

No. 836,509.

PATENTED NOV. 20, 1906.

C. A. KING.  
ACETYLENE GAS GENERATOR.  
APPLICATION FILED APR. 17, 1906.

Fig. 3.

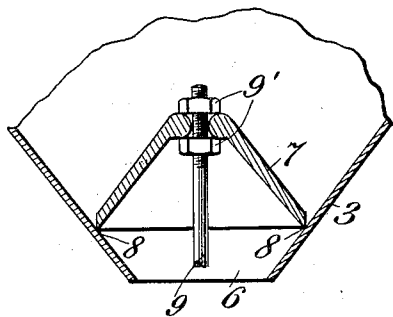


Fig. 1.

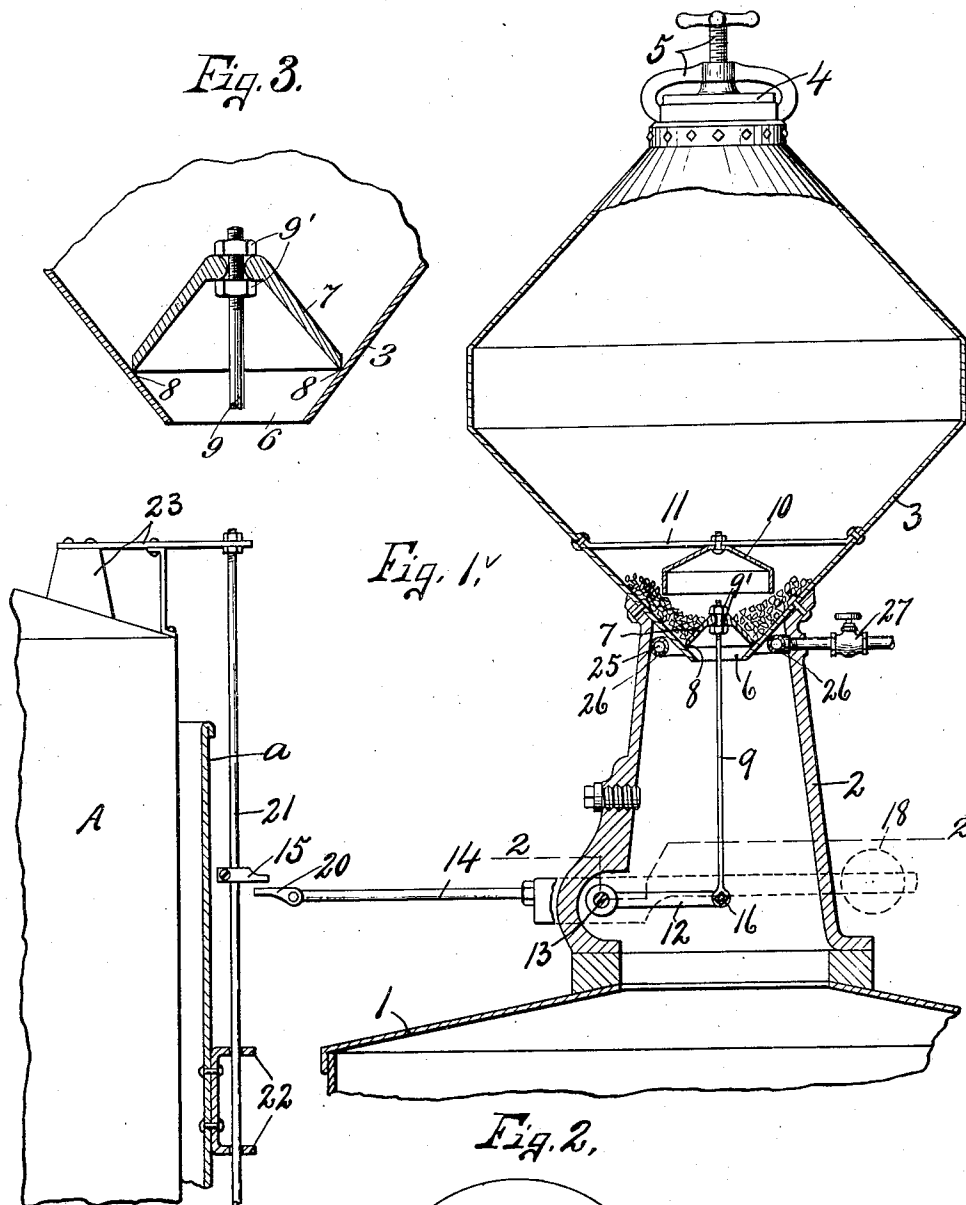
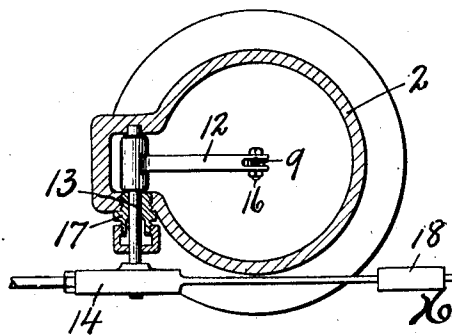


Fig. 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

CLARENCE A. KING, OF NORWICH, NEW YORK.

## ACETYLENE-GAS GENERATOR.

No. 836,509.

Specification of Letters Patent.

Patented Nov. 20, 1906.

Application filed April 17, 1906. Serial No. 312,188.

*To all whom it may concern:*

Be it known that I, CLARENCE A. KING, of Norwich, in the county of Chenango, in the State of New York, have invented new and useful Improvements in Acetylene-Gas Generators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in acetylene-gas generators, and refers more particularly to the means for feeding the carbid in limited quantities from the superposed hopper to an underlying water-chamber. In devices of this character the feed of the carbid is usually controlled automatically by the amount of gas generated, and it becomes of the utmost importance to render this automatic feed as positive in action as may be practical, so that only such quantities of the carbid are fed from the storage-hopper into the water-tank as may be required to maintain a predetermined quantity of gas in the gas-holder, and in doing this it becomes necessary to provide some means for relieving the weight or pressure of the carbid upon the valve which regulates the feed of such carbid through the outlet of the hopper and also to construct the valve in such manner that the resistance to its opening will be reduced to a minimum, while at the same time it must quickly cut off further feed of the carbid when allowed to close.

My object, therefore, is to provide a hopper or storage-reservoir for the carbid with a funnel-shape discharge-nozzle in which is seated a hollow conical valve having a sharp or knife-shape lower edge or base adapted to seat against the inner face of the discharge-nozzle to close said opening, the apex of said valve being uppermost, so as to readily pass through the overlying carbid when the valve is opened.

Another object is to loosely mount this valve upon an oscillatory stem, so that it may readily adjust itself to its seat when closing and also to better enable it to work upwardly through the carbid when opening.

A further object is to provide a hood or baffle-plate a sufficient distance above the valve to allow the latter to open a limited distance and at the same time to support a greater body of the carbid free from the valve, such hood or baffle-plate being of slightly less diameter than the inner diameter of the adjacent portion of the carbid in which it is located to allow the carbid to feed

around its margin to the underlying generator.

A still further object is to encircle the discharge end of the hopper with a suitable water-ring capable of discharging jets of water against the sides of the feeding-tube which connects the hopper to the water-tank.

Another object is to mount the valve-operating shaft in the connecting-tube above the water-line and to provide said shaft with a crank-arm projecting into the path of an operating member upon the bell of a gas-receiver, so that when the bell is lowered by the exhaustion of the gas therefrom it operates the crank-arm and rock-shaft to open the valve and allow additional carbid to enter the water-chamber for the production of more gas.

Other objects and uses will be brought out in the following description.

In the drawings, Figure 1 is a vertical section, partly in elevation, of a portion of a gas-generator, showing particularly my improved carbid-feeding device and its operating mechanism, including a portion of the gas-reservoir. Fig. 2 is a sectional view taken on line 2 2, Fig. 1. Fig. 3 is an enlarged sectional view of the lower end of the carbid-reservoir and valve therein.

In demonstrating the practicability of my invention I have shown a portion of a water-tank 1 as provided with an upwardly-projecting tube 2, to the upper end of which is attached a hopper or storage-reservoir 3 for the carbid, said reservoir having an inlet-opening in its upper end normally closed by a cap 4 and clamping device 5 to prevent the escape of gas. The lower end of this reservoir is funnel shape and is provided with a suitable outlet-opening 6, discharging into the upper end of the tube 2, which forms a conduit to deliver the carbid into the upper end of the generator 1.

A hollow cone-shape valve 7, having a lower knife-edge 8, is adapted to seat against the inner face of the lower end of the hopper 3 just above the outlet 6, while its apex is uppermost and is loosely mounted upon the upper end of an oscillatory rod or stem 9 between two shoulders, as nuts 9', whereby the valve and its stem are locked against relative endwise movement. The object of loosely mounting the valve upon an oscillatory stem is to enable the valve to readily adjust itself to its seat in the lower end of the hopper, and thereby prevent excessive feed

or waste of the carbid. The carbid is preferably placed in the hopper 3 in granulated form, so as to be more readily controlled in passing through the outlet end, and by forming the valve 7 with a lower chisel edge it more readily cuts through the carbid and forms a more perfect seat with the outlet end of the hopper.

The hood 10 is mounted upon a suitable cross-bar or equivalent support 11 directly over and a sufficient distance above the valve 7 to bear the weight of the greater portion of the superposed body of carbid, and thereby prevent excessive load or pressure upon the valve 7, which might tend to resist its opening, said hood or baffle-plate being of slightly less diameter than the interior diameter of the adjacent portion of the hopper in which it is located to allow limited quantities of the carbid to pass downwardly around the sides of the hood and against the sides of the valve. It is now obvious that the carbid which feeds downwardly around the shield or hood 10 lies against the downwardly-converging sides of the adjacent portions of the hopper and valve, and the quantity of carbid lying against the valve being comparatively small it is evident that but little resistance is offered to the opening of the valve, particularly when it is considered that the upper end of the valve is tapering and readily wedges through the light body of the carbid below the shield 10. The valve 7 is therefore opened with but a comparatively light power or upward pressure, which is effected through the medium of a rock-arm 12 and rock-shaft 13, having one end extended through one side of the shell 2 and provided with a lever 14, which projects into the path of an operating-shoulder 15, carried by the bell, as A, of the gas-receiver.

The lower end of the stem 9 is pivoted at 16 to the inner end of the rock-arm 12, which is secured to the shaft 13 within the shell 2. This rock-shaft 13 is mounted in the shell 2 above the water-line of the generator 1, and its outer end extends through a suitable stuffing-box 17 to prevent the escape of gas therethrough.

The lever 14 is centrally secured to the outer end of the rock-shaft 13 at the outer side of the shell 2 and has one arm extending in the direction of extension of the rock-arm 12 and is provided with a suitable counterweight 18, which is sufficiently heavy to close the valve 7 through the medium of the rock-shaft 13, rock-arm 12, and connecting-rod 9. The other arm of the lever 14 is provided with a shoulder 20, which is disposed in the path of the operating-shoulder 15. This shoulder 15 is adjustably secured to a vertical rod 21, which is guided at its lower end in suitable bearings 22 on the side of the outer shell, as *a* of the reservoir, while the upper end of said rod is attached, by means of suit-

able braces 23, to the bell A of the gas-reservoir, so that as the bell descends by the exhaustion of the gas therefrom the rod 21 will be similarly depressed and bring the shoulder 15 into operative engagement with and depress the adjacent end of the lever 14 against the action of the counterweight 18, thereby opening the valve 7, allowing the carbid to discharge through the opening 6 and tube 2 into the generator 1 for producing additional gas, such gas being conveyed from the generator 1 to the gas-reservoir in any well-known manner, not necessary to herein illustrate or describe, as the manner of connecting the generator to the reservoir forms no part of my present invention. It is now clear that when the valve 7 is opened in the manner just described to allow the entrance of carbid from the reservoir 3 to the generator the shield 10 holds back the greater body of the carbid and allows only limited quantities to feed downwardly around under the open valve and through the outlet 6. This additional supply of carbid will of course produce gas, which is immediately conveyed to and elevates the bell A of the receiver, thereby withdrawing the pressure of the shoulder 15 from the adjacent end of the lever 14 and allowing the latter to be returned to its normal position by the weight 18 to close the valve 7, and should any chunks of carbid get under the knife-edge of the valve it would be more or less liable to be cut in two, or else the valve will shift sidewise to adjust itself to its seat to prevent the further feed of the carbid through the opening 6. During this feed of the carbid through the tube 2 more or less will accumulate upon the sides of the tube, and in order to remove this I provide a water-ring 25 around the lower end of the hopper and within the upper end of the tube, said water-ring being provided with radial openings 26, discharging against the inner sides of the tube 2 and serving to clean it from any adhering material and to deposit it into the underlying generator, the water-supply being controlled by a suitable valve 27.

What I claim is—

1. In a gas-generator of the class described, a carbid-reservoir having a funnel-shape discharge-nozzle, in combination with a hollow cone-valve having a lower knife-edge adapted to be seated against the inner side of the nozzle, an oscillatory support for said valve, whereby the latter may readily adjust itself to its seat, and means to operate said support to open the valve.

2. In an apparatus of the class described, a carbid-holder having an opening in its lower end, a cone-shape valve seated in said opening and having its apex at the top, a rod upon which the valve is loosely mounted to tilt laterally shoulders on the rod to lock the valve and rod against relative endwise movement, and means for opening the valve.

3. In an acetylene-gas generator having a funnel-shape discharge-opening in its lower end, a tube surrounding said opening and leading downwardly therefrom, a water-ring  
5 also surrounding said opening and having radial apertures discharging against the inner sides of the tube.

In witness whereof I have hereunto set my hand on this 6th day of March, 1906.

CLARENCE A. KING.

Witnesses:

HOWARD P. DENISON,

MILDRED M. NOTT.