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Patented Nov. 6, 1900.

H. E. BRUNNER.
ACETYLENE GAS GENERATOR.

(Application filed Apr. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.

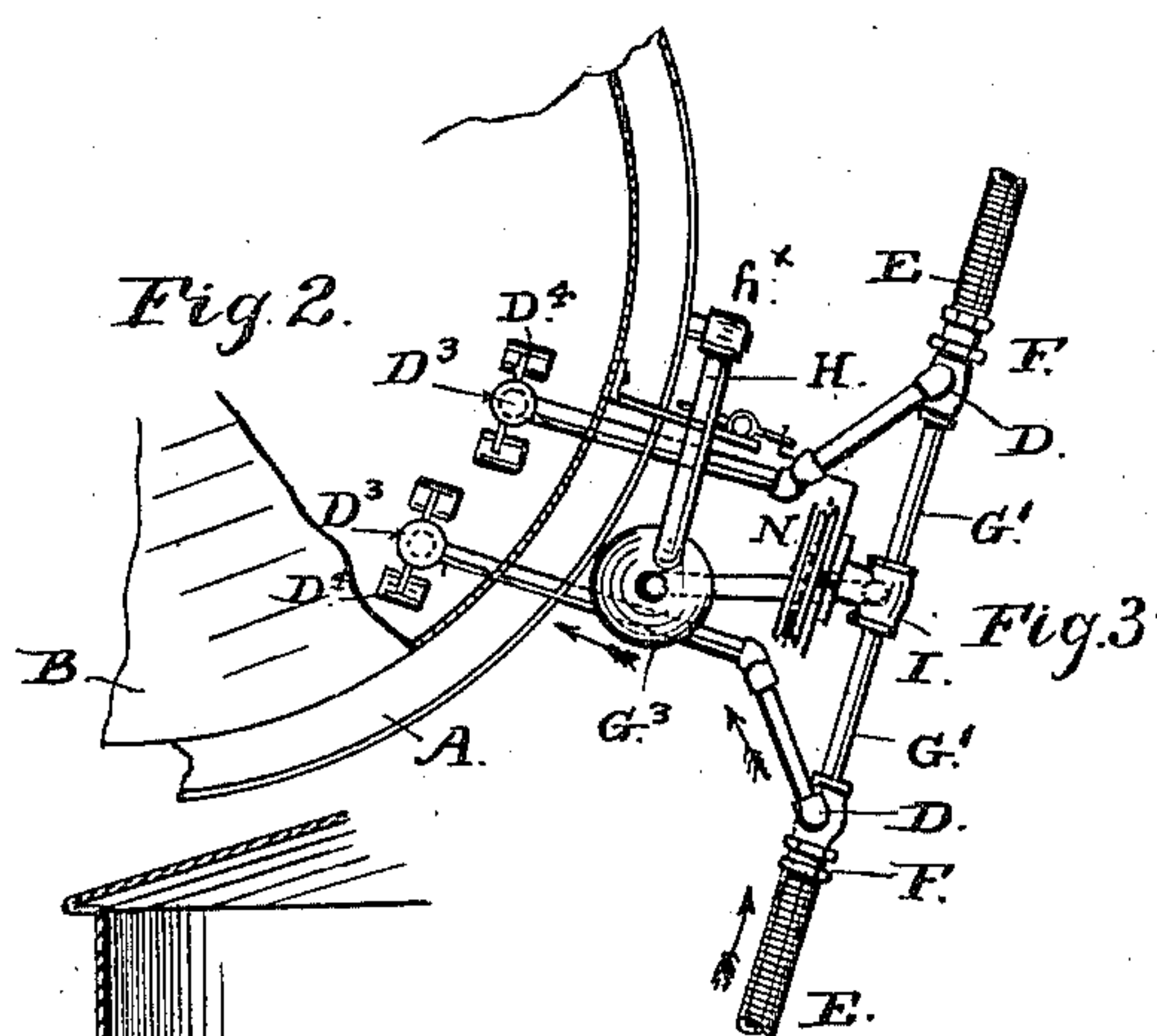
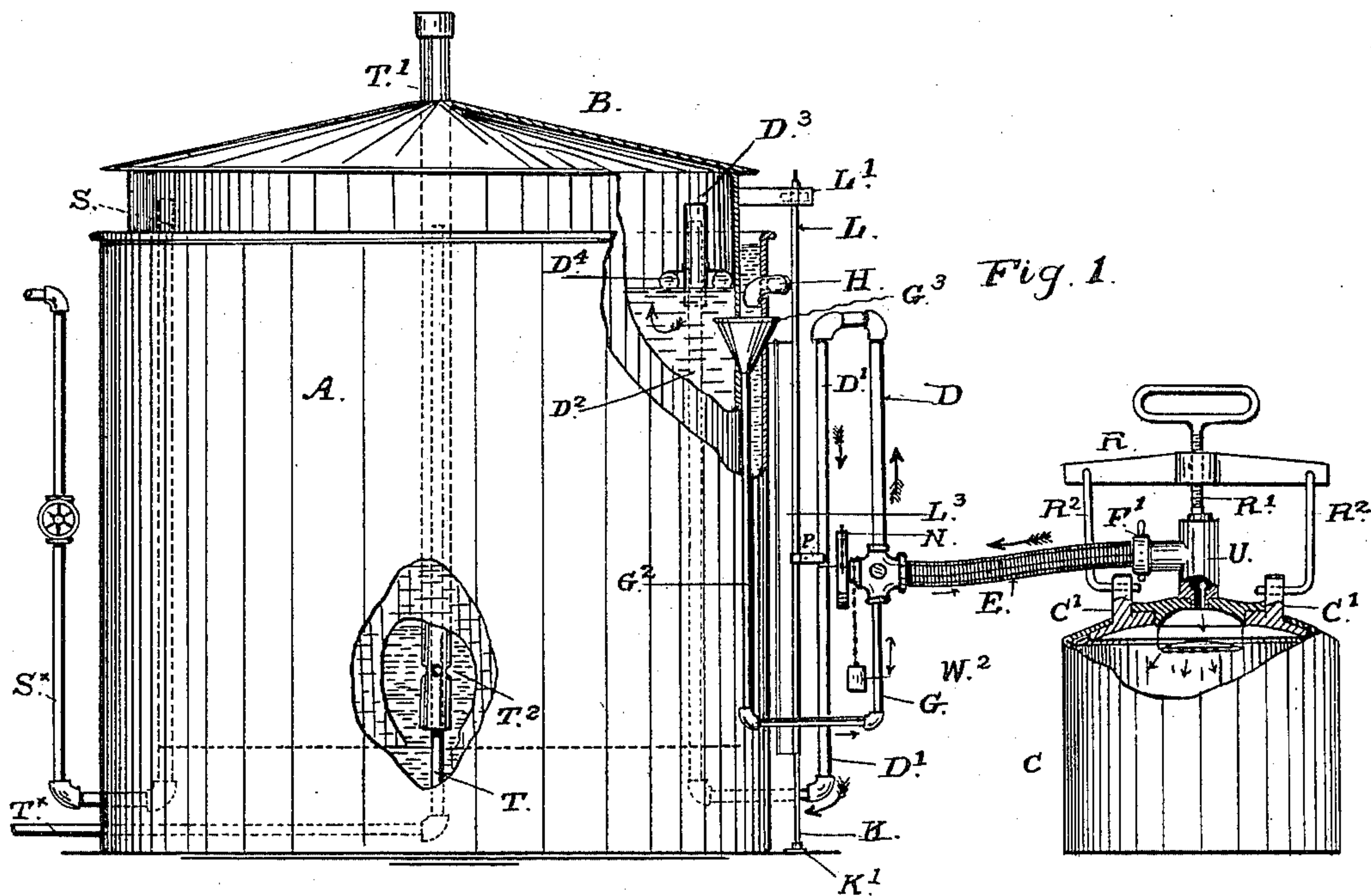
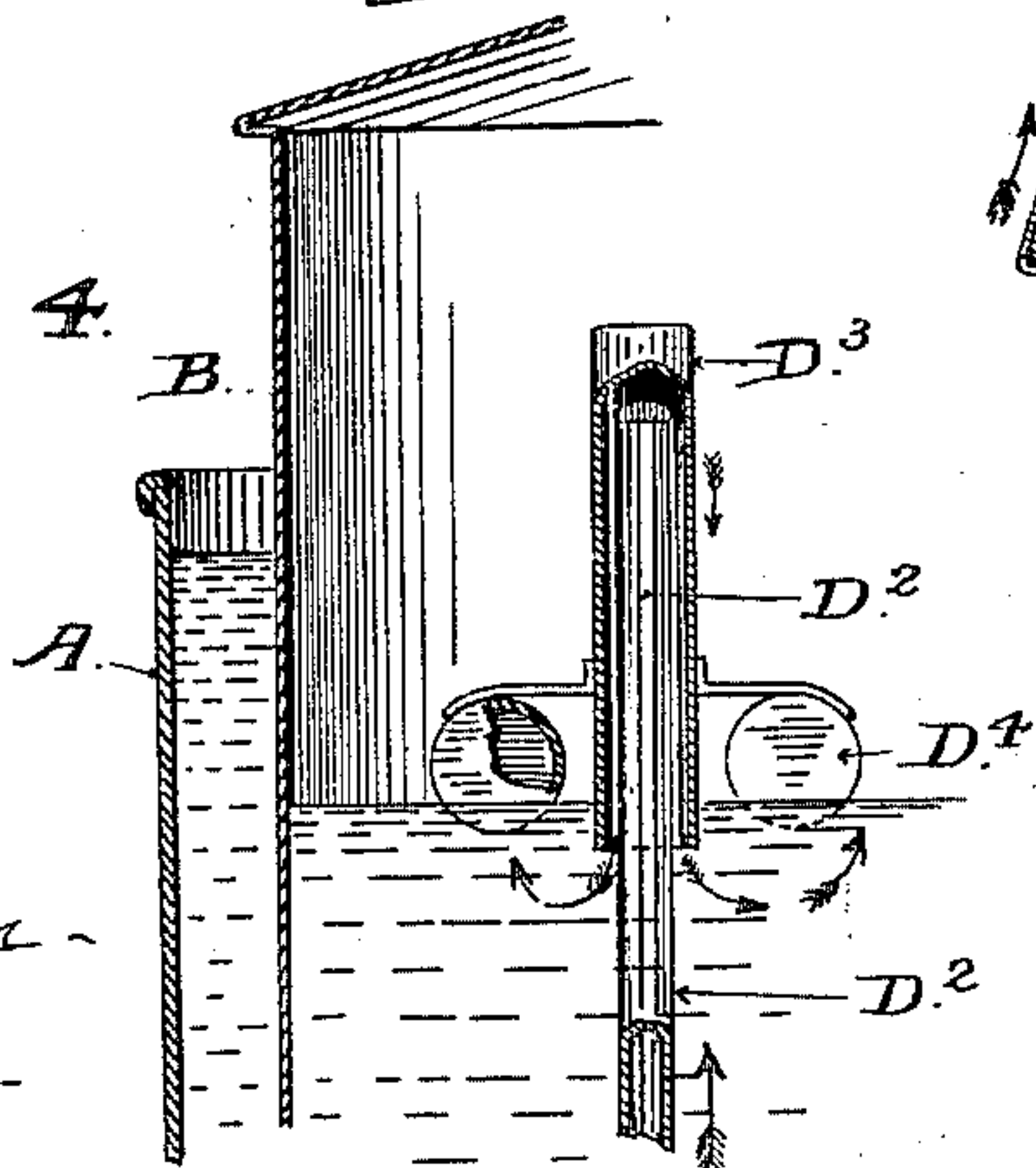


Fig. 4.



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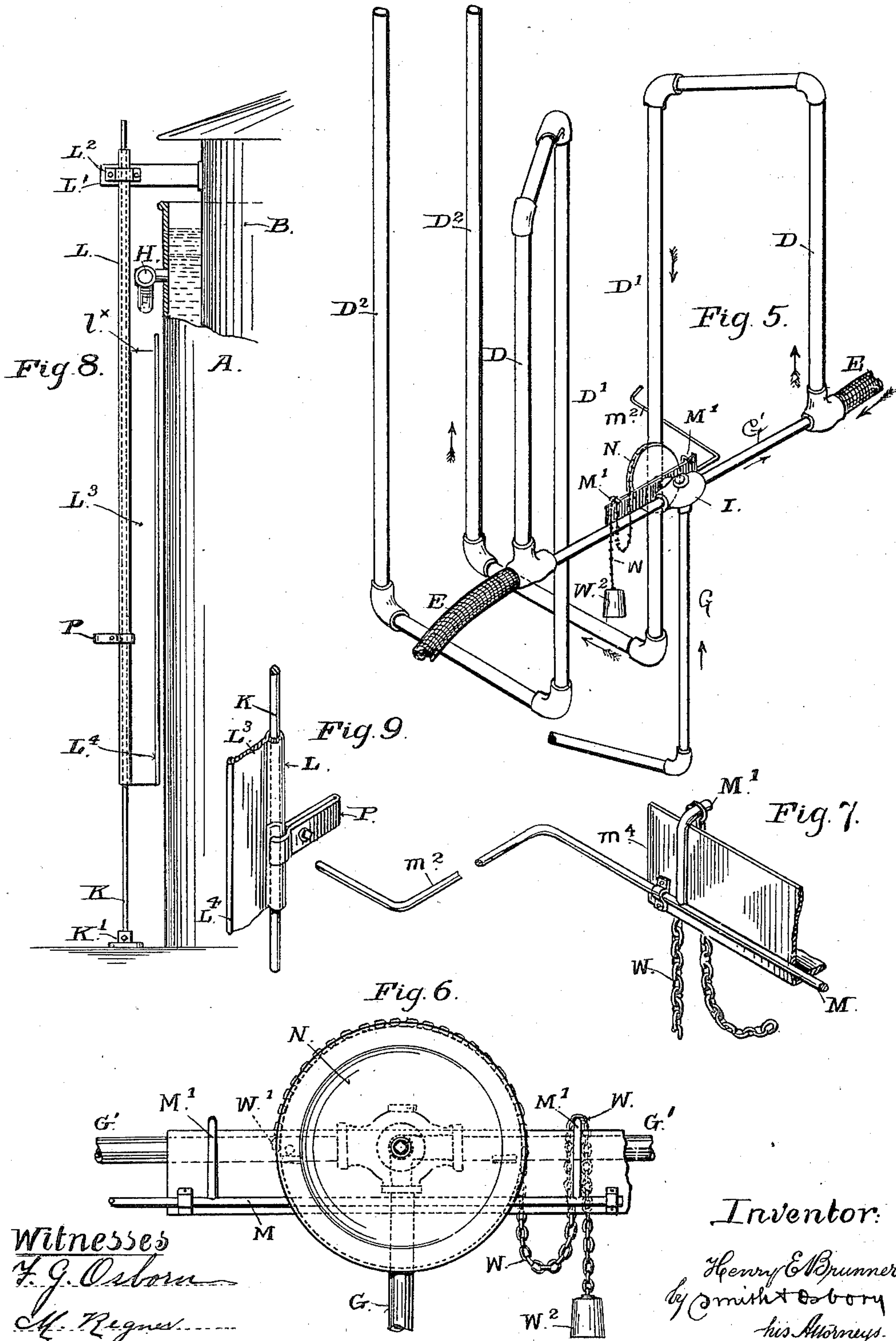
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

HENRY E. BRUNNER, OF HAYWARDS, CALIFORNIA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 661,284, dated November 6, 1900.

Application filed April 27, 1899. Serial No. 714,766. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. BRUNNER, a citizen of the United States of America, residing at Haywards, in the county of Alameda and State of California, have invented new and useful Improvements in Acetylene-Gas Machines, of which the following is a specification.

This invention has for its object mainly the production of a machine for generating and supplying acetylene gas having several points and features of construction that render it specially adapted for household use and in situations where such machines would be under the management of unskilled persons.

The invention embraces several novel elements and features, including those of safety and the absence of valves or cocks in the connections between the generator and the gas-holder. Among its novel features are the automatic control of the generator and its regulation in the production of gas by or from the movements of the gas-holder or in proportion to the quantity drawn from the gas-holder and the independent connection of several generators in series with the gas-holder in such manner that they are brought into action in successive order, one separately of the other, to maintain a continuous production of gas for the desired period. Each generator is connected with the gas-holder by separate connections, which allow the gas to pass from the generator into the gas-holder after the water is cut off or the generator is exhausted, but which prevent the flow of gas from the holder back into the generator or the connections between the generator and the gas-holder.

The following description explains at length the nature of my said improvement and the manner in which I proceed to construct and carry out the same, reference being had to the drawings that accompany and form part of this specification.

Figure 1 of the drawings is an elevation of a gas-machine constructed in accordance with my said improvements, portions of the gas-holding tank and the generator being broken away to show it in section. Fig. 2 is a part plan or top view in section, on a reduced scale, of the gas-holder and the independent connections between the gas-holder and two

generators. Fig. 3 is an elevation in detail of the parts of the generator and couplings for the connecting water and gas pipes. Fig. 4 is a vertical section of the trap and floats covering the outlet end of the connection between the gas-holder and the generator. Fig. 5 is a view in perspective of the water-pipes and gas-pipes and connections between the generator, the gas-holder, and the water-tank. Fig. 6 is an elevation, on an enlarged scale, of the valve mechanism controlling the supply of water to the gas-generators. Fig. 7 is a perspective view of the releasing device of the valve mechanism. Fig. 8 is an elevation, on an enlarged scale, of the tripping device that operates the valve mechanism by the movement of the gas-holder. Fig. 9 is a detail in perspective of the tripping device.

A indicates the water-tank, and B the floating gas-holder movable therein under the fluctuations of the body of gas confined in the space between the body of water and the top of the gas-holder.

C indicates a generator to contain a charge of calcium carbide.

D is a standing pipe having a return bend or leg D' outside the tank and an upright member D² situated within the inner cylinder B.

D³ is a cap or tube with a closed top covering the open end of the pipe D² and extending into the body of water in the gas-holder a sufficient distance to maintain a water seal, by virtue of which the back pressure of the gas in the holder is taken from the pipe D², while at all times the gas is free to flow from the generator into the gas-holder. This cap is carried by floats D⁴, which maintain a uniform submergence of the end of the cap-tube under all variations in the water-level.

E is a flexible coupling-pipe connected to the member D by a union F and provided on the other end with a coupling F' for connecting it with the generator.

G is a water-supply tube connected with the gas-conductor through a three-way cock I in a branch G' and having an upright limb or member G², the upper end of which is set in close relation to the side of the water-tank and is provided with a funnel-shaped mouth G³.

H is a swinging tube connected by a loose joint h^x to an outlet in the side of the tank A below the level of the water seal and of

proper length to extend from that connection h^x to the funnel G^3 , so as to turn the water into the funnel when the body of the tube H is inclined downward and to cut off the supply to the generator as often as the mouth of the tube is elevated above the level of the water in the tank.

The parts or features of the present improvements that pertain to the control and regulation of the water supplied to the generator by the rise and fall of the gas-holder comprise a novel means for raising and lowering the tube from the movements of the gas-holder, but do not include, broadly, the idea of taking the supply of water for the generator directly from the water seal of the gas-tank nor the use and combination of a swinging tube and a conducting-pipe disconnected from the tank from which the supply of water is taken. These parts in themselves are not claimed as novel in the present invention.

The means for raising and lowering the tube H by or from the variations in the consumption of gas from the holder operates both to cut off the supply of water to the generator and to stop the further production of gas when it flows into the holder more rapidly than it is drawn off or is found to accumulate therein above a given quantity, and also to renew the supply and start the generator again as soon as the quantity of gas stored in the tank is reduced below a given limit. The controlling device is so constructed that in the last-mentioned operation it will bring the pipe H into working position to supply the generator with water at a point of time sufficiently in advance of the extreme lowest position of the gas-holder to replenish the gas in the tank before the quantity therein is entirely exhausted. This device for raising and lowering the faucet H consists of a stationary upright rod K, fixed in a socket K' on the floor, and a section of tube L, rigidly attached to the movable bell of the gas-holder by a bracket L' and fitted to slide on the stationary rod, which constitutes a guide to maintain the tube in perpendicular position in its movements, and a plate or broad web L^3 , fast on and projecting from one side of the tube, with a stiffening-wire L^4 on the outer edge; but while this last-mentioned part extends laterally from the tube toward the body of the gas-holder for nearly the entire length of the tube its top edge terminates at a short distance below the faucet H, so that in the upward movement of the gas-holder in the tank the edge of the plate L^3 will not strike the faucet-body until the desired quantity of gas is stored in the gas-holder; but, on the other hand, when that quantity has accumulated the edge of the projecting part L^3 on the moving tube L will be brought against the faucet H from beneath, and by the continued movement in an upward direction it will elevate the outer end of the faucet, and thus cut off the flow of water. In the continued upward movement of the gas-holder the nose of the faucet will ride

against the web L^3 and will be held elevated at the required angle to shut off the water and will remain also in line with the top edge l^x to drop over it as soon as the return or downward movement of the gas-holder brings the tube L low enough for that purpose. The time of such contact between the edge l^x and the faucet H is regulated by loosening the clamp L^2 on the bracket L' and shifting the tube L up or down. By this adjustment the cutting-off point of the pipe H can be regulated as required and so as to accumulate a greater or less quantity of gas in the holder before the operation of generating the gas is suspended or interrupted by shutting off the supply of water to the generator.

The generator is constructed with a view to afford a clear opening unobstructed by bails or clamps and a ready access to the interior when the cover is removed. The fastening for the cover furnishes a convenient handle for carrying the generator and one that can readily be detached and taken off when the generator is to be cleaned and recharged.

The yoke R has a screw-threaded aperture for a clamp-screw R' , and to the ends are loosely attached rods or long hooks R^2 , the ends of which are turned at right angles to take into holes in ears C' upon the top of the generator. From these ears the yoke is detachable, so that it can be removed, leaving the top-opening unobstructed except for the short ears.

The cover C^2 has a broad flange fitted to the rim C^3 of the generator to insure a tight joint, and in the top an aperture C^4 is provided to receive the end of the coupling U, by which the draw-off tube is connected to the generator. This coupling is formed of a T-shaped tube having a screw-threaded socket U' on the central member to receive one end of the flexible tube E and a shouldered end portion U^2 to fit the hole in the cover and bear upon the top around that aperture. The top end of this principal member U is closed and formed with a seat for the point of the screw R' . The opposite end of the hose or flexible tube is connected to the shorter limb of the gas-pipe by the union-joint, and to that part is connected the water-pipe G, the three-way cock I being placed at that point and properly connected to control both the flow of water from the pipe G into the generator, as well as to shut off communication of both pipes with the generator.

The capacity of the machine is enlarged by connecting two generators to the gas-holder, and in that case separate and independent connections are provided for the two generators, so that when one is exhausted or the water is shut off from it there is still an open communication with the gas-holder, and no accumulation of gas under pressure can take place in the generator or its connections after it has ceased to operate actively. In using two generators each one is connected with the gas-holder by a separate pipe arranged

as shown in Fig. 5, with a single water-supply pipe connected to the shorter limb of each gas-pipe by the pipes G' through the cock I. According to the direction in which this cock is turned the water will be supplied from the tank to one generator and will be cut off from the other. The connections between the gas-holder and the generator are of such construction that valves are dispensed with, and thus the danger arising from leakage or from sticking valves is avoided.

In Figs. 2, 5, 6, and 7 I have illustrated a reversing device of novel construction by which the water is cut off from the exhausted generator and is let into the charged generator as soon as the body of gas in the gas-holder is reduced below a given quantity, the operation of this device being controlled in an automatic manner from the fall of the gas-holder in its tank.

On the stem of the plug in the three-way cock is fixed a sheave N, in the groove of which is a cord or chain W, attached at one end W' to the sheave and having on the other end a weight W². This chain is laid around the upper part of the sheave, so as to hang down on the opposite side of the axis from the point where the end of the chain is attached, and the weight is of proper size to turn the sheave a quarter-revolution when released and allowed to drop. The weight is supported and taken from the sheave by a catch composed of a rocker-shaft M, having two upright arms M' with hooked ends and an outwardly-turned arm m² on the end, standing at right angles to the main part of the shaft. Bearings for the shaft are provided on the front of the upright plate m⁴ of the frame or support that carries the sheave, this plate forming a stop by which the arms are held in upright position when the chain is hooked onto the bent end of one or the other. In that position, as illustrated in Fig. 6, the chain depends in a loop behind the plate, and the weight is held off the sheave until the outer end of the rock-shaft is struck from above with sufficient force to throw back the arm and free its hooked end from the chain. For this purpose a projecting arm or finger P, fixed on the piece L in line with the projecting end of the shaft M, is so arranged or adjusted as to come in contact with and press down the bent end m² of the shaft M at the proper time in the downward movement of the gas-holder to trip the weight W², thereby reversing the cock N and cutting off the water from one and turning it into the other generator. After the weight has been released and caused to turn the sheave in one direction it is laid over the top of the sheave to the opposite side of the axis, and the chain is hung on the hook upon that side of the device, so that it is ready to act on the sheave again when the rock-shaft is turned by the next descending movement of the gas-holder; but in the next operation the sheave is turned in the opposite direction because the weight

is placed on that side of the sheave. After the weight has been adjusted and hung from the proper hook on the operating-shaft this device requires no further attention and is ready to act as soon as the gas-holder has reached the limit of its downward movement when it is necessary or desirable to change the generators.

The pipe S conducts the gas away from the machine for use, and a connection outside the machine is made between that pipe and the service-pipe by the horizontal limb S^x, extending through the side of the tank. Its upright limb S opens into the gas-holding space above the water.

A safety-vent or blow-off operated by the rise of the gas-holder under the accumulation of gas when the quantity increases beyond what might be considered the limit of safety is arranged to open communication with a separate outlet-pipe T and allow a portion of the gas to escape. This blow-off is composed of the stationary stand-pipe T, connected with an outlet branch or limb T^x and a tube T', attached at the top end to the head of the movable gas-holder, from which it extends downward over the stationary pipe, so as to telescope over and cover the outlet end of that pipe. In the sides of this tube, at a greater or less distance below the working level of the water in the holder, are several apertures T², and through these the gas is allowed to flow into that tube, and thus escape through the standing pipe S when the gas-holder rises sufficiently high to uncover the vent-holes T². The time at which this blow-off will act is regulated by the distance of the apertures below the surface of the water.

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

1. In an acetylene-gas-generating apparatus, the combination, with a stationary water-tank, a floating gasometer therein, and a pivotally-attached faucet on the tank adapted by virtue of its adjustment to draw off a supply of water from the tank to the gas-generating chamber of the apparatus; of means for elevating and depressing the said faucet from the movements of the gasometer in the tank, comprising the stationary guide, a web or vertical plate slidable on said guide and adapted by its position with relation to the faucet to elevate and hold up the outer end of that member in the upward movement of the plate, and means adjustably connecting the upper end of the slidable web to the gasometer, whereby the time of contact between the web and the faucet can be regulated to take place earlier or later in the rise of the gasometer, as set forth.

2. In an acetylene-gas machine, the combination, with the floating gasometer movable in its tank under the variations in the generation and consumption of the gas, and having a pivotally-attached faucet which is adapted to supply water from the tank to the gas-

generator; of the stationary guide K, slidable
tube L, vertical web or plate L³ on said tube,
and the bracket L' and clamp L² on the gas-
ometer as a means for adjustably connecting
5 the slidable tube to the gasometer.

3. The combination, with a three-way cock
connecting two generating-chambers with a
common gasometer; of means for turning said
cock to connect one generator and disconnect
10 the other by the movements of the gasometer,
comprising a sheave on the stem of the cock,
a weight attached to said sheave by a chain,

means for supporting the weight to hold the
same out of action, and a tripping device ac-
tuated by the movements of the gas-holder 15
and adapted to detach the weight in the down-
ward movement of the gasometer and allow
the weight to act on the sheave.

In testimony that I claim the foregoing I
have hereunto set my hand and seal.

HENRY E. BRUNNER. [L. S.]

Witnesses:

EDWARD E. OSBORN,
M. REGNER.