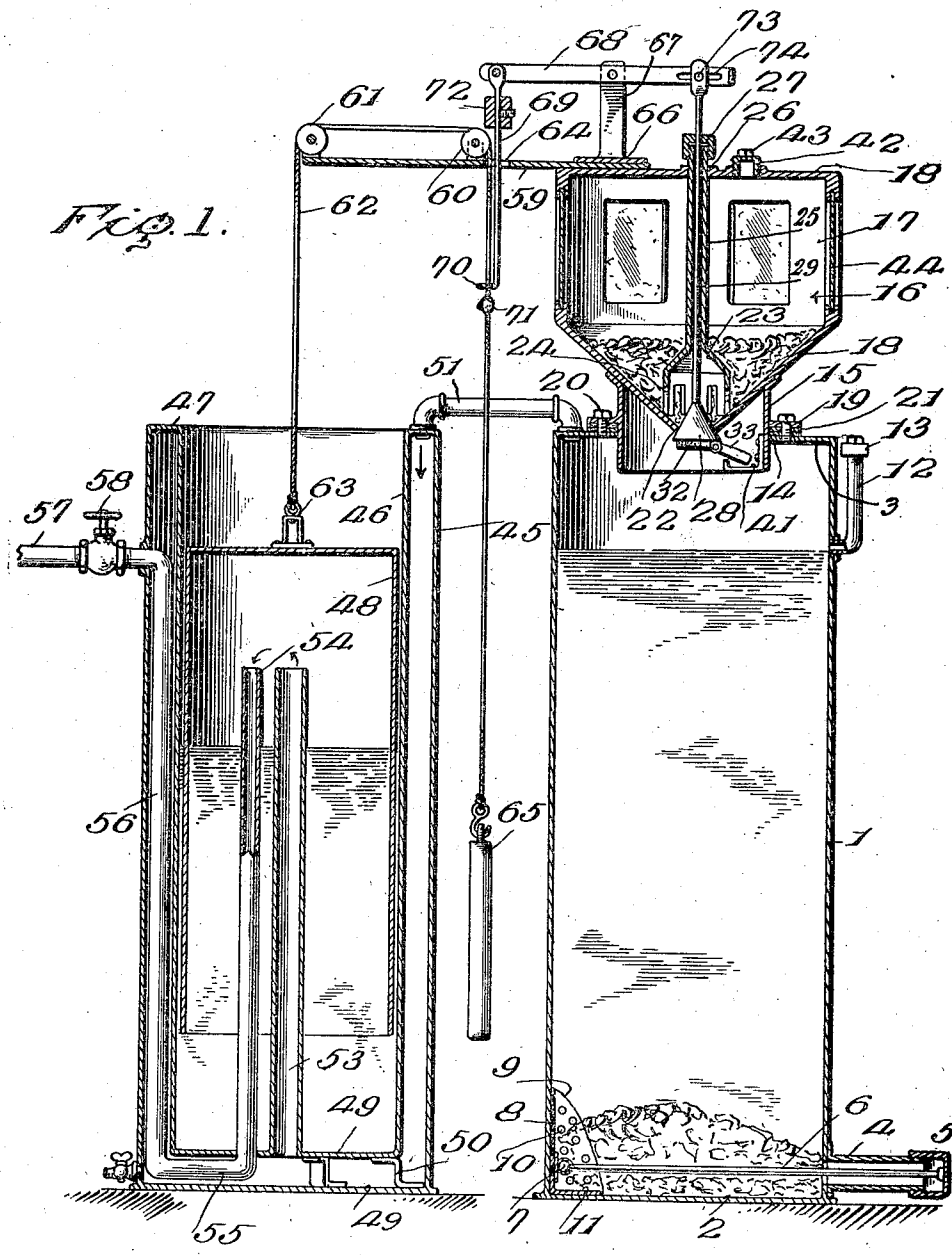
C. D. BAIRD.

GAS GENERATOR.

APPLICATION FILED JUNE 30, 1917.

1,277,821. Patented Sept. 3, 1918.

Fig. 1.



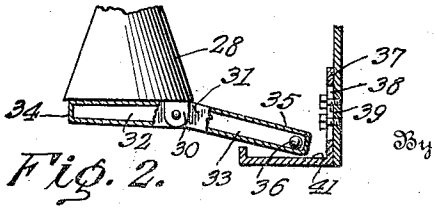


Fig. 2.

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GAS-GENERATOR.

1,277,821. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed June 30, 1917. Serial No. 177,920.

To all whom it may concern:

Be it known that I, CLARENCE D. BAIRD, a citizen of the United States, residing at Alexandria, in the county of Dekalb and State of Tennessee, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates to acetylene gas generators, and has as one of its objects to provide a generator which may be employed either above ground or in a pit and which in either instance will prove highly efficient in the generation of the gas, being entirely automatic in its operation, not liable to become clogged or feed an excess amount of carbid to the generating chamber, or for other reasons require frequent attention.

The invention has as one of its aims to provide in a generator of this class a novel mechanism for feeding carbid from the carbid hopper or container into the generating chamber in suitable quantities, which mechanism will not be liable to become clogged or permit the feeding of an excess amount of the carbid and will yet be so constructed that the feed valve will not have imposed upon it the entire weight of the carbid within the hopper which would be likely to interfere with the proper closing of the valve or cause accidental opening of the valve due to the weight imposed thereon.

Another aim of the invention is to provide in connection with the valve, means for vibrating or jarring the same both when it is moved to open position and when it is moved to closed position so that in the first instance the carbid above the valve will be loosened and causel to drop into the generating chamber and in the second instance any particles of the carbid which might otherwise lodge between the valve and its seat, will be jarred loose, thereby providing for a gas-tight closing of the said valve against its seat. Incidentally, the invention aims to so construct the vibrating means that the same may be adjusted so as to regulate the degree of vibration to which the valve will be subjected in its movements to and from its seat.

In the accompanying drawings:

Figure 1 is a vertical sectional view through a generator embodying the present invention.

Fig. 2 is a vertical longitudinal sectional view through the device provided for vibrating or jarring the valve which controls the delivery of carbid from the carbid hopper into the generating chamber.

The generating apparatus embodying the present invention includes a generating chamber which is preferably cylindrical in form and which is indicated by the numeral 1, which chamber has a closed bottom 2 and a top 3. At or near its lower end the generating chamber is provided with a nipple 4 which projects laterally therefrom and through which the residue from the carbid is to be removed. This nipple is provided at its outer end with a cap 5 removably threaded thereto and extending from this cap and through the nipple and into the lower end of the said chamber is a rod 6 which at its inner end is connected by a swivel joint 7 to an agitator or scraper 8 including an upstanding wall 9 which conforms substantially to the contour of the inner surface of the vertical wall of the chamber and normally seats thereagainst as shown in Fig. 1 of the drawings and which is provided with perforations 10. The agitator also includes a bottom wall 11 which rests upon the upper face of the bottom 2 of the generating chamber. It will be understood that when the cap 5 is unthreaded from the nipple 4, the agitator or scraper may be pulled back and forth in the direction of the inner end of the said nipple through the medium of the rod 6 so as to cause the accumulated residue from the carbid to pass through the nipple and after the residue has been removed, or at least the greater portion thereof, the rod 8 may be thrust inwardly to the position shown in Fig. 1 and the cap 5 threaded onto the outer end of the said nipple so as to close the same in a gas-tight manner. In order that water may be readily introduced into the generating chamber 1, the same is provided near its upper end with a filling pipe 12 which extends upwardly beside the said chamber and is normally closed by a cap 13.

The top 3 of the generating chamber is provided centrally with an opening 14 into

which is fitted the depending neck 15 of the carbid hopper, which hopper is indicated in general by the numeral 16 and includes an upstanding wall 17, a conical bottom 18, the lower portion of which projects downwardly into the neck 15, and a top 18. The neck 15 of the hopper is provided with a horizontal circumscribing flange 19 which overlies the top 3 of the generating chamber and bolts 20 are secured through the said flange and the said top of the chamber and serve to hold the carbid hopper in the position shown in Fig. 1, a suitable packing gasket 21 being interposed between the flange 19 and the said top 3 so as to prevent the escape of generated gas through the opening 14. As stated, the bottom 18 of the carbid hopper is conical and the lower end thereof is open so as to provide for the discharge of carbid from said hopper into the said generating chamber, the wall of the opening constituting a seat 22 for the valve which controls such discharge. Arranged within the carbid hopper 16 is a cage 23 the lower edge of the wall of which is secured upon the bottom 18 of the said hopper and surrounds but is located above the valve seat 22. The said cage 23 has a number of openings 24 in its wall through which the particles of carbid may enter prior to discharge past the valve seat 22 and into the generating chamber. Extending upwardly from the cage 23 is a tubular guide 25 which is secured through an opening 26 in the top 18 of the said hopper and which is provided at its upper end with a stuffing-box 27. The head of the valve for controlling the discharge of carbid from the hopper into the generating chamber is of conical form and is indicated by the numeral 28 and extending upwardly from the minor end of the head is a valve stem 29 which slidably fits within the tubular guide 25 and through the stuffing-box 27. The operation of the valve and the devices for automatically causing said operation will presently be fully explained. It will be understood that due to the provision of the cage 23, a suitable quantity of carbid may enter said cage in position to be discharged when the valve is opened, but that the cage constitutes a means for relieving the valve of the entire weight of the carbid in the hopper, thus providing against accidental opening of the valve which would be likely to occur if such weight were imposed thereon, and also providing for a more ready closing of the valve.

In order to vibrate or jar the valve, both when it is moved to closed position and to open position, and thereby respectively provide for loosening of the carbid resting upon the valve, and prevent the lodging of particles of carbid between the valve and its seat, there is provided means which will now be described. Ears 30 are provided upon the bottom of the valve 28 and pivotally mounted between these ears is a tubular rocker 31 having relatively angularly extending arms 32 and 33. Normally the arm 32 rests against the under side of the valve head 28 and the arm 33 extends downwardly and laterally at an angle beyond the pivot 30. The arm 32 is closed at its outer end, as at 34, and the arm 33 is closed at its outer end and weighted, as at 35. Arranged within the rocker for free movement endwise thereof is a spherical weight or ball 36 which normally rests in the closed outer end of the arm 33, but may roll into the arm 32 under conditions to be presently explained. The arm 33 is designed to coact with an abutment member comprising an attaching plate 37 having a slot 38 receiving threaded studs 39 upon the inner side of the neck 15, the attaching plate being disposed against the said inner side of the neck and nuts 40 being threaded on to the said studs whereby to secure the attaching plate 37 in place, it being understood that the same may be adjusted vertically so as to adjust the position of an abutment finger 41 which projects from the lower edge of the said plate below the arm 33. While the under side of the valve head 28 occupies a parallel plane, the lower side of the arm 32 of the tubular rocker is inclined downwardly in the direction of the pivot 30 or the arm as a whole may be so inclined by slightly lowering the pivot from the position shown in Fig. 2 of the drawings so that in such case the outer end only of the arm would strike against the under side of the valve head. As shown in the drawings, when the valve 28 is closed, the tubular rocker will occupy such position that its arm 33 will extend above the abutment finger 41. However, upon downward movement of the said head to open position the arm 33 will be brought into engagement with the abutment finger 41 and the rocker will be tilted so that the weight ball 36 will roll within the arm 33 and into the arm 32 until it rests at the closed end thereof. As the ball strikes the closed end of the said arm 32 the impact will serve to vibrate or jar the valve 28 so as to loosen or dislodge the carbid which is within the cage 23 and resting upon the said valve thereby insuring of its discharge into the generating chamber. The weight of the arm 33 including its weighted end 35 is slightly greater than the combined weight of the arm 32 and the ball 36 so that when the valve 28 is moved upwardly toward closed position the outer end of the arm 33 will swing downwardly and the arm 32 will be swung upwardly to its normal position whereupon the ball 36 will return to the

position shown in Fig. 2 and as it strikes the weighted end 35 of the arm 33, vibration or jar will again be imparted to the valve head 28 serving to dislodge any particles of carbid which might otherwise interfere with closing of the valve. Of course, the greater the angle to which the rocker is tilted, the greater will be the force of impact of the weight ball 36 against the ends of the arm comprising the said rocker and this may be regulated by adjusting the abutment finger 41 in an up or down direction. It will be observed that the pivot 30 for the tubular rocker is located at one side of the bottom of the valve head 28 and, consequently, maximum vibration or jar will be imparted to the valve upon relatively slight movement of the said rocker which, however, would not be the case if the pivot were located at the vertical axis of the said valve head. The carbid hopper 16 is provided in its top with a filling opening 42 normally closed by a plug 43 and in order that the quantity and condition of the carbid within the hopper may be readily determined, the wall 17 of the said hopper is provided with one or several transparent panes 44.

The gas generated within the chamber 1 is led therefrom into a discharge chamber which has spaced cylindrical walls 45 and 46, respectively, forming an annular chamber closed at its top in a gas-tight manner by a connecting wall 47. The wall 45 at its bottom is supported upon a bottom or base 48 and the wall 46 is supported by a bottom 49 in turn supported upon brackets 50 upon the bottom 48. Conductor pipes 51 lead from the top of the generating chamber 1 to the storage chamber through the top 47 thereof and it is preferable that two of these pipes be employed and that each be provided with a cut-off valve 52 whereby the supply of gas may be regulated or entirely cut off and also whereby a maximum volume of gas may pass from the generating chamber to the storage chamber without the employment of an extra large single pipe. The numeral 48 indicates a gas bell which is arranged to rise and fall within the compartment defined by the wall 46 and its bottom 49, this compartment containing a suitable volume of water in which the lower open end of the gas bell is immersed. The gas generated within the chamber 1 passes through the pipes 51 into the storage chamber from which it passes upwardly through a pipe 53 into the gas bell 48, the pipe opening through the bottom 49 and extending upwardly from said bottom and opening at its upper end into the gas bell above the maximum water level therein. From the bell 48, gas passes downwardly through a pipe 54 which also opens at its upper end into the gas bell above the water level, and this pipe leads from the bottom 49 and thence laterally, as at 55, between this bottom and the bottom 48 after which it extends upwardly, as at 56, within the annular storage chamber and through the wall 45 where it connects with a supply main 57, the flow through the main being controlled by a cut-off valve 58.

A supporting arm 59 extends laterally from the top 18 of the carbid hopper above the storage chamber and mounted thereon are pulleys 60 and 61. A cable 62 is trained over these pulleys and connected at one end to a swivel 63 upon the top of the gas bell 48. After passing over the pulley 60, the cable is led downwardly through an opening 64 in the said supporting arm 59 and is connected at its other end to a counterweight 65 which balances or nearly balances the weight of the bell 48. The supporting arm 59 is held upon the top 18 of the carbid hopper by means of the base 66 of an upstanding bracket 67 upon which is supported for oscillatory movement, a rocking arm 68. Pivotally connected to one end of this arm is a rod 69 which extends downwardly through the opening 64 and which is provided at its lower end with a horizontally disposed eye 70 through which the cable 62 passes, the cable being provided with an abutment adjustably clamped thereon and said abutment being indicated by the numeral 71 and being located below the said eye. A weight 72 is fixed upon the rod 69 and counter-balances or substantially counter-balances the weight of the valve 28. The upper end of the valve stem 29 is provided with a transverse pin 73 which at its ends work in slots 74 formed in the spaced portions of the arm 68, the said arm being formed from a suitable length of bar metal bent upon itself mid-way of its ends to provide the said spaced portions.

From the foregoing it will be understood that as the gas is consumed and its generation in the chamber 1 slackens the bell 48 will lower carrying with it the stretch of the cable 62 which is connected with the bell. As a result, the abutment 71 will engage the eye 70 and whereupon the rod 69 will be raised, thus rocking the arm 68 and causing lowering of the valve stem 29 and opening of the valve 28 to admit a charge of carbid to the generating chamber whereupon the generating and gas conducting operation, previously described, proceeds. Of course, the abutment 71 may be adjusted upon the cable 72 so as to cause opening of the valve 28 when the bell 48 has descended to any predetermined position.

Having thus described the invention, what is claimed as new is:

1. In a generator of the class described, a generating chamber, a carbid hopper ar-

ranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, and impact means independent of the valve moving means for vibrating the valve.

2. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, and impact means independent of the valve moving means for automatically vibrating the valve upon its movement.

3. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, and impact means independent of the valve moving means carried by the valve automatically operable to vibrate the valve upon its movement.

4. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve to open and closed positions, and impact means independent of the valve moving means for vibrating the valve upon its movement to open position.

5. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve to open and closed positions, and impact means independent of the valve moving means for vibrating the valve upon its movement to closed position.

6. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve to open and closed positions, and impact means independent of the valve moving means for vibrating the valve upon its movement to open and closed positions.

7. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve to open and closed positions, a vibrating member independent of the valve moving means pivotally mounted upon the valve, and means arranged for coaction with the said vibrating member whereby when the valve is moved toward one position the said vibrating member will be moved upon its pivot and when the valve is moved toward the other position the said vibrating member will be released whereby to vibrate the valve upon the return of the said member to its normal position.

8. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve to open and closed positions, a vibrating member independent of the valve moving means pivotally mounted upon the valve, and means arranged for coaction with the said vibrating member whereby when the valve is moved toward open position the said vibrating member will be moved upon its pivot and when the valve is moved toward closed position the said vibrating member will be released whereby to vibrate the valve upon the return of the said member to its normal position.

9. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, a rocker pivotally mounted between its ends upon the said valve and at one side of its pivot resting against a portion of the valve and at the other side of its pivot extending beyond the valve, a weight movable longitudinally of the said rocker member, the rocker member having its end portions provided with abutments against which the weight is to strike to vibrate the valve, and means for tilting the said rocker member in the movement of the valve whereby to cause movement of the said weight.

10. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, a rocker pivotally mounted between its ends upon the said valve and at one side of its pivot resting against a portion of the valve and at the other side of its pivot extending beyond the valve, a weight movable longitudinally of the said rocker member, the rocker member having its end portions provided with abutments against which the weight is to strike to vibrate the valve, and an adjustable abutment in the path of movement of the projecting end of the said rocker member whereby upon movement of the valve the rocker member will be tilted to cause movement of the said weight.

11. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, a rocker pivotally mounted between its ends upon the said valve and at one side of its pivot resting against a portion of the valve and at the other side of its pivot extending beyond the valve, a weight movable longitudinally of the said rocker member, the rocker mem-

ber having its end portions provided with abutments against which the weight is to strike to vibrate the valve, and means for tilting the said rocker member in the movement of the valve whereby to cause movement of the said weight, the projecting end of the rocker being of a weight at least equal to the combined weight of the valve-engaging end of the said rocker plus the weight of the movable weight.

12. In a generator of the class described, a generating chamber, a carbid hopper arranged to discharge into the said chamber, a valve for controlling the discharge, means for moving the valve, a rocker pivotally mounted between its end upon the said valve and at one side of its pivot resting against a portion of the valve and at the other side of its pivot extending beyond the valve, a weight movable longitudinally of the said rocker member, the rocker member having its end portions provided with abutments against which the weight is to strike to vibrate the valve, and means for tilting said rocker member in the movement of the valve whereby to cause movement of the said weight, the said supporting portion of the valve-engaging end of the rocker member being inclined downwardly toward the pivot for the said member.

In testimony whereof I affix my signature.

CLARENCE D. BAIRD. [L. S.]

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