

No. 827,503.

PATENTED JULY 31, 1906.

A. F. CHACE.
ACETYLENE GAS GENERATOR.

APPLICATION FILED APR. 3, 1905.

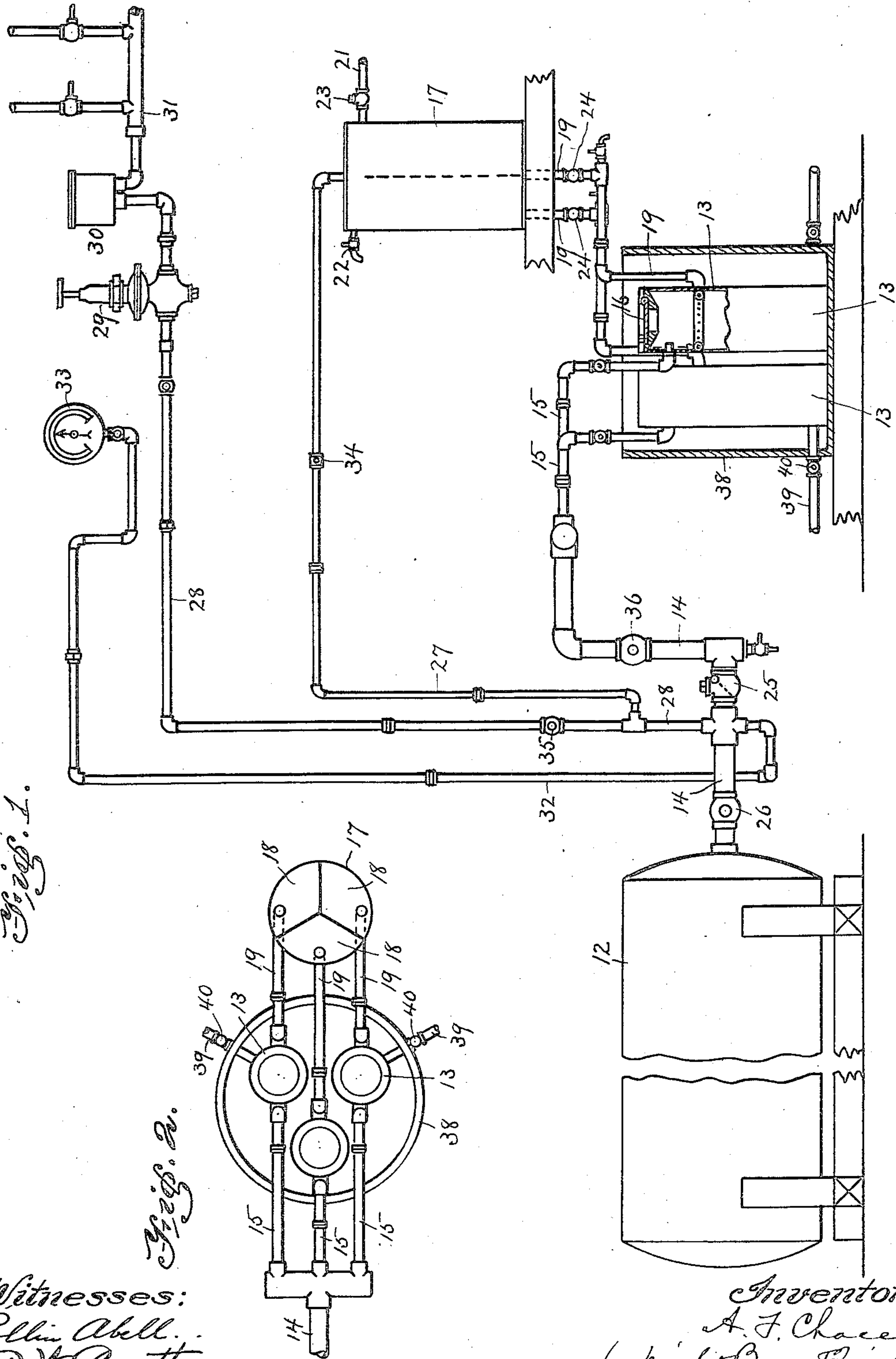


Fig. 1.

Fig. 2.

Witnesses:
Rollin Abell.
P. H. Pezzer.

Inventor:
A. F. Chace
by night Brown Quincy
Atty.

UNITED STATES PATENT OFFICE.

ALBERT F. CHACE, OF BOSTON, MASSACHUSETTS.

ACETYLENE-GAS GENERATOR.

No. 827,503.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed April 3, 1905. Serial No. 253,397.

To all whom it may concern:

Be it known that I, ALBERT F. CHACE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Acetylene-Generators, of which the following is a specification.

This invention has for its object to provide an apparatus which shall be entirely safe in its operation and can be used for generating and storing acetylene gas in a considerable volume or quantity under sufficient pressure to enable the apparatus to be used for charging lamp and other reservoirs with compressed gas or to enable the gas to be supplied through suitable pressure regulating and governing devices to burners.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of an apparatus embodying my invention. Fig. 2 represents a top plan view of a portion of the apparatus.

The same reference characters indicate the same parts in all the figures.

In the drawings, 12 represents a receiver, which is preferably a cylindrical vessel of fixed capacity and composed of metallic plates securely riveted together and of such strength as to be able to resist a relatively high pressure, such as two hundred pounds to the square inch.

13 13 represent a series of generators connected with the receiver 12 by means of a main pipe 14 and branches 15, connecting the main pipe with each of the generators. The generators are adapted to contain charges of calcium carbide, and the combined capacity of the series of generators is such that the reaction of water on the charges in all the generators will create sufficient gas to fill the receiver at the predetermined pressure. Each generator is provided with a carbide-receiving opening at its upper end and with a movable cover 16 for said opening. The generators should be of such strength that they are capable of resisting the same pressure as the receiver 12.

17 represents a water-reservoir, which is subdivided into a series of compartments 18, the number of compartments being the same as the number of generators, each compartment being connected with a corresponding generator by a pipe 19, which delivers

water to a perforated annular distributing-pipe within the generator. Each compartment of the water-reservoir contains the exact quantity of water required to react upon the charge of carbide held by the corresponding generator. The compartments 18 are open at the upper end of the reservoir, so that they are all filled through a feed-pipe 21, entering the upper portion of the reservoir-casing, the water flowing first into one compartment and then overflowing into the other compartments until all are filled. A waste-cock 22 is or may be provided at the upper portion of the reservoir for the escape of surface water above the compartment 18. The feed-pipe 21 is provided with a cock 23, by which it may be closed. Each of the pipes 19, connecting the reservoir-compartments with the generators, is also provided with a closing-cock 24. The pipe or conduit 14, connecting the generators with the gas-receiver, is provided with a check-valve 25, adapted to open toward the receiver and from the generators, so that while the check-valve permits the free passage of gas from the generators to the receiver it prevents the backward passage from the receiver to the generators. The conduit 14 is provided with a shut-off cock 26 between the check-valve 25 and the receiver 12.

27 represents a pipe forming a part of a connection between the conduit 14 and the top of the water-reservoir, the remaining part of said connection being provided by a pipe 28, of which the pipe 27 is a branch, said pipe 28 communicating with the conduit 14 and with a suitable pressure-regulator 29 and a governor 30. A distributing-pipe 31 extends from the governor and may supply burners or valved outlets adapted to supply gas to lamps and other portable reservoirs. 32 represents a branch from the conduit 14 and leading to a pressure-gage 33. A stop-cock 34 is provided in the pipe 27 and a stop-cock 35 in the pipe 28. A stop-cock 36 is provided in the conduit 14 between the branch 28 and the generators.

The apparatus may be operated as follows: The generators 13 being charged with carbide and the reservoir-compartments 18 with water, the water is allowed to pass either from one compartment to the corresponding generator or from all the compartments simultaneously to the generators with which they are connected. Each charge of water reacting on the carbide in the accom-

panying generators exhausts the charge of carbid, the gas passing to the receiver. Each generator is filled partly by the charge of water flowing into it from the water-receptacle to which it is connected and partly by the residuum from the carbid, so that the gas is entirely expelled from each generator and passes to the receiver. When the charges in all the generators have been exhausted, the receiver is charged with gas at the predetermined pressure. While the water is passing to the generators the cock 34 must be left open in order to vent and permit a free flow of water from the reservoir to the generators. When the cock 34 is closed while the gas is being generated, pressure of the gas in the generator will prevent the water from entering the generators, but when the cock 34 is opened the gas-pressure from the receiver acting on the surface of the water will counterbalance the pressure in the generators and permit water to flow by gravitation from the water-reservoir to the generators, and thus insure a continuous reaction and production of gas. While the receiver is being charged the stop-cock 35 in the supply-pipe 28 may be closed until the desired pressure has accumulated in the receiver, although this is not essential, as gas may pass from the receiver 12 to the supply-pipe 28 from the commencement of the generating operation.

The generators are contained in a water-tank 38, the water in which surrounds the external surfaces of the generators and prevents excessive heat in the generators. Each generator has a waste-outlet 39 at its lower end through which the residual matter may be forced by gas-pressure or otherwise. Each outlet 39 is provided with a stop-cock 40.

The described apparatus is simple in construction and safe and effective in operation. Owing to the employment of a series of relatively small generators I am enabled to generate an ample volume of gas without lia-

bility of excessive heat, such as would result from the reaction of water on a large mass of carbid. By proportioning the water charges to the carbid charges and by making the receiver of sufficient size to contain all the gas that can be supplied by the generators I make the operation of the apparatus largely automatic, it being only necessary to charge the water-reservoirs and the generators and then allow the water to flow to the generators until all the carbid has been exhausted.

After the receiver has been charged the generators and water-reservoir may be cut off from the system until the pressure in the receiver has been reduced by the consumption of gas sufficiently to require a fresh supply.

I claim—

1. An acetylene-gas apparatus comprising a closed water-receptacle, means for supplying water thereto, a generator, connections between the receptacle and generator, a gas-receiver, connections between said receiver and generator, and a connection between said gas-receiver and the top of the water-receptacle, said connection being independent of the water-supply connection, whereby, when the receptacle is being filled with water, gas in said receptacle will be forced toward the receiver without escaping to the atmosphere.

2. An acetylene-gas apparatus comprising a tank, a plurality of independent generators situated therein, a water-receptacle containing a plurality of compartments each compartment being separately connected to one of the generators, a gas-receiver, and connections between each of the generators and gas-receiver and between said receiver and all the compartments of the water-receptacle.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT F. CHACE.

Witnesses:

C. F. BROWN,
E. BATCHELDER.