

No. 612,753.

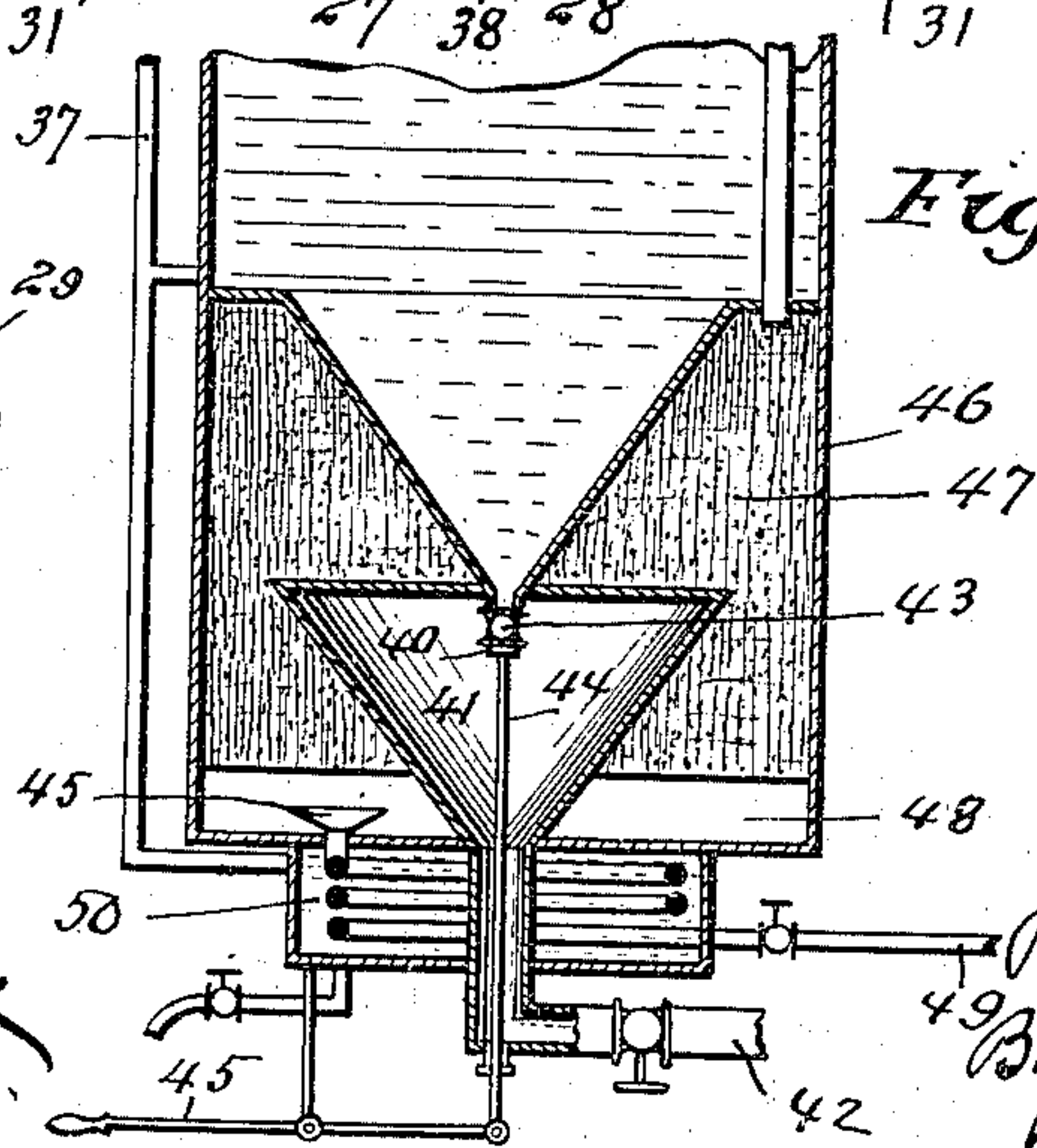
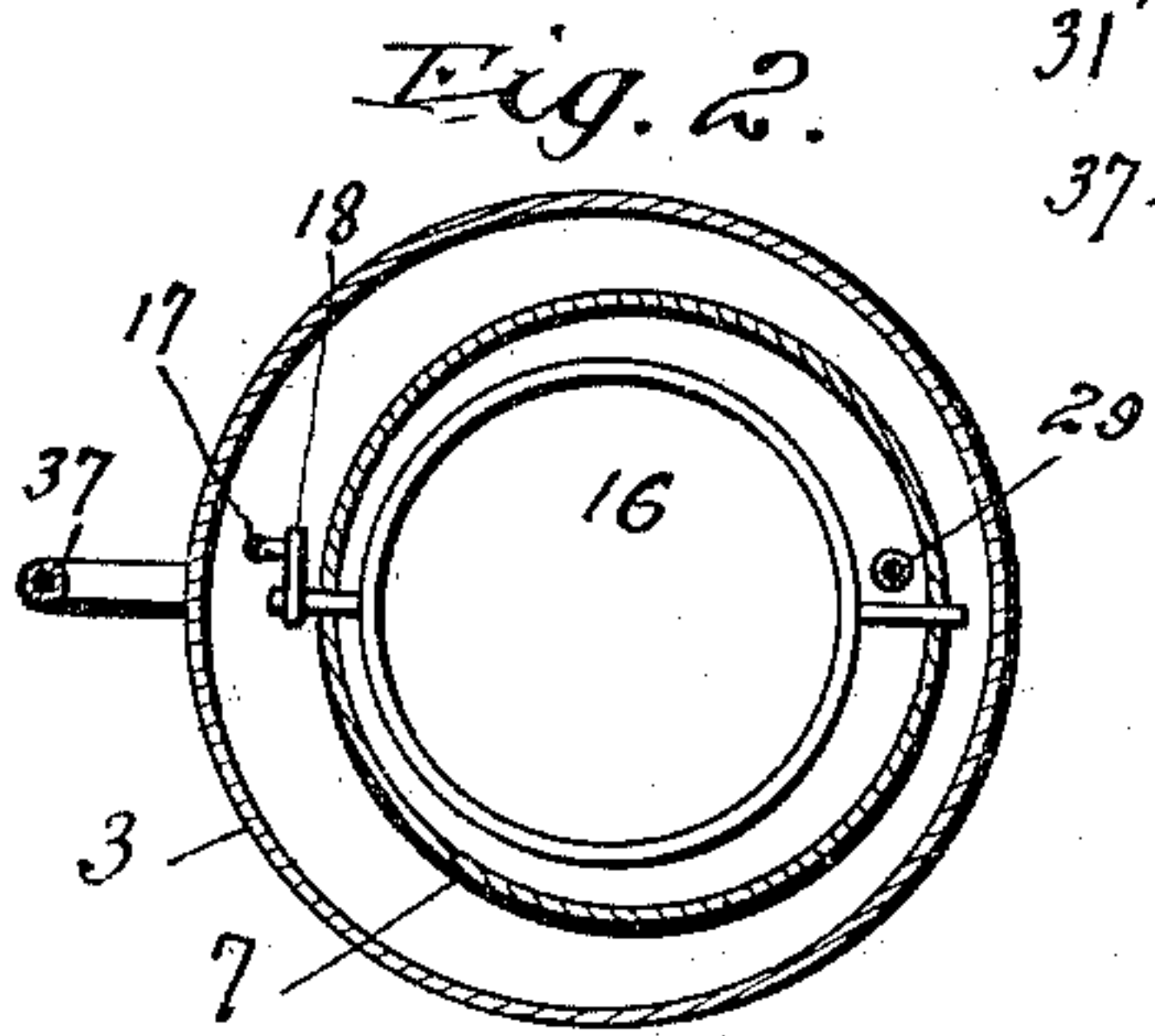
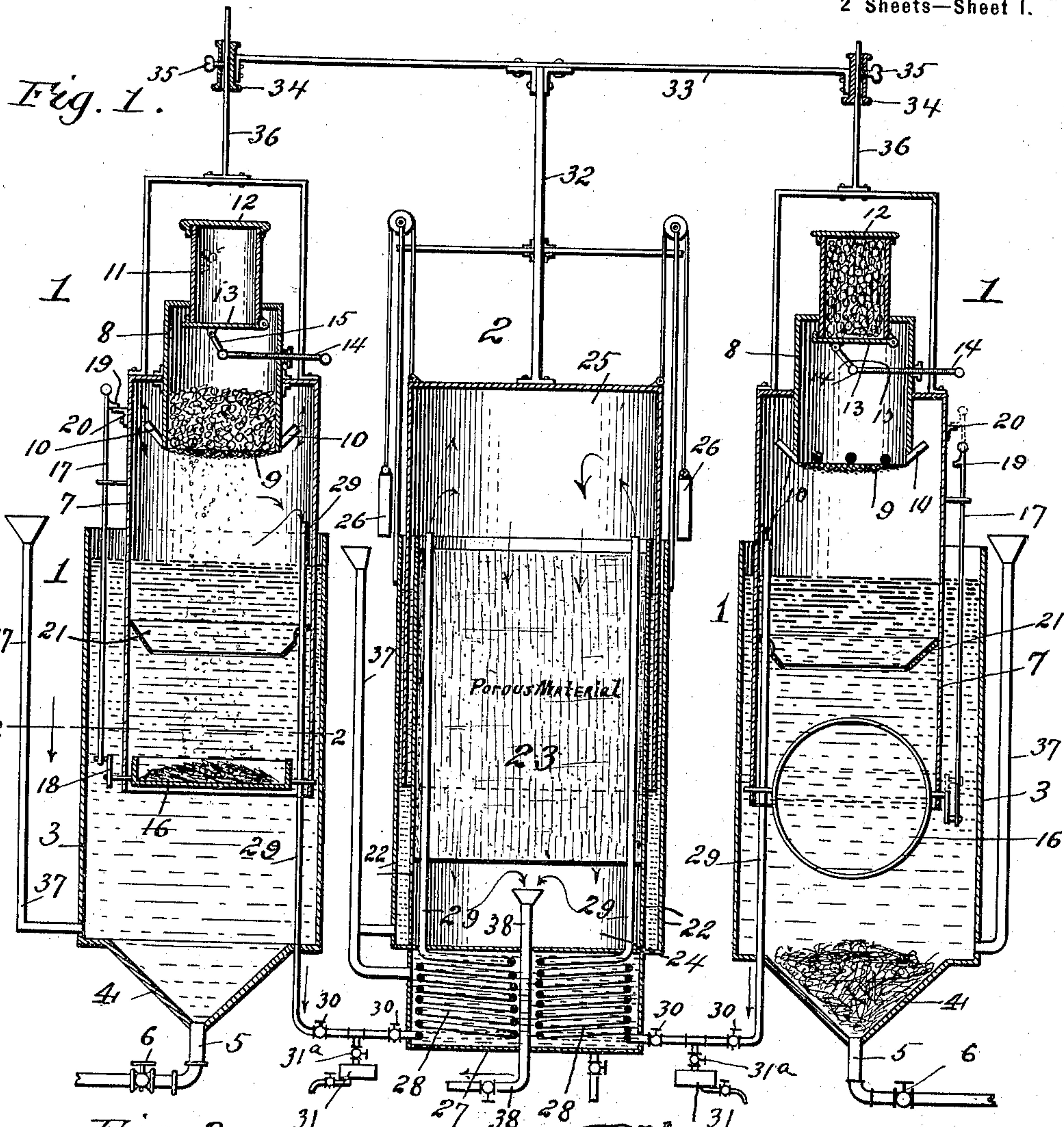
Patented Oct. 18, 1898.

J. H. NEEDELS.
ACETYLENE GAS GENERATOR.

(Application filed Dec. 31, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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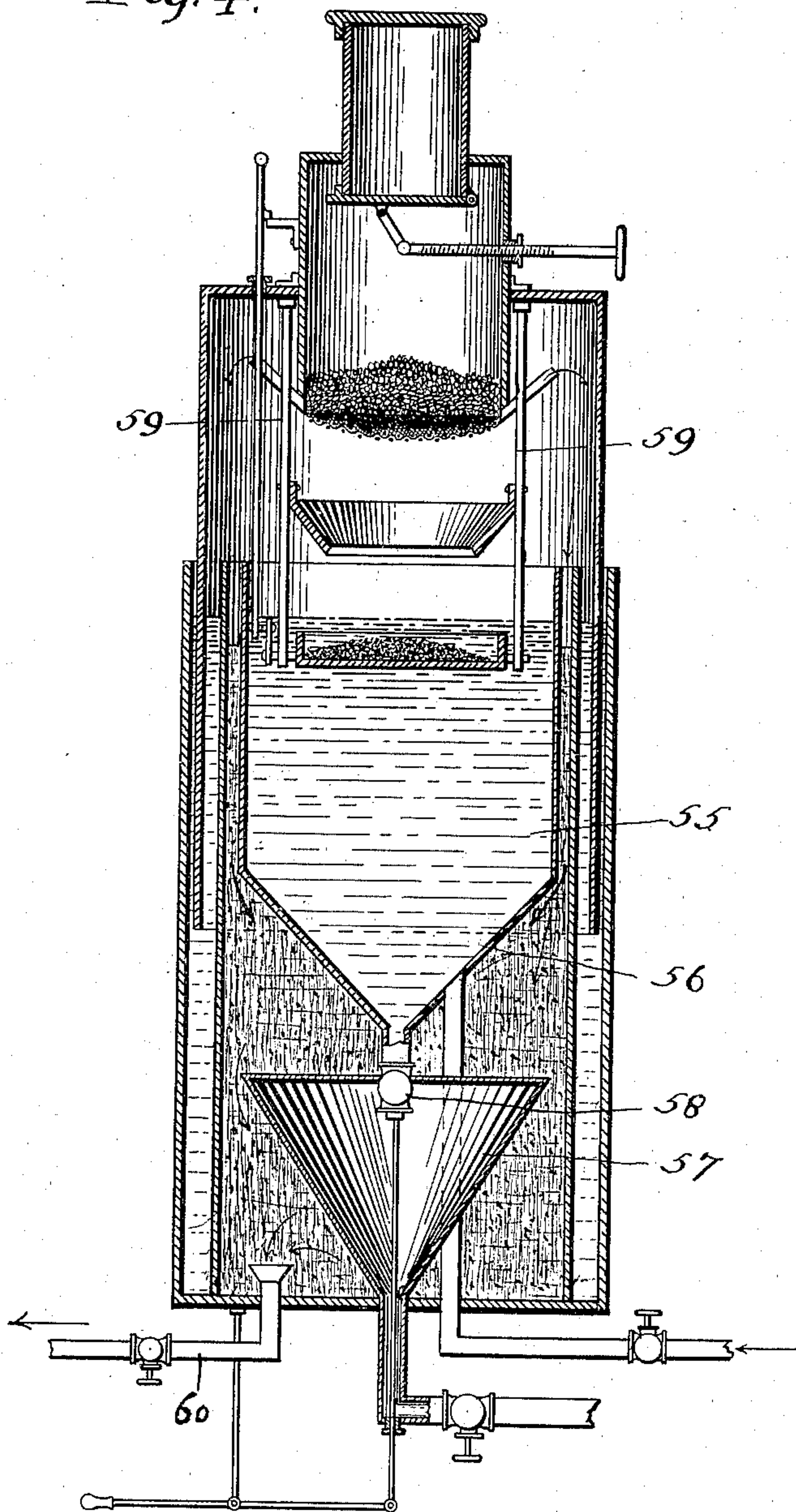
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Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES H. NEEDELS, OF ATLANTA, OHIO, ASSIGNOR OF ONE-THIRD TO
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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 612,753, dated October 18, 1898.

Application filed December 31, 1897. Serial No. 665,085. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NEEDELS, a citizen of the United States, residing at Atlanta, in the county of Pickaway and State of Ohio, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

10 Figure 1 is a vertical sectional view of the complete apparatus. Fig. 2 is a cross-sectional view of one of the generator-tanks, taken on line 2 2 of Fig. 1. Fig. 3 is a sectional view of a modification of the bottom of
15 the generator-tank; Fig. 4, a vertical section showing a modified form of the apparatus.

This invention relates to an improved apparatus for generating gas from calcium carbide; and it has for its main objects to provide means for recharging the generators and for cleaning the refuse from them without stopping the generation of the gas, and also to provide means for maintaining a substantially uniform pressure upon the gas throughout the process of generation.

Other objects and advantages of the invention will hereinafter appear.

30 The invention consists in the novel combination and arrangement of parts hereinafter more fully described, and particularly pointed out in the claims.

Referring to the parts by numerals, 1 1 designate two generators, and 2 the gasometer located between them. The generators are
35 alike in their construction, and a description of one will therefore suffice. Each of these generators consists of a water-tank 3, which is formed with an inverted conical bottom 4, and a drain-pipe 5, which is connected to the
40 apex of said bottom and is provided with a suitable valve 6. Within this tank is the holder 7, which is open at its lower end and closed at its upper end. Secured to the center of the top of this holder is the charging
45 mechanism, which consists of a vertical cylindrical basket 8, somewhat smaller in diameter than the holder and extending a suitable distance into the same. The lower end of this cylinder is open and is provided with
50 a wire screen 9. Extending outward and upward from the lower edge of this cylinder are

short tubes 10, whose inner ends communicate with the interior of cylinder 8, their outer and upper ends opening into the space between the cylinder 8 and the walls of the holder. Projecting upward from the top of cylinder 8 is a smaller charging-cylinder 11, whose upper end is closed by a gas-tight cover 12. The lower end of cylinder 11 opens into the cylinder 8 and is closed by a swinging valve 13. This valve may be opened and closed by means of a rod 14, which extends through the wall of the cylinder 8 above the holder 7, its inner end being connected to the valve by a link 15. This rod is screw-threaded through a suitable box and is connected to the link 15 by any suitable universal joint to permit of screwing the valve tight. Mounted in the lower end of the holder is a revolving pan 16, which is rotated by means of a rod 17, connected to a crank 18, secured to one of the pivots of the pan. Rod 17 is provided with a lug 19, which rests on a support 20, carried by the holder, when the pan is in its horizontal position, as shown on the left in Fig. 1. Secured within the holder above the pan is a deflector 21, which directs the slaked carbide into the pan 16.

The gasometer consists of a tank having double walls 22 22, which form a chamber in which water or other sealing liquid is contained. Within the inner tank porous material 23, such as charcoal or other suitable purifying agent, is placed, said material filling the upper part of the tank and arranged to leave a space 24 below it. The movable section or bell 25 of the gasometer fits in the space between the double walls and is provided with suitable counterbalancing-weights 26. Below the gasometer is arranged a water-chamber 27, within which are arranged two coils 28 of the gas-pipes 29. These gas-pipes extend down through the water-tanks of the generators from the gas-space thereof and are then formed into the coils 28, and from these coils they extend up through the porous material to the gas-space formed by the movable portion of the gasometer. Between the water-tank 27 and the generators each of the pipes is provided with two valves 30, and between these pipes a drip-box 31 is connected to said pipe, a valve 31^a being provided to

cut this box off from communication with said pipe.

Extending upward from the top of the movable part of the gasometer is an upright 32, which carries a horizontal arm 33. To the outer ends of this arm are secured vertical sleeves 34, provided with clamping-screws 35. Fitting within these sleeves and adjustably connected thereto by means of the screws 35 are vertical rods 36, which are secured to and support the holders 7. By means of this arrangement the holders are adjustably connected to the movable section of the gasometer and move with it, whereby a uniform gas-pressure is maintained through the apparatus.

Suitable pipes 37 are connected to the various water-spaces to enable said spaces to be filled, and a pipe 38 is connected to space 24 to draw the gas therefrom for consumption.

The operation is as follows: The water-chambers are filled and the carbid is placed in the charging-cylinders 11 and their tops secured in position. Valves 13 are then opened, depositing the charges upon the gauze bottoms of the cylindrical baskets 8. When the carbid contacts with the water, gas is generated and the bells of the generators and gasometer are raised, thereby lifting the baskets out of the water. The slaked carbid drops through the wire-gauze and is directed by the deflectors into the pans 16. The advantage of these pans carried by the holders is that the slaked carbid continues to act as a weight for the holders, and therefore the pressure on the gas in the holders is maintained substantially uniform instead of growing less and less as the operation of generating proceeds. This is important when a large apparatus suitable for lighting a town is in use. When the charges have been deposited in the baskets, the valves are tightly closed. This, together with the gas-tight covers 12, prevents the damp gas traveling upward through the unslaked carbid and partially slaking it. The object of the tubes 10 is to permit the escape of gas which is generated within the baskets just above the gauze to escape into the space surrounding said baskets, and they are inclined to enable this gas to escape when the gauze is below the water in the water-tank. They are carried upward a sufficient distance to prevent their outer ends from being submerged. The gas generated in the holders passes down pipe 29 and through the coils 28, where it is cooled, and thence up into the upper space of the gasometer. From here it passes down through the porous material, by which it is dried and purified, and enters the space 24. From this space it is led off to be consumed. By means of the drip-boxes the pipes 29 may be drained of water of condensation. When all the carbid in the baskets has been slaked and has fallen into pans 16, a new charge is placed in the charging-cylinders 11, as shown on the right in Fig. 1, and then pans 16 are revolved or upset sufficiently to deposit their contents in the bottoms of the

tanks, from which it may be drawn through pipes 5.

In Fig. 3 the conical bottom of the generator water-tank communicates through an opening 40 with a closed conical chamber 41, which is provided with a valved outlet-pipe 42. The opening 40 is provided with a valve 43, which is operated by a rod 44 and a connected lever 45. By means of this a single generator may be used, and it may be cleaned and recharged without stopping the operation of the apparatus. In this construction the contents of pan 16, after being deposited in the bottom of the tank, are first drawn into chamber 41 and valve 43 then closed. From chamber 41 it may then be removed without disturbing the action of the generator. This construction may be used in the apparatus shown in Fig. 1 if it be desired.

When it is desired to use the apparatus for a domestic or single-house service, the bottom 4 of the water-tank and chamber 41 is inclosed by a tank 46, and the chamber thus formed filled with porous material 47, leaving a gas-space 48 below said material. Opening into this space is a gas-pipe 49, which extends into a water-chamber 50 and is formed therein into a coil, and from there extends outward to conduct the gas to the point of consumption.

In Fig. 4 is shown another form of the apparatus adapted for domestic service. In this construction the water-tank is formed with double walls, between which works the movable section carrying the charging mechanism. Within the tank formed by the inner wall of the water-tank is placed a water-receptacle 55, which is formed with a conical bottom 56. This receptacle empties into a receptacle 57 through a valved opening 58. This latter receptacle is discharged in the same manner as receptacle 41. (Shown in Fig. 3.) The revolving pan is carried by the holder or movable section by means of depending rods 59, which are secured to the top of the movable section, and the operating-rod for said pan is carried through the top of the holder, as shown. The deflector is also carried by rods 59. The space between the receptacle 55 and the inner wall of the water-tank is filled with porous material, and the gas is led from this space through a pipe 60 at the bottom of the tank. The advantage of this construction is that the water which comes into contact with the carbid is entirely inclosed and does not contact with the walls of the movable section, the water in which the lower end of said section is immersed thus remaining comparatively fresh and unfouled.

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

1. In an acetylene-gas generator, the combination of a water-tank, a movable holder, a carbid-basket carried by the holder and provided with a gauze bottom and adapted to be immersed in the water in the tank when the

holder descends, and vent-tubes 10 communicating at their lower ends with the lower end of the carbid-basket, at a point just above the gauze bottom, and terminating at their upper ends within the gas-space of the holder, as and for the purposes herein set forth.

2. In an acetylene-gas generator the combination of a water-tank, a movable holder therein, a carbid-basket carried by said holder, a receptacle carried by the holder and adapted to catch the slaked carbid, and means for discharging said slaked carbid from said receptacle, substantially as set forth.

3. In an acetylene-gas generator the combination of a water-tank, a movable holder therein, a carbid-basket carried by said holder, a receptacle carried by the holder and adapted to catch the slaked carbid, means for discharging said slaked carbid from said receptacle, and a deflector carried by the holder to direct the slaked carbid into the receptacle, substantially as described.

4. In an acetylene-gas generator the combination of a water-tank, a movable tank therein, a carbid-basket carried by said holder,

a receptacle carried by the holder and adapted to catch the slaked carbid, and means for up-setting said receptacle to discharge its contents, substantially as described.

5. In an acetylene-gas generator the combination of a generator with a gasometer, said gasometer consisting of a stationary tank formed with double walls, a body of porous material contained within said tank, a gas-space being formed below said porous material, a movable tank forming the upper part of said gasometer, a water-receptacle below said gasometer, a gas-pipe leading from the generator and formed into a coil in the water-receptacle and then carried up above the porous material, and a pipe leading out from the gas-space below the porous material, substantially as described.

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

JAMES H. NEEDELS.

Witnesses:

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G. C. HAYS.