

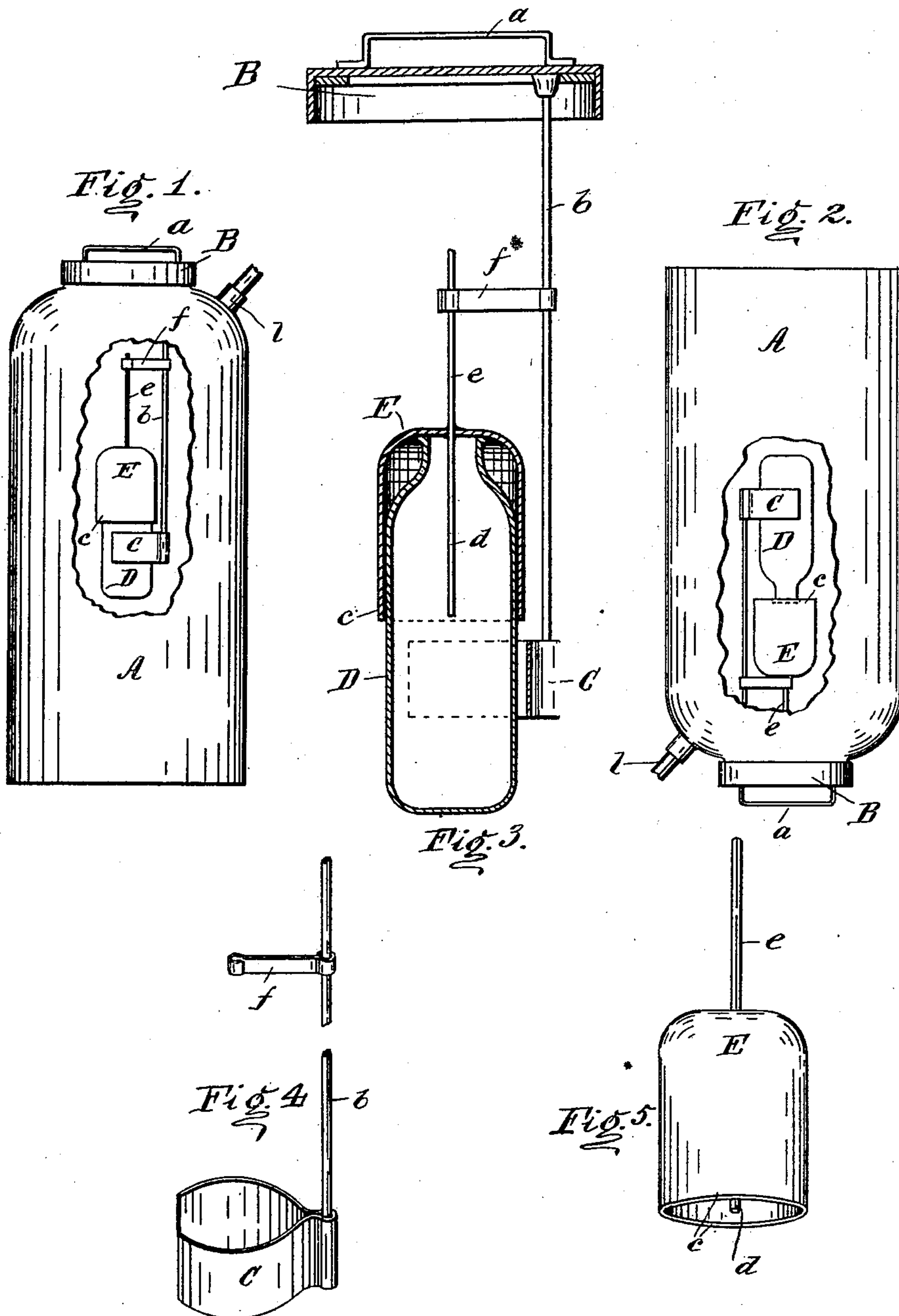
No. 700,696.

Patented May 20, 1902.

R. M. MARTIN.
FIRE EXTINGUISHER.

(Application filed June 2, 1900.)

(No Model.)



Witnesses.

Clarence E. Mehlhop.
W. S. Kyle.

Inventor.

Robert M. Martin
by Alfred M. Allen
Attorney.

UNITED STATES PATENT OFFICE.

ROBERT M. MARTIN, OF DAYTON, KENTUCKY, ASSIGNOR TO THE AMERICAN
CHEMICAL FIRE EXTINGUISHER COMPANY, OF CINCINNATI, OHIO, A
CORPORATION OF OHIO.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 700,696, dated May 20, 1902.

Application filed June 2, 1900. Serial No. 18,836. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. MARTIN, a citizen of the United States, residing at Dayton, in the county of Campbell, State of Kentucky, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvements relate to that class of chemical fire-extinguishers in which a closed receptacle containing some acid is inclosed in a second receptacle containing some alkali solution, the two liquids to be kept separate until the extinguisher is to be brought into use, when means are provided for distributing and mixing the acid with the alkali solution.

The principal object of my invention is to provide a simple, cheap, and effective method of sealing up the acid-receptacle, so that it can be submerged in the alkali solution without possibility of mixing therewith under normal conditions, but so arranged that the seal may be removed and the contents of the acid-receptacle without damage thereto evenly and slowly discharged when required. It has been customary to provide a glass bottle as the container for the acid and to seal the mouth of the bottle in various ways. Two methods of sealing the acid-bottle have been usually adopted—either to provide a loose stopper for the bottle, which will drop out when the extinguisher is inverted, or to seal the bottle tightly and by some suitable means either to break the bottle to discharge the contents or to draw out or to push in the cork or stopper at the proper time. When the first method is adopted with loose stopper, the mouth of the acid-receptacle cannot be submerged in the alkali solution for fear of premature mixing of the two solutions, so that with this class of devices when the acid is discharged the mixing takes place at the upper end of the main receptacle near the discharge-nozzle, and as a result the gas formed, and frequently some of the acid, is ejected through the nozzle, thus weakening the pressure and destroying the efficacy of the apparatus. With the

second method of tightly-sealed bottle, while the bottle can be submerged in the alkali liquid it frequently happens, where reliance is placed in drawing out the stopper or breaking the bottle, that the apparatus provided for the purpose fails to work for one reason or another. Chemical extinguishers being operated at very infrequent intervals, unless the acid-bottle will open automatically, the operative mechanism is liable to get out of order and fail to operate when wanted. Then where the bottle is broken or the acid emptied at once into the alkali solution the gas is formed almost with the force of an explosion. The resulting pressure is entirely too high and the pressure diminishes too rapidly, so that the discharge is not at all uniform. The gas-pressure for the proper discharge of the liquid through the nozzle should be maintained with uniformity, and the pressure should be behind the liquid and not in the neighborhood of the outlet. It is the purpose of my invention to remedy these defects in the manner hereinafter particularly pointed out and claimed, whereby the discharge of the acid may take place slowly and at the middle of the alkali solution and in which the seal shall simply drop away from the mouth of the vessel when the extinguisher is inverted, and although the acid vessel is submerged in the alkali liquid no premature mixing can take place.

In the drawings, Figure 1 is a side view of the extinguisher broken away to show the position of the acid-receptacle. Fig. 2 is a similar view with the extinguisher inverted to discharge the acid. Fig. 3 is a vertical section of the acid-receptacle and the holder therefor. Fig. 4 is a perspective view of the holder. Fig. 5 is a perspective view of the bottle-stopper.

A is the cylindrical casing of the fire-extinguisher, made in the usual shape for containing the alkali solution and provided with the usual screw-threaded cap B to close the extinguisher, the contents being discharged through a tube *l* in the usual way.

a is a handle secured to the cap B for convenience in carrying the extinguisher.

Secured to the inner face of the cap B is a rod *b* of sufficient length to extend about to the center of the retort and provided at the lower end with a spring-clip C to embrace and hold securely in position a bottle D of convenient size for holding the acid solution and preferably made of glass. E is the stopper for this bottle, provided with a broad flange *c* to come down over and embracing loosely the sides of the bottle, making the stopper bell-shaped when a cylindrical acid vessel is employed. This stopper or cap is preferably made of lead or other metal which will not be attacked by the acid or alkali solution and which will give it sufficient weight for the purpose. The stopper is provided with a guide-stem *d*, entering the mouth of the bottle, and with an external stem *e*, which passes up loosely through an eye on a guide-arm *f*, mounted on the rod *b*.

When the main reservoir is filled with the alkali solution, a sufficient quantity of acid is placed in the bottle D, the stopper E is placed over the mouth of the bottle, with the guide-stem *d* inside the mouth, while the external stem passes up loosely through the eye on the arm *f*, secured to the rod *b*. The cap B is then secured in place, which submerges the acid-bottle to a point about at the center of the main reservoir. The stopper E, with its bell-shaped mouth extending downward, the air-pressure within the mouth of the stopper effectually prevents the entrance of any liquid so long as the extinguisher is kept in an upright position or even at any incline not sufficient to allow the escape of air-bubbles from under the stopper-mouth. To discharge the contents of the acid-bottle, all that it is necessary to do, however, is to invert the extinguisher, as shown in Fig. 2, when the stopper at once drops away from the mouth of the bottle, where it is held by the arm *f* and guide-rods, allowing a discharge of its contents into the cup of the stopper, and a slow uniform mingling of the two solutions takes place generating the gas for the use of the apparatus. No matter how long the extinguisher may have been out of use this construction is always bound to work. The stopper resting loosely on the bottle-mouth, the moment the retort is inverted the discharge takes place. There is no mechanism that requires operation to effect the discharge, no instructions have to be followed to place the apparatus in operation, and with simple inversion of the extinguisher the performance is insured. The arm *f* is located at such a position that the stopper does not fall entirely away from the bottle when the extinguisher is inverted, and the flow of

the acid from the mouth of the bottle is also retarded by the guide-stem. The result is a slow discharge of the acid. There is no discharge of the acid to form almost instantaneously a large volume of gas, as would result if the stopper were not held in place, and a uniform gas-pressure is obtained, which continues until the liquid is entirely discharged from the vessel. There is no chance for unneutralized acid to be carried with bubbles of gas through the discharge-tube, because the acid is held in place by the cup of the stopper and the gas bubbles up into the inverted end of the retort, giving a constant pressure as the liquid is discharged.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a chemical fire-extinguisher, the combination, with an alkali and an acid receptacle, of a holder for the acid-receptacle to sustain same in a fixed position submerged within and below the surface of the liquid in the alkali-receptacle, a weighted diving-bell sealing device for said acid-receptacle, and means to permit said sealing device to drop away from the mouth of said receptacle when the fire-extinguisher is inverted without displacement from said acid-receptacle, substantially as shown and described.

2. In a chemical fire-extinguisher, the combination with the alkali and acid receptacles, of a holder for the acid-receptacle to sustain same in fixed position within the alkali-receptacle, and a bell-mouthed cover for the acid-receptacle provided with a rod, and an arm on the holder to guide same, whereby the cover may be prevented from displacement when the receptacles are inverted, substantially as described.

3. In a fire-extinguisher, the combination with a liquid-holding tank, of an acid-bottle and a weighted diving-bell sealing device therefor adapted to be submerged within and below the surface of the liquid in said tank, the said sealing device adapted to fall away from the acid-bottle when the tank is inverted, substantially as described.

4. In a fire-extinguisher, the combination with a liquid-holding tank, of an acid-bottle and a weighted diving-bell air-check sealing device therefor, adapted to be submerged within and below the surface of the liquid in said tank, the said sealing device adapted to fall away from the acid-bottle when the tank is inverted, substantially as described.

ROBERT M. MARTIN.

Witnesses:

W. S. KYLE,
R. P. HARGITT.