

No. 641,567.

Patented Jan. 16, 1900.

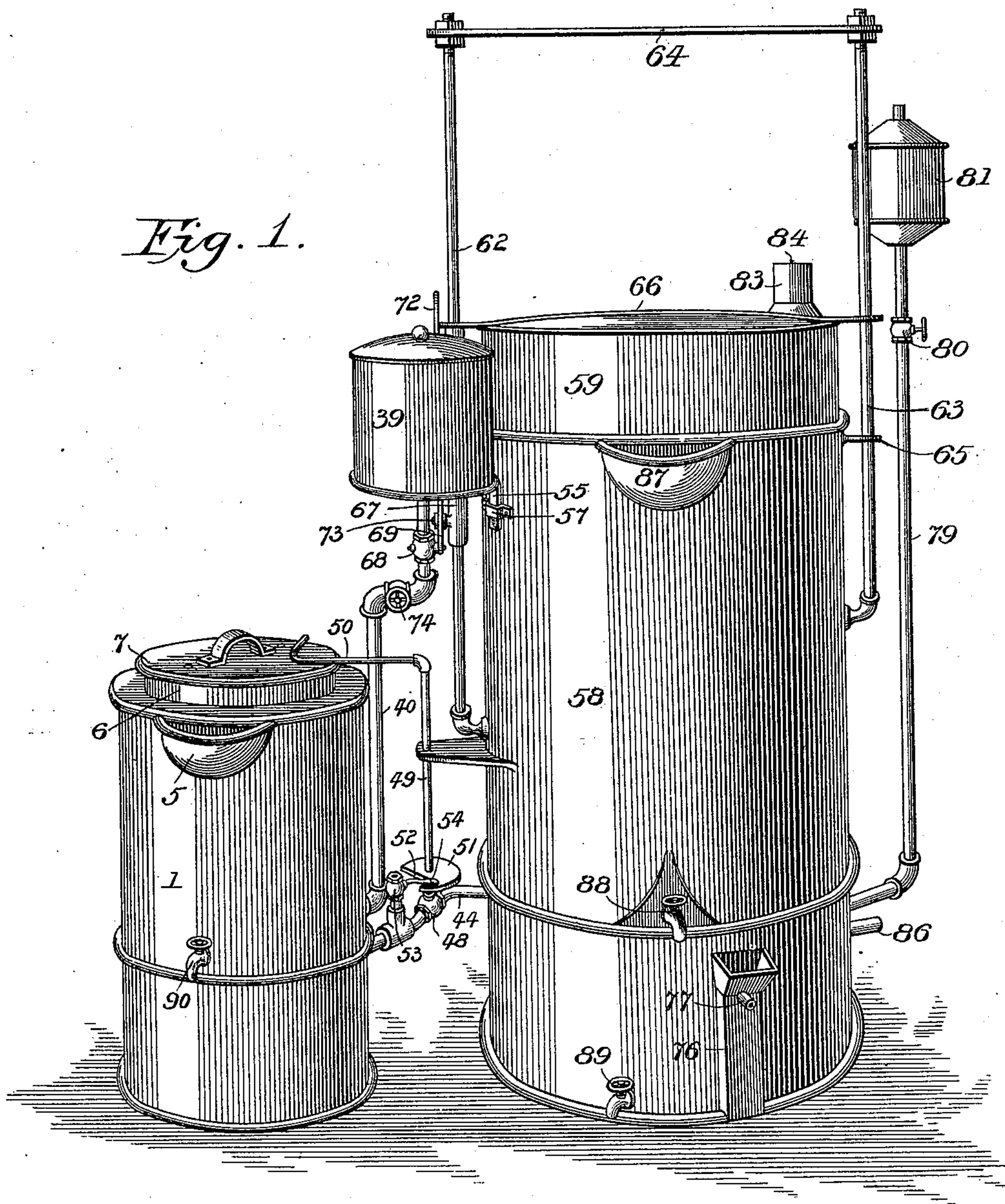
A. WHITE & H. M. ROHWEDER.  
ACETYLENE GAS MACHINE.

(Application filed May 1, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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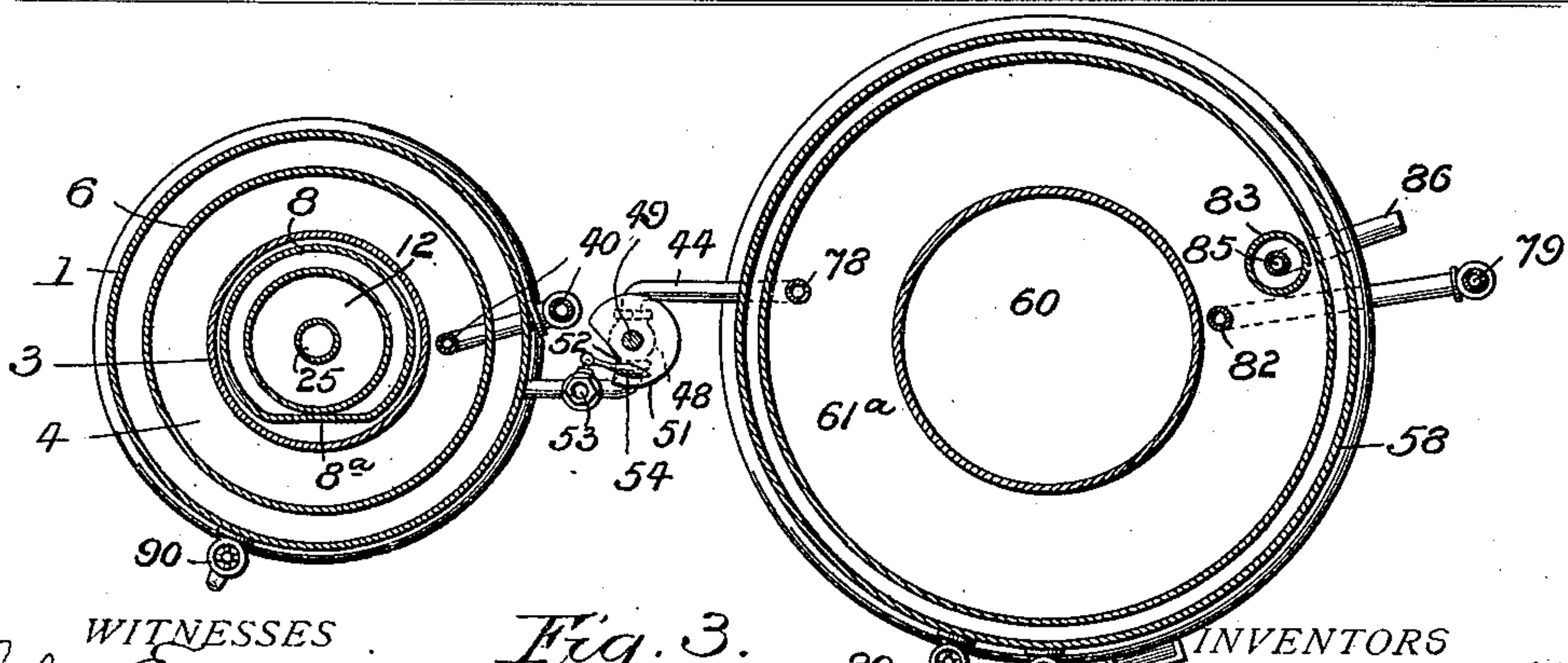
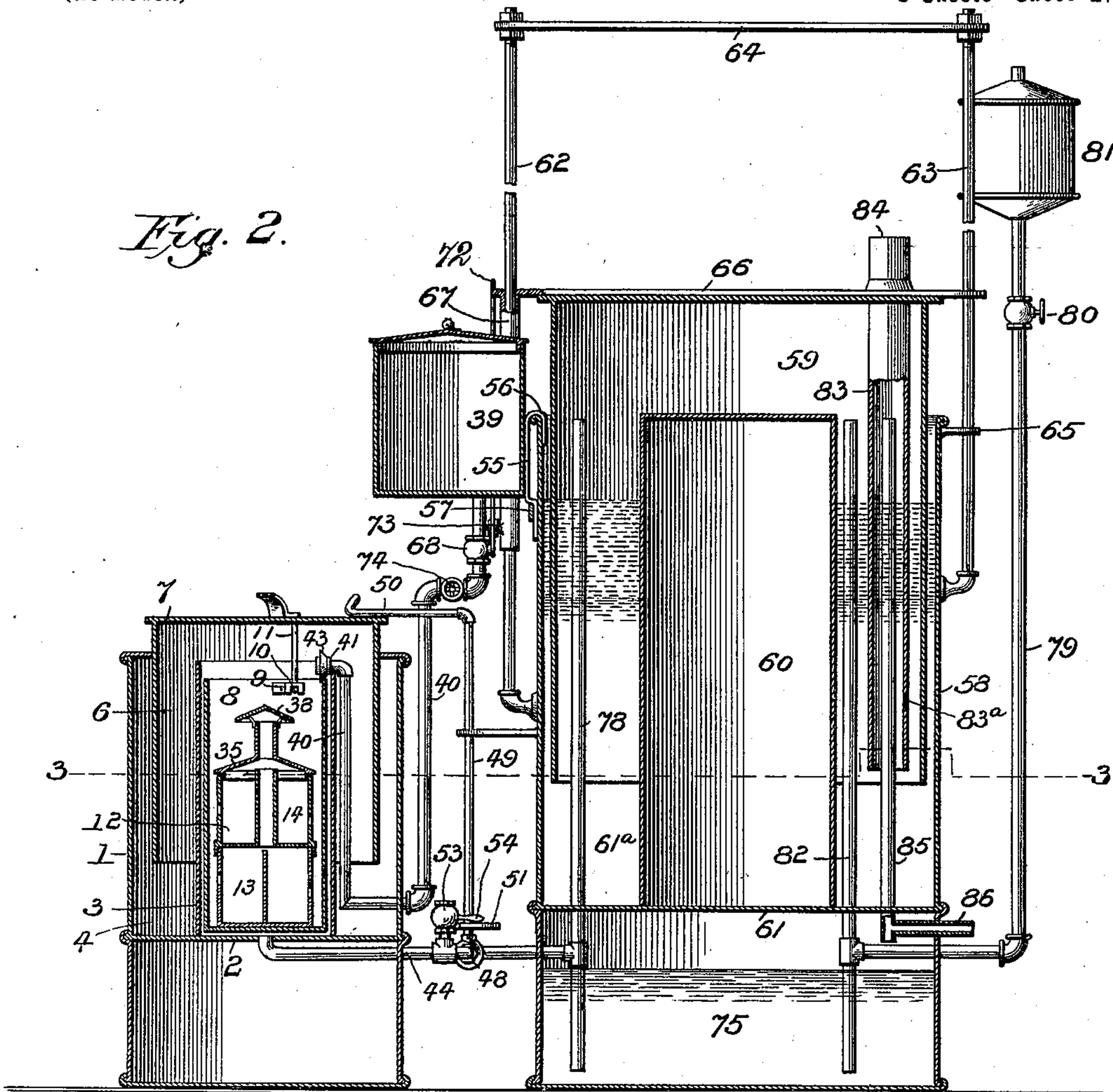
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Fig. 2.



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Fig. 3.

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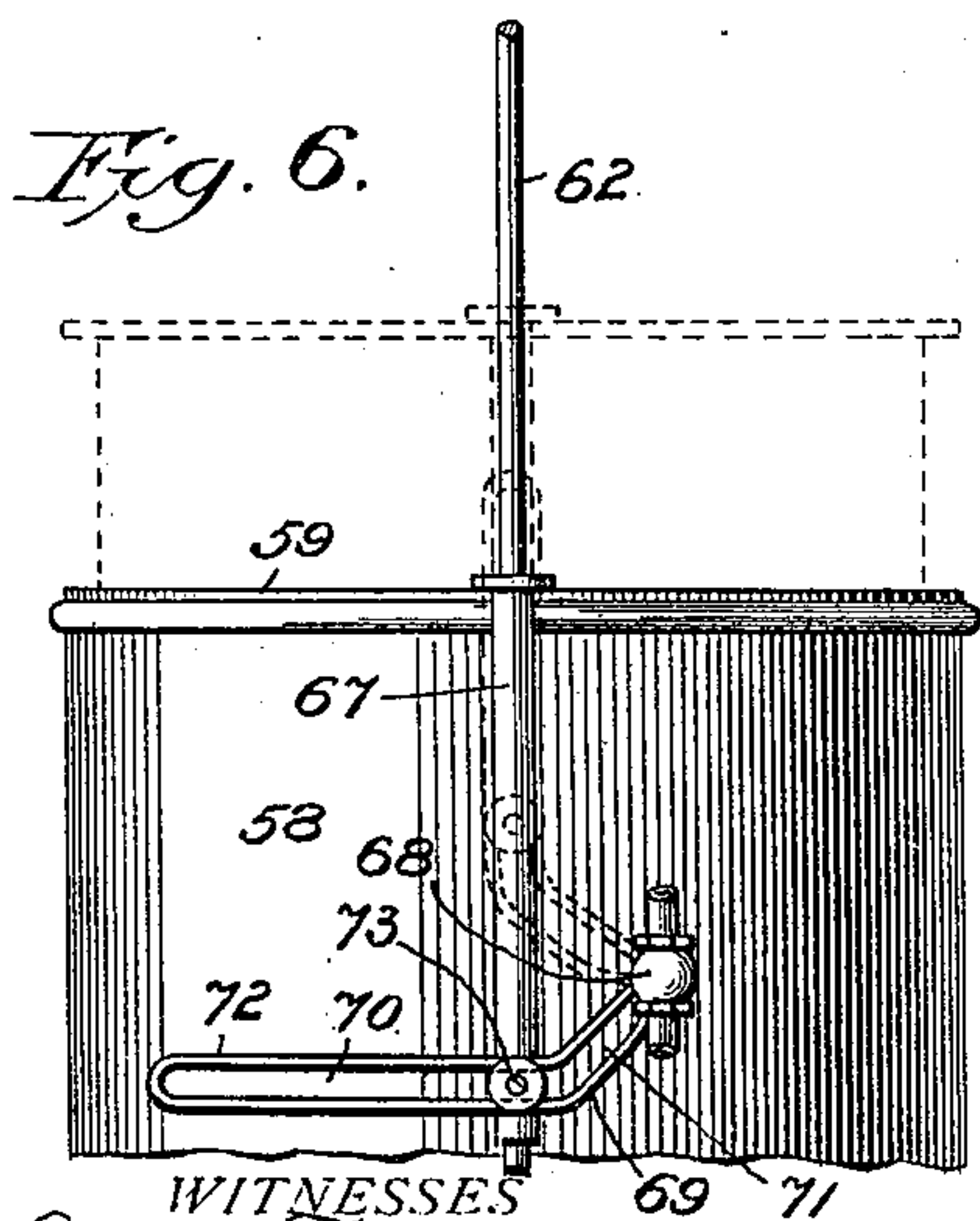
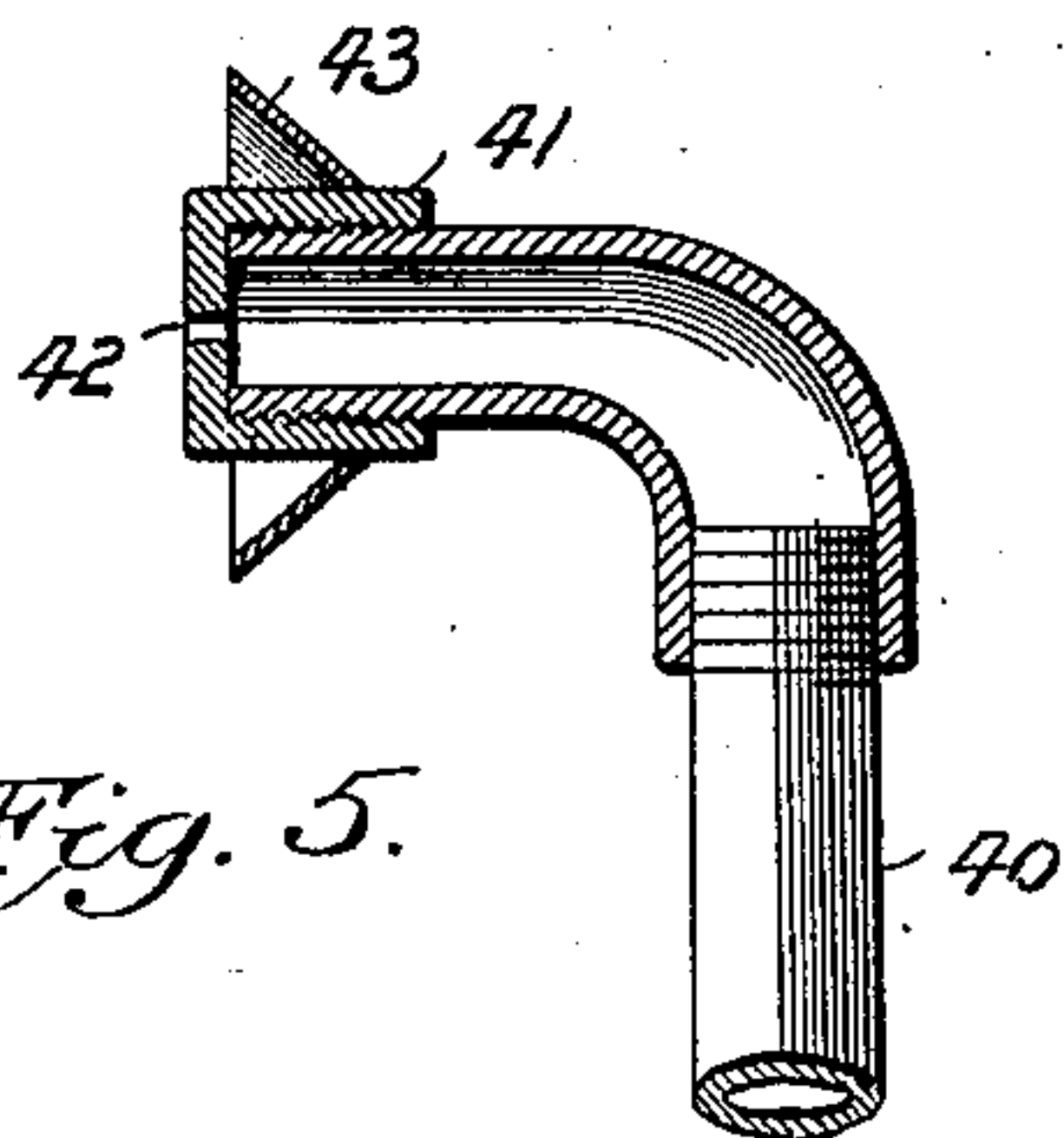
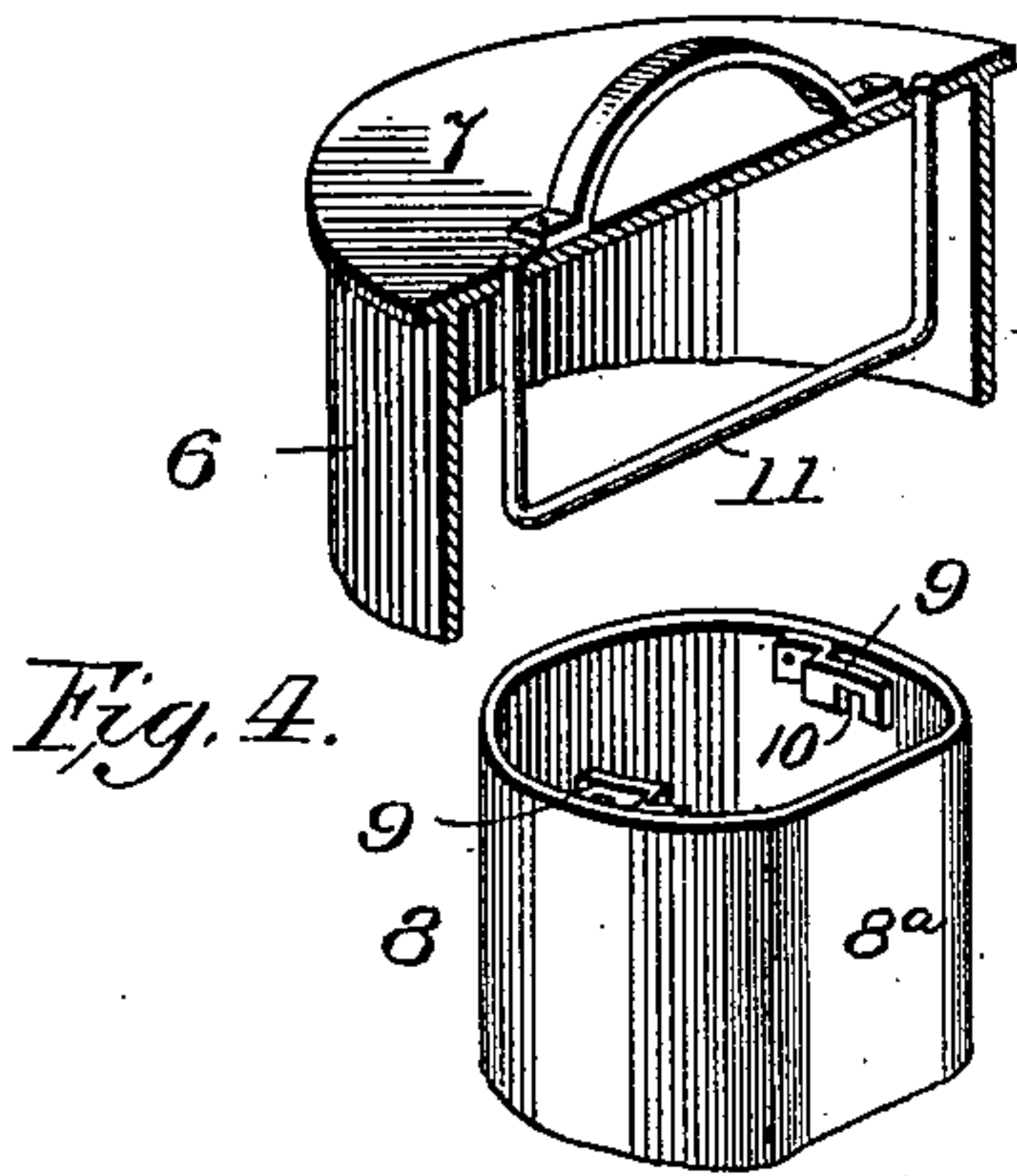
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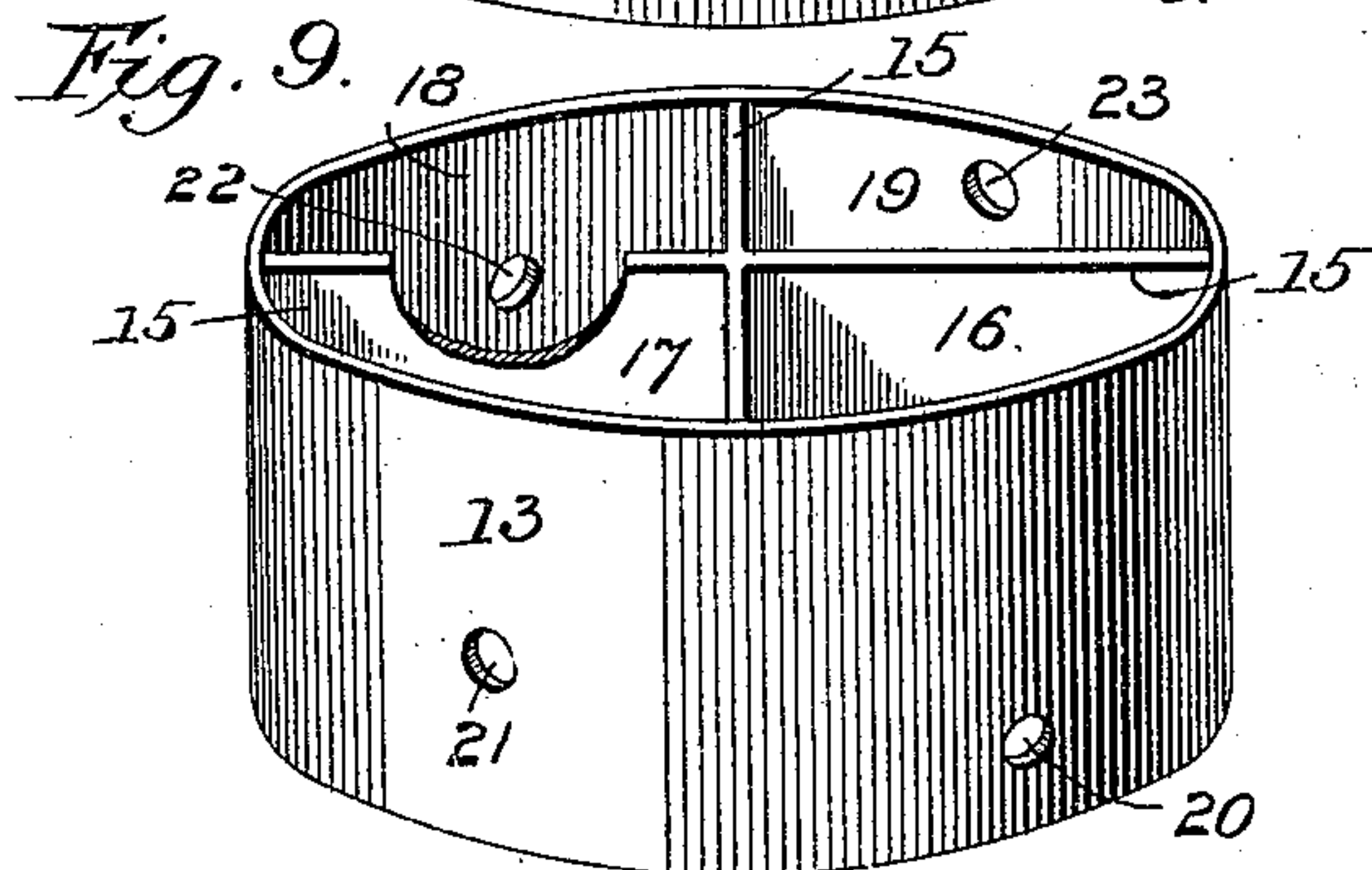
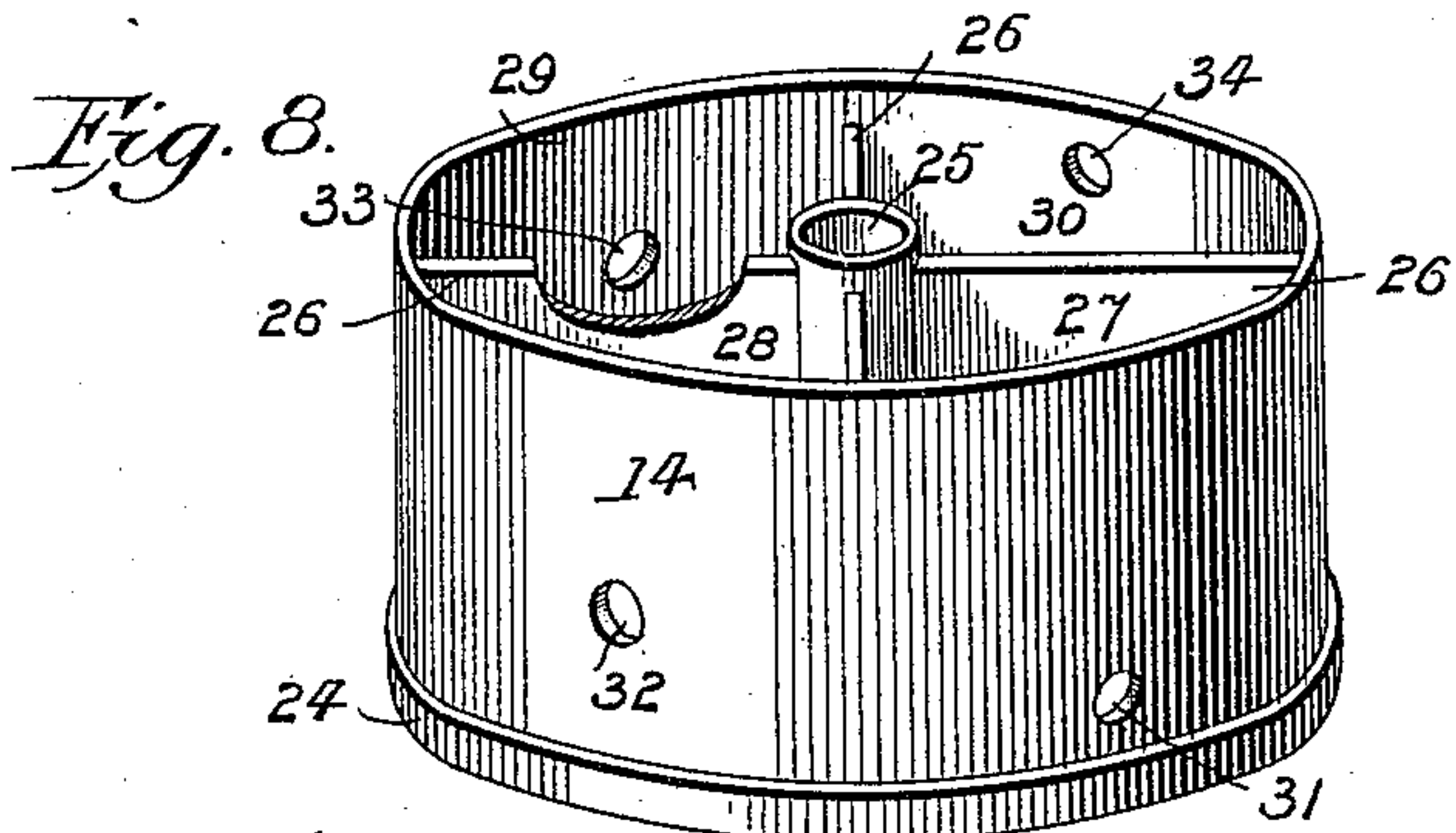
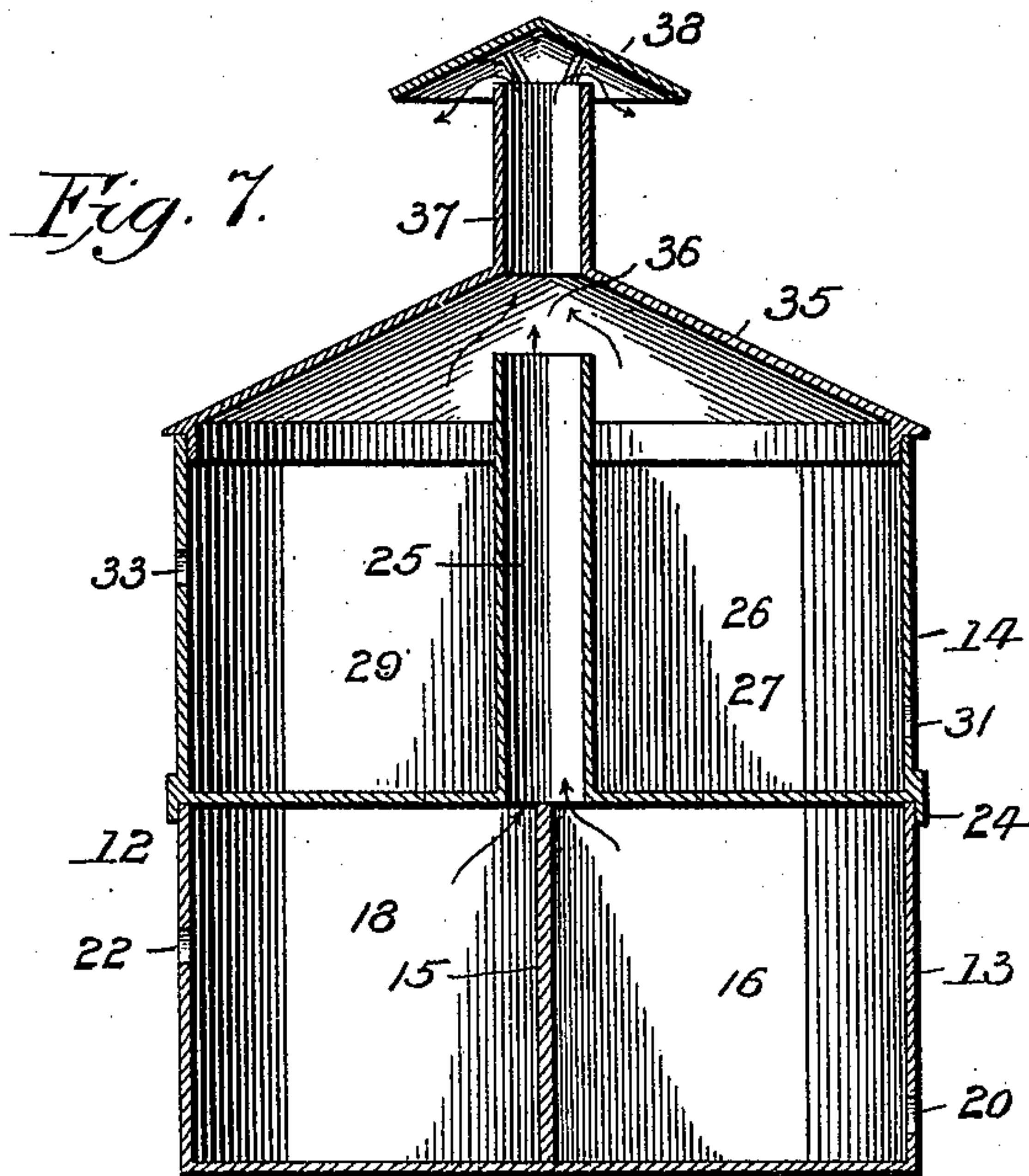
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(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

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ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE EPWORTH GAS LIGHT  
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## ACETYLENE-GAS MACHINE.

SPECIFICATION forming part of Letters Patent No. 641,567, dated January 16, 1900.

Application filed May 1, 1899. Serial No. 715,160. (No model.)

*To all whom it may concern:*

Be it known that we, ALEXANDER WHITE and HENRY M. ROHWEDER, citizens of the United States, residing at Epworth, in the county of Dubuque and State of Iowa, have invented new and useful Improvements in Acetylene-Gas-Generating Apparatus, of which the following is a specification.

Our invention relates to improvements in acetylene-gas-generating apparatus.

It is an object of the invention to provide an improved arrangement of valves controlling, respectively, the connection between the generator and the gas-holder and the admission of air to the generator.

A further object of the invention relates to the manner of supporting the carbid-chamber in the generator.

A further object of the invention relates to an improved construction of the generator proper.

Still further objects of the invention relate to certain details of construction and operation of parts, which will be more clearly explained hereinafter.

We have illustrated our invention in the accompanying drawings, in which—

Figure 1 is a perspective view of the apparatus. Fig. 2 is a sectional elevation thereof. Fig. 3 is a sectional plan view on the line 3 3 of Fig. 2. Fig. 4 is a perspective view, partly in section, showing the carbid-pail and the cover of the generator detached therefrom. Fig. 5 is a detail view of the discharge end of the water-supply pipe to the generator. Fig. 6 is a view in elevation of a portion of the gas-holder and of the mechanism for operating the valve in the water-supply pipe. Fig. 7 is a sectional elevation of the generator proper, and Figs. 8 and 9 are detached perspective views of the same.

Referring to the drawings, the reference-numeral 1 indicates the outer cylindrical casing of the generator. This casing is provided with a false bottom 2, upon which is fixed an inner concentric cylinder 3, affording the generating-chamber, and which is so located as to leave an annular space 4 between it and the outer casing 1. This space is provided

with water through a spout 5 and is designed to receive the depending cylindrical portion 6 of the cover 7 to afford a water seal for the generating-chamber.

The numeral 8 indicates what we term the "carbid-pail," which is removably seated in the generating-chamber 3. Near its upper end and on opposite inner sides this pail is provided with two projecting ears or lugs 9, slotted on their under sides, as indicated at 10. On the under side of the cover 7 is secured a bail 11, from which the carbid-pail 8 is suspended by means of the slotted lugs 9 in the manner of an ordinary bayonet-joint. The object of this construction is to permit the carbid-pail to be removed with the cover or bell 7 when it is desired to recharge the generator with carbid. By slightly turning the bell 7 or the pail 8 the bail 11 may be disengaged from the lugs 9 and the pail 8 removed.

The numeral 12 indicates the generator proper, which is formed in two parts or vessels, (indicated, respectively, by the numerals 13 14.) The lower part 13 comprises a cylindrical chamber open at the top and divided by partitions 15 into a series of carbid-compartments 16, 17, 18, and 19. The casing of the vessel 13 is provided with a series of perforations or apertures 20 21 22 23, each of these openings leading into a compartment 16, 17, 18, or 19, and beginning with the opening 20, being located at progressively different heights on the vessel 13, as shown. The upper vessel 14 rests on the top of the vessel 13, and its bottom is provided with a flange or annulus 24, which surrounds the top part of said lower vessel in the manner of a closure or cover. A central tube 25 in the vessel 14 permits the escape of gas from the lower vessel 13. Radiating from this tube are a series of partitions 26, which divide the vessel 14 into a series of carbid-compartments 27, 28, 29, and 30. A series of openings 31, 32, 33, and 34, located at progressively different heights on the vessel 14, respectively communicate with these compartments, as in the case of vessel 13. The cover 35 of vessel 14 is slanting, as shown, a space 36 for the pas-



sage of gas being left between said cover and the top of tube 25. The cover 35 is provided with a central flue or chimney 37, above which is supported a guard 38.

5 The numeral 39 indicates the water-supply tank, leading from which is a pipe 40, which enters the casing 1 near the false bottom 2 and then extends upward along the side of the generating-chamber 3, which it enters  
10 near the top thereof in a manner to project over the edge of the carbid-pail 8. Said projecting end is screw-threaded, and this screw-threaded end is supplied with a cap 41, having a small discharge-orifice 42. Said cap is  
15 surrounded by an outwardly-flaring flange 43, constituting what we term a "drip-guard," the purpose of which is to prevent the water issuing from the orifice 42 running back on pipe 40 and falling outside of the  
20 generating-chamber. In order to permit the carbid-pail to pass the projecting end of pipe 40, it is provided with a flat side 8<sup>a</sup>. After said pail is inserted in the generating-chamber it is given a slight turn to bring its curved  
25 side under the end of the water-pipe.

The operation of the generator as thus far described is as follows: The cover or bell 7 of the generator being lifted out of the casing 1, the carbid-pail 8 is removed from engagement with the bail 11, as previously described.  
30 The generating vessels 13 and 14 are now removed from the pail 8 and their several compartments filled with carbid, after which they are returned to the pail. The latter is suspended from the bail 11 and the bell 7 inserted in the casing 1, the pail 8 being thereby suspended in the generating-chamber 3 in a manner to leave a slight space between its side and the side of the said generating-  
40 chamber. Water being now admitted to the pipe 40 in the manner to be presently described, issues from the orifice 42 and falls upon the guard 38 or upon the cover 35 and passes to the bottom of the pail 8. As the  
45 water rises a sufficient distance in said pail it will first pass through the lowermost opening 20 in the vessel 13 and attack the carbid in the compartment 16. After all the carbid in the compartment 16 has been slaked the  
50 water will continue to flow until it has risen to a sufficient height to enter the opening 21 and attack the carbid in compartment 17. In like manner the carbid in the remaining compartments 18 19 is successively attacked  
55 by the water, and when all the carbid in the vessel 13 has been used the water will continue to rise and successively attack the carbid in the compartments 27, 28, 29, and 30 of vessel 14. The gas generated in vessel 13  
60 passes up through the tube 25 and chimney 37 and escapes from beneath the guard 38, and the gas generated in the vessel 14 passes through the space 36 to said chimney and escapes in like manner.

65 The numeral 44 indicates the pipe for leading the gas from the generator into the gas-holder. This pipe extends into the bottom of

the generating-chamber 3 and thence leads through the casing of the generator into a chamber in the bottom of the gas-holder, and  
70 serves also to carry the water of condensation from the generating-chamber, as presently described. The part of the cylindrical casing 1 below the false-bottom 2 constitutes the  
75 base of the generator.

Located in the pipe 44, between the generator and gas-holder, is a valve 48, operated by a rod 49, having an arm 50, which arm normally extends over the bell or cover 7 of the generator. Mounted on the rod 49, to  
80 turn therewith, is a disk 51, provided with a cut-away portion or recess 52. In order to remove the bell 7 from the generator, it is necessary, or at least preferable, to admit air under the bell, and for this purpose we provide  
85 an air-cock 53 in the pipe 44, between the generator and the valve 48, which is operated by a handle 54, which normally lies parallel with the disk 51 and slightly above the same. The handle 54 can only be turned downward  
90 from its normal position, and owing to its location cannot be turned at all when the circular portion of the disk 51 is beneath it. In operation when it is desired to remove the bell 7 the arm 50 must first be turned aside,  
95 and this will operate to close the valve 48 and prevent escape of gas from the gas-holder. This turning of rod 49 will also operate to revolve disk 51 and bring the recess 52 thereof beneath the handle 54. Said handle can now  
100 be turned down to open cock 53 and permit air to enter pipe 44 and pass to the space beneath the cover 7, whereby said cover may be readily removed from the generator. When  
105 the cover 7 has been replaced and it is desired to return the parts to operative position, the handle 54 is first raised to close cock 53, after which the handle 50 is turned to project over the cover 7, thereby, through the  
110 medium of rod 49, turning valve 48 to again open communication through pipe 44 between the gas-holder and generator and turning the circular part of disk 51 beneath the handle 54. By reason of the construction and arrangement of the parts just described it will be  
115 seen that it is impossible to remove the cover from the generator without first closing communication from the gas-holder, that the cock 53 cannot be opened until valve 48 has been closed, and that valve 48 cannot be opened,  
120 owing to the handle 54 extending downward in the recess 52, until the cock 53 has been closed.

For the mechanism just described we may substitute a three-way cock, operated by the  
125 arm 50, without departing from the spirit of my invention.

Secured on the water-tank 39 is a metal strap 55, having its upper end bent to form a hook 56, which engages over the edge of the  
130 casing of the gas-holder. The lower end of this strap projects below the bottom of the water-tank and is adapted to pass in a staple 57 on the gas-holder. This construction per-



mits the water-tank to be readily connected to or disconnected from the gas-holder, and this facilitates the readiness with which the parts may be packed for shipment.

5 The numeral 58 indicates the outer cylindrical casing of the gas-holder, and 59 the bell thereof.

The numeral 60 indicates an air-tight cylindrical casing which is supported on a false  
10 bottom 61 within the gas-holder. The purpose of this air-tight cylinder is to reduce the volume of water and air within the gas-holder. Between this cylinder 60 and the casing 1 is provided an annular space 61<sup>a</sup>, containing  
15 water, and in which the cylindrical part of the bell 59 is located, the construction affording a water seal, as will be understood. Secured at their lower ends, respectively at  
20 diametrically-opposite points, to the casing 58 are two rods 62 63, the rod 62 being somewhat longer than the rod 63, as shown. These rods are extended upward a considerable distance above the casing of the gas-holder and have their outer ends connected by a brace-  
25 rod 64, which brace-rod also serves as a stop to limit the upward movement of the bell of the gas-holder. The rod 63 is further braced by a lug or ear 65 on the rim of the gas-holder, through which lug or ear it passes. On the  
30 top of the bell 59 is secured a flat metal bar 66, having one end apertured and sliding on the rod 63. The opposite end of said bar is secured to the upper end of a relatively long sleeve 67, which slides on the rod 62. In the  
35 water-pipe 40 is a valve 68, to the stem of which is secured a valve-rod 69, which is formed of two parallel rods spaced throughout their length to afford a continuous slot 70. These rods are bent to afford a lower inclined  
40 part 71 and an upper vertical portion 72, but maintain their parallel relation throughout. On the lower end of the sleeve 67 is a short arm 73, extending into the slot 70 and provided on each side of the valve-rod 69 with a  
45 guide-collar.

The operation is as follows: As the bell 59 rises under the pressure of the generated gas the sleeve 67 is carried upward and the short arm 73 engages the bend in the valve-rod 69,  
50 thereby lifting said rod and gradually turning the stem of valve 68 until the latter is closed and the supply of water from tank 39 to the generator is shut off. The vertical portion 72 of the valve-rod will now occupy  
55 an upright position, and as the bell continues to rise the short arm 73 can ride up in the slot in said vertical portion without turning the valve 68 one way or the other. As gas is consumed the bell 59 falls, the arm 73 rides  
60 down in the slot 70 of the vertical portion of the valve-rod until the inclined portion 71 is reached, when the valve-rod will be turned downward, thereby opening the valve 38 and allowing water to flow through pipe 40 to the  
65 generator.

The mechanism just described for automatically controlling the supply of water to the

generator is simple in construction, positive and certain in operation, and offers the minimum amount of resistance or friction between the movable parts. 70

The numeral 74 indicates a valve in the pipe 40, operated by hand to shut off the supply of water from the tank 39 to the generator.

In the space beneath the false bottom 61 of  
75 the gas-holder we provide a chamber 75, which is partially filled with water by means of a spout 76, having an overflow-tube 77. The pipe 44 for conducting the gas from the generator passes through the casing 58 and connects with an upright pipe 78, having its  
80 lower end submerged in the water of chamber 75 and its upper end extended to near the top of the gas-holder. Any water of condensation passing through the pipe 44 from the  
85 generator will run down the pipe 78 into the water of chamber 75, while the water in said pipe will prevent the gas under normal pressure from escaping through the lower end of said pipe into said chamber 75. 90

The numeral 79 indicates the supply-pipe to the burners or other place of consumption, said pipe being provided with a valve 80 and also with a purifying-chamber 81, filled with excelsior or excelsior and sponge for freeing  
95 the gas from moisture and impurities. The pipe 79 likewise passes through the casing 58 and within the chamber 75 is connected to an upright pipe 82, extending up to near the top of the gas-holder and having its lower end  
100 submerged in the water of chamber 75. The pipe 82 conveys gas from the gas-holder to pipe 79, and any water of condensation can run down said pipe into the water in chamber 75. Secured on the bell of the gas-holder  
105 is a long cylindrical sleeve 83, having an upper closed end 84, projecting through and slightly above the top of the bell 59, as shown.

The numeral 85 indicates the safety escape-pipe, which projects upward in the sleeve 83  
110 and downward through the false bottom 61, having its lower end open and communicating with the chamber 75. A branch pipe 86 leads from the lower part of pipe 85 out through the casing 58, and to this branch  
115 pipe 86 may be connected a pipe leading from the building to the outer air. It will be understood that the water in the space 61<sup>a</sup> will normally form a seal between the lower end of the sleeve 83 and the upper end of pipe 85. 120  
The sleeve 83 has an opening 83<sup>a</sup> a few inches above its lower end, through which the gas may escape before the bell of the gas-holder rises to the top of the water seal. Should the bell of the gas-holder rise above a predetermined point, however, the opening near the  
125 lower end of sleeve 83 will be raised out of the water and gas will escape through pipe 85, branch pipe 86, and the pipe connected thereto to the outer air. The provision of  
130 the chamber 75 with the pipes 78 and 82, extending down into the water thereof, in combination with the blow-off 86, affords an additional means of safety, for an excess of



pressure in the gas-holder would operate to blow the water out of the pipes 78 and 82 and the gas could escape in the chamber 75 and out of the blow-off 86.

5 The water-space 61<sup>a</sup> is supplied with water through a filling-spout 87.

The numerals 88, 89, and 90 indicate cocks for letting water out of the respective compartments 61<sup>a</sup>, 75, and 4.

10 The water-valve 68 is made with a narrow passage through it for the passage of the water, said passage being made so narrow that the valve will pass from a closed position to a full open and on to closing position again  
15 in moving through less than one-quarter of a circle. The object of this is that when the bell of the gas-holder descends to a certain point it shall open the water-valve, and in case the carbid is exhausted and the bell  
20 passes down to its lowest point it shall carry the valve past the open to a closed position and in so doing shut off the water and prevent flooding of the carbid-pail, which latter would be the case with an ordinary valve, as  
25 the water would still continue to flow.

Having thus fully described our invention, what we claim as new is—

1. In an acetylene-gas-generating apparatus, the combination with the gas-holder and  
30 the generator of a pipe affording communication between the two, a valve in said pipe for controlling such communication, a cock in said pipe for admitting air therethrough to the generator, means for operating said valve  
35 and cock and means operating to prevent the opening of said cock until said valve has been closed or the opening of said valve until said cock has been closed, substantially as described.

40 2. In an acetylene-gas-generating apparatus, the combination of the gas-holder, of a generator having a removable bell, a pipe affording communication between the generator and gas-holder, a valve in said pipe for  
45 controlling such communication, an air-cock in said pipe for admitting air therethrough to the generator, a rod for operating said valve having an arm projecting over said bell, a handle for operating said air-cock and a disk  
50 carried by said rod and lying immediately beneath said handle and having a cut-away portion cooperating therewith, substantially as described.

3. In an acetylene-gas-generating apparatus, the combination with a casing affording  
55 a generating-chamber, of a removable bell located in said casing having a rectangular bail depending from the under side of its top, and a carbid-pail, open at its upper end only, located in said generating-chamber and extending  
60 upward in said bell and detachably supported

ported from the top thereof by means of bayonet-lugs secured on opposite inner sides of said pail and engaging over said bail, whereby said bell and pail may be removed together  
65 from the generating-chamber without permitting the escape of gas and the pail may subsequently be removed from the bell by turning the bail out of engagement with said lugs, substantially as described. 70

4. In an acetylene-gas-generating apparatus, the combination with the generator and a pipe for supplying water thereto, of a guard on the discharge end of said pipe for preventing the water from running down on said  
75 pipe, said guard comprising a cap having a discharge-orifice and surrounded by an outwardly-flaring flange, substantially as described.

5. In an acetylene-gas-generating apparatus the combination with the generating-chamber of a generator located therein comprising a vessel having a series of carbid-compartments and provided with a series of inlet-openings located at progressively different  
85 heights, each of said openings communicating with one of said compartments, a second vessel supported on the first vessel and having similar compartments and a similar arrangement of inlet-openings therefor, a  
90 chimney or flue communicating with the upper vessel, and an upright tube in said upper vessel communicating with said lower vessel, substantially as described.

6. In an acetylene-gas-generating apparatus the combination with the generating-chamber of a generator located therein and comprising a vessel having a series of carbid-compartments and provided with a series of inlet-openings located at progressively different  
100 heights, each of said openings communicating with one of said compartments, a second vessel supported on the first vessel and having similar compartments and a similar arrangement of inlet-openings therefor, a  
105 chimney or flue communicating with the upper vessel, a guard located above said chimney, and an upright tube in said upper vessel communicating with said lower vessel, substantially as described. 110

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

ALEXANDER WHITE.

HENRY M. ROHWEDER.

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