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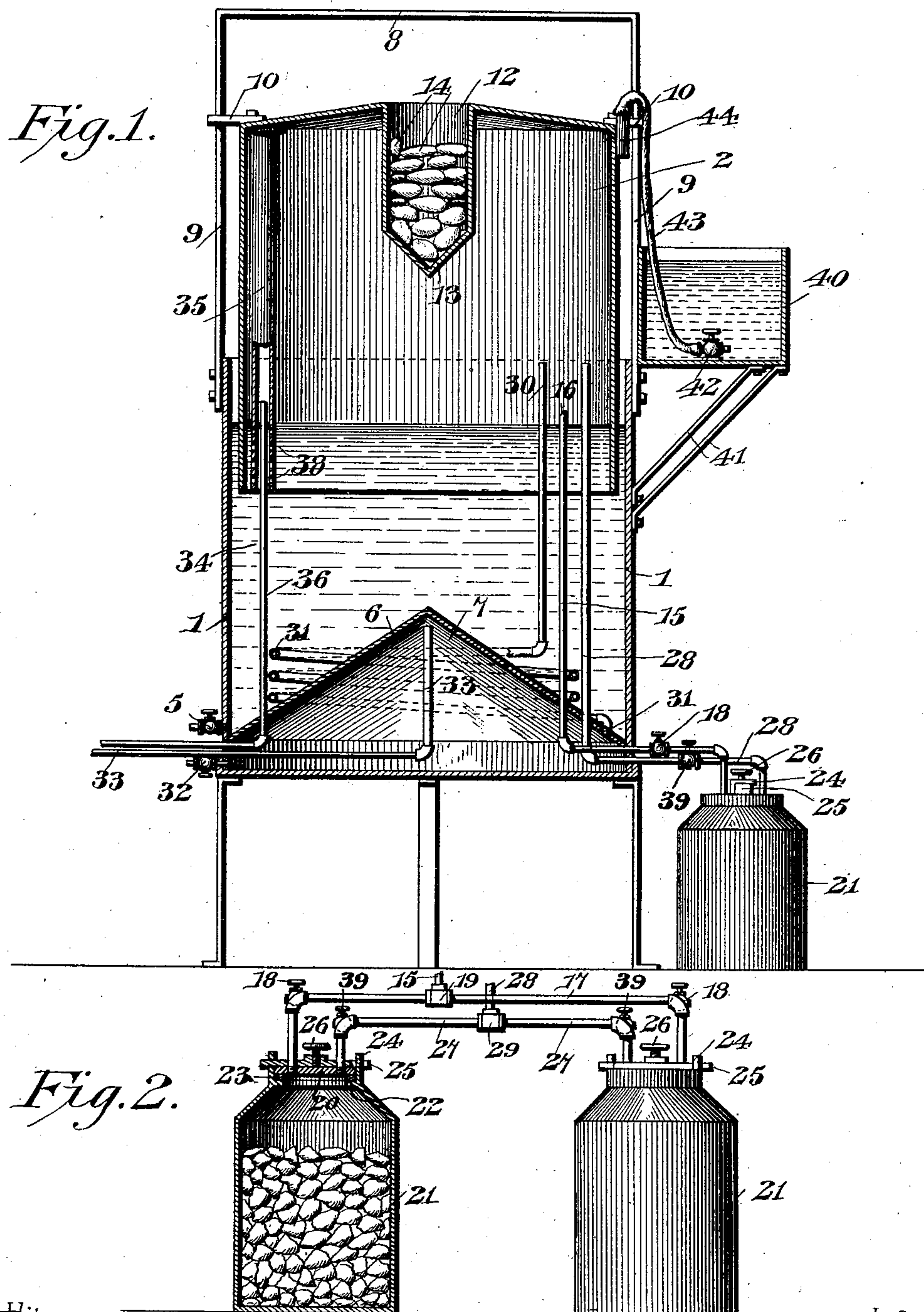
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C. OGBURN.

ACETYLENE GAS GENERATOR.

(Application filed Nov. 1, 1898.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

CALVIN OGBURN, OF RIVERSIDE, CALIFORNIA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 643,777, dated February 20, 1900.

Application filed November 1, 1898. Serial No. 695,168. (No model.)

To all whom it may concern:

Be it known that I, CALVIN OGBURN, a citizen of the United States, residing at Riverside, in the county of Riverside and State of California, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

This invention relates to acetylene-gas generators; and it has for its object to provide a new and useful construction of gas-generator of this type especially adapted for the lighting of halls, churches, stores, residences, factories, and other buildings where a medium or large number of burners are required.

To this end the invention contemplates an improved construction of generator constructed of a minimum number of parts and having simple and efficient means for insuring a uniform generation of the gas and in sufficiently small quantities to insure perfect safety in the use and handling of the apparatus.

A further object of the invention is to provide the generator with improved means for supplying water to the carbide by the displacement of the water, so that the supply of water to the carbide is in no way dependent upon the gas-pressure, whereby the gas-pressure is necessarily always the same, and therefore eliminates from the apparatus the danger of the gas reaching an excessive pressure, which is liable to occur in most types of acetylene-gas generators. The invention also provides for the thorough cooling of the gas and the elimination therefrom of all aqueous vapor and other condensable matter before the same is delivered to the service-pipe.

Another object of the invention is to provide simple and efficient means for automatically replenishing the water in the water-tank of the gasometer during the operation of the apparatus, and in carrying out this object the invention contemplates the employment of a water-supplying device automatically controlled by the rise and fall of the gas-bell of the gasometer.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

While the improvements contemplated by the present invention are necessarily susceptible to modification without departing from the spirit or principle of the invention, the preferred embodiment of the latter is illustrated in the accompanying drawings, forming a part of this application, and in which—

Figure 1 is a vertical longitudinal sectional view of an acetylene-gas generator constructed in accordance with my invention. Fig. 2 is a detail view of the exterior pair of carbide vessels, showing one of such vessels in section and illustrating the water and gas pipe connection with both vessels.

Referring to the accompanying drawings, the numeral 1 designates an upright water-tank closed at its lower end and provided with an open upper end, within which is arranged to freely play the vertically-movable gas-bell 2, said water-tank 1 and gas-bell 2 constituting what is commonly known in the art as a "gasometer." The upright water-tank 1 of the gasometer is designed to be arranged on any suitable support, and whenever it is desired or becomes necessary to drain the tank 1 of water or sediment standing therein this may be accomplished by opening the drain-cock 5, fitted to the tank 1, at one side thereof, and at the bottom of the chamber holding the water.

The upright tank 1 of the apparatus has fitted within the lower end thereof a conical false bottom 6, inclosing at the lower end of the tank a conical reservoir and condensing-chamber 7, into which the generated gas is directed before delivering the same to the point of use, and the utility of the said combined reservoir and condensing-chamber 7 will hereinafter be more fully explained in connection with the piping of the apparatus. In addition to the parts referred to, said tank has rigidly fitted to the upper end thereof an inverted-U-shaped guide-yoke 8, having the vertical parallel side rods 9, which are slidably engaged by the guiding-loops 10, secured to the top of the vertically-movable gas-bell 2 at diametrically opposite points, and through the medium of the said rods 9 and the guiding-loops 10 the gas-bell 2 is steadied and guided in its up-and-down movement within the water-tank.

The vertically-movable gas-bell 2, which is

inverted in the water-tank, has depending centrally from the top or upper dished end thereof a hollow cylindrical water-displacer 12, having an open upper end communicating exterior to the bell and provided at its lower closed end with a conical entering point 13, which readily enters the water within the water-tank and provides for the submerging of the displacer 12 in the water with the least possible resistance. The hollow cylindrical displacer 12 depends a material distance within the bell from the top thereof, and by being open at its upper end is designed to readily receive a suitable weight-filling 14, which insures the positive drop or plunging of the gas-bell into the water-tank as the supply of gas within the bell diminishes.

The plunging of the displacer 12 into the water within the water-tank necessarily displaces a certain amount of water, and this displaced water will overflow into the upright water-supply pipe 15, the upper end of which projects to a distance near the upper end of the water-tank and is preferably beveled at 16 to facilitate the flowing of the water into the same. The water-supply pipe 15 is supported in a vertical position within the tank, and the lower end of said pipe is extended through the side of the water-tank, at the bottom thereof, and is provided exterior to the tank with oppositely-extending branches 17, each provided with a suitable stop-cock 18. The oppositely-extending branches 17 of the pipe 15 are preferably connected thereto by a union or similar coupling 19, which permits its branches to be swung in a vertical direction when removing and replacing the lids or covers 20 of the carbid vessels 21. A pair of the carbid vessels 21 is preferably employed in connection with the apparatus, and these vessels are arranged exterior to the water-tank 1 and preferably in a plane below the bottom thereof, as plainly illustrated in Fig. 1 of the drawings. Each carbid vessel 21 consists of a plain cylindrical tank designed to have placed therein a charge of calcium carbid and provided with an upper open end having therein an interior annular seat 22, between which and the lid or cover 20 is interposed a suitable packing-gasket 23, and at this point it is to be observed that the lid or cover 20 of each carbid vessel 21 is designed to have rigidly fitted therein one of the branches 17 of the water-supply pipe 15. To provide for securely fastening the lid or cover 20 in place, each carbid vessel 21 is provided at its upper end with a pair of diametrically opposite loops or hooks 24, designed to respectively receive the opposite ends of a fastening-bar 25, arranged transversely above the lid or cover 20 and having mounted centrally therein a clamping-screw 26, adapted to impinge on the cover, and thereby provide simple and efficient means whereby the same can be tightly fastened in place to close the vessel, while at the same time permitting ready access to the vessel when recharging the same. The lid

or cover 20 of each carbid vessel 21 also has suitably fitted therein one end of one of the branches 27 of the gas-conducting pipe 28. The branches 27 of the pipe 28 extend in opposite directions, so as to connect with the separate carbid vessels, and are also preferably connected with said pipe 28 by a union or similar coupling 29, so as not to interfere with the removing and replacing of the lids or covers to the carbid vessels.

The gas-conducting pipe extends through the side of the water-tank 1 and projects upwardly therein alongside of the pipe 15 and extends to a point above the level of the water in the water-tank, so as to deliver the gas into the gas-bell 2. The gas which accumulates within the bell 2 is discharged therefrom into a condensing-pipe 30, having an upright portion grouped with the pipes 15 and 28 and provided with condensing-coils 31, encircling the upper surface of the combined reservoir and condensing-chamber 7 within the water-tank 1. The lower end of the condensing-pipe 30 is fitted to the reservoir and chamber 7 near the bottom thereof, so that the gas entering said chamber 7 will necessarily be caused to rise against the conical or sloping side thereof. The gas which comes in contact with the conical cooled sides of the chamber 7 has eliminated therefrom by condensation any aqueous vapor or other condensable matter not condensed in the coil 31, and the products of condensation drip from the conical walls of the chamber 7 to the bottom thereof, from which the products of condensation may be drawn off to the drain-cock 32, fitted to the water-tank at its lower end and communicating with the interior of the chamber 7. The purified and cooled gas collects within the chamber 7, at the apex thereof, and from this point is drawn off through the delivery-pipe 33, extending outside of the water-tank and connecting with the service-pipe of the gas-lighting system. The inner end of the delivery-pipe 33, within the chamber 7, extends to the apex thereof, so as to take out only the thoroughly purified and cooled gas.

In order to provide for blowing off or venting any excess of gas within the gas-bell and to satisfy the requirements of insurance organizations, the apparatus may be provided with a safety-pipe 34 of the form shown in Fig. 1 of the drawings. This safety-pipe consists of the upper and lower telescoping pipe-sections 35 and 36, respectively, the lower pipe-section 36 extending through the side of the water-tank to an exterior point and having its inner vertical portion within the tank projecting to a point near the top thereof and receiving thereover the larger upper section 35. The upper section 35 of the safety-pipe is rigidly secured at its upper end to the gas-bell 2, so as to move in unison therewith, and adjacent to its lower end it works over the lower section 36. The said upper pipe-section 35 is provided with a plurality of vent-

perforations 38, which under normal conditions are submerged or sealed in the water within the tank, so that there is no escape of gas through the safety-pipe. In the event of
 5 an abnormal or excessive amount of gas accumulating within the bell the latter rises to a point which will cause the vent-perforations 38 to be uncovered, and thereby permit the excess of gas to blow off through the
 10 lower pipe-section 36. When the excess of gas has been relieved, the bell 2 again lowers and causes the perforations 38 to be covered by the water.

In the use of the apparatus after the water-tank and carbid vessels have been charged the stop-cocks 39 of the gas-pipe branch 27 and the cocks 18 of the water-pipe branch 17, connected with the carbid vessel not in use, are closed, while communication with the
 15 other carbid vessel is opened up. By now opening the drain-cock 32 or opening all the gas-jets in the building the air is allowed to escape from the apparatus and the gas-bell will gradually settle until the water-displacer
 20 12 enters the water and causes an overflow into the water-supply pipe 15, from which the water passes to the carbid vessel in use. Gas will be immediately given off and enter the gas-bell either through the water-supply
 25 pipe 15 or the gas-conducting pipe 28, or both, and as the gas accumulates in the bell the latter rises and carries the displacer out of the water, thereby automatically cutting off the water-supply until the generated gas
 30 has been used. This operation is repeated automatically until the charge of the chemical is exhausted.

It is preferable to employ in connection with the apparatus two carbid vessels, using
 40 but one at a time, although it will be obvious that both vessels could be used at the same time, if desired.

To provide for automatically replenishing the water in the water-tank 1, an automatic
 45 water-supply device is preferably used in connection with the gasometer, and in carrying out this feature of the invention there is employed an exterior water-supply reservoir 40, which is arranged entirely outside of the gas-
 50 omer and is rigidly attached to the water-tank by suitable fastening means, so that the bottom thereof will be substantially on a level with the top of the tank. The exterior
 55 water-supply reservoir 40 is preferably sustained in its elevated position on the exterior of the water-tank and on the top thereof by means of the inclined bottom braces 41, extending from the side of the water-tank to the bottom of the reservoir 40; but it will of
 60 course be understood that the said supply-reservoir may be attached to the water-tank in any convenient manner and, in fact, could be supported on a separate stand or shelf without interfering with the operation of
 65 automatically replenishing the water within the gasometer as the gas-bell 2 rises and falls. The exterior water-supply reservoir

40 preferably has fitted within the bottom thereof a pet or similar cock 42, the projecting end or nipple of which has fitted there-
 70 over one end of a flexible supply pipe or hose 43. This flexible supply pipe or hose 43 extends out of the reservoir 40 and is fitted at its other end on the upper end of a connecting-nipple 44, fitted to the gas-bell 2. The
 75 nipple 44 is soldered or otherwise suitably secured to the gas-bell 2, preferably on top and at one edge thereof, said nipple being open at its lower end, as well as at its upper end, whereby the water which passes through the
 80 supply pipe or hose 43 will be directed by the said nipple directly against the exterior or outside of the gas-bell 2 and will flow down the outside of the said gas-bell into the water-tank.
 85

In the operation of the apparatus when the gas-bell descends it necessarily carries with it the end of the flexible supply-pipe attached thereto, and when said bell has reached a position bringing the end of the flexible pipe or
 90 hose attached thereto below the level of the water in the exterior supply-reservoir 40 the water will then flow from this reservoir into the water-tank of the gasometer in the manner explained. This, together with the dis-
 95 placement of the water by the cylindrical cone-pointed displacer 12, causes the water within the water-tank to overflow the pipe leading to the carbid vessel or vessels. As already explained, the gas which is eliminated
 100 from the carbid and passes into the gasometer causes the gas-bell to rise and carry with it the end of the pipe or hose 43 attached thereto, thus automatically cutting off the flow of
 105 water from the reservoir. When the gas in the gasometer is being exhausted, the bell descends and the water is discharged as before, thus insuring an entirely automatic supply of the water.

It has already been explained that the ap-
 110 paratus is preferably provided with two carbid vessels; but it will be obvious that only one of such vessels may be used to carry out the invention, and while a separate pipe has
 115 been shown and described for conducting the gas from the carbid vessel or vessels into the gasometer the water-supply pipe 15, by being made sufficiently large, may be utilized for the two purposes—namely, to conduct the
 120 overflow of water into the carbid vessel or vessels and to carry the gas generated therein into the gasometer; but these expedients do not affect the operation of the apparatus in the slightest degree and are fully within
 125 the scope of the invention.

Other changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this
 130 invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In an acetylene-gas generator, an up-

right water-tank provided within the lower end thereof with a closed conical reservoir and condensing-chamber, the gas-bell movable within the tank, the carbid vessel having a water-supply connection with the tank, a gas-condensing pipe projecting into the gas-bell and provided with a condensing-coil encircling the upper conical side of said reservoir and chamber and communicating with the interior thereof, and a gas-delivery pipe having an inner portion disposed within the conical reservoir and condensing-chamber and extending directly into the apex thereof, substantially as set forth.

2. In an acetylene-gas generator, the gasometer, a water-supply reservoir arranged exterior to the gasometer, and a flexible supply-pipe having one end fixedly connected with the reservoir and its other end connected with the exterior gas-bell to deliver the supply of water against the outer side of the latter, substantially as set forth.

3. In an acetylene-gas generator, the gas-

ometer, an exterior water-supply reservoir supported at the top of the water-tank of the gasometer, a supply-cock fitted to the reservoir, and a flexible supply-pipe connected at one end to said supply-cock and at its other end with the gas-bell to deliver the supply of water against the outer side of the latter, substantially as set forth.

4. In an acetylene-gas generator, the gasometer, the exterior water-supply reservoir supported at the top of the water-tank of the gasometer, a nipple open at both ends secured on the outside of the gas-bell and movable therewith, and a flexible pipe connection between said reservoir and the nipple, substantially as set forth.

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

CALVIN OGBURN.

Witnesses:

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