-holder 26 may be constructed of any suitable material. The carbid-holder 26 is held to turn upon the water-supply pipe 27, extending longitudinally through the carbid-holder 26 in the center thereof. The water-supply pipe 27 is provided with openings 28 on its under side, whereby water is admitted to the center of the mass of carbid in the carbid-holder with better results than if otherwise admitted. The carbid is supplied to the carbid-holder 26 through the opening 29 in the end wall of the generator and a corresponding opening 30 in the end wall of the carbid-holder 26, both of which openings may be closed by any well-known mechanical means. The generator C may be relieved of its hydrated lime through the opening 31 in the end of the gen-

erator, which may be closed by any well-known mechanical means.

For the purpose of automatically rotating the carbid-holder 26 I provide the ratchet 36, (shown in Figs. 2 and 9,) attached to the carbid-holder 26 and integral therewith. The ratchet is actuated in a step-by-step movement from the holder B through the rod 37, having at its upper extremity, above the tank A, an outwardly-turned end 38 and at its lower extremity, within the tank, an inwardly-turned end 38′, operating in guides 37′, attached to the inner side of the tank A, the link 42 connecting the outwardly-turned end of the rod 37 to the unweighted end of the lever 43, the weighted lever 43 attached between its extremities to a trunnion 46′, (shown best in Fig. 7,) the trunnion 46′ having its bearing within the receptacle 46, secured upon the top of the generator C, and pawl 45 pivoted to the free end of the stud 44, which is attached to the lever-trunnion 46′ within the receptacle 46. To prevent the ratchet from back movement, I provide the stops 47 47′, pivoted upon the trunnion 46′ within the receptacle 46, so located that one or the other of the stops will constantly engage the teeth of the ratchet.

Water is delivered from the tank A to the center of the carbid in the carbid-holder 26 in predetermined charges in the following manner: The stand-pipe 48 opens into the tank A near the septum 20 or at any convenient point for the passage of water, so that it may be raised to a height slightly above the pipe 27 in the center of the carbid-holder, and terminates in a chamber 49 of a predetermined capacity. (Shown best in Figs. 3 and 9.)

Within the chamber 49 is the float-valve 41, having its seats at 50 and 50′. When the float-valve is seated at 50, water is prevented from flowing from the chamber 49 into the stand-pipe 48, which is particularly desirable in case of a rupture of the walls of the gas-holder B or in case of a rupture of the service-pipe G exceeding the capacity of the holder, in which case the holder will drop to its lowest point, carrying the valve 41 to its seat 50, thereby rendering the entire apparatus inoperative until such rupture has been repaired. When seated at 50′, water is prevented from flowing into the chamber 49 from the stand-pipe 48. The valve 41 being guided by the valve-stems 51 and 51′ is actuated vertically in a downward direction within the chamber 49 from the gas-holder B through the rod 37, heretofore described, the link 39 resting by its lower end upon the lever 40, pivoted to the side of the tank A, which in turn rests upon the upper end of the valve-stem 51′. The link 39 is arranged to rest upon lever 40 at any desired point within its extent, so that the speed of the valve-float 41 in its descent may be accelerated when so desired in case but little gas is being consumed. It is plain that the depression of the gas-holder B by the means heretofore described will downwardly actuate the link 39 to depress the outer end of the lever 40, whereby the float-valve 41 will be forced in the direction of its upper seat 50 in chamber 49 and a quantity of water, which may be predetermined, will pass out of chamber 49, through the siphon 52, into the funnel 53, which is integral with the pipe 54, extending to the carbid-holder 26, and terminates in perforated pipe 27, through which perforations the water reaches the carbid, as hereinbefore described. It is plain that atmospheric pressure will be exerted upon the water in the pipe 54 by the opening in funnel 53, thereby maintaining the working pressure within the generator, as determined by the holder B, and preventing the escape of gas from the generator through the water-supply thereto.

Upon gas being generated in the generator C it will pass out from the generator through channel 55 into the inflow-chamber 32 and thence by the course hereinbefore described and indicated by arrows to the service-pipe by way of the gas-holder B.

The condensation-chamber II should be supplied with water through the funnel 34, prepared for that purpose, up to the point where water escapes from the named chamber through the overflow-pipe F, which is prepared for the overflow of any condensation that may take place during the operation of the apparatus.

For the purpose of preventing possible accidents I supply the following safety devices: From the top of the gas-holder B, I depend the tube 56, open at its bottom, into which is inserted the blow-off tube D, which communicates with the atmospheric air through the wall surrounding the condensation-chamber II and is also provided with an opening at its bottom into the condensation-chamber. The walls of the tube 56 do not extend downwardly as far as the outer walls of the gas-holder B, wherefore when the volume of gas in the gas-holder B has raised the gas-holder to its greatest possible height admissible by the stop 57 upon the upper end of the guide-rod 21 the lower end of the tube 56 will be above the water-line in tank A and the gas will pass from the holder B into the escape-pipe D and then find its way to the atmospheric air. In the event that the gas-holder B shall become filled with gas to its utmost capacity and the safety device already supplied is not operative from any cause and moisture in the generator C is sufficient to still add to the volume of gas the water from the condensation-chamber II within the inflow-chamber 32 and outflow-chamber 33 will be forced out of the lower ends of the named chambers and the gas will escape up through the water and through the gas-escape pipe E; but the latter safety device is important only in the event that the safety device previously described should become inoperative by any accident which would prevent the holder from rising

to its limit, in which case the safety device last described will become operative for the escape of the gas through the named gas-escape pipe. It is plain that the first-named safety device will be operative without increased pressure, while with a slightly-increased pressure the last-described safety device will become operative.

To prevent the return of gas to the generator C and its escape when the generator C is opened for any purpose—as to supply carbid to the carbid-holder 26 or to clear the generator C of hydrated lime—I supply the floating check-valve K, consisting of an inverted cup 58, supplied with the way 59, which is an annular tube beveled at its lower end, and a guide-rod 60, operating in guides 61 61′, attached to the inner side of the pipe 23. When the generator is opened, the float check-valve K will become seated on the top of the pipe 23 and the bottom of the way 59 will enter the water in the tank A and effectually cut off the return of the flow of the gas in the direction of the open generator. The lower end of the way 59 is beveled to better afford an opportunity for the gas to take up its course toward the gas-holder B on the closing of the generator.

A modification of the floating check-valve is shown in Fig. 5, in which the guide for the same is a sleeve 62 on the upper end of the tube 23. A further modification of the check-valve is shown in Fig. 6, wherein a cap 63 is pivoted on the support 64, attached to the side of the tube 23 and having the counterweight 65, an extended portion of the support being bent over the cap 63 to form a stop to define the extent of the valve-opening, which modification is reserved to become the subject-matter of a future application for Letters Patent of the United States.

Having described my invention, I claim—

1. In a device for generating and holding acetylene gas, in combination, a gas-holder, a tank, a vertically-movable arm held in guides within the tank, a link pivoted at its upper end upon the outwardly-turned end of the vertically-movable arm and having its lower end in contact with and adjustable upon a lever pivoted to the outside of the wall of the tank, and a lever pivoted at its inner end to the outside of the tank-wall and its outer end resting upon the top of a float-valve stem connected with a floating valve to downwardly actuate the floating valve, as and for the purpose set forth.

2. In a device for generating acetylene gas, in combination, a generator-case, a carbid-holder within the generator, a tank, a gas-holder within the tank, a vertically-movable arm in guides attached to the inner side of the tank-wall, a link connecting the outwardly-bent end of the vertically-movable arm with a weighted lever, a weighted lever connected at its unweighted end to a link and attached between its extremities to a trunnion, a trunnion carrying a stud, a pawl attached to the stud located upon the trunnion, a ratchet integral with a carbid-holder, and a carbid-holder, substantially as and for the purposes set forth.

3. In a device for generating and holding acetylene gas, in combination, a generator-case, a carbid-holder within the generator, a tank, a gas-holder within the tank, a vertically-movable arm in guides attached to the inner side of the tank-wall, a link connecting the outwardly-bent end of the vertically-movable arm with a weighted lever, a weighted lever connected at its movable end to a link and attached between its extremities to a trunnion, a trunnion carrying a stud, a pawl attached to the stud located upon the trunnion, stops pivoted upon the trunnion to engage the teeth of the ratchet, a ratchet integral with a carbid-holder, and a carbid-holder, substantially as and for the purpose set forth.

4. In a device for generating and storing acetylene gas, in combination, a generator-case, a carbid-holder within the generator, a tank, a gas-holder within the tank, a vertically-movable arm in guides attached to the inner side of the tank-wall, a link, a lever pivoted at one end to the outside of the tank-wall, the opposite end resting on a floating-valve stem, a floating valve having stems for guides in a water-chamber, a water-chamber of predetermined capacity connected with the tank, a siphon leading from the tank, and a connecting water-pipe leading to the carbid-holder, as and for the purposes set forth.

5. In a device for generating acetylene gas, in combination, a generator, a tank, a gas-holder within the tank, a pipe leading from the generator to the gas-holder through the tank, and a check-valve consisting of an inverted floating cup on a guide-rod in guides attached to the pipe, and a pipe through the inverted cup having its lower end beveled, as and for the purposes set forth.

6. In a device for generating and holding acetylene gas, in combination, a condensing-chamber below the tank and separated from the tank by a septum, means of charging the condensing-chamber with water, a pipe for the escape of water from the condensing-chamber, inflow and outflow gas-receiving chambers open at the bottoms thereof into the condenser-chamber, and a gas-escape pipe leading from the condenser-chamber to the atmospheric air, as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HAROLD J. BELL.

Witnesses:
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W. J. KOERTH.