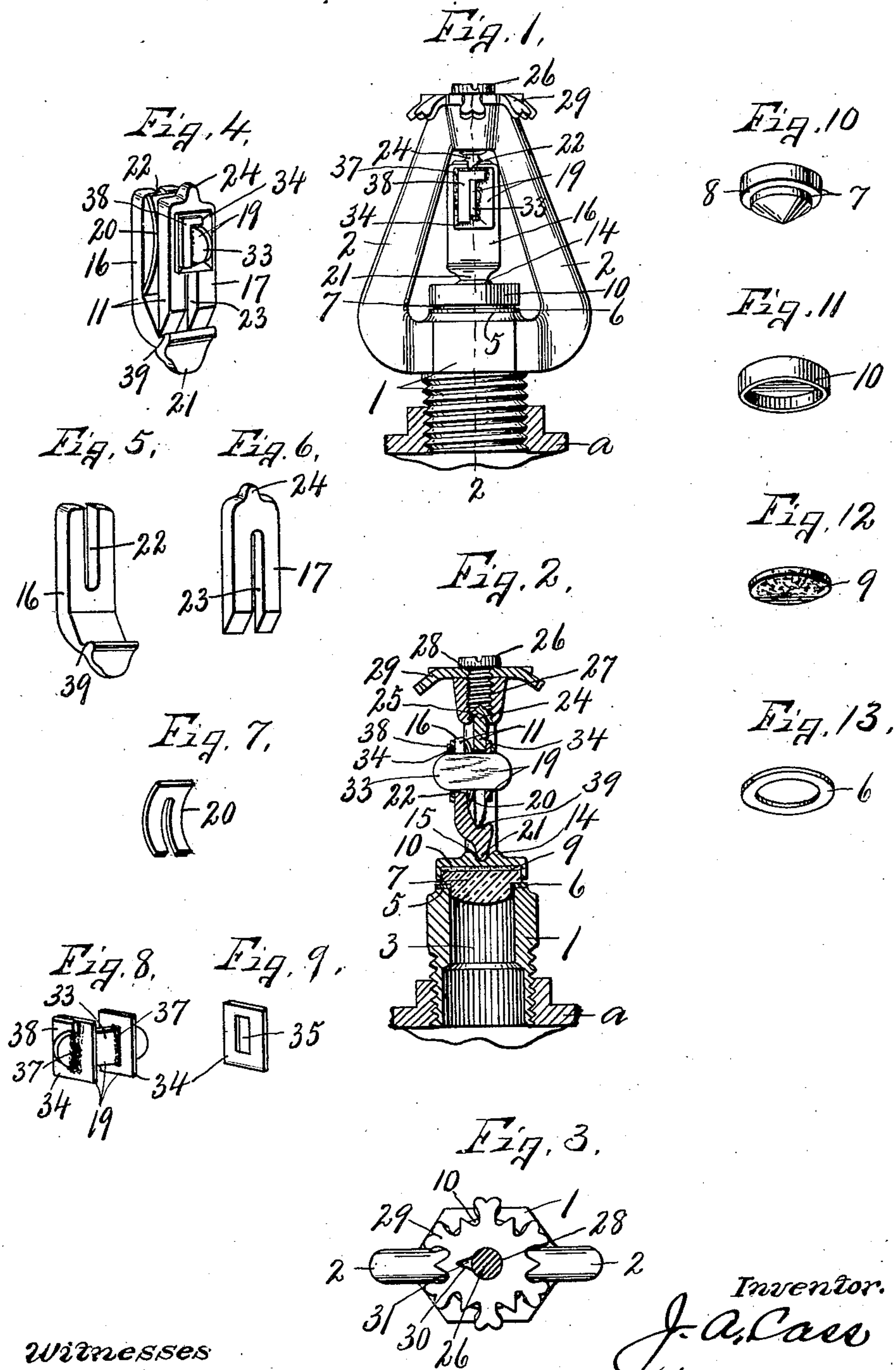


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J. A. CASS.
AUTOMATIC SPRINKLER HEAD.
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Witnesses
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AUTOMATIC SPRINKLER-HEAD.

No. 848,347.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES A. CASS, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Automatic Sprinkler-Heads, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in automatic sprinkler-heads adapted to be attached to one of the distributing-pipes of the sprinkler system and provided with a discharge-opening which is normally closed by a suitable stopper held in place by a fusible detent. These sprinkler-heads are in most instances required to remain indefinite periods of time before being called into active operation by the occurrence of a fire; and one of the essential objects of the construction hereinafter described is to prevent undue corrosion or deterioration of any of the elements, and particularly those which are relied upon to close the discharge-passage, so that no matter how long a time may have elapsed between the installation of the sprinkler system and first occurrence of the fire the fusing of the destructible detent will allow the instantaneous release of the stopper, and thereby permit the discharge of the water in the vicinity of the fire by which the detent was fused.

In other words, one of the most important objects of my present invention is to provide a non-corrodible stopper and to seat the same in the discharge-opening of the sprinkler-head in such manner as to endure for any period of time without liability of deterioration or unduly adhering to its seat when the detent is fused.

A further object is to hold the stopper in place under a yielding or cushion pressure of some yielding material interposed between the detent and stopper, so as to allow for ordinary contraction and expansion by varying climatic conditions or temperatures.

A further object is to confine the stopper-holding mechanism within a comparatively small space between the arms of the sprinkler-head and to avoid any exterior projections which might be struck or displaced by extraneous forces. The stopper and parts engaged directly therewith are held in place by what is commonly known as a "strut" or "struts," bridging the space between the cap of the stopper, and a suitable adjusting-screw, by which the strut is locked in place; and one

of my objects is to seat the lower end of the strut in the stopper-cap in such manner that when assembled the cap and strut will be locked against certain rotary movements.

A still further object is to make the strut in two sections or plates lapped upon each other face to face and held together by fusible connections against the action of an interposed spring, so that when the strut-plates are released by the fusing of such connections the spring will immediately act to separate the plates, and thereby break the integrity of the strut, leaving the stopper free to be forced from its seat by the pressure of the water within the head.

Other objects and uses will be brought out in the following description.

In the drawings, Figure 1 is a face view of my improved sprinkler-head shown as attached to one of the pipes of a sprinkler system. Fig. 2 is a sectional view taken on line 2 2, Fig. 1. Fig. 3 is a top plan of the sprinkler-head with the strut-retaining screw in section to show the lock between the spraying-disk and upper end of the sprinkler-head. Fig. 4 is an enlarged perspective view of the detached strut. Figs. 5 and 6 are enlarged perspective views of the detached sections of the strut. Fig. 7 is a perspective view of the opposed spring which is operatively assembled between the struts. Fig. 8 is a perspective view of the detached clamp by which the strut-sections are held together against the action of the spring. Fig. 9 is a perspective view of one of the detached heads of the clamp. Figs. 10, 11, 12, and 13 are perspective views, respectively, of the glass stopper, the cap for said stopper, a yielding cushion or buffer between the cap and stopper, and the lead washer which forms the stopper-seat.

The sprinkler-head proper consists of a one-piece frame or yoke, of bronze metal, comprising a hollow base-section 1, arms 2 converging upwardly from diametrically opposite sides of the base 1 and united at the top. The base 1 is provided with a central exit or discharge opening 3, extending therethrough from bottom to top, and is usually threaded externally to adapt it to be screwed into one of the pipes, as *a*, of the sprinkler system. The upper end of the base 1 terminates between the arms 2 and is provided with a comparatively smooth angular seat or face 5 for the reception of a lead washer or steam-gasket 6 and glass stopper 7. The stopper 7 has its lower end adapted to fit within the upper end

of the exit-opening 3 and is usually passed through the central opening in the washer 5, the upper end of said glass stopper being enlarged, forming an annular flange 8 of greater diameter than the adjacent end of the opening 3 and adapted to rest upon the upper face of the washer 6.

A circular disk 9, of cork or similar material, of substantially the same diameter as the flange 8 is interposed between the upper face of said flange or top face of the stopper 7 and a superposed cap 10, against which one end of the strut, as 11, is pressed or forced, the yielding disk or cushion 9 serving to allow for a slight expansion or contraction of the elements by which the stopper is held in place without liability of opening said stopper and also acting as a cushion between the metal cap 9 and glass stopper to prevent abrasion or breaking of the glass by the metal when the parts are positively forced into operative position.

The cap 9 is preferably made in the form of an inverted cup, having a depending marginal flange surrounding and fitting closely upon the sides of the glass stopper to retain the latter centrally in its adjusted position, although the reduced lower end of the stopper fitting into the upper end of the exit-opening serves to additionally center and retain the stopper against lateral displacement. This cap 9 may be made of any suitable metal, as brass or aluminum, and is provided with a central boss 14, having a transverse elongated groove 15, depressed at the center, for receiving the lower end of the strut and retaining it in fixed operating relation to the cap, so that the cap and strut are held against lateral rotary movement. The strut 11 comprises in this instance two comparatively thin metal plates 16 and 17, preferably of silver, metal, or other non-corrodible metal substance, which are connected by a clamp 19 and are adapted to be forced apart by an interposed comparatively stiff bow-spring 20.

The strut-plate 16 is provided at one end with a depending transversely-elongated rib 21, which is offset at one side of the main body of the plate and has its lower edge convexed to fit in the groove in the upper side of the boss 14, and thereby lock the cap and strut against rotary movement when the parts are assembled in their operative positions. The opposite end of the strut-plate 16 is provided with a lengthwise slot 22, opening downwardly from the upper extremity for receiving the intermediate portion of the clamp 19.

The strut-plate 17 is slotted upwardly at 23 from its lower end, also for receiving the intermediate portion of the clamp 19, the upper end of said strut-plate 17 being provided with a central raised or pointed projection 24, fitted into a recess 25 in the lower end of an adjusting-screw 26. This screw 26 is en-

gaged in a threaded aperture 27 in the junction of the upper ends of the arms 2 and is also engaged with a central threaded aperture 28 in a spray-cap 29, the screw serving to lock the spray head or disk against endwise movement relatively to the top of the main frame, upon which it is mounted. The aperture 28 of the spray-disk 29 is elongated radially, forming a V-shape recess 30, which fits upon a V-shape lug 31 on the upper end of the arms 2, thereby locking the disk and head against relative rotation—that is, the lug 31 forms a key at one side of the screw 26, fitting in the seat 30 of the aperture 28.

The clamp 19 is composed of a central bar 33 and opposite end heads 34, each of the latter having an elongated slot 35 for receiving the adjacent end of the bar 33, the slot 36 being slightly wider than the thickness of the bar 33 and is partially closed by a comparatively thin L-shape plate 38, which is soldered to the outer face of the head 34 and is fitted tightly against the adjacent end of the bar 33 at one side of the slot, so as to hold said bar against the opposite side of the slot. It now appears that each of the heads 34 is provided with one of the retainer-plates 38 and that each-retainer-plate is secured to its opposite head and to the adjacent end of the bar 33 by a solder which is fusible under a comparatively low temperature. This fusible solder is carefully worked into the joints between the plates 34 and 38 and bar 33, so as to firmly lock the heads to the bar against relative endwise movement, said heads being thus permanently secured to the bar 33 a sufficient distance apart to permit the strut-plates 16 and 17 and spring 20 to be easily inserted between the heads 34 and upon the bar 33, the strut-plates 16 and 17 being held together against the tension of the interposed spring 20, which tends to force the plates 16 and 17 from each other and against the inner faces of the heads 34 of the clamp 19.

The retainer-plates 38 are soldered to the outer faces of the heads 34 and are therefore exposed to any heat which might be caused by a fire within the vicinity of the sprinkler-head, in which case the solder would be instantly fused or melted, thereby first releasing the plates 38 and heads 34 from securement to the bar 33. The spring 20, which is now tending to force the strut-plates 16 and 17 apart, causes the latter to force the unsoldered heads 34 from the ends of the bar 33, allowing the strut-plates to tilt or rock one upon the other until they fill or are forced apart by the pressure of the water against the lower end of the stopper 7.

It will be observed upon reference to the drawings, particularly Figs. 2 and 4, that the lower end of the strut-sections 17 rests in a groove or upon a shoulder 39 on the strut-section 16 near its lower end and at one side of the vertical plane of the bearing of the lower end

of the strut-section 16 in the groove 14. The upward pressure which is exerted against the lower end of the strut-section 16 is therefore at one side of the bearing of the strut-section 17 upon the section 16, so that as the upward pressure is exerted upon the lower end of the struts 16 its upper end is tilted or rocked laterally, aided by the spring 20, to break the tie between the strut-sections, and thereby release the stopper. The object in making the slot or opening in the head 34 considerably wider than the thickness of the bar 33 is to prevent any possibility of the bar binding in the opening when the plate 38 is released by the fusing of the solder. This widened slot also serves to permit the entrance of a portion of the solder at the junction of the head 34 and plate 38, filling the excess of opening between the bar 33 and one side of the slot in the plate 34, and thereby forming a more positive bond at said junction. The cork disk between the cap 10 and stopper 8 not only affords a yielding cushion between said parts to allow for the slight expansion and contraction of the strut members without opening the stopper, but also prevents any liability of cracking the glass stopper by contact of the metal cap therewith when the struts are firmly screwed down onto the cap. The lead washer which is interposed between the glass stopper and its metal seat also prevents cracking of the glass, at the same time forms a water-tight packing at the joint.

What I claim is—

1. In a sprinkler-head, a base having an opening therethrough and arms diverging upwardly from opposite sides of the base and united at the top, a screw in the top, a glass stopper for the opening, a cap for the stopper, and a strut between the screw and cap, said strut comprising two furcated plates, and a clamp inserted in the furcated ends of the plates and provided with end heads held by a fusible bond, and means for forcing the plates apart when the bond is fused.

2. In a sprinkler-head, a base having an opening therethrough and opposite arms converging upwardly and united at the top, a screw in the top, a stopper for the opening, a strut between the screw and stopper, said strut comprising opposite furcated plates, an interposed spring tending to force the plates apart, and a clamp inserted in the furcated ends of the plates, including a fusible element for holding said plates against the pressure of the spring.

3. In a sprinkler-head, a base having a central lengthwise opening therethrough and

a frame rising from the base, a stopper for the opening, an adjusting-screw and a strut between the screw and stopper, said strut comprising opposite slotted plates engaging each other, one of the plates being engaged by the screw and the other plate holding the stopper in place, a bar inserted through the slots in the plates and provided with heads engaging the outer faces of said plates, fusible means for tying the heads to the bar, and a spring interposed between the plates tending to force the latter against the heads.

4. A sprinkler-head consisting of a frame having an opening in its base and a screw in its top, a glass stopper in the opening, a lead seat for the stopper, a cap fitting over the stopper, a yielding cushion between the cap and stopper, a strut between the screw and cap, said strut comprising opposite plates one of which is seated on the cap and provided with a shoulder at one side of the vertical plane of the seat, the other plate having its lower end seated on said shoulder and its upper end engaged with the screw, a spring between the plates tending to press them laterally, and fusible means for tying the plates together.

5. In an automatic sprinkler, a frame having an opening in its base, a glass stopper having a reduced lower portion fitting in the opening and its upper end enlarged forming an annular shoulder of greater diameter than the opening, a lead seat for said annular shoulder, a cap fitted over the upper end of the stopper, a yielding cushion between the cap and stopper, a screw in the top of the frame, a strut between the screw and cap and comprising opposite upright plates, one of said plates having its lower end seated on the cap and provided with a laterally-projecting shoulder, the other plate having its lower end seated on the shoulder and its upper end bearing against the screw, a spring between the plates tending to force them apart and a clamp for holding said plates against the action of the spring and including fusible parts adapted to be melted by heat to release the clamp, and thereby permit the spring to force the plates apart for the purpose of releasing the stopper when the strut is broken.

In witness whereof I have hereunto set my hand this 1st day of November, 1906.

JAMES A. CASS.

Witnesses:

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M. E. DELANEY.