The present invention relates to fire extinguishers and particularly to an improved liquid extinguisher having a corrosion controlling construction.

In some water type extinguishers the water is expelled by the release of carbon dioxide stored in a high pressure cartridge. The cartridge is, in some cases, supported in a cage inside the upper end of the extinguisher container adjacent puncturing means. By reason of the use of metals of differing composition, galvanic currents are often set up between the container and the cartridge resulting in the corroding and weakening of the cartridge with possible loss of its stored pressure medium. Further, the water extinguishing agent may become discolored from the products of corrosion and may stain objects upon which it is discharged.

In my copending application Serial No. 248,111, filed September 25, 1951, now Patent No. 2,702,600 issued February 22, 1955, there is disclosed constructions for the prevention of the corrosive action by the use of electrical non-conducting material interposed between the container and the cartridge so as to interrupt the galvanic circuit between these parts.

The present invention aims to overcome the difficulties and disadvantages of the use of a cage to support the cartridge by interposing electrical non-conducting material in the structure of the cage so as to interrupt the electrical current between the container and the cartridge in which the water or other extinguishing agent in the container is the electrolyte.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings which show, by way of examples, embodiments of the invention.

In the drawing:

Figure 1 is a vertical sectional view of a fire extinguisher in accordance with the invention, a portion of the extinguisher shown broken away.

Figure 2 is a top view of an insulating cage to support the pressurizing cartridge within the extinguisher container.

Figure 3 is a side view of the cage shown in Figure 2.

Figure 4 is a bottom view of the cage shown in Figure 2.

Referring to the drawing, there is shown in Figure 1 a fire extinguisher 1 including a container 2 for a liquid fire extinguishing agent such as water closed by a combination discharge head and carrying handle 3. In order that the fire extinguishing agent may be expelled from the container 2, a cartridge 4 of stored pressure medium such as carbon dioxide is provided and supported within the container 2 by a cage 5. The cage holds the container operatively positioned below a puncturing member 6 so that upon the inversion of the extinguisher 1 the cartridge 4 is guided by the cage 5 into contact with the puncturing member 6 to rupture a seal on the cartridge 4 for the release of the pressurizing medium. A spring 7 is interposed between the closure for the cartridge 4 and a top portion 9 of the cage 5 so as to prevent the movement of the cartridge 4 under vibration or shock conditions.

The container 2 may be constructed of any suitable material such as brass or stainless steel and is generally made of a strength to withstand a test pressure of five hundred pounds per inch. In the usual portable extinguisher the capacity of the container 2 is generally about two and one-half gallons of fluid although a container of any desired size may be used. Adjacent the top of the container 2 is an elbow outlet 10 having attached thereto a discharge hose 11 which may have a conventional discharge nozzle 12 at its other end for directing the fire extinguishing fluid to a fire.

The container 2 is charged through a filling opening at its top defined by a flange member 14 secured to the wall of the container 2 by a welded joint 15 or by other suitable means, the exterior of the flange member 14 is threaded to receive the combination discharge head and carrying handle 3.

The material used for the construction of the combination discharge head and carrying handle 3 may be cast brass or other suitable material. The carrying handle is provided with a downwardly depending flange 16 to threadedly engage with the flange member 14 about the outlet, a sealing gasket 17 providing a leak-proof joint.

The pressurizing medium generally used is compressed carbon dioxide stored in the cartridge 4. To provide the desired strength, the cartridge 4 is preferably made of high-tension strength steel, although brass or other material with sufficient tensile strength may be used. The cartridge is fitted with a closure fitting 20 such as is disclosed in Robert H. Hill application, Serial No. 169,490, filed June 21, 1950, now Patent No. 2,682,967 issued July 6, 1954, or other conventional construction. As shown, the cartridge neck 21 is threaded exteriorly to receive the closure fitting 20. The upper edge of the neck 21 has an upwardly extending annular portion providing a seat 22 against which is positioned a unitary sealing disc assembly 24 such as disclosed and claimed in Carl W. Mickelsen application, Serial No. 226,067, filed May 12, 1955. The unitary assembly 24 includes a sealing disc disc nut 25 having a gasket member 27 positioned at the lower end of the sealing disc nut, the gasket 27 providing a leak-proof seal for a sealing disc 29 and a metering assembly 30, a lower edge 31 of the sealing disc nut being turned inward to hold the metering disc, sealing disc, and gasket in a unitary assembly. The metering assembly 30 includes an orifice member 32 and a strainer 34.

The support for the cartridge 4 is the cage 5 supported by its top 9 against a shoulder 35 formed in the flange member 14. The cage as may be seen in Figures 2-4 is preferably made with the circular top 9 having openings 36 to receive fixed-in-position side members 37. Additionally a somewhat larger opening 39 is provided in the top to receive a removable side member 40. A bottom member 41 for the cage 5 is shown with a square shape although obviously a circular shape might alternatively be used, the square shape providing somewhat more economical use of material. The fixed-in-position side members 37 may be secured in position in any suitable manner by providing enlarged heads therefor. The removable side member 49 is provided with a reduced end portion 42 to fit a corresponding opening in the bottom member 41 and the upper end of the side member 40 is grooved to receive a conventional removable locking washer 44 so that the removable side member 40 may be lifted upwardly to provide for the replacement of the cartridge 4. On the under side of the top member 9 are formed lugs 45 and 46 to receive the lower end of the spring 7, the lower end of the spring 7 abutting against a ring nut 47 positioned about the closure fitting 20.
In accordance with the invention the cage 5 is at least partially made of non-conducting electrical material so that there is no electrical conducting path between the cartridge 4 and the container 2 excepting through the fluid in which the cartridge is immersed. The entire cage may be made of a laminated fabric phenolic resin impregnated material which is a good electrical insulating material and, of course, non-corrosive. The cage might be made of other electrical non-conducting material such as nylon, Bakelite, urea, formaldehyde, melamine, Teflon, hard or synthetic rubber or other equivalent material. Alternatively the cage might be made of an electrical conducting material such as metal, with its exterior surface coated with a non-electrical conducting material, or the rods 37 and 40 might be made of electrical non-conducting material and the ring nut 47 made of insulating material so that there is no electrical contact between the cartridge 4 and the container 2.

It is thus apparent that a fire extinguisher has been provided in which electrical non-conducting material is used for the support of the cartridge with respect to the container so that there is no metallic connection between the container and the cartridge for the flow of galvanic currents therebetween with the resulting hazard of pitting and weakening of the cartridge. The electrical insulating material may be wholly above the liquid level as for example if only the upper portion of the cage rods 37 and 40 and the top member 9 is made of electrical non-conducting material. If the top member 9 is made of metal and the rods 37 and 40 of the ring nut 47 are made of electrical non-conducting material, a portion of this material may be above the liquid level and another portion thereof beneath the liquid level. In a still further construction the portion of the rods 37 and 40 in contact with the cartridge 4 and the ring nut 47 may be made of electrical non-conducting material and may be positioned beneath the surface of the fluid.

While the invention has been described and illustrated with reference to specific embodiments thereof, it will be understood that other embodiments may be resorted to without departing from the invention. For example, while the cage has been described and illustrated as of a particular construction, it is obvious that other well-known constructions may be substituted therefor, but modified in that electrical non-conducting means is provided in such structures between the cartridge and the discharge head and carrying handle or supporting means for the top of the cage so that there is no metallic electrical circuit between the cartridge and the container. Therefore, the form of the invention set out above should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. A fire extinguisher of the type including a metal container for extinguishing fluid and a metal cartridge for pressurization fluid, a cage for the sole support of the cartridge within the container, and electrical non-conducting material interposed between the cartridge and the cage at all points of contact therebetween.

2. A fire extinguisher of the type including a metal container for extinguishing fluid and a metal cartridge for pressurization fluid, and a cage for the sole support of the container within the container, at least the part of the cage in contact with the cartridge made of electrical non-conducting material.

3. A fire extinguisher of the type including a metal container for extinguishing fluid and a metal cartridge for pressurization fluid, and a cage for the sole support of the container within the container, at least the part of the cage in contact with the container made of electrical non-conducting material.

4. A fire extinguisher of the type including a metal container for extinguishing fluid and a metal cartridge for pressurization fluid, and a cage for the sole support of the container within the container, the cage made of electrical non-conducting material.

5. A fire extinguisher of the type including a metal container for extinguishing fluid and a metal cartridge for pressurization fluid, a cage for the sole support of the cartridge within the container, the cage coated with electrical non-conducting material at least at all points of contact with the cartridge.

6. A fire extinguisher of the type including a metal container for extinguishing fluid and a metal cartridge for pressurization fluid, and a cage for the sole support of the cartridge within the container, the cage coated with electrical non-conducting material at least at all points of contact with the container.

References Cited in the file of this patent
UNITED STATES PATENTS
1,976,467 Wheeler Oct. 9, 1934
2,069,709 Mapes Feb. 2, 1937