(No Model.)

E. ROBINSON.

FIRE EXTINGUISHER.

No. 555,022. Patented Feb. 18, 1896.

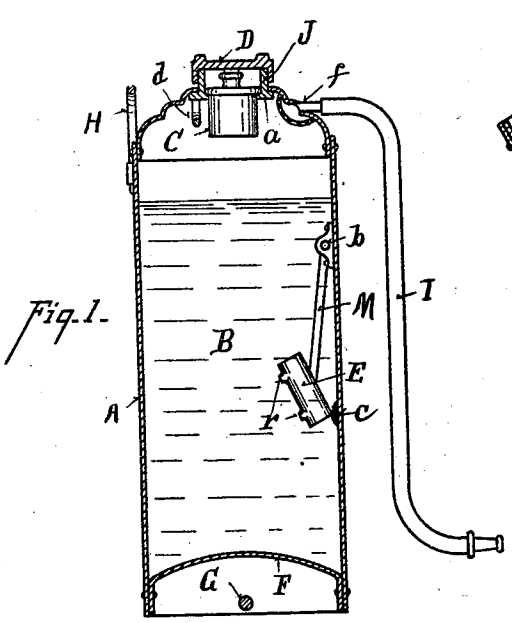

Fig. 1.

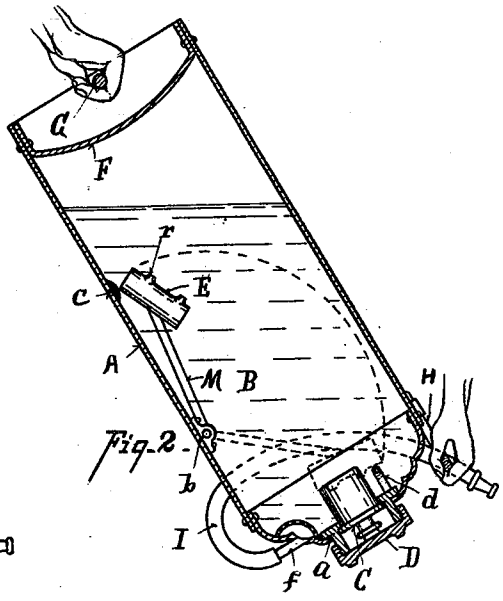

Fig. 2.

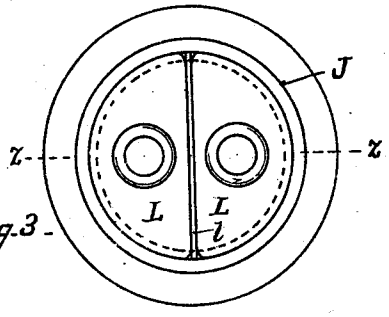

Fig. 3.

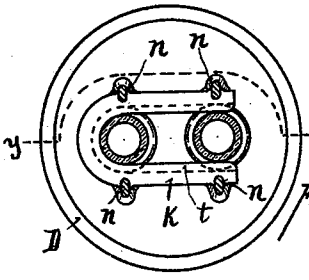

Fig. 5.

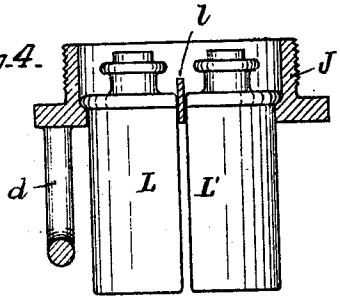

Fig. 4.

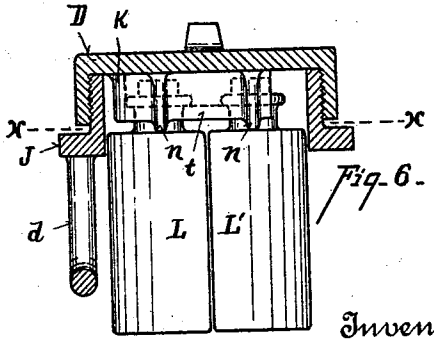

Fig. 6.

Witnesses
C. W. Miles.
Oliver B. Kaiser.

Inventor
Edgar Robinson
By Wood & Boyd
Attorneys

UNITED STATES PATENT OFFICE.

EDGAR ROBINSON, OF CINCINNATI, OHIO, ASSIGNOR OF TWO-THIRDS TO ANSON C. BROWN, OF SAME PLACE, AND LEWIS M. BERRY, OF NEWPORT, KENTUCKY.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 555,022, dated February 18, 1896.

Application filed March 14, 1895. Serial No. 541,775. (No model.)

To all whom it may concern:

Be it known that I, EDGAR ROBINSON, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a specification.

My invention relates to an improvement in fire-extinguishers.

One of the objects of my invention is to provide improved means for rigidly supporting in the mouth of a tank of a fire-extinguisher one or more acid-containing bottles.

Another object of my invention is to provide for the use of two acids, one of a heavier specific gravity than the other, contained in bottles rigidly supported in the mouth of the tank.

Another object of my invention is to provide means for more effectually breaking the bottles suspended in the tank.

The features of my invention will be more fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a central vertical section of my improvement. Fig. 2 is a similar view showing the tank partly inverted. Fig. 3 is a top plan view of the yoke, showing the bottles supported therein. Fig. 4 is a cross-section on line *z z*, Fig. 3, showing the bottles suspended. Fig. 5 is a cross-section on line *x x*, Fig. 6, showing a modified form of suspending the bottles. Fig. 6 is a cross-section on line *y y*, Fig. 5, showing the bottles suspended.

A represents the tank, made of any suitable material and preferably of the form shown in the drawings.

B represents the liquid in said tank.

C represents a bottle supported in the mouth *a* of said tank.

D represents a cap, screw-threaded to fit tightly over the mouth of said tank.

E represents a hammer hinged at a point *b* on the inside of the tank and resting against a cushion *c*.

r represents lugs or projections on the face of said hammer.

M represents the shank of the hammer. The hammer is hinged in such a way as to be only capable of a downward movement when the tank is inverted.

d represents a stop provided to arrest the movement of the hammer after the bottle is broken.

F represents the bottom of the tank, which is made of convex form to allow the handle G to be inserted.

H represents a handle in the top and side of the tank.

I represents a rubber hose attached to the outlet-orifice *f* of the tank.

J represents a yoke adapted to receive the flanged neck of the bottle C and, in connection with the cap D, to hold the bottle rigidly suspended in the mouth of said tank.

K represents a metal yoke attached to the under side of the cap D adapted to embrace and support the flanged necks of the bottles L L′, whereby said bottles are rigidly suspended in the mouth of said tank. Said yoke is provided with a rim *t* having lugs *n* projecting therefrom. It will readily be seen that when the tank is inverted the shoulders of the bottles will rest against the lugs *n* provided on the rim *t* of said yoke, forming a metal bearing which insures the breaking of the bottles by the blow of the hammer, either at the bottom of the bottles or at the shoulders thereof.

In fire-extinguishers of this class heretofore used the force of the blow of the hammer is frequently not sufficient to break the bottles. To obviate this difficulty, the shank of my hammer is made a little less in length than the diameter of the tank. The hammer itself is made very heavy, and its face is provided with lugs, so that when the tank is inverted the effect of the sweep of the long shank is to augment the force of the blow, and the lugs on the face of the hammer striking against the bottom of the bottles insure their breaking. The tank is filled up to a point below the orifice *f* with a solution of common salt and bicarbonate of soda.

Other well-known salts capable of evolving carbonic acid when acted upon by acids may be used in place of the soda.

It has been found in the previous use of fire-extinguishers of this class where only one

acid—say sulphuric acid—is suspended in the mouth of the tank, that when the bottle is broken the sulphuric acid being of a heavier specific gravity than the solution contained in the tank will remain at the bottom thereof and be blown out of the outlet-orifice by the pressure caused by the evolution of gas, rendering only the first-emitted portion of the fire-extinguishing liquid effective. To obviate this difficulty I preferably use two bottles L L′, one containing acetic acid or common vinegar and the other sulphuric acid. When the bottles are broken, the relative specific gravities of these two acids will assert themselves, and the acetic acid, being lighter than the solution contained in the tank, will rise to the top, and the sulphuric acid, being heavier, will remain nearer the bottom of the tank. The result is a uniform evolution of gas throughout the entire volume of the solution contained in the tank and a consequent added pressure inside of the tank, and also the last portion of the fire-extinguishing liquid expelled from the tank is as efficient as the first, and hence there is an economy of materials.

I do not wish to limit myself to the use of the two acids named, as other acids of differing specific gravities may be used to produce the same result.

By using two acids of different specific gravity and causing them to be discharged or delivered at the same time into the contents of the tank, the heavy acid will go to the bottom and the light acid will rise to the top, so that practically all portions of the carbonate solution will be acted on simultaneously and promptly. The pressure in the tank will not only be greater, but more lasting, and the evolution of gas is rendered far more uniform, so that the last-emitted portion of the fire-extinguishing material will be as effective as the first, which is an object of the greatest importance in the operation of a chemical fire-extinguisher.

The specific means herein described for holding the bottles of acid in a metal yoke of such construction that the bottle-shoulders will be in contact with a metal bearing is a novel and important feature by reason of thus insuring the fracture of the bottles when the tank is inverted.

When it is desired to use the fire-extinguisher it is grasped by the handles G H, and the end of the hose may be held by the hand which grasps the handle H, as shown in Fig. 2. The tank is inverted, causing the hammer to fall heavily against the bottom of the bottles L L′, the movement of said hammer being arrested by the stop *d* after the bottles are broken. The acids when liberated will react upon the solution contained in the tank, causing a rapid evolution of carbonic acid, and the heat occasioned by the mixing of the sulphuric acid and the solution in the tank will cause a portion of the sulphuric acid to react upon the solution of sodium chloride, generating chlorine gas. These gases, as is well known, will not support combustion and are extensively employed as fire-extinguishers.

The simultaneous evolution of gas in all parts of the tank will afford sufficient pressure to throw the fire-extinguishing liquid, permeated with and rapidly evolving these gases, with considerable force out of the orifice *f* and through the hose I, so that the tank can be held in the hand and the liquid thrown upon the burning object at a distance and in a manner calculated to produce the best results.

A modification of my improvement is shown in Figs. 3 and 4, where two bottles, semicircular in form, are employed. In this form of construction the flanges on the curved surfaces of the necks of the bottles L L′ are embraced and supported by the yoke J, the flat surfaces resting against the cross-piece *l*, so that when the cap is attached the bottles are secured rigidly in the mouth of the tank.

In Figs. 1 and 2 only one bottle is shown, and it is held firmly in the mouth of the tank by the coaction of the yoke J and cap D.

I claim—

1. In a tank for a fire-extinguisher, the combination with one or more acid-containing bottles provided with flanged necks, of a metallic yoke K, adapted to receive and support the flanged necks of one or more bottles, said yoke having a rim *t* provided with downwardly-projecting lugs *n* forming a bearing against the shoulders of the suspended bottles, substantially as specified.

2. In a tank for a fire-extinguisher, the bottles L L′ provided with flanged necks, and the cap D provided with the yoke K, embracing and supporting the flanged necks of the bottles L, L′, containing acids of different specific gravities, in combination with the hinged hammer E, substantially as specified.

3. In a tank for a fire-extinguisher, two acid-containing bottles rigidly secured in the mouth of said tank, the acid in one of the bottles being of a lighter specific gravity than that in the other, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand.

EDGAR ROBINSON.

Witnesses:
W. R. WOOD,
C. W. MILES.