

No. 637,546.

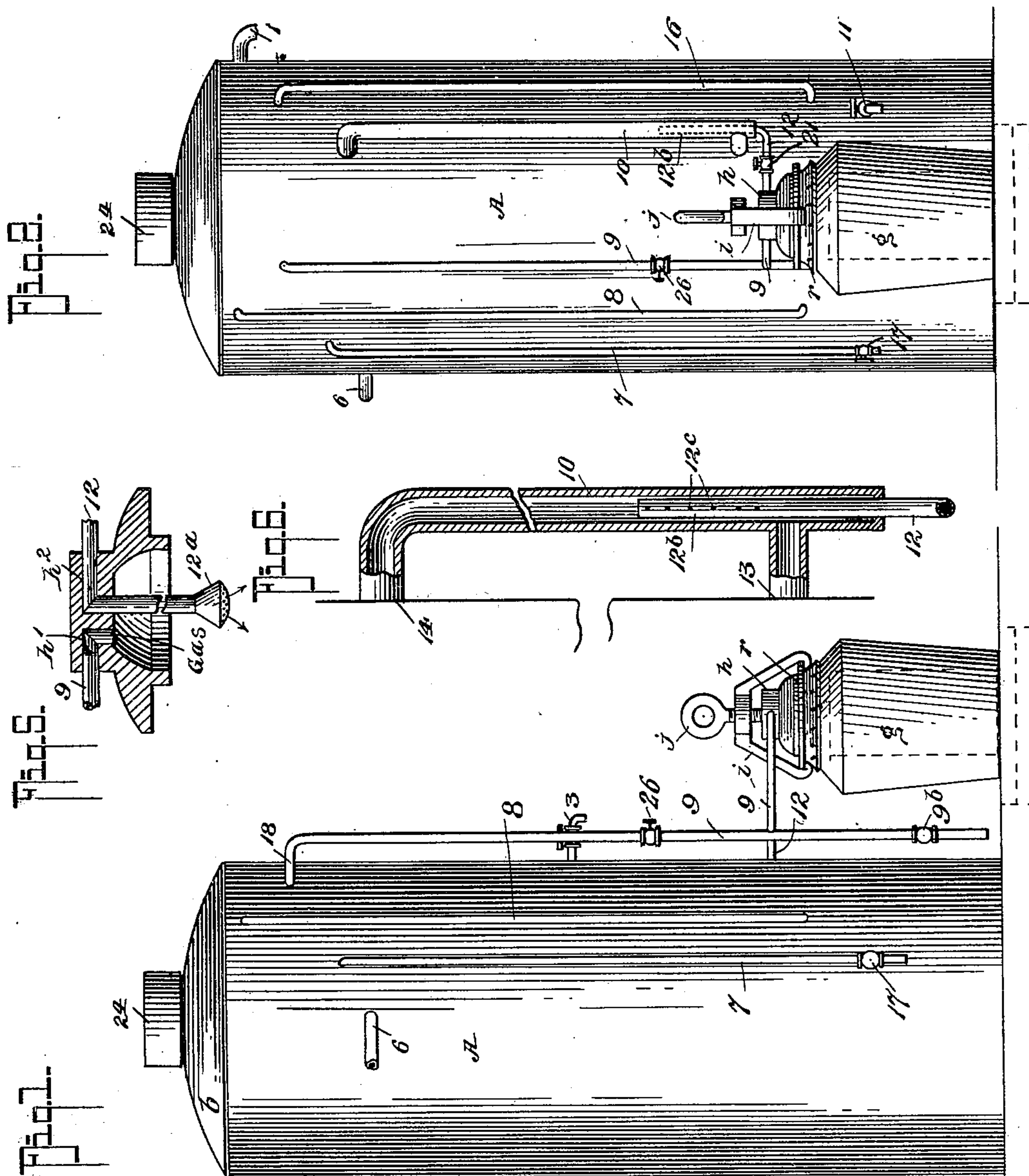
Patented Nov. 21, 1899.

G. S. BENNETT.
ACETYLENE GAS GENERATOR.

(Application filed Jan. 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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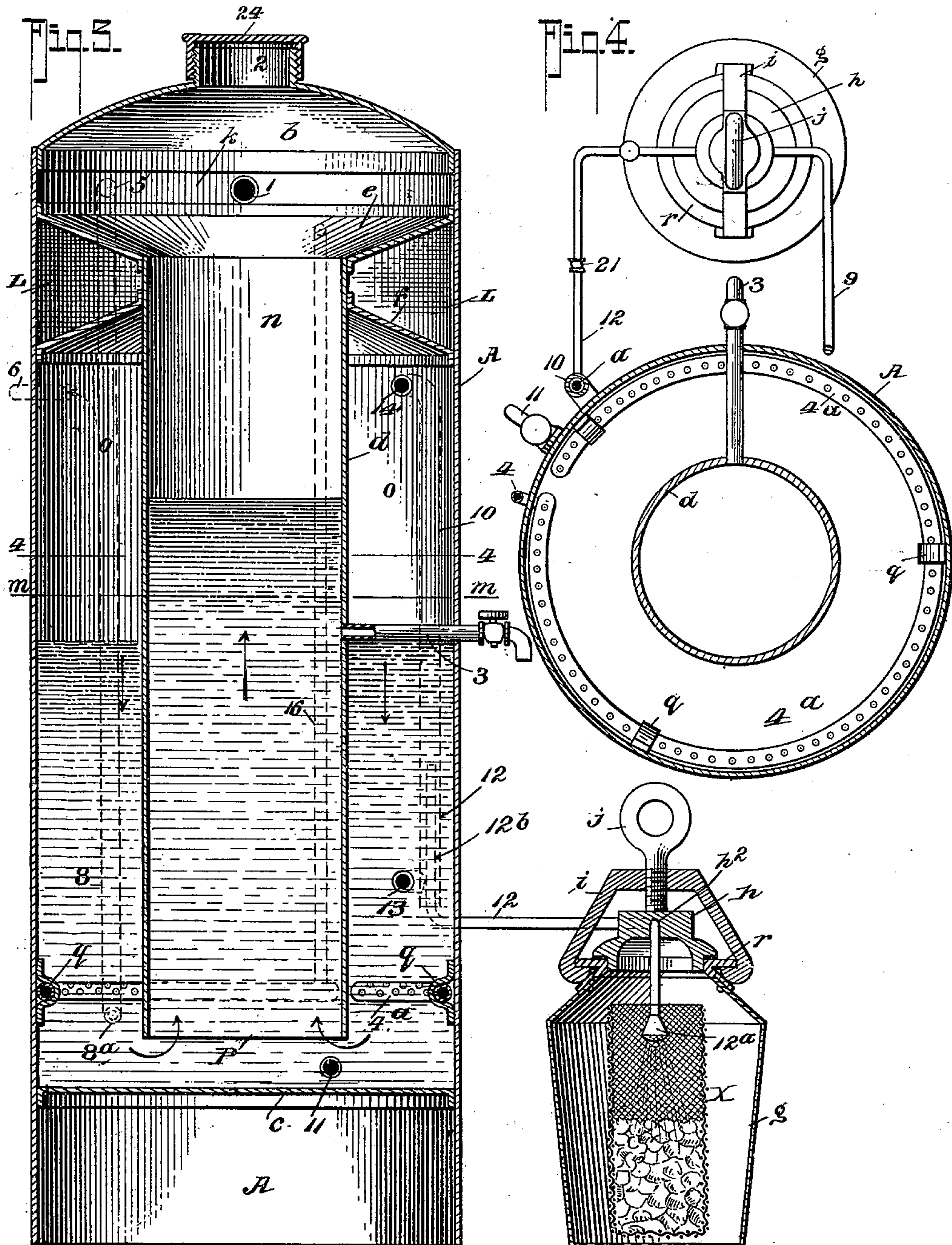
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UNITED STATES PATENT OFFICE.

GEORGE S. BENNETT, OF PORTLAND, OREGON.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 637,546, dated November 21, 1899.

Application filed January 7, 1899. Serial No. 701,474. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. BENNETT, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and Improved Acetylene-Gas-Generating Apparatus, of which the following is a specification.

This invention comprehends generally certain improvements in acetylene-gas-generating means whereby to provide a compact, stable, and easily-manipulated apparatus which is positively automatic in its action and which will effectively serve for its intended purposes.

One of the essential features of this invention lies in the peculiar construction of the combined gas settling, cooling, and storing tank, an exteriorly-held generator, and a water-feed governed by the consumption and the varying pressure of gas within the tank and without the use of valves or adjustable cut-offs.

This invention also comprehends a simple and novel construction of generator adapted to be held exteriorly of the main tank and including a carbid-holder detachably held within the generating-body by simple clamp devices readily manipulated, which will also serve to disconnect the generator from the main tank and water-feed and admit of the carbid-holder being removed from the generator-body proper.

In its subordinate features this invention embodies certain combinations and novel features of construction, which will be first described in detail and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved gas-generating apparatus. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical longitudinal section thereof, taken practically on the line 3 3 of Fig. 4. Fig. 4 is a horizontal section taken substantially on the line 4 4 of Fig. 3. Fig. 5 is a detail view of the cap-piece for the generator, and Fig. 6 is a detail view of the water-feed pipe and the generator-supply.

My improved gas-generating apparatus comprises a single tank of suitable proportions, which is provided at the upper end with a supplemental chamber which acts as a cushion or balancing chamber to receive the water as it is forced up from the purifying-compartment by the pressure of gas collecting therein, said cushion-chamber serving, as it were, the function of the ordinary rising-and-falling section of the ordinary gasometer. The said tank is also provided with a duplex water-holding compartment, with which at a point below and above the main or normal water-line connects a feed-pipe which has a series of escape-orifices arranged in different horizontal planes and above the lowermost feed-lateral which connects with the main tank or holder, and which openings are adapted to be brought in line with the varying water-level within the said main tank step by step in accordance with the varying pressure of gas upon the water within the tank and produced by the consumption thereof, whereby to create an automatically-regulated water-supply for the generator.

In my construction of acetylene-gas-generating apparatus the generator is in the nature of a holder suitably supported exteriorly of the main tank and provided with a detachable cap adapted to be held gas-tight on the generating-body proper by suitable clamping mechanism, said generator also including a carbid-holder in the nature of a screen-pocket removably held within the generator-body, its upper end being open and adapted to be held in line with the spray of the feed-pipe which passes through the cap. The generator-cap is also provided with a gas-outlet, with which connects an offtake-pipe having a suitable drip portion at the lower end for the collection of solids and adapted to communicate and discharge into a gas-settling chamber formed in the upper end of the main tank, from which chamber the gas is permitted to escape through a cooling-coil into the water-space of the main tank and through which it percolates and collects in the collecting-chamber above it and from whence, after being purified, it passes back to the settling-chamber, from whence it is allowed to escape through a house-supply pipe, which connects with the upper end of said settling-chamber.

Having thus generally outlined the construction of my improved apparatus, I shall now describe the same in detail, referring to the accompanying drawings by letters and

numerals, in which like numerals and letters designate like parts in all of the figures of the drawings.

A designates the tank or cylinder, which is
 5 formed of suitable metal and of any desired size, it having a top or dome portion *b* and a bottom *c*, which are hermetically sealed or closed, with the exception that the top has a feed-opening 2, which receives a screw-cap
 10 24, said opening being for the pouring of water into the tank. The upper portion of the tank terminates in an air-chamber *k*, the base of which is made conical, as at *e*, and terminates with a central downwardly-extending tube or cylinder *d*, the lower end of
 15 which is open, as at *P*, and ends near the bottom *c*, said cylinder being braced at the upper end by a conical diaphragm *f*, which has its inclination reversely to the base *e* of the
 20 chamber *k*, the said portions *e* and *f* serving to form an annular gas-settling chamber *L*, surrounding the pendent cylinder, the purpose of which will presently appear. The parts *f*, *d*, and *e* form the gas-circulating
 25 chamber *o o*, which communicates with the interior of the cylinder *d* through the opening *P* at the bottom.

In operation water is filled into the tank A through the opening 2 at the top to the
 30 normal water-line, (indicated by *m m*,) and the space within the cylinder *d* between the top of the water and the top of the tank A forms the air-chamber *k*, which chamber has a vent 1, which is always open.

4^a indicates a horizontally-disposed pipe-coil located near the lower end of the tank A and mounted in suitable brackets *q*. This coil is perforated and communicates, through
 40 the medium of the pipe 16, with the upper end of the gas collecting and settling chamber *L*.

g indicates the generator or carbid-holder receptacle, which is provided with a top *h*, through which the pipe 12, hereinafter referred to, passes, and said top *h* is held air-tight on the top of the holder *g* by a gasket-joint and yoke-clamp *i*, having claws to engage with an annular rim *r*, forming a part
 50 of the holder *g*, and the clamping-screw *j*, that engages a threaded opening in the yoke and bears upon the cap *h*, as clearly shown in Fig. 3. This receptacle *g* contains a wire basket or cylinder *x*, open at the top and extending substantially from the top to the bot-
 55 tom of the receptacle *g*, it being of such diameter as to be readily removable from the said receptacle. The object in making the carbid-holder *x* of open wirework is to permit the ash as it accumulates falling from
 60 the holder, and thereby always presenting fresh or unslaked carbid surfaces to the water-spray, it being obvious that by using this form of carbid-holder when the same is removed to be refilled should any unslaked
 65 carbid remain within the holder by gently tapping the sides of the said holder the re-

maining ash will discharge therefrom and the unslaked carbid remain.

The top or cap *h* of the generator has an offtake or discharge opening *h'*, with which
 70 connects a gas-offtake pipe 9, and an opening *h''*, through which passes the feed-pipe 12, the lower end of which has a spray 12^a, adapted to discharge into the carbid basket or holder *x*.

The gas-offtake pipe 9 enters the highest
 75 point of the gas-settling chamber in the tank, as indicated at 18 in the drawings, and said pipe 9 extends below its point of connection with the generator-cap member *h*, as indi-
 80 cated at 9^a, said portion forming a drip or collecting well, and is provided with an escape-valve 9^b, as clearly indicated in Fig. 1.

10 indicates a stand-pipe which enters the gas-purifying chamber *o* at two points, one,
 85 as indicated at 13, below the normal water-line *m* and the other, as indicated at 14, near the upper end of said chamber. The lower end of the stand-pipe is closed and has projected into it a vertical extension 12^b of the
 90 water-feed pipe 12, which extends laterally and passes through the generator-cap *h* and terminates in a spray-nozzle, as before stated. The extension 12^b of the pipe has a series of
 95 water-inlets 12^c arranged one above the other, the purpose of which will presently appear.

8 indicates a pipe located exteriorly of the tank A, the upper end of which passes at 5
 into the upper chamber *k*, while the lower end enters the gas-purifying chamber *o o* at
 100 8^a at a point below the coil 4^a.

7 indicates a pipe which enters the lowest point of the gas-settling chamber *L*, extends toward the exterior of the tank *o*, and terminates at the drip-cock 17, the purpose of
 105 said pipe being to lead off the collections within the settling-chamber *L*, which will readily, by reason of the flaring chamber *f*, flow toward the mouth of the pipe 7.

6 indicates an offtake-pipe which enters
 110 the gas-purifying chamber *o o* at the highest point, and 11 indicates a clean-out which enters the gas-chamber *o o* at its lower end.

26 and 21 indicate stop-cocks by means of which the flow of gas and the water-feed can
 115 be stopped and the communication between the tank A and the carbid-receptacle cut off at will.

The operation of my improved apparatus is best explained as follows: Assuming the
 120 water in both the chamber *o* and the cylinder *d n* to be at the normal water-line *m m* and the carbid placed within the holder *g* and properly sealed, the stop-cocks 26 and 21 are then opened, which allows the water in
 125 the pipe 10 to enter all the perforations in pipe 12 and pass down into the carbid-receptacle and, contacting with the carbid therein, generates the gas within the holder *g*, which passes out through the pipe 9 into the gas-
 130 chamber *L*, where it has an opportunity for settling, and from whence it passes from the

pipe 16 into the cooling-coil 4^a, which is provided with suitable perforations, through which the gas passes into the chamber *o o*, through which it rises and collects in the upper part of the chamber *o o* and passes out into the offtake 6, from which it can be drawn at will. By arranging the parts as described it will be readily seen that the gas-pressure which accumulates within the chamber *o* above the water will serve to force the water down in such chamber and correspondingly upward within the chamber *n*, such operation serving practically the same function of the vertically-movable member of the ordinary gasometer. As the water recedes within the space *o o* by the gas-pressure its level will fall in the plane with the upper end of the pipe 12, and as the gas-pressure increases within the said chamber *o o* the water-level will fall step by step below the several inlets to the pipe 12, the reverse taking place as the pressure of the gas reduces, thereby gradually and intermittently cutting off the supply to the generator proportionate to the varying pressure of gas within the tank produced by the consumption of the gas taken therefrom, it being obvious that as soon as the water within the tank *A* recedes below the lowermost feed-lateral of the pipe 10 water-supply to the generator will cease, it being also understood that as the water within the chamber *o* recedes it correspondingly rises within the chamber *n k*. Thus should the pressure of gas become sufficient to force the water within the chamber *o o* down below the end of pipe 8 the said pipe would then be freed of water and the gas allowed to pass out into the same until it was closed again by the rising of the water within the chamber *o o*, said pipe 8 acting, as it were, as a blow-off or safety-valve, as the gas within the chamber *o o*, as soon as the lower end of the pipe 8 is opened, will pass out through the said pipe into the chamber *k* at the top and out into atmosphere through the vent 1 until the pressure on the water is sufficiently reduced to bring its level again to the point on the lower end of pipe 8.

By constructing the several parts in the manner shown and described the generation of gas can be effected automatically without the use of a shut-off cock to regulate the same. Furthermore, it will be readily seen that supposing the water to be about in line with the lower feed-lateral of the pipe 10 the slight variation of gas-pressure within the chamber *o o* will permit the water to rise or fall and cut in or out the feed-orifices of the section 12^a, one at a time, thereby positively regulating the flow of the water to the carbide-holder proportionate to the pressure of gas contained within the tank *A*.

3 indicates a discharge for drawing off the water from the chamber *o* when necessary.

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

1. An acetylene-gas-generating apparatus

of the character described; comprising a tank having means for filling through the top, and an overflow-outlet in the said top, said tank having a central upwardly-extending section closed at the top from the water-holding space of the tank, its lower end being open and communicating with the aforesaid water-space; a generator and feed-water supply therefor connected with the tank-water space, governed in its supply by the varying water-level in the tank; a gas-collecting space within the said tank; a feed-pipe from the generator discharging into the said gas-collecting space, and a feed-pipe from the said gas-collecting space projected and discharging into the water-space of the tank, all being arranged substantially as shown and described.

2. In an acetylene-gas-generating apparatus as described; the combination with the generator mechanism; said mechanism including a water-feed communicating with the main-tank water-chamber, governed by the rise and fall of the water-level therein; of a tank having a chamber *o o*, serving as a water-holder and gas-collecting space, said chamber having an offtake-pipe 6, the upper end of said tank having an air-chamber terminating in a pendent cylindrical portion communicating with the chamber *o o*, said air-space having an open vent; and the blow-off pipe connecting the air-chamber at the top with the compartment *o o*, substantially as shown and for the purposes described.

3. The combination in an apparatus of the character described; with the gas-generating means, the water-supply of which connects with the main tank and is governed by the rise and fall of water therein; of a main tank having a settling-chamber, a feed-pipe opening therein and communicating with the gas-collecting space of the generator, said tank having an outer compartment *o o*; an inner compartment *n*, said compartment *n*, terminating in an air-space having an open vent and communicating with the compartment *o o*, and a pipe connection joining the settling-chamber of the tank with the water-space of the compartment *o*, all being arranged substantially as shown and for the purposes described.

4. In an acetylene-gas-generating apparatus of the character described; the combination with the tank having an air-space at the top provided with an open vent, and terminating in a central pendent cylinder opening at the bottom into the tank; an annular settling-chamber near the upper end of the tank; said tank having an annular space *o o*, forming a water-holder and a gas-collecting compartment, the gas-collecting portion of which has an offtake 6; a cooling or spray pipe located in the water-compartment of the tank; a pipe connecting the cooling-coil with the settling-chamber of the tank; a generator comprising a carbide-holder; a valved spray-pipe discharging onto the carbide held there-

in; a stand-pipe 10, communicating with the water-space of the compartment *o o*, the lower portion of which is below the normal water-line of said compartment, the said spray-pipe 5 having a perforated member projected up into the stand-pipe; and a gas-offtake pipe connected with the generator-chamber and discharging in the settling-space of the tank, all being arranged substantially as shown and 10 described.

5. The combination in an acetylene-gas-generating apparatus; with the generating mechanism including the water-valved spray-pipe 12; the valved offtake-pipe 9, said offtake- 15 pipe having a valved drip portion; of a tank A, having an annular compartment *o*, forming a combined water and gas collecting space, the gas-collecting portion having an offtake 6; an annular gas-settling compartment L, 20 disposed over the top of the compartment *o*, said compartment communicating with the

gas-pipe 9 of the generator; an air-chamber formed in the upper end of the tank having an open vent, and terminating in a cylindrical pendent portion extending to near the 25 bottom of the tank A, and communicating with the compartment *o*; a cooling-coil located in the lower end of the compartment *o*; a pipe connecting said coil with the settling-space L; a pipe opening at the upper end of 30 the upper space of the tank, its lower end communicating with the tank at a point below the perforated cooling-coil; a drip-pipe 7, connected with the lowermost portion of the settling-space, and a clean-out 11, all be- 35 ing arranged substantially as shown and described.

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Witnesses:

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