No. 887,201. PATENTED MAY 12, 1908.

V. LAPHAM.

SPRINKLER HEAD.

APPLICATION FILED MAY 9, 1904.

Fig. 1.

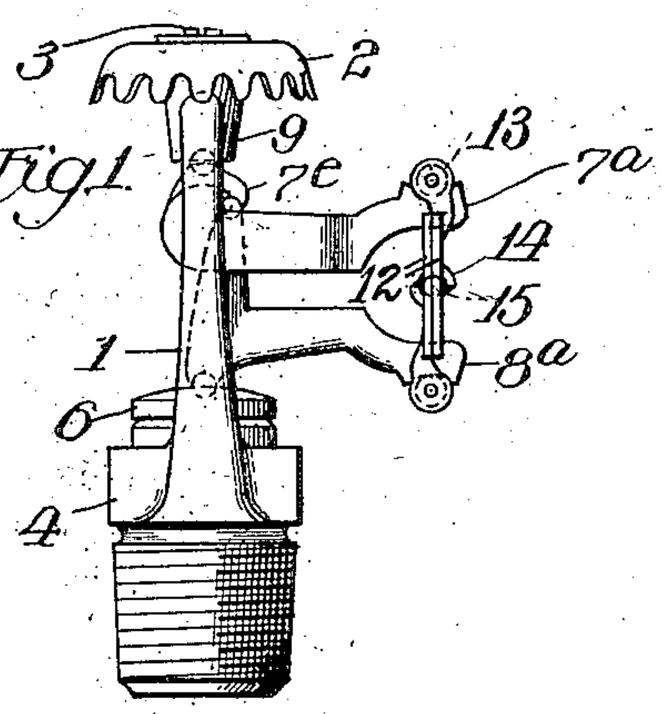


Fig. 3.

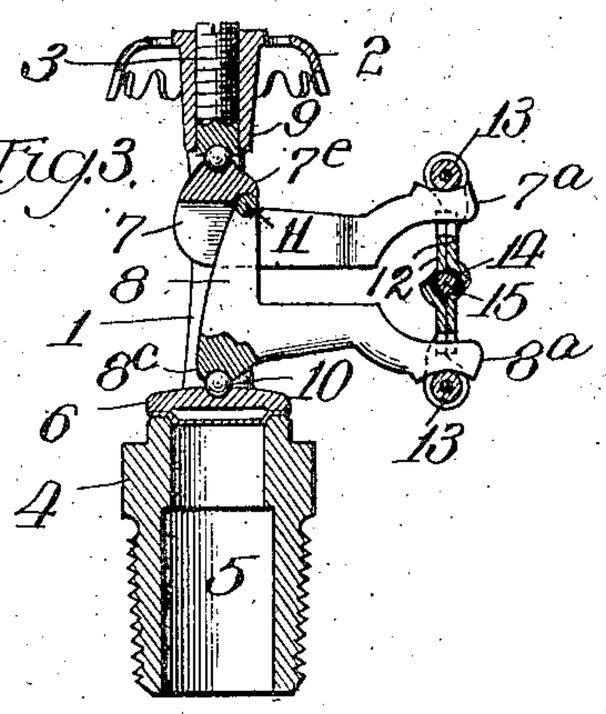


Fig. 2.

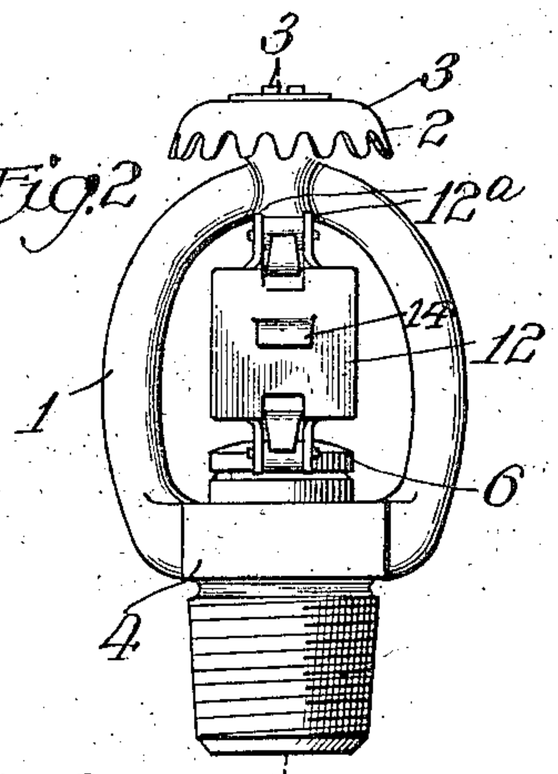


Fig. 4.

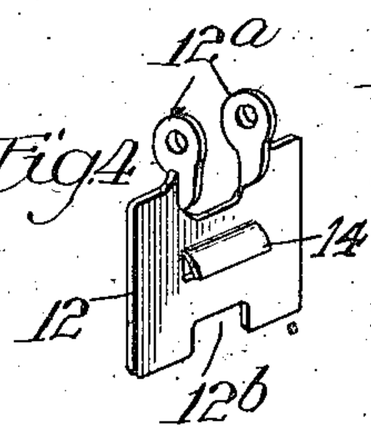


Fig. 5.

Fig. 6.

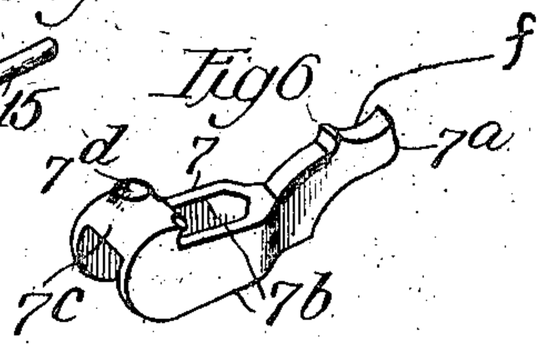


Fig. 7.

Fig. 10.

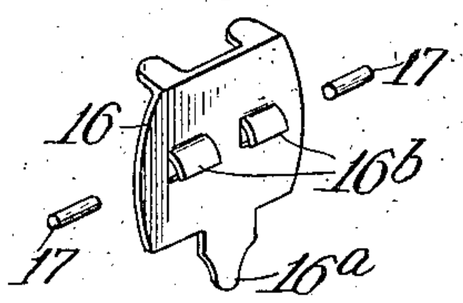


Fig. 8.

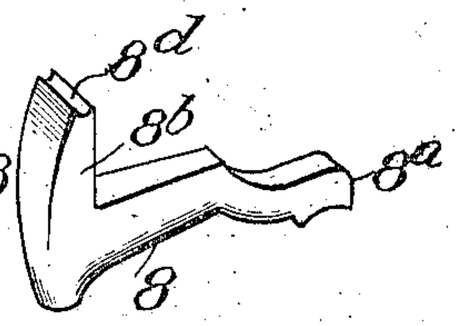


Fig. 9.

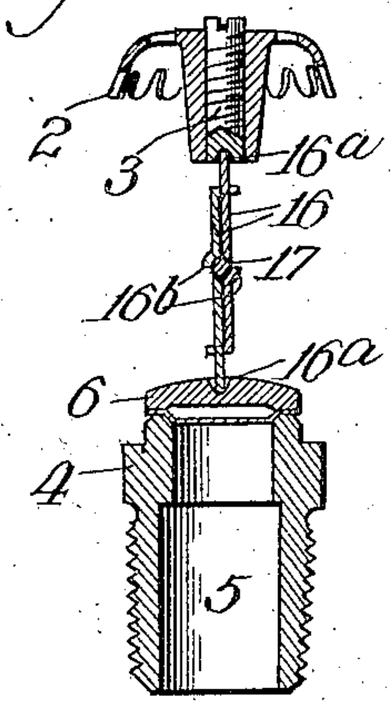


Fig. 12.

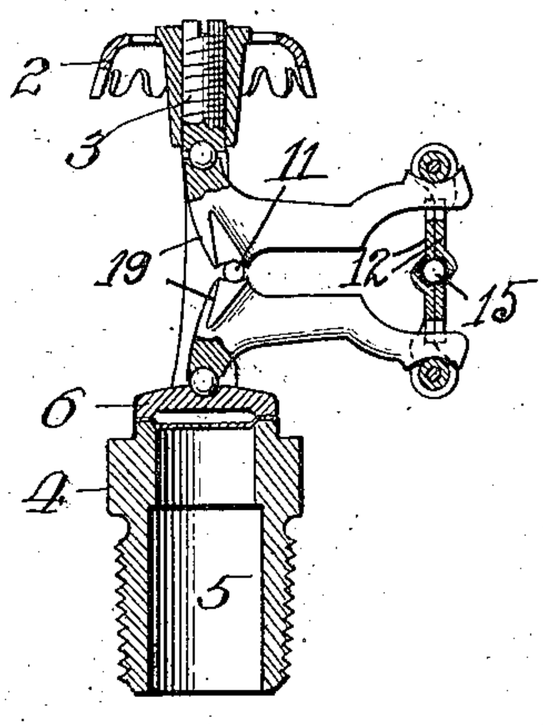
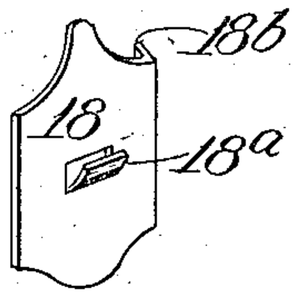


Fig. 11.



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UNITED STATES PATENT OFFICE.

VALENTINE LAPHAM, OF CHICAGO, ILLINOIS.

SPRINKLER-HEAD.

No. 887,201. Specification of Letters Patent. Patented May 12, 1908.

Application filed May 9, 1904. Serial No. 207,032.

To all whom it may concern:

Be it known that I, VALENTINE LAPHAM, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Sprinkler-Heads, of which the following is a specification.

My invention relates to what are commonly designated as sprinkler heads used in automatic fire sprinkler systems and intended, when "fired" or fused, to first release the air under pressure in the distributing pipes and then to sprinkle the water after the automatic opening of the valve, in case of the so-called dry pipe system, or to release and sprinkle the water directly, in case of the so-called wet pipe system.

The object of my invention is to provide a sprinkler head which shall be simple and inexpensive in its structure as well as reliable and sensitive in its operation. As is well known, devices of this character must be reliable at all times, to normally prevent water loss and, in case of fire, to prevent fire loss. The production of a sprinkler head possessing these qualities is the main object and desideration of my invention.

In the drawings, Figures 1 and 2 are elevations, taken from different sides, of a sprinkler head embodying my invention; Fig. 3 a section thereof on line 3—3 of Fig. 2; Figs. 4 to 8 detail views of some of the component parts of the strut device; Fig. 9 a section of a sprinkler head illustrating the principle of my invention as embodied in another form of strut; Fig. 10 a perspective of one of the members of the modified strut and the bearing rollers; Fig. 11 a perspective of another form of strut; and Fig. 12 a section showing a modification of the sprinkler head.

Referring to Figs. 1 to 8, the sprinkler head comprises the conventional yoke 1, deflector 2, set screw 3 and head proper marked 4, provided with the outlet passage 5 normally closed by the flat disk valve 6, and comprising, in addition, the strut elements constituting my invention and arranged within the yoke for the purpose of normally holding the valve seated.

As herein shown, the strut device comprises the two strut arms 7 and 8 which have a bearing on each other, off the center, and by preference toward one end of the yoke to insure reliability and sensitiveness in operation. To attain in greater measure the reliability and sensitiveness, I provide a ball bearing between the strut arms and the set screw and cap valve respectively and a roller bearing between the individual members or strut arms.

As illustrated more particularly in Fig. 3, the strut arms have oppositely directed sockets to receive the balls 9 and 10 bearing respectively against the set screw and cap valve which are likewise socketed to receive them. The bearing point or line between the individual strut arms consists of a roller 11, received in grooves as hereinafter explained.

The strut arms extend laterally and as to their outer ends the same are similarly made except that such ends 7^a and 8^a respectively are oppositely curved so as to leave a space occupied by the fusible link hereinafter described.

The inner end or body portion of the strut arm 7 comprises two parallel portions 7^b connected at their top and toward their outer end with a cross-piece 7^c whose apex is provided with the socket 7^d to receive the ball 9, and whose under surface has a transverse groove 7^a to receive the roller 11. The end of the arm or extended portion 7^a of the strut arm 7 is provided with a notch 7^f to receive the fusible link hereinafter particularly described. The construction of this strut arm is clearly shown in Figs. 3 and 6. The other strut arm 8, shown by itself in Fig. 8, comprises a main body portion 8^b from which its laterally extending arm 8^a proceeds. The lower end of such portion 8^b has a socket 8^c to receive its ball 10 and its upper end has a transverse groove 8^a (see Figs. 3 and 8).

The particular method of manufacture of these strut arms is entirely immaterial, as they may be cast, stamped out of sheet metal or otherwise formed as desired.

From the description thus far given, it will be seen that the strut arms do not bear directly against each other but through the medium of the roller 11, and likewise that they bear indirectly against the adjusting screw and cap valve through the medium of the balls.

As hereinbefore suggested, the outer or extended ends of the strut arms are curved and normally connected together by the link capable of collapsing when the solder thereon holding its component parts together is fused and the tension transmitted from the adjusting screw exerts itself to throw the

strut arms out of place in the so-called "firing" of the sprinkler head.

The link comprises two similar plates 12, each having the bearing lugs 12^a preferably stamped therefrom and twisted to form bearings or fastenings for a pin 13 which hooks over the ends of the strut arms which are each socketed or grooved to receive its pin as hereinbefore stated. A substantially rectangular tongue 14 is outwardly stamped from each plate to form a pocket 14, of such size and shape that when the two plates are brought into juxtaposition as seen in Fig. 3, they will conveniently receive between them in their pockets a roller 15, Fig. 5. Each plate is cut away at 12^b to accommodate the outer ends of the strut arms. The plates 12 with their roller 13 between them are soldered together with low fusible solder usually of about 165 degrees test, as required by underwriters' boards. The link is slipped over two strut arms made as described and the latter are assembled in the yoke with the roller 11 and balls 9 and 10 in place. The proper tension is then applied, as usual, by the adjusting or set screw 3.

The strut arm 8 is of such width as to fit between the parallel arms 7^b of the other strut as indicated in Fig. 3, and the slot or bifurcation formed by such parallel arms is of such length as to permit the upper end of the strut arm 8 to clear the inner end of such slot when the head is "fired" and the strut arms are snapped out of place.

In the form of sprinkler head above described, the collapsible element partakes of the form and operation of a link but my invention is applicable to the true form of strut when the strain or pressure instead of a pulling one as in the case of a link is a pushing or compressing one. In Figs. 9, 10 and 11 I have shown such strut form, the same comprising the two similar plates 16 provided with bearing points 16^a fitting or bearing against the set screw and valve respectively. These plates are also provided with the tongues 16^b forming the pockets to receive the pair of rollers 17 and are by preference provided with the end tongues 16^c. In Fig. 11 the strut comprises plates 18 similar to plates 16 but each having a single roller pocket 18^a and longitudinal flange 18^b.

It will be understood that the several different novel features of my sprinkler head may be employed and utilized independently of each other, for instance the novel link construction may be employed in a head in which the roller 11 is dispensed with, and likewise the balls might be dispensed with. So also the feature of the roller 11 or of the balls might be employed in connection with a link of different construction.

In Fig. 12 I have shown a modification as regards the construction of the strut arms, such arms 19 of this construction being similar to each other but arranged reversely to each other and heel to heel with the roller 11 interposed between them at their heels. This roller 11 is of course positioned at a point out of line between the adjusting screw and the valve cap, so that the strut arms will be released when the link 12 collapses in the manner hereinbefore described.

I claim:

1. A sprinkler head strut device comprising two plates having side openings which register when the plates are in assembled position, and a cylindrical roller arranged transversely of the plates and within the openings thereof.

2. A sprinkler head strut device comprising two plates having registering side openings and pockets formed thereat, and a roller arranged within the openings, said pockets being arranged to contain the fusible solder which is directly exposed.

3. A sprinkler head strut device compris ing two plates having tongues pressed out therefrom to form pockets, and a roller arranged within such pockets.

4. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms bearing upon each other and having outer ends curved in opposite directions, one of said arms having parallel plates 7^b with a heel portion 7^e between them and the other of said arms having an extension 8 bearing upon said heel portion, and a collapsible link arranged between said outer ends of the strut arms.

5. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms bearing against the valve and screw respectively and having a roller bearing between them, and a collapsible link consisting of two plates having a roller bearing between them intermediate their length and arranged between the ends of said arms, said plates having transverse openings registering with the pockets and receiving said roller.

6. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkle head and comprising strut arms bearing against the screw and valve respectively, and a collapsible link comprising two plates connected with the outer ends of the arms respectively and having interior pockets opening on both faces of the plates, and a roller fitting in said pockets intermediate their length.

7. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms bearing against the screw and valve respectively, and a collapsible link consisting of two plates having side pockets which register with each other when the plates are assembled and also having lugs 12^a, pins arranged

in said lugs and hooked over the outer ends of said arms, and a roller positioned within said pockets.

8. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms bearing against the screw and valve respectively, and a collapsible link consisting of two plates having bearing lugs 12^a, pins arranged in said lugs and hooked over the outer ends of said arms, said plates having tongues 12^b and pockets adjacent thereto, and a roller 15 arranged in said pockets between the plates.

9. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms bearing against the screw and valve respectively, and a collapsible link consisting of two plates having bearing lugs, pins arranged in said lugs and hooked over the outer ends of said arms, said plates having pockets, and a roller 15 arranged in said pockets between the plates.

10. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms 7 and 8 bearing against the set screw and valve respectively, and a collapsible link connecting the outer ends of such arms, the arm 7 having parallel portions 7^b between which the arm 8 fits; substantially as described.

11. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms 7 and 8 bearing against the set screw and valve respectively, and a collapsible link connecting the outer ends of such arms, the arm 7 having parallel portions 7^b between which the arm 8 fits and a cross piece 7^c bearing against the set screw; substantially as described.

12. A sprinkler head strut device arranged in combination with the valve and set screw of a sprinkler head and comprising strut arms 7 and 8 bearing against the set screw and valve respectively, and a collapsible link connecting the outer ends of such arms, the arm 7 having parallel portions 7^b and the arm 8 having a vertical portion 8^b fitting between such portions and bearing against the other arm; substantially as described.

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