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Patented Jan. 28, 1902.

F. GRINNELL.  
AUTOMATIC FIRE EXTINGUISHER.

(Application filed Jan. 16, 1900.)

(No Model.)

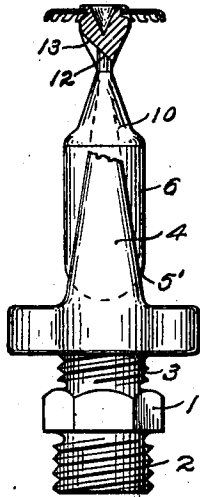


FIG. 3.

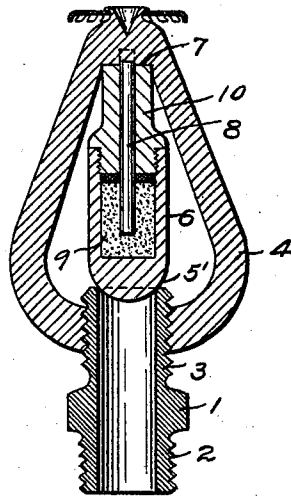


FIG. 2.

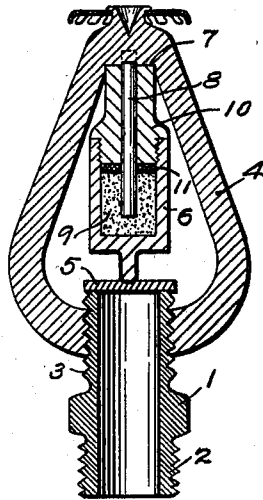


FIG. 1.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 691,760, dated January 28, 1902.

Application filed January 16, 1900. Serial No. 1,632. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK GRINNELL, of New Bedford, county of Bristol, and State of Massachusetts, have invented certain new and useful Improvements in Automatic Fire-Extinguishers; and I do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

The object of the invention is to provide a simple and compact structure in which the valve is held to its seat by a rigid holding device interposed between the valve and the frame or fixed abutment and forcibly disengaged from said abutment by means made operative by the action of heat. With the present improvements the valve is held to its seat by a rigid strut, which is forcibly disengaged from the frame or abutment by the action of a heat-controlled means located in the strut. With this construction a simple and compact device is provided, and the heat-controlled disengaging device is located where it is inclosed and protected by the frame.

The invention consists of the features and combinations hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is a sectional view of an automatic sprinkler embodying the present invention. Fig. 2 is a sectional view of a modified form of sprinkler; and Fig. 3 is an elevation, partly in section, of the same.

The automatic sprinkler (shown in Fig. 1 of the drawings) comprises a nipple or nozzle 1, screw-threaded at 2 for attachment to a distributing-pipe and also screw-threaded at its delivery end, as at 3, for the adjustment thereon of the frame 4. In this construction a valve 5 is held to its seat upon the end of the nozzle by means of a rigid strut 6, interposed between said valve and a shoulder 7 on the frame, which forms a fixed abutment for the end of the strut. By turning the frame upon the nozzle the strut may be forced firmly against the valve and will securely and immovably clamp said valve to its seat.

With the present invention the means for

forcing the end of the strut out of engagement with the abutment 7 is carried by the strut, and in the form shown this means comprises a plunger 8, provided with an incline or cam on its end, which is arranged to act against the frame when said plunger is forced outward, and thus forcibly dislodge the end of the strut from the shoulder 7. As shown, the strut is provided with a cylindrical chamber 9, which contains a material which will expand under the action of heat. The chamber 9 is closed by a plug 10, screwed into the end of said chamber. The plunger 8 passes through the plug 10 and into the chamber 9, and a packing 11 surrounds said plunger between the end of plug 10 and the expansion material in chamber 9. The outer end of the plunger 8 is inclined at 12 to form a cam for acting against the frame. The frame is also preferably provided with a corresponding incline 13, against which the end of plunger 8 acts. It will be understood that either of these inclines or cams may be omitted, although it is preferred to employ both. When the strut is in position, the outer end of the plug 10 engages the shoulder or abutment 7 and the end of the plunger 8 is in line with the incline 13. The plunger and its operating means, being carried in the strut, are protected from any accidental injury, and the parts are compactly and conveniently arranged and may be quickly and conveniently assembled.

When the sprinkler is subjected to heat, as at the breaking out of a fire, the material in chamber 9 expands, forcing the plunger 8 outward. During this movement of the plunger 8 the incline 12 or 13 or both crowd the end of plunger 8 laterally and with it the end of the strut 6, thus moving the end of said strut out of engagement with the abutment 7 and releasing the valve.

In Figs. 2 and 3 the invention is shown embodied in a sprinkler in which a spherical valve is rigidly held to its seat by a rigid strut between said valve and a fixed abutment. In the form shown the spherical valve 5' is formed integral with the strut 6, and the movement of the strut in releasing the valve also rocks the valve on its seat, thus causing a

rupture of any joint or connection between the valve and its seat, due to corrosion or adhesion.

5 What I claim as my invention, and desire to secure by Letters Patent, is—

10 1. An automatic fire-extinguisher having a valve, a strut between said valve and a fixed abutment, and heat-controlled means carried by said strut for forcing the end of said strut out of engagement with said abutment.

15 2. An automatic fire-extinguisher having a frame, a valve, a strut between said valve and a fixed abutment, a plunger carried by said strut and arranged to engage said frame and dislodge said strut, and heat-controlled means for operating said plunger.

20 3. An automatic fire-extinguisher having a frame, a valve, a strut between said valve and a fixed abutment, a chamber in said strut, an expansion material in said chamber, a plunger extending into said chamber and arranged to engage said frame and dislodge said strut.

25 4. An automatic fire-extinguisher having a frame, a valve, a strut between said valve and a fixed abutment, a plunger mounted in said strut, an incline on the end of the plunger arranged to act against said frame, and heat-controlled means for operating said plunger.

30 5. An automatic fire-extinguisher having a frame, a valve, a strut between said valve and a fixed abutment, a plunger mounted in said

strut, an incline on said frame arranged to be engaged by the end of said plunger, and heat-controlled means for operating said plunger. 35

6. An automatic fire-extinguisher having a frame, a valve, a strut 6 between said valve and a fixed abutment 7, a chamber 9 in said strut, an expansion material in said chamber, a plunger 8 extending into said chamber, an 40 incline 12 on the end of said plunger, and an incline 13 on said frame engaged by said incline 12.

7. An automatic fire-extinguisher having a frame, a spherical valve, a strut integral there- 45 with and engaging a fixed abutment, a plunger carried by said strut and arranged to engage said frame and dislodge said strut, and heat-controlled means for operating said plunger. 50

8. A strut for an automatic fire-extinguisher having a chamber, an expansion material therein, and a plunger extending into said chamber.

9. A strut for an automatic fire-extinguisher 55 having a chamber 9, a plug 10 closing said chamber, an expansion material in said chamber, and a plunger 8 extending through said plug 10.

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Witnesses:

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