

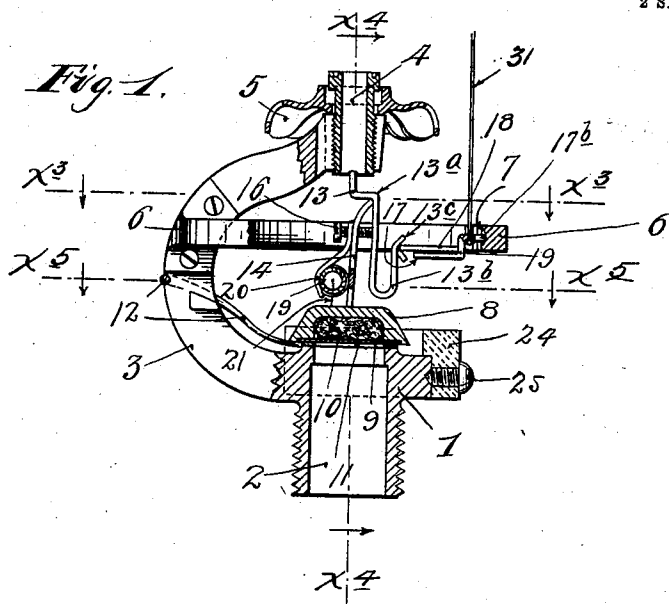
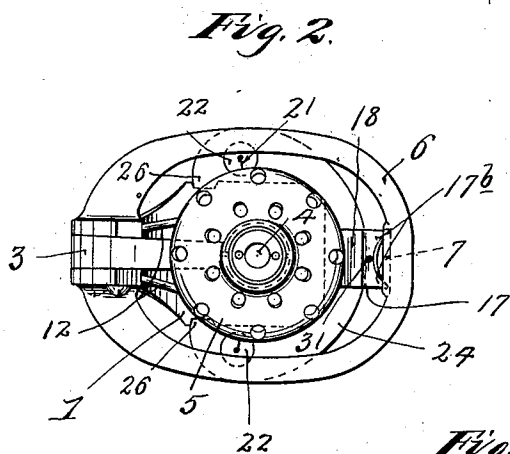
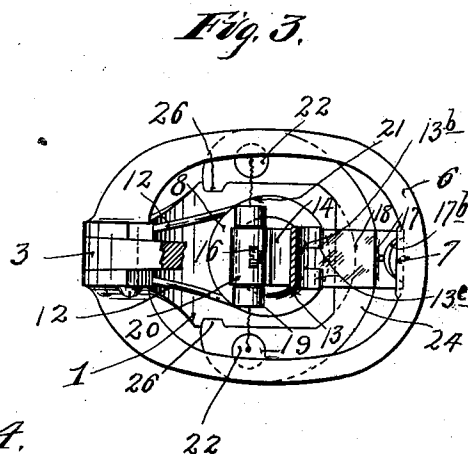
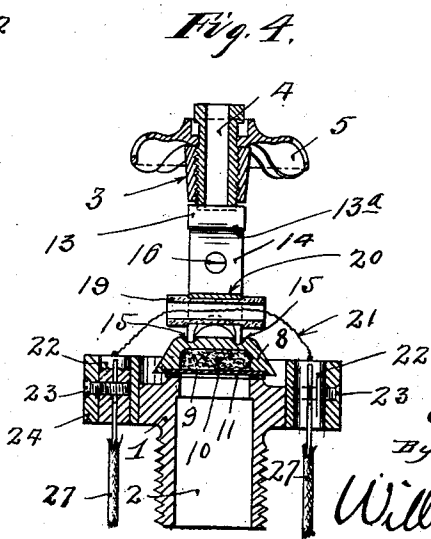
No. 758,522.

PATENTED APR. 26, 1904.

C. B. GARRETT.
AUTOMATIC SPRINKLER.
APPLICATION FILED APR. 18, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 5.

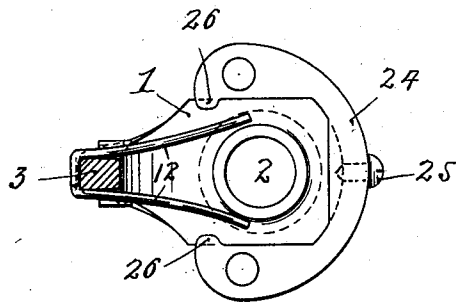


Fig. 6.

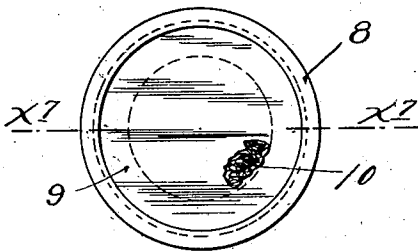


Fig. 7.

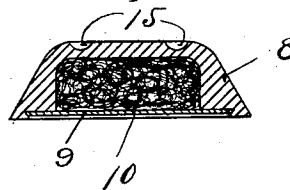


Fig. 8.

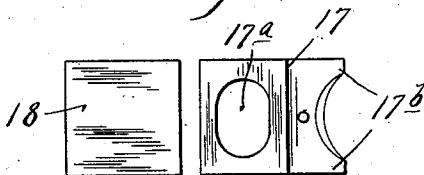


Fig. 9.



Fig. 10.

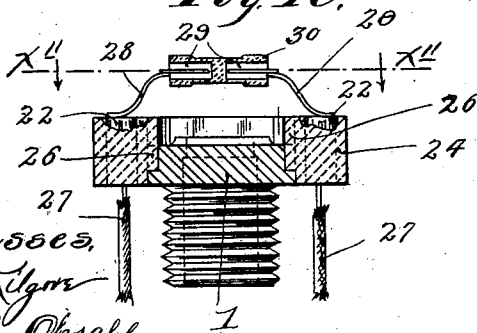
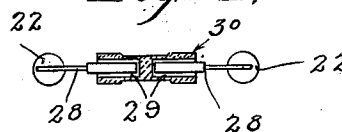


Fig. 11.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 758,522, dated April 26, 1904.

Application filed April 18, 1902. Serial No. 103,493. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. GARRETT, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Automatic Sprinklers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to automatic sprinklers for fire-extinguishing systems, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

Certain features illustrated in this application and not herein claimed are disclosed and claimed in my prior application, Serial No. 97,238, filed March 8, 1902, for an automatic sprinkler.

My invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view, partly in side elevation and partly in vertical section, showing an automatic sprinkler embodying the several features of my invention. Fig. 2 is a plan view of the same. Fig. 3 is a horizontal section on the line $x^3 x^3$ of Fig. 1. Fig. 4 is a transverse vertical section approximately on the line $x^4 x^4$ of Fig. 1. Fig. 5 is a horizontal section on the line $x^5 x^5$ of Fig. 1. Fig. 6 is a bottom plan view of the cap or stopper. Fig. 7 is a section on the line $x^7 x^7$ of Fig. 6. Fig. 8 is a detail view in plan, showing the parts of the so-called "fusible strut" separated. Fig. 9 is a plan view of the sleeve through which the fusible section of the annunciator-circuit is passed. Fig. 10 is a detail view in vertical section, showing a slightly-modified construction of the sprinkler-head and associated parts; and Fig. 11 is a section on the line $x^{11} x^{11}$ of Fig. 10.

The numeral 1 indicates the head of the sprinkler, which head is provided with a wa-

ter-delivery orifice 2 and is adapted to be supported in the usual or any suitable way at the delivery end of the water-distribution pipe. This head is provided at one side with an upwardly-curved yoke 3, the upper end of which terminates above the orifice 2 and, as shown, is split to afford a clamping-seat for a sleeve-like adjusting-screw 4. The adjusting-screw 4 loosely holds in position a spraying-wheel 5 of ordinary construction.

To the intermediate portion of the yoke 3 is secured a horizontally-extended thrust-resisting bracket afforded by a rigid loop 6, provided at the inner edge of its extended portion with indentations or depressions 7, into which, as will be presently noted, the prongs of a so-called "fusible strut" are adapted to be seated.

The orifice 2 is normally closed by a cap or stopper 8, which is normally held in working position directly by a toggle-acting spring-strut and indirectly by the so-called "fusible strut." A diaphragm or disk 9, of mica, is countersunk approximately flush into a shallow seat formed in the bottom or lower surface of said cap. Above the disk 9 the cap 8 is hollowed out or formed with a cavity which is quite tightly packed with an elastic or resilient material 10, such as hair, wool, or rubber. The marginal portions of the diaphragm 9 are pressed onto a packing-ring 11, preferably of soft metal, which is seated on the face of the head 1, surrounding the orifice 2.

One or more, but preferably a pair, of springs 12, secured at their outer ends to the yoke 3 or other suitable support, engage under the adjacent edge of the cap 8 at their extended ends and assist in unseating said cap when the same is released from the strain of the devices which normally hold the same in its closed position.

The toggle-acting spring-strut is made up of two sections 13 and 14, the former of which at its upper end engages a notch or depression in the lower end of the screw 4 and the latter of which at its lower end is shown as bifurcated and engages depressions 15, formed in the top of the cap 8. Slightly below its upper end

the strut-section 13 is formed with an offset shoulder 13^a, with which the laterally-bent upper end of the strut-section 14 engages. The strut-section 13 at its lower portion is in the form of a U-shaped spring extension 13^b, which terminates at its free end in a crotch 13^c, preferably formed by splitting the end of said spring extension and bending the lips thus formed in opposite directions, as best shown in Figs. 1 and 3. A thrust-screw 16 works with screw-threaded engagement through the strut member 14 and presses against the inner prong of the spring extension 13^b.

The fusible strut is made up of two sections 17 and 18, the flat surfaces of which are connected by solder 19 of the desired fusibility. The section 17 underlies the section 18 and is preferably provided with a perforation 17^a, which exposes a portion of the solder to the direct action of flames or hot drafts of air, which in case of fire melt the solder and throw the sprinkler automatically into action. The inner end of the strut-section 18 normally rests in the crotch 13^c of the strut-section 13 of the spring-strut. The outer end of the strut-section 17 is bent laterally out of line with the bodies of the sections 17 and 18 and, as shown, is formed with prongs 17^b, which normally engage the seats or depressions 7 of the bracket 6. A sleeve 19, of insulating material, is secured to one face of the strut-section 14 by means of a clamping-finger 20. A section 21 of an annunciator-circuit is passed loosely through said sleeve 19 and, as shown, is secured at its ends to contact-plugs 22, shown as held by screws 23 within suitable seats formed in a yoke-like insulating-support 24, which in turn is shown as secured to the head 1 of the sprinkler by means of a screw 25 and by lug-and-notch engagements 26. The leads 27 of the annunciator-circuit are suitably secured to the contact-plugs 22.

In the construction illustrated in Figs. 10 and 11 the part corresponding to the wire 21 is formed in two sections 28, and the ends of the said sections are inclosed within pockets 29 of an insulating-sleeve 30. This latter-described construction is intended for use where a normally open annunciator-circuit is employed, while the continuous wire 19 is intended for use where a normally closed annunciator-circuit is employed.

The numeral 31 indicates a wire or other connection to one member of the so-called "fusible strut." This connection 31 may extend to any suitable point and connected to any suitable device whereby it may be drawn upon to positively force the fusible strut out of working position and throw the sprinkler into action, as is frequently desirable in cases of fire.

The strut devices above described are adapted for use in connection either with dry-pipe or wet-pipe systems. The water cushioning device, however, would not be necessary in

dry-pipe systems in view of the elasticity of the air stored in the distribution-pipes, but is of course especially adapted for use in wet-pipe systems.

It is of course a well-known fact that water unmixed with air is one of the most inelastic substances known. It is due to this inelasticity of the water that all jars or vibrations applied to any of the parts of the wet-pipe system are through the water transmitted to the sprinkler-heads, producing thereon in many cases an almost incessant pounding action, technically known as "water-hammer." This incessant or frequent pounding action at the sprinkler-heads tends to produce crystallization and often renders the sprinkler-heads unreliable or inoperative.

The water cushioning device renders the above pounding action of the water harmless or at least minimizes the pounding effect of the water. With the construction above described it is evident that all jars or sudden vibrations at the sprinkler-heads upon striking the diaphragm of the cushion are exhausted, or so nearly so, that they are rendered harmless.

The diaphragm 9 may be made of various materials, among which may be mentioned thinly-pressed metal. Such construction of the diaphragm would not, however, be the full equivalent of the diaphragm formed of mica, since the former will corrode or rust, while the latter will not.

As already indicated, the toggle-acting spring-strut and the toggle-acting fusible strut are normally applied as best indicated in Fig. 1. It is also evident that when the solder of the fusible strut is melted enough to permit the sections of the strut to be separated under the spring tension of the spring-strut the sections 17 and 18 will be rapidly thrown apart by an angular or buckling movement resembling that of a toggle. Under this movement the sections of the fusible strut, as well as those of the spring-strut, are thrown away from the yoke 3 of the sprinkler-head 1 and all find a clear space through which they are thrown below the loop or bracket 6 and above the sprinkler-head. It is also evident that as soon as the spring-strut is released by the buckling of the fusible strut the sections thereof will be buckled under the coöperating action of two forces—to wit, the one due to the vertical tension put upon the offset shoulder 13^a of the section 13 and the other due to the lateral strain put upon the spring extension 13^b by the thrust-screw 16. It is further evident that by adjusting the set-screw 16 any desired lateral strain may be put upon the spring extension 13^b and through said spring extension onto the fusible strut. This adjustable feature I consider an important improvement over the prior state of the art.

It will of course be understood that the de-

vice above described is capable of considerable modification within the scope of my invention as herein set forth and claimed.

The sleeve 19, carried by the strut-section, is detachably held by the spring keeper or finger 20, and hence may be removed and replaced at will. When it is applied in working position, as illustrated in Figs. 1 to 4, inclusive, it serves when the struts are tripped to break or sever the wire 21 of the annunciator-circuit. This wire 21, it should be further explained, is not only a fine wire which may be easily broken, but should be composed of a metal or other conducting material which is easily fused, so that the heat which throws the sprinkler into action will render the same soft and more easily broken than under normal conditions.

In the construction illustrated in Figs. 10 and 11 when the sleeve 30 is thrown from working position by the tripping of the struts and the opening of the water-delivery orifice of the sprinkler-head the circuit between the sections of the divided or section conductor 28 will be closed by the outflowing column of water.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In an automatic sprinkler, the combination with a sprinkler-head having a water-delivery orifice, of a stopper normally closing said orifice, a toggle-acting spring-strut normally holding said stopper in position, means for adjusting or varying the tension tending to buckle the said toggle-acting strut, and a fusible strut normally resisting the buckling action of said toggle-acting strut and holding the same in working position, substantially as described.

2. In an automatic sprinkler, the combination with a sprinkler-head having a water-delivery orifice, of a stopper normally closing said orifice, means for holding said stopper in working position, said means comprising sections 13 and 14, the former having the shoulder 13^a, spring extension 13^b and prong 13^c, and the latter having the thrust-screw 16, and

a fusible strut normally pressed between said prong 13^c and a portion of said sprinkler-head, substantially as described.

3. The combination with a sprinkler-head having a water-delivery orifice and an upwardly-curved yoke terminating above said orifice, of a horizontally-extended yoke or thrust-bracket secured to the former yoke, a cap or stopper for normally closing said orifice, a toggle-acting spring-strut reacting on said cap or stopper and on the upper end of the former noted yoke, and a fusible strut reacting between said spring-strut and the extended portion of said horizontally-extended yoke, substantially as described.

4. The combination with a sprinkler-head having a water-delivery orifice, of a stopper normally closing said orifice, a toggle-acting strut normally holding said stopper in position, a sleeve or guide carried by one of the strut members, and circuit connections involving a fusible wire passed through said sleeve or guide, substantially as described.

5. The combination with a sprinkler-head having a water-delivery orifice, of a stopper normally closing said orifice, a toggle-acting strut normally holding said stopper in working position, a sleeve detachably secured to one of the strut members by spring finger or clamp, and circuit connections involving a fusible-wire section passed through said sleeve and adapted to be severed thereby when the strut is tripped, substantially as described.

6. The combination with a sprinkler-head having a water-delivery orifice, of a stopper normally closing the same, a toggle-acting strut normally holding said stopper in working position, a sleeve carried by one of said strut members and a circuit connection subject to the action of said sleeve when said strut is tripped, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES B. GARRETT.

Witnesses:

E. H. KELIHER,
F. D. MERCHANT.