June 7, 1949. R. ZIESCHANG 2,472,506

FIRE EXTINGUISHER

Filed Oct. 12, 1945

FIG. 1.

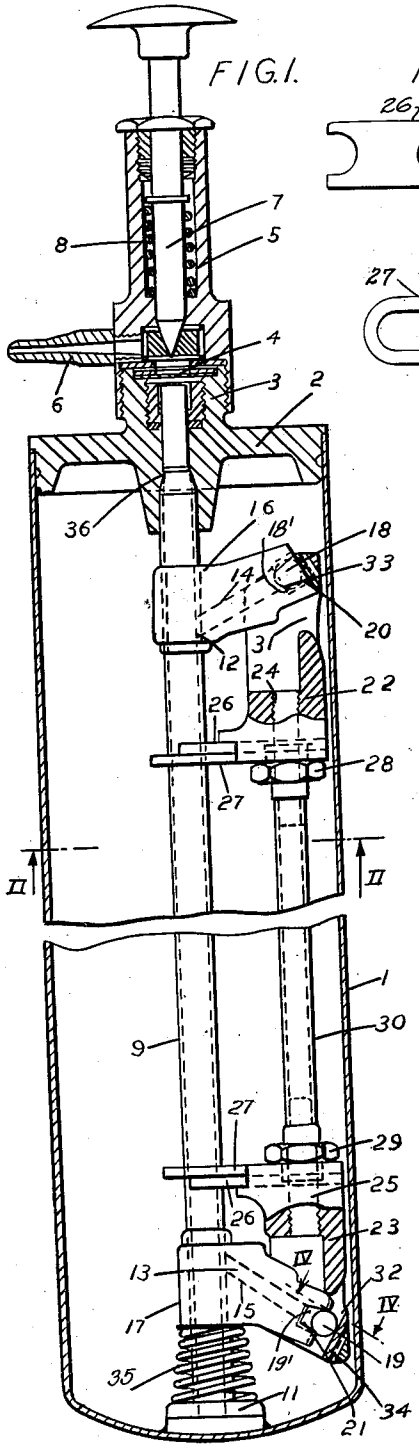


FIG. 5.

FIG. 6.

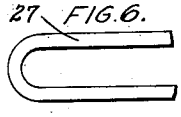


FIG. 2.

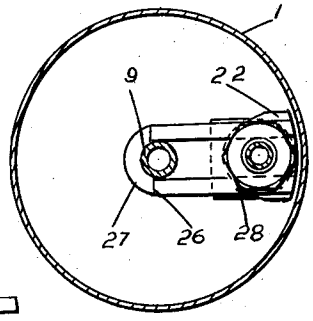


FIG. 3.

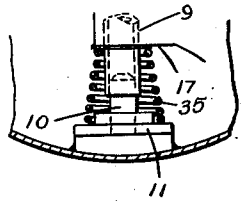
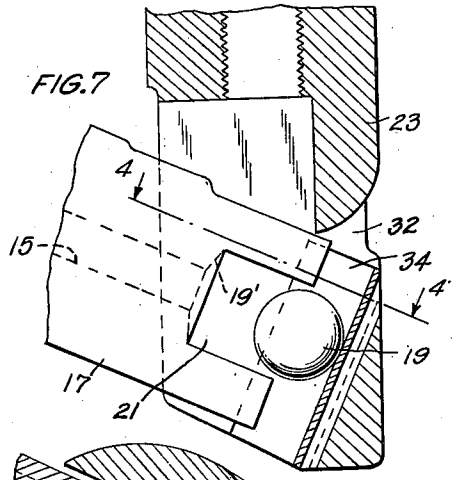


FIG. 7.



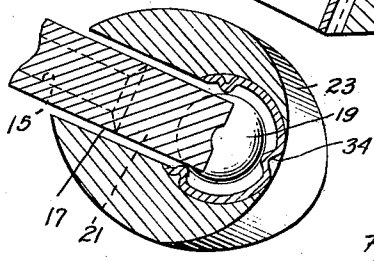


FIG. 4.

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UNITED STATES PATENT OFFICE

2,472,506

FIRE EXTINGUISHER

Richard Zieschang, Brentford, England, assignor to The Pyrene Company Limited, Brentford, England, a British company

Application October 12, 1945, Serial No. 622,003
In Great Britain November 13, 1944

2 Claims. (Cl. 169—31)

1

This invention relates to hand-operated fire-extinguishing apparatus of the type in which a fire-extinguishing liquid is ejected by pressure when a sealing member within the apparatus is pierced. The invention is particularly applicable to apparatus in which the liquid is kept under pressure until the sealing member is pierced but may be applied also to apparatus in which a small container of highly compressed gas is placed inside the apparatus and is pierced to provide the internal pressure required to drive out the liquid.

In existing apparatus of this kind it is only possible to expel the whole of the liquid in the apparatus when the apparatus is held in certain positions. In other positions the inlet to the discharge nozzle becomes uncovered by the liquid before all the liquid has been driven out, and thereafter gas passes out through the discharge nozzle instead of liquid.

The principal object of this invention is to provide an apparatus of the kind in question which will discharge a continuous jet of liquid until all or substantially all the liquid has been driven out, no matter what the position in which the apparatus is held.

In my invention I provide a revoluble pick-up device which extends over substantially the whole length of the liquid container and which includes a passage leading to the discharge orifice and has two valve-controlled inlets for liquid, one at each end of the device. I also provide a device slidable under gravity on the pick-up device and operative on sliding to move one valve positively off its seat and to force the other valve positively onto its seat.

My invention will be most readily understood by reference to the annexed drawings, which show the preferred embodiment of the invention and in which:

Figure 1 is a central longitudinal section through certain parts of the apparatus;

Figure 2 is a section on the line II—II in Figure 1;

Figure 3 is a fragmentary view showing the bottom of the apparatus more clearly;

Figure 4 is a section on the line IV—IV in Figure 1 but is on a larger scale;

Figures 5 and 6 show two parts embodied in the apparatus; and

Figure 7 is an enlarged view of a portion of the parts shown at the bottom of Figure 1.

The apparatus shown is of the type in which liquid is maintained under pressure in a cylindrical container 1 closed at the upper end by a disc 2 which is soldered in position, the disc having a boss 3 in which a sealing member 4 is secured and on which an operating head 5 is screwed. This head carries a discharge nozzle 6 and a pointed plunger 7 which can be forced against a spring 8 to pierce the member 4 and so to allow the extinguishing liquid to be expelled by the internal pressure.

2

The disc 2 is centrally bored and formed with a part-conical seat 36 on which one end of a tube 9 bears, the other end of this tube fitting over a lug 10 secured to a plate 11 at the bottom of the container 1. The tube 9 is free to revolve on the lug 10 and in contact with the conical seat 36 and it constitutes part of the revoluble pick-up device, all the liquid expelled from the container 1 passing through the tube 9 on the way to the discharge nozzle 6. The tube 9 has two inlets 12 and 13, which register respectively with the ends of passages 14 and 15 formed in radially extending parts of bosses 16 and 17 which surround and are secured to the tube 9. These passages 14 and 15 constitute the liquid inlets and their opposite ends form seats for ball valves 18 and 19 respectively. These ball valves lie in valve cages 20 and 21 formed by recessing and forking the ends of the radially extending parts of the bosses 16 and 17.

The device slidable under gravity to force the ball valves 18 and 19 off and on to their valve seats, 18' and 19' takes the form of two housings 22 and 23 which are tapped to receive short threaded tubes 24 and 25 over each of which two guide lugs 26 and 27 fit, these lugs being held in position by nuts 28 and 29. The tubes 24 and 25 extend through the nuts 28 and 29 into the ends of a hollow rod 30, to which they are soldered. The two housings 22 and 23 are thus united, and the resultant unit can both revolve and slide as a whole, since the guide lugs 26 and 27, which are shown separately in Figures 5 and 6, form radial arms slidable on the tube 9. The unit and the pick-up device revolve together, because the housings 22 and 23 fit over the ends of the bosses 16 and 17 but are slotted to allow the sliding movement to take place. The housings 22 and 23 are formed with inclined tubular passages 31 and 32 lined by part-cylindrical splined members 33 and 34 which loosely engage and retain the ball valves 18 and 19. The passages 31 and 32 extend at right angles to the axes of the passages 14 and 15, and when the whole sliding device moves longitudinally the ball valves 18 and 19 are forced to move in the directions of the axes of the passages 14 and 15 off and on to their valve seats 18' and 19'. In the position shown in

Figure 1 the splined member **33** forms an inclined surface by which the ball **18** is forced to engage the valve seat **18'** and close the end of the passage **14** by wedge action, and the splined member **34** is holding the ball **19** away from the valve seat **19'** at the end of the passage **15**. If the apparatus is turned the other way up the sliding device will move as a whole and force the ball **18** off its seat **18'** and the ball **19** onto its seat **19'**.

The pressure inside the pick-up device is the same as that outside it. In consequence, only the weight of the sliding device formed by the housings **22** and **23** and associated parts is to urge the ball valve **18** or **19** onto its seat **18'** or **19'** during discharge. It is to ensure that either the valve **18** or the ball valve **19** is kept firmly on its seat that I make use of the principle of wedge action, and I prefer to make the angle which the surfaces of the inclined passages **31** and **32** make with the axis of the whole pick-up device between 25 and 30°, although it may be as much as 45°.

If desired, the rod **30** may carry a freely slidable weight, the purpose of which is both to increase the weight of the sliding device and by striking the remainder of the sliding device to assist in dislodging it if it should stick to either end position. In order to prevent leakage from the upper end of the tube **9** it is forced onto the seat **36** in which the tube **9** rotates (as hereinbefore mentioned) by a spring **35** which bears on the plate **11** and surrounds the lug **10** and the lower end of the tube **9**.

I claim:

1. In a hand-operated fire-extinguishing apparatus of the kind set forth, a cylindrical container for a liquid having a discharge nozzle for the liquid to be expelled from said container, a pipe extending longitudinally inside said container and communicating with said discharge nozzle, and a revoluble liquid pick-up device extending over substantially the whole length of said container, said pick-up device having at each end a boss secured to said pipe and each provided with a passage communicating with the inside of said pipe, each of said passages having at its outer end a valve seat, a ball cooperating with each valve seat, a housing for each ball in which the ball is positively moved into and out of engagement with its valve seat, means slidingly supported for longitudinal movement on said pipe and carrying both of said housings whereby the latter must move in unison to force one of said balls away from engagement with its valve seat and the other ball into engagement with its valve seat.

2. A fire-extinguishing apparatus according to claim 1, in which each housing has a surface bearing on its ball which is inclined to the direction in which said housings move.

RICHARD ZIESCHANG.

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The following references are of record in the file of this patent:

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Certificate of Correction

Patent No. 2,472,506. June 7, 1949.

RICHARD ZIESCHANG

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 3, line 13, after "is" insert the word *available*;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 1st day of November, A. D. 1949.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.