No. 638,221. Patented Dec. 5, 1899.

H. ELDRIDGE.

ACETYLENE GAS GENERATING LAMP.

(Application filed Apr. 26, 1899.)

(No Model.)

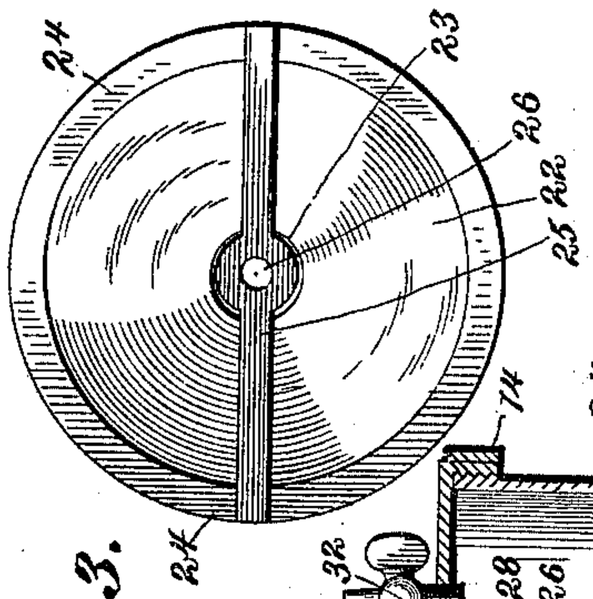

Fig. 3.

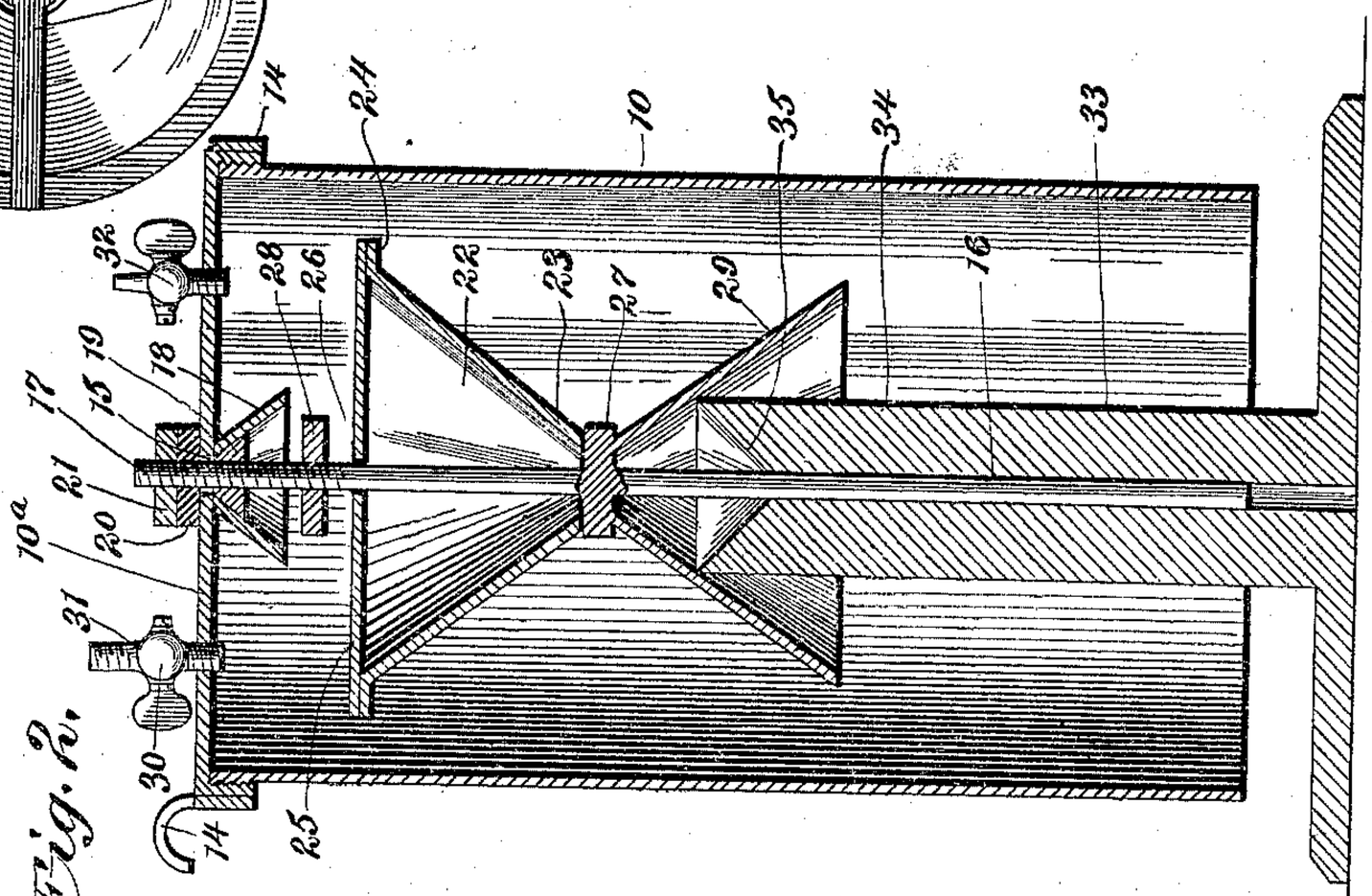

Fig. 2.

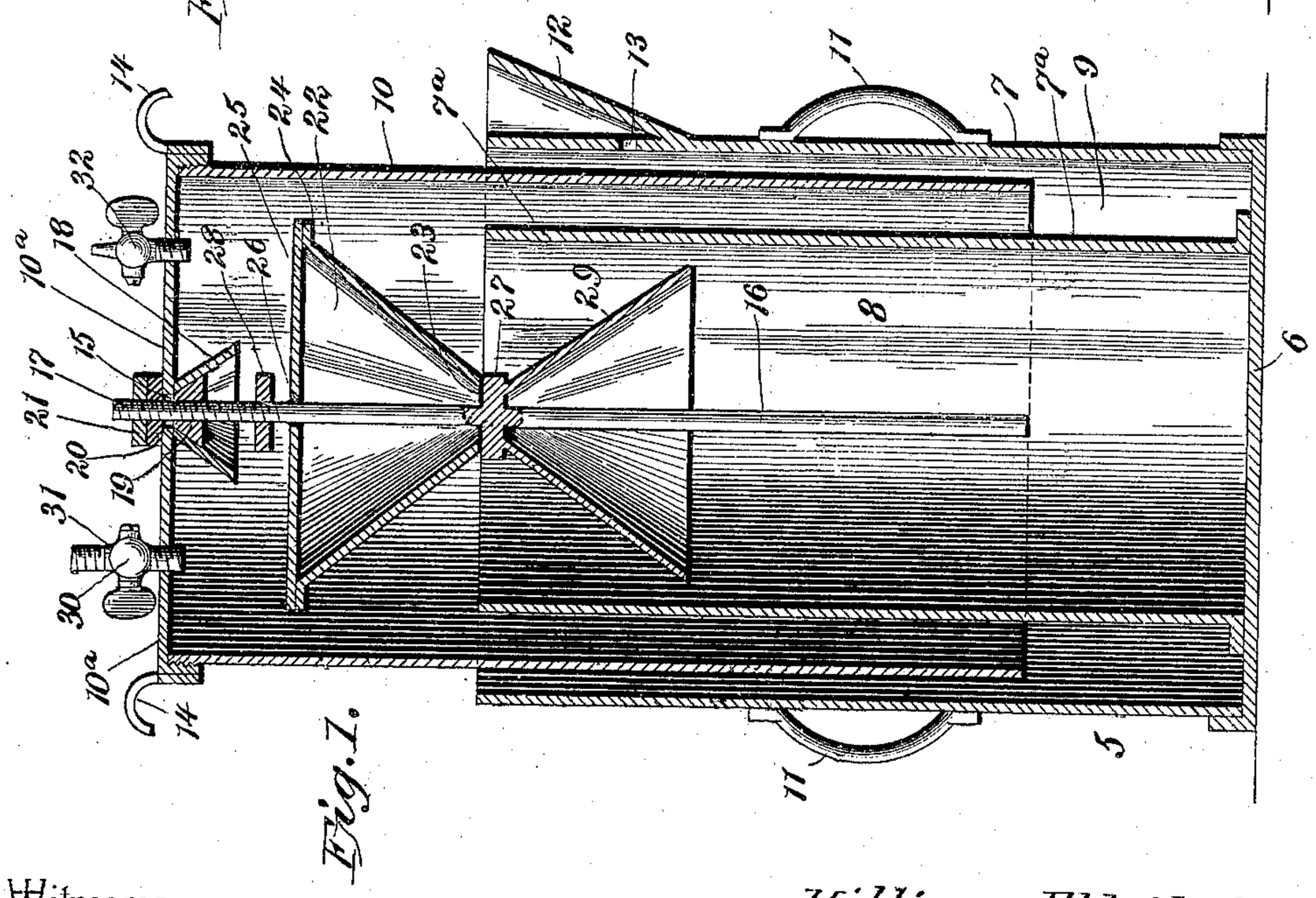

Fig. 1.

Witnesses
Howard D. Orr.
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Hilliary Eldridge, Inventor
By his Attorneys,
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UNITED STATES PATENT OFFICE.

HILLIARY ELDRIDGE, OF GALVESTON, TEXAS.

ACETYLENE-GAS-GENERATING LAMP.

SPECIFICATION forming part of Letters Patent No. 638,221, dated December 5, 1899.

Application filed April 26, 1899. Serial No. 714,569. (No model.)

To all whom it may concern:

Be it known that I, HILLIARY ELDRIDGE, a citizen of the United States, residing at Galveston, in the county of Galveston and State of Texas, have invented a new and useful Acetylene-Gas Lamp, of which the following is a specification.

My invention relates to improvements in acetylene-gas generators of that class wherein the charge of calcium carbid is contained in a magazine free from the influence of moisture and is dropped in regulated quantities into a bell of attacking liquid for the production of acetylene gas.

The primary object of the invention is to provide a generator especially adapted for service as a portable table-lamp, although the principles of the invention may be availed of in construction of devices for use generally in the production of acetylene gas. A portable gas-lamp, it should be noted, requires the elements to be made of compact simple construction for easy handling and movement, and the parts should be capable of ready separation and assemblage to facilitate renewal of the carbid-supply and cleansing of the tank from the carbid residue.

One of the leading features of my invention is a carbid-magazine movable with the floatable bell under certain conditions and a valve mechanism associated with said magazine and adapted to open a passage for the outlet of a limited quantity of carbid when the bell descends approximately to the limit of its lowermost travel, whereby the carbid is dropped into the bath for the resumption of gas-generation on a reduction of the available gas-supply in the apparatus.

A further feature of the invention is the provision of a skirt below the carbid-magazine and connected with the bell to travel therewith at all periods of its movement, said skirt being arranged to intercept the gas as it ascends from the bath, so as to condense the aqueous vapors which are contained in the heated gas, and said skirt also intercepting the carbid as it is dropped from the magazine in order to uniformly distribute the carbid in the water-bath for the attainment of maximum efficiency in the generation of the gas.

The apparatus also includes devices by which the leading elements are connected operatively to the bell for removal therewith in order to place the apparatus in a condition for easy cleaning of the tank and the expeditious renewal of the carbid-supply in the magazine, and also to provide means for regulating the travel of the movable magazine and the bell, and also to promote convenience in the manipulation and control of the working elements which constitute the apparatus.

The invention further consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter more fully described and claimed.

To enable others to understand the invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a vertical sectional elevation of an acetylene-gas generator constructed in accordance with the principles of my invention and illustrating the floatable bell in its raised position. Fig. 2 is a vertical sectional elevation of the floatable bell with the attached parts removed from the tank of the apparatus and fitted to a supporting-stand in a manner which permits removal of the bell from the carbid-magazine, so as to conveniently renew the charge of carbid in said magazine. Fig. 3 is a detail plan view of the carbid-magazine removed from the carrying-stem, and other parts of the generator.

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

In carrying my invention into practice I employ a stationary tank 5, which is constructed to form an independent water-chamber and a surrounding seal-chamber, and with this tank is combined a floatable gas-bell, which, as in some types of apparatus, carries the carbid-magazine. The magazine of my apparatus, however, is distinguished from the general class of devices in this art in that the magazine is adapted to seat itself within the tank against continued downward movement with the gas-bell on a reduction of the available gas-supply, and with this magazine is associated a valve device, which moves with the bell in all periods of its travel, whereby the

valve device opens the magazine for discharging a limited quantity of carbid therefrom when said magazine comes to a period of rest, thus dropping the carbid in the bath of the attacking liquid which is contained within the tank.

The tank 5 is constructed as shown more clearly by Fig. 1, and it includes a bottom 6 and concentric shells 7 7ª, said shells being united to the bottom by flanges and soldered joints in order to produce a gas and water tight structure. It will be understood, however, that the detailed construction of the tank may be varied within wide limits by a skilled constructor. The inner shell 7ª forms within the tank a chamber 8, which is adapted to be partially filled with water as the bath for attacking the carbid to produce acetylene gas, and this shell 7ª is arranged concentric with the shell 7 to provide a seal-chamber 9, which is independent of the chamber 8 and surrounds the latter for the purpose of receiving a sufficient quantity of water to form a seal for the floatable gas-bell. Said gas-bell 10 consists of a suitable shell and a head 10ª, which is shown by the drawings as having the flange and threaded connection with the shell. The bell is thus closed at its upper end and open at its lower end, and said open and lower end of the bell is inverted within the seal-chamber 9 of the tank, thus adapting the bell to travel freely within the water seal of the tank under the variations in the volume of gas stored or contained in the apparatus.

The seal-chamber 9 of the tank is designed to be filled with water to a considerable level above the water in the bath-chamber 8, and as a convenient means for supplying water to the seal-chamber I have provided the filling-spout 12, which is attached to the outside of the tank-shell 7, near the upper end thereof. The filling-spout has a broad open end in which the water may be conveniently poured, and communication between this spout and the seal-chamber 9 is established by a port 13, which is in the shell 7 near the bottom of the spout. To enable the apparatus to be easily handled or moved from one place to another, I provide the tank 5 with handles 11 of any suitable construction and which are attached to the outer shell 7 thereof, and in like manner the floatable gas-bell 10 is provided at its upper end with handles 14, which project outwardly from said bell and are disposed in positions to avoid interference with the travel of the bell 10 within the seal-chamber of the tank.

The floatable gas-bell is constructed for the reception of a stem which is adapted to carry the carbid-magazine and the flared skirt, and this stem is fastened to the head of the bell by clamping devices which produce a gas-tight joint between the stem and bell-head and at the same time permit the ready removal of the bell when it is desired to recharge the magazine with a fresh supply of active carbid. The head 10ª of the floatable bell is provided with a central aperture 15, through which is passed the upper extremity of the stem 16. Said stem is disposed centrally within the floatable bell, and its upper end is provided with an external or male screw-thread 17, said screw-thread extending a part of the length of said stem, as clearly shown by Figs. 1 and 2. To facilitate the entrance of the threaded end of said stem 16 into the aperture 15 of the bell-head in assembling the parts together, I employ a conical guide 18. This guide is fixed to the lower base or side of the bell-head in any suitable way, and it is fashioned to surround the central aperture 15 in the bell. A conical jam-nut 19 is screwed on the threaded end 17 of the central stem, and this jam-nut is adapted to fit snugly in the conical guide 18 of the bell. A gasket 20 is fitted on the threaded stem 16 and bears against the upper face of the head 10ª, and a nut 21 is screwed on said stem to bear upon the gasket 20. It will be noted that the conical nut 19 bears against the guide 18, which surrounds the aperture 15, and the gasket 20 is adapted to be pressed between the head and the nut 21, whereby the two nuts coact in fastening the stem to the bell, and the gasket is compressed tightly around the aperture 15 for the purpose of making a gas-tight joint between the stem and the bell-head.

One of the leading features of my portable gas-generator is the magazine 22, which is flared or of inverted-conical construction, and this magazine is fitted loosely on the central stem 16, so as to travel with the stem and bell under certain conditions, and at the same time the magazine is adapted to seat itself within the tank against continued downward movement with the stem and the bell. The flared magazine is provided at or near its upper edge with an annular ledge or rim 24, which protrudes beyond the face of the magazine, and this ledge or rim is of a diameter greater than the internal diameter of the inner shell 7ª, forming a part of the tank 5, whereby in the descent of the magazine with the stem and bell the flange or rim 24 is adapted to rest upon the tank-shell 7ª in a manner to arrest the continued downward movement of the magazine with the stem 16, which travels with the bell. The magazine is provided at its upper end with a transverse guide-bar 25, arranged centrally across the upper open end of said magazine and fastened securely at its ends to the flange or rim 24, and this guide-bar is enlarged at its middle to provide for the formation of the guide-aperture 26 therein. As the guide-bar is fastened securely to the magazine it presents the central vertical hole 26 in a position for the stem 16 to pass freely therethrough, and said bar thus serves as the means for loosely and slidably connecting the magazine to the carrying-stem 16, so that the magazine will be held in proper position on the stem and at the same time it is free to rest upon the tank for the stem to continue its vertical travel with the floatable bell.

27 designates a disk which constitutes the bottom of the flared magazine and as a valve therefor. The flared magazine 22 is open at its small end, and the disk 27 is fast with the central stem 16, so as to travel therewith at all times. The disk is arranged on the standard 16 at a point below the magazine, and said magazine is adapted to have its lower end rest directly upon the disk, whereby the gravity of the magazine and the carbid charge or load therein causes the magazine under ordinary circumstances to be seated upon the valve-disk 27.

To limit the vertical movement of the stem with relation to the carbid-magazine when the latter is seated within the tank 5 to occupy a stationary position therein, I provide a stop 28, which is fixed to the stem 16 at a point above the cross-bar 25 of the magazine, and this stop is preferably in the form of a nut, which is screwed on the threaded part 17 of the stem 16. The stop 28 occupies a distance above the valve 27 greater than the depth of the carbid-magazine, and the guide-bar 25 is adapted to abut against this stop when the magazine is seated within the tank, and the stem and stop continue to descend with the floatable bell on a reduction of the gas-supply, whereby the valve 27 is adapted to be carried by the stem away from the lower open end of the magazine to discharge the carbid therefrom.

The flared skirt 29 is arranged below the carbid-magazine, and it is connected with the central stem 16 to travel therewith at all times. The flared skirt is arranged in a position reversed to the taper or conicity of the magazine, and the lower end of said skirt is of a diameter somewhat less than the internal diameter of the shell 7^a, forming a part of the tank, thus providing a free space around the edge of the skirt and the inner surface of the tank-shell 7^a for the passage of gas. As shown by the drawings, the flared skirt 29 has its upper end made fast with the valve-disk for the attachment of the skirt to the stem; but it is evident that the valve and the skirt may be attached individually to the stem. Said skirt lies immediately below the valve and is contiguous to the carbid-magazine, and thus the skirt is disposed in a position to intercept the carbid as it drops from the magazine and before it passes into the bath contained in the chamber 8, whereby the skirt serves to change the course of the carbid as it is dropped and is made to operate as a distributer in order to uniformly deposit the carbid in the bath for the attainment of maximum efficiency. This skirt is, furthermore, made of hollow form to present a broad area of condensing-surface in the path of the ascending gas, and thus the skirt is made to intercept the gas for the latter to impinge against the surface of the skirt to effect the condensation of the aqueous vapors which are contained in the heated gas as it ascends from the water-bath.

The head of the gas-bell is furnished with a gas-outlet valve 30, which is tapped in the bell to communicate with the chamber thereof, and said gas-valve is provided with a threaded nipple 31, which is adapted for the attachment of a burner or of devices which convey the gas from the valve to the burner. In the portable type of apparatus adapted for service as a table-lamp the burner and accessory parts may be mounted upon the head of the bell in any suitable way, said burner being suitably connected with the nipple 31, or the burner may be screwed directly to the nipple, as desired.

A vent-cock 32 is also attached to the gas-bell for the purpose of permitting air to escape from the bell when the apparatus is first set in operation.

From the foregoing description it will be noted that the carrying-stem serves to connect the magazine and the condensing-skirt to the head of the bell, and all of these parts are thus mutually adapted for removal from the tank when the bell is lifted out of place. The removal of the bell is for a twofold purpose—namely, to enable convenient access to be obtained to the chamber 8 for cleansing the same of the spent residue therein and for recharging the carbid-magazine. In this connection it is desirable to employ means by which the magazine may be easily and readily refilled, and it should be noted that the stem is fitted or connected removably to the head of the bell. As a means for supporting the magazine in position convenient for refilling the same I employ a supporting-stand 33, which may be located at any convenient point—as, for instance, on a table or shelf. (See Fig. 2.) The supporting-stand is provided with a vertical socket or opening, (indicated by the numeral 34,) and the head of said stand has a flared mouth 35, which communicates with the vertical socket 34.

The operation may be described as follows: For charging the magazine 22 with carbid the bell and its contained parts are lifted from the tank 5 and the stem 16 is fitted in the socket of the supporting-stand 33, (see Fig. 2,) the flared mouth of said stand serving to direct the lower extremity of the stem 16 into the vertical stand-socket. The stem passes into the stand a sufficient distance for the upper end or head thereof to rest against the flared skirt 29, thus furnishing a secure support for the stem and the magazine. The operator now proceeds to remove the nut 21 and the gasket 20 from the threaded protruding end of the stem, and the entire bell may then be readily lifted off the stem, thus exposing the carbid-magazine 22 to easy access. In the portable type of apparatus herein described I find it advantageous to employ pulverized calcium carbid, because it is found that carbid in this condition will be attacked more quickly by water and the operation of generating acetylene gas is thus facilitated. Powdered carbid is deposited in the maga-

zine 22, which is seated upon the valve-disk 27, which closes the bottom of said magazine against the accidental escape of the carbid, and the bell may then be replaced, the flared guide of said bell serving to direct the stem 16 through the central opening 15. The guide of the bell rests upon the jam-nut 19, and the gasket and nut are then replaced to secure the stem and bell together by a gas-tight joint. Previous to replacing the bell the operator should pour a proper quantity of water into the chamber 8 to provide a bath for attacking the carbid when the same is dropped, and the chamber 9 should be filled with water by pouring the same through the spout 12 until the water-level is above the port 13. The tank is now in condition to receive the floatable bell, and the valves 30 32 having been opened the operator can adjust the bell and its contained parts to the tank by allowing the bell to enter the chamber 9. As the bell settles in the tank the air is free to escape through the valves 30 32; but just before the magazine 22 engages with or seats itself on the tank the operator should close the valve 32 against the continued escape of air, but the valve 30 should be opened for any air remaining in the bell to escape through the gas-burner. As the bell continues to settle the flange or rim 24 of the magazine will rest upon the tank-wall 7ª and the continued movement of the magazine with the stem 16 is thereby arrested. The stem 16 and the bell are capable of a limited vertical movement within the tank after the magazine is arrested or seated and until the stop 28 abuts against the guide-bar 25 of said magazine, and this continued movement of the stem withdraws the valve 27 from the magazine, thus opening the lower part of the magazine to the escape of the carbid contained therein. The carbid impinges or falls against the flared skirt 29, which thus serves to distribute the carbid within the chamber 8 of the tank, and owing to the decomposition of the carbid and water acetylene gas is at once produced. This gas rises from the bath and impinges against the flared skirt 29, so that the aqueous vapors are condensed therein, and the operator should now close the valve 30 in order to confine the gas within the floatable bell. The bell is raised by the accumulation of gas therein, and as the bell begins its upward movement the rod 16 and valve 27 are lifted, so that the valve engages the lower end of the magazine to cut off the continued outflow of carbid therefrom. The magazine is seated upon the valve 27 in order to travel in an upward direction with the stem 16 and the skirt with the bell, so under normal conditions the magazine and skirt will both move with the stem and the bell, as represented by Fig. 1. On a reduction of gas-supply within the floatable bell due to consumption of gas at the burner the bell will again descend until the magazine 22 seats itself within the tank in order to again discharge carbid to the bath for renewing the generation of gas, and this operation will be repeated indefinitely until the charge of carbid in the magazine shall have become exhausted.

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. In an acetylene-gas generator, a carbid-magazine adapted to travel under certain conditions with a floatable bell and to seat itself within a tank against continued movement with said bell, and means for opening the magazine for the outlet of carbid therefrom when thus seated within the tank, substantially as described.

2. An acetylene-gas generator consisting of a tank, a floatable bell, a carbid-magazine connected slidably with said bell to move therewith in its vertical travel and adapted to seat itself within the tank against continued downward movement of said bell therein, and means arranged to travel with the bell under all conditions and adapted to open a carbid-outlet from said magazine when the latter is seated within the tank, substantially as described.

3. An acetylene-gas generator consisting of a tank, a floatable bell, a valve-seat connected to the bell to travel therewith under all conditions, and a magazine normally seated on the valve and adapted to seat itself within the tank against continued downward movement with the bell and the valve-seat, substantially as described.

4. An acetylene-gas generator consisting of a tank, a floatable bell, a stem provided with a valve and connected to the bell to travel therewith under all conditions, a magazine slidably fitted to the stem and seated on the valve, said magazine adapted to seat itself upon the tank against continued downward movement with the stem and valve, substantially as described.

5. An acetylene-gas generator consisting of a tank, a floatable bell, a valve connected to said bell to travel therewith under all conditions, and a magazine normally seated by gravity upon the valve and arranged to seat itself within or upon the tank against continued downward movement of the valve with the bell, whereby the valve is withdrawn from the magazine as the bell approaches the limit of its lowest travel within the tank, substantially as described.

6. An acetylene-gas generator consisting of a tank, a floatable bell, a stem attached to said bell and provided with a valve, a magazine seated upon the valve to travel with the stem of the bell, and a stop arranged to limit the descent of the stem and bell subsequent to the seating of the magazine within the tank, substantially as described.

7. An acetylene-gas generator consisting of a tank, a floatable bell, a stem attached to said bell and provided with a valve, a magazine seated by gravity upon the valve and provided with a guide which is fitted slidably to the stem, and a stop attached to the stem and adapted to engage with the magazine-guide, substantially as described.

8. An acetylene-gas generator consisting of a tank, a floatable bell, a carbid-magazine slidably mounted within the bell to travel therewith under certain conditions and adapted to seat itself within the tank against continued downward movement with said bell, and a skirt connected with the bell and situated below said magazine to intercept carbid as it is discharged therefrom, substantially as described.

9. In an acetylene-gas generator, the combination with a floatable bell, of a stem attached thereto, a magazine slidably mounted on the stem, and a skirt situated below said magazine, and connected operatively with said stem, substantially as described.

10. An acetylene-gas generator comprising a tank, a floatable bell, a stem secured removably to said bell, a magazine fitted slidably to the stem, and a skirt fastened to the stem independently of the bell, said stem and its attached parts being removable with the bell from the tank, and said bell adapted to be detached from the stem to expose the magazine, substantially as described.

11. In an acetylene-gas generator, a floatable bell provided with a flared guide, a stem passing through said guide and the bell-head, and means for detachably fastening the bell and stem to secure a gas-tight joint, in combination with a tank, and a magazine carried by and fitted slidably on the stem, substantially as described.

12. An acetylene-gas generator consisting of a double-walled tank having the independent bath and seal chambers, a floatable bell provided with the vent and gas cocks, a stem secured removably to said bell and provided with a valve-disk, a carbid-magazine slidably fitted to the stem and seated upon the valve-disk, and a skirt fast with the stem below the carbid-magazine, substantially as described.

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

HILLIARY ELDRIDGE.

Witnesses:

E. R. CHEESBOROUGH,

B. I. WILLCOXON.