

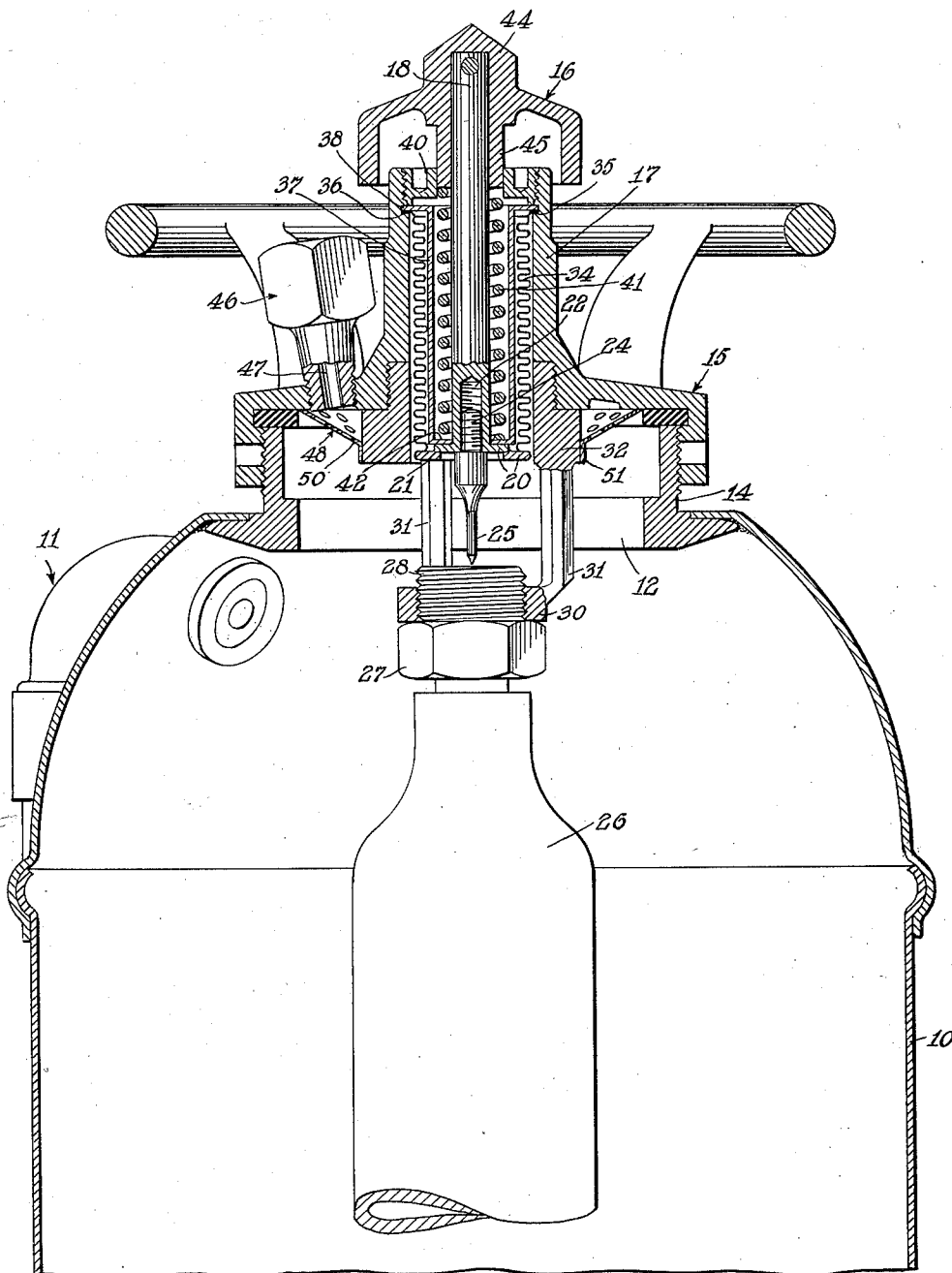
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FIRE EXTINGUISHER

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FIRE EXTINGUISHER

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1 Claim. (Cl. 169—31)

This invention relates to fire extinguishers of the type employing a cartridge, containing, for example, carbon dioxide, which, when the cartridge is punctured, is rendered available within the fire extinguisher as a pressure medium for expelling the extinguishing liquid therefrom.

An important object of the invention is to provide a generally improved cartridge puncturing unit, which is especially adapted for use with fire extinguishers of the above type and which is also simple in construction, inexpensive to manufacture, easily assembled and reliable in operation.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawing which is a fragmental, central, vertical, sectional view of a fire extinguisher embodying the present invention.

The invention is herein illustrated in connection with a fire extinguisher of the type which is normally maintained in an upright position, as shown in the drawing, but adapted to be operated in an inverted position pursuant to its having been conditioned for use while inverted. The extinguisher includes a container 10 which is adapted for the reception of a fire extinguishing liquid, not shown, and from which such liquid may be ejected through the usual hose-and-nozzle unit 11. The container 10 is provided at its upper end with a filling opening 12 and is equipped with the usual screw-threaded neck 14, adapted for the reception of a removable closure or head 15, with which is associated a cartridge-puncturing unit 16.

The cartridge-puncturing unit 16 includes a sleeve-like housing 17 which is formed integral with the head 15, and also includes a piercer-actuating rod 18, the lower end of which is formed with an outwardly extending abutment flange 20, secured in face-to-face relation to and forming a gas-and-liquid-tight connection with an annular or ring-like anchor plate 21, the outside diameter of which is somewhat greater than that of the flange 20 but somewhat less than the inside diameter of the housing 17. The lower end of the piercer-actuating rod 18 is formed with a screw-threaded socket 22, adapted to receive the screw-threaded shank portion 24 of a cartridge piercer 25 which is disposed in axial alignment with a gas-filled cartridge 26, equipped with a closure 27, having therein a suitable seal, not shown. The cartridge 26 may be attached to or detached from the head 15, as will be understood when it is taken into account that the screw-threaded portion 28 of the closure 27 is adapted

for screw-thread connection with an internally threaded retaining ring 30, carried by a plurality of supporting arms 31 formed integral with a screw-threaded sleeve-like boss 32 which is connected to the head in a coaxial relation to its associated housing 17.

Within the housing 17 there is disposed a syphon bellows 34, the lower end of which is secured to and forms a gas-and-liquid-tight connection with the anchor plate 21. The upper end of the bellows 34 is provided with an outwardly extending flange 35 adapted to rest on a shoulder-like ledge 36, formed internally of the housing 17 at the upper end thereof. Disposed within the bellows 34 is a cylindrical spring housing 37, the wall of which is spaced from the piercer-actuating rod 18 and the upper end of which is provided with an outwardly extending flange 38 adapted to rest on the correspondingly disposed flange 35 of the bellows. The bellows flange 35 is maintained in gas-and-liquid-tight engagement with the ledge 36 by a ring-like clamp nut 40, carried within the internally screw-threaded end of the housing 17 and adapted to be run down into impinging engagement with the flange 38 of the spring housing 37. Carried within the spring housing 37 is a compression spring 41, the lower end of which is supported on an inwardly extending guide flange 42 provided at the lower end of the spring housing. The guide flange 42 encircles the piercer-actuating rod 18, and is adapted to function in cooperation with the abutment flange 20 of the piercer-actuating rod 18 to limit outward displacement of that rod under the action of the compression spring 41 which is confined between the abutment flange and a button-like cap 44 secured to the upper end of the piercer-actuating rod.

The button-like cap 44 includes a sleeve-like hub 45, which is slidable within the clamp nut 40 and constitutes an abutment for the outer end of the spring 41. The clamp nut 40 which is reasonably accurately fitted to the sleeve 45 functions in cooperation with the guide flange 42 which reasonably accurately fits the piercer-actuating rod 18, to guide that rod in a coaxial relation to the housing 17, so as to insure proper alignment of the piercer 25 with the puncturable area of the cartridge seal hereofore mentioned.

As is customary, the extinguisher is equipped with a suitable pressure-relief device 46, the discharge passage 47 of which is protected against clogging by a screen-like guard 48. The guard 48 includes an inclined wall 50, which is perforated, and also includes an annular skirt 51

which embraces and is suitably secured to the sleeve-like boss 32.

From the foregoing description, reference being had particularly to the manner in which the bellows 34 is utilized in connection with the piercer-actuating rod 18 and its associated elements, it will become apparent that the structure is such as to provide for reciprocatory movement of the cartridge piercer 25 from without the container 10 and is also such as to maintain (in the absence of conventional rod packings, stuffing boxes, gland nuts and the like) a perfect seal between the piercer-actuating rod and the head 15 through which such rod extends.

In view of the structure thus far described, it will be understood that normally the extinguisher is maintained in an upright position, as shown in the drawing, and that the piercer 25 is maintained in its retracted position by the spring 41.

When it is desired to operate the extinguisher, it is inverted, whereupon the button-like cap 44 is subjected to an impact of sufficient intensity to cause the piercer-actuating rod 18 to move inwardly against the action of the spring 41 a sufficient distance to drive the piercer 25 through the cartridge seal, not shown, the extent of inward movement of the rod being limited by the hub 45 of the cap 44 upon engagement thereof with the clamp nut 40. Incident to puncturing the cartridge seal, the spring 41 serves to retract the piercer 25 despite the combined weight of the extinguisher and its contents. After puncturing the cartridge seal, the contents of the cartridge are rendered available for use as a pressure medium, whereby sufficient pressure is built up over the extinguishing liquid to effect com-

plete evacuation of the liquid from the container 10 by way of the hose-and-nozzle unit 11.

Although only one form of the invention is herein shown and described, it will be understood that various changes may be made without departing from the spirit of the invention or the scope of the following claim.

What is claimed is:

A cartridge puncturing unit comprising a housing, a piercer-actuating rod adapted for axial movement within said housing, a piercer carried by said rod, a sylphon bellows disposed within said housing and surrounding said rod, said bellows being at one end in gas-and-liquid-tight union with said housing and at its other end in liquid-and-gas-tight union with said rod, a spring housing disposed within said bellows and surrounding said rod, an inwardly extending flange carried at one end of said spring housing and adapted to slidably accommodate said rod, a cap secured to said rod exteriorly of the first-mentioned housing and including a sleeve-like hub, a ring-like clamp nut carried within the outer end of the first-mentioned housing and co-operating with said bellows and said spring housing to retain them within the first-mentioned housing, said clamp nut slidably accommodating said sleeve-like hub and functioning in cooperation with said flange to guide said rod in a co-axial relation to the first-mentioned housing, and a compression spring confined between said flange and said sleeve-like hub, said spring being adapted to exert a thrust on said rod in one direction and to yield incident to movement of said rod in an opposite direction.

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