(No Model.)

W. C. STOCK & H. W. TUFTS.

CHEMICALLY CHARGED NOZZLE FOR FIRE EXTINGUISHERS.

No. 577,121. Patented Feb. 16, 1897.

Fig. 1.

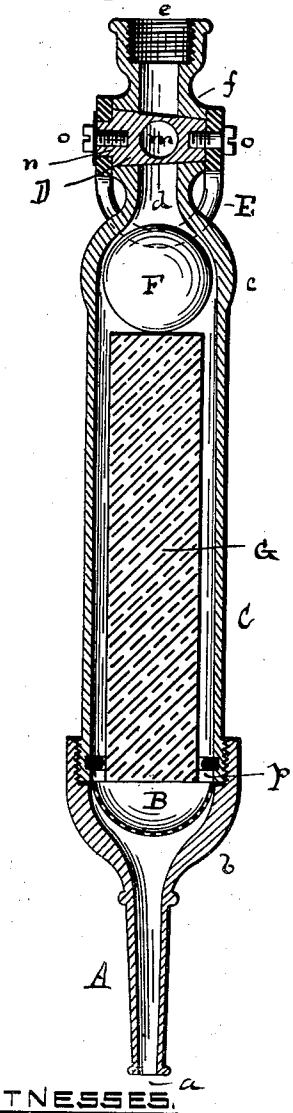


Fig. 2.

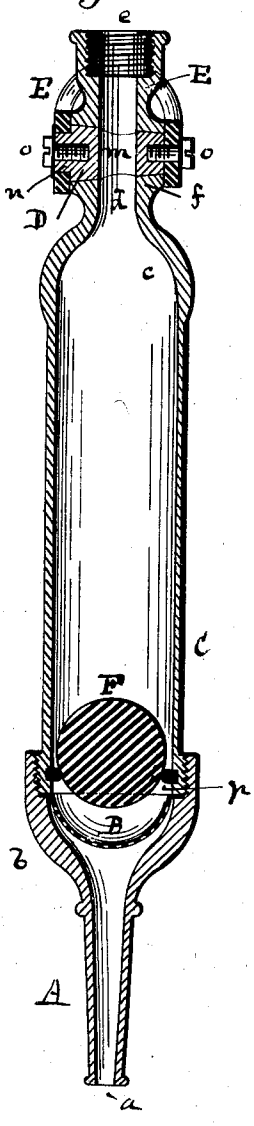


Fig. 3.

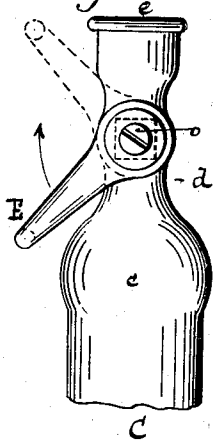


Fig. 5.

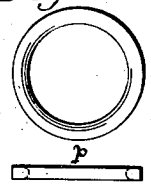
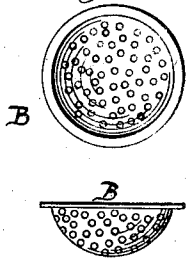


Fig. 4.



WITNESSES.

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CHEMICALLY-CHARGED NOZZLE FOR FIRE-EXTINGUISHERS.

SPECIFICATION forming part of Letters Patent No. 577,121, dated February 16, 1897.

Application filed October 19, 1895. Serial No. 566,254. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM C. STOCK and HARRY W. TUFTS, of North Attleborough, in the county of Bristol, in the State of Massachusetts, have invented a certain new and useful Improvement in Chemically-Charged Nozzles for Fire-Extinguishers; and we declare the following to be a specification thereof, reference being had to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a longitudinal section of our invention with the chemical cartridge in position in the chamber and with the ball-valve therein shown in side elevation. Fig. 2 is a longitudinal section of the same after the chemical cartridge has been wholly used up and the ball-valve has been forced into its forward position to stop the flow of water. Fig. 3 is a top plan of the valve which admits the water from the hose to the nozzle or shuts off the water when desired. Fig. 4 shows in front and side elevation the strainer at the forward end of the chamber. Fig. 5 shows a front and side elevation of the washer which forms a seat for the ball-valve in its forward position.

Our invention consists of the combination of a nozzle in two parts, one being a discharge-pipe enlarged circumferentially at its inner end and the other being a tubular chamber or pipe having a straight end fitted by a screw-thread to the enlarged end of the discharge-pipe and its opposite end hemispherically enlarged and provided with a straight water-passage of smaller diameter than the bore of said tubular chamber, a water cock or valve to admit or shut off the water, a ball or valve of a diameter less than the diameter of said bore and adapted to move in said chamber from end to end, and a cartridge made of suitable chemical substances, formed in a cylindrical shape and adapted to be loosely inserted in said chamber, as hereinafter particularly specified.

In the drawings, A represents the discharge-pipe of a nozzle having the small tapering bore *a*, as usual, and provided with a hemispherical enlargement *b*.

B is a hemispherical strainer, of wire or perforated metal, fastened within the enlarged end *b* of the discharge-pipe A.

C is a tubular chamber or pipe having a straight end, which is fitted into the enlarged end *b* of the discharge-pipe A by a screw-thread, as shown in Figs. 1 and 2. Said tubular chamber C has a hemispherical enlargement *c* at its opposite end, and from the center thereof is a tube or pipe *d*, integral therewith, whose bore opens into said tubular chamber C. At the end of the tube or pipe *d* it is provided with a screw-threaded coupling *e*, by which it can be coupled to a hose.

The pipe *d* is circumferentially enlarged to form a boss *f*, which has a diametrical tapering aperture to receive the tapering valve or cock D. This valve D has a water way or opening *m* of a diameter equal to the diameter of the bore of the pipe *d*. The valve D is provided with a square shoulder *n*. A loop or handle E has at one end a square opening to fit upon the square end of the valve D, as shown in dotted lines in Fig. 3, and screws *o o*, passing through the ends of the looped handle E, fasten it to the valve D, as shown in Figs. 1 and 2.

A ball or valve F, of a diameter less than that of the bore of the tubular chamber C, is inserted loosely in said bore and is movable therein from end to end by the force of the water-pressure. When in the position seen in Fig. 1, said ball F has its seat in the hemispherical enlarged end *c* of the tubular chamber C.

A cylindrical cartridge G, made of a suitable composition of chemical substances and formed with a diameter less than that of the bore of the chamber C, is inserted in said chamber, as shown in Fig. 1. At the rear or inner end of said cartridge G the ball F lies in contact therewith, being kept in such contact by the force of the water-pressure. At or near the forward or outer end of the chamber C it has an internal circumferential groove, within which is fitted a rubber washer *p*.

The cartridge G is made of a combination of alkaline and acid substances adapted, when exposed to the action of water, to generate carbonic-acid gas, and it is of such consistency as to be readily soluble in water.

The action of said device is as follows: When the cartridge G has been inserted in the chamber C and the ball F is forced home into its seat in the enlargement *c* of said chamber, the discharge-pipe A is screwed on the end of said tubular chamber C, as shown in Fig. 1, the valve D in the meantime being closed, as seen in said Fig. 1, so that no water can flow into or through the nozzle. In this condition the nozzle can be kept charged for as long a time as necessary until the emergency arises which requires its use.

When it is desired to use the device for extinguishing a fire, the valve D is turned ninety degrees by the handle or loop E to the position shown in Fig. 2, where it is seen that the water way or opening *m* of the valve D is now continuous with the bore of the pipe or tube *d*. The water now flows from the hose with the full pressure of the engine or reservoir and passing around the ball F comes into contact with the chemical cartridge G and gradually dissolves said cartridge, thus forming carbonic-acid gas, with which the water in the chamber at once becomes heavily charged. The so-charged water passing through the strainer E (which serves to retain any large pieces or particles of the chemical cartridge which may be dissolved off) passes out through the bore *a* of the discharge-pipe A and instantly on touching the burning material smothers the flame by the carbonic-acid gas thus discharged with the jet of water from the nozzle.

As the cartridge G melts away and shortens the ball F is pressed forward by the flowing water until said cartridge has been wholly dissolved. The ball F is then in the position seen in Fig. 2 and being forced into the opening of the elastic washer *p* forms therewith a valve entirely shutting off the current of water, so that no more water can enter the discharge-pipe A. The hoseman is thus notified that the chemical cartridge has been exhausted, and he then takes off the discharge-pipe A and inserts another cartridge in the chamber C, first having turned the valve D to the position shown in Fig. 1, the nozzle being thus charged again, as before, the discharge-pipe A being screwed on again, and the valve D once more opened to allow the flow of the water.

A chemical cartridge usually lasts for five minutes and should be made to easily dissolve in that time. If made hard, it will last longer, being less soluble, but the water will be less charged with carbonic-acid gas.

We claim as a novel and useful invention and desire to secure by Letters Patent—

1. The combination of a nozzle adapted to be connected with a hose, a soluble chemical cartridge loosely fitting within the nozzle and a valve within the nozzle movable by the pressure of the water-current therein and adapted to close the discharging end of the nozzle when the said cartridge is dissolved.

2. The combination of a nozzle, adapted to be connected with a hose, a soluble chemical cartridge loosely fitting within the nozzle and a ball also fitting loosely within the nozzle and movable by the pressure of the water-current to follow said cartridge until the same is dissolved and adapted then to close the discharging end of the nozzle substantially as set forth.

3. The combination of a nozzle, adapted to be connected with a hose, a soluble chemical cartridge, loosely fitting in the nozzle, a ball also loosely fitting in the nozzle and adapted to lie in contact with said cartridge by the pressure of the water-current from said hose and a strainer in said nozzle near the end thereof, substantially as specified.

4. The combination of a nozzle, adapted to be connected with a hose, a soluble chemical cartridge loosely fitting in the nozzle, a ball also loosely fitting in the nozzle and adapted to keep in contact with the cartridge by the force of the water-current from the hose, a strainer near the outer end of the nozzle, and a washer having a central perforation of less diameter than that of the ball, substantially as described.

5. The combination of the discharge-pipe A, having the bore *a* and enlarged end *b* and provided with the strainer B, the tubular chamber C, having the enlarged end *c* and the pipe *d*, opening therein, which is adapted to be connected with a hose, a valve D in the pipe *d*, the ball F within the chamber C of a less diameter than that of the bore of said chamber, the soluble chemical cartridge, composed of ingredients, which, when wet with water, generate carbonic-acid gas, and made in a cylindrical shape so as to loosely fit in said chamber, and the washer *p* held in the circumferential groove within the chamber and provided with a central perforation having a diameter larger than that of said cartridge but less than that of said ball, substantially as shown and for the purpose specified.

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HARRY W. TUFTS.

Witnesses:
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DANIEL W. FINK.