Apr. 24, 1923. 1,452,657

L. ROBINSON

FIRE EXTINGUISHER

Filed April 1, 1921

Fig. 1.

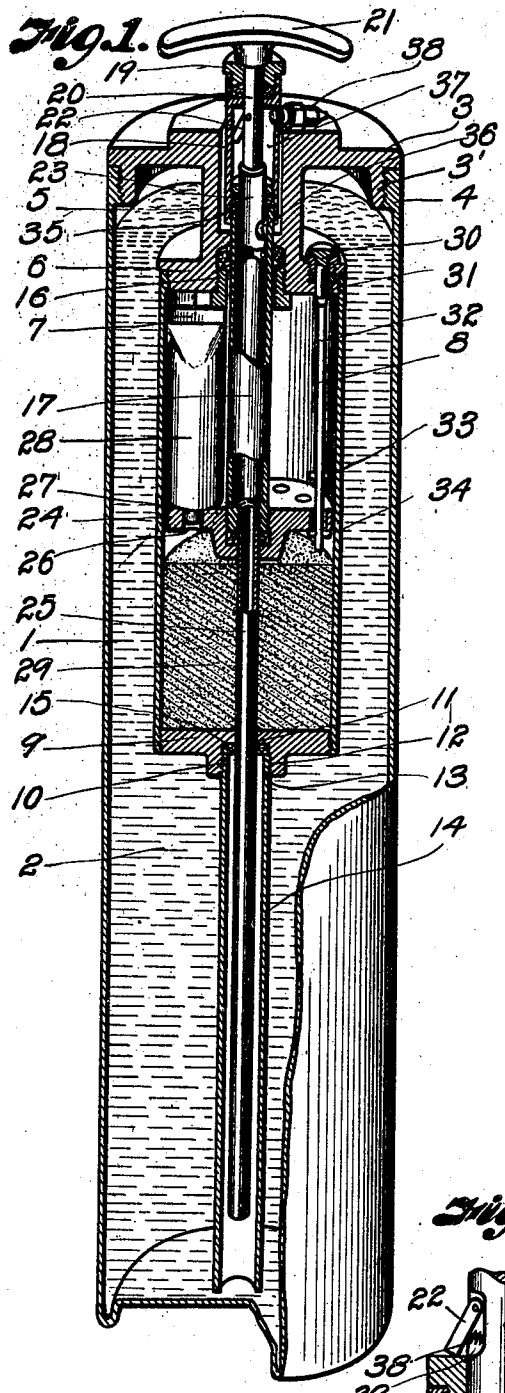


Fig. 2.

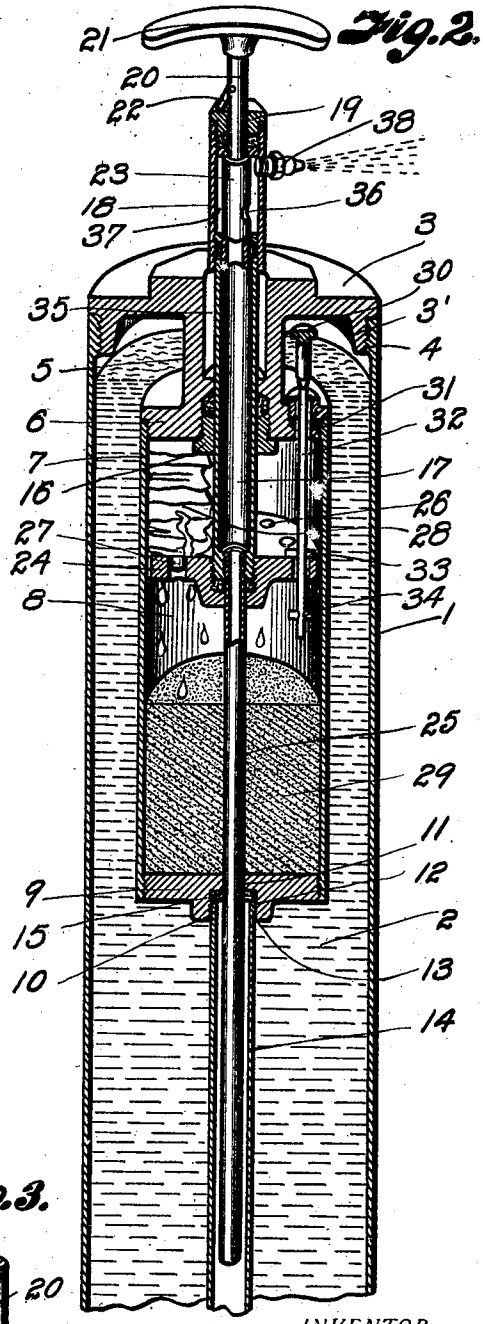
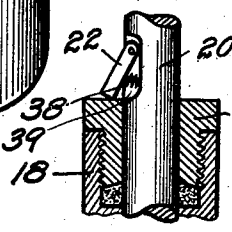


Fig. 3.



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UNITED STATES PATENT OFFICE.

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FIRE EXTINGUISHER.

Application filed April 1, 1921. Serial No. 457,629.

To all whom it may concern:

Be it known that I, LUTHER ROBINSON, a citizen of the United States, residing at Eldorado, in the county of Butler and State of Kansas, have invented certain new and useful Improvements in Fire Extinguishers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to fire extinguishers and one of the objects of the invention is to provide a novel, effective construction of fire extinguisher, the mechanism of which is so arranged that a suitable liquid may be stored within a main reservoir to be acted upon by gaseous pressure generated in a gas generating reservoir, the liberation of certain chemicals to generate the gaseous pressure being under the control of the operator so that it will exert pressure upon the liquid to force it from the container to be sprayed over the flame.

Carbon tetrachloride may be used in the main cylinder for extinguishing the fire and a suitble gas generating chemical may be employed in the gas generating chamber within the reservoir. I prefer to utilize soda and diluted sulphuric acid. The soda may be contained within the gas generating chamber in solid form but the sulphuric acid may be held in a disruptible container which, under the control of the operator, may be disrupted or broken so that the contents of the container may be discharged over the soda to combine therewith and generate gas which may escape from the gas generating chamber to exert pressure upon the fire extinguishing liquid, such as the carbon tetrachloride and force it through a nozzle, from which it may be directed upon the blaze.

I am aware that carbon tetrachloride has been employed hitherto in connection with fire extinguishers in which the liquid was ejected from the reservoir by means of pressure generated from a pump piston. A mechanical pump is objectionable for use in connection with a light, portable fire extinguisher because the operator's attention is so closely confined to the pumping action that the stream of fire extinguishing liquid or vapor is liable to be misdirected.

With my invention, just as soon as the acid envelope is disrupted or broken and the gas generates, pressure is immediately applied to the liquid so that the operator's attention can then be confined to directing the stream onto the blaze.

In the drawings,

Fig. 1 is a vertical, longitudinal, sectional view through a fire extinguisher constructed in accordance with my invention, the parts being in normal position.

Fig. 2 is a similar view showing the acid container disrupted with the parts in operative position, and

Fig. 3 is a detail perspective view of the pull rod showing a detent for preventing pumping action of the rod.

Referring now to the drawings by numerals of reference:

1 designates a cylindrical container in which may be a suitable liquid 2, such as carbon tetrachloride. One end of the cylinder 1 is closed by a cover or head 3 which has a threaded flange 3′ engaging the threaded portion 4 of the cover. The central portion of the cover 3 is provided with a cylinder 5, extending into the container 1 and provided with a circumferential flange 6, to which is fastened the cylindrical wall 7 of the gas forming chamber 8. The bottom of the cylindrical wall 7 is closed by a plug or end 9, having a threaded portion 10 surrounding an opening 11 and having an internally threaded portion 12 to receive the threaded portion 13 of a fixed tube 14, which extends practically to the closed end of the container 1. Said tube also serves as a packing gland for the packing 15 about the opening 11.

Within the cylindrical portion or neck 5 of the part 2 is a packing gland 16, which surrounds a tubular member 17, extending through said gland which is connected at its

upper end to a tubular casing or head 18, which is closed by a threaded plug 19.

Projecting through the plug 19 is a pull rod 20, provided with a handle 21 and having a spring-pressed detent or lock 22 which, in one position, is adapted to lie within the part 18 and when in another position, adapted to engage over the top of the plug 19, as seen in Fig. 2. The function of the detent will be explained hereinafter.

The tube 17 is slidable in the part 18 and it is connected by a tubular connector 23 to the stem 20. The tubular connector 23 has an end slightly greater in diameter than the stem 20, which is adapted to abut against the end of the connector 18, as will be presently described.

Within the gas generating chamber 8 is a piston 24, fastened to the tube 18, the lower end of which carries a tube 25, extending through the opening 11 in the part 9 and into the fixed tube 14. The piston 24 is provided with a plurality of openings 26, into one of which a projecting portion 27 of a disruptible, acid-containing envelope or container 28 may fit, the opposite end being adapted to bear against the gland 16 and the flange 6. The piston 24 and the flange 6 constitute clutching jaws or disrupting members for the envelope 28 so that when one of the jaws moves toward the other, the envelope, which may be of easily disruptible material such as lead or the like, usually employed in tubes of like character, may be easily disrupted. The holes 26 permit the released acid to pass into the lower portion of the gas generating chamber to come in contact with a second chemical, preferably soda, as indicated at 29, so that gas will be generated therein. The piston 24 is of less diameter than the interior diameter of the gas forming chamber so that the acid may also flow down over the perimeter thereof.

There is a valve 30 for normally closing the escape port 31 for the gas generating chamber and said valve is provided with a stem 32, projecting through one of the openings 26 and provided with jaw or piston-engaging portions 33 and 34.

When the parts are all assembled, as shown in Fig. 1 and it is desired to cause the device to function, the operator may grasp the handle 21 and pull upwardly thereon. The first pull will result in causing the connector 23 to have its end contact with the top of the part 18, sliding it out of its recess 35 in the cover 3, the operation causing the opening 36 for the part 23 to be positioned in the space 37 so that it can discharge thereinto and allow the liquid to escape through the diffuser nozzle 38 in the member 18. Upon the pull of the handle 21, the follower or piston 24 will move toward the abutment or jaw 6, causing the envelope 28 containing the acid to be crushed or disrupted so that the acid will feed onto the soda 29, causing the gas to be generated therein.

At the same upward movement of the follower or piston 24, it will come in contact with the stop 33, raising the valve 30 off its seat to allow the gas to escape on top of the liquid forced into the tube 14 through the pipe 25, through the tubular member 17, through 18, through openings 36 and through escape port 31.

Any tendency of the operator to pump the handle 21 will be eliminated by the detent 22 which, as soon as the handle is pulled out to the position shown in Fig. 2, will swing outwardly under the action of its spring 38′ and prevent a return movement of the stem 20 until the detent 22 is forcibly moved back into its recess 39 against the action of the spring 38′, this being done only upon reloading the device.

It will be apparent that the gas thus generated will forcibly empty the container 1 by gas pressure so that the operator need only confine his attention to directing the stream from 38 onto the fire.

The envelope will maintain the acid in a proper condition practically indefinitely so that there will be no danger of deterioration causing failure of the apparatus so long as the parts are held in the position shown in Fig. 1, the device being ready for use just as soon as the envelope is disrupted by pulling on the handle 21.

I prefer to use a lead envelope because it is not easily attacked by sulphuric acid and because a flexible disruptible envelope can be advantageously used instead of glass, the glass being of such nature that it will have a tendency to stop up the openings or the ducts through which the liquid is to be admitted.

It will be apparent from the foregoing that a device constructed in accordance with my invention will be simple in operation, easy to manufacture and will readily perform the function for which it is intended.

What I claim and desire to secure by Letters Patent is:

A fire extinguisher comprising a liquid container, a gas generating chamber rigid with the container and provided with a stuffing box, a longitudinally movable tube in the stuffing box having one end accessible from the exterior of the container and the other end extending into the chamber, a piston carried by the tube within the chamber, a liquid-containing envelope normally located between the piston and one end of the chamber whereby a movement of the piston in one direction will disrupt the tube to discharge its contents into the chamber, a second chemical within the chamber adapt-

ed to combine with the first to generate gas, the chamber being adapted to communicate with the main body of the container through an opening therein whereby the generated gas can exert pressure against the liquid in the container, a tube effecting communication between one end of the first named tube and the main portion of the container outside of the chamber, and a nozzle connected to the other end of the tube for discharging the liquid from the container to atmosphere.

In testimony whereof I affix my signature.

LUTHER ROBINSON.