

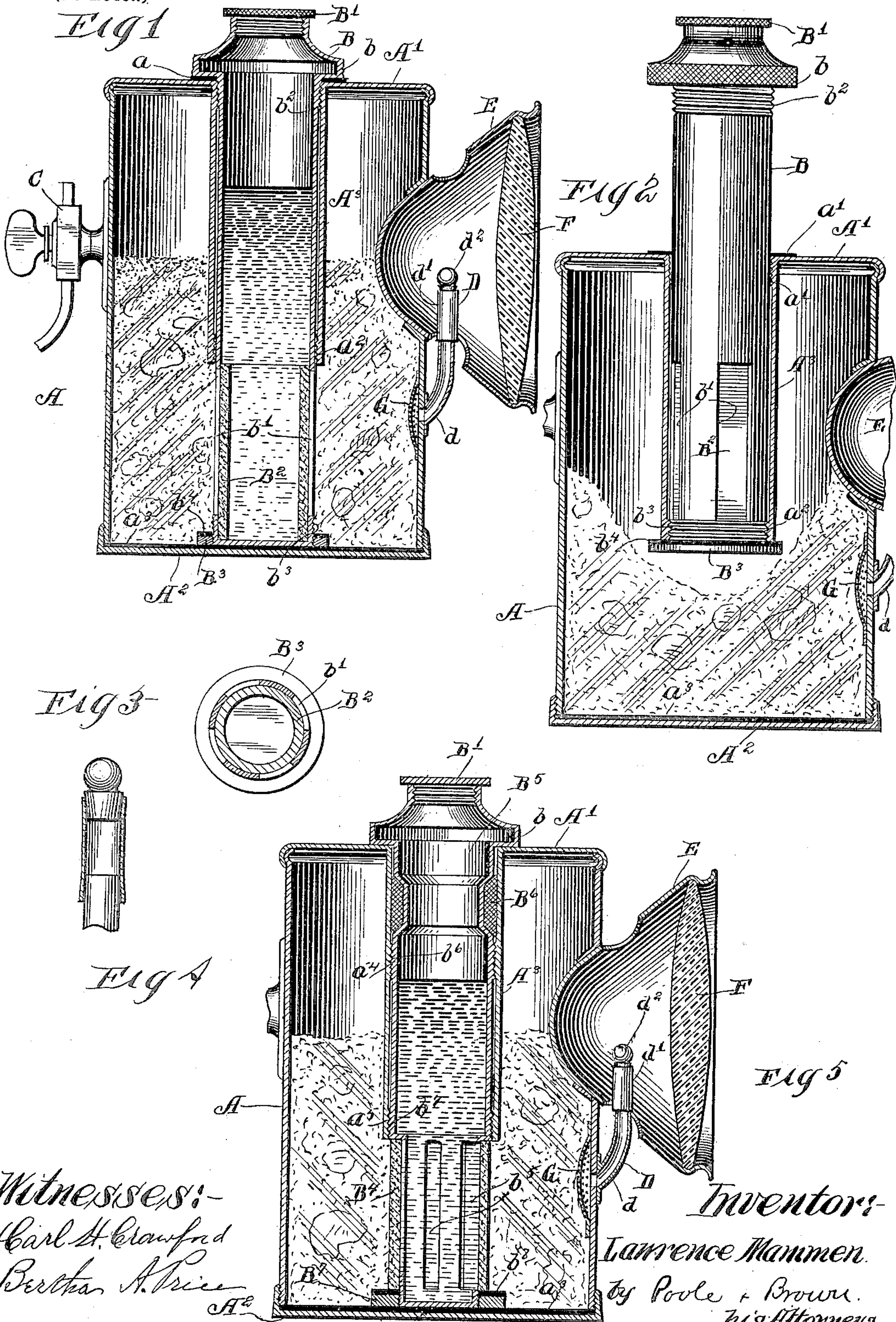
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Patented Oct. 16, 1900.

L. MAMMEN.
ACETYLENE GAS GENERATOR.

(Application filed Jan. 5, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

LAWRENCE MAMMEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF
TO WILLIAM LUENSE, OF SAME PLACE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 660,076, dated October 16, 1900.

Application filed January 5, 1900. Serial No. 429. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE MAMMEN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Acetylene-Generators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon,
10 which form a part of this specification.

This invention embraces improvements in acetylene-generators.

The invention is herein shown as embodied in a bicycle-lamp; but the essential features
15 of the generator may be embodied in a generating apparatus alone.

The invention also embraces features of improvements which may be applied to a lamp.

The invention consists in the matters hereinafter set forth, and more particularly pointed
20 out in the appended claims.

In the drawings, Figure 1 is a central vertical section of a bicycle-lamp provided with a generator embodying my invention. Fig.
25 2 is a similar view showing the parts in a changed position. Fig. 3 is a horizontal section taken through the lower end of a water-receptacle. Fig. 4 is a detail view of the burner-tube. Fig. 5 is a central vertical section
30 of a modified form of the device.

As shown in said drawings, A designates the generating-chamber, which is desirably made cylindric. A' designates the upper wall
35 of said chamber, and A² the bottom wall.

B designates the liquid-receptacle, which is located within the generating-chamber and shown as extending downwardly through the upper wall A', centrally thereof. Said receptacle is made of such length as to extend at
40 its lower end to the bottom of the generating-chamber and at its upper end outside of the chamber. The upper part of said receptacle is contained within a tube A³, which depends from the top wall of the shell and is shown as
45 made integral with said top wall. Said tube affords a guide for the liquid-receptacle and also a shield therefor when the generator is out of operation. The exposed end of said liquid-receptacle is provided with a flange b,
50 which overlaps the top wall of the generating-chamber, around the central apertures

through which the receptacle passes, and between said flange and the top wall is inserted a packing a, of rubber or the like. Said upper end of the liquid-receptacle is closed by
55 a screw-threaded plug B'. Said liquid-receptacle is longitudinally movable, whereby the lower end thereof may be withdrawn away from the calcium carbide contained within the generating-chamber, and such movement of
60 the receptacle brings the lower end thereof into the tubular guide A³. The lower end of the receptacle is surrounded by the calcium carbide in the chamber when the generator is in operation. Said lower end of the receptacle is
65 provided with one or more slits b', preferably a number which are circumferentially separated, and such slitted portion is covered by a lining B² of absorbent material. In Figs. 1 to
70 3 said lining is contained within the receptacle. The liquid contained within the receptacle comes in direct contact with said absorbent lining and passes therethrough and through the slits to the generating-chamber. Said lining is desirably made of a material
75 possessing considerable density and rigidity and having a plurality of minute pores which minutely subdivide or fractionate the liquid passing therethrough. Said liquid-receptacle is provided at its upper end with exterior
80 screw-threads b², which engage corresponding interior screw-threads a' in the upper end of the tube and by means of which said receptacle is held in its lowermost position. When the receptacle is in its lowermost position, the
85 packing-ring a prevents the escape of gas between said parts.

The liquid-receptacle is shown in Fig. 1 in the position which it occupies when the apparatus is in operation. When generation of
90 gas is to be discontinued, the receptacle is elevated away from the calcium carbide in the generating-chamber and the lower or slitted end of the receptacle is withdrawn into the tube A³. As a means for holding the liquid-receptacle in its elevated position it is
95 provided at its lower end with exterior screw-threads b³, which are adapted to engage corresponding interior screw-threads a², formed in the lower end of the tube A³. In order to
100 prevent leakage of gas or liquid at the lower end of said tube when the liquid-receptacle

is in its uppermost position, said receptacle is provided at its lower end with an annular flange B^3 , of greater diameter than the tube, and upon the upper surface of said flange is
 5 laid a packing-ring B^4 , of rubber or other yielding material, which when the receptacle is in its upper position is pressed between said flange and the lower end of said tube.

When the lower end of the liquid-receptacle
 10 is drawn into the tube A^3 , the calcium carbide, which is of granular form, shifts into the position shown in Fig. 2. In order to lower the receptacle into its operative position, the generator will desirably be so supported that it
 15 may be inverted. For this purpose the bracket C, by which the lamp in which the invention is shown as embodied is attached to its support, will embody a suitable swiveling device of any preferred character by which
 20 said lamp may be readily inverted. In case the joint between said tubular extension and the liquid-receptacle should not be tight enough to prevent the leakage of liquid there-
 25 through the reversal of the device will guard against such leakage by reason of the fact that the liquid will be contained in the opposite end of the receptacle and that said calcium carbide will be separated therefrom by wall of the tube A^3 .

The upper wall A' of the generating-chamber is shown as permanently attached to the shell A by having its margin spun around an annular bead on the upper end of the wall of the chamber. The bottom A^2 of said chamber
 30 has screw-threaded engagement with the lower end of the wall thereof and is adapted to be removed for the purpose of charging the generating-chamber and removing the solid products of generation therefrom. In
 35 order to provide a gas-tight joint between the removable bottom and the wall of the generating-chamber, a packing-ring a^3 , of rubber or like yielding material, is interposed between the same and the lower end of said
 40 wall. As a further improvement the cylindrical flange of the bottom on which the screw-threads are formed is shown as made slightly flaring or conical, so that when screwed in
 45 place a tighter joint is formed than would be afforded if the screw-threads were formed on two cylindrical parts. One of the parts on which
 50 the screw-threads $a' b^2$ are formed may similarly be made conical for a like purpose. Such flaring of the screw-threaded parts need
 55 be but slight, so that in the drawings this feature of the construction is hardly appreciable.

D indicates a burner-tube which is connected at its lower end with the generating-
 60 chamber and projects at its upper end into the usual reflector E at the rear of a lens F, secured in said reflector in a common manner. G designates a screen which is located at the mouth of the burner-tube and
 65 which is made of such fineness as to prevent the entrance of the calcium carbide into said tube. Said tube in the form here shown is

made of three parts—namely, a lower section d , an upper section d' , which have telescopic
 70 connection, and a burner-tip d^2 , which slips into the upper end of the upper section. Said lower section is made of a cylindric tube bent to proper form and the lower end of the upper
 75 section is made conical or flaring and is fitted over the lower section by being pressed tightly thereon. The shank of the tip d^2 is similarly tapered and is attached to the upper
 80 section in a like manner. The above construction of the burner-tubes affords a ready means of attaching the said parts together and making gas-tight joints between the same
 85 without the necessity of using solder or like means, as heretofore common in such constructions. The burner-tube D is unvalved, so that whatever gas remains in the generat-
 90 ing-chamber after the water-receptacle has been moved away from the calcium carbide therein will be allowed to burn until the flame dies out. The porous or absorbent lining B^2 ,
 95 as before stated, is of a dense character, so that the water passing therethrough from the liquid-receptacle is finely subdivided or fractionated, so that it will come in contact with
 100 the calcium carbide in its finely-divided state and be uniformly diffused throughout the mass of carbide. I have found a composition of plaster-of-paris with cement to be a suitable
 105 material for such porous or absorbent lining. Such material while permitting the passage of water therethrough acts to retard its free flow, as would be true if the pores of such
 110 material were relatively large. Moreover, by reason of the fact that the said liquid is fractionated in its passage through the porous or absorbent material and it enters the generat-
 115 ing-chamber in a finely-subdivided state the generation of the gas by decomposition of the calcium carbide goes on gradually and is not suddenly generated in large quantities, as is true where the water is admitted to the
 120 generator-chamber in its natural state and freely. Furthermore, by reason of the fact that the liquid is finely subdivided when it exudes from the inner surface of absorbent or porous lining any excessive pressure with-
 125 in the generating-chamber will act to retard the flow of water through the lining until such excessive pressure is reduced, so that the pressure within the generating-chamber will be automatically controlled and does not
 130 rise to a point where it would endanger the integrity of the device. In the practical operation of the lamp, therefore, the pressure of the gas within the generating-chamber controls the admission of the liquid to the generat-
 135 ing-chamber and maintains a substantially constant pressure within said chamber and, furthermore, prevents such excessive pressure as would endanger the safety of the device.

In Fig. 5 the generating-chamber A, the burner D, and the reflector E are made like the same parts shown in the other figures. In this construction the absorbent lining B^4 ,

through which the liquid passes to the generating-chamber, surrounds the lower end of the liquid-receptacle B⁵. Said lower end of the receptacle is reduced to an extent equal
 5 to the thickness of the porous lining B⁴, so that said porous lining is approximately equal in exterior diameter to that of the receptacle. Said lower end of the receptacle is provided
 10 inside of the lining with a plurality of circumferentially-separated longitudinally-arranged slits b⁵, through which the liquid passes to the absorbent lining. The receptacle is provided near its upper end with an annular depression or recess which is filled with a
 15 packing B⁶, which takes the place of the packing-ring a of Fig. 1, to prevent the escape of gas through the tube A³. The said liquid-receptacle is held in its lowermost position by means of external screw-threads b⁶ thereon
 20 which engage corresponding internal screw-threads a⁴ in the tube and is held in its uppermost position by external screw-threads b⁷, which engage corresponding internal screw-threads a⁵ at the lower end of said tubular
 25 extension. The lower end of the liquid-receptacle is provided with an annular flange B⁷, which limits the upward movement of the receptacle, and on the upper surface of said flange is located a packing-ring b⁸, of rubber
 30 or the like, which is pressed between said flange and the lower end of said tubular extension A³ when the liquid-receptacle is in its uppermost position. The operation of this
 35 form of the device is the same as the operation shown in Figs. 1 and 2, the lower end of the liquid-receptacle being extended beyond the tube A³ when the generator is in operation and withdrawn into the tube when it is
 40 desired to discontinue the use of the generator. Said lamp may be provided with a swiveling bracket, whereby it may be inverted in the manner above stated.

The flanges B³ and B⁷ on the lower ends of the liquid-receptacle are made removable,
 45 they being shown as having the form of rings having screw-threaded engagement with the receptacles. When said flanges are removed, the receptacle may be entirely removed from the generating-chambers.

50 I claim as my invention—

1. An acetylene-generator comprising a generating-chamber and a movable liquid-receptacle therein connected by a passage with the chamber, which, when in its operative
 55 position, is adapted to be partially surrounded by the calcium carbide contained within the generating-chamber, and which is constructed to be moved away from its operative position to discontinue the operation of the generator.

60 2. An acetylene-generator comprising a generating-chamber and a movable liquid-receptacle therein which, when in its operative position, is adapted to be partially surrounded by the calcium carbide contained within the
 65 generating-chamber, and which is constructed to be moved away from its operative position to discontinue the operation of the generator,

said liquid-receptacle being provided in its part adjacent to part of the generating-chamber which receives the calcium carbide with
 70 one or more openings and the wall of said part covered by a lining of porous material.

3. An acetylene-generator comprising a generating-chamber, a liquid-receptacle connected by a passage with said chamber one
 75 end of which is contained within the chamber and the other end of which projects outside of the chamber, said receptacle being movable whereby it may be moved outwardly away from the portion of the generating-chamber
 80 adapted to contain the calcium carbide and a removable closure on the outer end of the liquid-receptacle.

4. An acetylene-generator comprising a
 85 generating-chamber, a liquid-receptacle the lower end of which is contained within the generating-chamber and the upper end of which projects outside of the chamber, said tube being vertically movable and being provided at its lower end with a plurality of cir-
 90 cumferentially-separated slits and a lining covering the walls of the receptacle in its part containing the slits, said lining being made of a rigid material.

5. An acetylene-generator comprising a
 95 generating-chamber, a movable liquid-receptacle therein connected by a passage with the chamber which, when in its operative position, is adapted to be partially surrounded by the calcium carbide contained in the generat-
 100 ing-chamber, and which is constructed to be moved away from its operative position to discontinue the operation of the generator, and a tube within which the liquid-receptacle is withdrawn when moved into its inop-
 105 erative position.

6. An acetylene-generator comprising a generating-chamber, a liquid-receptacle connected by a passage with the chamber, which,
 110 when in its operative position is adapted to be partially surrounded by the calcium carbide contained within the generating-chamber, and which is constructed to be moved away from its operative position to discontinue the
 115 operation of the generator, an inclosure within which said liquid-receptacle is withdrawn when moved into its inoperative position, and means for holding said liquid-receptacle from movement with respect to said inclosure.

7. An acetylene-generator comprising a
 120 generating-chamber, a movable liquid-receptacle therein connected by a passage with the chamber which, when in its operative position is adapted to be partially surrounded by the calcium carbide contained within the generat-
 125 ing-chamber, and which is constructed to be moved away from its operative position to discontinue the operation of the burner, said generator being supported in a manner permitting it to be inverted.

8. An acetylene-generator comprising a
 130 generating-chamber, having a tube depending from the upper wall thereof and open at its upper and lower ends, a liquid-receptacle

connected by a passage with the chamber, the upper end of which is contained within said tube, and the lower end of which extends below the tube into the generating-chamber said liquid-receptacle being adapted to be moved upwardly with the lower end thereof contained in said tube.

9. An acetylene-generator comprising a generating-chamber, having a tube depending from the upper wall thereof and open at its upper and lower ends, a liquid-receptacle connected by a passage with the chamber, the upper end of which is contained within said tube, and the lower end of which extends below the tube into the generating-chamber, said liquid-receptacle being adapted to be moved upwardly with the lower end thereof contained in said tube, and means on the tube and receptacle for holding said receptacle in its lowermost position and means on said parts for holding said receptacle in its withdrawn position.

10. An acetylene-generator comprising a generating-chamber, a tube depending from the upper wall thereof, and open at its upper and lower ends, a liquid-receptacle, the upper part of which is contained within said tube, and the lower part of which projects below said tube into the generating-chamber, said lower part of the receptacle being provided with one or more openings and being covered with a lining through which the liquid passes to the generating-chamber and the receptacle being vertically movable whereby the lower end thereof may be withdrawn into said tube.

11. An acetylene-generator comprising a generating-chamber, a tube depending from the upper wall thereof, which is open at its upper and lower ends, a liquid-receptacle, the upper end of which is contained within said tube and the lower end of which projects below the tube into the generating-chamber, the walls of the lower end of the receptacle being constructed to permit the passage of liquid therethrough and a flange on the lower end of said receptacle, said receptacle being vertically movable whereby the lower end thereof may be withdrawn into said tube, and the flange on the lower end of said receptacle when the receptacle is in its upper position bearing against the lower end of the tube to provide a fluid-tight joint.

12. An acetylene-generator comprising a generating-chamber, a tube depending from the upper wall thereof, which is open at its upper and lower ends, a vertically-movable liquid-receptacle connected by a passage with the chamber, the upper end of which is contained within said tube and the lower end of which projects beyond the tube into the generating-chamber, screw-threads on said liquid-receptacle which engage corresponding screw-threads on the tube to hold the same in its lowermost position, and screw-threads on the liquid-receptacle adapted to engage corresponding threads on the tube when the

receptacle is in its elevated position to hold it in such position.

13. An acetylene-generator comprising a generating-chamber, a tube depending from the upper wall thereof which is open at both ends, a vertically-movable liquid-receptacle, the upper part of which is normally contained within said tube and the lower part of which projects beyond the tube into the generating-chamber, said receptacle being adapted to be withdrawn with its lower end in the tube; means permitting the passage of liquid from the liquid-receptacle to the generating-chamber, a packing inserted between said liquid-receptacle and the said tube and means for holding the receptacle stationary with respect to said tube in both its vertical positions.

14. An acetylene-generator comprising a generating-chamber, a tube depending from the upper wall thereof, which is open at its upper and lower ends, a liquid-receptacle the upper end of which is contained within said tube and the lower end of which projects beyond the tube into the generating-chamber, and constructed to permit the passage of liquid from the receptacle to the generating-chamber, said receptacle being adapted to be withdrawn with its lower end in the tube, screw-threads on the tube and liquid-receptacle for holding said receptacle stationary with respect to said generating-chamber, one of said screw-threaded parts being made slightly tapering to afford a tight fit between said screw-threads.

15. An acetylene-generator comprising a generating-chamber, a liquid-receptacle which is partially surrounded by the calcium carbide contained within said generating-chamber, a part of said receptacle which is surrounded by said calcium carbide being provided with a plurality of circumferentially-separated slits, a rigid lining covering the slitted portion of the receptacle, and a tube attached to said generating-chamber within which slitted portion of the receptacle is adapted to be withdrawn when the operation of the generator is to be discontinued.

16. An acetylene-generator comprising a generating-chamber, a liquid-receptacle which when in its operative position is adapted to be partially surrounded by the calcium carbide contained within the generating-chamber, and which is movable to permit it to be moved away from said calcium carbide to discontinue the operation of the generator, means of permitting the passage of the liquid from said liquid-receptacle to the said generating-chamber, a plate constituting the bottom of the chamber provided with an annular flange which fits outside of and has screw-threaded engagement with the wall of said chamber, one of said screw-threaded parts being made slightly tapering.

17. An acetylene-generator comprising a generating-chamber and a movable liquid-

receptacle therein connected by a passage with the chamber which when in its operative position is adapted to be partially surrounded by the calcium carbid within the
5 generating-chamber and which is constructed to be moved away from its operative position to discontinue the operation of the burner and means for entirely removing the receptacle from the generating-chamber.

10 18. An acetylene-generator comprising a generating-chamber, a tube depending from the upper wall thereof which is open at its upper and lower ends, a liquid-receptacle the upper end of which is contained within said

tube and the lower end of which projects below the tube and into the generating-chamber and connected by a passage with the chamber, and a removable flange on the lower end of said receptacle limiting the upward movement thereof. 25

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 30th day of December, A. D. 1899. 20

LAWRENCE MAMMEN.

Witnesses:

WILLIAM L. HALL,
GERTRUDE BOYCE.