

W. P. VAN DEURSEN.
FIRE EXTINGUISHER.

No. 109,975.

Patented Dec. 6, 1870.

Fig. 1.

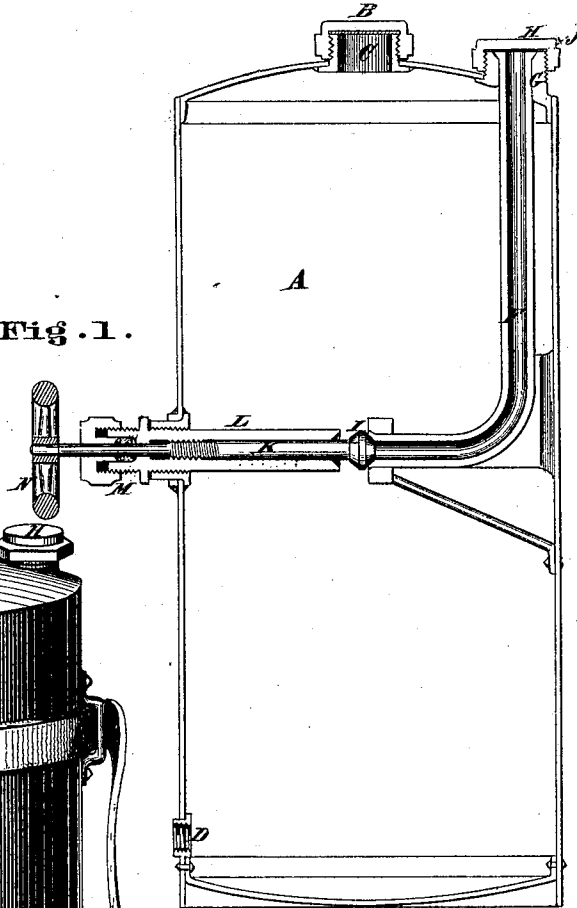
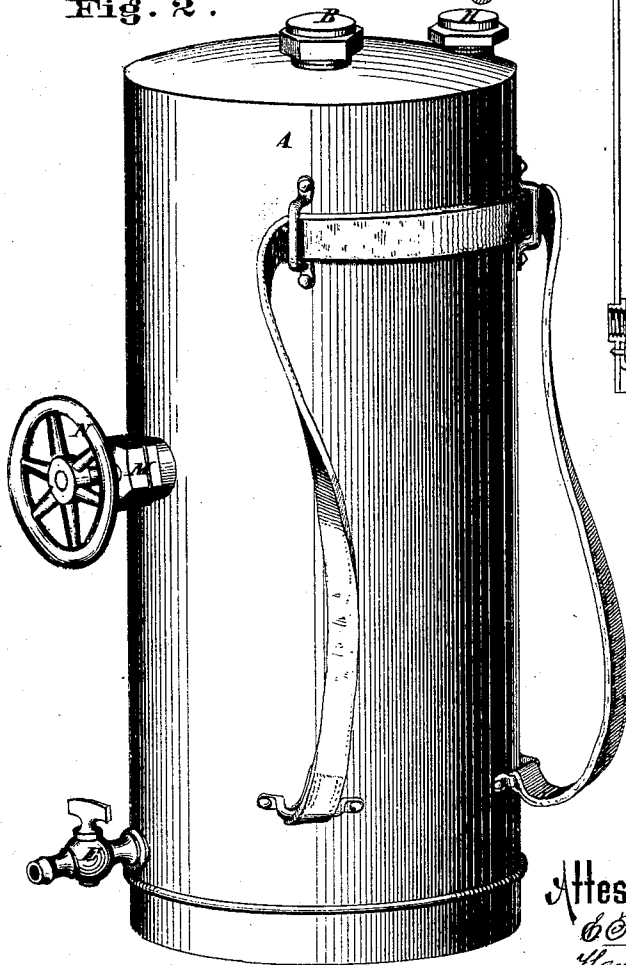


Fig. 2.



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IMPROVEMENT IN FIRE-EXTINGUISHERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM P. VAN DEURSEN, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Fire-Extinguishers; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable one skilled in the art to which my invention appertains to make and use it, reference being had to the accompanying drawing making part of this specification.

Nature and Objects of Invention.

My invention relates to apparatus for generating carbonic-acid gas or other gas within a fire-extinguisher; and

It consists—

First, in the provision within the gas-generating chamber of an acid-chamber, of such peculiar form and connection that, while it is adapted to be filled from the exterior of the tank at the top, as the customary and most convenient place, is opened by devices inserted and operated in and through the side of the tank, the object being to locate the devices for filling and discharging the acid at certain points with relation to each other, which will permit of a simple device being used to discharge the acid without damage to the chamber.

Second, in a certain construction of acid-chamber, which, while being always accessible by the means provided for filling in and discharging the acid, is, when closed, totally lined with lead, the object being an acid-chamber, which can be opened at either end and non-corrosive in all its parts.

Third, in a peculiarly-formed and connected sleeve for supporting and guiding the valve-stem to the acid-chamber, the end of the sleeve serving as a valve-seat, against which the back of the valve is seated, when the acid discharge is open, and thus prevents the escape of gas by way of the valve-stem, when the acid is being discharged into the tank, and gas is generated.

Fourth, in a general combination and arrangement of parts composing the entire apparatus.

Description of the Accompanying Drawing.

Figure 1 is an axial or central vertical section of an extinguisher embodying my invention.

Figure 2 is an exterior perspective view of the same.

General Description.

A is the gas-generating chamber of customary form. It is provided with cap B over the aperture C, through which the chamber is filled, and an aperture, D, at the bottom, for the insertion of the discharge-cock E.

F is the acid-chamber, which is of letter L or elbow form, as shown. This form permits of the chamber being filled at the top and opened at the lower end of the acid-chamber by devices operated through the side of the tank.

The chamber cannot be opened at the bottom by devices which are operated through the top of the tank, except by the use of complicated mechanism, liable to leakages, and the necessity of two or more holes in the top of the tank, through which the valve can be operated.

By the use of the elbow-form F, a simple device can be adopted to govern the discharge.

The upper end of the acid-chamber is expanded and riveted to tightly fit the bushing G, which is fitted with a screw-cap, H, to close the top of the chamber.

The lower end of the chamber is countersunk at the mouth, to form a valve-seat for the double-faced lead valve I.

The chamber F is composed of lead, the only cheap metal which is, for this use, non-corrosive, and the cap is fitted interiorly, with a plate or gasket of lead, J.

The valve I being of lead, it will be seen that when the chamber is closed it is totally lined with lead, and, therefore, cannot be corroded in any of its parts by the action of the sulphuric acid.

The chamber F is braced to the side of the tank A in the manner shown, to resist the pressure of the valve I in closing.

The stem K of the valve is guided and supported by the sleeve L, which is secured in the side of the tank substantially in the manner shown, and fitted with a stuffing-box, M, for packing the valve-stem.

The stem is screw-threaded to fit the female screw in the sleeve L, and is operated by the hand-wheel N.

The interior end of the sleeve L is countersunk in the manner shown, to form a seat for the back face of the valve I, and thus enable the valve I, when open, to close up the sleeve, through which it passes, in order to effectually prevent leakage of gas by way of the valve-stem.

The stuffing-box M, I do not consider reliable to prevent leakages entirely when the pressure is in the chamber A, and it is provided merely to close up as much as possible this avenue of escape, when the lower end of the acid-chamber is closed by the valve, for the purpose of refilling.

The cock E can be furnished with suitable hose, for discharging the contents where desired, and straps, O, can be attached to the tank, to enable a person to conveniently carry it on his back.

Operation.

The operation of my apparatus is similar to others

which combine an acid-chamber within a gas-generator, except those in which the acid-chamber is destroyed when discharged, and is as follows:

Water and bicarbonate of soda (in solution or not, as may be convenient,) is put into the tank A through opening C, and sulphuric acid is placed in the chamber F. When it is necessary or desirable to use the contents of the tank upon a fire, the valve I is opened, and the acid discharged into the chamber A. The acid and alkali are commingled, and by chemical action of one upon the other, carbonic acid gas is generated with a rapidity depending somewhat upon the amount of soda the liquid has dissolved, and the time it takes the acid to reach the bottom of the tank, where the undissolved portions of the soda are always deposited.

Water will absorb under ordinary circumstances of pressure and temperature its own volume of carbonic-acid gas, and, under increased pressure, as much more in proportion to the number of atmospheres of pressure—one volume to each additional atmosphere of pressure, or thereabout; therefore, as fast as the gas generated creates a pressure, it is absorbed to the above extent by the water, and when, in the course of a few moments, it is desired to throw the contents (water and absorbed gases) upon the fire, the pressure is sufficient to throw from forty to sixty-feet. The accumulated or dissolved gas held in the water and escaping with it is of material advantage in putting out the fire.

By my device (which differs from nearly all others in this respect) the acid can be delivered to the alkali in determinate quantities, so as to have as little or much pressure as may be desired, or to charge the tank with some pressure, and then to fill up the acid-chamber, so that the full pressure can be generated again at any time necessary.

The condition of the tank and acid-chamber can be tested at any time by the removal of the caps B H, and if any doubt still exists, open the valve I sufficiently to allow a drop of acid to fall into the soda liquid, and the result (harmless, whether the cap B be on or off,) will be satisfactory.

The advantages of my invention over all others in use, in addition to what has been already specified are as follows:

The lead-acid receptacle being a common lead-pipe,

does not require special manufacture, and the simplicity of its parts renders it easy of construction and repair, and less liable to get out of order than any other in use. The sleeve L being detachable, as shown, from the tank A, the valve can be taken out, examined, and repaired, when necessary.

I do not desire to confine myself to any specific form of valve and valve-faces, as flat or other form may be used in place of the countersunk form.

The sleeve L may be made of such length as to permit of two valves being used on the stem K, if preferred, to the double-faced valve, as shown.

The apparatus is designed especially for a fire-extinguisher, but may be used as a generator of gases for other uses. The discharge-opening of the acid chamber being in the center of the tank horizontally, and about the center vertically, the acid reaches the bottom of the tank in much less time than when put in from near the top, and the gas is generated in larger quantity in less time than by any other device.

Claims.

1. In the described connection with the gas-generating chamber A, the acid-chamber F, substantially of the form described, when constructed to be opened at the upper end from the outside and top of the chamber A, and at the lower or discharging-end from the side of the chamber, as described, and for the purpose specified.

2. The acid-chamber F, when constructed of lead and fitted with lead-lined cap H J, and lead-discharging valve I, as described, and for the purpose specified.

3. In the described combination with the acid-chamber F and valve I K, the sleeve L, as and for the purpose described.

4. The chamber A B C D E, acid-chamber F H, valve I K, and sleeve L, combined and arranged substantially in the manner and for the purpose specified.

In testimony of which invention I hereunto set my hand.

WILLIAM P. VAN DEURSEN.

Witnesses:

FRANK MILLWARD,
CHARLES E. CALLAHAN.