No. 891,616. PATENTED JUNE 23, 1908.

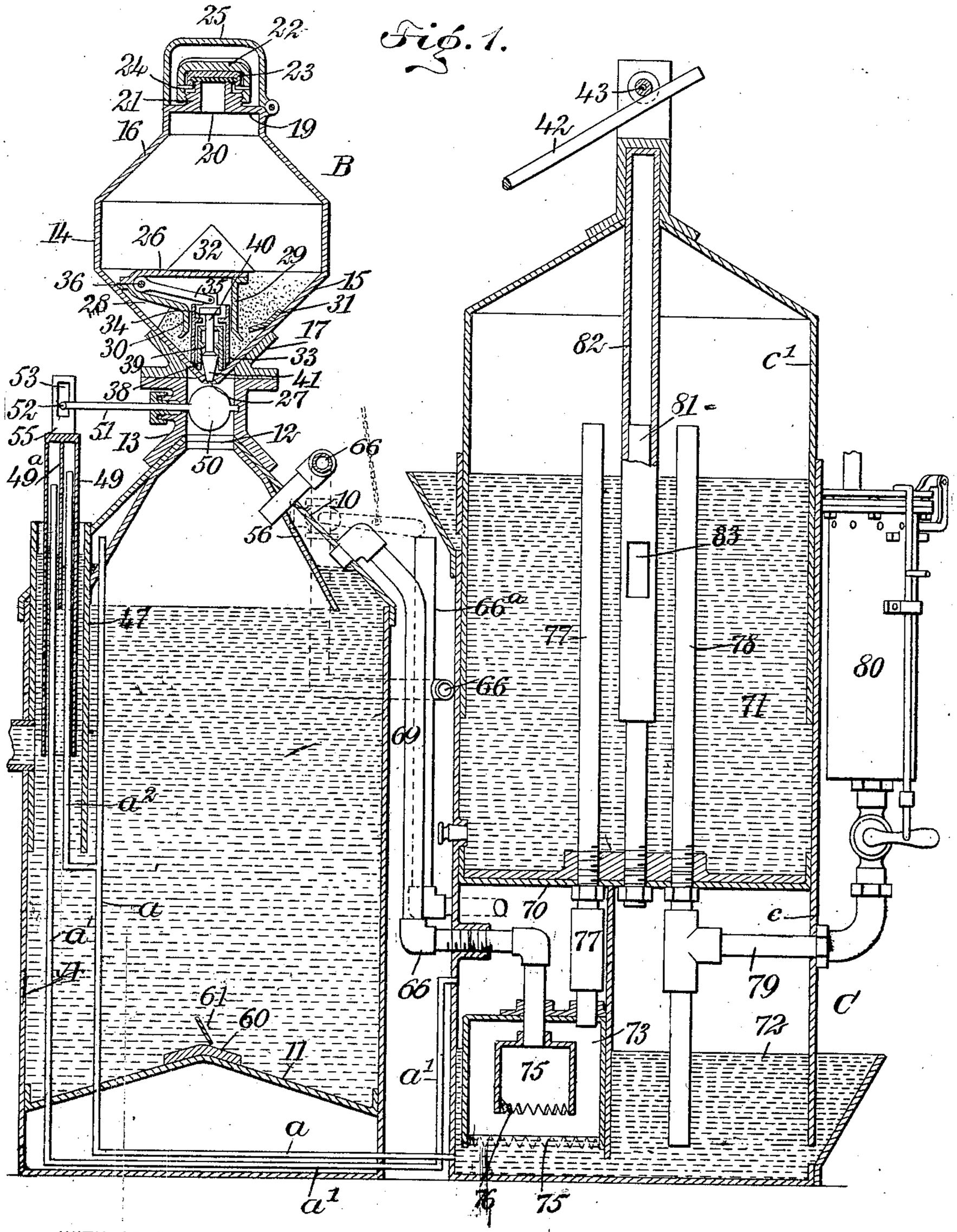
O. H. HASNEDER.

ACETYLENE GAS GENERATOR.

APPLICATION FILED MAY 29, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

H. C. Abbott

F. E. Oakes

INVENTOR

Otto Huber Hasneder

BY Munn & Co

ATTORNEYS

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2 SHEETS—SHEET 2.

Fig. 4.

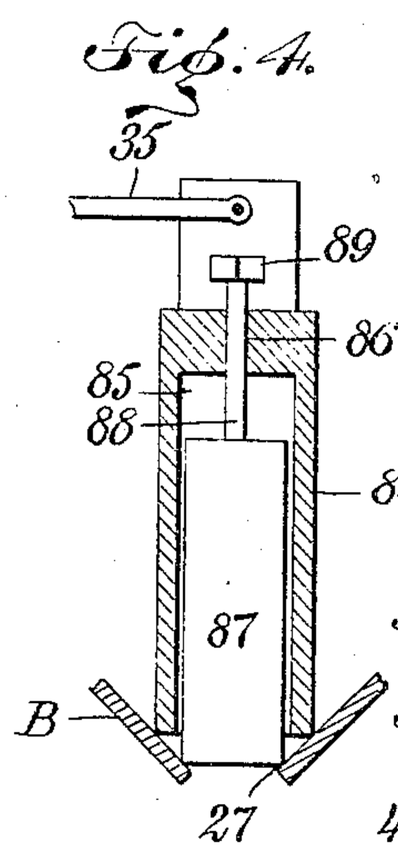

Fig. 2.

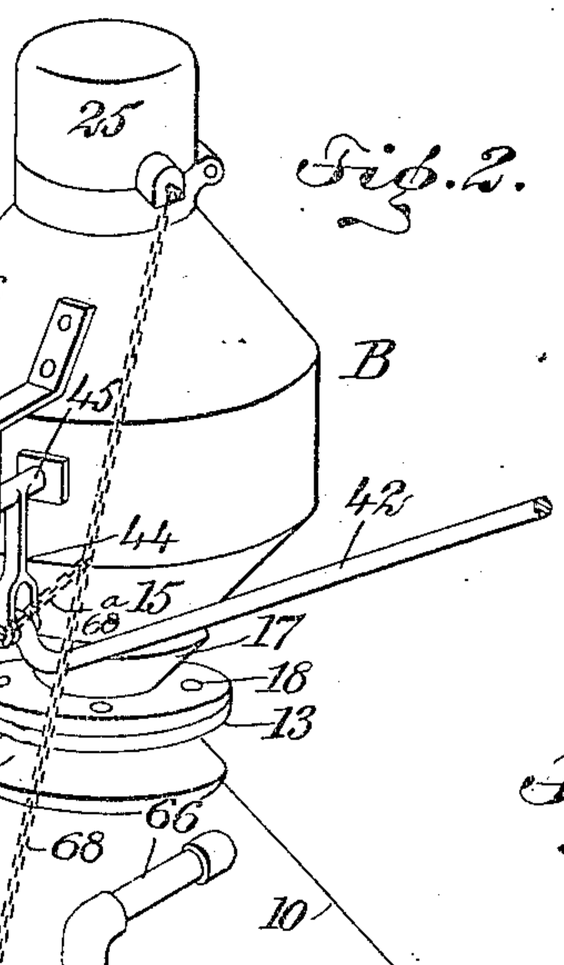

Fig. 3.

Fig. 5.

WITNESSES

A. C. Elliott

J. Bedecker

INVENTOR

Otto Huber Hasneder

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

OTTO HUBER HASNEDER, OF SEAFORD, NEW YORK.

ACETYLENE-GAS GENERATOR.

No. 891,616. Specification of Letters Patent. Patented June 23, 1908.

Application filed May 29, 1906. Serial No. 319,244.

To all whom it may concern:

Be it known that I, OTTO HUBER HASNEDER, a citizen of the United States, and a resident of Seaford, in the county of Nassau and State of New York, have invented a new and Improved Acetylene-Gas Generator, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a generator for acetylene gas, which will be compact, safe and durable and practically automatic in its action, and which will be an improvement upon the generator for which Letters Patent were granted to me May 2, 1905, No. 788,901, to the extent that the entire machine is simplified in construction, and wherein the feed is rendered accurate, positive and sure, and wherein also the feed is of such detail construction and its operation is such that sticks and other foreign matter is effectually prevented from passing into the generator with the charge of carbon.

Another purpose of the invention is to so construct the feed mechanism that the carbid will be prevented from sticking to the sides of the hopper, but will be pulverized adjacent to and at the outlet for the hopper by the nested valves forming a portion of the feed mechanism, thus insuring a steady and uniform feed from the hopper to the generator at each operation of the feed mechanism.

A further purpose of the invention is to provide a float which will drop down to or enter the bottom of the generator, and to provide effective and easily operated means for cleaning the generator from sediment, together with means for preventing tampering with such cleaning mechanism and likewise with the supply of carbid to the hopper.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section through the hopper, the generator and gasometer of the improved machine; Fig. 2 is a fragmentary exterior perspective view of the generator and hopper; Fig. 3 is a vertical section through the generator, taken at an angle to the section shown in Fig. 1 and illustrating in detail the operation of the cleaning devices; Fig. 4 is a sectional side elevation of a slightly modified form of the feed device, a portion of the hopper being also shown in section; and Fig. 5 is a bottom plan view of the cleaning shaft shown in Fig. 3, illustrating the position of the blades relatively to each other, and the shaft to the said blades.

A represents the generator, B the hopper and C the gasometer of an acetylene gas machine, the gasometer consisting of the usual body section *c* and bell section *c'*. The generator A is provided with a conical top 10 and a more or less conical true bottom 11, the other bottom shown being generally omitted. The true bottom 11 has an inclination from the rear downward to the forward portion of the said generator as illustrated in Fig. 3. The inlet 12 of the generator is at the central portion of its conical top 10, and the said opening 12 is surrounded by a reinforcing flanged neck 13, suitably secured to the outer face of the top 10 of the generator as shown in Fig. 1.

The hopper B is preferably given the form illustrated in Figs. 1 and 2, wherein the hopper consists of a lower conical section 15, an intermediate cylindrical section 14 and an upper truncated section 16. The lower section 15 of the hopper is attached to the neck 13 of the generator by passing bolts 18 through the flange of a sleeve 17 firmly and exteriorly secured to the said hopper as is also shown in Figs. 1 and 2. A closing plate 19 is provided at the upper central portion of the upper truncated section 16 of the hopper, and in this plate an inlet opening 20 is formed of suitable dimensions, surrounded by an upwardly extending exteriorly threaded collar 21, but the upper exterior portion of the said collar 21 is reduced and plain as is shown in Fig. 1.

The collar 21 is adapted to have screwed thereon an interiorly threaded cover 22, and a cap 23 having a suitable washer is held to turn loosely in the cover 22, usually being supported therein by pins 24 extending from the cover below the lower edges of the cap, as is also shown in Fig. 1, so that the cap will immediately engage with the upper end of the collar 21 the moment the cover is placed thereon, and the cover as it is screwed to place on the collar will tend to press the cap firmly and in a gas and air-tight manner upon the said collar. A hood 25 covers the collar 21 and the cover 22 when in position on the said collar, and the said hood is hinged at its rear portion to the rear adjacent portion of

the body of the hopper, as is clearly shown in Figs. 1 and 2.

A narrow horizontal plate 26 is supported in the lower portion 15 of the hopper, extending from its central portion to what may be termed the front side portion, so as to extend over the outlet 27 for the hopper B, which outlet is at the lower pointed end of the hopper as shown in Fig. 1. The plate 26 is attached to a box casing 29, the latter being supported by a suitable bracket 28; and the said box casing 29 is provided with a downwardly-extending circular neck 30, outwardly flared at its lower edge, and a ring 31 is secured to the inner face of the lower conical section 15 of the hopper B, the inner edge of which ring is upwardly and inwardly flared and is made to approach the flared portion of the neck 30 of the said casing as is shown in Fig. 1. The opening between the outwardly flared portion of the casing 29 and the ring 31 is sufficiently large to permit the carbid to readily flow down to the outlet portion of the hopper and be directed to the sides thereof by the flared portions of the casing 29, but said opening is not sufficiently large to permit sticks and other foreign matter to pass down even with finely reduced carbid. The carbid when placed in the hopper is deflected at the sides and at the end portion of the plate 26 of the casing 29, by means of a pyramidal plate 32, supported by the said plate 26, as is shown in Fig. 1.

The feed device or mechanism controlling the outlet in the hopper B consists preferably, as is shown in Fig. 1, of three valves, namely, an outer tubular valve 33 open at the top and at the bottom and of sufficient diameter to move in the neck portion 30 of the casing 29, and of sufficient diameter to engage with the slanting lower wall of the hopper B at a certain distance from the outlet 27, and this outer tubular valve 33 is provided with an interior flange 34 adjacent to its upper edge. This valve 33 is pivotally attached to an arm 35 operating within the casing 29, and secured to a shaft 36 which extends out through the hopper at the front of the same as is shown in Fig. 2, the shaft being provided at its outer end with an angular arm 37 secured thereto for a purpose to be hereinafter described. The second valve 38 of the feed mechanism is also tubular and is open at its bottom, partially open at the top and provided between its ends with an interior annular flange 39. When the inner tubular valve 38 is raised a certain distance it engages with the flange 34 of the outer valve 33. The inner valve 40 is a plug valve, the plug 41 whereof is straight or conical and is adapted normally to enter and close the outlet aperture 27, while at the same time the surrounding tubular valves have bearing at their lower edges on the carbid around the said outlet, serving in the action of these valves to pulverize the said carbid, and also to prevent it from sticking to the sides of the hopper. The stem of this inner valve 40 extends up through the opening surrounded by the flange 39 in the inner valve, and through the opening at the upper end of the said inner tubular valve, and said stem likewise passes through the opening surrounded by the flange 34 in the outer tubular valve 33, and at its upper end the said stem is provided with a head. The plug 41 is within the inner valve just below its flange 39. In the operation of this feed mechanism, in lifting it to cause a discharge of carbid into the generator, the shaft 36 is turned by a means to be hereinafter described, and the arm 35 is lifted, which carries up the outer tubular valve 33. As this valve rises its flange 34 engages with the head of the valve 40 and raises said valve from its seat at the outlet 27, and the plug 41 of the said valve 40 as the valve rises, in its turn engages with the flange 39 of the inner tubular valve and carries that valve upward, so that all the valves travel upward when carbid is to be released, but they move one after the other, and the moving influence is above the combined valves. In dropping, the inner tubular valve closes first, the valve 40 next, and the valve 33 last, and the action of the two tubular valves 33 and 38 in closing will cause a pulverization of the carbid below them and likewise more or less agitation of the carbid around them, while the plug 41 completely closes the outlet aperture 27. The order of closing of said valves is just the reverse of the order of opening, and further with reference to said valves the outer one 33 is essentially an agitator, the valve 40 acts to close the opening in the hopper, and prevents moisture gaining access to the carbid, while the intermediate or tubular valve 38 controls the feed, but is assisted by the outer valve 33 so that practically a double cut-off is secured.

The carbid is discharged automatically when gas is needed in the gasometer, and therefore a lever 42 is employed, shown in Fig. 2, one end of which lever extends up to an engagement with a roller 43 at the top of the gasometer, while the opposite or front end portion of the lever 42 is usually pivoted to the forked end of a crank arm 44, secured to a short shaft 45, journaled in proper bearings at the exterior of the hopper, and the inner or forward extremity of the lever 42, or that end adjacent to its bearing on the hopper, is provided with a head 46, more or less pointed to engage with the angular arm 37 on the shaft 36. Thus when the rear end of the lever 42 is pressed down by the downward movement of the bell of the gasometer, the shaft 36 is rocked to carry the arm 35 more or less upward to more or less open the feed mechanism of the hopper. The short

shaft 45 is mounted to turn so that the lever has swinging movement, enabling said lever, as will be hereinafter described, to disengage itself from the latch head or angular plate 37 on the feed shaft 36 and thus permit the feed mechanism to return automatically to closing position relatively to the hopper. This separation is accomplished when the hood 25 is removed to replenish the hopper, permitting the feeding mechanism to remain in inactive closed position, while the hopper is being filled, since it will then be unaffected by the rise or fall of the gasometer.

Within the generator A at one side near the front, a tube 47 is constructed, open at the top and at the bottom, and the water inlet pipe 48 for the generator is passed into said tube. The tube 47 is a guide tube for the float 49, and the upper end of the guide tube extends out through the top portion 10 of the said generator as is shown in both Figs. 1 and 2. The float 49 operates a disk valve 50, which is mounted to turn in the reinforced neck of the generator, and when the said valve is in its normal position, that shown in Fig. 1, the carbid in passing from the hopper to the generator will not be interfered with; but at other times the valve 50 is in a horizontal position and when in such position receives the charge of carbid, should one be given, until a suitable time arrives to discharge it into the generator. The float 49 is provided at its upper portion with an interior partition 49^a, extending down a slight distance from its top as shown in Fig. 1; and in connection with said float two main pipes a and a' are provided and a branch pipe a^2. The pipe a extends from the bottom of the generator, being above the water line, and is carried down through the generator and made to connect with the lower water seal 72 in the gasometer. The other main pipe a' extends up into the float to a point at one side of its partition, and said pipe a' is then carried downward and is connected with the lower compartment in the gasometer formed by a partition 70. The branch pipe a^2 extends from the main pipe a and is carried beneath the guide tube 47 for the float 49 and then up into the float to a position at the opposite side of the partition 49 to that occupied by the upper end of the pipe a'. In the operation of this construction, if the gas pressure is too severe in the gasometer the gas will find its way down through the main pipe a, will pass up the branch pipe a^2 and will raise the float 49, causing the valve 50 to close; and as the float rises sufficiently to carry its partition 49^a above the upper ends of both the pipes a and a', the gas in the float will pass down through the pipe a' into the said lower chamber of the gasometer and out through a discharge pipe 66^a connected with such chamber as shown in Fig. 1.

I desire it to be understood that the float 49 may be placed wholly within the generator if so desired. The valve 50 is brought to a receiving position when the water in the generator is below the proper level, but when the water reaches the proper level, which level is shown in Fig. 1, the valve reverses and dumps its load, or is carried out of the path of the carbid falling from the hopper. This valve 50 is provided with a stem 51, extending out through the neck 13 of the generator, and the stem is usually provided with a T-head 52, the members of which head enter slots 53 and 54 in arms extended upward from the upper end of the float 49, as is illustrated best in Fig. 2. When the float rises to its normal position its action is to turn the valve 50 to a discharging position; but when the float 49 drops down from its normal position it turns the said valve 50 to intercept the carbid; other means, however, may be provided for this purpose. A substantially conical deflecting plate 56 is located within the generator at its upper portion, in order to confine the carbid within certain points, and to compel all the dust to dissolve as well as the solid particles of carbid, thus preventing choking of the burners; and it also prevents a collection of dust below the feed.

In Figs. 3 and 5 I have illustrated means for cleaning the generator, and to that end I employ a tube 57 open at the top and bottom. This tube passes down through the top 10 of the generator with a downward and rearward inclination, but stops short of the conical bottom 11. A shaft 58 extends the length of the said tube 57 and is protected thereby, and the upper outer end of the shaft is provided with a handle 59, while the inner end of said shaft 58 is mounted to turn in a bearing 60 secured to the central portion of the said bottom 11. Opposing blades 61 are secured by suitable hubs to the lower end of the shaft 58, and these blades, which are given a propeller twist in opposite directions as is shown in Fig. 5, travel over the bottom 11 quite close to its inner face, and serve to clean the bottom without actually scraping it and to set up a violent agitation in the liquid in the generator. This agitation is further brought about by the addition of agitating arms 62, which are curved in opposite directions and are oppositely located above the blades 61, the propeller-like blades 61 and the curved agitating arms 62 being at right angles to each other. The water and the slush are drawn off from the bottom portion of the generator through a suitable offtake faucet 63, preferably located at the front, the plug 64 whereof is operated by connection with a rod 65, and said rod extends up through one or more guides 66^b to a point at or near the upper end of the tube 57. The water inlet tube 48 for the generator is carried around to the front of the machine up

beyond the lower edge of the conical top as best shown in Fig. 2; and normally the upper end of the said tube 48 and the upper end of the rod 65 are covered by a cover plate 63ª, hinged at one end to the top 10 of the generator, the opposite end having connection with the plug 64ª of a valve 65ª located in a relief or discharge pipe 66 leading into the dome of the generator, and this plate 63ª is provided with a handle 67 connected by a chain 68 with the hood 25 of the generator.

Any approved means may be employed for locking the handle 67 in its lower position, and at such time the valve in the relief or discharge pipe 66 is closed and the hood 25 is also held closed so that the contents of the hopper can not be tampered with. When the cover is raised the valve 64ª is opened, and the gas in the generator will escape into the discharge pipe 66 of the gasometer with which it is connected as is shown in Fig. 1, thus permitting the gas to escape from the generator and enabling the hopper to be conveniently filled.

When the cover plate 63ª is opened it uncovers the pipe 48, permitting the generator to be supplied with water, and it likewise enables the outlet valve 63 of the generator to be opened. It also causes the chain 68 to slacken, so that the hood 25 of the hopper can be drawn back to fill the hopper or to inspect it. A short length of chain 68ª is attached to the chain 68 and to the arm 44 so that when the hood 25 is removed to fill the hopper the said short length of chain will draw the lever 42 back from engagement with the latch head 37, thus when the valve 65ª is open the motion of the gasometer ceases to affect the feed of the carbid. It may be here remarked that gas can only escape through the pipe 66 when the valve 65 is open, which as stated is when the hopper is to be charged.

The gas supply pipe 69 for the generator, and which may also serve as an overflow pipe, enters the body *c* of the gasometer C at its bottom portion. The body *c* of the gasometer may be provided with a horizontal partition 70, whereby to provide an upper water seal 71 for the bell *c'* of the gasometer and the second water seal 72 in the lower portion of the body of the said gasometer. A gas-receiving box 73 is supported in this lower water seal, as shown in Fig. 1, the bottom of the box being open and its bottom edge being provided with serrations 74. In this box 73 a smaller box 75 is supported, attached to the discharge end of the gas supply pipe 69, which pipe also passes through the other receiving box 73. The serrations 74 at the lower end of the receiving box 73 are provided so that the gas will offer the best possible resistance to the water seal 72; and the lower edge of the inner and smaller box 75 is provided with similar serrations 76 in order that the discharge of gas from the smaller into the larger box will be as slow as possible.

A pipe 77 is introduced into the larger receiving box 73 at the top, and this pipe extends through the partition 70 in the body of the gasometer up to a point beyond the level of the upper water seal 71. In this manner the gas enters the bell, and the gas passes out from the bell through a pipe 78 which is practically a duplicate of the pipe 77, but the lower end of the pipe 78 is immersed in the water seal 72, and a branch pipe 79 is provided to carry the gas from the pipe 78 to a purifier 80 of any approved type.

In order to prevent danger of the gasometer being overloaded I employ a pipe 81 intermediate of the pipes 77 and 78, which intermediate pipe 81 extends through and below the partition 70; and a second pipe 82, closed at its top and secured to the upper portion of the bell of the gasometer, is made to telescope the tube 81, and the telescoping tube 82 is provided with a slot 83 therein between its ends. When the bell rises sufficiently to bring the opening 83 in the tube 82 above the upper end of the intermediate pipe 81, the overplus gas will pass out through the bottom of the tube 81 into the lower chamber of the body, and out through the discharge pipe 66.

In Fig. 4 I have illustrated a slightly modified or simpler form of feed device, and one which is especially adapted to be used in connection with large-grained carbid. The hopper B is the same as that heretofore described, being provided with the same character of outlet opening 27. The feed device, however, consists of an outer circular valve 84, provided with a chamber 85 therein extending from a point near its upper end through its lower end, so that the lower end of the valve is open and its upper end is closed, except that a central opening 86 is made therein. The outer valve 84 is connected in any approved manner with the aforesaid arm 35 acting in the hopper. The inner valve 87 is solid, is of less length than the length of the chamber 85 in the outer valve and has sliding movement in said chamber, being provided with a stem 88, which extends out through the opening 86 in the outer valve and terminates in a head 89. Thus when the outer valve is raised, which is the first to be raised, it passes some distance up before it raises the inner valve 87 to uncover the outlet in the hopper, and on the return action of these two valves they act one after the other upon the carbid which may have collected around or adjacent to the outlet 27, the inner valve 87 closing the said outlet while the outer valve rests upon the surrounding inner surface of the hopper.

It may be here remarked referring to the construction of the generator as illustrated in Fig. 1, that the connection between the cen-

tral and annular gas spaces is brought about in the following manner: The two said spaces are separated by the conical deflecting plate 56, hence the pressure of gas exerted in the said central space, or within the space defined by the deflecting plate, forces the water in the body of the generator downward, whereupon the gas is forced through the water and bubbles up into the annular space and is more or less purified in its passage from one space to the other.

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

1. In acetylene gas generators, a safety feed consisting of a hopper having an inlet and an outlet, a series of nested coöperating controlling valves for the outlet and parts of the hopper adjacent to the outlet, comprising an inner closing valve, an intermediate valve controlling the feed, and an outer valve that acts as an agitator and as an auxiliary cut-off, exteriorly-operated means for controlling the movement of one valve, and sliding connections between adjacent valves, which connections are such that the valves consecutively lift and release one another.

2. In acetylene gas generators, a safety feed consisting of a hopper having an inlet and an outlet, telescopic valves having sliding movement in the hopper to and from the outlet, comprising an inner closing valve, an intermediate valve controlling the feed, and an outer valve that acts as an agitator and as an auxiliary cut-off, a guide casing for the valves, sliding connections between the valves, the sliding movement being within prescribed limits, and flanges carried by the valves, the flange of one valve being adapted for consecutive lifting and releasing action on the flange of the next valve, and an externally operated mechanism having connection with one of the valves to bodily lift and release the same, said action being at the upper end of the said valve.

3. In acetylene gas generators, a safety feed consisting of a hopper having a tapering lower portion, an inlet at its upper portion, and an outlet at its pointed lower portion, a tubular cut-off valve having normal bearing upon the hopper and adapted for movement to and from the said outlet, a plug valve mounted to slide in the tubular valve and to directly close the outlet opening in the hopper when said plug valve is in its normal position, an outer agitating valve that telescopes the cut-off valve and which likewise acts as an auxiliary cut-off, lifting and releasing connections between the upper portions of the valves, external means for elevating and releasing the valves in predetermined order, and a guide casing for the valves.

4. In acetylene gas generators, a safety feed consisting of a hopper having a tapering lower portion, an inlet at its upper portion and an outlet at its lower pointed portion, telescopic valves, comprising an outer and an inner tubular valve and a centrally located plug valve, the outer tubular valve being provided with interior flanges for engagement with the upper portion of the inner tubular valve, the inner tubular valve being provided with internal flanges for engagement with the plug section of the plug valve, the shank of which plug valve extends up through the inner tubular valve and beyond the flanges of the outer tubular valve, terminating in a head, a casing located within the hopper, within which the valves have movement, and externally operated means for lifting and releasing the outer tubular valve.

5. In acetylene gas generators, a safety feed consisting of a hopper having a tapering lower portion, an inlet at its upper portion and an outlet at its lower pointed portion, telescopic valves comprising an outer and an inner tubular valve and a centrally-located plug valve, the outer tubular valve being provided with interior flanges for engagement with the upper portion of the inner tubular valve, the inner tubular valve being provided with internal flanges for engagement with the plug section of the plug valve, the shank of which plug valve extends up through the inner tubular valve and beyond the flanges of the outer tubular valve, terminating in a head, a casing located within the hopper, within which the valves have movement, and externally-operated means for lifting and releasing the outer tubular valve, the said casing being provided with a neck section the lower end of which is outwardly flared, and a ring secured to the inner face of the hopper, having its inner edge flared in direction of the flaring portion of the casing neck, a space intervening between the flaring portion of the ring and the flaring portion of the neck sufficient to permit the passage of carbid but not sufficient to permit the passage of sticks or other obstructions.

6. In acetylene gas generators, a safety feed consisting of a hopper having a tapering lower portion, an inlet at its upper portion and an outlet at its lower pointed portion, telescopic valves, comprising an outer and an inner tubular valve and a centrally-located plug valve, the outer tubular valve being provided with interior flanges for engagement with the upper portion of the inner tubular valve, the inner tubular valve being provided with internal flanges for engagement with the plug section of the plug valve, the shank of which plug valve extends up through the inner tubular valve and beyond the flanges of the outer tubular valve, terminating in a head, a casing located within the hopper, within which the valves have movement, and externally operated means for lifting and releasing the outer tubular valve, the said casing being provided with a

neck section the lower end of which is outwardly-flared, and a ring secured to the inner face of the hopper, having its inner edge flared in direction of the flaring portion of the casing neck, a space intervening between the flaring portion of the ring and the flaring portion of the neck sufficient to permit the passage of carbid but not sufficient to permit the passage of sticks or other obstructions, a generator with which the hopper is connected, a valve located in the said generator beneath the outlet thereof, and a float operating in the generator and being operatively connected with the said valve.

7. In acetylene gas generators, a generator having an open ended tube extending out through the top and within the generator for a portion of its length, a float mounted within the tube and having one end extending out beyond the upper end of the said tube, a controlling valve for carbid mounted to turn in the inlet portion of the generator, and a stem projecting from said valve and operatively connected with the projecting end of the said float, whereby to turn the said valve to open and close the same by the movement of said float.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO HUBER HASNEDER.

Witnesses:

J. FRED ACKER,

EVERARD B. MARSHALL.