No. 652,209. Patented June 19, 1900.

J. S. HARGER.

ACETYLENE GAS GENERATOR.

(Application filed Apr. 26, 1899.)

(No Model.) 3 Sheets—Sheet 1.

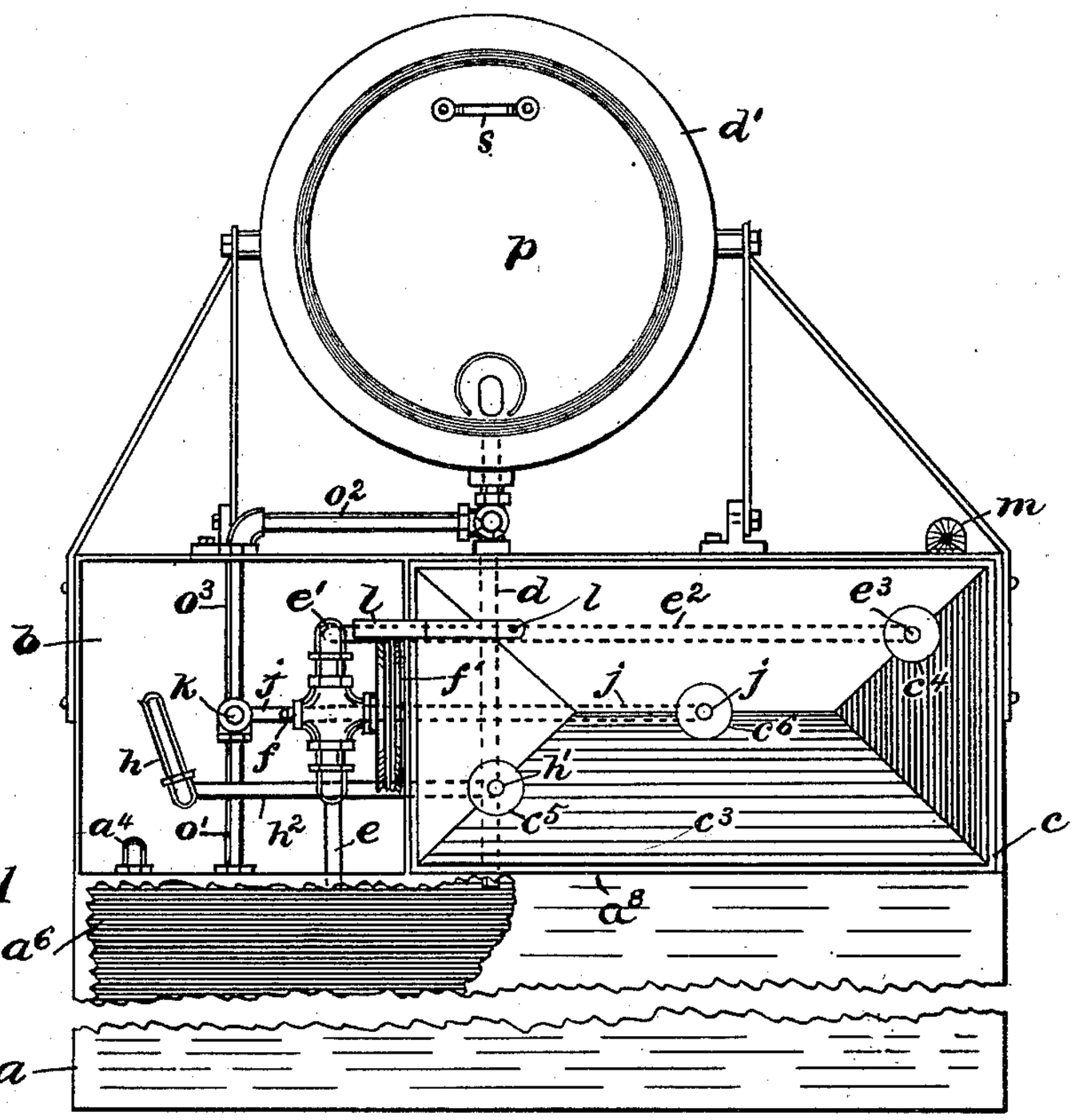

Fig. 1

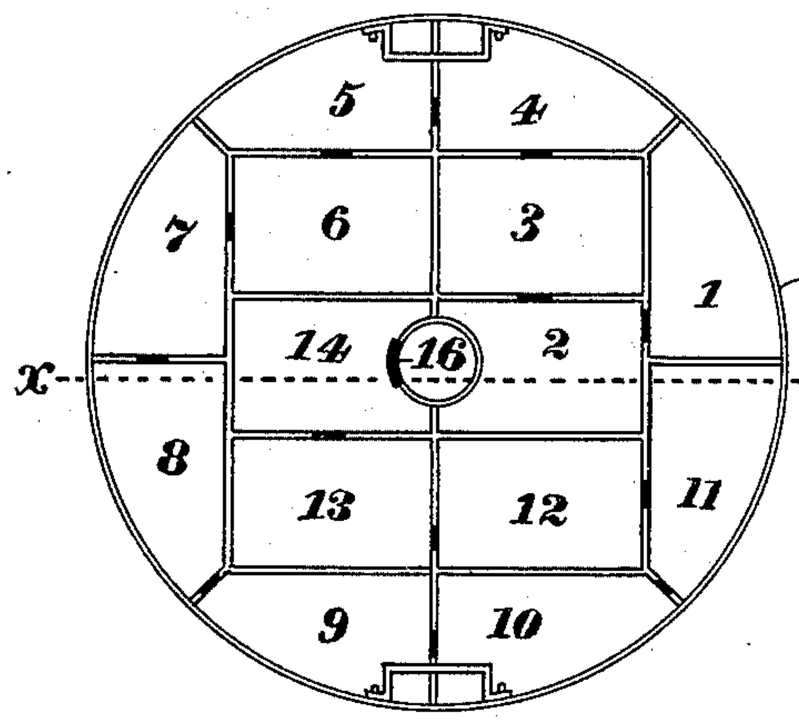

Fig. 4

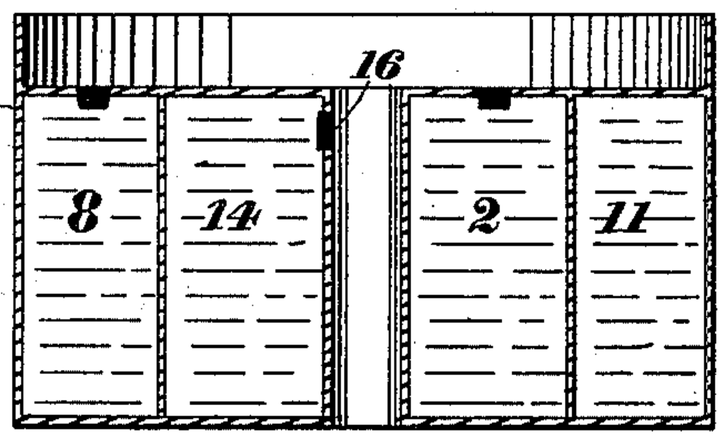

Fig. 5

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Fig. 9.

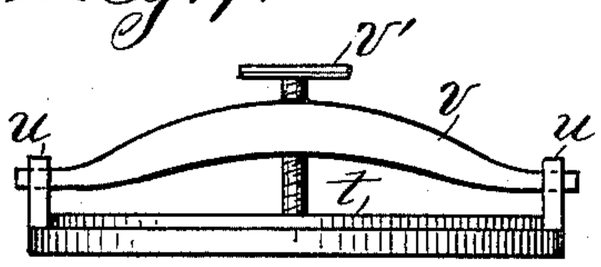
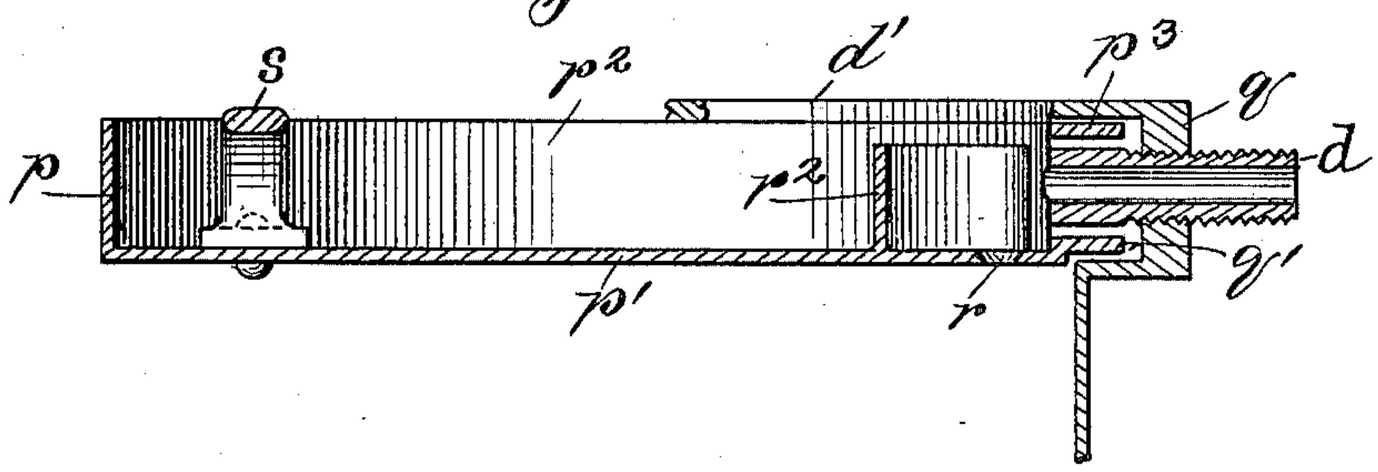


Fig. 2.

Fig. 10.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

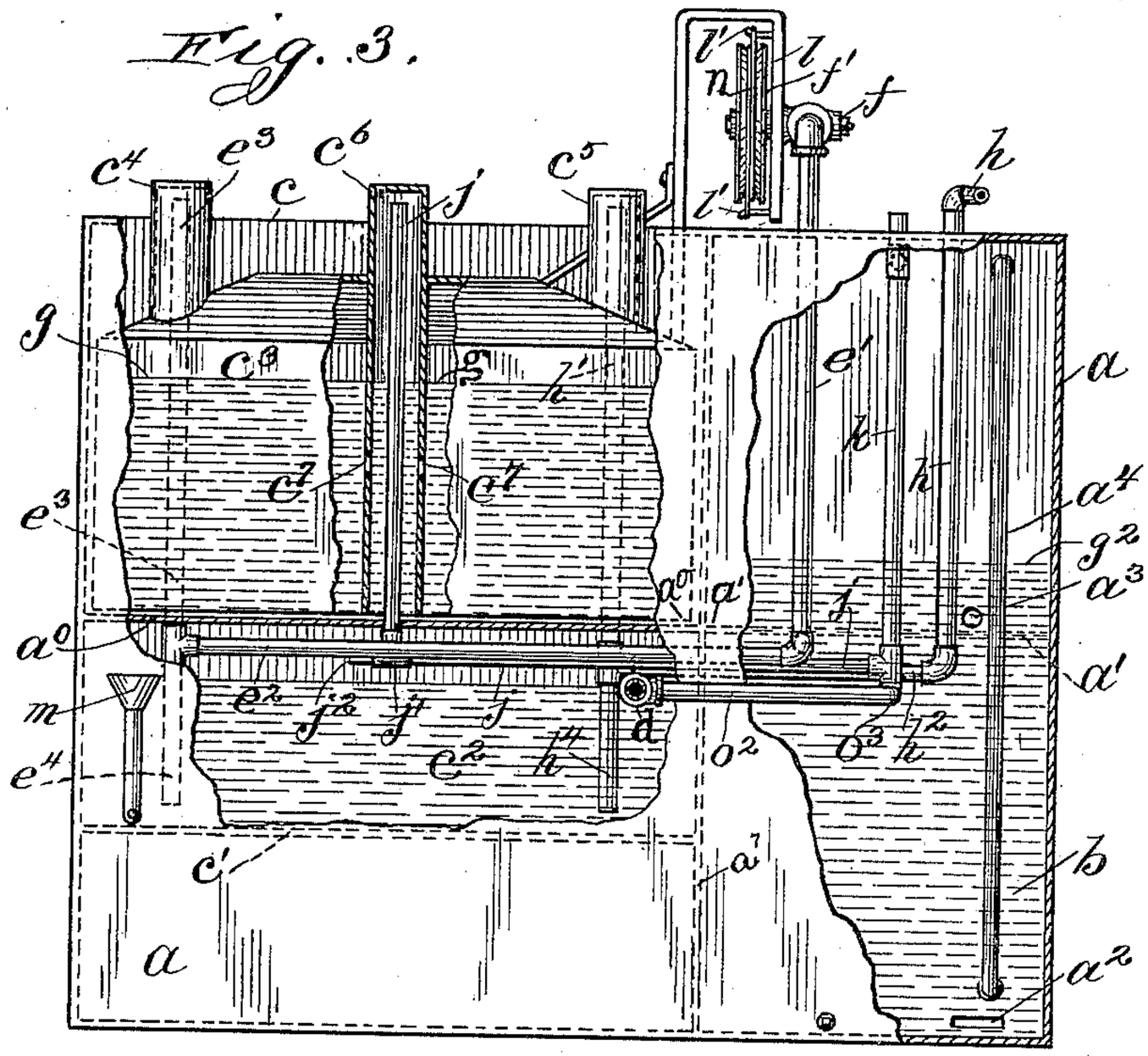


Fig. 7.

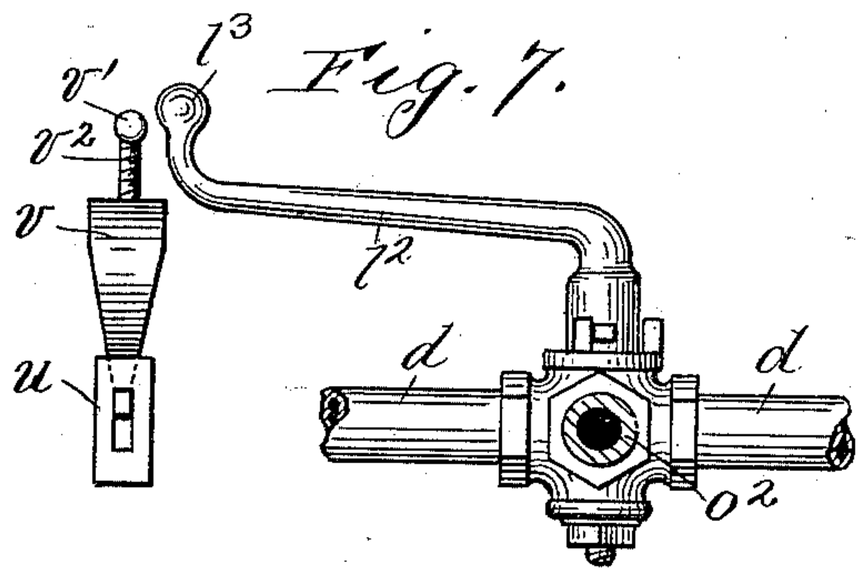


Fig. 6.

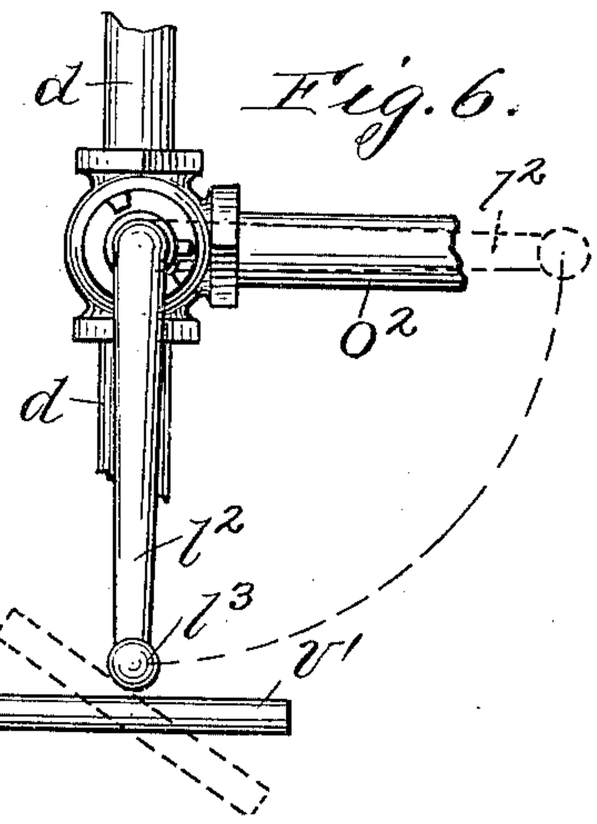
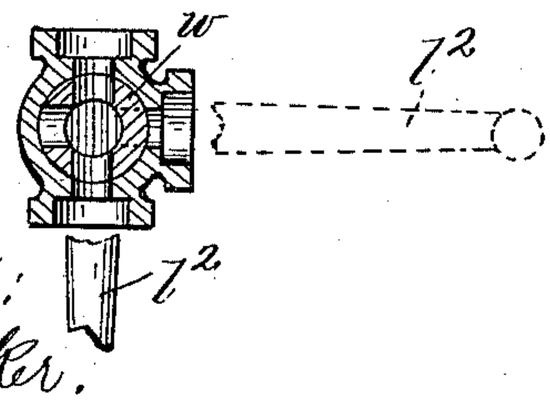


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN SANFORD HARGER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO MARY J. MURPHY, OF SAME PLACE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 652,209, dated June 19, 1900.

Application filed April 26, 1899. Serial No. 714,495. (No model.)

To all whom it may concern:

Be it known that I, JOHN SANFORD HARGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Machines, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 shows my said new acetylene-gas machine in plan view, in part fragmentary, and having a part of the top of the water-chamber broken away to expose its floor and the cover and its yoke or cover-holder of the generator removed. Fig. 2 shows my said device in side elevation, partly fragmentary and partly in section, to show interior construction. Fig. 3 shows the holder or cubical box which holds both gas and water in front elevation without the gas-generator, with various walls broken away to show the interior construction. Fig. 4 shows a plan view of a carbid-bucket, and Fig. 5 shows the same in sectional elevation on the plane $x\,x$ of Fig. 4, both on a scale larger than that of Fig. 1. Fig. 6 shows a plan view of the three-way gated connection between the holder and gas-generator in open position, the position indicated in broken lines showing a closed position. Fig. 7 shows most of Fig. 6 in side elevation as seen from the right-hand side of Fig. 6. Fig. 8 shows a horizontal section of the gate shown in Fig. 6, taken through the axial lines of its pipes. Fig. 9 shows the closing mechanism or cover-holder of the generator. Fig. 10 shows the drip-pan in central vertical section.

Like letters and numerals of reference denote like parts.

The object of my invention is to produce an acetylene-gas machine which shall be easy of management and economical and safe in its operation. To attain said desirable end, I construct my said new machine in substantially the following manner, namely:

I make a cubical holder a of three suitable dimensions, Figs. 1 and 2 showing a portion of the rearwardly-extended dimension of said holder broken out. Said holder is divided horizontally and centrally into two gas-tight compartments a^5 a^6 by means of a floor or diaphragm a'. Near the lower and the central floors are holes a^2 a^3 through the front wall a^8 of said holder. Said front wall also forms the rear wall of a well b, which is in front of said holder and flush with one side of it. Slightly above said hole a^2 enters the lower end of a connecting-pipe a^4 into the gas-chamber and rises to near the top of the chamber a^6, called a "water-chamber," which it enters, as shown. The well b is a rectangular open cistern of about the same depth as the height of the holder a, to the side of which and in front of the holder a is another open-top cistern c, attached to the holder a and separated from said well by a wall a^7, having its front wall in the same plane in which is the front wall of the well b and of which its farther side wall is in a plane corresponding to that wall of the holder a. The bottom a^0 of said cistern is about in the same plane as that of the diaphragm a', and about midway between said floor and the ground-floor of the holder a is a horizontal floor c', which forms the bottom of a room c^2, called a "drip-chamber." Said drip-chamber contains water for sealing the pipe ends e^4 h^4 and whose head is determined by the exterior funnel m thereto connected. A gasometer or bell c^3 floats in a water seal in said cistern, and a feed-pipe d passes through said drip-chamber and into the gas-chamber and connects the latter with the generator d'. Said pipe is placed at such a depth below the floor a' as to be alternately in either the gas or water space of the gas-chamber, as will appear hereinafter.

The generator d' is provided with superimposed carbid-buckets l^5, which are divided into cells, as here shown, from 1 2 3 on to 15, having a central discharge-pipe, with notch 16 and top notches $n^\times$ between the cells 2 and 3 and similarly between all other of said cells, as shown. There is a three-way gate w in the pipe d, provided with a lever l^2, having a vertical handle l^3 close to the central side of a horizontal bar v'. A gas-pipe e from the gas-chamber a^5 ascends out of the well a short distance and then becomes horizontal and provided with a gate f, from which it descends, as pipe e', below the plane of the

floor a^0, at which point it turns under said floor, as pipe e^2, which ends in a T, of which one part ascends through the said floor to near the top of the roof-dome c^4, and the other branch of said T descends through a water seal to near the floor of the tank c^2. A roof-dome c^5 has a gas-pipe h' descending from near its top through the floor a^0 and passes to near the bottom of the tank c^2, where its open end is also in a water seal, and has a T just below the floor a^0, from which a horizontal pipe h^2 passes into the well b and then rises, as pipe h, which supplies the burner-pipes. Said bell c^3 also has a central dome c^6, which descends to the plane of the bottom of the bell, and about eight or nine inches from its lower end are blow-holes c^7, and in said dome is a gas-pipe j, which passes through the floor a^0 and ends in a T, one end of which is open at j^2, and the other end forms a horizontal pipe j, which passes into the well b and then ascends, as pipe k, which near the top of the well receives an inlet-pipe o' from the top of the water-chamber a^6, said pipes o' and k forming blow-off or safety pipes. A bracket l, provided with pins l', is fastened to the bell c^3, so as to be on one edge of a pulley f', attached to the gate f, and around said pulley is passed a cord n, whereof the ends are fastened to said pins l', whereby as the tank c^3 rises and lowers said gate turns, and thus throttles the flow of gas.

The top carbid-cells are covered by a drip-pan p, having a bottom p' and rim p^2, fitting closely within the tank d', and on said rim is a sleeve p^3, which slides over the end of the feed-pipe d, which passes through the boss q on the tank d', into which it is threaded, and around the end of said pipe is an annular space q' in said boss to receive the sleeve p^3, which thus prevents the passage of water outside of the drip-pan instead of through the hole r in the pan-bottom and which said hole is directly over cell 1. A handle s is provided for lifting said pan, and an open rim r^2 prevents the water from the pipe d overflowing the said pan.

To put the machine in operation, the carbid-cells 1 to 15 are charged each with a given weight of carbid and the tank and pipe d closed with the gate w and lid t. Water is then poured into the well until it rises above the level of the floor a', which thereby also fills the gas-chamber a^5 with water. The bell c^3 is sealed with water and the chamber c^2 provided with its water seal through the funnel m. Water is then allowed to flow through the gate w into carbid-cell 1. The gas thus generated flows over the inflowing water through the pipe d and accumulates over the water in the gas-chamber a^5, thereby depressing the water in said chamber by causing it to flow out through the hole a^2 and rise to a head g^2 in the well b, from which it flows through the hole a^3 into the water-chamber a^6, where the water is stored and from whence it flows as it is needed. When said gas-pressure ceases or the gas is exhausted sufficiently from the gas-chamber, the water returns to the gas-chamber until it again flows into the generator and saturates and fills another carbid-cell, whereby the gas-pressure is renewed and the water again lowered below the pipe d, and so on continuously. The gas escapes from the gas-chamber through the pipe e, gate f, and pipes e' e^2 e^3 into the gasometer c^3 and from it through the pipes h h' h^2 to the burners connected to the pipe h. Under the varying gas-pressure the gasometer rises and falls, and thus by means of said cord n turns the gate f, which thereby throttles the flow of gas and thereby keeps a practically-uniform pressure on the service-pipes. If, accidentally, the gas-pressure should continue to lower the water-level in the gas-chamber until it falls below the entrance of the pipe a^4, the gas will then escape through the pipe a^4 into the top of the water-chamber a^6, which is now also nearly full of water, from which the gas will escape through the pipe o' into the blow-off or safety pipe k, and thus prevent all danger of explosion. In like manner if the gasometer should stick and gas continue to flow the gas would lower the water-level g within the bell c^3 until the gas escaped through the blow-off holes c^7 of the dome c^6 and thence escaped down the pipe j into the horizontal pipe j', where at j^2 it would discharge into the tank c^2 at one end and into the pipe k at its other end, and in case that pipe should fail the water in the tank c^2 would be depressed and overflow the funnel m. In the meantime and before such final result the gas might also escape through the water-sealed ends e^4 h^4 and rise above the water in the drip-chamber c^2, and thereby cause its water to overflow the funnel m and release the pressure before the said last preceding condition occurred.

The eyes or lugs u of the generator receive the ends of the yoke v, which is provided with a screw v^2, whose end depresses the lid t gas-tight on the generator. The operating-lever v' of said screw is close to the vertical handle l^3 of the lever l^2, which opens the three-way gate w, when the pipe d passes the gas. The position of said parts v' and l^3 is for the special purpose of necessitating the removal of said handle l^3, which when done closes the gate w to the escape of gas from the gas-holder and thereby prevents accidents. When this machine is to be set in operation, water is poured into the well b until the gas-chamber a^5 is at least entirely full of water. The air escapes through the pipe e and gate f, which is set for that purpose and afterward rearranged to its normal position.

What I claim is—

1. The combination with connected, top-notched and successively-acting carbid-cells and a gated gas and water conveying pipe, of a water-filled gas-chamber below a water-chamber and a well, exterior to and connect-

ing said chambers, and means to pass water from the gas-chamber to the water-chamber through said well, substantially as specified.

2. The combination with connected, top-notched, and successively-acting carbid-cells, and a gated gas and water conveying connecting-pipe, a water-filled gas-chamber, a water-chamber above said gas-chamber, and a well connecting said gas and water chamber, a gasometer and a gated connection between said gas-chamber and gasometer and means connected with said gate and operated by the gasometer to throttle the gas-flow through said gate, substantially as specified.

3. The combination with connected top-notched and successively-acting carbid-cells and a generator with a single pipe opening therein, of a drip-pan with a hole in its bottom and a sleeve to its rim to surround the end of said pipe, substantially as specified.

4. The combination with a water-charged gas-chamber and a superimposed water-chamber and a well to connect said chambers, of a water-sealed gasometer, a pipe, or pipes, connecting said gas-chamber and gasometer, a rotary gate in said pipe, or pipes, and reciprocating mechanism with means to connect the same to said rotatable gate, substantially as specified.

5. The combination with a gas-generator a gas-chamber and a superimposed water-chamber and a well to connect said gas and water chamber, of a gasometer and a drip-chamber and gas-receiving and gas-discharging pipes with water-sealed parts in said drip-chamber, substantially as specified.

6. The combination with a gas-generator, a gas-chamber, and a superimposed water-chamber, and a well with water connections to said chambers, a floating gas-tank and gas-pipes to and from said gas-tank, of a blow-off pipe and a yielding water seal to said gas-pipes, substantially as specified.

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