

July 21, 1942.

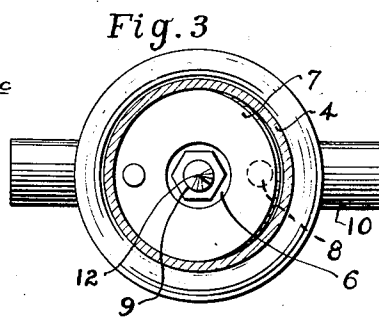
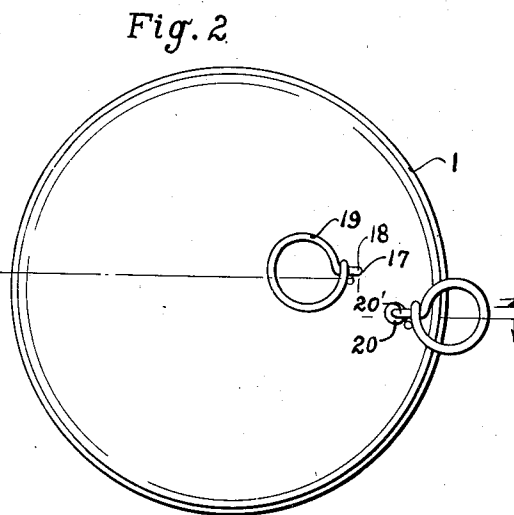
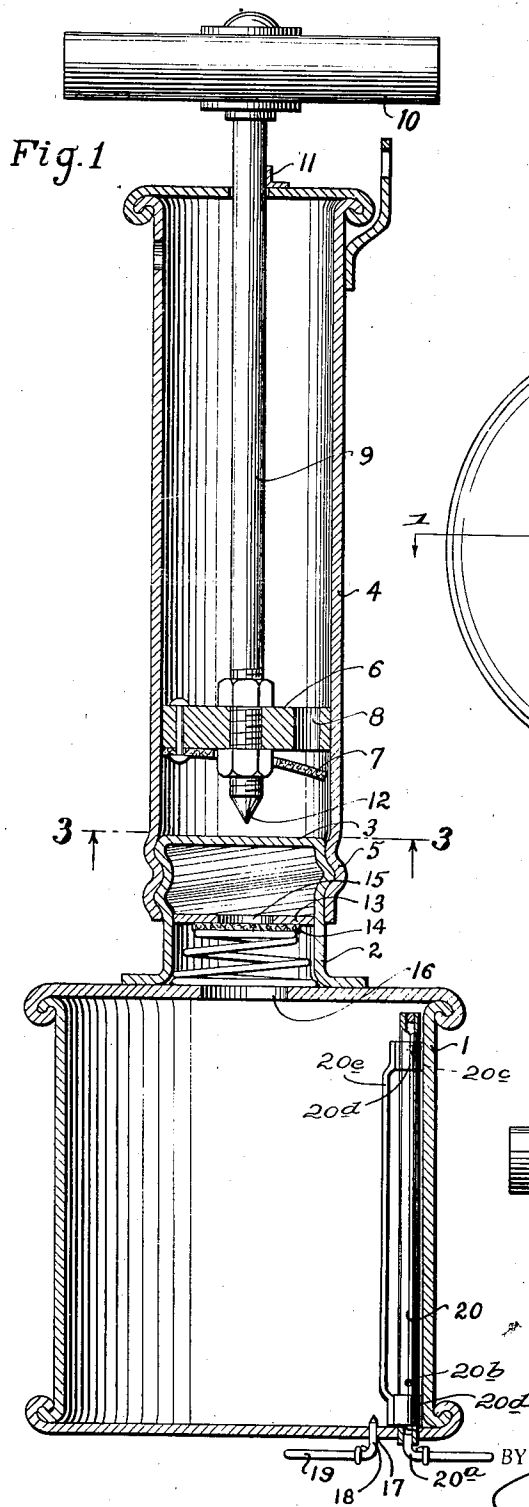
W. D. KEITH

2,290,594

FIRE EXTINGUISHER

Filed Dec. 1, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4

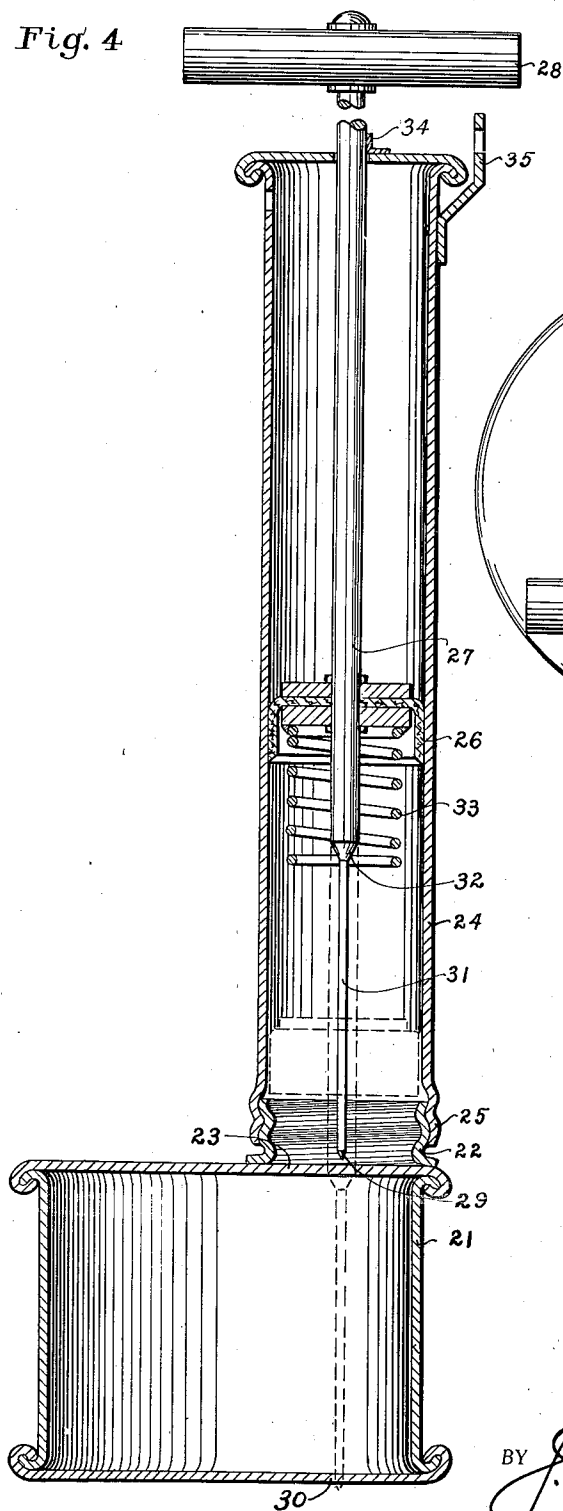
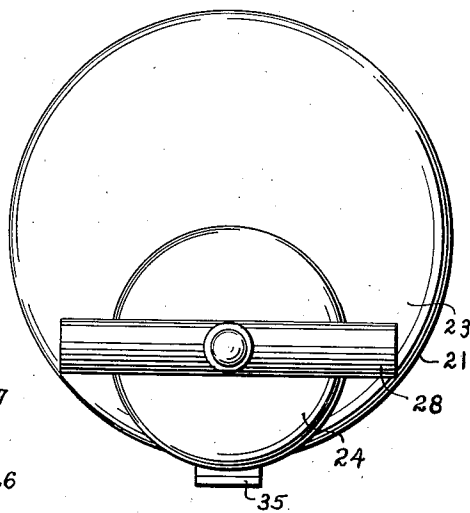


Fig. 5



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UNITED STATES PATENT OFFICE

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FIRE EXTINGUISHER

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Application December 1, 1938, Serial No. 243,447

6 Claims. (Cl. 299—96)

This invention relates to an improvement in fire extinguishers.

The object of the invention is to improve the construction of fire extinguishers, so as to render them simple in construction, positive in operation, fool-proof and easy to operate and capable of being rebuilt at low cost.

Another object of the invention is to enclose the fire extinguishing fluid within a sealed container capable of being punctured by the operation of the device for directing the fluid into the fire, the opening means being self-contained with the device.

A preferred embodiment of this invention together with a modification thereof, is illustrated in the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view through the complete device on the line 1—1 of Fig. 2;

Fig. 2 is a bottom plan view thereof;

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a longitudinal sectional view partly in elevation of a modified form of extinguisher; and

Fig. 5 is a top plan view thereof.

Referring to the form of the invention, shown in Figs. 1 to 3, the numeral 1 designates a container which is sealed and may contain a fire extinguishing fluid, such as carbon tetrachloride, although any suitable fluid may be used therein. The container 1 is provided with a threaded neck 2 on the top thereof, the upper end of which neck is sealed at 3. This sealed wall 3 is of such thickness that it may be readily and easily punctured.

A pump is adapted to be secured to the container 1 and is shown as comprising a pump cylinder 4, the lower end portion of which is screw-threaded at 5, to be screwed onto the threaded neck 2 of the container. The cylinder 4 has a plunger 6 operatively mounted therein, and this plunger 6 carries a check valve 7 over an orifice 8 in the plunger to permit air to pass through the latter as it is reciprocated lengthwise of the cylinder 4, whereby to pump such air through the lower portion of the cylinder.

The plunger 6 is secured to an end of a connecting rod 9 which extends lengthwise through the cylinder and has a handle 10 on the opposite end thereof from the plunger to permit of manual reciprocating movement where the connecting rod 9 passes through the end wall of the cylinder. A safety seal 11 may be provided temporarily attached, as by solder, to the connecting rod externally of the wall, and if desired, also to the end wall, to prevent accidental downward

movement of the connecting rod before its time of use. This safety seal 11 may be readily removed from the connecting rod when it is desired to use the fire extinguisher.

The lower end of the connecting rod 9, below the plunger 6, is pointed in prong shape as shown at 11, in position to puncture the fragile end wall or seal 3 of the neck 2 of the container to permit air to be pumped into the container.

The container neck 2 may be provided with a perforated partition 13 therein against which is seated a spring-pressed check valve 14 normally closing an orifice 15 in the partition to prevent the escape of fluid from within the container, but which check valve will open automatically in response to the pressure of the air pumped into the neck 2 of the container to admit this air to pass into the container through an opening 16 in the top thereof within the confines of the neck. After the air is thus pumped into the container, the check valve 14 will close automatically and hold the air pressure therein.

For discharging the container, an orifice 17 is provided in the bottom thereof normally closed by a pin or wire 18 of small diameter and held in place by soldering material, sealing wax, or other means, so as to be capable of ready removal when it is desired to use the fire extinguisher. The wire 18 or other sealing means preferably is provided with a hand-hold 19 capable of grasping for the removal of the seal from the perforation 17 and opening the latter to discharge the contents of the can. It will be apparent that the air pumped into the container 1 under pressure will act on the fluid contained therein to eject it through the perforation 17, discharging a continuous stream of fluid on the fire or desired point. The pressure of the container will be held and maintained by the check valves 7 and 14, but additional pressure may be built up by successive strokes of the plunger 6.

Mounted in the container beside the opening 17 is a tube 20 closed at its bottom outlet end by a removable pin 20^a. The tube 20 extends from the bottom of the container to a point near the top of the container and has its upper end closed. The tube has side openings 20^b and 20^c near the bottom and top respectively of the container, and sleeves 20^d are freely slidable on the tube 20 but having sufficient close fit therewith to close alternately the openings 20^b and 20^c. The sleeves 20^d are held in spaced relation by a bar 20^e.

These sleeves form valves to regulate the discharge through the openings to permit discharge alternately through the openings when the ex-

tinguisher is held either downward or upward. Thus, when turned downward, the opening 20^b will be uncovered for discharge therethrough, and when turned upward, the opening 20^c will be uncovered for discharge, the other opening being closed in either position.

The tube 20 may be used for discharge without the opening 17, or the latter may be provided also as an emergency discharge if the tube 20 or its openings becomes clogged.

The container 1 is sealed preferably against unauthorized access or leakage and so as to prevent evaporation, disintegration or tampering with the contents. Thus the owner of the extinguisher can be assured of a full supply when needed. By making the container of relatively thin sheet metal, when it becomes exhausted, it may be discarded and replaced with a sealed container of fluid, at relatively low cost.

A modification of the invention is shown in Figs. 4 and 5, in which provision is made for the use of a container having both top and bottom sides sealed but capable of being punctured by a single stroke of the plunger rod.

In this form of the invention, the container is designated 21 and has a threaded neck 22, while the portion of the top of the container within the neck is closed and sealed as indicated at 23. The pump cylinder is designated 24 and has a threaded lower end portion 25 adapted to be screwed onto the threaded neck 22 in the manner described above. Within the pump cylinder 24 is a plunger 26 ported or otherwise constructed to pump air thereby when reciprocating, said plunger being mounted on a plunger rod 27 extending lengthwise through the upper end portion of the cylinder with a handle 28 on the outer end thereof for reciprocating said rod. The lower end portion of the plunger rod 27 is pointed at 29, so as to pass through and puncture the sealed wall portion 23 and also the bottom of the container which is designated 30. It is preferable to have the lower portion of the plunger 27 reduced in diameter, as shown at 31, providing a conical connection 32 with the major portion of the plunger rod 27. This permits a small hole to be formed in the bottom 30 of the container and an appreciably larger hole to be punctured in the top wall portion 23, when the plunger is moved to the extent indicated by dotted lines in Fig. 4 where the conical portion 32 passes into the top wall portion 23 and enlarges the punctured hole therein. This allows a large supply of air to be pumped quickly and readily into the container, thus creating a relatively high pressure for the ejection of the fluid from the relatively smaller perforation in the bottom of the container.

Secured to the underside of the plunger 26 is a coiled spring 33 of sufficient length to bear yieldingly upon the wall portion 23 when the plunger is in its lowermost position. Thus the pointed end 29 and conical portion 32 may function as valves for the respective perforations when the plunger is moved to its extreme lower position, as shown in dotted lines, stopping the flow of fluid from the container when desired.

The neck 22 preferably is positioned at a side of the container so that the plunger will puncture the outer hole near the edge of the bottom wall and allow most of the fluid to be pumped from the container when the extinguisher is held either in a downward position or in a horizontal position. If it is desired to release the air pressure from the container after only a part of the contents have been discharged this may be done by reversing

the position of the extinguisher from that shown in Fig. 5, so that the perforations will be above the contents to permit the escape of the air from the hole punctured in the bottom.

The plunger rod 27 has a safety seal 34 secured thereto, similar to the seal 11 described above to prevent accidental puncturing of the container until its use is desired.

A perforated ear 35 is secured to a side of the cylinder 24 adjacent the upper end thereof, by which the extinguisher may be hung in an upright position on a nail, pin, or the like, ready for use.

The simple construction of the extinguisher enables it to be manufactured at small cost and yet it is capable of instant use when desired.

I claim:

1. A fire extinguisher comprising a container having a neck, a pump cylinder having screw-threaded connection with said neck, a plunger mounted in said cylinder and having a plunger rod connected therewith and extending in opposite directions therefrom, one end portion of said plunger rod having a handle connected therewith, the opposite end portion of said plunger rod having a pointed end in position to pierce an aligned portion of the container, check valve means within the neck of the container in position to prevent the escape of fluid from the container after piercing of the neck by the plunger, said container having an orifice in a side wall thereof for discharge of the contents, and sealing means for said orifice.

2. A fire extinguisher comprising a container having a neck, and having means for forming an outlet therefor, a pump cylinder having a detachable connection with said neck, a plunger operatively mounted in said cylinder, said neck having a sealed end thereof toward the cylinder constructed for piercing to provide fluid communication from the pump cylinder into the container and create pressure therein upon operation of the plunger, and a check-valve between the sealed end and the container to prevent the escape of fluid after piercing of the neck.

3. A fire extinguisher comprising a container having a neck, and having means for forming an outlet therefor, a pump cylinder having a detachable connection with said neck, a plunger operatively mounted in said cylinder, said neck having a sealed end thereof toward the cylinder constructed for piercing to provide fluid communication from the pump cylinder into the container and create pressure therein upon operation of the plunger, and a check-valve between the sealed end and the container to prevent the escape of fluid after piercing of the neck, and means projecting from the plunger toward the container for puncturing the sealed end of the neck.

4. A fire extinguisher comprising a container having means for forming an outlet therefor, a pump cylinder connected with said container, a pump plunger mounted in the cylinder and having means connected therewith in position to pierce an aligned portion of the container and provide fluid communication from the pump cylinder into the container and create pressure therein upon operation of the pump plunger, and check valve means within the container adjacent said piercing portion thereof in position to seal the space between the body of the container and said piercing portion and prevent

the escape of fluid from the container after the piercing of the container by said means.

5. A fire extinguisher comprising a container having a discharge tube connected with a wall thereof and extending into said container, said tube having inlets at spaced points thereof, sleeve valves slidably mounted on the tube in positions for closing said inlets, and means for connecting said sleeve valves rigidly together for alternate opening and closing movements thereof.

6. In a fire extinguisher, a reservoir for containing liquid, a pump having a plunger rod and a plunger therein and connected with the reservoir in position to pump fluid under pres-

sure into said reservoir, means attached to the lower end of said pump plunger for piercing said reservoir, said reservoir having an outlet in one side thereof to permit outflow of fluid from said reservoir in one angular position thereof, an outlet tube connected with said outlet and extending to the opposite side of the reservoir, said outlet tube having openings therein adjacent opposite end portions thereof, and valve means for said openings, whereby fluid may be forced from said reservoir in different angular positions thereof.

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