Aug. 7, 1951 C. K. HUTHSING, JR 2,563,171

APPARATUS FOR CONTROLLING CORROSION IN FIRE EXTINGUISHERS

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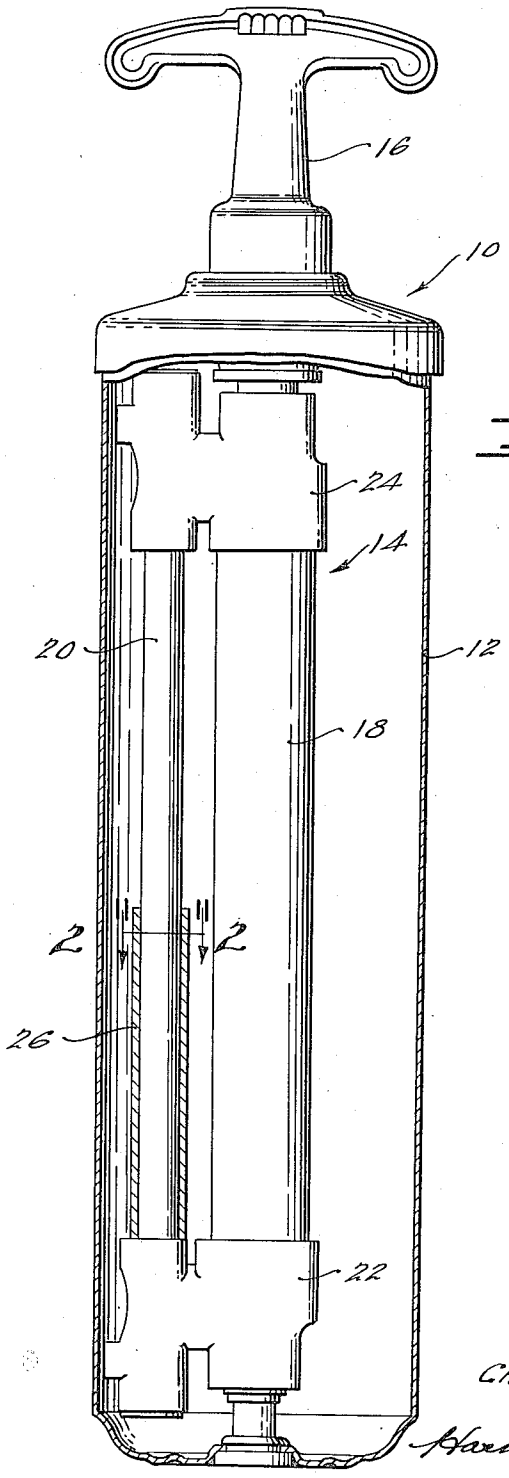


FIG. 1.

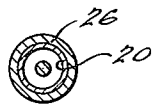


FIG. 2.

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APPARATUS FOR CONTROLLING CORROSION IN FIRE EXTINGUISHERS

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3 Claims. (Cl. 169—33)

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The present invention relates to an improved method of and apparatus for controlling corrosion in fire extinguishing apparatuses.

It is common in many types of fire extinguishers to employ fire extinguishing fluids, such for example as those having carbon tetrachloride as a principal component, which may include traces of water and/or acids. It is also common practice in the construction of such fire extinguishers to employ metals such as brass, copper and lead which will corrode in the presence of such traces of water or acid. When such extinguishers remain inactive and are not operated for considerable periods of time, as is very frequently the case in the normal life of such extinguishers, a serious problem of corrosion frequently develops causing disintegration of the metal parts and frequently rendering it impossible to operate the extinguisher properly. This corrosion results from the small quantities of water and acids which frequently appear in fire extinguishing fluids especially in the recharging of the extinguishers, and is the result of the chemical reaction which takes place when these traces of water and acid are in contact with the metal parts of the extinguisher.

Accordingly, it is an object of the present invention to provide an improved method of and apparatus for controlling the corrosion within extinguishers of this type.

Another object of the invention is to provide an improved method of and apparatus for removing the small quantities of water and acids sometimes found in the non-aqueous fire extinguishing fluids of such extinguishers.

A further object of the invention is to provide an improved apparatus for the above mentioned purpose which is simple in design, economical of construction and efficient in operation.

Other and more detailed objects of the invention will become apparent from a consideration of the following specification, the appended claims and the accompanying drawing.

In the drawing:

Figure 1 is a broken view partly in elevation and partly in section of a fire extinguishing apparatus embodying the present invention; and

Fig. 2 is a sectional view of the construction illustrated in Fig. 1 taken along the line 2—2 thereof.

In fire extinguishers of the above mentioned type, when corrosion takes place, the copper, brass, lead or other metal parts, are attacked resulting in corrosion of the surface of these metals and frequently necessitates either the replacement of corroded parts or the condemning of the entire extinguisher. It has been found that if the liquid charged into the fire extinguisher is completely free of water and acid, corrosion is substantially eliminated and no longer presents a problem. Likewise, it has been found that in the case of fire extinguishers charged with liquids including small quantities of water and/or acid, there is no corrosion problem if these small quantities of water and/or acid are in some way automatically removed in a relatively short period of time. The present invention contemplates the removal of any such small quantities of water and acid, which may be present in the liquid charged into the fire extinguisher, by placing in the liquid in the extinguisher a piece of metallic magnesium. It has been found that when this is done, the magnesium combines with the water and/or acid and removes it from the fire extinguisher fluid. This results in the formation of magnesium hydroxide on the surface of the magnesium and there is no appreciable corrosion at any other point within the extinguisher apparatus.

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Tests indicate that in the absence of the magnesium any small quantities of water or acid present in the fire extinguishing liquid will result in serious corrosion of the metallic parts of the extinguisher. By way of illustration, it has been found that small quantities of water in the fire extinguishing fluid will react with the carbon tetrachloride, or other liquids, when used in the presence of brass, to form acid which acid then reacts with the brass and copper to cause corrosion and effect a very marked disintegration of such parts. This frequently results in a deformation of the parts and an interference with the valve action. When the magnesium is inserted in the fire extinguisher liquid, tests indicate that it functions first, to combine directly with the water or acid, thereby removing it from the liquid, and secondly, it results in the production of a basic material, namely, magnesium hydroxide which is the product of the direct chemical combination of the magnesium and the water, and this magnesium hydroxide is effective in neutralizing any acid which may have been formed by the water prior to the removal of the water from the liquid by direct combination with the magnesium, or any other acids which may be present in the fire extinguishing fluid.

In addition to the corrosion resulting from the formation of acid as mentioned above, a part of the corrosion resulting when small quantities of

water are present is probably due to the fact that such small quantities of water frequently render the liquid an electrical conductor, thereby permitting the preferential corrosion known to result on metals occupying different positions in the electromotive series when such metals are in mediums capable of conducting electrical currents. This type of corrosion is, of course, also eliminated when the water or acid is removed from the liquid, since carbon tetrachloride and other fire extinguishing fluids are non-conductors.

Referring to the drawing, the fire extinguish 10 there illustrated is generally conventional, and includes the usual brass casing 12 adapted to be filled with fire extinguishing liquid and containing mechanism generally indicated at 14 operable by means of an external handle 16 for effecting and controlling the discharge of the fire extinguishing liquid from the container 12. The mechanism 14 includes a metallic tube 18 defining a pumping chamber internally thereof, a second metallic tube extending generally parallel to the tube 18 serving as a syphon tube, and lead castings or forgings 22 and 24 housing valve elements (not shown) and to which the tubes 18 and 20 are connected at their upper and lower ends.

The construction described to this point may be of any suitable conventional design. The present invention contemplates the mounting of a piece of metallic magnesium 26 within the casing 12 and in position to contact the fire extinguishing liquid received within the casing 12. It will be appreciated that in the broader aspects of the invention the piece of magnesium 26 may be of any desired shape and may be supported within the fire extinguisher 10 in any desired manner in or out of electrical contact with the other parts of the extinguisher. In the preferred embodiment illustrated in the drawing, the piece of magnesium 26 is in the form of a tubular sleeve encircling the tube 20. Although in the construction illustrated the metallic magnesium sleeve 26 is in electrical contact with the tube 20, such contact is not essential and the magnesium will function effectively to remove water and acid from the liquid and provide the basic magnesium hydroxide effective in neutralizing any acid which may be in the fire extinguishing fluid, independently of whether the magnesium 26 is electrically connected to any of the other parts of the extinguisher 10.

While only one specific embodiment of the invention has been illustrated and described in detail, it will be readily appreciated by those skilled in the art that numerous modifications and changes may be made without departing from the spirit of the present invention.

What is claimed is:

1. A fire extinguisher comprising a brass container, a fire extinguishing fluid including carbon tetrachloride and traces of water or acids, means for effecting and controlling the discharge of said fluid from said container and including parts disposed within said container and exposed to said fluid, said parts being formed of metals including copper and lead, and a solid magnesium member disposed within said container mounted on one of said parts and exposed to said fluid.

2. A fire extinguisher comprising a container, a fire extinguishing fluid including carbon tetrachloride and traces of water or acids, means for effecting and controlling the discharge of said fluid from said container and including parts disposed within said container and exposed to said fluid, and a solid magnesium member mounted within said container and exposed to said fluid, said container and said parts of said means for effecting and controlling the discharge of said fluid being formed of metals of substantially lower position in the electromotive series than magnesium.

3. A fire extinguisher comprising a container, a fire extinguishing fluid including a substantially non-aqueous liquid and traces of water or acids, means for effecting and controlling the discharge of said fluid from said container and including parts disposed within said container and exposed to said fluid, and a solid magnesium member mounted within said container and exposed to said fluid, said container and said parts of said means for effecting and controlling the discharge of said fluid being formed of metals of substantially lower position in the electromotive series than magnesium.

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