(No Model.)

C. L. HORACK.

AUTOMATIC FIRE EXTINGUISHER.

No. 262,777. Patented Aug. 15, 1882.

FIG. 1.

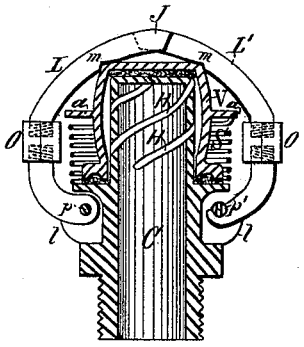


FIG. 2.

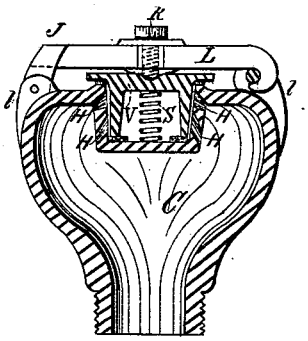
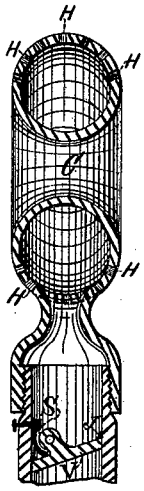


FIG. 3.



Witnesses.
John Buckler.
Waldorf J. Phillips

Inventor.
Chas. L. Horack

UNITED STATES PATENT OFFICE.

CHARLES L. HORACK, OF BROOKLYN, NEW YORK.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 262,777, dated August 15, 1882.

Application filed May 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HORACK, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Automatic Fire-Extinguishers, of which the following is a specification.

The object of this invention is to reduce the strain on a soldered joint required to keep in position a valve closing the outlet or outlets in an automatic fire-extinguisher. I accomplish this by employing levers, placing the soldered joint farther from the fulcrum than the point where the valve-pressure is transferred to the lever, and, by arranging the valves to be partly balanced by the pressure of the extinguishing-fluid, I make it possible to keep said valve in position by means of a very small amount of fusible solder. As on a partly-balanced valve the pressure tending to open it is less than the pressure which would occur on the discharge opening or openings if the same were not provided with said valve, the pressure of the extinguishing-fluid alone might not be sufficient to totally rupture the soldered joint before water had begun to escape and to cool said joint. I apply a spring to said valve, so as to assist in entirely removing the same.

Figures 1, 2, and 3 show vertical sections of distributers embodying my invention.

In Fig. 1 I represent an automatic sprinkler having for a sprinkling-cup a hollow cylinder with "rifled" perforations H H on its outer surface. A valve, V, constructed in the shape of a cap, is placed over said distributer in such a manner as to approximately conform with the sprinkling-cup described above. The seat of the valve below the perforations is constructed so as to form two separate rims, between and under which a suitable packing of rubber, soft metal—such as lead—or any other proper material is placed. I also provide an elastic packing between the upper end of the sprinkling-cup and the inside of the upper end of the cap. In order to hold said valve V in position until released by the action of heat, I have provided two levers, L and L′, which meet above the cap, where they are connected by means of a soldered joint, J. The lever L is represented as being hinged below the sprinkling-cup to an axis, *p*, which forms its fulcrum, while L′ represents another method of providing a fulcrum for a lever by hooking it to a pin, *p*′. Where the valve V comes in contact with the levers L L′ at the points *m m* said levers are provided with notches, so as to make their shape correspond with that of the upper rim of said valve in such a manner as to make the two rest firmly upon each other after the soldered joint J has been made. Making the packing between the upper end of the sprinkling-cup and the corresponding part of the valve elastic will help to cause the valve and the levers to remain in contact at the points *m*, said packing acting as a spring, which becomes compressed when the upper ends of the two levers are brought together, so as to form the joint J. To further accomplish the same object, I provide for lengthening or shortening said levers, as indicated, by constructing each lever of two separate pieces connected by means of nuts O O, having screw-thread above and below running in opposite directions, or in any other suitable manner. A collar, *a a*, is shown to run around the valve V, having resting against it and connected with it a compressed spring, S, supported below by a projection on the sprinkling-cup. After the solder at J has melted, the force of the spring, in addition to the upward pressure of the water, will have a tendency to move the valve upward, thereby spreading apart the levers and allowing the water to escape through the perforations. The shoulders on the valve at *m m* and the corresponding notches in the levers are made slightly sloping outward and downward, for the purpose of facilitating the sliding off of the levers. Instead of a collar, *a a*, as described, several arms or projections might be used to perform the same office. Instead of rifled perforations, round ones or others of any suitable shape might be used, and they might be made to produce intersecting streams. Other details might be varied, and particularly the lower valve-seat might be constructed with only a single rim.

Fig. 2 represents a sprinkling-cup with a recess on top, the walls of which, being constructed vertical or nearly parallel to each other or to a common axis, contain the perforations H H for distributing the extinguishing-fluid. The valve V is shown to be constructed in the

shape of a hollow plug, although a hollow cylinder would answer the same purpose, its periphery facing the perforations, and being made to either closely or else approximately conform with the walls containing the perforations. Above as well as below said perforations suitable seats are provided for said valve on the body of the sprinkling-cup, and packing of soft metal, rubber, or similar material is arranged between the valve and the sprinkling-cup, as indicated. In the cavity formed by the walls facing the perforations a spring, S, is placed connected with said valve, and so arranged as to force the latter upward as soon as the soldered joint has been broken. The lower valve-seat will ordinarily keep the water from entering said cavity and affecting the spring; but to guard against the consequences in that respect of any possible leak it might be well to nickel-plate or otherwise protect the said spring. The upper valve-seat is shown to be horizontal and above the cavity containing the main body of the valve, although it might be made directly on the walls adjoining the perforations. There are two sets of lugs, *l l*, provided on the upper part of the sprinkling-cup. A lever, L, is attached to an axis through one set of lugs, either by means of a hook, as indicated, on the right-hand side, or else by means of an eye. The other end is at J, secured by means of fusible solder to an arm rigidly connected with the other set of lugs. A screw, R, passes through said lever over the center of the valve, and it will readily be seen that by turning said screw the lever can be tightened and forced to its seat, as shown in this drawing. The upper surface of the valve might be made of any suitable shape; but it would be well to provide a recess for the point of the screw R, thereby preventing the lever from sliding. Another way of tightening the valve would be to omit the screw R, but instead to construct the lever of two pieces with a soldered-joint connecting them and screw-thread arrangement beyond said soldered joint, so as to draw it downward, and to thereby force down the valve, the latter being in contact with the lever on the opposite side of the soldered joint. While the inlet to the sprinkling-cup is shown in the drawing to be directly under the valve it might be well to make the same come in horizontally and directly opposite some of the perforations.

Fig. 3 represents a swinging and partly-balanced valve, V, arranged in the pipe supplying the extinguishing-fluid. The spring S is so arranged as to force downward the smaller side of the valve, thereby assisting the water-pressure to open said valve after the solder confining the same has melted. In this case the sprinkling-cup is shown to be ring-shaped with perforations on the outside. The best distribution of fluid through the same could be obtained by placing it in a horizontal position.

The distributer shown in Fig. 2 has the perforations so arranged as to produce intersecting streams, although one continuous outlet, rifled, or of any other suitable form, so as to distribute the water over a large area, might be used instead.

While bracing-pieces between the valve and the lever confining said valve are only shown in Fig. 2, (the screw shown acting as such brace,) it might under circumstances appear best to apply braces also between the levers and valve shown in Fig. 1.

The above-described devices and combinations specified as being applied to valves partly balanced by the pressure of the extinguishing-fluid might in the same manner be applied to valves fully balanced by the pressure of the extinguishing-fluid.

I do not claim herein, broadly, a valve partly balanced by the extinguishing-fluid and arranged to become entirely detached from the distributer or the reservoir containing the extinguishing-fluid after it has been relieved, owing to the heat of a fire; nor do I claim, broadly, such a valve arranged to become entirely detached under the circumstances stated, owing to its own weight, or to its own weight and the pressure of the extinguishing-fluid combined.

I claim as my invention and wish to secure by Letters Patent—

1. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve being partly balanced by the pressure of the extinguishing-fluid, the remaining pressure being taken up by a brace transferring said pressure to a lever secured so as to become released by the action of heat, substantially as described.

2. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve being partly balanced by the pressure of the extinguishing-fluid, the remaining pressure being taken up by a lever secured by a thin film of solder, and arranged to become entirely detached from the sprinkling-cup after the soldered joint has been broken and the valve removed from its seat, substantially as described.

3. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve being partly balanced by the pressure of the extinguishing-fluid, and held in position by means of a lever arranged so as to become released by the action of heat, substantially as described.

4. In an automatic fire-extinguisher, a valve closing a series of outlets arranged so as to produce intersecting streams, said valve being held in position by means of a lever arranged so as to become released by the action of heat, substantially as described.

5. In an automatic fire-extinguisher, a valve closing one or more outlets confined by a lever arranged to be relieved by the action of the heat of a fire, said valve being adjusted in its position by screw-thread arrangement, substantially as described.

6. In an automatic fire-extinguisher, the com-

bination of a valve closing one or more outlets and confined by a lever arranged to be relieved by the action of the heat of a fire, and a screw passing through the lever and resting upon the valve, substantially as described.

7. In an automatic fire-extinguisher, a valve closing one or more outlets, confined by a lever arranged to become released by the action of the heat of a fire, said lever containing screw-thread arrangement for adjusting the valve, substantially as described.

8. In an automatic fire-extinguisher, the combination of a valve closing one or more outlets and partly balanced by the pressure of the extinguishing-fluid, a lever confining the same until relieved by the action of heat, and a spring arranged so as to assist in opening said valve, substantially as described.

9. In a fire-extinguisher, a sprinkling-cup with a recess the walls of which contain the perforations for the discharge of the extinguishing-fluid, substantially as described.

10. In an automatic fire-extinguisher, a sprinkling-cup with a recess the walls of which contain the outlets for the extinguishing-fluid, substantially as described.

11. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve having two separate seats, one above and the other below the outlet or outlets, substantially as described.

12. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve being partly balanced by the pressure of the extinguishing-fluid and connected with a spring arranged to assist in opening said valve, substantially as described.

13. In an automatic fire-extinguisher, a valve constructed as a cap or plug, said valve being arranged so as to be partly balanced by the pressure of the extinguishing-fluid, substantially as described.

14. In an automatic fire-extinguisher, a cap or plug-shaped valve closing one or more outlets, said outlets being directed toward the circumference of said valve, substantially as described.

15. In automatic fire-extinguishers, a distributer provided with a series of openings arranged so as to produce intersecting-streams, combined with a valve preventing the discharge of the extinguishing-fluid upon a fire until released by the action of the heat of a fire, substantially as set forth and described.

16. In automatic fire-extinguishers, a distributer arranged to discharge the extinguishing-fluid in different directions, so as to make it meet at a point outside of the distributer, combined with a device preventing the discharge of the extinguishing-fluid upon a fire until released by the action of the heat, substantially as set forth and described.

17. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve being partly balanced by the pressure of the extinguishing-fluid, combined with a brace arranged to take up and transmit the remaining pressure to a soldered joint, substantially as set forth and described.

18. In an automatic fire-extinguisher, a valve closing one or more outlets, said valve being partly balanced by the pressure of the extinguishing-fluid, combined with a connecting-piece between said valve and a seal, which seal is arranged to be broken by the heat of a fire, substantially as set forth.

CHAS. L. HORACK.

Witnesses:
T. W. OSBORN,
RUFUS M. WILLIAMS.