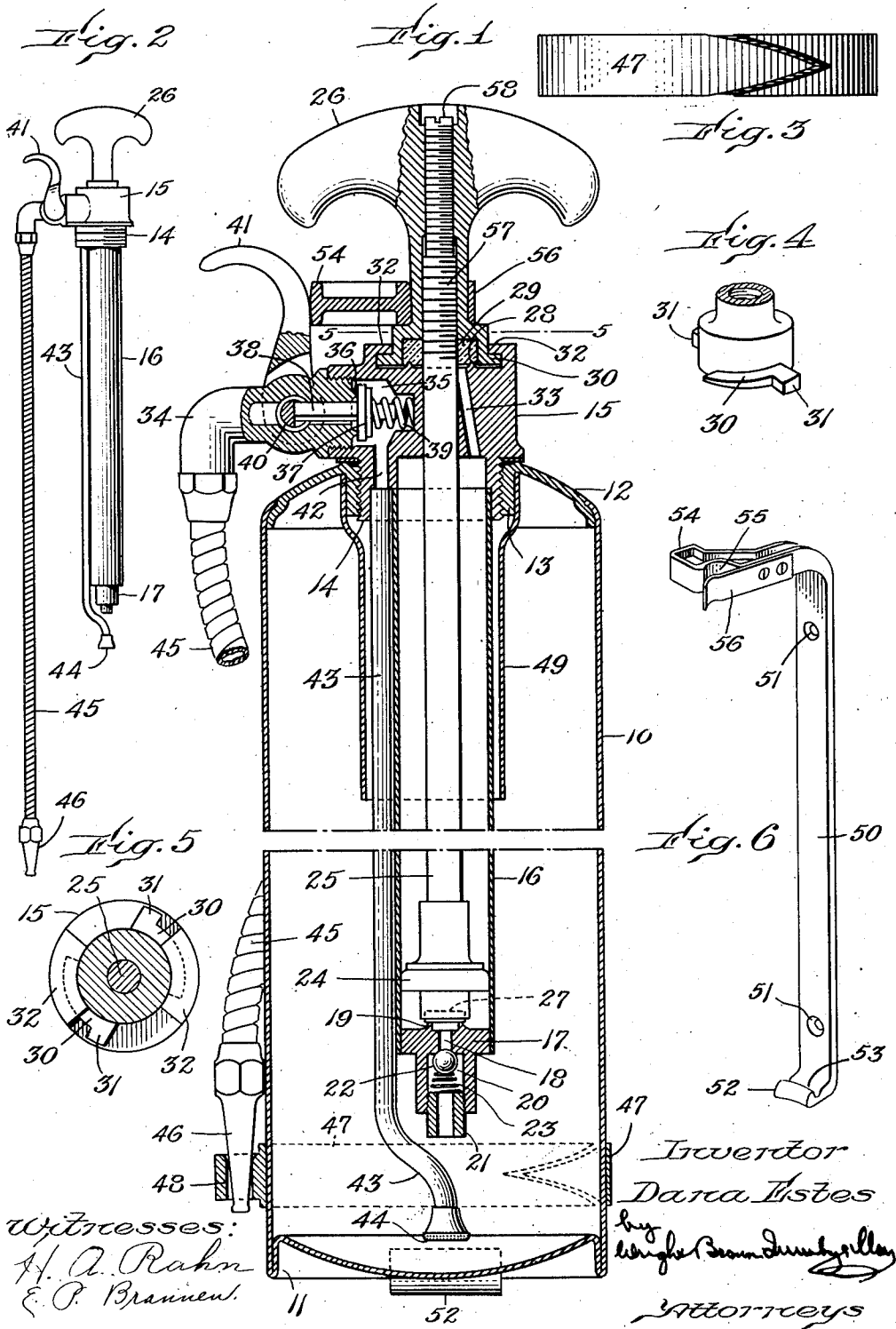


D. ESTES.
 FIRE EXTINGUISHER.
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FIRE-EXTINGUISHER.

1,112,202.

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To all whom it may concern:

Be it known that I, DANA ESTES, a citizen of the United States, and a resident of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a specification.

This invention relates to fire extinguishers, and particularly of the portable or hand type which is not inverted for use, the pressure for discharging the liquid being obtained by means of an air pump.

While my improved extinguisher is designed for the employment of liquid such as carbon tetrachlorid, I do not limit myself to the use of the apparatus with any particular liquid or compound.

As hereinafter explained, some of the features of my invention, especially those relating to the pump, provide for the exclusion of liquid from the pump so as to prevent corrosion of the pump mechanism.

One of the objects of my invention is to provide a construction which will render it practically impossible that any parts or pieces of the mechanism can become lost when the parts are separated for filling the reservoir.

Another object is to provide a structure whereby the reservoir may be held by one hand in such manner that the finger of that hand may control the discharge, leaving the other hand of the user free to manipulate the hose and nozzle.

Another object is to provide locking means which will prevent the liquid in the reservoir from working into the pump.

Another object is to provide means which will insure the preservation of a chamber for air under compression to expel the liquid, said means preventing the person who may be refilling the reservoir from placing too much liquid therein.

A further object is to provide means for preventing the outlet-controlling valve from being manipulated when the extinguisher is in its rack or supported position.

To these and other ends hereinafter explained, my invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings: Figure 1 represents a broken-out, vertical section of an extinguisher embodying my improve-

ments; Fig. 2 is an elevation of the parts which are removable as a unit from the reservoir; Fig. 3 is a detail view of the band which is frictionally held on the lower part of the reservoir; Fig. 4 is a detailed perspective view of the lower end of the main handle; Fig. 5 represents a section on line 5-5 of Fig. 1; Fig. 6 is a perspective view of the bracket for supporting the extinguisher, and showing the means for automatically locking the valve handle against operation.

Similar reference characters indicate similar parts in all of the views.

The reservoir 10, preferably cylindrical in form, has its lower end formed with a vertical flange 11. The top 12 of the reservoir has an inwardly projecting flange or thimble 13 which is internally threaded to receive the threaded nipple 14 of the head 15 of the pump. A suitable washer may be employed between the head 15 and the top of the flange 13, as indicated in Fig. 1.

Rigidly secured to the nipple 14, as by brazing, or otherwise, is a pump barrel 16, the lower end being closed as by means of a disk or plug 17 having a vertical aperture 18, the upper end of which is surrounded by a rib or shoulder 19 to form a seat for a stopper plug or disk hereinafter described. A lower extension of the plug or disk 17 is formed with a chamber 20, the lower end of said extension having a tubular plug 21 screwed therein. A ball valve 22, held by a spring 23, normally closes the port 18.

The piston 24 of the pump is carried by a piston rod 25 which extends up through the head 15 and is provided with a handle 26, the connection of the handle with the piston rod preferably being adjustable as hereinafter described, in order that when the piston rod is locked, a stopper disk 27, carried at the lower end of the piston rod, may be closely seated upon the rib 19. The stopper disk 27 is preferably of such material as vulcanized fiber.

The upper surface of the head 15 is formed or provided with an annular rib or shoulder 28 surrounding the aperture through which the piston rod slides, and the lower end of the handle is formed with a recess containing a packing 29 which is adapted to cooperate with the rib 28, when the piston rod is in the position shown in Fig. 1, in positively preventing the passage

of any air through the port 33 presently described, or around the piston rod. The lower end of the handle is formed with outwardly extending inclined ribs 30 (Figs. 4 and 5) and with stop lugs 31. The head 15 is formed with undercut flanges 32. The spaces between the flanges 32, as indicated in Fig. 5, are such as to permit the ribs 30 and lugs 31 to pass between said flanges 32 when the handle is turned to proper position for this to be done, as hereinafter described. The inlet 33 through the head supplies air to the pump barrel when the piston is moved inwardly.

The head 15 is provided with a nozzle 34 shown in the drawings as elbow-shaped, the passage in said nozzle communicating with a chamber 35 in the head. The inner face of the piece constituting the nozzle is provided with a valve seat 36 for a valve 37 located in the chamber 35 and having a stem 38 projecting outwardly through the passage hereinbefore mentioned. A spring 39 adds to the internal pressure in the reservoir, tending to keep the valve closed on its seat. Mounted to rock in the body of the nozzle 34 is a cam 40 having a hook or trigger-shaped handle 41 so that when said handle is rocked the flat face of the rocking cam 40 will act upon the stem 38 of the valve to thrust the latter away from its seat 36. The head 15 is formed with a port 42 leading to the chamber 35. A small pipe 43 is connected at one end with said port 42 and extends downwardly alongside of the pump barrel 16, said tube being preferably rigidly secured to the outer surface of the barrel 16, as by solder. The lower end of the pipe 43 is preferably provided with a suitable strainer 44, the pipe 43 constituting the outlet pipe or passage for liquid contained in the reservoir under pressure of air in the upper portion of the reservoir, as hereinafter explained.

Connected with the nozzle 34 is a flexible hose 45 having a nozzle 46. This hose is preferably of a length greater than the vertical height of the reservoir, so that the hose can be bent without undue strain if it should be necessary to direct the outflowing liquid directly upward to the ceiling while the extinguisher is held in the vertical position. It is to be understood at this point that for the purposes for which my extinguisher is designed, it must always be used when in vertical position or substantially so, in order that the air under pressure will expel the liquid. In order that the flexible hose of a length greater than the height of the reservoir may be held with the nozzle not depending below the bottom of the reservoir, I provide means for holding the nozzle with the hose wrapped more or less around the reservoir. For this purpose I provide a spring band 47 which

frictionally clasps the reservoir, said band having a socket 48 to hold the nozzle 46. The band may be slipped to the proper vertical position relatively to the bottom of the reservoir, and rotated after the nozzle 46 has been placed in the socket or holder 48, this resulting in wrapping the hose closely around the reservoir, but holding it in such manner that the nozzle can be quickly disengaged from the socket when it is necessary to use the extinguisher. Owing to the fact that the band 47, with its socket or holder 48, is free to be shifted vertically as well as rotatively on the reservoir, the socket can be so located as to receive the nozzle 46 without having the nozzle bind in the socket, and then when it is desired to use the extinguisher in an emergency, separation of the socket and nozzle can be instantly effected by simply slipping the band downwardly.

The reservoir has no opening whatever leading into it excepting that within the flange or thimble 13 at the top. To fill or refill the reservoir the head 15, by means of its screw-threaded nipple 14, is removed from the opening, said head carrying with it all of the parts, as illustrated in Fig. 2, these parts being separable from the reservoir as a unit, without liability of loss of any of the parts when the pump is removed for refilling the reservoir.

In order that the person who is refilling may be prevented from pouring so much liquid as to prevent the presence of an air chamber when the parts are reassembled, I provide a tube 49 within the reservoir and surrounding the pump, the lower end of the tube being open and extending sufficiently far downwardly within the reservoir so that when a person is filling the reservoir through the opening at the top and the tube 49, the liquid cannot rise around said tube 49 above its lower end. The proportion of this tube 49 relatively to the cubic contents of the reservoir is so designed as to insure a sufficient air space around the tube 49, above the liquid, to permit air to be compressed in that space to a sufficient degree to afterward force out all of the liquid. However, as hereinafter explained, air can be supplied at any time by means of the pump.

When the apparatus is to be used a person grasping the handle 26, and with one finger engaged with the hook 41, may carry the apparatus and direct the stream ordinarily wherever wanted. I provide means for preventing the operation of the trigger handle 41 when the extinguisher is connected to its supporting bracket, such as that indicated at 50 in Fig. 6. Said bracket is provided with holes 51 for screws by means of which it may be screwed in any suitable position that will render the ex-

tinguisher accessible. The foot 52 of the bracket is provided with a groove 53 which receives the bottom flange 11 of the reservoir. The upper end of the bracket is formed as an arm 54 of such width as to fit between one side of the stem of the handle 26 and the inner face of the trigger handle 41, and so fill that space that the trigger handle cannot be moved in a direction to cause the valve to open. One side of the arm 54 is recessed as at 55, and opposite said recess is a spring 56, the said recess 55 and the spring 56 presenting a yielding socket into which the stem of the handle 26 can be slipped and from which it can be quickly removed.

The upper end of the piston rod 25 is threaded as at 57, and the handle 26 is internally threaded to engage the threaded portion 57. A jam screw 58 in a vertical central aperture bears at its lower end against the top of the piston rod 25. This is to enable the handle to be adjusted very accurately on the piston rod. The reason for this is that the inclined ribs 30 must coact with the flanges 32 so that when the parts are turned to substantially the relative positions shown in Fig. 5, the stem 25 will be so forced downwardly that the stopper disk 27 will tightly close the bottom aperture.

When the apparatus is to be used it is first removed from the bracket as hereinbefore described and carried by means of the handle 26 and the trigger handle 41 operated by a finger of the carrying hand, while the other hand of the user can direct the stream by means of the nozzle 46, the air under compression in the chamber around tube 49 forcing the liquid up through the small pipe 43 and through the port 42 and out through the nozzle and tube. If additional internal pressure is needed, the operator simply turns the handle enough to release the ribs 30 from the locking flanges 32, after which the piston can be operated to force air down through the lower port, which air will of course rise through the liquid to the chamber around the tube 49. When the handle and piston rod are unlocked as just described and lifted, the packing 29 is of course removed from the rib 28 so that air can flow in through the port 33.

The bracket 50 is useful not only as a support for the extinguisher, but also as a valve-locking attachment if it is desired to transport the extinguisher. When the flange 11 is in the groove 53 and the stem of the handle is in the socket of the bracket hereinbefore described, the bracket is so connected to the extinguisher that it will remain attached thereto with its arm 54 locking the trigger handle 41 so that the valve 37 cannot be opened. In this condition the extinguisher and its locking attachment bracket may be safely transported, and even placed

on its side in the tool box of an automobile. From such place it can be removed and the bracket pulled away to release the valve handle to permit use of the extinguisher.

Having described my invention, I claim: 70

1. A fire extinguisher comprising a reservoir, a pump barrel in the reservoir, said pump barrel having its lower end closed and provided with a vertical aperture, a rib or shoulder being formed around the upper end of the aperture, a piston in the pump barrel, said piston having a stopper plug or disk adapted to be seated upon the said rib, a piston rod movable through the upper end of the reservoir, and means for locking the piston rod with the stopper plug or disk firmly seated upon said rib to prevent access of liquid from the reservoir into the pump barrel. 75

2. The combination with a fire extinguisher provided with a handle, and having an outlet valve provided with a movable operating handle, of a supporting bracket having an arm interposed between said handles when the extinguisher is supported by the bracket to prevent operation of said valve. 80

3. The combination with a fire extinguisher provided with a handle, and having an outlet valve provided with a movable operating handle, of a supporting bracket having an arm interposed between said handles when the extinguisher is supported by the bracket to prevent operation of said valve, said arm having a socket to receive the first mentioned handle. 85

4. The combination with a fire extinguisher provided with a handle, and having an outlet valve provided with a movable operating handle, of a supporting bracket having an arm interposed between said handles when the extinguisher is supported by the bracket to prevent operation of said valve, said arm having a socket to receive the first mentioned handle, and a spring plate normally closing said socket. 90

5. The combination with a fire extinguisher provided with a handle and having an outlet valve provided with a movable operating handle, of a supporting bracket having means at its lower end for supporting the extinguisher and having an arm at its upper end provided with an enlargement interposed between said handles when the extinguisher is supported by the bracket to prevent operation of said valve. 95

6. The combination with a fire extinguisher provided with a handle and having an outlet valve provided with a movable operating handle, of a supporting bracket having means at its lower end for supporting the extinguisher and having an arm at its upper end provided with an enlargement interposed between said handles when the extinguisher is supported by the bracket to prevent operation of said valve, said arm 100

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having a socket to receive the first mentioned handle.

7. The combination with a fire extinguisher provided with a handle and having
5 an outlet valve provided with a movable operating handle, of a supporting bracket having means at its lower end for supporting the extinguisher and having an arm at its
10 upper end provided with an enlargement interposed between said handles when the extinguisher is supported by the bracket to

prevent operation of said valve, said arm having a socket to receive the first mentioned handle, and a spring normally closing said socket.

In testimony whereof I have affixed my signature, in presence of two witnesses.

DANA ESTES.

Witnesses:

W. P. ABELL,
P. W. PEZZETTI.