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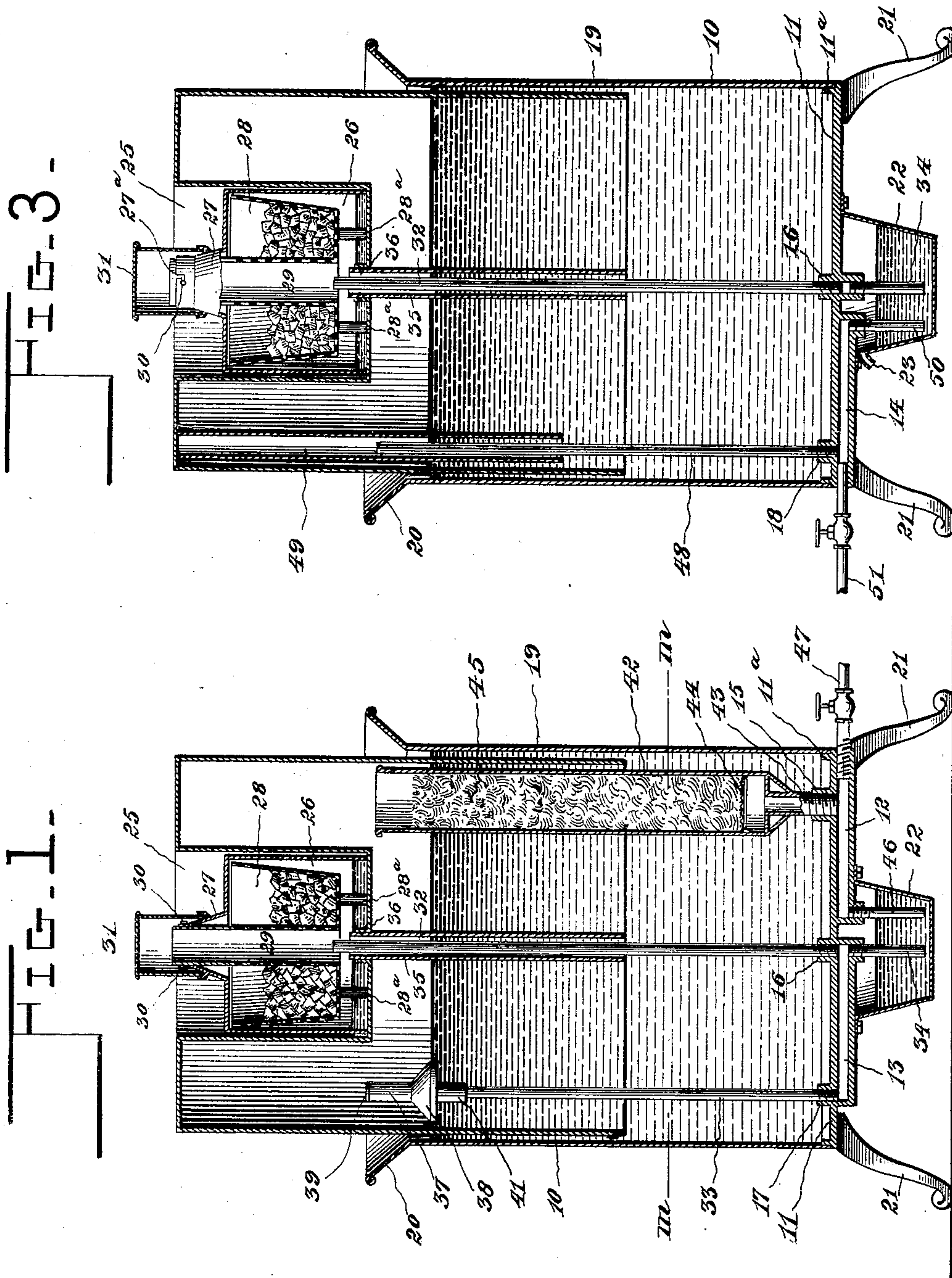
Patented Oct. 31, 1899.

T. SEEVERS.
ACETYLENE GAS GENERATOR.

(Application filed May 1, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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By *his* Attorneys,

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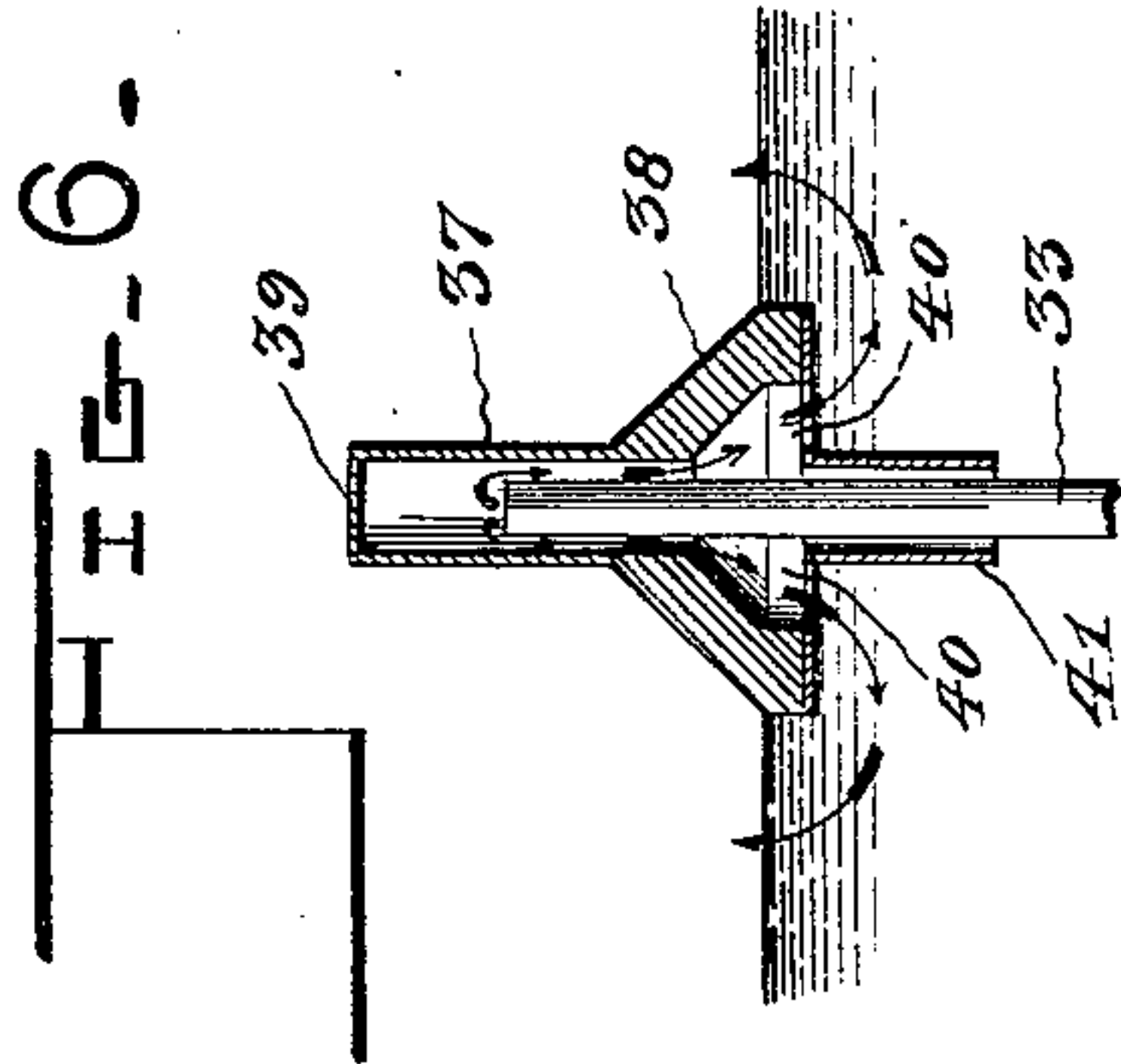
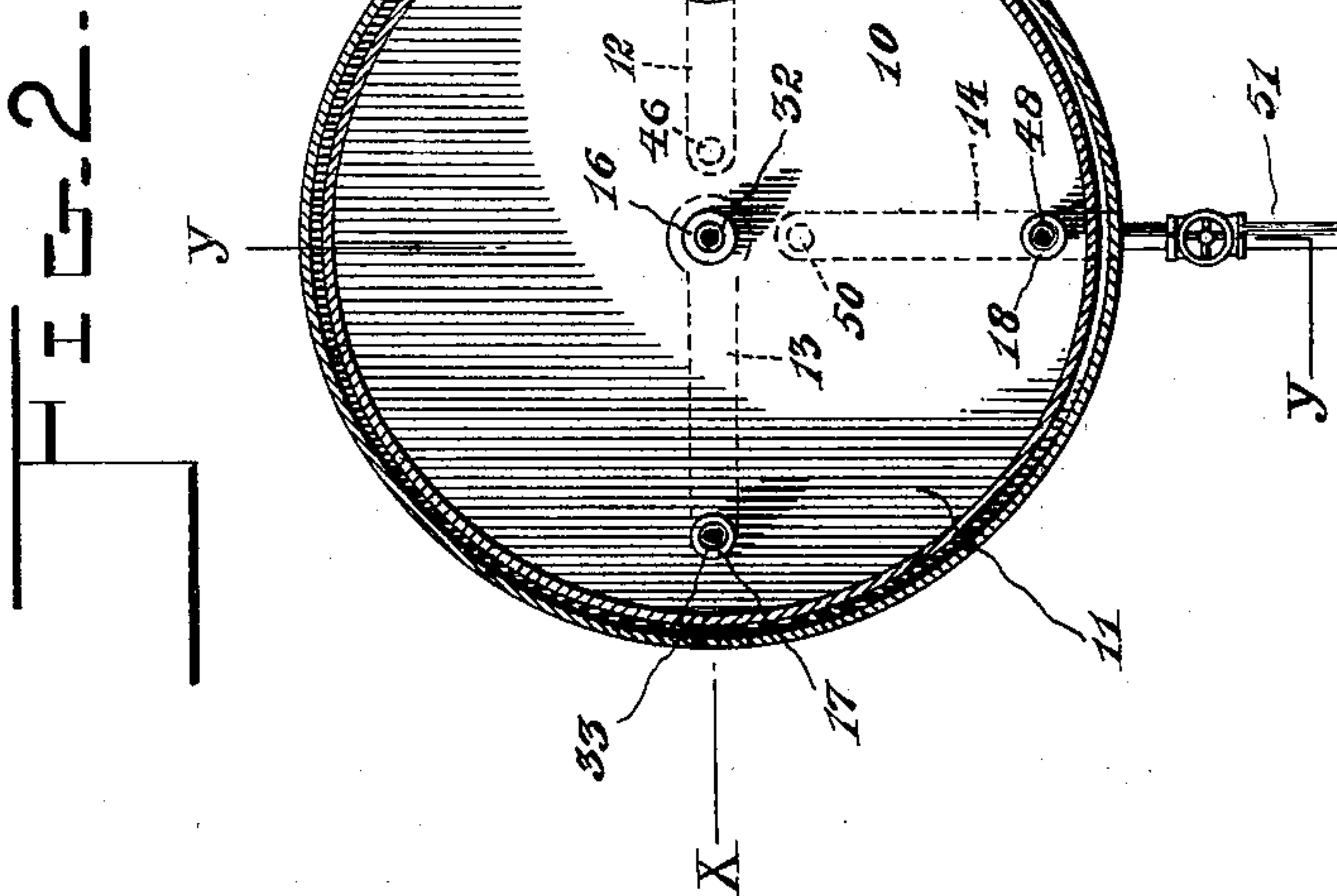
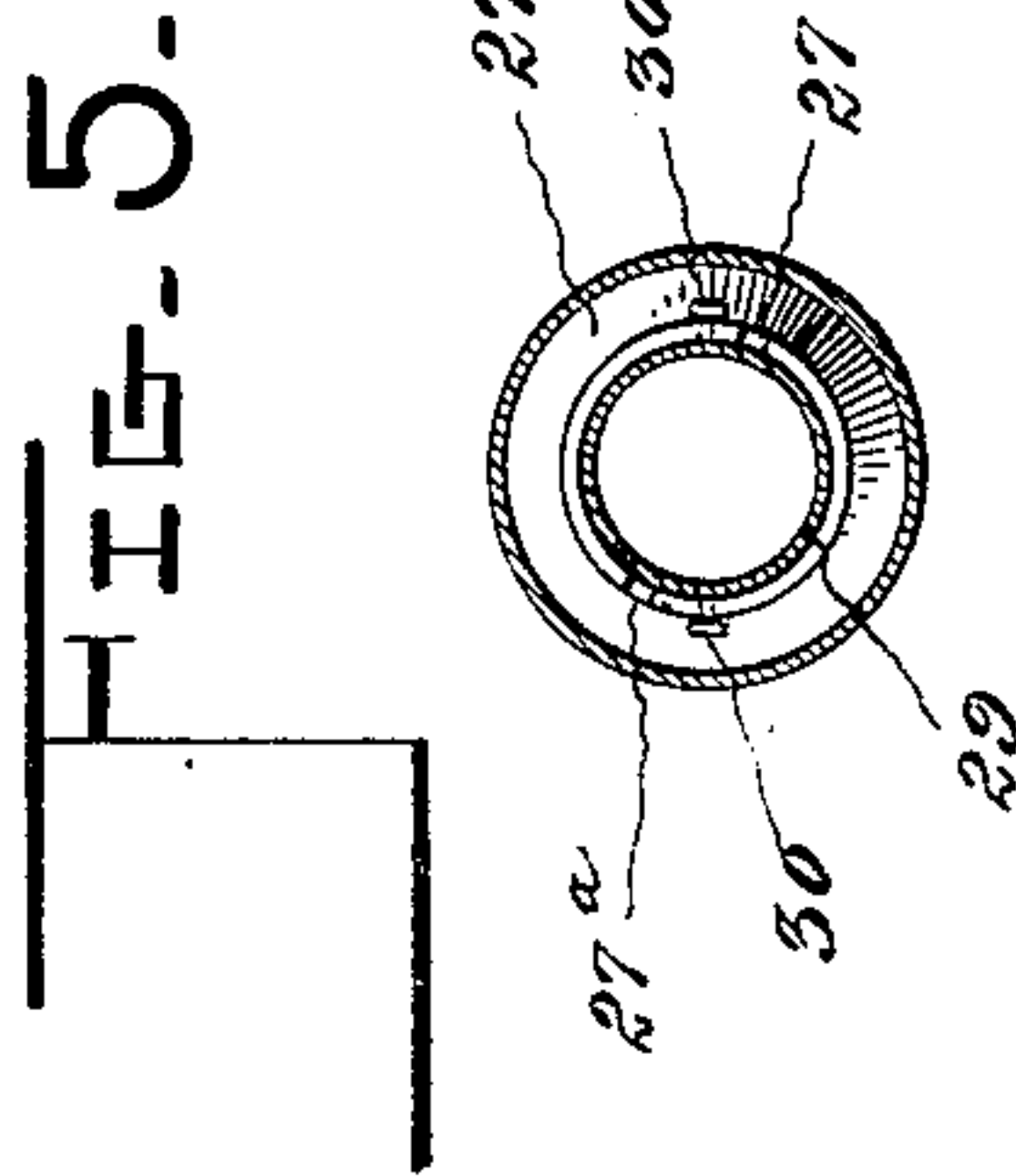
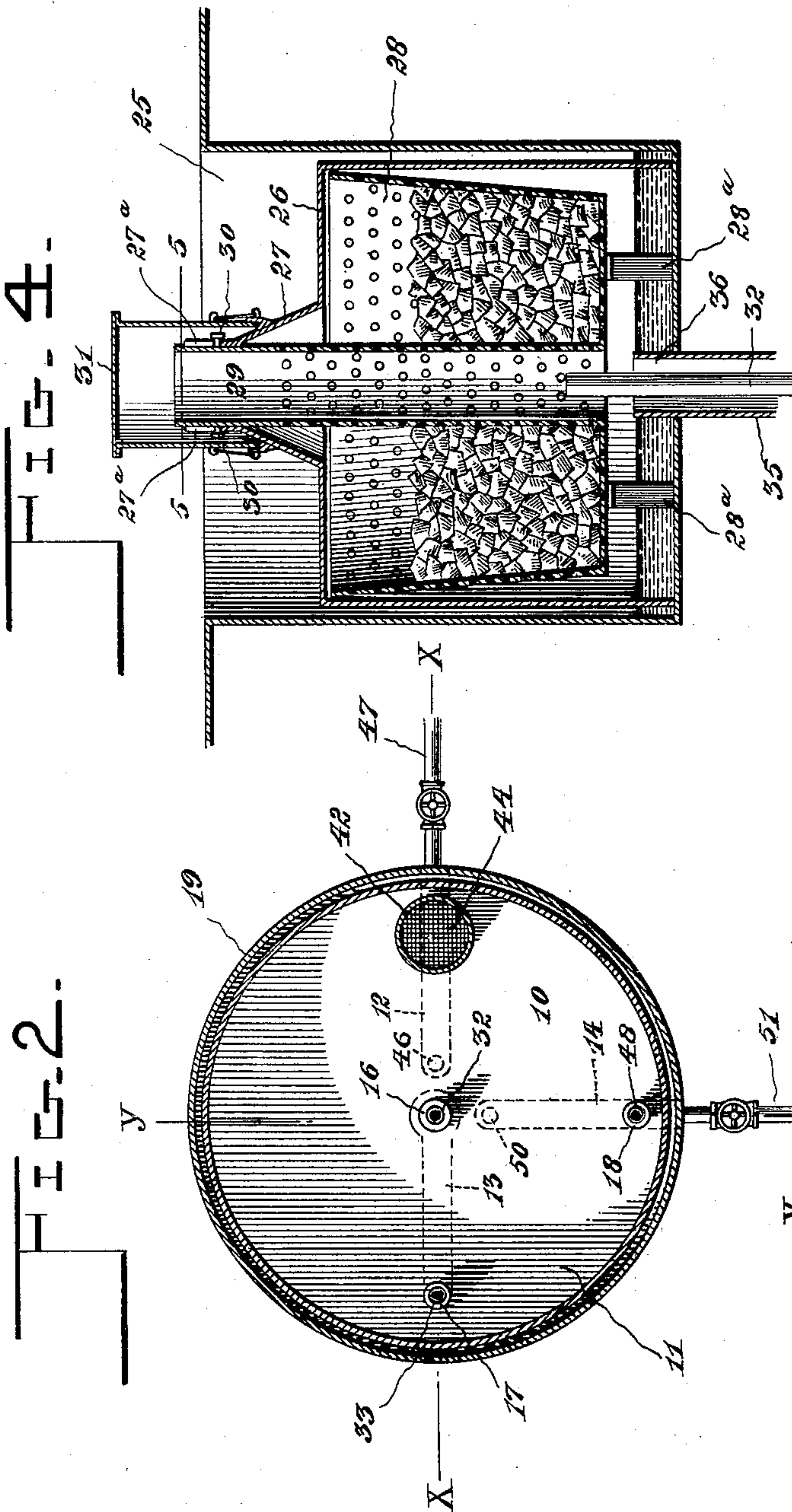
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UNITED STATES PATENT OFFICE.

THOMAS SEEVERS, OF OSKALOOSA, IOWA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 636,006, dated October 31, 1899.

Application filed May 1, 1899. Serial No. 715,142. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SEEVERS, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

My invention relates to improvements in apparatus for the generation of acetylene gas; and one object is to provide an improved construction of generator adapted to be carried by the floatable gas-bell and having a pipe connection with the water-chamber of the gasometer, so connected as to maintain a water seal in the generator against leakage of gas around the movable element of said generator.

Further objects are to provide for ready removal of the generator to obtain ready access to the carbide vessel, to obviate back pressure of gas from the floatable bell to the generator-chamber, to condense and purify the gas before admitting the same to the service-pipes, to automatically vent the gasometer on the excessive accumulation of gas therein, and to provide a common trap connection for the gas-pipes, which trap receives the water resulting from condensation of the aqueous vapors in the gas.

With these ends in view the invention consists in the novel combination of devices and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical sectional elevation of a gas-generator embodying my invention, the plane of the section being indicated by the dotted line *xx* of Fig. 2. Fig. 2 is a horizontal sectional plan view on the plane indicated by the dotted line *mm* of Fig. 1. Fig. 3 is a vertical section through the apparatus on a plane at right angles to the section of Fig. 1 and indicated by the dotted line *yy* of Fig. 2. Fig. 4 is an enlarged detail sectional view through a part of the floatable bell and the generator. Fig. 5 is a detail cross-section on the line 5 5 of Fig. 4. Fig. 6 is an enlarged detail section of the floatable back-pressure valve.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

The tank 10 of a gasometer forming a part

of my gas-generator apparatus is provided with a base 11, which is preferably cast in a single piece of metal to accommodate all of the pipes which are used for the circulation of gas in said apparatus. This cast-metal base has an integral annular flange 11^a, a series of three hollow ribs 12, 13, and 14, and a plurality of bosses or nipples 15, 16, 17, and 18. The gasometer-tank has a vertical annular shell 19, fitted to the flange 11^a of the base, said parts being united together in any approved way to secure a water-tight joint at the bottom of the tank. The upper end of the shell 19 is flared to form the rim 20, and said tank is intended to be filled with water up to the lower edge of said flared rim, whereby the rim forms a space which will receive the water when the level thereof is raised outside of the floatable bell, owing to an increase in the pressure of gas within said bell, thus preventing overflow of water from the tank. The base 11 is provided with legs 21, that serve to support the tank a suitable distance above the floor to accommodate the drip-trap 22, and this drip-trap is secured detachably to the base 11 in a central position thereon. The drip-trap is provided at or near its upper end with an overflow-pipe 23, and with this drip-trap communicate the hollow ribs 12 13 14 of the base, said ribs being arranged in radial positions on the under side of the base, substantially as shown by dotted lines in Fig. 2. The radial rib 12 provides a means for connecting the condenser and purifier with the trap 22. The rib 13 provides for the connection of the gas-pipe from the generator to the floatable bell of the apparatus, and the hollow rib 14 establishes communication between the safety-vent and said trap, whereby the trap is adapted to receive the water of condensation from all the gas-pipes. Said trap is designed to be filled with water nearly to the level of the overflow 23, and each of the radial ribs has a dip-foot which is immersed in the seal of the trap to prevent the gas from escaping through said trap and also provide for the ready flow of water of condensation thereto.

While I have described and shown the tank as having a cast-metal bottom constructed in a peculiar manner for the accommodation of all the pipes, I do not desire to limit myself to this particular construction and arrange-

ment of the cast-metal base, because I am aware that a suitable bottom of sheet metal may be employed in connection with the shell 19, and the tubes or pipes may be attached to the sheet-metal bottom to serve the purposes of the hollow ribs.

The floatable gas-bell is inverted into the tank 10 and the water seal therein, so as to travel in a vertical direction under variations in the volume of gas which is stored in the apparatus, and the head of this bell is constructed to provide a central vertical cavity or well 25, which forms a part of the generator that is adapted to be mounted directly upon the bell and to travel therewith in its vertical play within the gasometer-tank. The generator 26 is fitted within the cavity or well 25 of the bell, and the lower edge of this generator is adapted to rest upon the bottom of said cavity or well. The upper closed end of the generator has its head formed to produce a conical or tapering nipple 27, that is disposed in central relation to said generator, and in the upper edge of this conical nipple is formed the slots or recesses 27^a, which are adapted to coact with lugs on the carbid vessel for the purpose of interlocking the generator and said vessel.

The carbid vessel 28 is arranged to rest upon ledges or supports 28^a, so as to elevate the bottom of the carbid vessel above the bottom of the cavity or well 25 of the floatable bell, (see Figs. 1, 3, and 4,) and said carbid vessel is provided with a central perforated tube 29, which serves to convey the gas from the generator to the vertical fixed pipe that extends centrally through the gasometer-tank, as will hereinafter appear. The generator 26 is designed to be inverted over the carbid vessel 28, so that the tube 29 of said carbid vessel will pass through the conical nipple 27 at the upper part of the generator, and to provide for interlocking connection between the generator and the carbid vessel I prefer to employ lugs 30, which are fixed or integral with the tube 29 at diametrically opposite points and near the upper end of said tube, said lugs 30 being adapted to fit in the slots or recesses 27^a in the upper edge of the nipple 27 on the generator. In assembling the generator and carbid vessel the generator is slipped over the vessel 28 for the tube 29 to pass through the nipple 27, and as said generator slides or moves into position the lugs 30 will engage with the slots 27^a of the nipple, and thereby interlock the generator and carbid vessel detachably together. The tube 29 is thus caused to project above the nipple of the generator, and to close said tube and nipple against escape of gas I provide a cap-piece 31. This cap-piece may be either made fast to or fitted removably on the nipple of the generator, and in the event of making the cap separate from the nipple 27 I may either weight the cap, so as to press it firmly in place, or said cap may be fastened to or clamped upon the nipple in any suitable

manner to produce a gas-tight joint around the upper end of the tube 29, forming a part of the carbid vessel.

The gas is conveyed through the tank 10 and from the gasometer by means of a vertical pipe 32, which is fixed securely at its lower end to the boss 16, so as to communicate with the hollow rib 13, and the upper part of this gas-pipe 32 passes through the generator-chamber and the tube 29 of the carbid vessel, so as to communicate with the hollow cap 31 when the bell is in its lowered position, said gas-pipe being loosely fitted in the generator to communicate therewith at all times, notwithstanding the variation in the position of the bell, owing to the travel of said generator with the bell. The inlet-pipe 33 from the hollow rib 13 to the floatable bell of the apparatus is fixed at its lower end to a boss 17, which communicates with the hollow rib 13, and thus the gas may flow from the generator through the pipe 32 into the hollow rib 13 and from thence through the pipe 33 to the chamber of the floatable bell. The inlet-pipe 33 is disposed in a vertical position to extend through the water seal of the tank 10, and the upper end of this pipe is adapted to discharge the gas into the floatable bell. The hollow rib 13, with which communicates the gas-pipes 32 33, is provided with a dip tube or foot 34, which extends into the seal of the trap 22, and thus water of condensation from the pipes 32 33 is conducted to the trap.

The water necessary to attack the carbid in the carbid vessel of the generator for the production of acetylene gas is supplied to the cavity or well 25 by means of a water-tube 35. This water-tube is arranged in a vertical position centrally within the tank, and it is fixed to the floatable bell to travel therewith and to open into the chamber of the generator. The water-tube surrounds the vertical gas-pipe 32, so as to serve as a guide to the floatable bell in its travel within the tank, and this water-tube is immersed in the water of the tank 10, so that the water from said tank will pass through the tube and enter the generator-chamber on the descent of the floatable bell. It is important to provide a seal around the lower edge of the generator 26 to prevent the gas from escaping from the well or cavity 25 when the bell is lifted by the accumulation of gas therein to a level where the water will flow from the generator-chamber, through the tube 35, back into the tank, and in order to produce this seal for the generator 26 under all conditions in the travel of the bell I find it expedient to extend the water-tube 35 into the generator-chamber, as at 36, so that the upper end of the tube 35 will terminate above the bottom of the well or cavity 25, whereby a limited quantity of water will be retained in the well or cavity to surround the lower edge of the generator 26 and form a seal therefor against the leakage of gas.

To effectually prevent back pressure of the

gas from the floatable bell to the generator, I employ a floatable valve which is slidably fitted to the outlet end of the inlet gas-pipe 33, and said floatable valve is adapted to rise and fall with variations in the water-level of the tank 10. Said valve consists of a tube 37, which is connected in a suitable way to a float 38, and said tube is closed at its upper end by a suitable head, as at 39. The tube opens through the float 38 by means of ports 40, and the valve is equipped with a depending tubular guide 41, that is disposed in line with the valve-tube 37 and is slidably fitted on the gas-pipe 33. The float of the valve is immersed in the water of the tank to sustain the tube 37 in proper position over the outlet end of the gas-pipe 33, and the tube 37, which forms the valve, is thereby supported by the float in a position to unseat itself from the upper end of the pipe 33, so as to provide for the free escape of gas from the pipe as it flows from the generator to the floatable bell. The ports of the floatable valve open through the float 38, so as to discharge the gas below the float and into the water of the gasometer, and thus the gas is prevented from passing from the floatable bell into the pipe 33 and thence to the generator.

I have also equipped the apparatus with a condenser and purifier which is contained within the tank 10, so as to be immersed in the water therein, and this condenser is thus kept in a cool condition by the surrounding body of water in order that the gas as it impinges against the condenser in circulating therethrough will have its aqueous vapors condensed by the cylinder. The condenser and purifier consists of a cylinder 42, arranged in a vertical position within the tank at one side of the vertical pipe 32, and this cylinder has its lower end connected by a nipple 43 to the boss 15, which is in communication with the hollow rib 12, that leads to the trap. A screen 44 is seated in the foot of the cylinder 42 at a suitable distance above the bottom thereof, and this screen supports a suitable packing 45, adapted to eliminate any impurities which may be contained in the gas. The packing which I prefer to employ consists of mineral wool, or any other suitable material may be used, and this packing is sustained by the screen in a position above the bottom of the cylinder, so as to leave the chamber for the free outlet of gas to the nipple 43. The upper end of the cylinder 42 is open and extends above the water-line in the tank to permit the gas to pass from the floatable bell to the condenser and purifier. The hollow rib 12, with which communicates the purifier, is formed at its inner end with a dip-tube 46, that is immersed in the water of the trap, and to the outer end of this hollow rib is coupled a service-pipe 47.

I have also provided the apparatus with a safety-vent, consisting of a pipe 48 and a telescopic pipe 49. The vent-pipe 48 is fixed to the nipple 18, which communicates with the

hollow rib 14, and the inner end of this rib has a dip-tube 50 entering the seal of the trap, while to the outer end of the rib is coupled the off-bearing vent-pipe 51. The telescopic pipe 49 is attached to the head of the floatable bell to travel therewith, and on excessive accumulation of gas within the bell the pipe 49 travels upward with said bell until its lower end is withdrawn from the water, thus permitting gas to pass into the pipe 49, thence to the pipe 48, and finally from the apparatus through the pipe 51.

The operation is as follows: Water is supplied to the tank 10, nearly to the rim 20, and the trap 22 is supplied with water up to the level of the overflow 23. A proper quantity of carbid is placed in the vessel 28, and the generator 26 is then inverted over and connected with the lugs and tube of said carbid vessel, after which the vessel and generator are fitted in the cavity or well of the bell. As the bell settles in the water of the tank the water passes through the tube 35 and into the generator, and the rise of water in said generator-chamber causes the water to attack the carbid in the crate or vessel 28. Acetylene gas is at once generated by the decomposition of the water and carbid, and the gas passes through the tube 29 into the pipe 32, thence through the rib or passage 13 into the pipe 33, and finally emerges from the floatable valve to the chamber of the floatable bell. The continued accumulation of gas in the bell lifts said bell and the water-tube 35, and water flows from the generator through this tube 35, except a limited quantity which is retained in the cavity or well 25 to form a seal around the generator 26.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what I claim is—

1. The combination with a floatable bell, a generator mounted on said bell, and a tank in which the bell moves having a lower trap, of an imperforate tube attached to the bell to travel therewith and extending into the generator to terminate above the bottom thereof, the extended end of the tube serving to prevent the escape of water from the generator and thereby form a seal around the cover of said generator, the said cover and a pipe connected to the said trap and over which the said tube loosely moves.

2. In an acetylene-gas apparatus, the combination of a floatable bell, a generator therein comprising a well or cavity and a pendent water-tube which opens into said cavity, the upper terminal of the said tube being located above the bottom of the well or cavity to prevent the escape of water therefrom, a carbid vessel, a cover mounted over the carbid vessel and closed by a water seal established by the retained water in the well or cavity, and

a central perforated gas-tube, a tank in which the said bell moves having a lower trap, and a gas-pipe extending from said perforated gas-tube through the pendent water-tube and communicating with the trap at the bottom of the tank.

3. In an acetylene-gas apparatus, the combination of a floatable bell, a generator therein comprising a well or cavity, and a water-tube which enters said cavity, an upper nipple, a carbid vessel having a perforated tube which is interlocked with said nipple, a tank in which said bell has movement and provided with a lower trap, and a fixed gas-tube extending from a point of communication with the trap upwardly through the water-tube of the bell and communicating with the tube of the carbid vessel.

4. In an acetylene-gas apparatus, the combination of a generator having a nipple at its upper end, a carbid vessel provided with a perforated tube which enters said nipple and has interlocking engagement therewith, a cap for closing the upper end of the perforated tube, and a gas-pipe entering the tube of the carbid vessel and receiving gas from the generator, substantially as described.

5. In an acetylene-gas apparatus, the com-

bination with a tank having a lower trap, of a floatable bell having a depending tube, a generator carried by said bell also having a depending tube, and a gas-pipe having two lengths arranged to communicate with both of the said tubes to provide a service-feed and a vent.

6. In an acetylene-gas apparatus, the combination with a tank, a floatable bell, a generator carried by the bell, a gas-tube having two lengths arranged to communicate with the generator and the gas-chamber of the floatable bell, and a valve provided with a float and fitted slidably to the end of that length of the gas-pipe which conveys the gas to the floatable bell, said valve having ports which open through the under surface of the float and a third length of pipe for venting the apparatus, all the lengths of pipe being in communication with a trap at the lower end of the tank.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOS. SEEVERS.

Witnesses:

I. R. ECKART,
A. M. BAKER.