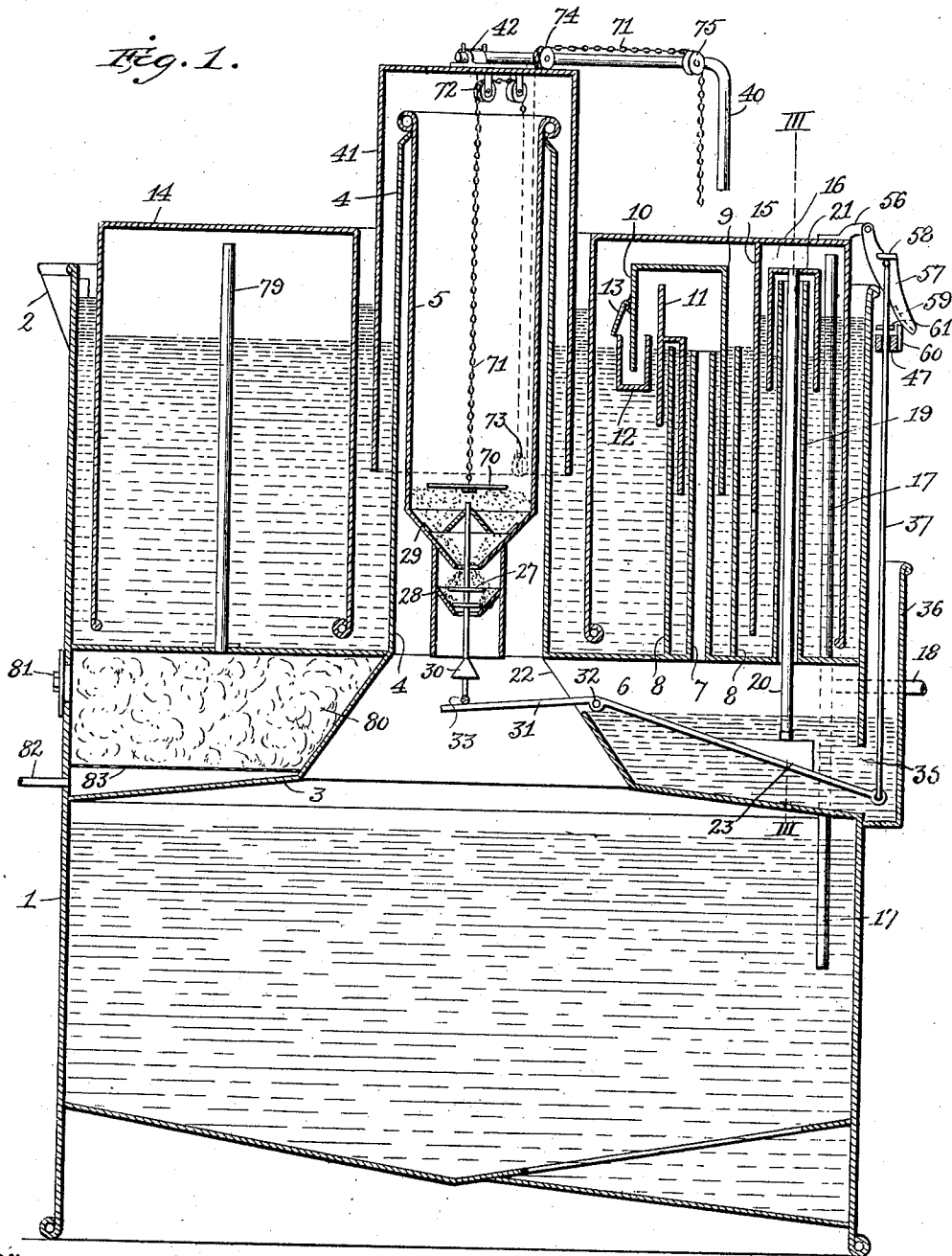


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ACETYLENE GENERATOR.
APPLICATION FILED SEPT. 3, 1909.

972,285.

Patented Oct. 11, 1910.

2 SHEETS-SHEET 1.



Witnesses

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384

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Fig. 2.

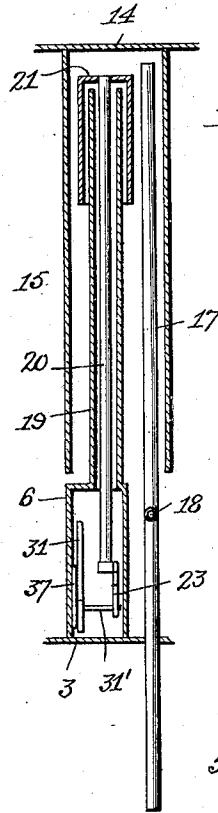
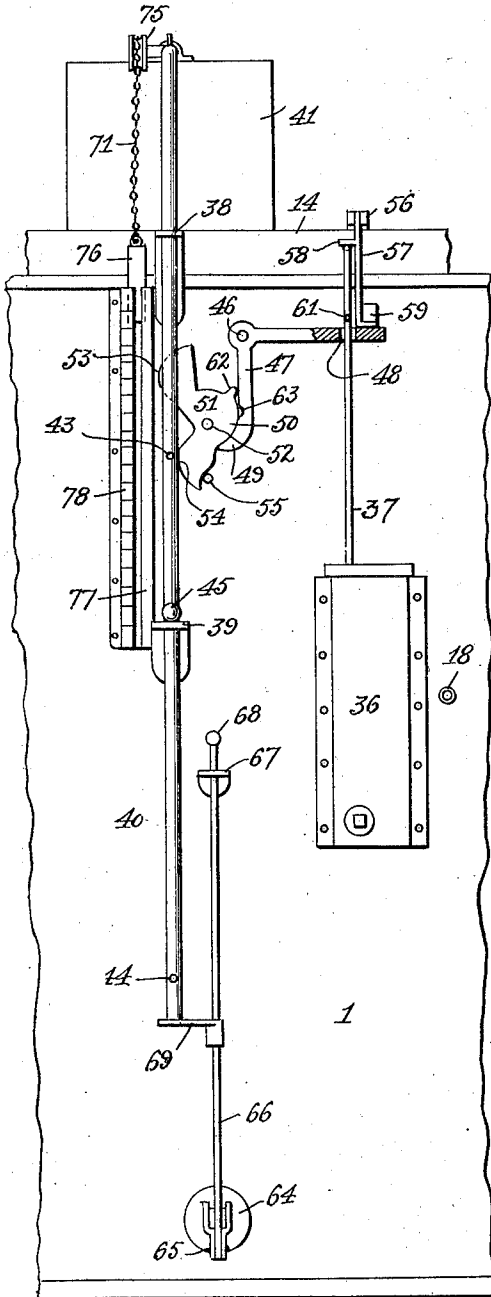


Fig. 3.

Fig. 4.

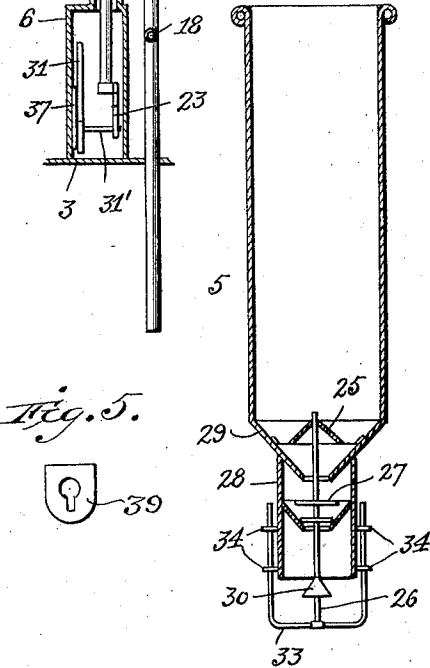


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GENERATOR.

972,285.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed September 3, 1909. Serial No. 515,992.

To all whom it may concern:

Be it known that I, FRANK E. STOVER, a citizen of the United States, residing at Luray, in the county of Page and State of Virginia, have invented new and useful Improvements in Acetylene-Generators, of which the following is a specification.

My invention relates to improvements in acetylene gas generators of the carbid feed type, and has for its objects to provide certain improvements in the construction of the same as will be hereinafter more specifically described and claimed, reference being had to the accompanying drawing, in which:

Figure 1 is a central vertical sectional view of the generator, the upper end of the lifting rod for the carbid chamber cover being shown, for the purposes of illustration, moved to the opposite side of the overflow chamber from its true position as shown in Fig. 2. Fig. 2 is a detail side elevation of the generator. Fig. 3 is a detail vertical sectional view on the line III—III, Fig. 1. Fig. 4 is a detail vertical sectional view of the carbid chamber and its valve, taken at a right angle to Fig. 1. Fig. 5 is a detail plan view of one of the brackets for the lifting rod.

Similar numerals of reference indicate corresponding parts in the several views.

In the said drawing the reference numeral 1 denotes the outer casing, on the top of which on one side is located a filling spout 2 for charging the same with water. Said casing is divided into an upper or gas chamber and a lower or generating chamber by a partition 3, formed into a central neck 4 open at its top for the reception of the removable carbid chamber 5. On top of said partition 3 at one side is located a narrow upwardly projecting chamber 6, into the top of which is tapped a pipe 7, the same projecting upwardly into the gas chamber and being open at top and bottom for the purpose of affording communication between the gas and generating chambers. Encircling said pipe 7, and projecting a little above the same, is a pipe 8, open at its top only. Resting on pipe 8 is a cup valve 9, the same being water-sealed between said pipe and pipe 7, and being extended at one side at 10, a partition 11 ex-

tending almost to the top of said cup valve, dividing the same into two chambers. At the lower end of said extension 10 is a trap 12, the upper outer side of which is provided with a flap valve 13, all for a purpose hereinafter to be described.

An annular gas bell or holder 14 is located in the upper or gas chamber, the same being open centrally to accommodate the vertical neck 4 receiving the carbid chamber 5, as shown. By means of a partition 15 a chamber 16 is formed in the gas bell, into which opens the upper end of the branch 17 of vent pipe 18, said chamber also receiving the tube 19 communicating at its lower end with the generating chamber. Passing freely through this tube is a vent pipe 20, open at both ends, and carrying at its upper end a cup 21 covering the upper end of tube 19 and water-sealing the same.

The partition 3 where it is inclosed by the chamber 6 is apertured at 22 to afford free communication between said chamber 6 and the generating chamber, and the lower end of pipe 20 is normally below the lower edge of said opening 22, as shown in Fig. 1, and is adapted to be raised by a projection 23, as will be hereinafter described.

Within the carbid chamber 5, near its lower end, is a deflector plate 25, through which passes the rod 26 of the feed valve 27. Said valve is of the double disk construction disclosed in Letters Patent No. 874,351, granted to me December 17, 1907, but is located in an elongated sleeve 28 depending from the inverted cone-shaped lower end 29 of carbid chamber 5, while a deflector 30 is mounted on the lower end of rod 26. By means of this construction the carbid in dropping is scattered in a circle outside the walls of sleeve 28, so that as the generated gas rises any moisture contained therein will condense outside the sleeve 28 and will drip back into the generating chamber.

To operate the feed valve I employ a lever 31 pivoted at 32 within the chamber 6 and having its inner end extending beneath a U-shaped bar 33 fixed to the lower end of rod 26 and extended upward at its ends through guides 34 on the outside of sleeve 28, as best seen in Fig. 4. Said lever extends at its outer end through an aperture 35, formed in the casing 1 within the confines of chamber

6, and into a water seal box 36. To this end of said lever is connected an operating rod 37 extending above the casing 1, as shown.

Mounted to move vertically in brackets 38 and 39 fixed to the outside of the casing 1 is a lifting rod 40 for the carbid chamber cover 41, said rod being extended horizontally to engage said cover at 42, and being provided with pins 43 and 44 and with lifting handle 45 for a purpose hereinafter to be described.

Pivoted at 46 to the side of casing 1 is a bell crank lever 47, the same having its horizontal arm apertured at 48 to receive freely therein the upper end of rod 37. The vertical arm of said lever has a curved extension 49, against which contacts the cam face 50 of a member 51 pivoted at 52 to the casing 1, and formed with another cam surface 53 and a shoulder 54. The movement of the lower end of said member 51 on its pivot to the right is limited by a stop pin 55 on the casing 1, and, when in contact therewith, the cam surface 53 projects in the path of vertical movement of the pin 43 on the lifting rod 40. Pivoted in a bracket 56 on the gas bell 14 is an arm 57 having fixed thereto a horizontal projection 58, adapted in the downward movement of gas bell 14 to contact with the upper end of rod 37 to depress the latter, and also having its inner lower side inclined and offset at 59 against which a finger 60 fixed to the horizontal arm of lever 47 is adapted to contact when the latter is lifted. Also fixed in rod 37 a little above the horizontal arm of lever 47 is a pin 61, against which said arm contacts in its upward movement to lift said rod 37. Formed on the cam face 50 of member 51 is a stud 62, and in the side of the vertical arm of lever 47 is a corresponding recess 63, all operating as hereinafter described.

At the lower portion of the casing 1 is the usual sludge valve 64, to the lever 65 of which is connected an operating rod 66 passing upward therefrom through a bracket 67 on the casing 1 and terminating in a handle 68. Fixed to and projecting from one side of said rod 66 is a lug 69, upon which rests the lower end of lifting rod 40 when the latter is in its lowermost position.

The device is also provided with an improved carbid indicator, the same consisting of a weight 70, adapted to rest on and move with the body of carbid in carbid chamber 5, and from which extends a chain 71 passing over pulleys 72 in the upper end of the carbid chamber cover 41, as seen in Fig. 1, and from thence downward outside the carbid chamber 5 to a pulley 73 located at the bottom of the carbid chamber cover 41, as seen in dotted lines in Fig. 1. From said pulley the chain 71 passes upward between the carbid chamber cover 41 and the gas bell 14 to the pulley 74 on the horizontal portion

of lifting rod 40, and from thence around pulley 75 to the outside of the casing 1, where it carries at its lower end an indicating block 76 vertically movable in a guide 77 on the casing 1 marked with a scale 78. So far this construction of carbid indicator is identical with that described and claimed in an application for Letters Patent filed by me July 9, 1908, Serial No. 442,637, but in the present construction the indicating block 76 is made heavier than the weight 70 within the carbid chamber, the result being that said weight 70 will be normally retained in its uppermost position, and the amount of carbid in chamber 5 indicated only when the block 76 is lifted manually to lower the weight into contact with the carbid, which is the position of the parts shown in Figs. 1 and 2 of the drawing.

Projected up into the gas bell 14, and open at its upper end, is a discharge pipe 79 which communicates at its bottom with a purifying chamber 80 located above the partition 3, the same being filled with cotton or other purifying agent through a hand hole closed by a plug 81. Communicating with said chamber is the service pipe 82 of the generator, a screen 83 being located in said chamber 80 to prevent the cotton therein from choking said service pipe.

The operation of my improved construction is as follows: It is charged with water through filling spout 2 alone, the gas bell chamber being first filled thereby to the level of pipe 8, which then fills and overflows through pipe 7 into the underlying chamber 6, and from thence through opening 22 into the generator chamber. With the carbid chamber charged with carbid and the parts in the position shown in Figs. 1 and 2, an initial discharge of carbid into the generating chamber is effected by manually moving the operating rod 37 up and down, which, through lever 31 and bar 33, operates valve 27. The gas generated thereby passes upward through pipe 7 and over partition 11 and blows the water out of trap 12, whereby it passes into the gas bell 14 through flap valve 13. The rise of the gas bell, due to the accumulation of gas therein, will cause arm 57 to swing by gravity over rod 37 so that as the gas is subsequently exhausted from gas bell 14 through service pipe 82, the consequent sinking of said gas bell will cause projection 58, by its contact with the upper end of rod 37, to depress the latter, and thereby actuate feed valve 27, through lever 31, to generate more gas.

To vent the machine it is only necessary to lift the rod 40 until the pin 43 thereon passes cam 53 on member 51, which results in turning said member 51 on its pivot, which, through the engagement of cam 50 with the extension 49 of bell crank lever 47,

tilts the latter on its pivot 46 thereby raising the horizontal arm thereof, which initially engages the inclined inner side of arm 57 to tilt the latter on its pivot outward, whereby its projection 58 will be moved out of the path of rod 37, so that the latter will not be actuated upon the downward movement of the gas bell 14. As this outward tilting of arm 57 takes place the horizontal extension of lever 47 will contact with the pin 61 on rod 37, whereby the latter will be lifted, which, by the consequent rocking of levers, carries the inner end of the latter well away from the U-shaped bar 33 of the carbide feed valve 27, so that there will be no possible danger of any feed of carbide. Furthermore, this movement of lever 31 will, through projections 23 mounted thereon, lift the lower end of pipe 20 out of the water in chamber 6, thereby breaking the seal and venting the generating chamber through said pipe 20, chamber 16 and branch 17 of vent pipe 18. This described movement of member 51 on its pivot results in the stud 62 thereon registering with the recess 63 in the lever 47, the engagement of which locks the parts in the open position against anything but a positive displacement. This rocking movement, however, of member 51 causes its shoulder 54 to be projected into the path of movement of the pin 43 on rod 40, so that upon the return of said rod to its normal position the member 51 will be again rocked on its pivot to its initial position shown in Fig. 1, thereby restoring the parts to their operative position. The venting of the generating chamber will at the same time, through pipe 7, vent cup valve 9, reducing the pressure therein to atmosphere, which causes the excess pressure in gas bell 14 to force the water up between trap 12 and partition 11 until said trap fills, which prevents the escape of gas from the gas bell 14, the flap valve 13 offering sufficient opposition to the initial return of the gas to permit this operation, as will be readily understood. To recharge the carbide chamber 5 the rod 40 is lifted until the lower pin 44 thereon passes through the lower bracket 39, the apertures in said brackets 38 and 39 being so shaped as shown in Fig. 5 as to permit the passage of pins 43 and 44, when by rotating said rod 40 part way the pin 44 will engage the top of said bracket 39 and thereby support said rod 40 in its lifted position. This lifting movement of rod 40 also raises the carbide chamber cover 41 until the latter is clear of the carbide chamber 5, and the subsequent rotation of said rod 40 then swings said cover 41 bodily to one side, thereby permitting access to the carbide chamber 5. The indicating block 76 being heavier than the weight 70 will cause the latter to remain normally in its uppermost

position in the carbide chamber cover 41, 65 where it will not interfere with the lateral movement of the latter. It will be observed that the upward movement of rod 40 carries it away from contact with the lug 69 on the sludge valve rod 66, so that by the 70 time the machine is vented said rod 66 is free to be moved vertically by its handle 68 to open the sludge valve 64, and that the return of rod 40 to its lowermost position automatically forces said sludge valve to its 75 closed position.

I have shown the branch 17 of vent pipe 18 extended downward through the partition 3 and water sealed at its lower end in the generating chamber, though this construction is not essential to the operation of the device. 80

In Fig. 1 I have shown the upper part of the rod 40 and its chain 71, which would not show in a true sectional view through box 36, as seen in Fig. 2, this method of illustration being adopted to dispense with the necessity for an additional sectional view like Fig. 1, but in a different vertical plane. Furthermore, I have shown in Fig. 1 the service pipe 82 and the purifying chamber 80 upon the opposite side of the casing to the vent pipe 18 and the other operative parts, whereas said parts are all preferably located on the same side of the generator. 85 90 95

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

1. In an acetylene generator, a casing, a carbide feed valve, a vent pipe, and a common operating rod for operating said valve and for opening communication between said vent pipe and the generating chamber. 100

2. In an acetylene generator, a casing, a carbide feed valve, a vent pipe, an operating rod, and means whereby the movement of said rod in one direction operates said valve, and its movement in the opposite direction opens communication between said vent pipe and the generating chamber. 105 110

3. In an acetylene generator, a casing, a carbide feed valve, a pivoted lever in the generating chamber adapted to move into and out of contact with said valve, and means for operating said lever to move it into and out of contact with said valve. 115

4. In an acetylene generator, a casing, a carbide feed valve, a water sealed chamber in the generating chamber, a lever pivoted in said water-sealed chamber and adapted to move into and out of contact with the carbide feed valve, a rod connected with said lever and operated by the gas bell, and means for operating said rod to move said lever out of contact with the carbide feed valve. 120 125

5. In an acetylene generator, a casing, a carbide feed valve, a water sealed chamber in the generating chamber, a lever pivoted in

said water-sealed chamber and adapted in its movement to contact with and operate said valve, a vertically movable vent pipe normally water sealed at its lower end in
5 said water sealed chamber, and a rod connected to said lever for operating the latter in one direction to operate the carbid feed valve and in the other direction to lift said vent pipe out of its water seal.

- 10 6. In an acetylene generator, a carbid chamber, a removable carbid chamber cover, a rod for lifting said cover, and a carbid indicator carried entirely by said cover and

rod, and embodying a relatively light weight adapted to contact with the carbid in the
15 carbid chamber, a relatively heavy indicating block exterior to the generator, and a flexible connection between said weight and block.

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

FRANK E. STOVER.

Witnesses:

PERCY B. HILLS,
EDWIN L. YEWELL.