W. C. BRUSON.

Chemical Fire-Extinguishers.

No. 148,173. Patented March 3, 1874.

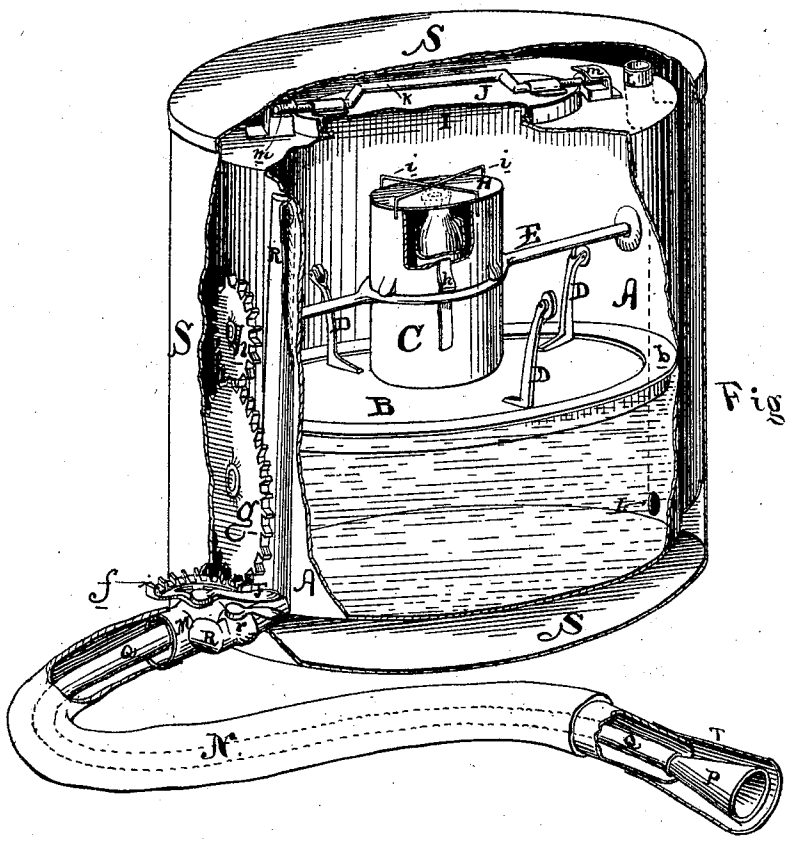
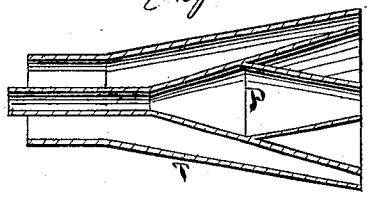


Fig. 1

Fig. 2



Attest.

J. S. Brown,

A. L. Brown.

Inventor.

Willard C. Bruson

By his atty

W. C. Smith.

UNITED STATES PATENT OFFICE.

WILLARD C. BRUSON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN CHEMICAL FIRE-EXTINGUISHERS.

Specification forming part of Letters Patent No. **148,173**, dated March 3, 1874; application filed August 4, 1873.

To all whom it may concern:

Be it known that I, WILLARD C. BRUSON, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Fire-Extinguishers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional perspective view of my invention. Fig. 2 is a longitudinal section of the jet-nozzle.

My invention relates to that class of fire-extinguishers wherein the union of an acid with an alkali is employed to produce gas-pressure for the expulsion of water, or the gas itself, with force sufficient to project it to a considerable distance; and it consists, first, in an arrangement of devices whereby the charger which contains the acid and alkaline solutions may be inverted to discharge its contents without inverting the whole apparatus; second, in an internal construction of the tank whereby the water to be expelled is kept separated from the acid and alkaline solutions; third, in constructing the apparatus so that the water and gas may be ejected either singly or together; fourth, in an arrangement of devices whereby a single movement of the hand suffices to invert the charger and open the escape-cocks; fifth, in the jet-nozzle.

That others may fully understand the construction and operation of my invention, I will particularly describe it.

A is the tank, in the bottom portion of which is placed the water which is to be expelled when the apparatus is used. The quantity of this water contained in tank A will vary with the capacity and design of the apparatus. In those denominated hand apparatus, and designed to be carried upon the back of the user, about four gallons will be a proper quantity, and the tank A will then have a capacity of about eight gallons. A floating piston or diaphragm, B, separates the tank into two compartments, the lower one being occupied by the water, and the upper one by the charger C, and the gas when generated. The piston B may be made of wood or other proper material, and its edge may be packed with a washer of leather, *b*, or in some other proper manner. Guides D D may be set upon the piston B to steady its movements, and prevent its displacement from proper position. The charger C is secured to a shaft, E, which has its bearings in opposite sides of the case or tank A, so that if said shaft is rotated the charger C will be inverted, and the contents thereof will be permitted to escape. To effect this rotation of said axis at the proper time, I extend one end of said shaft through the wall of said tank, and connect it with some suitable device, whereby the operator may rotate said shaft by the movement of the water-cock lever F, and, therefore, employ therewith the segment *f* and gears *g h*, or some equivalent mechanism to transmit the motion of said cock-lever to said shaft. By this means the accidental bursting of the tank A is rendered impossible, because of the opening of the escape-cock at the time of inverting the charger, and not after gas has begun to be generated. The charger C is composed of an inner and an outer chamber. The inner chamber receives a glass bottle in which the charge of acid is placed, and the outer chamber may contain the alkaline powder or solution; or, if a compound gas is to be generated, one portion of the charge may be placed in the outer chamber, while the remaining portion (preferably the alkaline) may be placed in solution on top of the piston B. One or two gallons of water should, in any event, be placed above said piston, to dilute the acid and alkaline substance, and thereby regulate and control the rapidity of the gaseous evolution. The charger C, and the inclosed glass bottle, are closed at top by the cover H, which is retained in place by the cage *i*, so that when said charger is inverted the contents may escape without the displacement of said cover. As shown in the drawing, I prefer to form said shaft E with a yoke at its center, within which the charger C is fitted and retained by a friction-spring, *k*, or some other suitable latching device, so that when requiring to be replenished the charger C, may be readily removed from said yoke. Such removal may be effected through an opening in the top of the tank A, as at I, said opening being closed by a cover, J, fitted air-tight by a flange with air-tight washer interposed between it and the bottom edge

of the cover. A crank-rod, K, is placed in bearings secured to said cover, and the ends of said rod project beyond the edge thereof, and engage under the lugs *m* secured to the top of the tank A, which may be made oblique, or, as I prefer, with small eccentrics placed upon the ends of the crank-rod, so that as said crank-rod is rotated to depress the crank said eccentrics will engage beneath said lugs, and produce the required pressure to close the said cover. A pipe, L, extending from the top of the tank, and opening into the lower chamber of the same, serves to admit the necessary charge of water below the piston. Said pipe must be provided with a valve or cock, to prevent the escape of said water when under pressure. The water-escape pipe M enters the tank A, near its bottom, and is provided with a cock, of which F represents the lever. Said escape-pipe is prolonged by a flexible hose, N, terminated by a suitable jet-nozzle, whereby the escaping jet of water may be directed toward any required point. The nozzle T, which I have found most advantageous, is shown in Fig. 2. It is constructed with an annular orifice, and is conical in form, with the base outward. From this nozzle the water is projected in the form of a hollow expanding cone, and the effect thereof upon a burning surface is twofold: First, the jet encircles and covers immediately a large area; and, second, the space within said cone, being inclosed by a film of water, will be quickly exhausted of its oxygen, and the flame so inclosed will be smothered, even if not quenched by the direct action of the water. When employed with the apparatus herein described, I prefer to make the said nozzle double by connecting the interior cone P with the gas-pipe Q, which is coupled to the gas-escape R, so that the interior space of said conical water-jet will be filled with gas devoid of oxygen, and in presence of which combustion cannot exist. The pipe R enters the top of the tank A and the water-pipe M outside of the cock, and is provided with a cock, *r*, the lever of which is located directly beneath the lever F, so that both may be operated by the hand at the same instant and by the same movement; or either cock may be opened singly, as may on the occasion be required. The tank A and the gearing or other moving parts may be inclosed within a protecting case or jacket, S, with a removable cover, and the space between said tank and jacket may be packed with some suitable non-conducting material. By removing the pipe Q, then the gas and water will become mingled in the hose N, and will escape together at the nozzle.

Having described my invention, what I claim as new is—

1. In combination with the tank A, charger C, and shaft E, the water-cock lever F, connected with said shaft so as to move simultaneously therewith, substantially as set forth.

2. In combination with the tank A, charger C, and shaft E, the cock-lever F and the gears *f g h*, substantially as set forth.

3. The charger C, constructed with an inner and an outer chamber, for the purpose set forth, and closed by the cover H, which is secured in place by the cage *i*, as set forth.

4. In combination with the tank A of a fire-extinguisher, a diaphragm or piston to divide said tank into two compartments, and separate the water to be expelled from the pressure-gas.

5. In combination with the tank A of a fire-extinguisher, the floating piston or diaphragm B, substantially as described.

6. In combination with the tank A of a fire-extinguisher and the floating piston B, the guides D, substantially as described.

7. In combination with the tank A of a fire-extinguisher, the cover J, and the lugs *m* with the crank-rod K, provided with eccentrics upon its ends, as and for the purpose set forth.

8. In combination with the tank A of a fire-extinguisher and the water-pipe M, the gas-pipe R, arranged to discharge at the center of said water-pipe, as and for the purpose set forth.

9. In combination with the tank A of a fire-extinguisher and the water and gas pipes M R, the cock-levers thereof arranged relatively the one above the other, so that both may be operated by a single movement, as set forth.

10. In combination with the separate pipes N Q, the expanding conical annular nozzle T, provided with the concentric conical nozzle P, substantially for the purpose set forth.

WILLARD C. BRUSON.

Witnesses:
R. D. O. SMITH,
WILSON JONES.