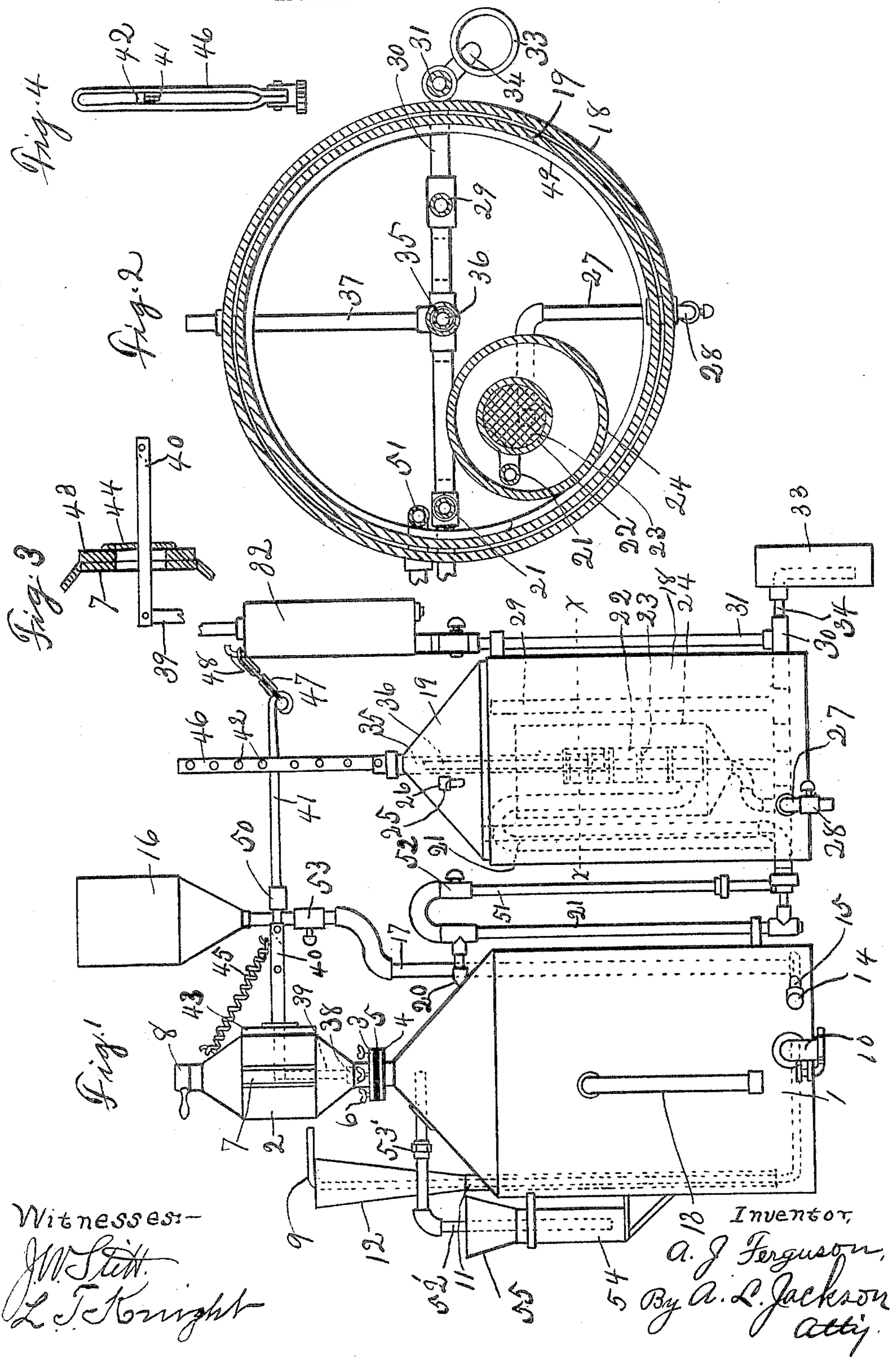


No. 804,591.

PATENTED NOV. 14, 1905.

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GAS GENERATOR.

APPLICATION FILED JUNE 20, 1904.



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UNITED STATES PATENT OFFICE.

ANDREW J. FERGUSON, OF FORT WORTH, TEXAS; CLARENCE M. FERGUSON, ADMINISTRATOR OF SAID ANDREW J. FERGUSON, DECEASED, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AMERICAN ACETYLENE GAS LIGHT COMPANY, OF FORT WORTH, TEXAS, A CORPORATION.

GAS-GENERATOR.

No. 804,591.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed June 20, 1904. Serial No. 213,305.

To all whom it may concern:

Be it known that I, ANDREW J. FERGUSON, a citizen of the United States, residing at Fort Worth, Texas, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates to gas-generators, and more particularly to machines for manufacturing acetylene gas; and the primary object is to construct a machine that is simple in construction and easily operated.

A further object is to construct a machine which has no parts that can or will be disarranged in operation. One difficulty in the use of acetylene gas is the choking of the burners by accumulations in the gas-exits through the burners. I have provided means for clearing matter from the gas in order to prevent this choking of the burners.

Another object of this invention is to provide means for transferring the gas from the gas-bell to the generator in case some work is to be done in or about the gas-bell or its tank and to transfer the gas back to the gas-bell and to keep air out of these vessels.

Other objects and advantages will be fully understood from the following description, and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this application.

Figure 1 is a side elevation of the gas-generator. Fig. 2 is a horizontal section along the line *xx* of Fig. 1. Fig. 3 is a detail view, being a broken section of the carbide-receptacle, illustrating the feeding mechanism. Fig. 4 is an edge view of the rack for actuating the feed mechanism.

Similar characters of reference are used to indicate the same parts throughout the several views.

The machine is provided with a gas-generator 1, and a carbide-receptacle 2 is mounted above the generator. The carbide-receptacle 2 is connected to the generator 1 by means of an air and gas tight joint composed of a flange 3 on a reduced portion of the carbide-receptacle 2 and a flange 4 on a reduced portion of the generator and packing 5 between the flanges 3 and 4. The flange 3 is then pressed down on the packing 5 by means of thumb-screws 6. The carbide-receptacle 2 is provided

with a glass panel 7, which serves as a gage to determine the amount of carbide there is in the receptacle. The receptacle is provided with a screw-cap 8 for closing the carbide-receptacle. The generator 1 is provided with an agitator 9 for removing the spent carbide, which can be drawn out of the generator through the faucet 10. In order to prevent the escape of gas up by the agitator 9, a water seal is provided as follows: The agitator is mounted in a pipe 11, which is attached to the upper part of the generator and extends near the bottom of the generator. The agitator extends through this pipe 11 and is then bent at a right angle to the side of the generator, so that it will sweep along the bottom of the generator. The agitator is extended up some distance on the outside of the generator, and a long funnel 12, which is connected to pipe 11, extends up about the agitator 9, so that water will not fall therefrom when forced up the pipe 11 by the pressure of gas within the generator. The generator is provided with a water-gage 13. Water is poured into the generator until the water begins to run out the pipe or gage 13. This gage is bent down and extends downward so that the water that may run therefrom may be caught in a suitable vessel; but as soon as the water begins to run out this pipe the pouring of water in the generator is stopped and a cap is placed on the pipe 13. Water may be placed in the generator by unscrewing the cap 14 on the pipe 15 and connecting with the waterworks-pipe or water may be poured in the receiver 16. The pipe 15 is placed at an angle to the generator 1, so that when water is forced therein it will be given a whirling circular motion. The generator may be cleared of spent carbide in this manner when the faucet 10 is opened. The receiver 16 is provided with a pipe 17, which extends near the bottom of the generator, so that the same will be immersed in water to prevent the escape of gas.

This invention is provided with means for storing the gas, consisting of a tank 18 for containing water and a gas-bell 19 telescoping downward in the tank 18. Gas escapes from the generator 1 through the pipe 20 and pipe 21 to the interior of the gas-bell 19. The gas-bell 19 rises in the tank 18 as the gas ac-

cumulates. Means are provided for washing the gas. The gas passes through pipe 21, which extends near the top of the tank 18 and bends downward and discharges the gas into a vessel 22. This vessel is provided with a series of disks 23, composed of wire mesh. The gas escapes from the pipe 21 and passes up through these disks, and the gas particles are broken thoroughly to pieces in the presence of the cleansing liquid. The vessel 22 is open at the top and at the bottom, and the disks 23 are horizontally disposed therein. The cleansing liquid may be water or gasoline or other suitable liquid. I show provision for using gasoline for the purpose of washing the gas. A tank 24 is mounted in the tank 18 for containing the gasoline, and the vessel 22 is mounted in the vessel or tank 24. The gasoline-tank may be filled through a short pipe 25, inserted in the gas-bell. This pipe is closed by a screw-cap 26 when not in use. Gasoline may be drawn out of the gasoline-tank by means of the pipe 27, which is provided with a suitable cock 28. Gas passes from the bell 19 through the pipe 29 and the pipe 30 to pipe 31. The pipe 31 is connected to the drier 32, from which the gas is taken by a suitable pipe for consumption. The pipe 30 is in communication with a water-tank 33 by means of a pipe 34. This provision is for regulating the pressure of the gas. The machine is provided also with pipes, which serve as a safety-valve. A pipe 35 is attached to the gas-bell 19 and projects down into the water in the tank 18. A pipe 36 with the upper end open telescopes within the pipe 35 and connects with a pipe 37, which leads to the open air, so that if the pipe 35 is drawn up out of the water by the gas-bell gas will escape down the pipe 36 and out 37 to the atmosphere, and thus prevent an explosion.

The tank 24 may be dispensed with and water used to wash the gas if a party prefers that method of washing the gas.

The feeding of the carbid is regulated by the falling of the bell. A valve 38 closes the passage between the carbid-receptacle and the generator. Feeding is accomplished by the raising of this valve so that carbid can drop through into the generator. The valve-stem 39 of the valve 38 is pivotally connected to the lever 40, which is fulcrumed in the side of the carbid-receptacle. The lever has an extension 41 pivotally connected thereto, so that said extension will break upward, but not downward. This lever extends through the rack 46, which rack is pivotally connected to the gas-bell 19. This rack is provided with a pin 42, and the rack is provided with a number of holes, so that the pin can be placed at different adjustments. The lever 40 is made resilient by means of a brass plate 43, which is soldered or otherwise secured to the receptacle 2, and by the brass plate 44, which is secured in any suitable manner to the plate

43. The plate 43 and the side of the receptacle 2 have large openings therethrough, and these openings are closed by the plate 44, the plate 43 being cut away, so that the plate 44 will be resilient. The lever 40 is made more resilient by the spiral spring 45, which is connected to the lever and to the receptacle 2. The plate 44 will buckle enough to allow the operation of the lever 40. When the gas-bell descends and the pin 42 strikes the lever 41, the valve 38 will be raised and carbid will fall into the water in the generator. Gas will be immediately generated, and the bell will rise, and the valve 38 will be closed, a small quantity of carbid having fallen into the water. The time at which the pin will strike the lever 41 may be varied by placing the pin at different heights in the rack 46. The gas-bell may be locked in an elevated position by the lever 41 and a suitable chain 47, which engages the lever, and a hook 48 on the drier 32. This is desirable if it is necessary to pour gasoline in the tank 24 through the pipe 25. By locking the bell in the elevated position no gas will escape while this operation is going on. Pressure is obtained for the gas-bell by attaching a heavy rim 49 to the bottom part of the interior of the gas-bell. This makes a convenient place for locating the weight for the gas-bell. The two parts of the levers 40 and 41 may be made rigid with each other by means of a cuff 50, which can be slipped over the joint of these two parts.

Means are provided for transferring the gas from the gas-bell to the gas-generator, or vice versa. A pipe 51 is in connection with pipe 20. This pipe 51 extends down near the bottom of the tank 18 and enters that tank below the rim of the gas-bell and extends above the water-level in the tank 18. Suppose the gas-bell is full of gas and it is desired to transfer the gas to the generator. Draw the water out of generator 1 through faucet 10 and pour the water up into vessel or tank 16 until enough water has been drawn out of the generator to let the gas-bell down as low as wanted. Before commencing to draw the water out of the generator from faucet 10 open cock 52. As the water is being drawn out the gas will escape from the gas-bell through pipe 51 to the generator. The gas can practically all be transferred from the gas-bell to the generator in this manner in case some repair or other thing is to be done to the gas-bell. When the gas-bell is ready to receive gas again, open cock 53 in the pipe, which connects the vessel 16 with the generator. The weight of the water in vessel 16 will gradually press the gas back out of the generator through a pipe 21 to the gas-bell. These operations can all be done without admitting air in the generator or in the gas-bell. The exclusion of the air from these vessels is particularly useful, because the machines that admit air are frequently

full of air, and sometimes it requires considerable time for the air to escape before the gas will burn.

The operation of this machine is simple.

5 Water is placed in the generator until it commences to run out of pipe 13. A sufficient quantity of water is placed in the tank 18. The receptacle 2 is partly filled with carbid. If the valves are all in the proper condition,
 10 the lever 40 may be agitated slightly, so that carbid will fall from receptacle 2 into the water in generator 1. Gas will be generated immediately and cause the gas-bell to rise. The gas in passing to the gas-bell is thoroughly
 15 disintegrated and washed by being conducted through the washing vessel 22, which is suspended in the tank of gasolene. The gas particles are thoroughly broken to pieces as they rise through the wire-mesh disks 23. The
 20 gas is dried before it is used by passing up through the vessel 32, which is in common use. To clear the generator 1 of spent carbid, stir the spent carbid with the agitator 9 and open the faucet 10. The spent carbid and
 25 water will run out through this faucet.

Various changes may be made in the construction of the machine herein described without departing from my invention.

30 A safety-valve is provided for the gas-generator. This safety-valve consists of a pipe 52', projecting in the upper part of the generator 1, a union 53', and a vessel 54, attached to the side of the generator 1 and terminating in a funnel-shaped top 55. This valve is pro-
 35 vided to prevent explosion of the generator if too much carbid should fall into the water in the generator. Should a very great quantity of carbid fall into the water in the generator, the pipe 20 would not be sufficient to
 40 convey away the gas. To provide an escape for the gas, the vessel 54 is filled with water and the pipe 52' is extended within vessel 4, near the bottom thereof. When there is very

great pressure in the generator 1, the gas will escape out the lower end of the pipe 52', and
 45 thus prevent an explosion.

The gas, in passing through the gasolene and through the wire mesh 23, mounted in the gasolene vessel 24, will be thoroughly cleansed of the matter which usually chokes
 50 the burner.

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

1. In a gas-generator of the class described, 55 a carbid-receptacle having a feed-valve mounted therein and having an opening in one side thereof, a perforated strengthening-plate secured to said receptacle and having an opening registering with the opening in said re- 60 ceptacle, an approximately flat flexible plate attached to said strengthening-plate, a lever pivotally connected to said feed-valve and extending through said flexible plate, and means for actuating said lever. 65

2. In a gas-generator, a gas-generating vessel, a gas-tank and a gas-bell telescoping into said gas-tank, a suitable pipe connecting said gas-generating vessel and said gas-bell, a car- 70 bid-receptacle connected to said generating vessel, a feed-valve mounted in said receptacle, a lever pivotally connected to said feed-valve and projecting out of the side of said receptacle, said lever being jointed and capa- 75 ble of breaking upward, a spiral spring attached to said receptacle and to said lever, and a graduated rack carried by said gas-bell for actuating said lever.

In testimony whereof I set my hand, in the presence of two witnesses, this 9th day of De- 80 cember, 1903.

ANDREW J. FERGUSON.

Witnesses:

A. L. JACKSON,
 D. A. WHISENANTS.