A. S. PHELPS & J. N. J. HILBERT.

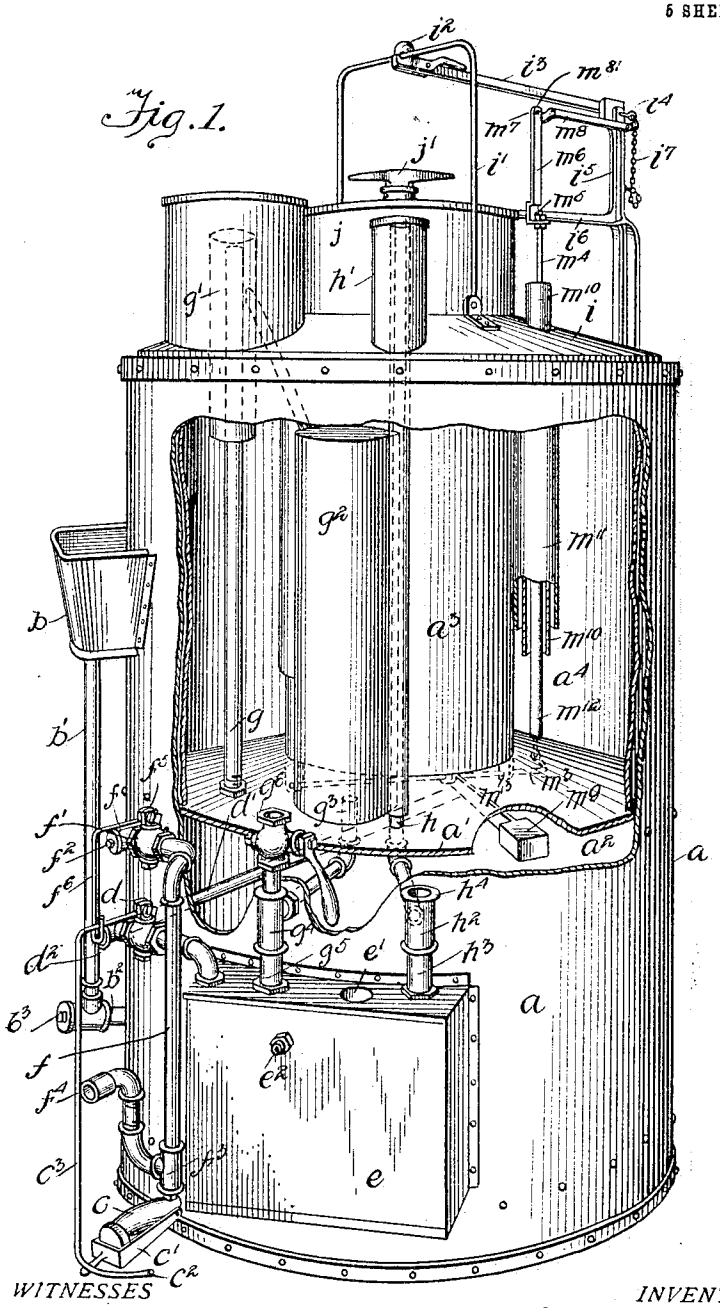
ACETYLENE GENERATOR.

APPLICATION FILED SEPT. 18, 1909.

1,121,758. Patented Dec. 22, 1914.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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5 SHEETS—SHEET 2.

Fig. 2.

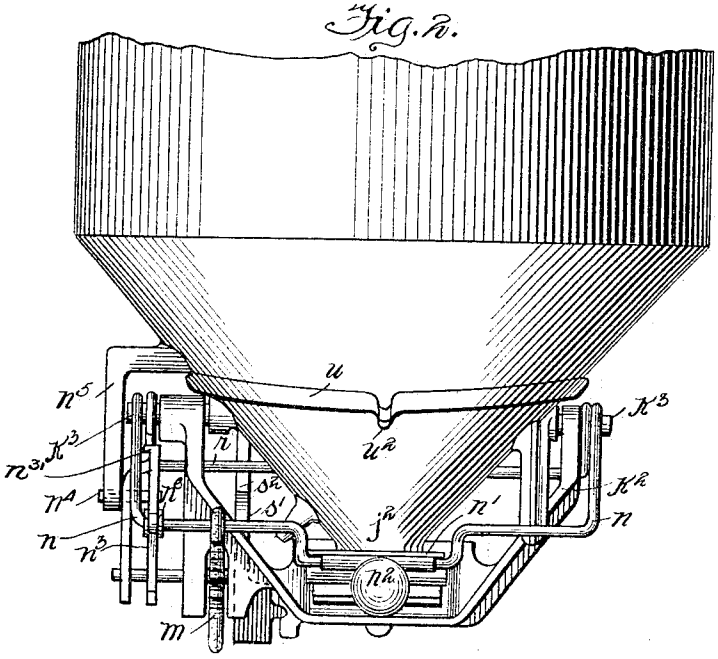
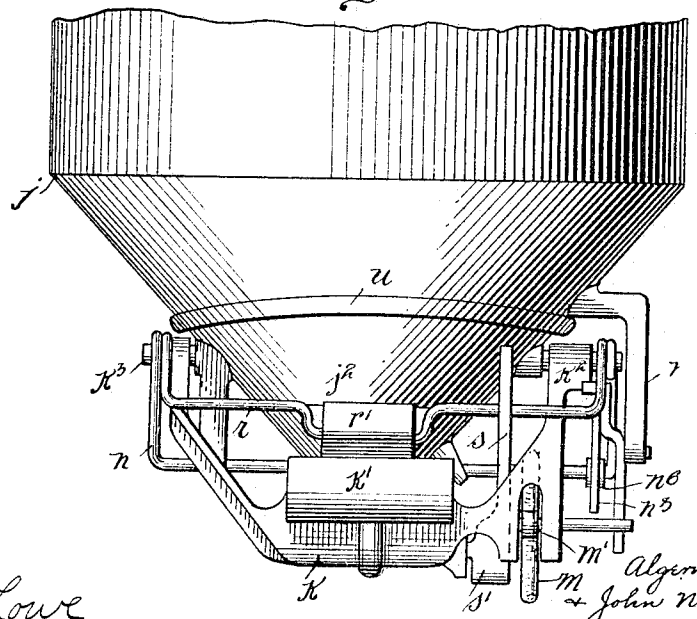


Fig. 3.



Witnesses

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5 SHEETS—SHEET 3.

Fig. 4.

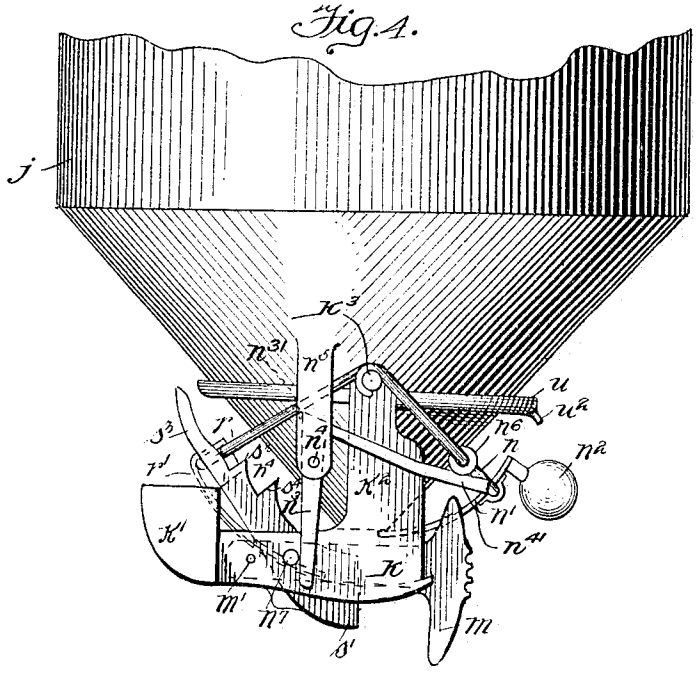
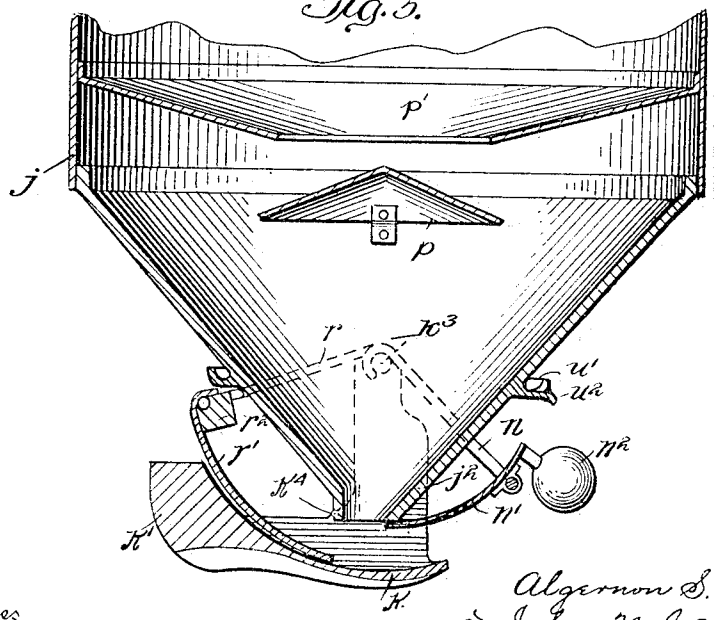


Fig. 5.



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6 SHEETS—SHEET 4.

Fig. 6

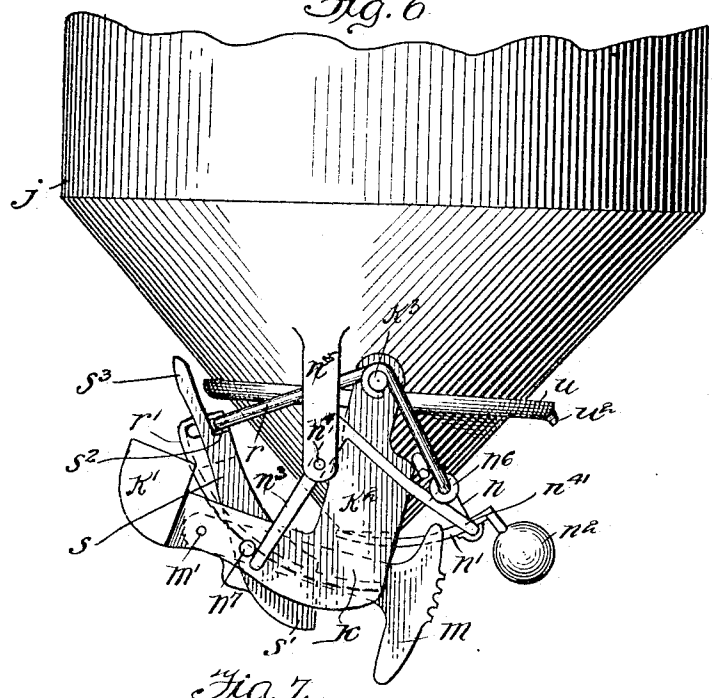
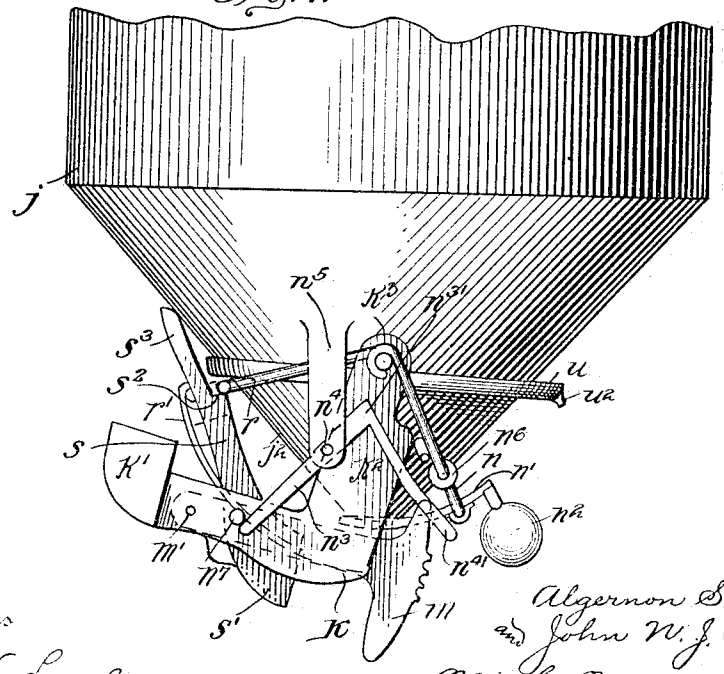


Fig. 7.



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5 SHEETS—SHEET 5.

Fig 8.

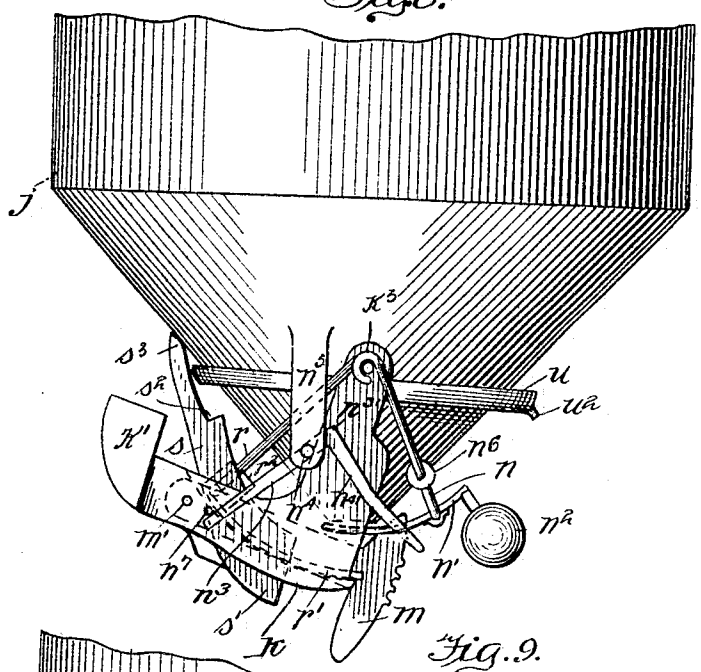
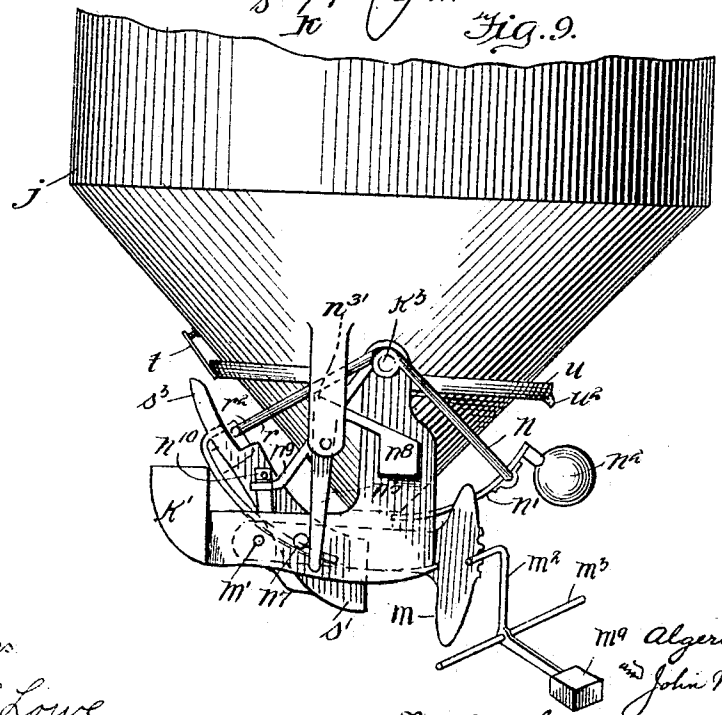


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

ALGERNON S. PHELPS AND JOHN N. J. HILBERT, OF CHICAGO, ILLINOIS.

ACETYLENE-GENERATOR.

1,121,758. Specification of Letters Patent. Patented Dec. 22, 1914.

Application filed September 13, 1909. Serial No. 518,369.

To all whom it may concern:

Be it known that we, ALGERNON S. PHELPS and JOHN N. J. HILBERT, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Acetylene-Generators, of which the following is a specification.

Our invention relates to improvements in gas generators, and, in particular, to acetylene generators.

The object of our invention is to provide an acetylene generator which will comply with all the requirements of the Underwriters' Association, which will be capable of automatically controlling the generation of gas under all conditions of use, of maintaining a uniform gas pressure, of preventing a flooding of the generator, and, in short, a generator wherein safety is assured and which will automatically adjust itself to varying circumstances and demands.

Our invention has for its object, moreover, the prevention of the caking of carbid in the feeding device, the maintenance of an auxiliary supply of carbid in reserve, and the automatic feeding of the same when required, and, in general, the accomplishing of further advantageous results in the manufacture of acetylene gas as hereinafter more specifically set out.

With these objects in view, our invention consists in the features, details of construction, and combination of parts, which will first be described in connection with the accompanying drawings, and then particularly pointed out in the claims.

In the drawings: Figure 1 is a perspective view of the generator complete with certain portions broken away to reveal the interior construction; Fig. 2 is a front elevation of the carbid feeding device; Fig. 3 is a rear elevation of the same; Fig. 4 is a side elevation of the carbid feeding device in a position of rest; Fig. 5 is a vertical section through Fig. 4; Figs. 6, 7, and 8 are side elevations at different positions of the feed mechanism; and Fig. 9 is a similar view of a modification.

Referring to the drawings in detail, the main or generator casing a is divided by the partition a' into two compartments, a lower generating chamber a^2 having an upward extending cylindrical portion a^3, and an upper chamber a^4 serving as a receptacle and water seal for the gasometer to be hereinafter more specifically referred to.

Water is supplied to the generating chamber by means of a filling lip b and a pipe b' provided with a T, and extending at b^2 into the generator and terminating therein in an upturned nipple to form a trap, (not shown). A removable plug b^3 closes one arm of the T, whereby to provide cleaning access to the inward extension b^2. The generating chamber is emptied through a pipe c closed by a gate valve c'. This gate is normally locked by a foot c^2 formed on the rod c^3. The rod c^3 is rigidly connected with the cock d controlling the vent pipe d' which leads from within the chamber a^2 above the water level by way of a T provided with a removable cleaning plug d^2, and the cock d to the upper space of the by-pass.

The by-pass e is of the usual construction, being a tight box, arranged to be partially filled with water by a filter pipe e' terminating near the bottom of the box, and also having an outlet e^2. An overflow pipe f, tapping the inside of the generating tank at the maximum water level, leads by way of a T f', having a removable cleaning plug f^2, to the lower outside of the casing, where is situated another T f^3, thence the pipe extends upwardly to form a water trap and discharges at f^4 into the waste. By this construction the overflow water is taken from the top and the water trapped therein is comparatively free from sediment which would not be the case if it were taken from the bottom of the generating chamber. This overflow pipe f is controlled by a cock f^5 by means of a rod f^6 interlocked with the rod c^3, whereby the two cocks f^5 and d must be opened and closed simultaneously, and the gate c' cannot be opened until the said cocks have been operated to open the vent and also the overflow.

The gas, generated by the discharge of carbid into the water in the generating chamber by the carbid feeding mechanism to be hereafter described in detail, passes by

way of the pipe g through the washer g' and the filter g^2, into the pipe g^3 to the T g^4 having vertically extending arms, one of which, g^5, as a drip pipe, extends into the water in the by-pass box e and the other g^6 is connected to the house supply pipe. A blow-off pipe h having its inner open end terminating in the upper gasometer space and surrounded by the usual hood h', extends outside the gasometer to the T h^2, having one vertical arm h^3 leading to the upper space of the by-pass and the other h^4 discharging out of doors into the atmosphere.

The gasometer i is of the usual general form open at the bottom and floating, when filled with gas, within the receptacle a^4, on a body of water which serves to seal the lower end. It is of annular shape, enveloping the washer g' and the filter g^2 and surrounding the cylindrical upward extension a^3, of the generating chamber. A bail i' attached to the gasometer is detachably connected by the catch i^2 to an arm i^3 pivoted at i^4 to a bracket i^5 carried by the casing a and supported by the brace i^6. The pivot i^4 is in the form of a removable pin attached to a chain i^7 to prevent loss. Within the cylindrical extension a^3 of the generating chamber a^2 the carbid magazine, j is supported, and the atmosphere excluded by the cover j'. This carbid magazine j is of the usual form with an upper cylindrical portion and lower conical or funnel shaped portion terminating in the discharge chute j^2, but it is used in connection with certain important improvements in the carbid feed.

In our carbid feed mechanism we employ a feed shoe k counterweighted at k' and supported by the yoke k^2 pivoted at k^3 to swing below and at an appreciable distance from the mouth k^4 of the chute j^2. A T-headed lever m is pivotally connected with the shoe at m' and the head thereof is escalloped or recessed as shown. An arm m^2 of a rock shaft m^3 rests against the lever head in one of the recesses. The rock shaft is arranged to be rocked, upon the descent of the gasometer, in any approved manner, as for instance by a rod m^4 extending upwardly and connected to the yoke m^5 of a depending link m^6 pivoted at m^7 to an arm m^8 pivoted to the bracket i^5. This arm m^8 may be bent or offset as at m^{81} in such manner as to partially underlie the arm i^3, and as the gasometer i and with it in the arm i^3 descends, the rod m^4 is depressed and the shaft m^3 is rocked. A counterweighted arm m^9 restores the shaft to its normal position as soon as the gasometer again rises and releases the arm m^8.

To prevent escape of gas and avoid the necessity of bushings, we employ a particular method of connecting the rod m^4 with the rock shaft m^3, making no claim to the same herein. Secured tightly to the rod m^4 is a downwardly opening hood m^{10} extending downwardly around the rod and telescopically into the well m^{11} to a point below the water level in the gasometer. An upwardly extending pipe m^{12} fixed to the diaphragm or partition a' communicates between the gas space of the generating chamber a^2 and the upper part of the hood m^{10} and the bore of the pipe serves as a passage for the rod m^4. Below the partition a' the rock shaft m^3 is journaled in the bracket m^{13} and thus the rod m^4 has no sliding bearing in any part requiring a bushing and the connection is effectually water sealed. A bow or bail n is mounted at each side of the magazine on the pivot k^3 and has journaled thereon in its intermediate portion a sheet metal cut-off n' weighted at n^2 and curved as an arc about the pivot k^3 as a center. This cut-off plate is at a less distance from the said pivot than is the shoe k and is journaled at substantially the same radial distance from its pivot as is the mouth of the chute, so that it will be held closely against the same by the counterweight n^2 and thus act as a cut off for the carbid. An angle lever pivoted at n^4 to ears n^5 depending from the magazine underlies with one arm n^{41} a roll n^6 carried by the bail n and its other arm n^3 is disposed in the path of a stud n^7 carried by the shoe k.

The relation of the several parts just described is such that when the feed shoe occupies a position beneath the mouth of the magazine (Figs. 4 and 5), the stud n^7 presses against the lever arm n^3 and arm n^{41} holds the bail and cut-off plate in an elevated position away from the mouth. In this position, the carbid may flow freely through the mouth into the shoe. This is the normal situation when the gasometer is full of gas. As the gasometer descends and the shaft is rocked, the shoe k is swung to the rear upon its pivot k^3 from beneath the mouth of the magazine, dropping into the generating chamber a part of the quantity of carbid resting on the shoe. This feeding movement of the shoe is accompanied by a movement of the cut-off plate, the stud n^7 being withdrawn from the angle lever arm n^3 and permitting the plate n' to drop to a position closing the mouth of the magazine against which it is held by the weight n^2, effectually shutting off any flow of carbid while the shoe is withdrawn. Within the lower portion of the magazine a shield p is formed immediately above the mouth k^4, and above this is a deflector p' guiding the carbid in its flow on to the shield, the purpose being to guard the mouth and cut-off plate from the direct flow and weight of the carbid. Ordinarily the shoe does not swing through its full arc of movement, as the feed device is so sensitive that a very small deposit of carbid in the generating chamber

is sufficient to close the shoe before it is emptied and to slightly open the cut-off, while a very small consumption of the gas will cause the cut-off to close the chute and the shoe to feed another minute portion of its carbid. The result is the maintenance of an almost continuous feed and a consequent highly desirable uniformity in the gas pressure in the service pipes so that flickering of the lights is avoided. It has been found, however, that this nearly continuous feed in connection with a positive cut-off results in a gradually progressive depletion of the store of carbid in the shoe without sufficient reacting of the gasometer to open the cut-off, until a point is reached where the carbid is so far exhausted from the shoe that the gas generated thereby is not sufficient to raise the generator and open the cut-off to furnish a new supply, and thereupon the generator "dies." It has been sought, by some, to avoid this difficulty by so constructing the cut-off as not to be absolute, but to leak some carbid. This is a dangerous practice, however, and practically nullifies the advantage, in point of safety, which demands the cut-off.

In our construction, we have furnished means to maintain the cut-off absolute in its action and at the same time to prevent the generator from "going dead." To this end, we so construct the shoe that while the feed across its surface is clean, that is the new supply to the shoe pushes the old off and maintains the supply to the shoe fresh and thus prevents hydration, yet if not pushed by an incoming supply, a certain portion will not fall by gravity. This portion we call a "reserve" charge as it is held back just previous to the time when, under the circumstances noted above, the generation of the gas would cease and the machine die. This point having been reached, and the cut-off being closed to prevent a further supply, it is our object to dump this remaining "reserve" of carbid into the generating chamber and generate enough gas to elevate the gasometer sufficiently to open the cut-off and again set up the practically continuous but very gradually diminishing feed so necessary to a safe and uniform generation of gas. We accomplish this result by the following means: A wire frame r is mounted on the pivot h^3 of the bow or bail n, and intermediate its length swings a reserve-feed plate r', the free edge of the plate resting on the bottom of the feed shoe and riding in the same at the rear of the carbid charge. This reserve feed plate may be weighted as shown at r^2. A reserve feed latch s, which may be pivotally mounted on the shoe, as on an extension of stud n^7, for example, and which is weighted at one end s' to maintain it yieldingly in a substantially vertical position, has at its upper end a notch or shoulder s^2 and a projecting nose s^3. The notch or shoulder s^2 is arranged to be engaged by the wire frame r as the shoe and latch moves forward after a feeding action, and serves to carry the frame r and reserve feed plate r' back with it in the next feeding movement, the latch retaining the frame and holding the feed plate in the rear part of the shoe behind the charge of carbid.

As the shoe moves back and forth in its normal feed movement the reserve feed plate moves therewith but remains inactive, but when, as stated above, the gas reaches such a low stage that the normal feed is insufficient to raise the gasometer far enough to open the cut-off, the gasometer continues to sink and by the feed rod m^4 to rock the shaft m^3 and retract the shoe until the nose s^3 of the latch impinges against the inclined face of the magazine as shown in Fig. 8 or other trip, as for example the bracket t, shown in Fig. 9 and in this way the end of the latch is forced downward or pushed back and thereby caused to set free the frame r, whereupon it and its attached feed plate r' suddenly falls and shoves the reserve portion of carbid off the shoe, the position of the parts after release of frame r being shown in Fig. 8. The reserve carbid charge thus brought into action generates sufficient acetylene to raise the gasometer and thereby to cause the feed shoe to move forward, that is, toward the right in the drawings. In this movement, the stud n^7 carried by the feed shoe engages lever n^3 whose arm n^{31} is thereby swung upwardly to engage roller n^6 and thus to swing frame n and cut off plate n' toward the right, opening the magazine discharge outlet and permitting carbid to be supplied to the shoe. In the meantime the angular projection n^{31} of lever n^3 has engaged frame r and has swung it and the reserve feed plate to the left far enough to permit the frame r to be again caught in the notch, or in one of the notches, of the weighted latch. The position of the parts at the end of this movement is indicated in Fig. 4. The normal feed of carbid to the generator is then resumed, the reserve feed frame and plate being held idle by the latch but ready for the next emergency. This reserve feed may be made to repeat in case of necessity by providing the latch s with two notches s^2 and s^4, as shown in Fig. 4, instead of with but one notch s^2. In such construction, when the nose s^3 contacts with the lower face of the magazine and is pushed aside far enough to cause the frame r to leave the notch s^2, the frame is caught by the second notch s^4. In this way the plate r' does not sweep all the reserve carbid from the shoe but a portion only. If this portion is sufficient to raise the gasometer, the operation proceeds as before, but if in-

sufficient, the gasometer continuing to sink will push the nose s^3 farther aside and cause the frame r to leave the second notch s^4 sweeping the entire reserve feed of carbid from the shoe into the generator chamber insuring a sufficient supply of gas to raise the bell and renew the normal operation.

A water shed is formed as an annular rib u about the lower conical surface of the magazine, the rib being preferably cast integral with the magazine and disposed at an inclination to the horizontal. The rib has a groove or gutter u' in its upper side, terminating in a discharge lip u^2 on the lower side where it will conduct any moisture of condensation away from the carbid on the shoe. This arrangement forms the subject matter of a separate application of one of us, Serial Number 865,871, filed October 9, 1914. The continuous change and renewal of carbid on the shoe under normal feed also prevents hydration of any carbid therein. The periodical operation of the reserve feed, moreover, also serves to keep the shoe clean and to discharge the last remnant of carbid therefrom in case the magazine is allowed to become empty.

Another form of operating mechanism for the reserve feed and cut-off devices is illustrated in Fig. 9. Here, the arm of the angle lever n^3 does not underlie the bail n but is counterweighted at n^8 instead. Moreover, the bail n is not operated by the angle lever n^3 but has an extension n^9 passing around its pivot k^3 and into the path of a stud or projection n^{10} carried by the shoe. Otherwise the arrangement is the same as that previously described with reference to the other figures of the drawing. In this form of construction, as the feed shoe moves to the left in feeding, the cut-off plate swings to its operative position across the mouth of the magazine, and as the shoe moves to the right after feeding, the projection n^{10} engages the extension n^9 and moves the cut-off plate away from the magazine mouth. As in the former construction, the frame r is lifted or swung to the left in the forward movement of the feed shoe by the projecting angle n^{31} of the angle lever n^3 actuated by the stud n^7 against the opposing influence of the counterweight n^8. The frame is thus caused to be engaged by the gravity latches.

Certain matter disclosed but not claimed in the present application forms part of the subject-matter of a co-pending application of one of us, Serial No. 518,168, filed September 17, 1909.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to reciprocate beneath the carbid magazine, and means controlled by the gasometer to reciprocate the shoe to feed a portion of the carbid thereon to the generating chamber, of a reserve feed plate arranged adjacent to the carbid in the shoe, and means actuated only at a predetermined position of the gasometer to operate the plate to push the reserve portion of the carbid from the shoe.

2. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a reserve feed plate arranged behind the reserve portion of the carbid on the plate, and means actuated only upon a sinking of the gasometer below a predetermined position to operate the plate to push the reserve portion of the carbid from the shoe.

3. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a reserve feed plate arranged adjacent to the reserve portion of carbid, a latch normally holding the plate out of operation, and a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate to push the reserve portion of the carbid from the shoe.

4. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a frame pivoted to swing about substantially the same center as the shoe, a plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch normally holding the frame with the plate out of operation, and a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate to push the reserve portion of the carbid from the shoe.

5. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by

the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a frame pivoted to swing about substantially the same center as the shoe, a plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch carried by the shoe and normally holding the frame with the plate out of operation, a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate to push the reserve portion of the carbid from the shoe.

6. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a frame pivoted to swing about substantially the same center as the shoe, a plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch carried by the shoe and normally holding the frame with the plate out of operation, a trip arranged to be engaged by the latch upon the sinking of the gasometer below a predetermined position to release the plate and thereby to push the reserve portion of the carbid from the shoe, and means actuated by the return of the shoe after feeding the reserve carbid to lift the frame into engagement with the latch.

7. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a frame pivoted to swing about substantially the same center as the shoe, a plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch carried by the shoe and normally holding the frame with the plate out of operation, a trip arranged to be engaged by the latch upon the sinking of the gasometer below a predetermined position to release the plate and thereby to push the reserve portion of the carbid from the shoe, a lever arranged to engage the frame, a projection on the shoe arranged to move the lever away from engagement with the frame, and means arranged to operate said lever in the opposite direction to swing the frame into engagement with the latch.

8. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a cut-off device mounted to swing independently of the shoe beneath and closely adjacent to the magazine, an angle lever bearing with one arm against the cut-off device and having its other arm in the path of the shoe, whereby the cut-off device is controlled by the shoe to occupy a position under the mouth alternately therewith.

9. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a bail pivoted to swing about substantially the same center as the shoe, a cut-off plate hinged to the bail, a weight pressing the free edge of the cut-off plate toward the magazine and its mouth, an angle lever bearing with one arm against the bail and having its other arm in the path of the shoe, whereby as the shoe is withdrawn from the magazine mouth the cut-off plate swings beneath and closes said mouth and the plate is withdrawn from the mouth as the shoe returns after the feeding movement.

10. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a cut-off device mounted to swing independently of the shoe beneath and closely adjacent to the magazine mouth, and means actuated by the feed shoe to swing the cut-off device beneath the mouth as the feed shoe is withdrawn and to withdraw the cut-off as the shoe comes beneath the mouth, of means to hold a reserve charge of carbid, and means actuated at a predetermined position of the gasometer to feed such reserve charge.

11. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a bail pivoted to swing about substantially the same center as the shoe, a cut-off plate hinged to the bail, a weight pressing the free edge of the cut-off plate toward the magazine and its mouth, an angle lever bearing with one arm against the bail and having its other arm in the path of the shoe, whereby as the shoe is withdrawn from the magazine mouth the cut-off plate swings beneath and closes said mouth and the plate is withdrawn from the mouth as the shoe returns after the feeding movement, means arranged to hold back a portion of each charge to maintain a reserve,

and means actuated at a predetermined position of the gasometer to feed such reserve.

12. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a cut-off device mounted to swing independently of the shoe beneath and closely adjacent to the magazine mouth, and means actuated by the feed shoe to swing the cut-off device beneath the mouth as the feed shoe is withdrawn and to withdraw the cut-off as the shoe comes beneath the mouth, a reserve feed plate arranged behind the charge of carbid on the shoe, a latch normally holding the plate out of operation, and a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate to push the reserve portion of the carbid from the shoe.

13. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a cut-off device mounted to swing independently of the shoe beneath and closely adjacent to the magazine mouth, and means actuated by the feed shoe to swing the cut-off device beneath the mouth as the feed shoe is withdrawn and to withdraw the cut-off as the shoe comes beneath the mouth, a frame pivoted to swing about substantially the same center as the shoe, a reserve feed plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch carried by the shoe and normally holding the frame with the plate out of operation, a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate to push the reserve portion of the carbid from the shoe, said latch being arranged to reëngage and hold said frame in normal position when the shoe returns after the reserve carbid has been fed.

14. In an acetylene generator, the combination, with a generating chamber, a carbid magazine, and a feed shoe mounted to swing beneath and at an appreciable distance from the mouth of the magazine, of a bail pivoted to swing about substantially the same center as the shoe, a cut-off plate hinged to the bail, a weight pressing the free edge of the cut-off plate toward the magazine and its mouth, an angle lever bearing with one arm against the bail and having its other arm in the path of the shoe, whereby as the shoe is withdrawn from the magazine mouth the cut-off plate swings beneath and closes said mouth and the plate is withdrawn from the mouth as the shoe returns after the feed movement, a frame pivoted to swing about substantially the same center as the shoe, a plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch carried by the shoe and normally holding the frame with the plate out of operation, a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate to push the reserve portion of the carbid from the shoe, and means to insure reëngagement of the latch with the frame when the shoe returns after the reserve carbid has been fed.

15. In a gas generator, the combination, with a container for gas producing material, and means controlled by the partial depletion of the stored gas to normally feed a portion of the material to renew the gas production, of means to maintain a reserve charge of material, and means actuated by a greater depletion of the stored gas to feed such reserve charge in instalments.

16. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a reserve feed plate arranged adjacent to the reserve portion of carbid, a latch normally holding the plate out of operation, and a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the plate sufficiently to push a part of the reserve carbid from the shoe and upon the further sinking of the gasometer to further release the plate to push the remainder of the carbid from the shoe.

17. In an acetylene generator, the combination with a generating chamber, a carbid magazine, a feed shoe arranged to receive carbid from the magazine and controlled by the normal range of movement of the gasometer to feed a portion only of the carbid thereon to the generating chamber, and a cut-off arranged to stop the flow of carbid during the feeding movement of the shoe, of a frame pivoted to swing about substantially the same center as the shoe, a plate pivoted at one edge to the frame and riding with its free edge in the shoe at the rear of the charge of carbid therein, a latch carried by the shoe and normally holding the frame with the plate out of operation, said latch provided with a plurality of notches to receive and hold the frame, a trip arranged to engage the latch upon the sinking of the gasometer below a predetermined position to release the frame from the first notch

and allow it to drop into the second notch and the plate in following to push a part only of the reserve carbid from the shoe, and upon the further sinking of the gasometer to release the frame from subsequent notches to permit the plate to push the remainder of the carbid from the shoe.

In testimony whereof we affix our signatures in presence of two witnesses.

ALGERNON S. PHELPS.
JOHN N. J. HILBERT.

Witnesses:
A. D. WARNER,
L. M. JENSEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."