Aug. 21, 1945. R. C. IDDINGS ET AL 2,383,129

FIRE EXTINGUISHER

Original Filed March 9, 1942 2 Sheets-Sheet 1

Fig. 2

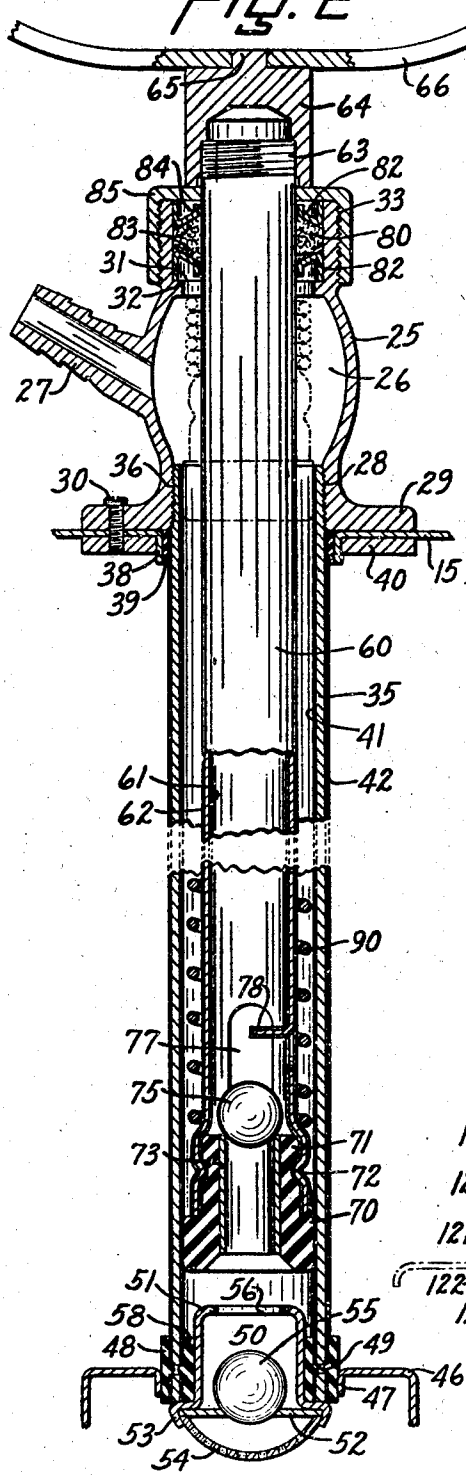
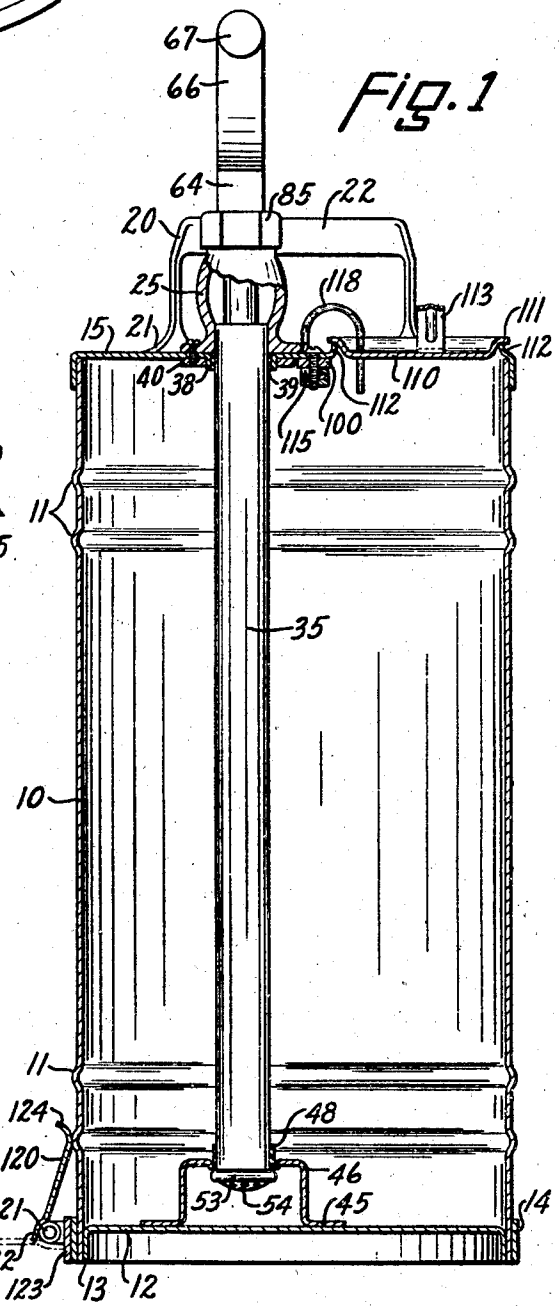


Fig. 1



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Original Filed March 9, 1942 2 Sheets-Sheet 2

Fig. 3

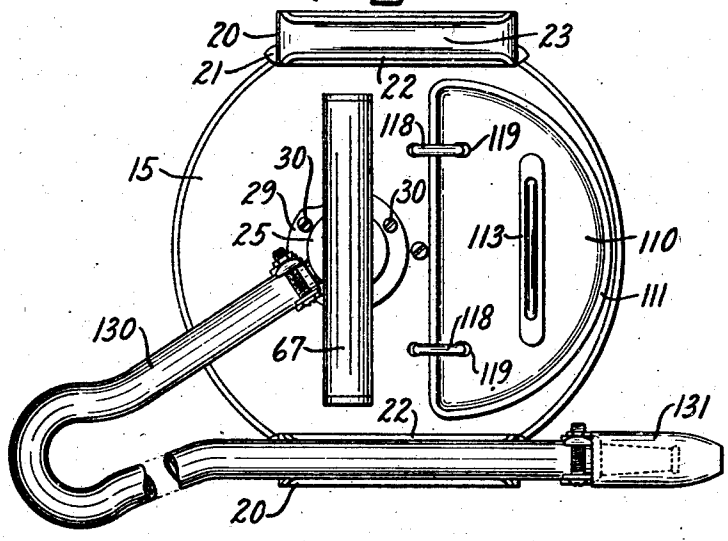
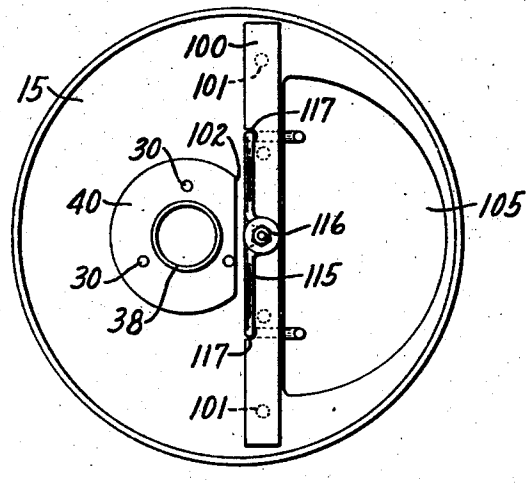


Fig. 4



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UNITED STATES PATENT OFFICE

2,383,129

FIRE EXTINGUISHER

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Continuation of application Serial No. 433,842, March 9, 1942. This application July 29, 1944, Serial No. 547,173

8 Claims. (Cl. 169—33)

This invention relates to fire extinguishers of the liquid pump type.

It is the principal object of the invention to provide a portable fire extinguisher of the liquid pump type which can be manufactured easily and efficiently, which is made of readily available and inexpensive materials, which is readily portable, and which operates rapidly and effectively to discharge the fire extinguishing liquid in the form of a spray as desired.

It is a further object to provide an extinguisher capable of receiving severe and rough treatment, which will not be adversely affected as to its operability even when allowed to stand idle over long periods of time, and which eliminates the requirement for the use of any substantial quantities of corrosition resisting material such as brass or the like.

It is a further object to provide a liquid pump construction which is made primarily of steel or other ferrous metal the surface of which is fully protected against corrosition or rusting by a coating of enamel or the like in which the enameled parts are properly supported against such possible mishandling as might result in the fracture or damage of the enamel coating.

It is also an object to provide a fire extinguisher in which certain parts such as the pump cylinder and piston are given a coating of non-rusting material such as enamel and in which the assembled extinguisher is properly protected at all of its exposed parts and at the joints against rust and corrosion and in which proper working contact of the pump mechanism with the enameled surface of the pump cylinder is provided for.

It is a further object to provide a fire extinguisher having a liquid pump in which the pump cylinder is anchored at both ends to be securely supported against movement such as might result in misalignment or damage to the surface thereof against which the piston moves, and in which the piston is guided in its movement and prevented from being accidentally removed from the cylinder, so that throughout its range of operation it remains properly guided and supported against misalignment or damage to either itself or to the cylinder.

It is a still further object to provide a fire extinguisher having a carrying handle at the upper end provided with an open curved top, the extinguisher having an elongated flexible hose carrying a nozzle at one end, the flexible portion of the hose being adapted to be received in the open curved top of the handle and yieldingly retained therein, and in which the upper end is also arranged with an enlarged filling opening adjacent to the side thereof covered by a removable closure member of simple and yet easily workable construction.

Other objects and advantages will be apparent from the accompanying drawings, the following description and the appended claims.

In the drawings,

Fig. 1 is a view in vertical section through a fire extinguisher constructed in accordance with the present invention;

Fig. 2 is a broken sectional view on an enlarged scale showing the pump mechanism of the extinguisher;

Fig. 3 is a top plan view looking at the upper end of the extinguisher; and

Fig. 4 is an inverted plan view looking upwardly at the under side of the top cover of the extinguisher.

This application is a continuation of copending application Serial No. 433,842, filed March 9, 1942.

Heretofore in the production of fire extinguishers, and particularly extinguishers of the liquid pump type, it has been customary to provide a non-rusting casing, made out of brass or other similar non-ferrous material, and to fabricate the pump and its associated operating mechanism largely of similar non-ferrous metal. Such construction was utilized to overcome the effect of the water or other liquid utilized in the extinguisher and to prevent the rusting action which would take place over a period of time.

In accordance with the present invention a fire extinguisher is provided in which the use of brass and non-ferrous metals is practically eliminated, and in which at most only a small quantity of such metal is utilized. The extinguisher is fully protected against rusting or other corrosition and deterioration, and is adapted to have long life with assurance of being in proper operative condition at all times. It is simple in construction, relatively light weight, and is arranged for ready portability so that it may be handled when filled with liquid, having adequate strength to resist the normal shocks and rough usage encountered in normal operation.

The extinguisher is further constructed with a filling opening of substantial size located adjacent the periphery of the casing, so that if desired the extinguisher may be filled by dipping the casing into a body of water. Simple and sturdy hinge means are provided for guiding and supporting the closure for the opening, making it possible to quickly assemble, release, or repair the closure in the event that that is necessary.

Likewise all parts of the extinguisher construction are adapted for ready replacement or repair, in the event that such becomes necessary.

Referring to the drawings which disclose a preferred embodiment of the invention, the extinguisher casing is shown at 10 preferably in the form of a generally cylindrical shell having a series of rolled beads 11 formed therein for the purpose of adding strength. The tank is preferably of hot galvanized steel, satisfactory results having been secured using steel of 20 gauge. While the shell may be riveted, it is preferred to weld the overlapping edges.

A bottom end closure 12 is received within the one end and stands above the bottom edge of the casing forming a peripheral flange 13. To further strengthen the bottom of the extinguisher, a band 14 is fastened in place on the outer periphery. Similarly a top closure 15 is received over the top end of the casing, both end closures and band being preferably welded or otherwise suitably secured to the ends of the casing. This welding of the ends upon the sealed body is preferably effected prior to the hot galvanizing treatment so that when galvanized, the entire exposed surface of the casing including its end walls, will be effectively covered and protected.

In order to make the extinguisher readily portable, one and preferably a pair of carrying handles 20 is provided in the form of steel straps of inverted U shape which have lower ends 21 shaped to conform with the outer surface of the casing and welded thereto. The straps extend upwardly and are provided with a central portion permanently curved in a generally semi-cylindrical form. This provides a hand grip portion 22 having a conveniently rounded lower surface to fit the hand of the user. The edges of the grip are turned inwardly toward each other on the top of the grip, forming an elongated recess or groove 23, the purpose of which will be hereinafter described. Where two such handles are provided, they are located on diametrically opposite sides of the extinguisher as shown in Fig. 3.

The extinguisher comprises a liquid pump which is preferably arranged for a two-way action, that is, to provide for pressure delivery of the liquid on each up and down stroke thereof. The pump comprises a discharge fitting 25 which has an enlarged discharge chamber 26 formed therein which communicates with the discharge nipple 27, formed as an integral part of the fitting, the nipple being adapted to receive a flexible discharge hose. The fitting 25 is threaded at its lower end as shown at 28, and is provided with an outwardly extending flange 29 which seats upon and is demountably fastened to the top surface of the end cover 15 by screws 30. Further the upper end of the fitting is counterbored as indicated at 31 and is formed with a shoulder 32 which is for the purpose of receiving the packing members to be hereinafter described. The fitting is likewise provided with external threads 33 at its upper end.

This fitting is suitably made of a cast iron construction which is then subjected to a sherardizing treatment in order to render it rustproof and prevent any deterioration as a result of prolonged contact with the liquid. In this way the use of brass or other non-ferrous metal is avoided and a satisfactory corrosion resistant construction is provided.

The pump cylinder is shown at 35 and is formed of a steel tube the upper end of which is threaded as shown at 36 to be received within the threaded portion 28 of the discharge fitting. The tube 35 is given a coating of vitreous enamel on both its inner and outer surface, being dipped in the enamel so that all portions of the tube, including the ends but not the threaded portion 36, are fully coated and protected. The threaded part may be covered by a suitable fitting during the dipping or the threaded end may be wiped clean, to keep the threaded section clear of enamel.

The top closure member 15 is preferably formed with an inwardly extending annular flange 38, and a rubber sleeve 39 is received around the external periphery of the tube to guide the same through the flange 38 and to prevent contact between the flange and the enamel surface. To further strengthen and provide adequate support for the pump cylinder a ring 40 of relatively heavy metal material is secured in place on the underside of the cover, and in position to surround the depending flange 38, the screws 30 extending into the ring. This construction therefore provides for reinforcement of the end wall of the casing and provides a firm yet somewhat flexible support for the upper end of the pump cylinder. If desired a quantity of liquid cement may be applied over the rubber sleeve 39 in order to completely protect and seal the threaded portion of the pump cylinder, and to prevent any possibility of the liquid contents of the extinguisher from coming in contact therewith. The enamel coating on the inside and outside of the cylinder is indicated at 41 and 42, respectively.

It is found to be important in such an extinguisher construction to provide for some flexing or yielding movement of the cylinder but to properly guide and support the same so that it is not subject to misalignment, nor to strains which might be imposed thereupon to cause objectionable bending or fracture of the enameled surfaces. The upper end of the cylinder is guided and supported as described above, and in some cases this top support may be sufficiently firm and stable, leaving the lower end of the cylinder free of contact with the interior of the casing. Preferably, however, an additional support is provided which is located remotely from the top support and adjacent the bottom of the extinguisher casing so that the two spaced supports will provide the proper guiding and reinforcing action, permitting a limited relative movement of the pump in the casing, as in the event of the casing receiving a severe blow, but preventing the transmission of shocks or severe strains to the pump, and avoiding damage thereto which might result from any misalignment of the structure.

For this purpose the lower end closure member 12 is provided with a bracket 45 which is welded to the inner face of the closure and provided with an upwardly extending portion 46. A central annular downturned section 47 provides a guiding and supporting area, and a rubber sleeve 48 is received between the flange 47 and the lower end of the pump cylinder 35. Such sleeve is thus resiliently held in position between the pump cylinder and the bracket, avoiding direct contact between the metal and the enameled surface, but serves to yieldably guide and support the cylinder from the remote end of the casing. If desired the lower end of the cylinder may have a series of perforations 49 therein into which the rubber sleeve 48 is pressed to yieldably retain the same on the end of the cylinder.

Likewise carried by the lower end of the pump cylinder 35 is the lower pump valve assembly indicated generally at 50. This construction is

preferably assembled initially as a separate unit, comprising a recessed cup-like member 51, a valve disc or seat 52 which is held to the member 51 by means of the overturned flange 53, and a strainer 54 likewise held in the assembly by the flange 53. The disc 52 has a central aperture which forms a seat for the valve body shown at 55, the recessed part of the member 51 being open upwardly as shown at 56, but having an aperture small enough to prevent passage of the valve body therethrough.

The recessed member 51, the valve disc 52 and the strainer 54 are preferably made of non-rusting material such as brass or the like, and being relatively light in weight, require only a small amount of such material. The valve body 55 is formed of an inert material, the preferred material for this purpose being glass, a glass marble having been found to be entirely satisfactory.

The valve unit is assembled with the body 55 in place therein and a rubber ring 58 is received over the recessed member 51, the rubber having a tendency to closely and tightly adhere to the cylindrical brass surface with which it is in contact. Rubber cement may then be applied over the sleeve 58 and the unit then pressed into place in the lower end of the pump cylinder, the assembly being additionally held in place by the action of the rubber material 58 tending to squeeze into the apertures 49, so that with the setting of the adhesive, the entire unit is firmly and securely retained in position in the end of the pump cylinder.

The pump piston is shown at 60 as comprising a hollow steel piston rod likewise having an inner enameled coating 61 and an outer enameled coating 62. The upper end of the rod is threaded as shown at 63 where it is received within a steel hub 64 which in turn is provided with an upstanding neck 65 over which there is received the steel yoke 66 forming the handle for operating the pump. The end of the extension 65 is spun over the yoke 66 to securely retain the handle in place upon the upper end of the piston. A wooden grip 67 provides for convenient manual operation of the pump.

At its lower end the piston rod carries a piston indicated at 70. This piston, being operable against the enameled inner surface of the cylinder 35, is formed of a material which will not scratch or disrupt the smooth surface of the enamel, but which in contact therewith will provide for an effective close fitting and pumping action. A suitable material has been found to be a rubber material, such as the synthetic rubbers which have good properties of flexibility, long life, and resistance to decomposition under exposure to air and sunlight, and which likewise are not adversely affected by oil or grease which may be applied to the packing around the piston rod for lubricating the same. Similar synthetic rubber material may be utilized throughout in place of natural rubber.

The piston is formed with an upwardly extending neck portion 71 which is received within the hollow piston rod, the rod having an inwardly recessed annular portion 72 over which the neck 71 is pressed to yieldably retain the same in position. For this purpose also the piston is provided with a central sleeve 73 of brass, which forcibly compresses the rubber in the region of the recess 72, to prevent undesired withdrawal of the piston from the rod during operation. Likewise the sleeve 73 forms a seat for the upper valve body 75. This body, like the valve body 55, is formed of an inert material having a specific gravity greater than that of the fluid in which it operates, satisfactory results having been secured with the use of a glass sphere such as a marble, for this purpose.

The piston rod is formed with a series of elongated slots 77 to prevent any obstruction to the upward flow of liquid. The rod is also formed with a struck-out portion, the material being bent at right angles to form a projection or ear 78 extending inwardly of the piston rod, providing a stop against which the valve body 75 operates in the actuation of the pump, the valve thus traveling between its seated or closed position as shown in Fig. 2 and its open position where it is against the ear 78. It will be understood that such slots and ear are formed in the piston rod prior to the enameling thereof so that all surfaces are fully covered and protected by the enamel coating. Further the valve body is relatively small in weight, and its action in striking against the ear 78 or against the enameled inner surface of the tube is not sufficiently severe to cause damage to or fracture of the enamel surface.

Suitable packing is provided around the piston rod, such packing being shown at 80, positioned within counterbore 31. In order to provide a tight packing gland, a pair of annular wedge shaped members 82 are provided which are conveniently made by stamping operations from brass or other suitable non-corrosive and non-rusting material. Members 82 are identical, and are assembled oppositely, the inner one against shoulder 32. They are formed with sloping surfaces 83 as indicated to force the packing material against the piston rod, and have an inner annular face 84 of slightly greater diameter than the piston rod, to give proper clearance with respect thereto. By tightening down on packing nut 85 received over the threaded end portion 33 of the discharge fitting the packing is held forcibly against the piston rod but there is no contact of the metal parts against the enameled piston rod.

It will thus be seen that upon actuation of the pump handle 67, and during an upward stroke of the piston, upper valve 75 seats in its closed position and lower valve 55 is opened to provide for the flow of liquid into the space beneath piston 70. Meanwhile liquid above the piston is being lifted into the discharge chamber 26, against the air cushion provided by the air trapped in the hollow piston rod above apertures 77. This provides a pressure discharge stroke so that liquid is expelled through the discharge nipple 27. On the down stroke, the lower valve 55 closes to prevent escape of the liquid from the cylinder, and upper valve 75 opens to permit the liquid displaced by the piston and piston rod to pass upwardly and to be similarly discharged, against the pressure cushion provided by the trapped column of air.

It will be noted that the piston rod is guided and supported at its upper end by reason of the packing 80, and at its lower end through contact of the piston 70 with the walls of the pump cylinder. It will also be seen that as the handle is lifted upwardly, the points of this support approach each other until in the uppermost position, the piston 70 is adjacent the upper end of the cylinder 35. Means are provided for preventing accidental raising of the piston rod to such

an extent as to withdraw the pump piston from the cylinder and into the chamber 26. Such means comprises a coiled spring member 90 which is received loosely around the piston rod, and supported against the pump plunger 70. Such spring is preferably of steel and is provided with a suitable non-corrosive and non-rusting coating so that it can remain in the body of the liquid without deterioration. Satisfactory results have been secured using a cadmium plated steel spring.

The spring 90 is of such size that it comes into contact with the lower side of shoulder 32 of the discharge fitting before the piston 70 has reached the end of its upward travel. As shown in dotted lines in Fig. 2, initial contact is made when the piston is still well within the cylinder. There is thus a preliminary checking of the upward movement upon which further compression of the spring is stopped without however causing objectionable shock. The spring characteristic is preferably such that even when fully compressed, it still has sufficient length to keep the plunger in engagement with the cylinder; hence even with a maximum upward movement of the pump handle, it is not possible to actually disengage the plunger from the end of the cylinder.

It is desirable to avoid possibility of such withdrawal of the piston, as the delay incident to replacing it in the cylinder might be material in the operation of the pump under emergency conditions. It is further desirable to prevent such a condition which if it occurs may be the cause of damage to the pump or the cylinder, resulting from misalignment of the parts. It will be seen that with the plunger in its uppermost position, the points at which the piston rod is guided are still spaced a substantial distance from each other, and thus even with pressure applied to the handle in a direction normal to the usual reciprocating motion, the pump will not be misaligned and will not result in placing unusual or excessive stress upon the piston rod or forcing the same into contact with the metal parts of the packing gland. It will further be apparent that possibility of damage to the cylinder itself, and to the upper end thereof is avoided in the same manner.

Inasmuch as the casing is made of relatively light weight material, and because the operation of the pump places substantial strain upon the end member, such upper end 15 is preferably strengthened and reinforced. For this purpose a steel strap 100 is fixed to the underside of the closure by suitable means such as spotwelds indicated at 101. The pump is located eccentrically of the extinguisher casing, and the strap is preferably also located somewhat eccentrically on the opposite side of the center, extending across the entire width of the end member. As shown, the one edge 102 of the reinforcing disc 40 may be trimmed off if desired to provide for the proper location of these parts, depending upon the actual physical dimensions of the structure.

The filling opening for the extinguisher is indicated at 105, and as shown has one surface which closely approaches the periphery of the casing. This makes it possible to fill the extinguisher by means of dipping the entire casing into a shallow body of liquid, if that should be desired.

The closure for the filling opening is in the form of a sheet metal piece 110 having suitable peripheral flanges 111 which are adapted to seat upon upturned flanges 112 formed in the end member. A handle 113 is provided which is secured to the closure at opposite ends by means of welding or the like.

In order to provide for the hinge action of the closure, a simple and effective construction is provided comprising a bent wire 115 which is looped to be received under a bolt 116 threaded into and through the reinforcing strap 100, on the underside of the end member. The wire extends in opposite directions from the central looped portion and passes upwardly through spaced apertures in the end closure 15, the reinforcing strap being notched as shown at 117 to provide for such upward passage. The two ends of the wire are formed with loop portions 118 of relatively large radius, and pass downwardly into the body of the tank, through enlarged apertures 119 formed in the closure 110. In this way the closure is guided and supported for lifting or rotating hinge-like movement from its closed position to an open position where it provides an opening of substantial size for the filling of the casing. It will likewise be apparent that if desired the wire member could be carried by the closure and operate through apertures in the end member. The construction shown is desired for the reason that it permits of the assembly of the entire casing construction including the reinforcing strap, prior to the galvanizing operation. In this way the construction of the assembled casing is first galvanized, the wire and the closure cover being separately galvanized. Thereafter the closure parts are assembled, the wire being bolted to the reinforcing bar after the latter has been welded in place and fully protected by galvanizing. It will thus be apparent that the galvanizing and protecting surface is not disrupted by the necessity to carry out any welding operation subsequent to the application of the galvanizing.

In order to provide a foot rest for holding the casing in proper operative position, a curved plate 120 is provided which is secured to the lower edge of the casing by means of a hinge member 121. This hinge is preferably of the piano hinge type, the plate 120 having a flat end 122 adapted to be brought against the plate 123 secured to band 14, in the lowered or operative position to prevent further downward swinging thereof.

The plate 120 also has a downwardly curved lip 124 which in the upper position provides a convenient means for contact with the toe, providing for readily moving the plate to its lower or operative position. And when lowered, it will be seen that the lip portion 124 extends to substantially the same ground level as the flange 13, this being desirable where the extinguisher is being used upon soft ground or the like, to assure that the lip 124 will penetrate into the ground to substantially the same extent as the main base flange of the extinguisher.

A flexible discharge hose 130 is fastened to the discharge nipple 27, the hose preferably having a considerable length to permit of its use at a point some distance removed from the actual location of the extinguisher. This hose may be conveniently coiled around the casing and is preferably of such external diameter as to be yieldably received within the upwardly opening groove 23. The end of the hose is provided with a discharge nozzle 131, and in order to properly retain the hose in convenient position, the flexible portion adjacent the discharge nozzle may be pressed into the groove 23, in the manner indicated in Fig. 3. In this position the looped hose may be kept in proper position, and the nozzle guarded

against picking up dirt or any foreign matter which would interfere with its proper discharge, the hose at all times being readily available and immediately removable as a result of the yielding action of the hose itself in being withdrawn from the handle grip. Thus a simple and effective support for the hose is provided while assuring a firm and solid handle construction for the handling of the extinguisher casing.

As an example of an extinguisher constructed to contain five gallons of liquid, the entire assembly has a weight when empty of approximately fifteen pounds, and of this weight, only four ounces are represented by brass or other corrosion resisting materials.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A fire extinguisher of the character described comprising a casing for receiving a quantity of fire extinguishing liquid, a discharge fitting fastened to one end of said casing, a metal pump cylinder extending through the end of said casing and having one end received within said fitting, said cylinder having an inner and an outer coating of enamel, means on the opposite end of said casing for supporting and securing the other end of said cylinder against movement relative to the casing, resilient protective members interposed between the enameled surface of said cylinder and said casing at each end thereof to prevent direct contact therebetween, a hollow metal piston rod extending through said discharge fitting, and means to operate said piston rod from the exterior of said casing, said piston rod also having a rust resisting coating of enamel on its inner and outer surfaces.

2. A fire extinguisher of the character described comprising a casing for receiving a quantity of fire extinguishing liquid, a discharge fitting having an enlarged discharge chamber fastened to one end of said casing, means for reinforcing the end of said casing to reduce objectionable flexing thereof in use, a pump cylinder having its upper end extending through said casing and received within said fitting, said pump cylinder having a coating of enamel on the inner and outer surfaces thereof, a resilient member interposed between said enameled surface of said cylinder and the wall of said casing, a metal bracket carried by the opposite end of said casing and adapted to receive and support the inner end of said cylinder in spaced relation above the bottom wall of said casing, a resilient member interposed between said bracket and said enameled surface of said cylinder, a piston rod extending through said fitting to the outer surface of said casing, and means to operate said piston rod in said cylinder to discharge fluid upwardly into and through said discharge chamber.

3. A fire extinguisher of the character described comprising a casing for receiving a quantity of fire extinguishing liquid, a discharge fitting carried by one end of said casing on the outside thereof, a pump cylinder passing through said end of the casing and received within said fitting, a bracket carried by the opposite end of said casing and receiving the lower end of said cylinder therein to guide and secure the same against movement, a valve assembly received within the lower end of said cylinder and including an inwardly extending metal chamber, a resilient sleeve for securing said chamber within the lower end of said cylinder in spaced relation with respect to the inner wall of said cylinder, and a valve body of inert material supported within said valve chamber, and a piston rod operable in said cylinder and extending outwardly through the top of said discharge fitting.

4. A fire extinguisher of the character described comprising a casing for receiving a quantity of fire extinguishing liquid, a discharge fitting carried by one end of said casing on the outside thereof, a pump cylinder passing through said end of the casing and received within said fitting, said cylinder having an inner and an outer enameled coating, a bracket carried by the opposite end of said casing and receiving the lower end of said cylinder therein to guide and secure the same against movement, a valve assembly received within the lower end of said cylinder and including an inwardly extending metal chamber, a resilient sleeve for securing said chamber within the lower end of said cylinder in spaced relation with respect to the inner wall of said cylinder, and a valve body of inert material supported within said valve chamber, and a piston rod operable in said cylinder and extending outwardly through the top of said discharge fitting.

5. A fire extinguisher of the character described comprising a casing for receiving a quantity of fire extinguishing liquid, a discharge fitting fastened to one end of said casing, a pump cylinder secured to said fitting, said discharge fitting having a discharge chamber above said cylinder of larger diameter than said cylinder, a piston rod extending upwardly through an opening in said fitting, said cylinder and said piston rod having a rust resisting surface coating of enamel thereon, a packing gland for said piston rod located above said fitting opening and having metal members spaced from said piston rod for pressing packing material into yieldable sealing contact with said enamel coated surface, a piston carried by said piston rod in operative relation with said cylinder, said discharge chamber having a length axially of said cylinder sufficient to receive said entire piston therein allowing withdrawal thereof from said cylinder, and yieldable means operable between said piston and the wall of said discharge chamber for limiting the withdrawing movement of said piston rod to maintain said piston in proper operative engagement in said cylinder preventing the cocking of said piston rod and resulting objectionable contact of the enamel coated surface thereof with the metal members of said packing gland.

6. A fire extinguisher of the character described comprising a generally cylindrical casing for receiving a quantity of fire extinguishing liquid and having an end wall of sheet metal construction, said end wall of said casing having a filling opening of substantial size therein, said end wall being adapted to support a pump thereon having a piston rod extending outwardly through said end wall, means to operate said piston rod from the exterior of said casing to develop a discharge pressure for said liquid, a relatively stiff reinforcing member secured to the end wall of said casing out of alignment with said pump and said filling opening to prevent objectionable flexing of said end wall during operation of said pump, a closure for said filling opening, and means providing for the hinging action of said closure from

closed to open position while preventing removal thereof from said casing including spaced loop members engaging in apertures formed in said closure, and means for supporting said loop members on said relatively stiff reinforcing member to maintain the desired spacing thereof during operation of said pump means.

7. A fire extinguisher of the character described comprising a casing for receiving a quantity of fire extinguishing liquid, a discharge fitting fastened to one end of said casing, a pump cylinder connected to said fitting, a hollow metal piston rod extending through said fitting, means to operate said piston rod from the exterior of said casing, said hollow metal piston rod having a smooth rust resisting coating of enamel on its inner and outer surfaces, the lower end of said piston rod being open and having a recessed portion therein, a piston of resilient material engaging the wall of said cylinder and having a neck portion received inwardly of the open end of said piston rod, and a sleeve member extending internally of said piston forming a passage for the flow of liquid therethrough and compressing said resilient material against said recessed portion to retain said piston in operative position on the lower end of said enameled piston rod.

8. A fire extinguisher as defined in claim 7 in which a valve body is carried on the upper end of said sleeve member, the sleeve forming a valve seat for the valve body in the operation of the pump.

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