(No Model.)

C. L. HORACK.

AUTOMATIC FIRE EXTINGUISHER.

No. 310,432. Patented Jan. 6, 1885.

Fig. 1.

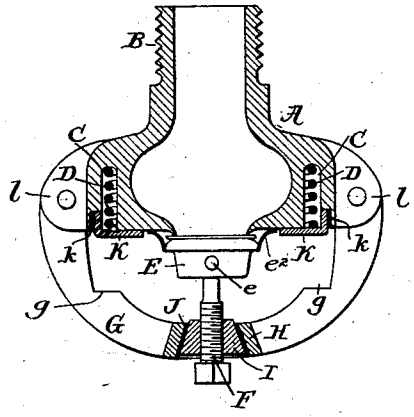
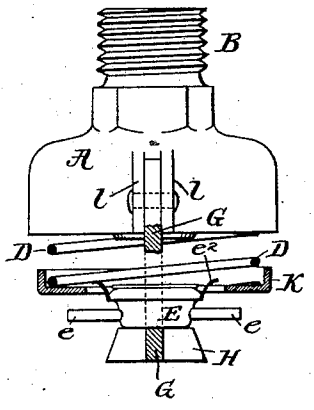


Fig. 2



Attest:

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UNITED STATES PATENT OFFICE.

CHARLES L. HORACK, OF BROOKLYN, NEW YORK.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 310,432, dated January 6, 1885.

Application filed March 26, 1883. (No model.)

To all whom it may concern:

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

My present invention relates to that class of fire-extinguishing nozzles or fluid-distributers which are held closed by fusible devices or joints, and are automatically opened by the heat of a fire rupturing the said fusible devices or joints.

The object of my improvements is to combine with a distributer of the class mentioned movable devices for effectively spraying the extinguishing-fluid and for assisting the deflecting instrumentality to move into position in the path of the outflowing current when the fusible joint whereby said deflector is held in position is ruptured by the heat of a fire, the said devices in whole or in part being adapted to serve as a means for insuring the removal of the fluid-supply valve from its seat when the heat of a fire has fused the joint whereby the valve is held in a normally-closed condition. The device which acts upon the deflector to force it into position for action is a spiral spring, which is so confined by a fusible joint as to be kept wholly from contact with the supply-valve.

By my improvements the deflecting device is rendered automatically adjustable and is brought into position for action by the same instrumentality—the heat of a fire—as that which opens the valve for supplying the extinguishing-fluid; but there is no permanent connection between the supply-valve and the deflecting device, either before or after the occurrence of a fire, and the fusible means which secure the deflecting device and the valve in their normal positions are also entirely independent of each other. The fusible joint whereby the deflecting device is confined in position and the spring is restrained is located above the fluid-outlet, and hence above the seat of the supply-valve, thereby securing it against the possibility of its being injuriously affected by accidental leakage of the extinguishing-fluid.

My improvements may be used in connection with any style of valve and with various means for supporting the valve in a closed position.

The features of novelty in this invention for which I seek protection are pointed out in the claims at the end of this description.

Referring to the accompanying drawings, which form a part of this description, and in which like parts are indicated by like letters—

Figure 1 represents a vertical section of a sprinkler in a closed condition embodying my improvements, and Fig. 2 is a side elevation of the same after the valve has been relieved by the heat of a fire.

In the drawings, the letter A represents the sprinkler-casing, which may be of any suitable style. It is provided with screw-threads B, whereby it may be secured in position on the pipes containing or communicating with the fire-extinguishing fluid.

C is a recess in the casing, which is adapted to receive the spiral spring D, the office of which will be hereinafter explained. The valve which closes the outlet for the extinguishing-fluid is represented by E, and it is provided with arms *e*, which extend out from the valve to a point beneath the ring deflector K. This valve may be of any approved form, and either it or its seat will be provided with some suitable packing material for insuring a water-tight joint when the valve is closed. In this instance the valve E is held to its seat by the screw-threaded pin F, which is supported in the yoke G, the latter being secured to lugs *l l* on the body of the casing, in the manner shown, it being thus suspended beneath the discharge-opening of the sprinkler. The yoke G is provided with, or is formed in part of, a ring, H, and to this ring the nut I is secured by the fusible solder-joint J. This is the joint which holds the valve in position, and which will be affected by an unusual rise of temperature due to the breaking out of a fire, and which when ruptured permits the valve to leave its seat, thus providing for an unobstructed flow of the extinguishing-fluid. It is obvious that by means of the pin F the valve E may be effectually compressed against its seat.

K represents a ring, which is secured to the

casing by a fusible joint, *k*, located above the outlet for the extinguishing-fluid and above the seat of the valve, and which lies over the entrance to recess C, thereby compressing the spring D into said recess and confining it therein until a fire ruptures the joint *k*. This ring K also serves to protect the spring from dust, &c. When the joint J is fused, the valve E, pin F, and nut I, owing to their weight and the pressure of the extinguishing-fluid upon the face of the valve, will assume a downward motion. To insure this movement of the valve is one of the functions of the spring D, and as it is desirable to keep all extraneous pressure from the joint J until a fire actually occurs, the spring is held compressed within the recess of the casing by the ring K, in the manner explained. The fusing of the joint *k*, which holds the ring K in position, causes the confined spiral spring to expand downward, carrying before it the ring. The construction is such that the thrust produced by this movement of the spring and ring will also be exerted upon the arms *e* of the valve E, with the effect of facilitating the opening of said valve in case the valve has not assumed a downward motion simultaneously with the spring and the ring K, which ring thus serves as a shoe upon which the spring bears, for the purpose of transferring through it, after a fire has broken out, the elastic force of said spring to the projections provided on the valve. In my structure the ring K is also made to perform the function of a deflector after it has become seated on the rests provided for it on the supporting-yoke G. Such position of the ring K is indicated in Fig. 2. The solder used for the joint *k*, which secures the ring K in position and restrains the spiral spring, may be composed of ingredients which will permit it to fuse at a lower temperature than the joint J, which confines valve E to its seat.

As before stated, the fusible joint which secures the ring in position is located above the discharge-outlet for the extinguishing-fluid and above the seat of the valve E. This is important, as by this arrangement the fusing of the joint is rendered less liable than otherwise would be the case of being interfered with by the premature escape of water.

The idea of locating a fusible joint in such a position on the extinguisher as to prevent its being subjected to the cooling influence of the extinguishing-fluid is shown in my Patent No. 288,059, and I have therefore not deemed it necessary to show my present improvements embodied in a structure including that desirable feature, as my present invention does not relate to the fusible joint or to the means for holding the valve closed.

Attached to the valve E by any means which will produce a water-tight joint is a flexible collar, e^2, which, as shown, bears upon the casing A when the valve is seated. The object of this collar is to prevent the premature discharge of the extinguishing-fluid in general, and particularly upon the solder-joint which holds the valve to its seat.

In the Patent No. 288,059, referred to above, a flexible collar for similar purposes is also shown; but in that instance the collar is secured to the casing and bears upon a collar on the valve.

It is obvious that as soon as the joint *k* begins to fuse the confined spring will assist in rupturing said joint by its pressure upon the deflector K, the action of the spring being exerted first upon said deflector and afterward may be exerted upon the valve E by means of the ring K, which here serves as a shoe for the spring.

In addition to the functions already ascribed to the spring D, it has another important office. After the joint *k* has been ruptured the spring D forces the ring deflector downward and assumes a position directly in the line of the discharging fluid, resting upon the ring K, which is supported on the shoulders *g* of the yoke G. In this position the said spring serves as an efficient deflector assisting materially the deflector K and also the valve E, which likewise serves to deflect the fluid in breaking up the stream of water and spreading it over an extended surface. The ring thus serves as a deflector as effectually as if it were permanently attached to the valve or to some support beneath the outlet for the extinguishing-fluid.

By my arrangement of the spiral spring and ring K, serving as its shoe, whereby the action of said spring upon the valve is restrained until actually required, the fusible joint J, which holds the valve to its seat, is relieved of the pressure which the spring would exert upon it if it were permitted to rest upon or in contact with the valve. If the joint *k*, which confines the spring in position, should "creep," no injury would follow therefrom, as this joint is entirely independent of the joint which holds the valve which controls the outlet for the fluid.

Having made the relation between the disk E, constructed to act substantially as and for the purpose described, and of its screw-threaded supporting-post the subject of another application now pending before the Patent Office, I do not here offer any claims covering said features.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An automatic fire-extinguisher provided with a valve held closed by a fusible solder-joint and having a movable deflector held by an independent fusible joint, substantially as set forth.

2. An automatic fire-extinguisher provided with a valve held closed by a fusible solder-joint and having a movable deflector held above the discharge-outlet by an independent fusible joint, substantially as set forth.

3. An automatic fire-extinguisher provided with a valve held closed by a fusible solder-

joint and having a movable deflector held by an independent fusible joint and a spring arranged to act upon the deflector when the restraining-joint is fused, substantially as set forth.

4. An automatic fire-extinguisher provided with the yoke G, in combination with the valve E, held closed by a fusible joint in the yoke, and the movable deflector K, held to the extinguisher by an independent fusible joint, substantially as and for the purpose set forth.

5. In an automatic fire-extinguisher, the combination, with a casing provided with a discharge-outlet, of a valve held by a fusible joint, a deflector held by an independent fusible joint, a spring constructed to bear upon the deflector, and a projection extending from the valve into the path of the deflector, for the purpose of communicating the thrust of said spring, after the independent fusible joint has been broken, to the agencies restraining the movement of the valve, substantially as set forth.

6. In an automatic fire-extinguisher, the combination, with a casing provided with a discharge-outlet, of a valve held by a fusible joint, a spring held by an independent fusible joint, a shoe upon which the spring bears, and projections on the valve in the path of the shoe, substantially as and for the purpose specified.

7. In an automatic fire-extinguisher, the combination, with a casing provided with a discharge-outlet, of a valve held by a fusible joint, a spring held by an independent fusible joint located above the discharge-outlet, a shoe upon which the spring bears, and projections on the valve in the path of the shoe, substantially as set forth.

CHARLES L. HORACK.

Witnesses:
WALDORF H. PHILLIPS,
CHAS. J. SUMMERSON.