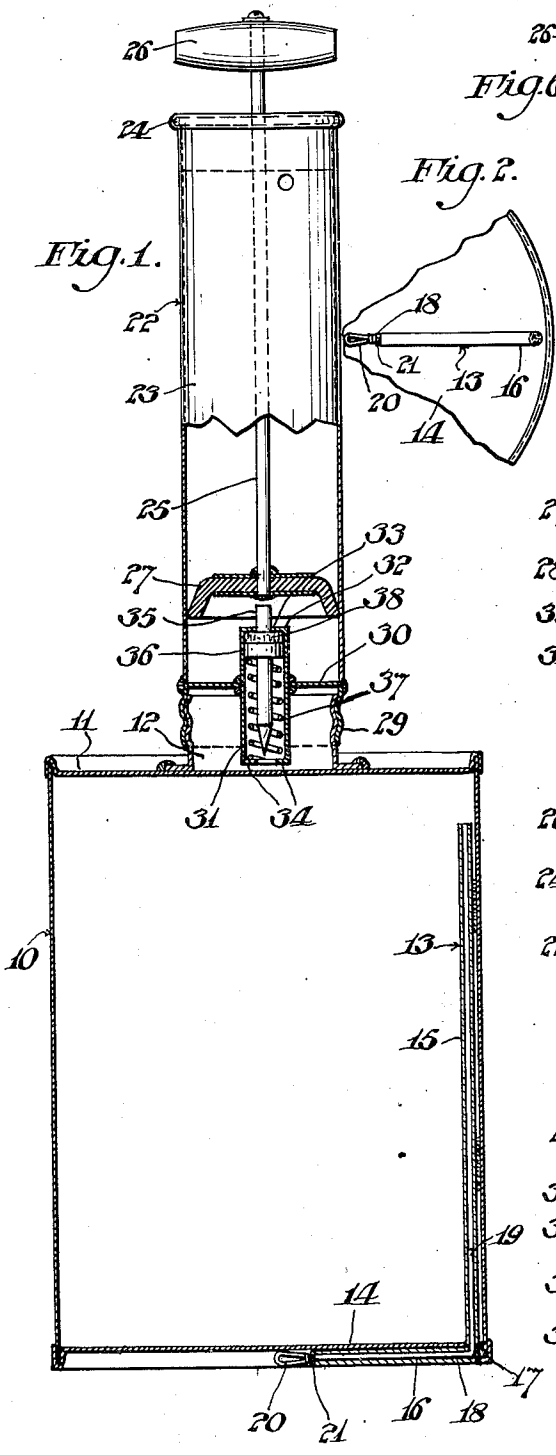
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FIRE EXTINGUISHER

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FIRE EXTINGUISHER

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12 Claims. (Cl. 299—96)

My invention relates to a new and useful fire extinguisher, the same being an improvement on my copending application filed November 14, 1938, Serial No. 240,329.

One of the objects of the present invention is to provide a portable hand operated fire extinguisher consisting of a sealed receptacle containing fire extinguishing fluid and a hand pump detachably connected to the receptacle and carrying a valve mechanism and a puncturing instrumentality.

Another object of this invention is to provide a fire extinguisher including a receptacle having an outlet tube with its outer end lying against the outside surface of the bottom end of the receptacle, said outer end of the tube being normally sealed and to be broken off to open the same.

Another object of the invention is to weaken the tube at the point it is desired that said tube shall break.

Another object of the invention is to assemble a wire in a portion of the outlet tube thereby to strengthen said tube and provide means which may be readily grasped for breaking the tube and for the latter purpose the outer end of the wire may have a loop formed thereon.

Another object of the invention is to provide a fire extinguisher consisting of the combination of a puncturable receptacle having an outlet, and a pump detachably connected to said receptacle and carrying means to be actuated by the operation of the pump to puncture or perforate the receptacle for providing an air inlet opening to said receptacle.

Another object of the invention is to provide a valve in combination with the puncturing intrumentality to prevent withdrawal of the air or sucking of the extinguisher fluid from the receptacle into the pump barrel.

Another object of the invention is to provide a fire extinguisher including, in combination, a receptacle for fluid, which receptacle has a puncturable area or wall surrounded by a neck to receive a pump carrying a connector to temporarily unite the receptacle and pump, said pump, and more particularly the connector, carrying a spring actuated valve and a puncturing instrumentality to be operated by the operations of the pump.

A further object of the invention is to construct the connector from a closure cap and mount therein a housing holding a spring actuated valve and a puncturing instrumentality, said connector being soldered or attached in any known manner to the end of the pump barrel.

A still further object of the invention is to utilize an ordinary hand pump with a connector attached to the outlet end and carrying a housing in which a perforator is slidably mounted so that one end protrudes from the housing which end, if found desirable, may have a head thereon, and is to be contacted by the pump plunger or stem thereof, said perforator carrying a collar against which bear a valve washer and one end of a spring.

With the above and other objects in view this invention consists of the details of construction and combination of elements hereinafter set forth and then designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same I will describe its construction in detail referring by numerals to the accompanying drawing forming a part hereof, in which—

Fig. 1 is a view partly in elevation and partly in section showing one embodiment of my invention.

Fig. 2 is a bottom plan or end view thereof.

Fig. 3 is a sectional view, partly in elevation, of the pump per se.

Fig. 4 is a sectional view of the connector showing the relation of the housing and illustrating the perforator with a head.

Fig. 5 is an outer end view thereof.

Fig. 6 is a view partly in section of a modification of pump construction.

Fig. 7 is an enlarged fragmentary sectional view of the receptacle and its outlet tube to show the weakened part thereof.

In carrying out my invention as herein embodied 10 represents a receptacle which, while it is generally made of tin or other similar metallic substance, may be of any other suitable material having at least one wall 11 that is puncturable by a pointed instrument when the latter is driven forward by the power of a person's arm. This wall 11 can be one of the usual end walls of a tin or other light weight metallic receptacle, it can be the end wall of a closure cap or lid, or it can be a plate of light weight metal set into or attached to any wall of the receptacle, which structures are well known in the can trade. The use of a separate plate as the puncturable wall has the advantage of using lighter material, which can be readily punctured, in connection with a receptacle having heavy or

thick walls or ones that cannot be pierced without cracking.

The receptacle shown herein for purposes of illustration is similar to those used for packing fruits, vegetables and the like, and for the objects of this invention a threaded neck 12 is secured to the puncturable wall 11 in any suitable and well known manner. It is obvious that any equivalent structure may be utilized such, for example, a neck formed integral with the wall 11 leaving an opening through the neck which is closed at the inner end by a plate. Such structures are well known.

To provide a proper outlet for the receptacle I utilize a tube 13 which projects through a wall 14, in the present instance the bottom end wall, of the receptacle. Preferably the inner portion 15 of the outlet tube extends lengthwise of the receptacle along one of its side walls to a location in proximity to the top end wall 11. This arrangement will cause the liquid to flow towards the open inner end of the outlet tube when the device is pointed upward or held in a position that the portion 15 of the tube 13 is in the then bottom location as will be apparent by reference to Fig. 2. For stability said inner portion 15 of the outlet tube may be soldered or otherwise fixed to the adjacent side wall of the receptacle.

The outer portion 16 of the outlet tube 13 is bent to lie against the bottom end wall 14 of the receptacle and is weakened at the elbow by a notch 17. A wire 18 may be inserted in the outer portion 16 and a part of the inner portion 15 of the tube 13 so that the inner end of said wire terminates a short distance beyond the elbow, as at 19, while the outer end of said wire protrudes from the tube and may have a loop 20 formed thereto. The wire strengthens the tube and prevents it from being deformed while being bent into position and also clears away any protuberances caused by the breaking off of the outer portion 16 of the tube which is done for a purpose to be presently explained.

The terminal of the outer portion 16 of the tube is closed at 21 by solder or other suitable sealing means and where the wire 18 is used the solder fixes said wire in place.

Whenever the apparatus is to be used, the outer portion 16 of the outlet tube 13 is pulled outward away from the receptacle wall 14 which will cause said outer portion to break off at the elbow, especially because of the weakened area 17, and provide an opened outlet. This may be done by grasping the tube portion 16 if no wire is used therein or by grasping the loop 20 when a wire is assembled in the tube. In the latter case, when the tube is broken the wire is pulled out of the inner portion of the tube and will clear away any protuberances caused by breaking the tube.

As illustrated herein a pump 22 is provided for detachable connection to the receptacle and comprises a barrel 23 having a head 24 at its outer end through which a stem 25 slides. On the outer end of the stem is a handle 26 and, as shown in Figs. 1 and 3, on the inner end of said stem is mounted the usual plunger 27 in the customary manner. In the construction shown in Fig. 6 the plunger is located a distance from the inner end of the stem to provide an extension or tappet 28.

At the inner end of the pump barrel is a screw threaded connector 29 for detachable application to the neck 12 for coupling the pump to the receptacle. As shown herein said connector may be in the form of a screw cap secured to the pump barrel by soldering sweating or in any other desirable manner or the threaded section might be an integral part of the barrel with a partition forming the end wall of such connector as is well known and in either case constituting a transverse wall 30.

A housing 31 is mounted in the wall 30 and said housing preferably comprises a tubular body with an inturned flange 32 at its inner end forming a valve seat on the inner surface and providing an opening 33 while at the outer end of said housing are lugs 34 projecting inwardly in the finished article for a purpose to be later described.

In that form of the device illustrating in Figs. 1 to 5 inclusive, a puncturing or perforating instrument or pin 35 is mounted in the housing 31 with an end projecting through the opening 33 and in the path of travel of the pump plunger and especially the stem 25. On the instrument 35 is a collar 36 to be engaged by one end of a coil spring 37, the other end of said spring resting on the lugs 34 so that the instrument is urged inwardly. On the upper or inner end of the instrument is mounted a valve or washer 38 in contact with the collar 36 between said collar and the valve seat provided by the inturned flange 32 so that said valve is normally urged towards said seat.

If desirable the inner end of the puncturing or perforating instrument may have a head 39 thereon, as shown in Fig. 4, and of course the outer end is pointed. The head in addition to providing a larger contact surface also acts as a stop to limit the outward movement of the instrument by engagement of the head with the wall 32.

In the modification illustrated in Fig. 6 a free valve or disc 38' is slidably mounted in the housing 31 for cooperation with the flange 32 or valve seat and a puncturing instrument or perforator 35', having a pointed shank and a head similar to a large tack or small nail, is likewise slidably assembled in the housing. Both the valve and perforator are urged inwardly by a spring 37', one end of which engages the underside of the head of the perforator and the other end rests against the lugs 34 of said housing 31. With this construction, when the pump plunger is forced inward the stem extension or tappet 28 passes through the hole 33 and contacts the valve 38' to force it and the perforator 35' against the action of the spring 37' for unseating the valve and moving the perforator a sufficient distance to cause the perforator to puncture a wall of the receptacle to which the pump is attached.

From the foregoing it will be apparent that a single pump, with the valve and perforating instrument thereon, can be employed in connection with any number of receptacles and therefore after the contents of one receptacle have been used a refill or new and full receptacle can be purchased at a low price and the pump connected thereto. Due to the above fact one pump may be retained for years even though a number of receptacles of extinguishing fluid have to be purchased.

To operate the extinguisher, the stem 25 and component parts is first given a sufficient inward movement under the impulse of a slightly extra manual pressure causing the perforator to be driven forward for puncturing one wall,

as 11, of the receptacle. The parts may be so arranged that this initial movement will cause the handle 26 to contact or closely approach the head 24 of the pump and thereafter the handle gripped so that the fingers of the operator function as spacers and prevent the perforator from being constantly driven into the perforation produced by it due to the fact that the handle 26 is not permitted to reach the head 24. Upon backward movement of the pump plunger the spring will retract the perforator leaving the perforation in the receptacle open for the passage of air. At the same time the valve will be seated to prevent any liquid running into the pump barrel. Thereafter the pump may be operated to furnish a supply of compressed air to the receptacle and the valve will prevent escape or return of the air to the pump.

Either before starting to pump air or after some pressure of air has been built up in the receptacle the outer portion 16 of the tube 13 is broken off to open the outlet. As long as air under pressure remains in the receptacle or is supplied thereto a continuous stream of extinguishing fluid will be expelled from the receptacle.

While it is necessary during operation to hold the apparatus so that the inner end of the inner portion 15 of the tube 13 is always in the fluid there is also the advantage that if all of the fluid is not used the device may be placed in an upright position, as in Fig. 1, after the air pressure has been reduced and the remaining fluid will not run out.

A fire extinguisher constructed as above described is inexpensive, compact, simple and efficient in operation and after the contents of the original receptacle have been used a new full one may be obtained at very reasonable cost. To place the full receptacle in condition for use it is only necessary to remove the pump from the old receptacle and unite it to the new one thus eliminating the necessity for refilling one receptacle from another or the removal of the pump for puncturing or perforating the receptacle walls.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having thus described my invention what I claim as new and useful is:

1. A fire extinguisher comprising a receptacle, an outlet tube having a portion located within the receptacle and another portion located on the outside of said receptacle, said outer portion being sealed and capable of being wholly broken off to provide an outlet from the receptacle, an air pump mounted on the receptacle, and means carried by the pump and actuated by the plunger thereof to puncture the receptacle for forming an inlet to said receptacle from the pump.

2. The structure in claim 1, in combination with a valve associated with the puncturing means to prevent flow of liquid from the receptacle to the pump.

3. The structure in claim 1, in combination with a wire fixed in the tube and having an end protruding from the outer end of said tube.

4. In a fire extinguisher, a receptacle, an outlet projecting through an end wall of said receptacle providing an inner portion within the receptacle and an outer portion bent over and lying against the outer surface of said end wall, said outer portion capable of being broken off, and means to seal the terminal end of said outer portion of the tube, in combination with a wire located in the outer portion and a part of the inner portion of the tube.

5. In a fire extinguisher, a receptacle, an outlet projecting through an end wall of said receptacle providing an inner portion within the receptacle and an outer portion bent over and lying against the outer surface of said end wall, said outer portion capable of being broken off, and means to seal the terminal end of said outer portion of the tube, in combination with a wire located in the outer portion and a part of the inner portion of the tube, said wire having an end protruding from the terminal end of the outer portion of the tube, and a loop formed on said protruding end of the wire.

6. A fire extinguisher comprising a receptacle having a normally sealed outlet at one end, a neck fixed to the other end of said receptacle, a pump including a barrel and a plunger and a stem by which said plunger may be operated, a connector carried by the barrel for coaction with the neck to attach the pump to the receptacle, a housing mounted on said connector and including a valve seat, a valve in said housing, a perforator also in the housing to be moved forwardly by the pump plunger mechanism for perforating a wall of the receptacle, and a spring to retract the perforator and seat the valve.

7. A fire extinguisher comprising a receptacle having a normally sealed outlet at one end, a neck fixed to the other end of said receptacle, a pump including a barrel and a plunger and a stem by which said plunger may be operated, a connector carried by the barrel for coaction with the neck to attach the pump to the receptacle, a housing mounted on said connector and including a valve seat, a perforator slidably mounted in said housing with the inner end of said perforator projecting into the pump barrel in endwise alignment with the stem to be moved forwardly by said stem, a collar on said perforator, a valve carried by the perforator, and a spring to retract the perforator and seat the valve.

8. The structure in claim 7 wherein a head is formed on the inner end of the perforator.

9. In a fire extinguisher, a hand operated air pump including a barrel and a plunger and a stem by which said plunger may be operated, a screw threaded connector carried by the outlet end of the pump barrel and including a transverse wall, a housing fixed in said transverse wall and comprising a tubular body and an inturned flange at the inner end of said body to provide a valve seat and form an opening and lugs at the outer end of said body, a perforator slidably mounted in the housing with the inner end of said perforator extending through the opening, a collar on the perforator, a valve mounted on said perforator between the collar and the seat, and a spring in the housing engaging the collar and lugs to urge the perforator and valve inwardly.

10. A fire extinguisher comprising a pump having a valve controlled outlet, a spring actuated perforator in said outlet adapted to be moved forwardly by the actuation of the operating mechanism of said pump, a connector on the pump, a normally sealed receptacle, and means on said receptacle with which the connector coacts to detachably connect the pump to the receptacle.

11. A fire extinguisher comprising a small portable normally closed receptacle having a

sealed outlet at one end, an air pump removably mounted on the opposite end of said receptacle, means interposed between the pump and receptacle and arranged to be actuated by the operating mechanism of said pump while said pump and receptacle are in assembled relation to puncture the receptacle and thereby provide a communication between the pump and the receptacle, and a valve associated with the puncturing means and also interposed between the pump and receptacle.

12. A fire extinguisher comprising a unit consisting of a receptacle having a normally sealed outlet at one end and a neck fixed to the other end of said receptacle, a second unit consisting of a pump including a barrel with plunger mechanism and a connector on the pump barrel for coaction with the neck to detachably join the two units, a housing mounted on one of said units and located at the joint between the two units when said units are assembled together, a valve seat in said housing, a valve also within the housing coacting with the valve seat, a perforator in the housing movable forwardly by the pump plunger mechanism for perforating a wall of said receptacle, and a spring to retract the perforator and seat the valve.

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