H. BROUSSEAU.

GAS GENERATOR.

APPLICATION FILED JUNE 19, 1909.

980,918.

Patented Jan. 10, 1911.

3 SHEETS--SHEET 1

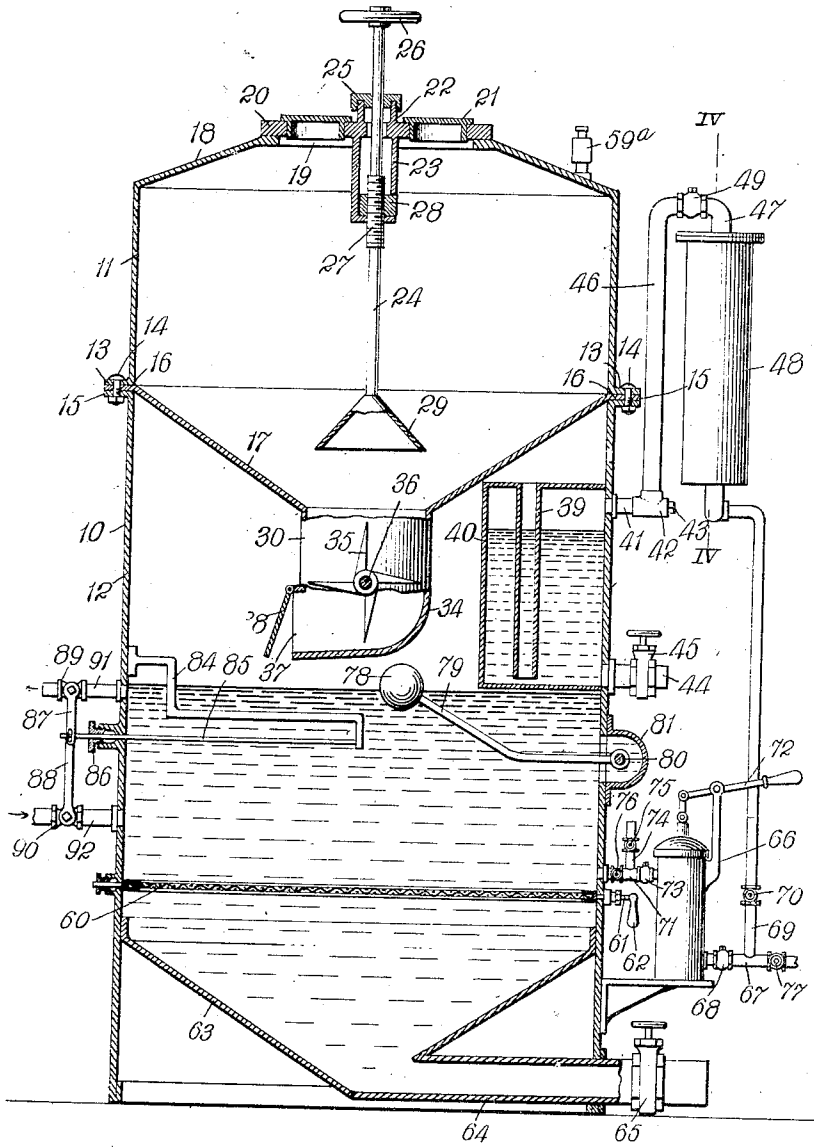


Fig. 1.

WITNESSES:

J. Dinnhaupt.

INVENTOR

Harry Brousseau

BY

Criswell & Criswell

ATTORNEYS

H. BROUSSEAU.

GAS GENERATOR.

APPLICATION FILED JUNE 19, 1909.

980,918

Patented Jan. 10, 1911.

3 SHEETS—SHEET 2.

Fig. 3.

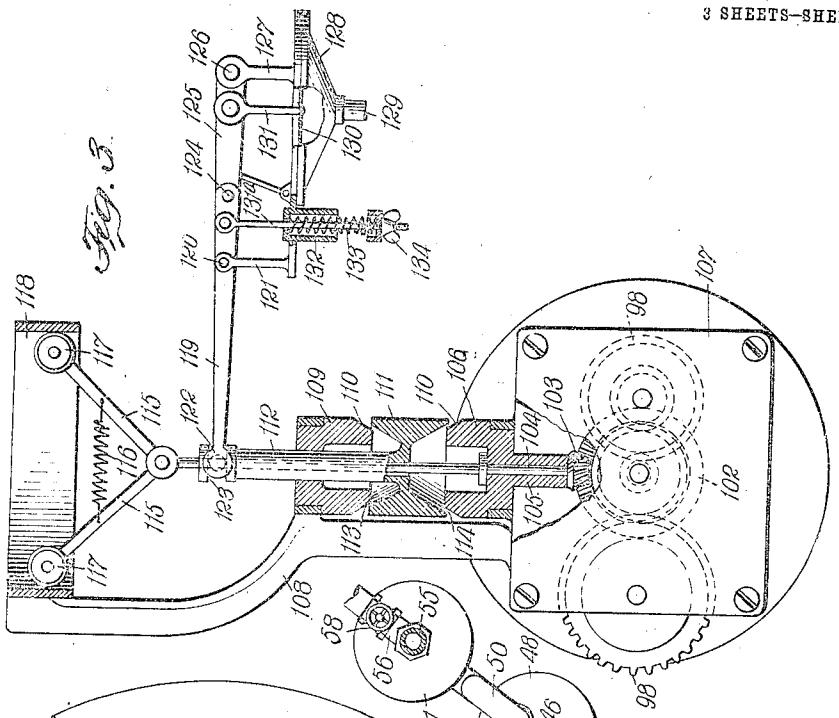
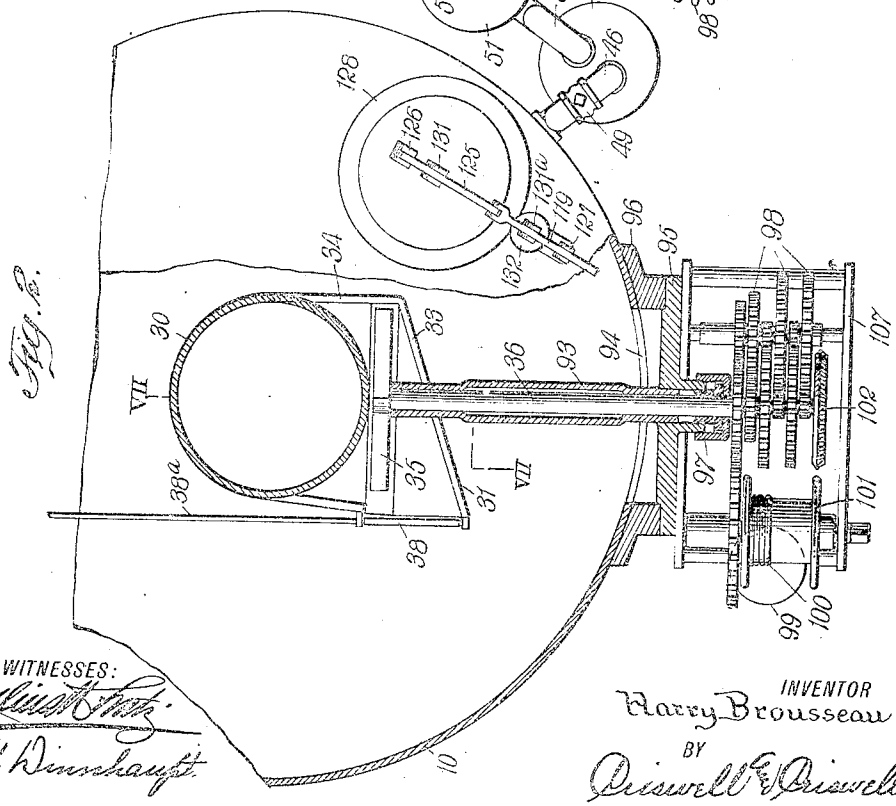


Fig. 2.



WITNESSES:

J. Elliott Fritz

M. Dinnhaupt

INVENTOR

Harry Brousseau

BY

Driswell & Driswell

ATTORNEYS

H. BROUSSEAU.

GAS GENERATOR.

APPLICATION FILED JUNE 19, 1909.

980,918. Patented Jan. 10, 1911.

3 SHEETS—SHEET 3.

Fig. 4.

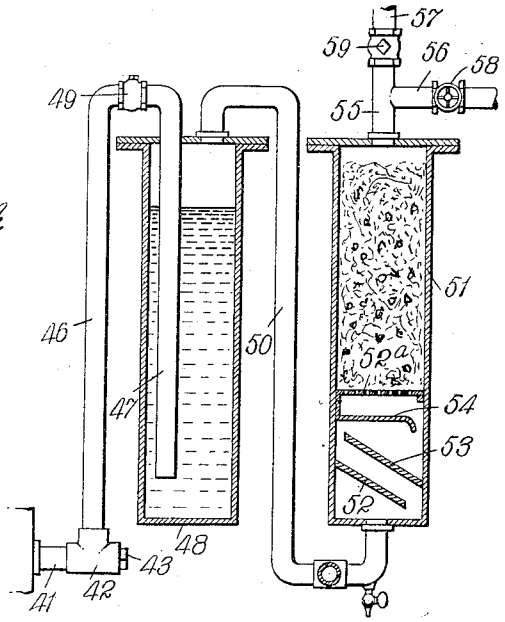


Fig. 5.

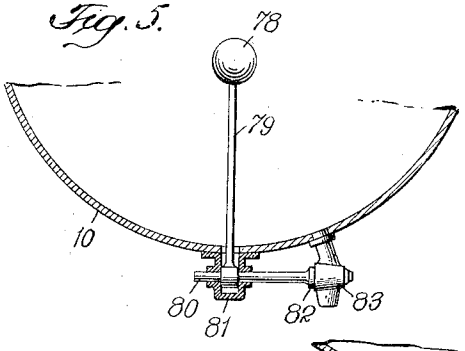


Fig. 6.

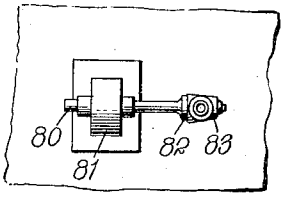
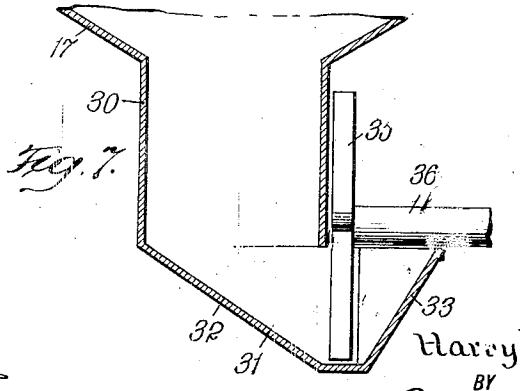


Fig. 7.



WITNESSES:

J. Louis Hertz

M. Dinnhaupt.

INVENTOR

Harry Brousseau

BY

Criswell & Criswell

ATTORNEYS

UNITED STATES PATENT OFFICE.

HARRY BROUSSEAU, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO MARCUS STERN, OF NEW YORK, N. Y.

GAS-GENERATOR.

980,918. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed June 19, 1909. Serial No. 503,117.

To all whom it may concern:

Be it known that I, HARRY BROUSSEAU, a citizen of the United States, and a resident of New York, county and State of New York, have invented certain new and useful Improvements in Gas-Generators, of which the following is a full, clear, and exact description.

This invention relates more particularly to an apparatus for generating acetylene gas.

The primary object of the invention is to provide a simple and efficient means by which the carbid may be automatically fed to the water in such a way that the feed will be uniform; and to provide means whereby the apparatus may be self-contained and entirely automatic requiring practically no attention after being once started.

Other objects of the invention are to provide simple means whereby the carbid may be suspended in the water; and to provide means whereby the water may be prevented from rising too high in the apparatus.

Another object of the invention is to provide simple means whereby water may be forced into the apparatus and by the same means remove the air from within the generator when the apparatus is started.

A further object of the invention is to provide simple and efficient means for directing the carbid to the feed, and to provide simple means whereby the interior of the apparatus is readily accessible for cleaning, repairing or for other purposes.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a vertical section, partly in elevation, of one form of apparatus embodying my invention. Fig. 2 is a fragmentary sectional plan view of the apparatus, partly in elevation, showing the feed mechanism. Fig. 3 is a section, partly in elevation, showing how the pressure of the gas may be made to automatically control the carbid feed mechanism. Fig. 4 is a sectional view of the purifying and filtering means for the gas, taken on the line IV—IV of Fig. 1. Fig. 5 is a fragmentary sectional plan, showing one form of means for permitting the water within the receptacle or apparatus to automatically pass therefrom in case it rises too high when in operation. Fig. 6 is a fragmentary front elevation of the device shown in Fig. 5; and Fig. 7 is a vertical section, taken on the line VII—VII of Fig. 2.

The receptacle 10 of the apparatus may be of any suitable construction and may comprise an upper section 11 for the carbid, and a lower section for the water or liquid medium. The upper section 11 is provided with a flange 13 at its lower edge which is clamped by bolts 14, or otherwise, to a flange 15 on the lower section 12, and between the flanges 13 and 15 is held the flanged edge 16 of a hopper 17 in which the carbid is adapted to be placed. The section 11 has its top 18 provided with an opening 19, and this opening is covered by a cap or head 20. The cap or head 20 has a plurality of openings in which are held the covers 21, and said head 20 is provided with a tubular projecting part 22 which extends outwardly therefrom, and an inwardly projecting tubular part 23 forming substantially a continuation thereof. A rod 24 extends through the tubular connection 22 and at one end passes through a stuffing box 25 and has an operating handle 26 by which the said rod may be rotated. The rod 24 has a threaded portion 27 which engages a nut 28 held in the tubular part 23 so that said rod may be raised or lowered, and when raised or lowered will carry a conical device 29 secured to the lower end thereof which is adapted to partly support and properly direct the carbid as the same passes the hopper 17.

To properly feed the carbid to the water contained in the lower section 12, I form the hopper with a tapering body which terminates in a cylindrical tubular part 30, through which the carbid is adapted to pass freely without any obstruction other than the device 29. The lower end of the tubular part 30 is provided with a carbid holder 31, Figs. 1, 2 and 7, and this holder may be operated from the tubular part 30 or formed as a part thereof. As shown, the holder 31 forms a part of the carbid feed and has an inclined side or wall 32 forming an inclined base for the tubular part 30, and an outer

inclined side or wall 33 arranged angularly with respect to the rear wall 34, Fig. 2, so that the carbid will pass along the wall 32 over against the wall 33 which may extend high enough to prevent the carbid from passing over the same. The space is thus entirely free for the carbid to pass to the holder and to fill the space between the walls 32 and 33. A star wheel or other rotary or movable element 35 is held to move adjacent to the tubular part 30 and has the lower portion thereof movable in the carbid holder 31. This wheel is held to rotate with a shaft 36 and has four blades projecting outwardly therefrom, though this number may vary, and these blades are so arranged that they will not offer resistance to the free feed of the carbid to crowd over against the wall 33, and said blades are simply intended as a pushing means for forcing and feeding a determined quantity of carbid to the water. It will be seen that the carbid will fill the spaces between the blades, and as the element 35 rotates, it will force a determined quantity, according to the spacing of the blades out through the opening 37 of the carbid holder, the latter being provided with a hinged cover 38 located at

thereby avoid an explosion, for the water in the receptacle 48 will fill the pipe 47 in case of back pressure but cannot pass by the check valve 49, the latter, of course, permitting the gas to pass by the same into said tank 48. This tank 48 has a chamber at the upper part thereof connected by a pipe 50 to the lower part of a receptacle or tank 51, and this tank may be filled with mineral wool and carbid to remove moisture from the gas, and at the lower portion thereof may be provided with baffled plates 52 and 53 which are angularly arranged and are adapted to assist in collecting the moisture from the gas, and fitted within the receptacle is a perforated plate 52^a and a horizontally-extending plate 54 arranged below the same to cause the gas to take a circuitous route and also to divide the gas in its passage through the mineral wool and carbid. The gas passes from the tank or receptacle 51 through a pipe 55 which may have branches 56 and 57 controlled by suitable valves 58 and 59, respectively, to be used as desired, a safety valve, as 59^a, being provided to prevent the gas from exceeding a certain pressure within the receptacle 10.

74 opening into the atmosphere connects with the pipe 71 and in this pipe 74 is a valve 75. If the valves 70 and 75 are opened and the pump operated by the handle 72, air may be withdrawn from above the water in the receptacle 10 through the pipe 69 past the check valve 68 and forced into the pipe 71 out through the pipe 74. This pumping element 66 may also be used for pumping water into the receptacle 10 and in this case the pipe 71 is extended to connect with the receptacle 10 and is provided with a valve 76, and the pipe 67 is extended to connect with a source of water supply and is controlled by a valve 77. When it is desired to force water into the receptacle 10, the valves 70 and 75 are closed and the valves 76 and 77 opened so that by operating the pump, water may be forced into the receptacle 10, and when the valves 76 and 77 are closed and the valves 70 and 75 opened, air may be withdrawn from within the receptacle 10 on starting the apparatus as already explained.

As a means for preventing the water from rising too high in the receptacle or casing 10, which might result in the water reaching the carbid in the holder 31 and hopper 17, I provide a float 78 which is connected by a rod 79 to a valve rod 80. The casing of the receptacle 10 is provided with an opening, and this opening is closed by a cap 81 so as to permit proper movement of the arm or rod 79 and to form a means to rotatably hold the valve rod 80, as shown in Figs. 1, 5 and 6. The rod 80 may operate the plug member 82 of a cock 83, and this cock is connected to the receptacle so that the water may pass therethrough when the cock is opened by the lifting of the float 78 when the water rises too high within the receptacle 10.

A safety device is provided in case the water within the receptacle becomes too hot, which permits the hot water to automatically escape and cold water to flow into the receptacle. As one means I provide a bracket or arm 84, Fig. 1, which is of more expansible material than the casing of the receptacle 10, and this arm is held in the water near the upper part thereof. A rod 85 of less expansible metal or material is held to the arm 84, and this arm passes through a stuffing box 86 on the receptacle 10 and connects at its outer end to handles 87 and 88 of the valves 89 and 90 respectively. The valve 89 is arranged in an outlet pipe 91 located near the water line and the valve 90 is arranged in an outlet pipe 92 which may be connected to a suitable head or supply of water, so that if the water becomes too heated, it will cause the arm 84 to expand and this will operate the arm 85 and through it the valve handles 88 and 87, permitting the water within the receptacle 10 to flow out through the pipe 91 and cold water to pass in through the pipe 92 into the receptacle until the proper temperature of the water is restored.

The start wheel or feed element 35 may be rotated by any suitable mechanism, and this mechanism may be automatically controlled by the pressure of the gas within the receptacle 10 or otherwise in any suitable manner. As shown, the shaft 36 is held to rotate in a sleeve 93, Figs. 2 and 3, and this sleeve projects through an opening 94 in the casing and is held in a head or cap-piece 95, which is properly secured to the flange 96 of the receptacle casing. The head or cap-piece 95 is provided with a stuffing box 97 for the shaft 36, and this shaft is operated by a train of gears 98 similar to that of the ordinary clock, and this train of gears may be operated by a weight 99 which is held to a rope or other flexible connection 100 passing around the drum 101 to which one of the gears of the train is held so that by rotating the drum 101, the mechanism will rotate the shaft 36 and through it the feed wheel or element 35 to feed the carbid to the water. The train of gears 98 operates a bevel gear 102, and this bevel gear is in mesh with a smaller bevel gear 103. The gear 103 is held to a shaft 104 and this shaft is held to rotate in a boss or sleeve 105 projecting from a normally fixed governing element or block 106 located on the gear frame 107. A bracket 108 extends upwardly from the frame 107 and on the bracket is a normally fixed governing element or block 109. The blocks, devices or elements 106 and 109 have one end beveled, as at 110, and movably held between the blocks 106 and 109 is a brake element 111. This element is provided with a sleeve portion 112 and is slidingly held on the shaft 104, and by means of a feather and spline is adapted to rotate therewith. The brake element 111 has a beveled tapering recess 113 adapted to engage the beveled end of the element 109 and has a tapering or beveled recess 114 adapted to engage the beveled end 110 of the element 106 so that when the sleeve portion 112 and brake element 111 is moved upward or downward beyond a normal position sufficiently to engage either of the blocks 106 and 109, it will stop the rotation of the shaft 104. The shaft 104 at its upper end is provided with pivotally held arms 115 which are normally forced toward each other by a spring 116, and on the end of the arms 115 are weights 117 which are adapted when rotated beyond a certain speed to engage the inner surface of a ring or device 118 supported on a bracket 108 and thereby regulate the rotary movement of the shaft 104 if the same exceeds a certain speed.

A lever 119 is pivotally held, at 120, to a supporting bracket 121, and this lever at one end is provided with a forked portion 122

having means to enter a groove 123 of the sleeve 112 whereby when the lever 119 is operated, it will raise or lower the sleeve 112 according to which way it is moved, and at the same time permit rotary movement of said sleeve. The lever 119 is pivotally held, at 124, to the end of a shorter lever 125, and this lever 125 is pivoted at 126 to a bracket 127, forming a part of the casing of a suitable gas regulator 128. This regulator may be of the usual construction and may have a connection, as 129, to the upper portion of the receptacle 10 in order that the gas may exert a pressure on the under side of a diaphragm 130. The diaphragm 130 is adapted to move a device or arm 131 connected to the levers 125, so that a slight movement of the lever 125 will impart a greater movement to the lever 119 and thereby the brake element 111. The lever 119 has a rod 131ª connected thereto at one end, and this rod passes through a tubular part 132 of the regulator casing, and said rod is normally forced in one direction by a spring 133 which may have its tension varied by means of a wing or other nut 134. The action of the spring 133 is against the outward movement of the diaphragm 130 so that the action of the brake element 111 may be regulated according to the pressure in the receptacle 10. The mechanism thus described, serves as a very effective means for controlling the operating mechanism of the feed.

From the foregoing it will be seen that a very simple and effective feed is provided which permits a free flow of the carbid, and which will positively force and deposit a determined quantity of the carbid at each movement of the movable feed element; that effective means is provided for regulating the speed of the feed automatically and through the pressure of gas in the apparatus; that effective means is provided for purifying the gas and for removing the moisture therefrom, and at the same time preventing an explosion from a back-flash or the like; that simple means is provided for cleaning the apparatus; that said apparatus is so constructed as to be self-contained and automatic in its action so that very little attention is required; that simple means is provided for regulating the normal water line to prevent the water from reaching the stored carbid; that simple means is provided for regulating the temperature of the water so as to automatically supply cold water to the receptacle in case the water therein becomes too hot; and to provide means for positively forcing water into the receptacle or to remove air therefrom when starting the apparatus.

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

1. In a gas generator, a carbid receptacle, a water chamber located below said receptacle, means for feeding carbid to said water chamber, means for regulating the quantity of water contained therein, a plurality of rods extending within said receptacle, said rods carrying means for regulating the temperature of the water contained in said receptacle, and means for exhausting the air from said water receptacle.

2. In a gas generator, the combination with a receptacle adapted to hold water, a carbid holder located above said receptacle, a carbid feeding means, a rod adapted to be moved by the temperature of the water within said receptacle, and means connected with said rod for regulating the temperature of the water.

3. In an acetylene gas generator, the combination with a receptacle adapted to hold water, of a hopper, a carbid holder located under the hopper above the water, a rotary element having a plurality of blades, a shaft to which the element is secured, and means for directing the carbid transversely of the blades under the axial line of said shaft to fill the spaces between the blades, in the line of movement of the carbid.

4. In an acetylene gas generator, the combination with a receptacle adapted to hold water, of a carbid holder located above the water, a movable element having open parts providing an unobstructed passage in the line of flow of the carbid, means for directing the carbid into the open parts, and means for moving said element to force a determined quantity of the carbid from the holder into the water contained in the receptacle.

5. The combination with a receptacle adapted to hold water, of a rotary element having a plurality of blades, a shaft for rotating said element, means for feeding the carbid into the spaces between the blades under the axial line of the shaft transversely of said element, means for holding the carbid freely between and on opposite sides of the blades, and means for rotating the shaft to force a determined quantity of carbid into the water.

6. The combination with a receptacle adapted to contain water, of a rotary element having a plurality of blades, and a holder having inclined walls for directing the carbid between the blades and for holding the same on opposite sides thereof with a tendency to crowd between the blades.

7. The combination with a receptacle adapted to contain water, of a hopper supported within the receptacle and provided with a downwardly-extending tubular portion, a holder for the carbid having angular and inclined walls located beneath the tubular portion, one of said walls forming an inclined base for the tubular portion to cause the carbid when placed in the hopper

to flow freely through the tubular part and into the holder to crowd against both walls thereof, the other wall being inclined at a different angle and off-set from the body of the holder and a rotary element movable adjacent to the tubular portion and having the lower part thereof entering the holder and adapted when rotated to force a determined quantity of carbid from the holder into the water.

8. The combination with a receptacle adapted to contain water, of a hopper supported within the receptacle and provided with a downwardly-extending tubular portion, a holder for the carbid having angular and inclined walls located beneath the tubular portion, one of said walls forming an inclined base for the tubular portion to cause the carbid when placed in the hopper to flow freely through the tubular part and into the holder to crowd against both walls thereof, the other wall being inclined at a different angle and off-set from the body of the holder and a rotary element having a plurality of blades movable adjacent to the tubular portion and having the lower part thereof entering the holder and adapted when rotated to force a determined quantity of carbid from the holder equal to the amount between two of the blades.

9. The combination with a receptacle adapted to contain water, of a hopper supported within the receptacle, a holder for the carbid having inclined walls located beneath the hopper, one of said walls forming an inclined base for said hopper to cause the carbid when placed in the hopper to flow freely therefrom into the holder to crowd against the walls thereof, the other wall being inclined at a different angle and off-set from the body of the holder and a movable element entering the holder and adapted to force a determined quantity of carbid from the holder into the water.

10. The combination with a receptacle adapted to contain water, of a hopper in which the carbid is placed located within the receptacle above the water, said hopper having an inclined body and a downwardly-extending tubular part, a holder formed integral with the tubular part and having a downwardly-extending wall forming an inclined base for the tubular part, and an outer inclined and angularly arranged wall extending approximately to the lower end of the tubular part to permit the carbid to flow freely through the tubular portion and to crowd between the walls of the holder, and a rotary element having the lower portion thereof in the holder and adapted to push a determined quantity of carbid from the holder at each movement thereof.

11. The combination with a receptacle adapted to contain water, of a hopper in which the carbid is placed located within the receptacle above the water, said hopper having an inclined body and a downwardly-extending tubular part, a holder located under the tubular part and having a downwardly-extending wall forming an inclined base for the tubular part, and an outer inclined and angularly arranged wall extending approximately to the lower end of the tubular wall to permit the carbid to flow freely through the tubular portion and to crowd between the walls of the holder, and a rotary element having a plurality of blades the lower portion of which moves in the holder and are adapted to push a determined quantity of carbid from the holder at each movement thereof.

12. The combination with a receptacle adapted to contain water, of a hopper in which the carbid is placed located within the receptacle above the water, said hopper having an inclined body and a downwardly-extending tubular part, a holder located under the tubular part and having a downwardly-extending wall forming an inclined base for the tubular part, and an outer inclined and angularly arranged wall extending approximately to the lower end of the tubular wall to permit the carbid to flow freely through the tubular portion and to crowd between the walls of the holder, and a rotary element having four blades movable adjacent to the tubular part and having its lower portion only movable in the carbid, a shaft to which the element is secured, and means for rotating said shaft.

13. The combination with a receptacle adapted to contain water, of a hopper located within the receptacle above the water, a holder located under the hopper and having walls between which the carbid is adapted to flow freely, a movable feed element, and a conical distributing device movably held in the hopper and means for moving said device from the exterior of said hopper.

14. The combination with a receptacle adapted to contain water, of a hopper located within the receptacle above the water, a holder located under the hopper, a movable feed element, and a device movably held in the hopper, and means for moving said device from the exterior of said hopper.

15. The combination with a receptacle adapted to hold water, of a hopper having a tubular extension, a holder located at the lower end of the tubular extension, a feeding device having a part thereof movable in the holder and arranged adjacent to the tubular part, a device located over the tubular part of the hopper and adapted to guide the carbid thereto, a rod to which said device is connected, said rod having a threaded portion, a normally fixed nut engaged by said threaded portion whereby the said de-

vice may be raised or lowered, and a cap piece having openings therein and provided with means for holding the nut.

16. The combination with a receptacle adapted to hold water, of a hopper having a tubular extension, a holder located at the lower end of the tubular extension, a feeding device having a part thereof movable in the holder and arranged adjacent to the tubular part, a device located over the tubular part of the hopper and adapted to guide the carbid thereto, a rod to which said device is connected, means for raising and lowering said rod, and a cap piece having openings therein and provided with means for guiding said rod.

17. The combination with a receptacle adapted to hold water, of a hopper having a tubular extension, a holder located at the lower end of the tubular extension, a feeding device having a part thereof movable in the holder and arranged adjacent to the tubular part, a conical distributing device located over the tubular part of the hopper and adapted to guide the carbid thereto, a rod to which said device is connected, and means for adjusting said rod, said means being located at exterior of said hopper.

18. The combination with a receptacle adapted to contain water, of a hopper having an inclined body and a tubular part extending downwardly therefrom, a rotary element for feeding the carbid after it leaves the tubular portion, mechanism for rotating said element, a governor adapted to control the speed of rotation of the feed element, and means operated by the pressure of gas within the receptacle to stop the feed.

19. The combination with a receptacle, of means for feeding carbid, a valve-controlled water outflow and inflow, levers connected to the valves, a rod connected to the levers, and an expansible device connected to the rod whereby the heat of the water may cause the device to expand and thereby operate the valve-controlled connections to permit the water to escape from the receptacle and cold water to enter the same.

20. The combination with a receptacle, of means for feeding carbid, a valve-controlled water outflow and inflow, and means operated by the heat of the water in the receptacle to actuate the valves and permit the water to escape from the receptacle and cold water to enter the same.

21. The combination with a receptacle, of means for feeding carbid, a valve-controlled water outflow and inflow, levers connected to the valves, and an expansible device operatively connected to the levers whereby the heat of the water may cause the device to expand and thereby operate the valves to permit the hot water to escape from the receptacle and cold water to enter the same.

This specification signed and witnessed this 16th day of June A. D. 1909.

HARRY BROUSSEAU.

Witnesses:
W. A. TOWNER, Jr.,
M. DINNHAUPT.