March 13, 1945. J. SPILLANE 2,371,364

FIRE EXTINGUISHER

Filed Dec. 28, 1942

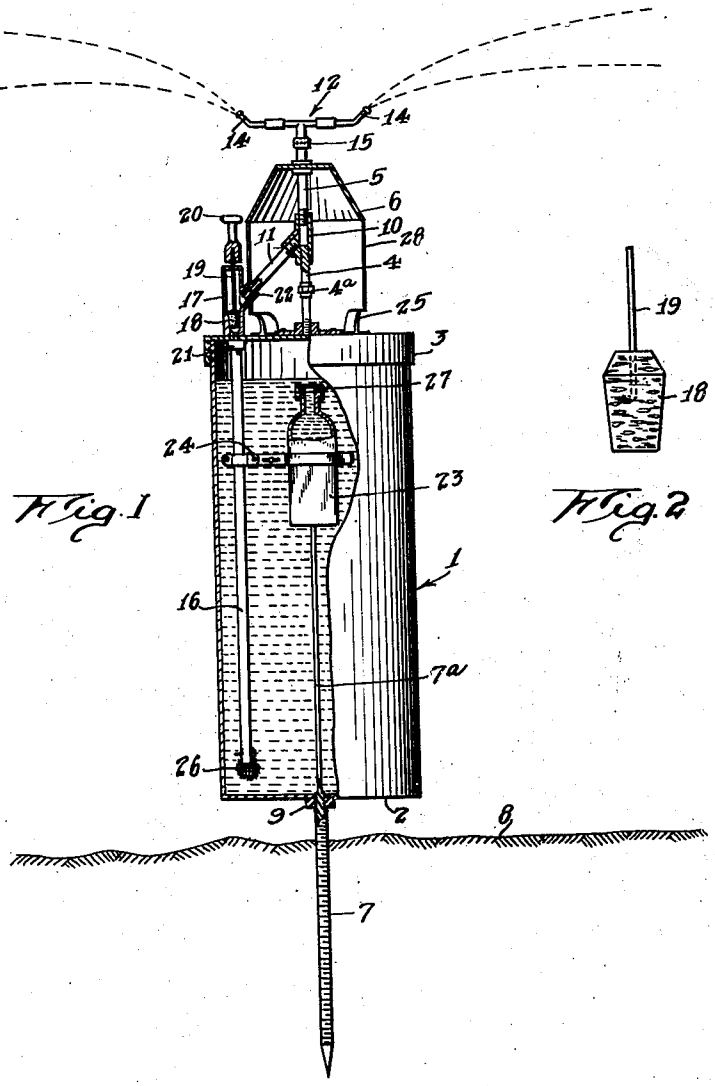


Fig. 1

Fig. 2

Inventor

James Spillane

By Lyon & Lyon Attorneys

Patented Mar. 13, 1945

2,371,364

UNITED STATES PATENT OFFICE

2,371,364

FIRE EXTINGUISHER

James Spiliane, Los Angeles, Calif.

Application December 28, 1942, Serial No. 470,351

4 Claims. (Cl. 169—32)

This invention relates to apparatus for extinguishing fires, and, while the invention may be practised for extinguishing indoor or outdoor fires, in the following specification an adaptation is described of the invention employed for extinguishing forest, brush, or grain field fires. Every year millions of dollars in values are lost by reason of such uncontrollable fires.

One of the objects of the invention is to provide fire extinguishing apparatus that will be brought automatically into operation by dropping the same onto the ground or a floor.

The apparatus includes a container for the extinguishing fluid, or fluids, and means for distributing the extinguisher fluid; and one of my objects is to provide means for normally confining the fluid so as to enable the container to be shipped or carried, but operating in such a way that the fluid will be automatically liberated to the distributing means as soon as the container is dropped adjacent the fire.

A further object of the invention is to provide a fire extinguisher having a container adapted to be dropped from a point above a brush fire, forest fire, or grain field fire, having means for insuring that it will light on the ground and hold itself in an upright position so as to facilitate efficient operation of the distributing means for the extinguisher fluid.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce an efficient fire extinguisher.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:

Figure 1 is a vertical section through a fire extinguisher embodying my invention.

Figure 2 is a side elevation of a closure, partly broken away, that may be employed for retaining the fire extinguisher fluid or compound within the container.

In practising the invention to produce an extinguisher for an outdoor fire, I employ a container 1 that may consist of a cylinder that is capable of resisting considerable internal pressure. For this purpose, I may employ a piece of iron pipe with a head 2 welded into it, and provided with a removable screw cap 3.

This container is intended to be dropped from aloft from an aeroplane flying over the fire, and is provided with means enabling it to light in a substantially upright position and maintain itself in that position while discharging the fire extinguishing fluid, fluids, or compound.

For this purpose, the cap 3 may be provided with a post 4, preferably supporting a tubular extension 5 that supports a small retarder 6, giving the effect of an "umbrella" or parachute to maintain the top end uppermost as the container falls. A long spur or spear 7 fastened in the bottom head becomes impaled in the earth below the ground level indicated by the line 8. This spear may be threaded through an ordinary nut 9 welded onto the bottom head 2.

The tube 5 is secured in a Y-fitting 10 screwed onto post 4 that cooperates with an inclined pipe 11 to form a duct for conducting the extinguisher fluid to a distributor nozzle 12—preferably in the form of a rotary sprinkler head or Barker's mill that rotates itself by the reaction of the streams issuing from backwardly turned tips 14. This nozzle is mounted on a swivel connection, preferably in the form of a ball bearing 15. Any kind of a centrifugal nozzle can be employed for this purpose. This type of nozzle has the advantage that it will throw a spray to a considerable distance so as to affect a considerable zone of the fire. The tips 14 preferably incline upwardly to increase the range of the spray.

Communication from the interior of the container to the nozzle is normally closed through the medium of a valve or closure, so mounted that it will automatically admit the fluid to the nozzle when pressure develops within the container. In other words, the closure is pressure-controlled. For this purpose, I provide an uptake pipe 16 that leads up from a point near the bottom of the container, with its upper end secured in a valve chest 17 that is attached to the upper head 3 of the container. This valve may be of any suitable construction so that it is opened automatically by the pressure, and in the present instance it consists of a plug 18. This closure or plug is seated tight in the lower end of the chest 17, and preferably carries a stem 19 that is guided to the outside through a hole in the upper end of the chest, and has a handle or knob 20 for operating it.

The upper end of the uptake pipe 16 may be threaded into a nut 21 welded to the underside of the top head 3. When pressure develops in the container, this pressure blows out the plug valve 18, lodging it in the upper end of the chest and thereby opening communication through a Y-port 22 into the pipe 11.

Any suitable means may be provided for developing the pressure in the container. For this purpose, I prefer to provide two separated elements that will react when mixed, to develop pressure and at the same time form an extinguisher fluid or compound. In the present instance, I substantially fill the container with a water solution of sodium bicarbonate, and support a quantity of acid, such as sulphuric acid, in such a way that a frangible retaining member will break when the container strikes, thereby mixing these ingredients.

In this way, carbon dioxide gas is generated, that is, the water becomes carbonated water and CO_2 gas rises to the space under the head, thereby forcing the carbonated water up the uptake pipe and blowing out the valve **18** to deliver the carbonated water to the sprinkler head.

The sulphuric acid is preferably carried in a frangible glass bottle **23** held in an adjustable bracket **24** clamped on the uptake pipe **16**, the bottom of the bottle resting or substantially resting on the upper end of a stem **7***a* that extends up from the upper end of the spear. When the spear **7** strikes the ground, the impact forces the stem **7***a* upward sufficiently to break the bottle **23**. The bottle is preferably well immersed in the bicarbonate solution so as to insure a quick and thorough dispersion of the acid through the bicarbonate solution.

In order to assist in keeping the container with its axis substantially vertical as it falls, and also to increase accuracy in its fall to the target, I may provide vanes **25** on the upper head **3** having slight pitch. These vanes preferably project to or beyond the edge of the head, and the passing slip stream of air during the descent striking against them will give sufficient rotation to the container to accomplish this.

The mouth of the uptake pipe may be provided with a hood **26** of wire gauze to prevent any broken glass from passing up.

The bottle **23**, of course, has a permanent closure **27** that is impervious to the acid within the bottle.

The edges of the parachute may be held down if desired by guy wire braces **28** that may be attached to the vanes **25**.

The threads of the rod or spear **7** may extend all the way down to its tapered point. This facilitates removal of the device from a log that might be struck, or from hard ground by rotating it on its axis.

A union **4***a* is provided in the post **4** for facilitating the assembly of the post and its connections.

In the operation of this extinguisher, the carbonated water is of course dispersed over a large area due to the centrifugal force developed by the rotary sprinkler. This water rapidly gives off carbon dioxide gas that blankets the fire and excludes the air that would support the combustion. It also wets down a large area to reduce its inflammability.

Many other embodiments of the invention may be resorted to without departing from the spirit of the invention.

What I claim is:

1. In a device of the class described, the combination of a container adapted to contain a water solution, a second container of a frangible character contained within the first container and adapted to confine a second solution which upon mixing with the first fluid will form a gas to produce pressure within the first container, a spear carried by the first container and adapted to be embedded in a surface on the dropping of the device and when so embedded to maintain the first container in upright position, means between the spear and the second container and operable to break the second container upon impact of the spear with the surface whereby the second solution is released, a sprinkler device carried at the end of the container opposite the spear, and a valved conduit connecting the first container with the sprinkler to conduct the solution through the sprinkler under the pressure of the gas developed in the container.

2. In a device of the class described, the combination of a container adapted to contain a water solution of an alkali carbonate, a second container mounted within the first container and adapted to contain a solution of an acid which, upon mixing with the first solution, will form a gas to produce a pressure within the container, a spear carried by the container and adapted to be embedded in a surface on the dropping of the device and when so embedded to maintain the first container in an upright position, means between the spear and the second container and operable to release the acid from the second container upon impact of the spear with the said surface, a sprinkler carried by the container, a conduit connecting the sprinkler with the interior of the first container for conducting the solution under pressure to the sprinkler.

3. In a device of the class described, the combination of a container adapted to contain a water solution of an alkali carbonate, a second container mounted within the first container and adapted to contain a solution of an acid which, upon mixing with the first solution, will form a gas to produce a pressure within the container, a spear carried by the container and adapted to be embedded in a surface on the dropping of the device and when so embedded to maintain the first container in an upright position, means between the spear and the second container and operable to release the acid from the second container upon impact of the spear with the said surface, a sprinkler carried by the container, a conduit connecting the sprinkler with the interior of the first container for conducting the solution under pressure to the sprinkler, and a releasable valve means mounted in the conduit and adapted to open under the pressure of the gas withtin the container to permit flow of the solution from the container to the sprinkling device.

4. In a device of the class described, the combination of a container adapted to contain a water solution of an alkali carbonate, a second container adapted to enclose an acid mounted within the first container, a spear carried by the first container and adapted to be embedded in a surface on the dropping of the device and when so embedded to maintain the first container in an upright position, means between the spear and the second container and operable to release the acid from the second container upon impact of the spear with the surface, a sprinkler device carried by the container, a conduit connecting the interior of the container with the sprinkling device for delivery of liquid from the interior of the container to the sprinkling device, and means carried by the container adapted to aid in the maintaining of the device in upright position when dropped.

JAMES SPILLANE.