(No Model.) 2 Sheets—Sheet 1.

N. HICKS.

AUTOMATIC FIRE EXTINGUISHER.

No. 541,547. Patented June 25, 1895.

Fig. 1.

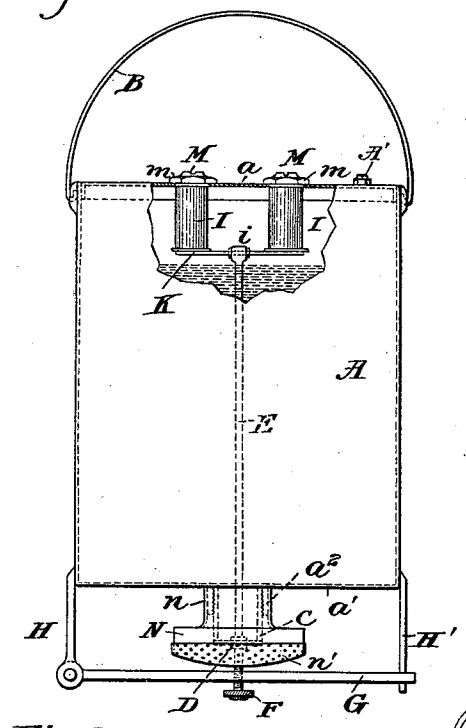


Fig. 3.

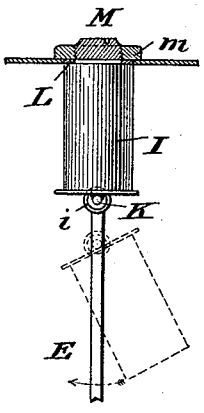


Fig. 4.

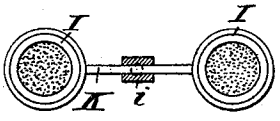
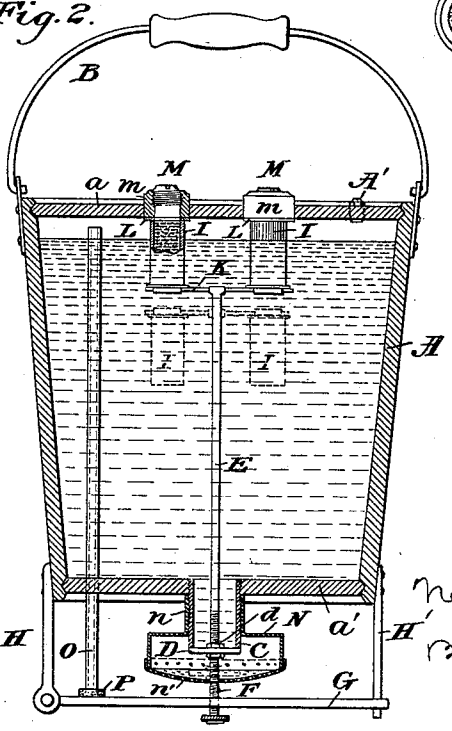


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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FIG. 5.

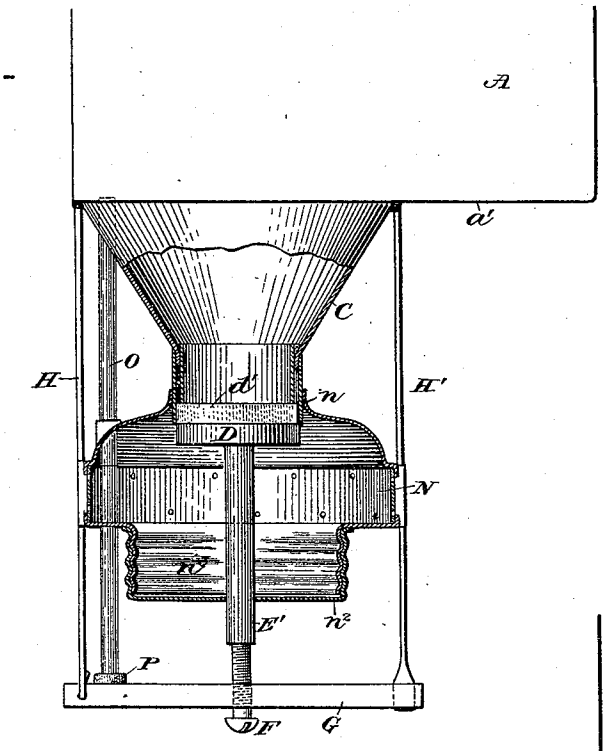
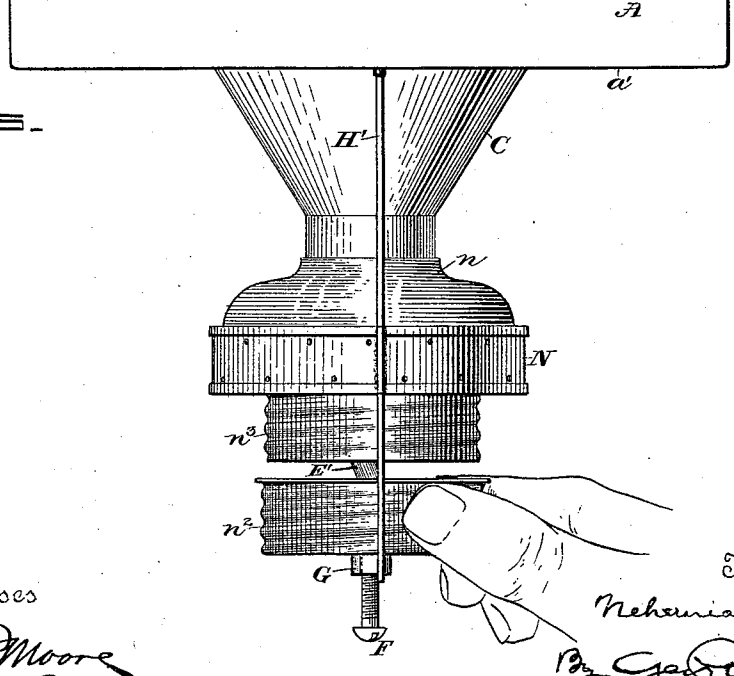


FIG. 6.



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AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 541,547, dated June 25, 1895.

Application filed February 25, 1895. Serial No. 539,629. (No model.)

To all whom it may concern:

Be it known that I, NEHEMIAH HICKS, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to fire extinguishers, and its object is to render a chemical fire extinguisher automatic in its action.

The invention consists, first, in a closed receptacle for containing an inert liquid, one or more acid cups supported within said receptacle on a rod which controls a valve at the lower end of the receptacle, and a thermally releasable stop, holding the valve closed. When the stop gives way, the valve rod drops, opening the valve and permitting the acid to mingle with the liquid, thereby either generating a gas which forces the liquid out through a nozzle or sprinkler, or forming a fire extinguishing compound which escapes through the sprinkler by gravity.

The invention consists, secondly in an improved nozzle, which can be applied to any automatic sprinkler, and which enables the valve to be removed when necessary, without disconnecting the thermal releasing devices.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of a fire-extinguisher embodying my invention. Fig. 2 is a vertical section of a modified form, and Figs. 3 and 4 are details. Fig. 5 is a vertical sectional side elevation of my improved nozzle, and Fig. 6 is a front elevation of the same.

The receptacle A may be of metal or of wood, and is preferably provided with a permanent or other closed top, *a*, in which is a filling orifice, closed by a stopper A′. The receptacle has also a bail B by which to carry it about and hang it up. In its bottom *a*′ is an opening provided with a neck or nozzle C, the lower end of which is closed by a valve D, preferably a flat disk abutting against the end of the nozzle. The valve is mounted on a rod E, and is adjustable vertically by means of the nuts *d* screwing upon threads cut on the rod and holding the valve D between them. The foot of the valve rod is stepped on a set screw F carried in a lever G which is fulcrumed at one end on a suitable support, such as the hanger H fastened to the receptacle A. At the other end, the lever is supported by a fusible connection, such as a soldered joint between the lever and hanger H′. The screw F enables the valve to be firmly closed against the nozzle after the lever has been secured in position.

The valve rod passes up through the nozzle and the receptacle and carries at its upper end one or more acid cups I. These may be rigidly fastened to a cross bar K which is journaled in a bearing *i* in the rod I, as shown in Fig. 1; or they may be hinged to the cross bar, which in turn is rigidly fastened to the rod I as in Fig. 2. In either case, the cups are free to turn upside down if left to themselves. The valve rod is long enough however, to hold the cups up against gaskets L placed on the under side of the top *a* of the receptacle A, and concentric with filling orifices for the cups. The orifices can be closed by suitable stoppers, preferably screw plugs M screwed into fixed bushings *m*. By means of the nuts *d* the rod can be so adjusted that the cups will be held tightly against the gaskets when the valve D is closed.

Surrounding the nozzle C and inclosing the valve D is a sprinkler N having a neck *n* which is secured either to the nozzle as in Fig. 2 or to a sedarate neck a^2 secured to the bottom of the receptacle, as shown in Fig. 1. The sprinkler has a convex head *n*′ which is preferably screwed on. The screw F passes through a hole in the center of the head *n*′ so that on backing down said screw the valve rod shown in Figs. 1 and 2 cannot be wholly removed because the acid cups are attached to it; but when the head *n*′ is removed, the rod can be dropped down far enough to give ready access to the valve. The head can be unscrewed and taken off, the rod E and its valve D then dropping down so that the valve

packing can be renewed without disturbing the other parts or breaking the soldered joint. When the mingling of the contents of the acid cups with the liquid does not generate a gaseous pressure but merely forms a fire extinguishing compound, it is necessary to provide an air vent. This is best accomplished by means of a pipe O running up through the bottom of the receptacle and nearly to the top *a*. The lower end of the pipe is normally closed by a pad or stopper P carried on the lever G. When the fusible joint melts and the lever falls, the vent pipe is opened simultaneously with the opening of the nozzle C. It is evident that the vent pipe may be omitted, and a vent provided in the top of the receptacle, as by a loose stopper at A'; or, the receptacle may be an ordinary open pail, the part marked *a* in Fig. 2 representing, in this case, a bar across the top of the pail to afford an abutment for the acid cups. In this way, a row of ordinary fire pails can be made into automatic extinguishers without interfering seriously with their use as fire pails when occasion requires.

In place of the nozzles shown in Figs. 1 and 2, I may use that illustrated in Figs. 5 and 6, where the removable head is in the shape of a cap n^2 screwed upon a neck n^3 depending from the perforated sprinkler. The short valve rod E' passes through this cap, and is stepped on the screw F.

Fig. 5 shows clearly the washer *d'* of leather or the like which abuts against the end of the nozzle inside of the neck thereof. When it is desired to remove the valve for renewal or repair, the screw F is backed down, as shown in Fig. 6. The cap n^2 is then unscrewed, and by sliding it out sidewise the cap and valve-rod and valve can be entirely removed from the sprinkler without disturbing the soldered joint between the lever G and the hanger H'. This nozzle is especially applicable to either open or closed receptacles from which the liquid is to escape by gravity. In the case of a closed receptacle, an air vent tube O is provided, closed by a pad P until the lever falls, as previously described in connection with Fig. 2.

Having thus described my invention, what I claim is—

1. A fire-extinguisher, comprising a receptacle, a nozzle in the bottom thereof, a valve for closing said nozzle, a valve rod, one or more acid cups hinged to the upper end of said rod, and a thermally releasable support for said valve rod, substantially as described.

2. A fire-extinguisher, comprising a receptacle, a nozzle in the bottom thereof, a valve abutting against the end of said nozzle, a valve rod vertically adjustable through said valve, one or more acid cups hinged at the upper end of said rod, a fixed support against which said cups are held, and a lever supporting the rod and held by a fusible connection, substantially as described.

3. A fire-extinguisher comprising a receptacle having a nozzle in its bottom, a valve closing said nozzle, a valve rod having a cross bar at its upper end, hinged acid cups supported by said bar, a fixed support having stoppered filling orifices above said cups, gaskets interposed between said support and the cups, a sprinkler surrounding the nozzle, a lever below the valve rod, an adjusting screw in the lever on which the rod is stepped, and a fusible joint holding the lever, substantially as described.

4. In a fire-extinguisher, the combination with a nozzle, of a valve for closing it, a valve rod, a sprinkler concentric with said rod, a head screwed on the sprinkler and having a central hole for the valve rod, and means independent of said head for supporting the valve rod, whereby the head can be unscrewed to get access to the valve without disturbing the other parts, substantially as described.

5. The combination with the receptacle A, having the closed top *a* provided with filling orifices closed by screw stoppers, and the bottom *a'* containing the nozzle C, of the valve D controlling said nozzle, the valve rod E, the lever G carrying the screw F on which the lower end of the valve rod is stepped, the sprinkler N surrounding the end of the nozzle, the cross-bar K on the upper end of the valve rod, the acid cups hinged to said rod, the vent pipe O extending from the upper part of the receptacle down toward the lever G, and the pad P on said lever for closing the end of the vent pipe, substantially as described.

6. In a fire extinguisher, the combination with a receptacle, of a valve rod provided with a valve controlling the escape of liquid from said receptacle, and acid cups supported by said rod and movable therewith, substantially as described.

7. A fire extinguisher, comprising the combination with a receptacle, of a nozzle in the bottom thereof, a valve abutting against the end of the nozzle, a sprinkler inclosing the valve and the end of the nozzle, a valve rod passing through the sprinkler, a lever supporting said valve rod below the sprinkler, and a fusible connection holding the lever, the bottom of the sprinkler being independent of said lever and connection and separately removed to permit the valve packing to be renewed without removing or disturbing the fusible connection.

In testimony whereof I affix my signature in presence of two witnesses.

NEHEMIAH HICKS.

Witnesses:
EDWIN ALDRICH,
CHAS. I. WELLES.