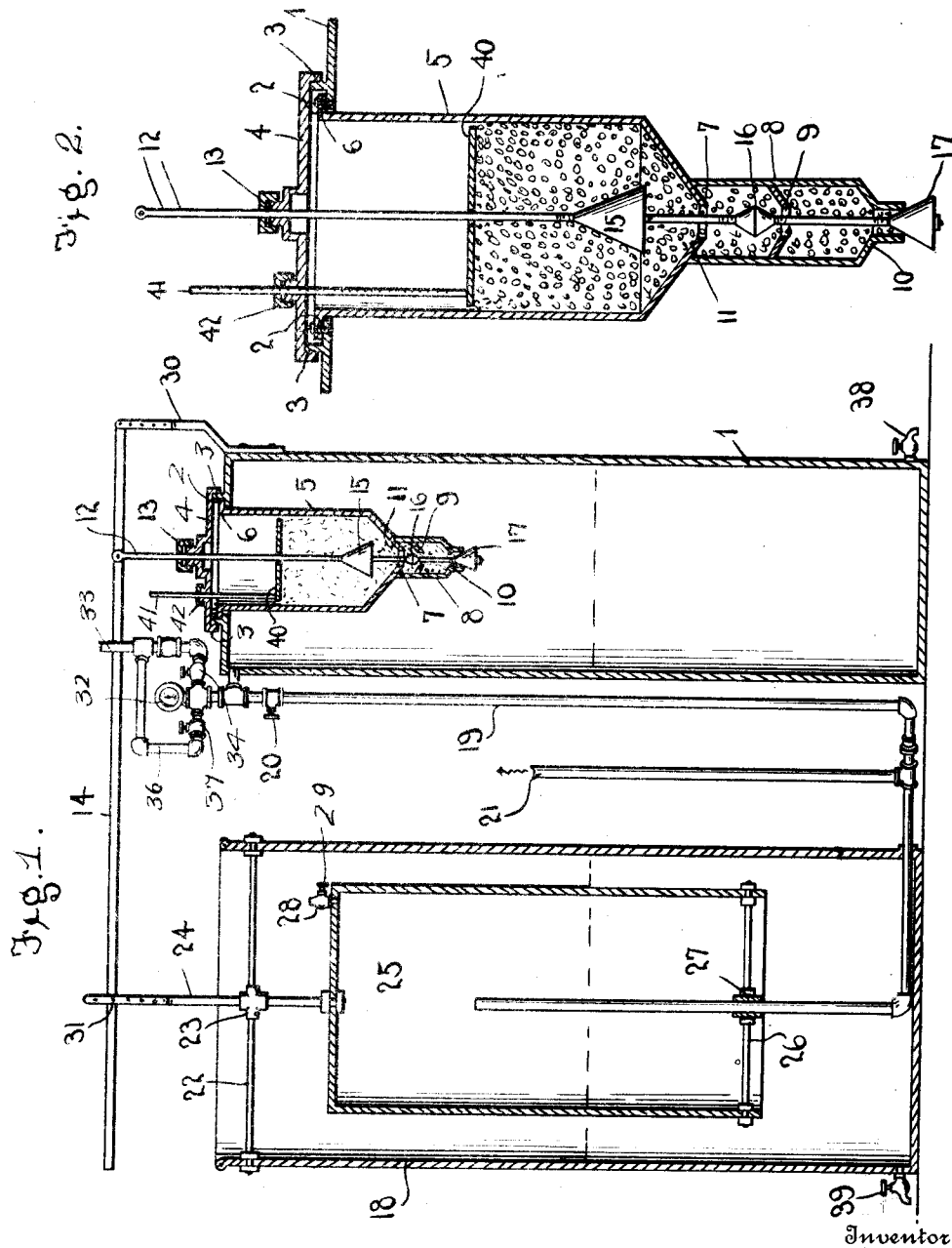


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ACETYLENE GENERATOR.
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Patented Mar. 11, 1913.



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UNITED STATES PATENT OFFICE.

EMORY V. PENNINGTON, OF MOHAWK, TENNESSEE.

ACETYLENE-GENERATOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EMORY V. PENNINGTON, a citizen of the United States, residing at Mohawk, in the county of Greene and State of Tennessee, have invented certain new and useful Improvements in Acetylene-Generators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in acetylene gas generators.

One object of the invention is provide an acetylene gas generator having an improved construction and arrangement of carbide feeding mechanism, whereby all danger of overcharging the generator is obviated.

Another object is to provide an improved means for automatically controlling the carbide feed mechanism.

A further object is to provide an acetylene generator which will be extremely simple, strong, durable and inexpensive in construction, efficient and reliable in operation and in which an even pressure and unfailing flow of gas is maintained.

In the accompanying drawings:—Figure 1 is a central vertical section; Fig. 2 is an enlarged central vertical section of the carbide feeding mechanism.

My improved gas generator comprises a generating tank 1 having in its upper end an opening 2, which is surrounded by an upwardly projecting threaded flange 3, on which is screwed a cap 4. Arranged in the opening 2 is a carbide hopper 5 having on its upper end an annular radially projecting flange 6, which engages the edge of the opening 2 in the upper end of the generator tank and is preferably screwed or otherwise firmly and removably secured to said edge.

The bottom of the hopper 5 tapers to a central discharge opening 7 and to the bottom of the hopper over the opening 7 is secured a depending valve casing or measuring chamber 8, in which is arranged a central valve seat 9 and a lower valve seat 10. The bottom of the hopper above the valve casing 8 forms an upper valve seat 11. The valve seats 9, 10 and 11 taper toward central discharge openings and arranged through said openings is a valve stem 12 which extends upwardly through a stuffing box 13 on the cap 4 of the generating tank 1 and is connected at its upper end with a

valve operating lever 14 hereinafter described. On the valve stem 12 in the hopper 5 and adapted to engage the valve seat 11 is an upper feed valve 15, which is adapted to open and close the discharge opening 7 which connects the hopper 5 with the measuring chamber 8. The valve 15 is of conical form to prevent the carbide from accumulating or catching on the valve. On the lower portion of the stem 12 within the chamber 8 and adapted to pass through and to close the opening in the seat 9 is an intermediate feed valve 16 which is here shown and is preferably in the form of a double cone to obviate any danger of the carbide accumulating thereon, to permit the carbide to pass freely around the valve when the latter is in open position and to facilitate the passage of the valve 16 in either direction through the opening in the valve seat 9. On the extreme lower end of the valve stem 12 is secured a lower conical shaped valve 17, which is adapted to open and close the discharge opening in the lower end of the casing or chamber 8.

Arranged in a suitable position adjacent to the generating tank 1 is a gas reserve tank 18, said tank being connected with the generator tank 1 by a gas conducting pipe 19. The pipe 19 is connected near its upper end with the upper portion of the tank 1 and has its opposite end extending for a suitable distance up into the tank 18, as shown. In the pipe 19 immediately below its connection with the tank 1 is a cut-off valve 20, and to the pipe 19 between the generator tank 1 and the tank 18 is connected a gas supply pipe 21 which leads to the burners to be supplied by the generator.

Arranged across and secured to the upper end of the reserve tank 18 is a centrally-disposed guide bar 22. The bar 22 is preferably formed in sections, the inner ends of which are engaged with a four-way coupling 23. Slidably engaged with the vertical branches or members of the coupling 23 is a lever operating rod 24, the lower end of which is secured to a gas bell 25. The bell 25 is slidably mounted in the tank 18 and has its lower end inserted in the water contained in the lower portion of the tank 18, whereby a gas-tight closure is formed for the lower end of the bell. The lower end of the bell is guided and held in position in the tank 18 by a guide bar 26, which has its ends secured to the sides of the bell and

is provided with a centrally-disposed guide coupling 27 similar to the coupling 23 on the cross bar 22. By thus supporting and arranging the bell 25, it will be seen that as the gas is discharged from the end of the pipe 19 and accumulates in the bell, the latter will be raised in the tank 18, thus raising the lever operating rod 24 and causing the latter to raise the lever 14 and close the valve 17 at the lower end of the measuring chamber 8 and open the valves 15 and 16 thus cutting off the supply of carbid to the generator tank and permitting the carbid to fill the measuring chamber 8. As the gas is consumed and drawn from the bell 25, the latter will lower in the tank 18, thus lowering the valve operating lever to open the feed valve 17 and close valve 15 causing valve 16 to pass through the opening in valve seat 9, thereby discharging a fresh measure charge of carbid into the water of the generator tank from which a fresh supply of gas will be formed and conducted to the bell 25, as will be readily understood. The charge consists of the amount of carbid contained in chamber 8. The intermediate valve 16 is so positioned on the stem 12 as to close the opening in valve seat 9 when the valves 15 and 17 are about half way more or less open to provide for the cutting off of the feed should the machine for any reason stop when the valves 15 and 17 are in this position. The valve 16 is adapted to pass through said opening in the valve seat 9 during the raising and lowering of the stem 12 when the machine is in operation. Should the stem 12 stop operating when the valves 15 and 17 are slightly open, the valve 16 will partially close the opening in valve seat 9 and thus greatly retard the passage of the carbid and the larger lumps would choke the reduced passage and permit only fine particles to pass through. In the upper end of the bell 25 is a discharging nipple 28 having a valve 29, whereby air may be released from the bell to permit the same to fill with gas.

The valve operating lever 14 is pivotally and adjustably secured at one end to a supporting bracket 30 arranged on the upper end of the generating tank 1 and the free end of the lever has an adjustable connection with the upper end of the lever operating rod 24 of the gas bell, as shown at 31. The upper end of the valve stem 12 is pivotally connected with the lever 14 adjacent to its connection with the bracket 30, as shown.

On the upper end of the gas conducting pipe 19 is a pressure gage 32 and connected to the pipe 19 below the gage 32 and above the connection of said pipe with the generator tank is a blow-off pipe 33, in which is arranged a safety valve 34 and a cut-off valve 35. Also connected with the upper end of the pipe 19 below the gage 32 and

above the connection of said pipe with the generator pipe is an air exhaust pipe 36. The pipe 36 connects with the blow-off pipe 33 and has arranged therein a cut-off valve 37. By means of the air exhaust pipe 36 any air which may enter the generating tank while the hopper 5 is being recharged may be exhausted into the blow-off pipe 33 which extends upwardly and out of the building.

In one side of the generating tank 1 near the bottom thereof is arranged a drain-cock 38, whereby the water and waste carbid may be drawn from the generating tank and in the reserve tank 18 is also arranged a drain-cock 39, whereby the water may be removed from this tank when desired. In the carbid hopper 5 is arranged a freely movable follower plate 40, which is of substantially the same size as the cross sectional area of the hopper and is adapted to rest on the carbid in said hopper and is provided with a centrally-disposed aperture, through which the valve stem 12 passes. Connected to the plate 40 is a graduated gage rod 41, which extends upwardly through a packing gland 42 in the cap 4 of the carbid hopper. The plate 40 and rod 41 when thus arranged will lower as the carbid is discharged from the hopper and the plate resting on the entire body of carbid will accurately indicate the exact quantity of carbid contained in the hopper.

By constructing and arranging the carbid hopper and feed valves as herein shown and described, it will be seen that when the valves are actuated to open the lower end of the measuring chamber the upper valve will close the lower end of the hopper, thus permitting the discharge of only the carbid contained in the measuring chamber 8. By providing the central valve 16 and the valve seat 9 in the center of the valve casing, the discharge opening in the valve seat 9 will be closed by the valve 16 when the valves 15 and 17 are half-way open, so that the contents of the valve casing will not be discharged all at once. By this arrangement any danger of an overcharge of carbid is obviated, should the stem 12 stop operating while the valves 15, 16 and 17 are open and if sufficient gas is generated by the preliminary charge of the carbid in the lower portion of the valve casing 8, to cause the bell 25 to rise and actuate the lever 14; the lower valve of the feeding mechanism will be immediately closed, thus preventing the carbid contained in the upper portion of the valve casing from discharging into the generator. If, on the other hand, the first discharge of the carbid does not generate a sufficient quantity of gas for raising the bell 25, the valve stem will continue to move down until the central valve 16 passes through the opening in valve seat 9 and the upper valve 15 closes, thus permitting the

entire contents of the chamber 8 to be discharged into the generator. As soon as this charge of carbid has generated sufficient gas to actuate the bell 25, the lever 14 will immediately raise the valve stem thereby closing the lower valve 17 and opening the upper valve 15, which will permit a fresh charge of carbid to enter the valve casing. By this arrangement and operation of the valves, it will be seen that the feeding of the carbid to the generator chamber is controlled by the rise and fall of the gas bell 25 and any danger of an overcharge being fed to the generator is positively obviated.

15 The valves 15, 16 and 17 preferably have a screw threaded engagement with the lower portion of the valve stem 12, whereby said valves may be adjusted to control the discharge of the carbid from the hopper and the valve casing. By arranging the reserve tank and bell 25 as herein shown and described, a uniform supply of gas will be maintained in the pipe 21 and the weight of the bell 25 will provide sufficient pressure for forcing the gas through said pipe to the burners.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, as claimed.

Having thus described my invention, what I claim is:—

1. An acetylene gas generating tank having a gas outlet, a carbid receptacle arranged in said tank and having in its lower end a discharge opening, a casing secured to the lower end of said hopper around said discharge opening, said casing having in its lower end a discharge opening, valve seats

arranged respectively at the upper and lower ends of said casing and another seat arranged intermediate of the ends of said casing, extending through said receptacle and casing, a series of valves arranged on said stem and positioned to alternately open and close the openings at the upper and lower ends of the casing, whereby the carbid is discharged from the hopper in measured quantities, and an intermediate valve arranged to engage said intermediate seat when the upper and lower valves are half-way open, and means controlled by the gas consumption for actuating said valves.

2. An acetylene gas generator comprising a generating tank having therein a carbid hopper provided in its lower end with a discharge opening, a casing secured to said hopper over said opening and having in its lower end a discharge opening, a valve seat arranged in said casing and dividing the latter into upper and lower compartments, a valve stem, an upper valve, a lower valve and an intermediate valve adjustably secured to said stem and arranged in such position thereon that when the upper valve is closed the intermediate and lower valves will be opened and when the lower valve is closed the upper and intermediate valves will be opened and when the upper and lower valves are half-way open the intermediate valve will be closed, thereby permitting the carbid to discharge first from the hopper to the upper compartment of the casing and then from the upper compartment of the casing to the lower compartment, and means controlled by the gas consumption to operate said valves.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EMORY V. PENNINGTON.

Witnesses:

JAMES B. SKEEN,

GLYSSUS G. RADER.