

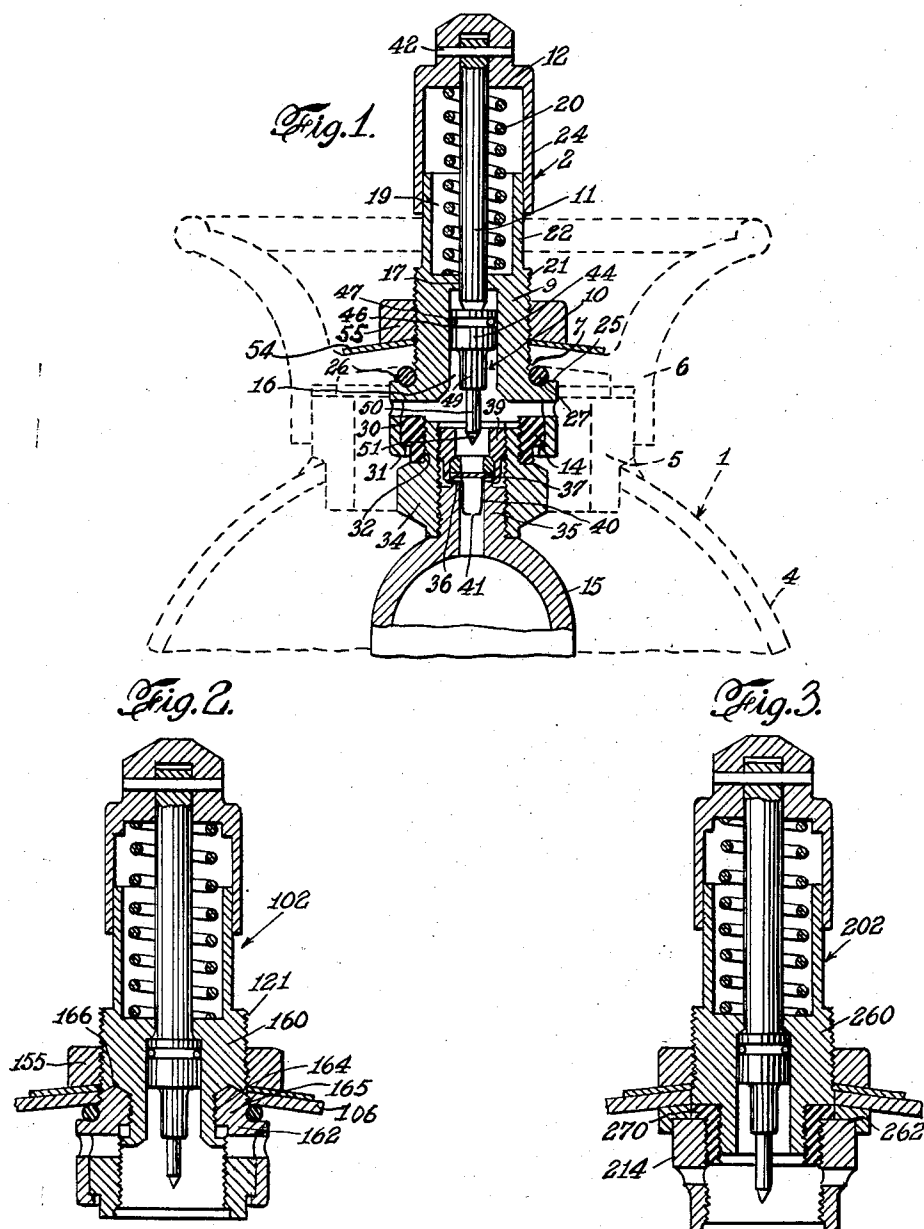
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FIRE EXTINGUISHER ADAPTER

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FIRE EXTINGUISHER ADAPTER

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1 Claim. (Cl. 169—31)

The present invention relates to fire extinguishers, and particularly to an adapter to convert a soda-acid fire extinguisher to a stored gas-pressurized fire extinguisher.

Portable extinguishers of the soda-acid type are used in great quantities. In the soda-acid extinguisher water is the basic extinguishing fluid and is expelled by gas pressure developed by the reaction of bicarbonate of soda and sulphuric acid. In charging the extinguisher, the bicarbonate of soda is mixed with the water and a bottle of sulphuric acid is positioned within the shell of the extinguisher. The soda-acid extinguisher is operated by inverting it so that the acid will react with the bicarbonate of soda solution to produce carbon dioxide gas which acts as an expelling agent to propel the mixture to a fire. By reason of variations in the components and because of improper mixing, the expelled fluid may contain an excess of acid or of soda, and in any event, the fluid will contain a sulphate of sodium resulting from the reaction. The fluid, thus, in some cases, may cause damage to some materials which would be undamaged by contact with water alone.

Furthermore, the recharging of the soda-acid extinguisher presents some difficulties to inexperienced personnel and is somewhat hazardous by reason of the handling of the acid. In addition the extinguisher should be periodically recharged with fresh acid and soda mixture to assure proper operation in an emergency.

The foregoing difficulties and disadvantages are overcome by the extinguisher using solely water as the extinguishing fluid and in which the expelling agent is generally carbon dioxide stored under pressure in a gas cartridge, the gas being released by actuating a discharge head to puncture a frangible disc closing the gas cartridge. The water extinguisher is economical in maintenance inasmuch as the periodic inspection does not necessitate recharging of the extinguisher and only involves an inspection as to the water level in the container and a weighing of the gas cartridge to ascertain whether the gas charge has leaked out. Obviously, the maintenance of the water extinguisher may be safely performed by inexperienced personnel at low cost.

The present invention aims to overcome the difficulties and disadvantages of the soda-acid extinguisher by providing an adapter for conversion to a water extinguisher.

In accordance with the invention this is accomplished by providing an adapter assembly to be secured in an opening to be made in the closure member of the soda-acid extinguisher.

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

In the drawings:

Figure 1 is a vertical sectional view of an adapter in accordance with the invention. The pressurizing cartridge is shown partly broken away and the closure member and a portion of the container of the extinguisher are shown in dotted lines.

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Figure 2 is a vertical sectional view of an embodiment of the invention in which the body member of the adapter is made in two portions.

Figure 3 is a vertical sectional view of another embodiment of the invention in which the adapter is made in two portions with an intermediate insulating portion therebetween.

Referring to the drawing, there is shown in Figure 1 the dotted outline of an extinguisher 1 fitted with an adapter 2 in accordance with the invention. The extinguisher 1 is of the conventional type including a sheet metal container 4 having a filling opening flange 5 to which is screwed the conventional ring handle closure member 6. While the adapter is intended for use as a conversion unit, it may, of course, also be used in a new construction. When using the adapter as a conversion unit, the usual soda-acid extinguisher 1 is opened and the closure member 6 made with an opening 7 positioned approximately in the center of the closure member. The usual acid bottle supporting means is discarded.

The adapter 2 is comprised of a body member 9 having a passage 10 therethrough in which is positioned a puncturing member 11 having at its outer end a cap 12. At the lower end of the body member 9 is an enlarged portion 14 providing supporting means for the gas pressurizing cartridge 15.

As shown in Figure 1, the body member 9 may be made in one piece of tubular material having an outer diameter of the size of the enlarged lower portion 14. By suitable machining operations, the passage 10 is formed with its lower end 16 of one diameter while its intermediate portion 17 is made of reduced diameter and of a size to slideably receive the puncturing member 11, and the upper end of the passage 10 is enlarged as indicated at 19 to provide space for a spring 20 adapted to yieldingly hold the puncturing member 11 in the upward position. The exterior of the body member 9 at its intermediate portion is threaded as indicated at 21. The upper end of the outer surface of the body member 9 is made of reduced diameter as indicated at 22 to slideably receive a depending edge or skirt 24 of the cap member 12. The dimensions of the parts are so arranged that the outer diameter of the skirt 24 of the cap 12 is no greater than the diameter of the threaded portion 21 so that the adapter may be assembled prior to insertion in the opening 7 of the closure member.

The enlarged lower portion 14 of the body member 9 is made with a shoulder 25 preferably recessed as indicated at 26 to receive a gasket 27 adapted to contact the under side of the closure member 6 to provide a leak-proof seal. The enlarged lower portion 14 is made of an enlarged diameter to receive an insulating bushing member 30 which may be secured in position in any suitable manner, as by inwardly spinning its edge 31.

The insulating bushing 30 is shown and described in my co-pending application, Serial No. 248,111, filed September 25, 1951, now Patent No. 2,702,600 dated February 22, 1955. The inner surface of the insulating bushing 30 is threaded as indicated at 32 to receive a closure fitting 34 for the cartridge 15. The closure member 34 engages with neck 35 of the cartridge 15 which has as its upper edge an annular sealing surface 36 against which is positioned a frangible sealing disc 37 secured in position by a ring nut 39 threadedly engaging with the inner surface of the closure member 34. The pressure fluid stored within the cartridge 15 is adapted to be released upon the rupture of the sealing disc 37. The pressure fluid discharge from the cartridge is metered through a downwardly depending member 40 having at its lower end an orifice 41, a construction which is shown and described in application Serial No. 137,847, filed January 10, 1950,

by Frank B. Allen, now Patent No. 2,684,180, issued July 20, 1954.

The puncturing member 11 is shown in application Serial No. 167,220, filed June 9, 1950, by Frank B. Allen, now Patent No. 2,610,693, issued September 16, 1952 and is preferably a one-piece member having an outer end laterally apertured to receive a pin 42 to secure the cap member 12. The intermediate portion of the puncturing member 11 is enlarged as indicated at 44 and made with an annular groove 46 to receive an O-type gasket 47. The lower end of the puncturing member 11 is reduced in diameter as indicated at 49 and made with an extension tip 50 having a pointed end 51 to facilitate the rupture of the sealing disc 37.

A name plate disc 54 is apertured so as to slip over the body portion 9 and may be inscribed with operating and refilling instructions for the operation of the extinguisher. A ring nut 55 is adapted to engage the threaded portion 21 of the body member 9 and abut against the name plate disc 54 to hold the assembly in position in the closure member 6 of the extinguisher.

In the operation of the extinguisher, it is inverted and the cap member 12 struck against a firm surface to urge the puncturing tip 51 to rupture the sealing disc 37 to release the stored pressure medium to pressurize the extinguishing fluid to expel it from the container 4.

Another embodiment of the invention is shown in Figure 2 in which corresponding parts are identified with the same numerals as in Figure 1 with the addition of 100. The adapter 102 shown in Figure 2 differs from the adapter 2 in that it may be made in two parts so as to economize in material. The upper portion 160 may be made from stock having the same diameter as the threaded portion 121 while lower portion 162 is made from stock of larger diameter. In order that the parts may be attached together, the upper portion 160 is recessed as indicated at 164 and threaded to engage the inner surface of upper end 165 of the lower portion 162. Preferably, the upper edge of the lower portion 162 and the bottom of the upper portion 160 are formed with a matching inverted V-shaped, cross-sectional surface 166 to provide a leak-proof connection between the parts. With the construction of the adapter 102, illustrated in Figure 2, a somewhat different construction may be utilized to substitute for the ring nut 55 of Figure 1 in that an annular collar 155 may be made integrally with the part 160 or alternately may be made as an annular ring secured in position by a pin, by welding, or by a friction fit. In the event these alternative constructions are used, the adapter may be secured in position in a closure member 106 by separating the parts 160 and 162 and reassembling them in position within the opening in the closure member 106.

In Figure 3 another embodiment of the invention is shown in which the corresponding parts are designated by the same reference numerals as in Figure 1 with the addition of 200. In Figure 3 the adapter 202 differs primarily from the previous embodiments in that it is made in three main parts—an upper portion 260, a lower portion 262, and an intermediate portion 270 preferably made of an electrically non-conducting material. In this construction the flange 214 may be made entirely of metal

and of a size to engage with the usual closure fitting of a pressure cartridge.

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. Therefore, the form of the invention set out above should be considered as illustrative and not as limiting the scope of the following claim.

I claim:

An adapter for use to convert a soda-acid type fire extinguisher having an opening of predetermined size in its cover member to a stored gas pressurized type fire extinguisher, the adapter comprising a unitary assembly including a generally cylindrically shaped body member having a passage therethrough, the body member of a diameter fitting the opening of predetermined size in the extinguisher cover member, the body wall thickened intermediate its ends forming an apertured partition separating the passage into outer and inner portions, the inner end of the body member enlarged forming a shoulder adapted to bear against the inside of the fire extinguisher cover, the inner end of the body member threaded and adapted to support a gas cartridge, vent means in the body member above the gas cartridge for the release of fluid therefrom, the body member having an outer end of reduced diameter, an operating member slidably carried in the body member and extending through the apertured partition, an upwardly directed portion of the operating member extending outwardly from the outer end of the body member, a puncturing tip at the inner end of the operating member, a cap member, means to secure the cap member to the operating member extension, the cap member having a depending portion slidably guided by the reduced outer end of the body member, the outer diameter of the cap member no greater than the diameter of the body member thus adapted to pass through the opening in the cover member, a spring abutting at one end against the apertured partition and at its other end against the underside of the cap member yieldingly holding the puncturing tip away from the gas cartridge which it is adapted to puncture, the outer surface of the body member threaded, and a ring nut adapted to engage the threaded outer surface of the body member whereby the unitary assembly is adapted to be secured in position in the fire extinguisher cover member opening.

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