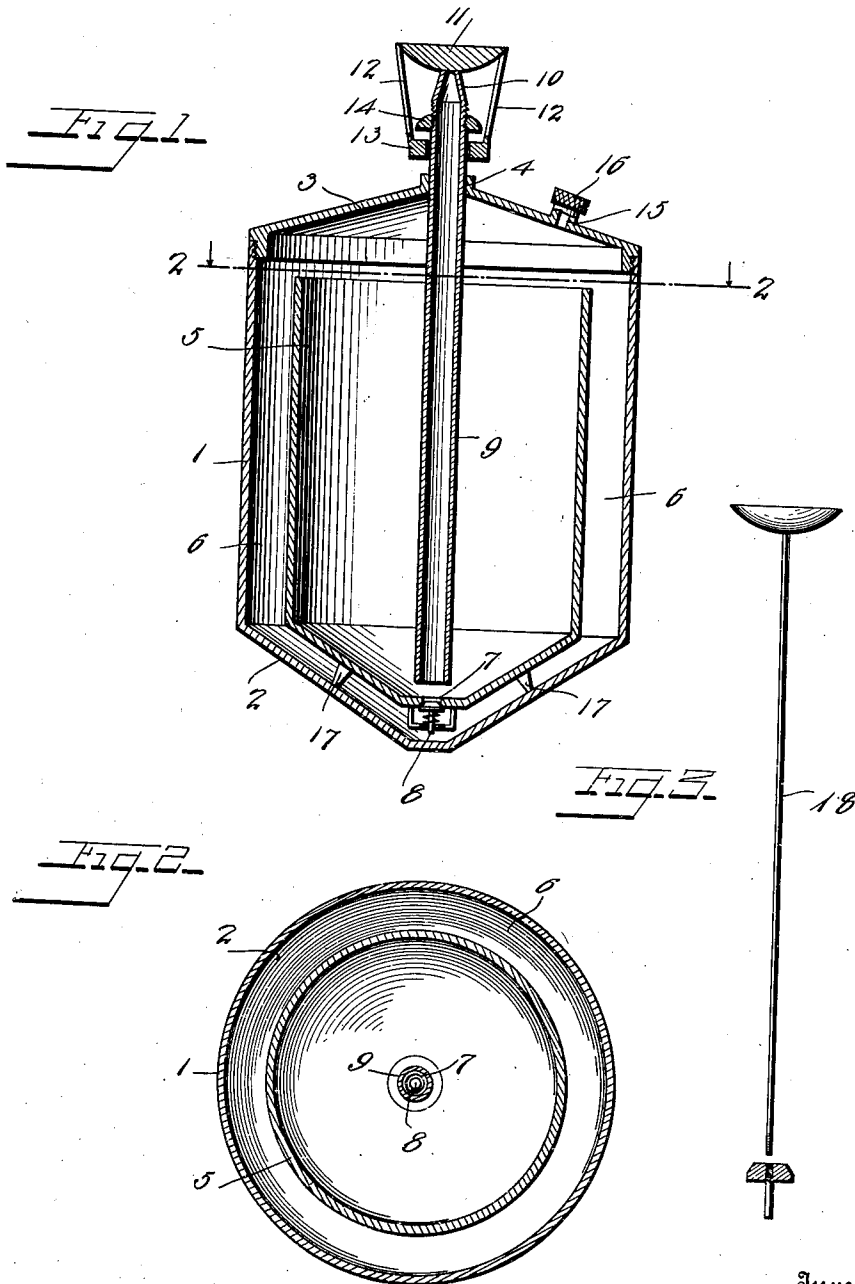


H. W. DOUGHTY.  
 AUTOMATIC FIRE EXTINGUISHER.  
 APPLICATION FILED JUNE 3, 1912.

1,050,627.

Patented Jan. 14, 1913.



Witnesses  
 J. R. Pierce  
 S. M. M. Coll,

Inventor  
 H. W. Doughty

By *A. B. Wilson*  
 Attorney

# UNITED STATES PATENT OFFICE.

HOWARD W. DOUGHTY, OF AMHERST, MASSACHUSETTS.

## AUTOMATIC FIRE-EXTINGUISHER.

1,050,627.

Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed June 3, 1912. Serial No. 701,403.

*To all whom it may concern:*

Be it known that I, HOWARD W. DOUGHTY, a citizen of the United States, residing at Amherst, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Automatic 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.

This invention relates to a portable automatic fire extinguisher of the sprinkler type. One object of the invention is to provide a self-contained automatic sprinkling fire extinguisher which requires no central reservoir, no elaborate system of pipe connection—each unit being complete in itself and absolutely independent of every other unit—and which is very simple in construction, thereby insuring cheapness of manufacture, and in which the cost of installation is only that incidental to hanging the extinguisher to a suitable support.

Another object of the invention is to provide a fire extinguisher in which an extinguishing liquid of a low boiling point and non-combustibility is employed, and one which readily mixes with any of the organic liquids, such as kerosene, gasoline and the like, the machine being so constructed that its sensitiveness is greatly increased, thereby increasing its efficiency.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 represents a vertical longitudinal section of one form of fire extinguisher constructed in accordance with this invention; Fig. 2 is a horizontal section thereof; Fig. 3 is a side elevation of a modification showing another means for actuating the valve and cap.

In the embodiment illustrated a simple form of the invention is shown, comprising a container consisting of an outer metal shell 1 which is a good conductor of heat and which may be of any suitable or desired shape, the form here shown being that of a cylindrical body having an inverted truncated cone-shaped bottom 2 and a top 3 having a central opening 4, for a purpose to be described. An inner casing 5 is ar-

ranged within the shell 1, conforming in outline to the shape of said shell 1, and spaced a suitable distance therefrom to form a liquid containing chamber 6 of restricted capacity. This casing 5 terminates at its upper end at a point below the upper end of the shell 1, and is open at said end for a purpose to be described. The lower truncated end of this casing 5 is preferably provided with an aperture 7 equipped with a valve 8, or not, as may be desired, and through which the liquid in the casing is designed to pass into the space or chamber 6 whereby said chamber is continuously filled with liquid. This casing 5 is preferably formed of earthenware or some other poor conductor of heat, and its object is to form the restricted heat chamber 6 and insulate it from the liquid contained within the casing.

A tube 9 extends through the opening 4 in the top 3 of the shell 1 and is secured in said opening by any suitable means. This tube 9 is preferably tapered at its upper end to form a restricted jet or nozzle 10, and the lower end thereof extends nearly to the bottom of the casing 5.

A suitable cap 11, which may be varied somewhat with the conditions of service, is here shown in the form of a disk having a convex lower face which rests normally on the end of the nozzle 10 and closes it, said cap being held in closed position by means of wires 12 which connect it with a collar 13 loosely mounted on the tube 9 outside the container. A flange or collar 14 is fixed to the tube 9 above or outside of the collar 13, and is positioned to limit the outward movement of said collar and consequently prevent the lifting of the cap 11 beyond a predetermined point. The inner face of the cap may be varied to regulate the spreading action of the liquid or vapor sprayed through the nozzle 10, as will be herein-after more fully described.

The top of the shell 1 is provided with an opening 15 closed by a suitable plug 16, and is designed for filling the container when necessary with the liquid to be used. The casing 5 is spaced from the inner face of the shell 1 by spacing lugs 17, which are here shown projecting laterally from said casing 5 and engaging the inner face of the shell 1, but it is obvious that any other suitable or desired spacers may be employed. A suitable fire extinguishing liquid having

a low boiling point is used in connection with this container, carbon tetra-chlorid being especially adapted for this purpose because of its low boiling point and its volatility.

The size of the apparatus will depend somewhat on the conditions of service, and each unit is complete in itself and independent of any external pipe or reservoir, thereby adapting it for use in small stores, rooms and other places where the hydraulic system is not available. In the use of this extinguisher, it having been filled with a suitable liquid, said liquid filling both the casing 5 and the space between said casing and the shell 1, the device is then suspended in any suitable location where it will remain indefinitely ready for use. When the temperature in the vicinity of the device is raised beyond a predetermined point the heat causes the carbon tetra-chlorid or other liquid in the chamber 6 to boil in a very few minutes owing to the small quantity exposed to the heat, and this boiling liquid produces an expansive vapor the pressure of which forces the liquid in the casing 5 up and out of the tube 9, thereby lifting the cap 11 and permitting the stream of liquid to escape through the nozzle 10 and impinge on the lower face of said cap whereby it is spread out or sprayed over a considerable area, the spraying of the liquid being varied according to the shape of the lower face of the cap. It will thus be obvious that by placing the casing 5 within the shell 1 and forming it of non-heat-conducting material, the small quantity contained in the space between the casing 5 and shell 1 will be much more quickly heated to the boiling point than would the entire contents of the shell 1 were this casing not used. Furthermore, it is undesirable that the liquid delivered from the nozzle be at its boiling point; rather the contrary being preferred so that premature volatilization shall not take place, but the liquid may be delivered as such.

The aperture 7 is designed to permit a slow flow of liquid from the casing 5 back into the chamber 6, but this aperture is not absolutely necessary and it may be provided with a valve or not, as desired, said valve when provided being adapted to close the chamber 6 against pressure from below.

It will be obvious that this double walled container renders the device very sensitive to a rise in temperature and thereby greatly

increases its efficiency. A desirable modification is shown in Fig. 3 in which a rod 18 is secured to the lower face of the cap 11 and extends through the tube 9, and is connected with the valve 8 so that when the cap is closed the valve will be open and when the cap is raised by the liquid the valve is closed. When this form is used, the loose collar attachment for the cap will be dispensed with.

I claim as my invention:

1. An automatic fire extinguisher comprising a container consisting of an outer shell closed at both ends, an inner shell spaced from said outer shell to form a liquid containing chamber of restricted capacity, said inner shell terminating at its upper end below the upper end of said outer shell, and a tube extending through the top of said outer shell into said inner shell and provided with a suitable closure.

2. An automatic fire extinguisher comprising a container consisting of an outer shell closed at both ends, an inner shell or casing conforming in shape to the shape of said outer shell and spaced therefrom to form a liquid containing chamber of restricted capacity and having an extended exposed surface, said inner casing terminating at its upper end below the upper end of said outer shell, and a tube extending through the top of said outer shell into said inner shell and provided with a suitable closure.

3. An automatic fire extinguisher comprising a container consisting of an outer shell closed at both ends, an inner shell conforming in shape to the shape of said outer shell and spaced therefrom to form a liquid containing chamber of restricted capacity and having an extended exposed surface, said inner casing terminating at its upper end below the upper end of said outer shell, a tube extending through the top of said outer shell into said inner shell, a removable closure for said tube, a valve arranged at the lower end of said inner casing, and a rod connected with said valve and with the closure in said tube.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HOWARD W. DOUGHTY.

Witnesses:

B. H. WILLIAMS,  
T. F. WHITAKER.