Oct. 7, 1930. P. DORSEY 1,777,299

FEEDING APPARATUS FOR CHEMICALS

Filed Oct. 20, 1927

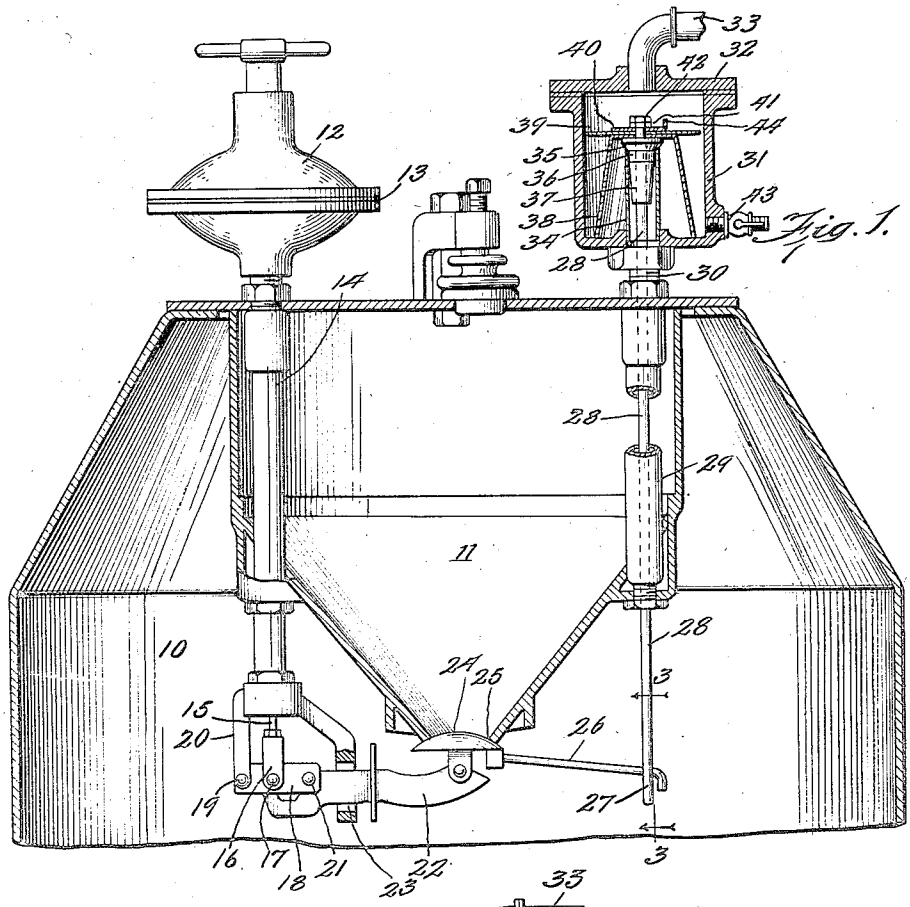

Fig. 1.

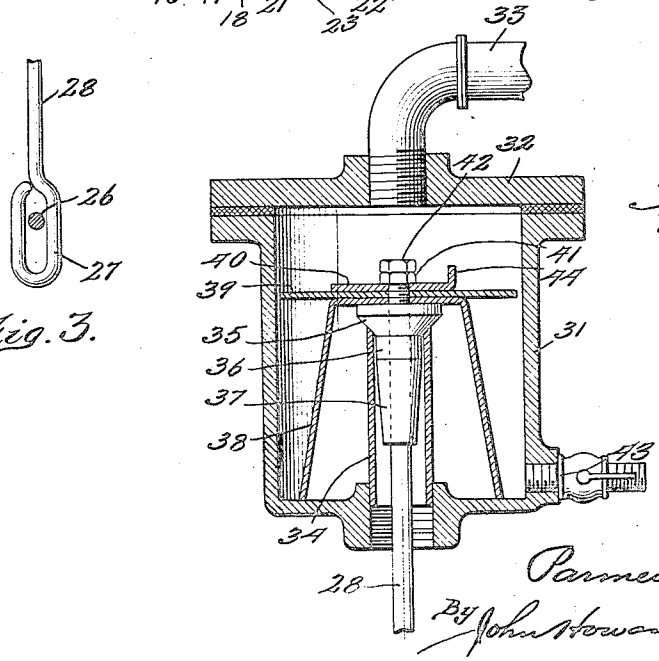

Fig. 2.

Fig. 3.

Inventor:
Parmer Dorsey
By John Howard McElroy
his Atty.

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UNITED STATES PATENT OFFICE

PARMER DORSEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE IMPERIAL BRASS MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

FEEDING APPARATUS FOR CHEMICALS

Application filed October 20, 1927. Serial No. 227,508.

My invention is concerned with certain new and useful improvements in feeding apparatus for chemicals, which I have shown as substituted for a fundamentally different apparatus having the same function in my application No. 525,566, filed December 29, 1921, for acetylene generator, in which the feed of the carbide is effected at necessary intervals to maintain the desired pressure, by the gradual rise and sudden fall of a small gas bell through which all the gas being drawn from the generator must pass, the sudden fall being effected by the sudden escape from the bell of the gas under pressure contained therein when the bell has been raised by the gas pressure high enough to lift its open bottom from the sealing liquid necessarily employed, and in which it is ordinarily immersed.

In my improved construction, while still retaining an element rising and falling as before, I improve its durability and certainty of operation by dispensing with the sealing liquid and employing other and different means for controlling its movement, as will be hereinafter fully described and claimed.

To illustrate my invention, I annex hereto a sheet of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which,—

Fig. 1 is a central vertical section through the upper portion of an acetylene generator to which my invention has been applied;

Fig. 2 is a view of a portion of the mechanism shown in Fig. 1, on a larger scale; and

Fig. 3 is a section, slightly enlarged, on the line 3—3 of Fig. 1.

10 is a generating chamber of the customary type containing water, into which carbide is dropped from the carbide holder 11 occupying the upper portion of the top of the casing. Secured in the top of the carbide holder is a pressure regulator 12 containing a diaphragm 13 opposed by a spring and acted upon by the pressure of the gas in the generating chamber to which it is connected by the tube 14 extending down through the carbide holder and terminating at its lower end in the generating chamber. The diaphragm 13 has connected thereto the rod 15 extending down through the tube 14 and terminating in a fork 16 which is pivotally connected at 17 to the short lever 18 fulcrumed at 19 in the bearing bracket 20 secured on the bottom of the tube 14. Fulcrumed at 21 on the free end of a lever 18 is another lever 22 having its shorter end engaging the under side of the lever 18, so that when the lever 18 is lifted the lever 22 will be lifted with it, while when the lever 18 is shoved down far enough, the lever 22 will contact with the bottom of the loop 23 supported from the bottom of the tube 14 and cause the outer end of the lever 22 having the mushroom valve 24 pivoted thereon to be raised, so that the valve 24 can be brought into engagement with the outlet 25 of the hopper by either pulling the rod 15 up, as it would be pulled by the action of the diaphragm when the pressure is too great, or by forcing the rod 15 down far enough, as will be done when it is desired to stop the operation of the apparatus. The valve 24 when in operation stands at a distance from the outlet 25 which is determined by the desired pressure, as where the desired pressure is great, the diaphragm 13 will hold the valve 24 some distance from the outlet 25, whereas when the pressure is materially smaller, the valve will be held closer to the outlet by the diaphragm. The valve 24 is at no time moved far enough away from the outlet 25 to permit the carbide to flow or run out of the holder 11, but a portion is always caught between the valve 24 and the edge of the outlet 25 unless it is completely shut off. When it is so caught, if the valve 24 be rocked on its pivot, a small quantity of carbide will be discharged, the amount depending on the distance that the valve 24 is from the outlet 25. This structure so far described is identical with that shown in my prior application No. 525,566, above referred to, to which reference is made for fuller disclosures of the details of construction.

The valve 24 has secured thereon the arm or rod 26 which extends through the loop 27 formed on the bottom of the rod 28 by which the valve 24 is rocked by the mechanism to be described. This rod 28 extends vertically upward through a tube 29 extending up through the carbide holder 11 and having at

its upper end a threaded portion 30 on which is secured the cylindrical cup 31, the upper end of which is closed by the top 32 which has the pipe 33 leading therefrom and carrying the gas to be used to the customary "flashback" chamber, from which the gas, after being drawn through water, is taken to the torches, where it is used.

The chamber 31 has secured in the center of the bottom thereof a tube 34 which might be considered as an extension of the tube 29, and projects up preferably somewhat over one-half of the distance toward the top of the chamber. The upper end of this tube 34 is preferaby beveled, as shown, to form a seat for the valve 35, which consists of the truncated, conical top and the short, substantially cylindrical portion 36 which fits in the tube 34, and the tapering portion 37, the entire valve member being carried on the upper end of the rod 28, the upper portion being threaded thereon so that it acts as a nut on the threaded upper end of the rod.

Held on the upper end of the valve member 35 is the bottom of the inverted, truncated, conical-shaped cup 38, through which passes the threaded upper end of the rod 28. The cup is so adjusted that when the valve 35 is seated on the tube 34, the rim of the cup rests on the bottom of the cylinder 31. Above the cup 38 is the disk 39, which has a small clearance, say one-sixteenth of an inch, from the cooperating cylindrical walls of the cup 31. Above the disk 39 is a washer 40, the bottom of the cup 38, the disk 39 and the washer 40 being held between the nut-like valve portion 35 and the nut 41 and the lock nut 42, which holds the the parts in adjusted position. At the bottom of the chamber 31, I place a cock 43, which is necessary to draw off the water before beginning a run, as when the pressure is lowered in the generator when it is shut down, back pressure usually forces some water from the flashback chamber back into the chamber 31, and the presence of water in this chamber 31 would interfere with the operation of the cup 38.

The operation of the apparatus is as follows:

Assuming that the parts are in the position shown in Fig. 2, they will remain in said position until the pressure of the gas in the generating chamber is sufficient to lift the valve 35 off of its seat, when a little gas can escape into the cup 38, and as the cup is raised, the gas can escape faster, as the rise of the tapered portion 37 permits its increase. The gas escapes underneath the bottom of the cup 38 and rises around the disk 39, serving to lift the rod 28 until the pressure above the disk 39 becomes as great as that below it, when gravity will serve to cause the parts to fall to their normal closed position. While there is a certain amount of lost motion between the rod 28 and the arm 26, if the valve 24 is held far enough away from the outlet 25 to allow any feed of the carbide, the lost motion is not enough to prevent the rod 28 from swinging the arm 26, and this rocks the valve 24 on its fulcrum and causes some of the carbide caught between the valve 24 and the edge of the outlet 25 to be fed into the water beneath. When the valve 24 is tightly closed, the length of the loop 28 is sufficient to permit the rise and fall of the cup 38 so as to continue the feed of the gas as long as the pressure in the tank will permit.

To prevent the possibility of the cup 38 being carried up far enough so that the washer would strike the bottom of the cover 32 and thus seal the aperture to the pipe 33, I form on the washer 40 the upstanding lug 44 to contact with the under side of the cover 32.

While I have herein shown and described some features of the structure embodied in my generic application No. 525,566, filed December 29, 1921, I do not herein claim anything that can be claimed in the aforesaid application, No. 525,566, but reserve all common subject matter for said aforesaid generic application.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modification, and that I do not desire to be limited in the interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class described, the combination with a gas generating tank, of a dry chemical holder located above the tank and having an outlet discharging thereinto, a closure for said outlet movable into and out of contact with it, a conduit from said tank through which the gas to be consumed passes, a chamber in said conduit having an upwardly-opening aperture for the gas entering the chamber forming a valve seat, a cup over said seat carrying a valve adapted to co-operate therewith and having its rim seated on the bottom of the chamber when the valve is seated, an outlet for the gas in the chamber outside of the surface covered by the cup, and connections from the cup to the closure whereby when the cup is raised and lowered the closure will be vibrated if it is not seated in the outlet.

2. In a device of the class described, the combination with a gas generating tank, of a dry chemical holder located above the tank and having an outlet discharging thereinto, a closure for said outlet, means for regulating the normal distance of the closure from the outlet, a conduit from said tank through which the gas to be consumed passes, a chamber in said conduit having an up-

wardly opening aperture for the gas entering the chamber forming a valve seat, a cup over said seat carrying a valve adapted to co-operate therewith and having its rim seated on the bottom of the chamber when the valve is seated, an outlet for the gas in the chamber outside of the surface covered by the cup, and connections from the cup to the closure whereby when the cup is raised and lowered the closure will be vibrated if it is not seated in the outlet, said connections consisting of a rod depending from the cup having an elongated slot in its lower end and a transverse rod extending through the slot and connected to the closure.

3. In a device of the class described, the combination with a gas generating tank, of a dry chemical holder located above the tank and having an outlet discharging thereinto, a closure for said outlet, means for regulating the normal distance of the closure from the outlet, a conduit from said tank through which the gas to be consumed passes, a chamber in said conduit having an upwardly opening aperture for the gas entering the chamber forming a valve seat, a cup over said seat carrying a valve adapted to co-operate therewith and having its rim seated on the bottom of the chamber when the valve is seated, a disk on the top of the cup co-operating with the vertical walls of the chamber, an outlet for the gas in the chamber outside of the surface covered by the cup, and connections from the cup to the closure whereby when the cup is raised and lowered the closure will be vibrated if it is not seated in the outlet.

4. In a device of the class described, the combination with a gas generating tank, of a dry chemical holder located above the tank and having an outlet discharging thereinto, a closure for said outlet movable in and out of contact with it, a conduit from said tank through which the gas to be consumed passes, a chamber in said conduit having an upwardly opening aperture for the gas entering the chamber forming a valve seat, and a downwardly opening aperture in the top thereof from which the gas escapes, a cup over said seat carrying a valve adapted to co-operate therewith and having its rim seated on the bottom of the chamber when the valve is seated, a stop to limit the upward movement of the cup and prevent its closing the aperture in the top of the chamber, and connections from the cup to the closure whereby when the cup is raised and lowered the closure will be vibrated if it is not seated in the outlet.

5. In a device of the class described, the combination with a gas generating tank, of a dry chemical holder located above the tank and having an outlet discharging thereinto, a closure for said outlet, means for regulating the normal distance of the closure from the outlet, a conduit from said tank through which the gas to be consumed passes, a chamber in said conduit having an upwardly opening aperture for the gas entering the chamber, a cup over said aperture carrying a valve adapted to co-operate therewith, said valve having a tapered extension into the tubular aperture which it closes, an outlet for the gas in the chamber outside of the surface covered by the cup, and connections from the cup to the closure whereby when the cup is raised and lowered the closure will be vibrated if it is not seated in the outlet.

6. In a device of the class described, the combination with a gas generating tank, of a dry chemical holder located above the tank and having an outlet discharging thereinto, a closure for said outlet, means for regulating the normal distance of the closure from the outlet, a conduit from said tank through which the gas to be consumed passes, a chamber in said conduit having an upwardly opening aperture for the gas entering the chamber forming a valve seat, a truncated-cone-shaped cup over said seat carrying a valve adapted to co-operate therewith and having its rim seated on the bottom of the chamber when the valve is seated, a disk on the top of the cup co-operating with the vertical walls of the chamber, an outlet for the gas in the chamber outside of the surface covered by the cup, and connections from the cup to the closure whereby when the cup is raised and lowered the closure will be vibrated if it is not seated in the outlet.

In witness whereof, I have hereunto set my hand.

PARMER DORSEY.