May 10, 1932. H. E. VAN NESS 1,857,797

FIRE EXTINGUISHER

Filed Feb. 8, 1929

Fig. 1.

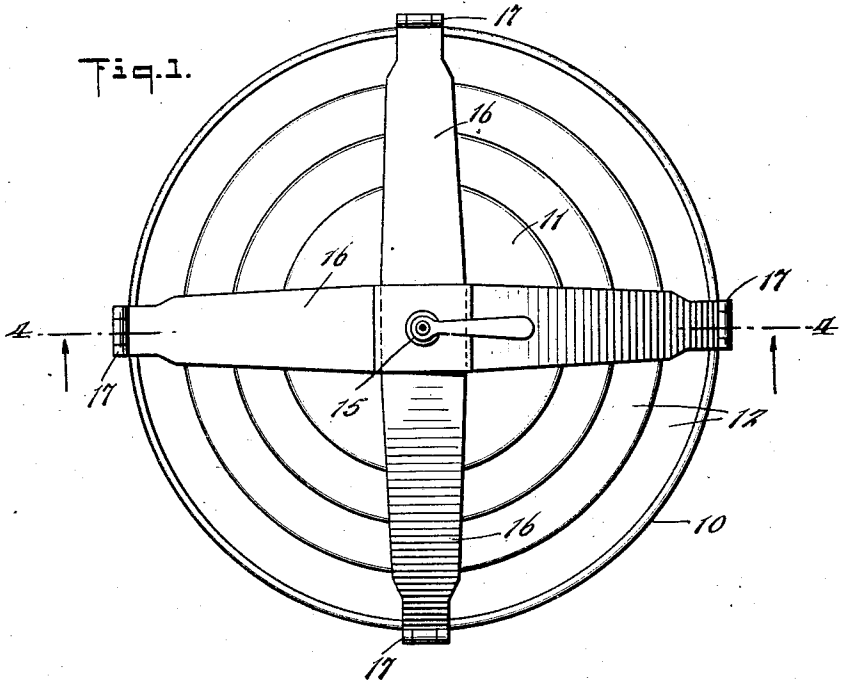


Fig. 2.

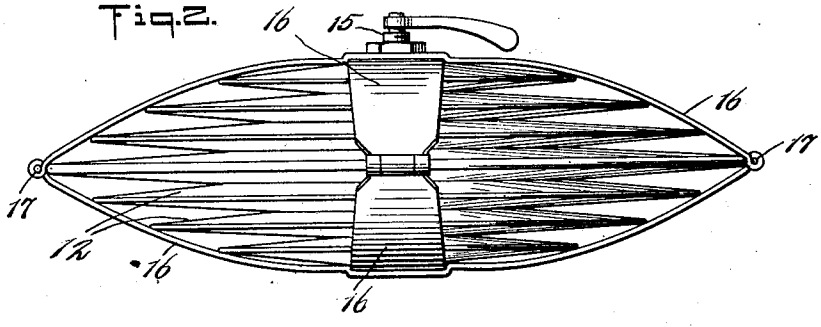


Fig. 3

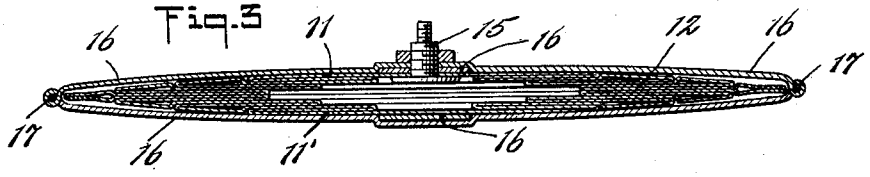
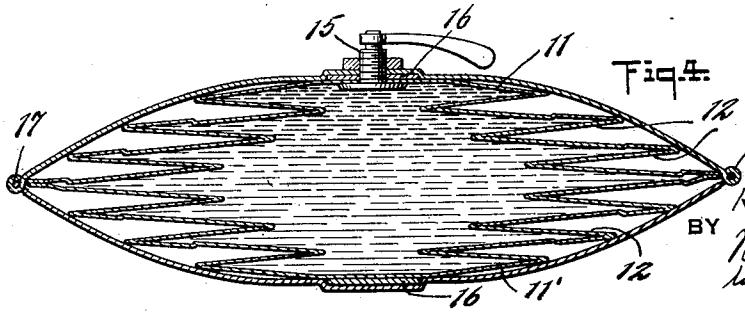


Fig. 4.



INVENTOR
Henry E Van Ness
BY
Robert W Byerly
his ATTORNEY

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UNITED STATES PATENT OFFICE

HENRY E. VAN NESS, OF ELMIRA, NEW YORK, ASSIGNOR TO ROBERT W. BYERLY, OF NEW YORK, N. Y.

FIRE EXTINGUISHER

Application filed February 8, 1929. Serial No. 338,366.

This invention relates to fire extinguishers, and has for an object to provide a simple, reliable fire extinguisher containing a fire extinguishing liquid which is maintained always under pressure so that it may be projected upon a fire by the mere opening of a valve.

The invention relates to the type of fire extinguisher shown in U. S. Patent No. 1,663,678, issued to Robert W. Byerly on March 27, 1928, in which a body of fire extinguishing liquid is confined in a closed container of sheet material formed to permit a variation in the volume of the container by a bending of the sheet material, and is retained under pressure by resilient means located outside the container. The invention provides an improved fire extinguisher of this type in which a large variation in the volume of the container may be obtained through a slight bending of the sheet material of which it is composed. This object is obtained in accordance with the invention by providing a container with folds so that it may expand and contract like bellows.

Other objects and advantages of the invention are hereinafter referred to in connection with a detailed description of a specific embodiment of the invention illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of a fire extinguisher embodying my invention;

Fig. 2 is a side view of the extinguisher; and

Figs. 3 and 4 are central sections of the extinguisher showing its empty and filled positions respectively.

The container 10 of the extinguisher illustrated is made up of two circular pieces of sheet metal 11, 11′ and a plurality of annular pieces 12 of sheet metal assembled as clearly shown in Fig. 4 to provide a metal bellows. The inner and outer peripheries of the successive pieces of sheet metal are secured together preferably by a welding so as to provide a one-piece metal bellows as shown in Figs. 3 and 4. While I regard welding as the best method of fastening the edges of successive pieces together, other methods such as crimping and soldering can be used.

While it is within the scope of my invention to make the pieces 10, 11 and 12 of shapes other than circular, I prefer to use pieces of progressively-increasing external diameter in each half of the extinguisher so that the container when filled and expanded has at least approximately the shape of an ellipsoid.

The container 10 has a valve controlled passage opening which may conveniently be provided by a valve 15 set in one of the circular pieces 11 as shown in the drawings.

In order to maintain the fire-extinguishing liquid in the container under pressure so that it is always ready to be forcibly discharged through the valve 15, external springs 16 are provided. These springs may consist of crossed pairs of leaf springs as shown, preferably having a normally inward curvature like those described in Patent No. 1,663,678 heretofore mentioned. The ends of the springs may be cut and bent to form hinges so that they may be secured together by hinge pins 17 as shown.

Such leaf springs when expanded take an approximately elliptical form. Owing to the ellipsoidal form of the container hereinbefore referred to, the container when expanded fully utilizes the space between the expanded springs and enables the springs to exert an even pressure on the container, since they come in contact not only with the end pieces 10, 11 but also with the outer peripheries of the annular pieces 12.

When empty, the extinguisher is held in the form shown in Fig. 3 by a tendency of the springs to move inwardly towards each other. It is filled with fire-extinguishing liquid such as carbon tetrachloride by introducing this liquid under pressure through the valve 15. The pressure under which the liquid is supplied is such that the liquid expands the container against the action of the springs, opening and entering the folds in the wall of the container. A large expansion of the volume of the container and a wide separation in the end pieces 10, 11 may be obtained with only a very slight bending of the metal forming these folds.

After the container has been filled, the

liquid therein is retained under pressure by the resiliency of the springs which tend to collapse the folds of the container wall. In order to use the extinguisher, it is necessary only to open the valve 15. When the valve is opened, the fire-extinguishing liquid is forcibly ejected from the container by the springs.

What I claim is:

1. A fire extinguisher, comprising a closed container having a wall formed with circular bellows-folds of progressively increasing diameter, and a bowed spring extending diametrically across said container adapted to engage an intermediate fold and tending to collapse said folds to maintain a body of fire-extinguishing liquid in the container constantly under pressure.

2. A fire extinguisher, comprising a container consisting of two circular end pieces of sheet metal and annular pieces of sheet metal of progressively-increasing diameter toward the median plane of the container secured together at their inner and outer peripheries to provide bellows-folds, and a pair of bowed springs secured together at their ends, embracing said container and adapted to engage an intermediate fold and tending to move towards each other to collapse said folds so as to maintain a body of fire-extinguishing liquid in the container constantly under pressure.

In testimony whereof I have hereunto set my hand.

HENRY E. VAN NESS.