

B. P. HALL.
 AUTOMATIC SPRINKLER FOR AUTOMATIC FIRE EXTINGUISHERS OR THE LIKE.
 APPLICATION FILED JUNE 23, 1911.

1,010,045.

Patented Nov. 28, 1911.

Fig. 1.

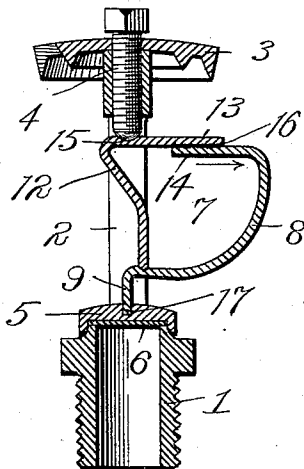


Fig. 3.

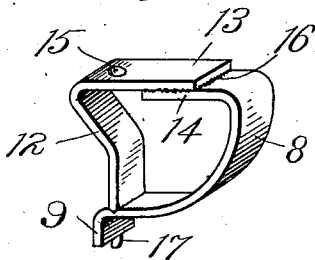


Fig. 5.

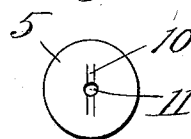


Fig. 2.

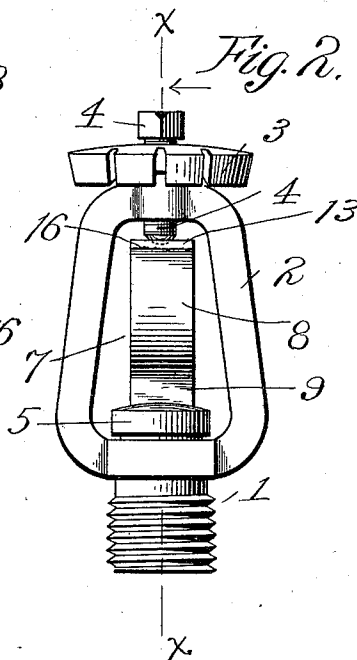
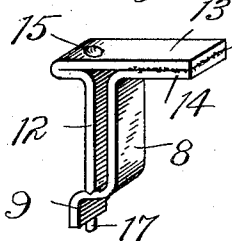


Fig. 4.



Witnesses:
 H. Alfred Gamble.
 H. H. Knight

Inventor
 Burton P. Hall
 By his Attorneys *Wm. C. Wood*

UNITED STATES PATENT OFFICE.

BURTON P. HALL, OF FANWOOD, NEW JERSEY, ASSIGNOR TO NEW YORK AUTOMATIC SPRINKLER CO., A CORPORATION OF NEW YORK.

AUTOMATIC SPRINKLER FOR AUTOMATIC FIRE-EXTINGUISHERS OR THE LIKE.

1,010,045.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BURTON P. HALL, a citizen of the United States, and resident of Fanwood, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Automatic Sprinklers for Automatic Fire-Extinguishers or the Like, of which the following is a full and clear specification.

My invention relates in particular to such automatic sprinklers in which the sprinkler nozzle is opened by releasing the cap which closes it through the fusing of a metal which normally holds the releasing device in such position that the nozzle cap is held thereby on its seat.

The particular novel features of my improvement are the arrangement of the releasing device such that the number of its elements is reduced to not more than two, and that these elements are directly fused together, thus avoiding an additional fuse strip as has been frequently employed heretofore in many other devices of this character, whereby the releasing elements are locked together. Moreover the elements of the releasing device are arranged in such manner that the mechanical strain upon the fused portion of the device is reduced to a minimum and exerted in such direction that only considerable pressure far above the normal is capable of breaking the fused joint without heat. Also the arrangement of my releasing device is such that the fused joint is exposed to the best advantage to the heat which strikes the sprinkler head. The manner in which I accomplish these results will be clear from the accompanying drawings, in which—

Figure 1 is a longitudinal central vertical section through the sprinkler on the line $x-x$ in Fig. 2. Fig. 2 is a full side view of the sprinkler. Figs. 3 and 4 are two different forms of the releasing device which may be employed in the sprinkler shown to retain the cap on the nozzle, and Fig. 5 is a plan view of the nozzle cap.

As will be noted from Figs. 1 and 2, the sprinkler nozzle 1 has integral with it a yoke 2 which arches over the nozzle as shown and above the yoke a diverting plate 3 is disposed and supported on the yoke for instance by set screw 4 as shown, against which plate as is common in such sprinklers,

the water emanating from the nozzle impinges and by which it is deflected downwardly or upwardly according to the position in which the sprinkler is being used. Set screw 4 protrudes through the arch of the yoke and is substantially in line with the longitudinal central axis of nozzle 1. Normally, that is when the sprinkler is not in operation, nozzle 1 is closed by means of a cap 5 which if desired may have a washer 6 between the nozzle rim and the cap, and the cap is held on its seat by means of the releasing device 7, which I will now describe.

The device shown in Figs. 1 and 2 and illustrated in perspective in Fig. 3 consists of two elements, the cap-holding member 8 which is seated with its foot 9 in a slot 10 provided in cap 5, the slot being shown in Fig. 5, and besides this foot is provided with a pin 17 which is seated in a central recess 11 in the cap so that the foot is thereby prevented from accidentally sliding off the cap by jolts or jars. This holding member 8 is curved outwardly shortly above its foot and its upper end is turned inwardly so that it stands substantially at right angles to the nozzle axis as shown. The second member of the device is the bracing member 12 which is braced with its lower end against the lower portion of holding member 8 adjacent to foot 9, but slightly laterally of the axis in which foot 9 is located. Member 12 extends upwardly and is turned at right angles to the nozzle axis so that its free end 13 is located adjacent to and overlaps the free end 14 of member 8. Moreover the portion of member 12 adjacent to the bend is seated with a recess 15 against the set screw 4, this recess being in line with the nozzle axis. If now set screw 4 is tightened a pressure is exerted in the direction of the cap which tends to throw free end 14 of member 8 in the direction of the arrow and thus to separate the ends 13 and 14 in the direction of their longitudinal axis. To prevent such separation normally when the device is not in action these two ends are fused together as shown at 16, the fusing material being of such character that it will fuse at the temperature desired, so that at such temperature under the pressure of screw 4 members 8 and 12 will separate. Thus cap 5 is released and flies off its seat under the water pressure inside of the nozzle

and the sprinkler is thrown into operation. By having pin 17 located in recess 11, holding member 8 in tilting away after it is released from member 12, tends to aid in throwing the cap 5 off its seat.

By the arrangement just described, the result is obtained that notwithstanding the considerable pressure which may be exerted against the releasing device by means of screw 4 in order to hold cap 5 normally on its seat, this pressure does not tend to put an undue separating strain on the fused portion 16 in the direction at right angles to the fused ends 13 and 14, the principal strain exerted on this portion of the releasing device being in the direction of the arrow, in which the fused joint is capable of standing the most strain. As shown for instance in Fig. 3, the two members 8 and 12 may be made of flat resilient metal and thus the fused joint offers a large surface to the heat and is most favorably exposed to changes in temperature.

Instead of forming the releasing device as shown in Figs. 1 and 3, its two members may be also shaped as shown in Fig. 4 from which it will be noted that member 8, after turning outwardly a short distance above foot 9, runs upwardly and its free end 14 extends outwardly instead of inwardly as shown in Figs. 1 and 3. Member 12 is again braced with its lower end against member 8 in similar manner as shown in Figs. 1 and 3, its upper end being T-shaped as shown whereby its free end 13 overlaps end 14 of member 8. Similar to the device shown in Figs. 1 and 3, a recess 15 is provided on the upper side of member 12 in line with foot 9 of member 8 for the purpose previously described. The two free ends 13 and 14 are likewise fused together as shown at 16 in Fig. 14 and the tendency of the two ends 13 and 14 to separate in the direction of their longitudinal axis when under pressure on the line between recess 15 and foot 17 is the same as described with reference to the device shown in the other figures.

It is obvious that the shape of the two members may be greatly varied without changing the effect so long as their mutual relation is such that their free ends tend to separate in the manner described so as to take undue strain off the fused joint in the direction at right angles to the free ends.

In Fig. 1 of the drawings I have shown cap 5 attached to its seat with a washer 6 interposed. Such washers have the disadvantage that they might cause the cap to stick onto its seat notwithstanding the comparatively high water pressure. In filtering the cap directly to its seat, I find that, unless the cap is ground thereon, which for economic reasons is prohibitive, it is very hard to obtain a water-tight fit with the metals ordinarily used for manufacturing

such devices, such as for instance brass, bronze or the like. By making this cap of aluminum, I find that even the ordinary finishing of cap and seat, as by milling, turning or the like, is sufficient to obtain a tight fit which I find will withstand many hundred pounds of water pressure without leaking, and without thereby exerting an undue pressure through screw 4.

What I claim is:

1. A sprinkler head of the character described, having a nozzle, a yoke supported thereon, a nozzle cap for closing said nozzle and a two-piece releasing device, comprising a cap-holding member seated with its foot against said cap substantially in line with the nozzle axis and having its upper end turned in a direction at an angle to said axis, and a bracing member bearing with its lower end against said holding member at a point slightly offset to said nozzle axis and having its upper portion in parallel contact with the upper end of the holding member and braced against said yoke at a point in line with said foot of the other member, the contact faces of said two members being fused together, and adjustable means in said yoke, in contact with said bracing member, for exerting pressure upon said releasing device, in the direction of the nozzle axis, to press the cap onto the nozzle, said pressure tending to separate said two members at their fused ends, substantially longitudinally of said ends.

2. A sprinkler head of the character described, having a nozzle, a yoke supported thereon, a nozzle cap for closing said nozzle and a two-piece releasing device, comprising a cap-holding member having a pin at its foot with which it seats in said cap substantially in line with the nozzle axis and having its upper end turned in a direction at an angle to said axis, and a bracing member bearing with its lower end against said holding member at a point slightly offset to said nozzle axis and having its upper portion in parallel contact with the cap holding member and braced against said yoke at a point in line with said foot of the other member, the overlapping ends of the two members being fused together, and adjustable means in said yoke in contact with said bracing member for exerting pressure upon said releasing device in the direction of the nozzle axis to press the cap onto the nozzle, said pressure tending to separate said two members at their fused ends, substantially longitudinally of said ends, the foot pin of said cap member holding the cap laterally in place when the device is inoperative and tending to throw off said cap when said members separate.

3. A sprinkler head of the character described, having a nozzle, a yoke supported thereon, a nozzle cap for closing said nozzle

and a two-piece releasing device, comprising a cap-holding member seated with its foot against said cap in a direction substantially in line with the nozzle axis and being curved outwardly from said axis, the upper end being turned inwardly at an angle to said axis, and a bracing member bearing with its lower end against said holding member at a point slightly offset to said nozzle axis and having its upper portion in parallel contact with the cap-holding member and braced against said yoke at a point in line with said foot of the other member, the overlapping ends of said two members being fused together, and adjustable means in said yoke in contact with said bracing member for exerting pressure upon said releasing device in the direction of the nozzle axis to press the cap onto the nozzle, said pressure tending to separate said two members at their fused ends, substantially longitudinally of said ends.

4. A sprinkler head of the character described, having a nozzle, a yoke supported thereon, a nozzle cap for closing said nozzle and a two-piece releasing device comprising a cap-holding member seated with its foot on the cap in a direction substantially in line with the nozzle axis and a bracing member, braced with its lower end against said holding member at a point slightly offset to said nozzle axis and braced intermediate its end against said yoke at a point substantially in line with said nozzle axis, the free ends of said two members overlapping each other and being fused together and adjustable means in said yoke at the bracing point of said bracing member for exerting pressure upon said releasing device in the direction of the nozzle axis to press the cap onto the nozzle, said pressure tending to separate

said two members at their fused ends substantially longitudinally of said ends.

5. A sprinkler head of the character described, having a nozzle, a yoke supported thereon, a nozzle cap for closing said nozzle and a two-piece releasing device, its two members being braced upon each other and between the cap and said yoke at points substantially in line with the central axis of said nozzle, their mutual bracing point being located intermediate the cap and the yoke and slightly laterally to said axis, the free ends of said two members overlapping each other and being directly fused together in parallel contact whereby they tend to separate substantially longitudinally of their ends.

6. A sprinkler head of the character described, having a nozzle, a yoke supported thereon, a nozzle cap for closing said nozzle and a two-piece releasing device, its two members being braced upon each other and between the cap and said yoke at points substantially in line with the central axis of said nozzle, their mutual bracing point being located intermediate the cap and the yoke slightly laterally to said axis, the free ends of said two members overlapping each other and being directly fused together in parallel contact and means at the bracing point on said yoke for exerting pressure upon said device in the direction of said axis to hold the cap on the nozzle whereby said members tend to separate at their free ends substantially longitudinally of the direction of said free ends.

BURTON P. HALL.

Witnesses:

M. K. LOTTERER,
H. ALFRED JANKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."