

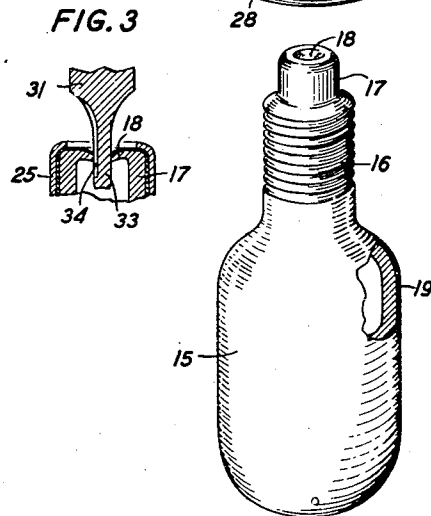
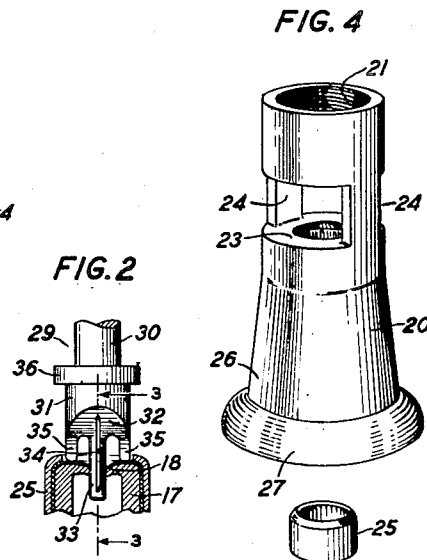
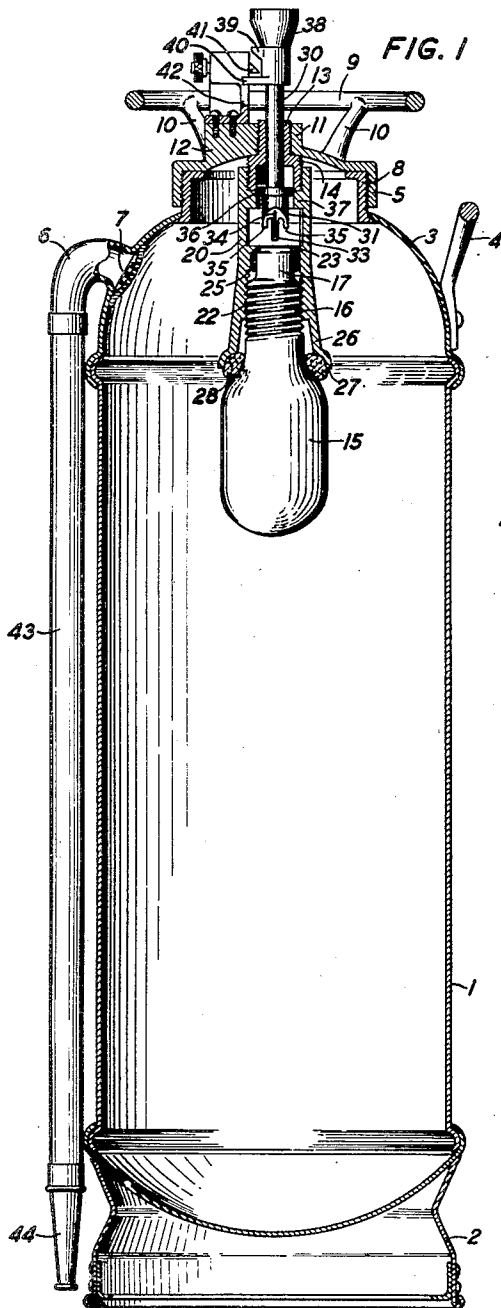
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FIRE EXTINGUISHER

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FIRE EXTINGUISHER

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2 Claims. (Cl. 169—31)

This invention relates to fire extinguishers and more particularly to fire extinguishers of the type in which a fire extinguishing medium is expelled from a tank by pressure released from a cartridge within the tank.

The object of this invention is to prevent freezing at the outlet end of the cartridge case during the escapement of fluid from the cartridge case into the tank.

A feature of this invention resides in a stem for puncturing the cartridge which serves as an aspirator and permits sufficient circulation of the fire extinguishing medium around the puncturing portion of the stem and across the outlet end of the cartridge case to prevent freezing at the point at which the fluid under pressure is escaping into the tank.

In the drawing, Fig. 1 is a side elevational view partly in section of a fire extinguisher embodying this invention;

Fig. 2 shows a fragment of the upper portion of a cartridge case in section and a fragment of a stem puncturing the cartridge case;

Fig. 3 is a view in section taken on the line 3—3 in Fig. 2 and shows a fragment of the upper portion of the cartridge case and a fragment of the stem puncturing the cartridge case; and

Fig. 4 is an exploded view partly in section of a cartridge case, a coupling for holding the cartridge case suspended within the main tank of the extinguisher from a screw cap of the tank and gaskets for preventing the entrance of moisture to end and neck portions of the cartridge case.

Fire extinguishers of the type shown in Fig. 1 are usually filled with a chemical in liquid form which serves as a fire extinguishing medium. To expell the fire extinguishing chemical from the tank with sufficient force to reach a fire, gas held under pressure within a cartridge case supported within the tank, is released from the cartridge case and allowed to escape into the tank.

There are some instances, however, when in putting out a fire the use of fire extinguishing chemical is found undesirable. This is particularly true in the extinguishment of fires occurring among delicately adjusted mechanical and electrical elements or comparatively close networks of wires such, for instance, as found in telephone equipment in central stations. When fire extinguishing chemical is used in extinguishing a fire occurring among telephone relays, switches or wire networks, considerable damage is done to the apparatus by reason of the corrosive effects of the chemical on the comparative-

ly closely spaced contacts and the inherent adhesive properties of the chemical in sticking to the apparatus parts upon which it happens to fall. In addition to the damage caused by the fire and the corrosive effects of the chemical fire extinguishing medium, there is also a considerable loss due to the time required in removing the chemical from the apparatus and reconditioning the apparatus for service again. It has therefore been found advisable in extinguishing fires in some instances to use water as the fire extinguishing medium in place of a chemical. When water is used as the fire extinguishing medium, the parts to which it is applied and which are not damaged by fire may be quickly dried out and restored to operable condition.

A cartridge of carbon dioxide under pressure has been found a satisfactory medium for creating sufficient pressure within a tank of water to expell the water from the tank. Applicant has found, however, by actual experience that when a comparatively small puncture is made in a cartridge case containing carbon dioxide and the carbon dioxide is allowed to escape through the aperture into the water in the tank, freezing occurs at the point of puncture. The freezing at the point of escapement of the carbon dioxide from the cartridge case into the water-filled tank results in either complete stoppage of the flow of carbon dioxide into the tank or an intermittent flow and hence either complete cessation of the flow of water from the tank to the fire or an intermittent flow so ineffective as to render the fire extinguisher comparatively useless for the purpose intended.

In the present invention a stem for puncturing the cartridge case is provided which permits sufficient circulation of water or other fire extinguishing medium around the point of puncture in the cartridge case to prevent freezing at this point.

For a complete description of this invention, reference will now be had to the various figures in the drawing in which like parts bear like numerals and in which 1 is a comparatively large tin-lined copper tank having an annular base 2, a top portion 3, a handle 4, a screw cap 5 and an outlet connection 6, across the inner end of which is a perforated plate 7. The screw cap 5 is screw-threadedly attached to a comparatively large annular filler connection 8 located in the top portion 3 of the tank 1 and is provided with a comparatively large diameter ring-shaped handle grip 9 which is connected to the screw cap 5 by spokes 10. The top of the screw cap 5 has an upwardly extending annular centrally located

boss 11 and a fin 12 extending radially from the boss 11. The boss 11 is internally threaded to receive the smaller externally threaded end of a reducing coupling 13 which is screwed into the threaded boss 11 from the underside of the screw cap 5, the larger externally threaded end 14 of the reducing coupling 13 extending downward from the underside of the screw cap 5 through the filler connection 8 and towards the interior of the tank 1.

Supported within the tank 1 is a cartridge case 15 containing a charge of carbon dioxide under pressure. This cartridge case 15 is a bottle-shaped casing of steel having an enlarged lower end portion, an externally threaded neck portion 16 and an upper reduced end portion 17. The walls of the cartridge case 15, as shown in section in Fig. 4, are comparatively thick. The wall, however, at the extreme upper end of the reduced end portion 17 is considerably reduced in thickness as shown at 18 in Figs. 2, 3 and 4 to provide a comparatively thin wall section which may be punctured when it is desired to allow escapement of the carbon dioxide from the cartridge case 15 to the tank 1. To prevent corrosion of the steel cartridge case and electrolytic action between the steel of the cartridge case and the inner wall surface of the tank 1 which would result in pitting of the steel wall of the cartridge case and finally allow escapement of the carbon dioxide from the cartridge case into the tank 1, the enlarged portion of the cartridge case 15 is enclosed in a lead shirt as shown in section at 19 in Fig. 4. This lead shirt encloses the whole of the lower section of the cartridge case 15 and extends up to the threaded neck portion 16. The threaded neck portion 16 and reduced end 17 and the outer surface of the reduced wall at 18 are tinned to prevent corrosion of these parts.

The cartridge case 15 is suspended within the tank 1 from the reducing coupling 13 by means of a sleeve 20 which is internally threaded at 21 to engage the externally threaded larger end 14 of the reducing coupling 13 and internally threaded at 22 to receive the externally threaded neck portion 16 of the cartridge case 15. An annular inwardly extending beveled shoulder 23 is provided about midway of the ends of sleeve 20 to form a receptacle for the reduced end portion 17 of the cartridge case 15. Between the shoulder 23 and the interiorly threaded end 21 are two comparatively large side outlet ports 24—24. A cap gasket 25 of lead, apertured at the top, is fitted over the reduced end 17 of the cartridge case 15 and compressed against the internally extending annular beveled shoulder 23 of the sleeve 20 to prevent moisture from gaining access to the reduced end portion 17 of the cartridge case 15. The lower portion of the sleeve 20 is flared out in the form of a bell at 26 and provided with an outwardly extending annular offset 27 to accommodate the lower end of the neck portion of the cartridge case 15. To prevent moisture from gaining access to the threaded neck portion 16 of the cartridge case 15 in the region of the lower portion of the sleeve 20 a rubber ring gasket 28 is slipped over the neck of the cartridge case 15 and compressed against the inner wall surface of the annular offset 27 of the sleeve 20.

To puncture the cartridge case 15 at the reduced wall portion 18 a stem 29 is provided. The stem 29 which is adapted to move longitudinally within the reducing coupling 13, comprises a shank portion 30 which extends upward through the reducing coupling 13 to the outside of the

extinguisher and an enlarged lower cylindrical end 31 which extends downward within the tank. The lower portion of the enlarged lower cylindrical end 31 of the stem 29 is chamfered on opposite sides and cut down to form a spade end 32 having three spaced prongs in parallel, the central prong being about twice the length of the other two and forming a cylindrical puncturing pin 33 for puncturing the cartridge case 15 at the point 18 where the wall of the cartridge case 15 has been reduced in thickness. A groove 34 is provided in one side of the puncturing pin 33 to allow escapement of the carbon dioxide from the cartridge case 15 when the puncturing pin 33 is thrust through the reduced wall portion 18. The groove 34 does not extend the full length of the puncturing pin 33 but starts at a point slightly above the lower extremity of the pin and extends upward into the curved portion of the chamfer as shown in Figs. 1, 2 and 3. When the puncturing pin 33 is driven through the reduced wall portion 18 of the cartridge case 15 as shown in Figs. 2 and 3 it makes a round hole in the reduced wall portion 18 and is thrust far enough through so that the full round solid end of the puncturing pin extends below the inner surface of the reduced wall portion 18 and the lower end of the groove 34 is within the cartridge case 15. Carbon dioxide within the cartridge case 15 then escapes from the cartridge case 15 into the tank 1 by way of the groove 34 and the side outlet ports 24—24 of the sleeve 20. The two outside prongs 35—35 on the spade portion 32 of the stem 29 rest on the top of the cartridge case 15 and limit the extent of thrust of the puncturing pin 33 through the reduced wall portion 18 of the cartridge case 15 and in cooperation with the puncturing pin 33 form two arch-like channels on opposite sides of the puncturing pin 33 for circulation of the water or other fire extinguishing medium across the top of the cartridge case 15. Between the enlarged lower cylindrical end 31 and the shank portion 30 of the stem 29 is an outwardly projecting annular shoulder 36 which bears against the inner wall surface of the larger end 14 of the reducing coupling 13 and the inner wall surface of an inwardly projecting annular shoulder 37 provided in the upper portion of the sleeve 20 as shown in Fig. 1.

On the outer end of the stem 29 is an impact knob 38 to receive a blow administered to the stem 29 when the puncturing pin 33 is to be thrust through the reduced wall portion 18 of the cartridge case 15. The impact knob 38 has an inverted cone-shaped upper portion terminating in a cylindrical lower portion which is longitudinally bored to accommodate the outer end of the shank 30 of the stem 29. Laterally projecting from the lower cylindrical portion of the impact knob 38 is a lug 39 and directly below the lug 39 and extending in the same direction is a pair of spaced fingers 40, only one of which is shown in Fig. 1. The lug 39 is beveled on its undersurface and cooperates with a spring pressed bolt 41 supported by a bracket 42 on the fin 12 to hold the stem 29 in its projected position and driven through the reduced wall portion 18 of the cartridge case 15. The spaced fingers 40 project on opposite sides of the bracket 42 and prevent rotation of the stem 29.

In operating the fire extinguisher a blow is delivered to the impact knob 38 sufficient to drive the stem 29 inward of the tank 1. This may be conveniently done by turning the extinguisher upside down and driving the impact knob 38

against a floor surface. The stem 29 thereby is driven inward of the tank 1 and the puncturing pin 33 of the stem 29 is thrust through the reduced wall portion 18 of the cartridge case 15. The lug 5 39 on the impact knob 38 is driven against the spring pressed bolt 41 and causes sufficient displacement of the bolt 41 to allow the lug 39 to pass. When the lug 39 passes the bolt 41 the spring pressed bolt 41 again resumes its normal position and prevents withdrawal of the puncturing pin 33 from the cartridge case 15. Carbon dioxide then begins to escape from the cartridge case 15 by way of the groove 34 in the puncturing pin 33 and passes through one of the ports 24 of the sleeve 20 into the tank 1 and exerts sufficient pressure in the tank 1 to expel the water from the tank, the water finding an outlet through the apertured plate 7 and outlet connection 6 from whence it flows through the hose 43 and nozzle 44 with sufficient force to be directed to the fire.

When the carbon dioxide begins to escape from the cartridge case 15 by way of the groove 34 in the puncturing pin 33 it sets up an aspirator effect around the point of puncture in the reduced wall portion 18 and starts a circulation of water across the point of puncture, the water being drawn through the port 24 opposite to that which faces the groove 34 and passing across the punctured end of the cartridge case 15 and around the puncturing pin 33 by way of the arch-like channels formed by the outer prongs 35—35 and the punc-

turing pin 33. Circulation of water around the puncturing pin 33 continues as long as the carbon dioxide continues to escape and prevents freezing at the point of puncture.

What is claimed is:

1. In a fire extinguisher comprising a tank containing water and a cartridge of compressed fluid supported within the tank, a stem having a pin portion to be thrust into said cartridge to allow escapement of said compressed fluid into the tank, and a pair of fins projecting from said stem, said fins projecting parallel to said pin portion and spaced therefrom to form channels for circulation of the water in the tank around said pin when said pin is thrust into said cartridge and the compressed fluid is escaping into the tank.

2. In a fire extinguisher comprising a tank containing water, and a cartridge containing fluid under pressure supported within the tank, a movable stem having a free end pin portion to be thrust into said cartridge, said pin portion having a recess formed in one side providing a channel for escapement of the fluid from said cartridge, and fins projecting from said stem parallel to said pin and spaced from said pin to limit the extent of thrust of said pin into said cartridge and forming in cooperation with said pin and an end of said cartridge, channels for circulation of the water in said tank around the pin portion and across an end of said cartridge.

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75	150