

(No Model.)

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SPRINKLER.

No. 571,012.

Patented Nov. 10, 1896.

Fig. 1.

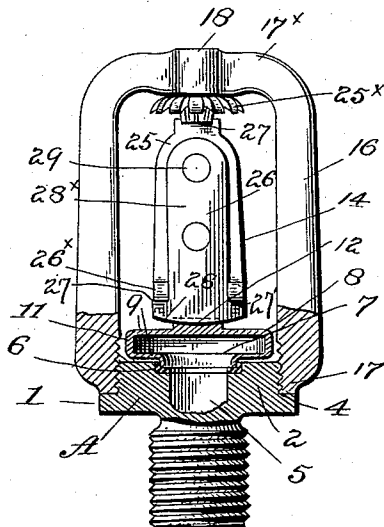


Fig. 2.

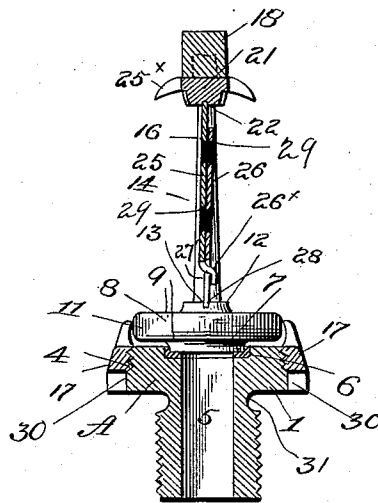


Fig. 4.

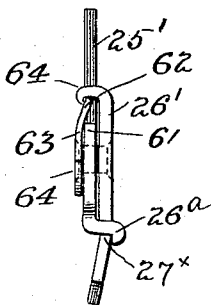


Fig. 3.

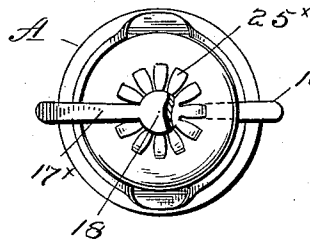
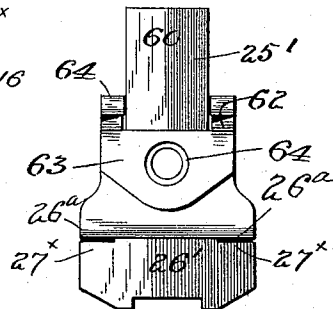


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES NERACHER, OF CLEVELAND, OHIO; OTTO J. FREY ADMINISTRATOR
OF SAID NERACHER, DECEASED.

SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 571,012, dated November 10, 1896.

Application filed February 23, 1894. Serial No. 501,245. (No model.)

To all whom it may concern:

Be it known that I, CHARLES NERACHER, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Sprinklers, of which the following is a specification.

It is the object of my invention to provide a sprinkler for use in fire-extinguishing systems in which the valve will be more firmly seated the greater the pressure of the water thereon tending to open it, said valve being hollow to receive the water-pressure, formed of one piece with both its upper and lower walls flexible, by which the internal pressure of the water will tend to spring outwardly the walls, and thus force the valve into firm contact with its seat in proportion to the pressure, in order to prevent leakage.

My invention includes a special form of expandible valve and a special form of truss, all as hereinafter fully described.

In the drawings, Figure 1 is a central vertical section through the sprinkler; Fig. 2, a view a quarter-turn from that of Fig. 1; and Fig. 3 is a plan view. Figs. 4 and 5 show details.

In the drawings the base of the sprinkler A is provided with the threaded nipple for attachment to the water-supply pipe, and it has a lateral flange 1 and a central portion 2, forming with the lateral flange a shoulder 4. About the central opening 5 for the water a depressed annular valve-seat 6 is provided in the solid central part, and into this the flange 7 of the valve 8 fits and finds a solid bearing. This seat is preferably formed of a ring of soft metal adapted to provide a slightly-yielding bearing for the valve mouth or flange, in order to get a water-tight joint.

The valve is formed hollow, the body portion 8 extending laterally and annularly about the flange or mouth and comprising upper and lower preferably parallel walls 9 of thin metal connected at their edges by the integral side 11. This side is slightly thicker than the upper and lower walls, and may be slightly rounded or rounded at the corners. The valve has also a boss 12 on its outer side

provided with a kerf 13 to receive the lower

end of the strut 14. The whole valve, with its upper and lower walls, its side, its mouth or flange, is formed of one piece, and, the upper and lower walls being thin, they are both adapted to yield under the pressure of the water, and as the outer or lower wall cannot move outwardly, owing to the resistance offered by the unyielding strut engaging therewith, the whole yielding effect is given or transmitted to the valve in the direction of its seat, thus forcing the flange or mouth into firm contact with its seat to make a perfectly water-tight joint.

The flange or mouth of the valve is the only point of contact with the valve-seat; and as the main body of the valve extends laterally about this central mouth and has no bearing whatever on the valve-seat or upon any part of the frame, and, further, as this entire body portion is yielding, it will be clear that the maximum spring effect will be secured. The bearing of the strut with the valve, it will be noticed, is also central, and this adds to the effect above described, as the main body portion of the valve is left free.

It may be noted also that the mouth or flange, extending as it does about the water-passages of the sprinkler, allows the water to enter the valve freely and the pressure to have full force. The thicker sides of hollow valve serve to prevent the valve from buckling or getting out of shape under great pressure. The frame for holding the distributor comprises the arms 16, having an internally-threaded ring 17, engaging corresponding threads around the shouldered portion of the sprinkler-base, said ring fitting against the lateral flanges of said base. The arms 16 are opposite each other, and are connected by an integral cross-piece 17^x at their ends having a boss 18, to which the distributor 19 is attached. The distributor consists of a disk having a central boss 21 with grooves around its sides and a kerf 22 in its top for the end of the strut. The disk is slightly dish-shaped and has numerous radial slots extending from its outer edge to near the central boss of the arms, and these form a series of wings or fingers 25. The arms 16 are flat-sided and are arranged with their narrow edges toward

the distributor, and their longer major axis extending substantially radial from the center of the distributor.

The slots of the distributor are so arranged that those nearest the arms will discharge the water along the sides of said arms without striking them, that is to say, one of the fingers or wings between the slots is in the same plane with the long dimension of the arms, and the arms thus lie between the sprays or streams of water passing from the distributor without offering any obstruction whatever to the uniform distribution. By this arrangement the water striking the dish-shaped distributor will be thrown laterally, and some of the water will pass directly through the slots and thus serve to distribute the water vertically above and below the sprinkler.

The strut consists simply of two lever-arms 25 26, the former or upper part having the projection 27 to engage the central boss on the distributor and the latter or lower part having the edge 28 to engage the boss on the valve. The part 25 has the hook-bearings 26^x to engage the lateral lugs or ears 27 on the lever 26, the main portion 28^x of the lever 26 passing up between the hooks, to lie against the face of the lever 25. These lever parts have conical openings 29, flaring outwardly in opposite directions, and in these the holding solder is placed, which forms a double rivet adapted to hold the parts firmly together, said solder also lying between the contiguous faces of the arms. The hooks and ears form a pivotal connection between the lever parts, and the arrangement is such that when in normal position the lever part 26 will extend at an angle to the part 25, and it is necessary to apply pressure in order to spring the levers into contact. The solder rivet is then applied and the lever-arms forming the strut are thus held under tension, and when the solder melts they spring out of contact with each other and thus release the valve.

The lever-arms are of such length that they cannot be placed in position between the valve and the distributor excepting by swinging the arms apart slightly on their pivotal connection, and when the lever-arms are pressed together or straightened the valve is placed under strong tension and is forced firmly on its seat.

The kerfs in the distributor and valve are in the same vertical plane, whereas the lever-arms must extend slightly in inclined position from the valve to the distributor. This brings the pivotal point between the lever-arms slightly to one side of the vertical plane of the points of contact with the lever and distributor, so that even though the lever-arms are not sprung into contact, as above described, the pressure from the spring-valve will cause their release when the solder melts.

By my special valve the solder-joint is protected from the water until the parts are fully released, this being a material advantage and preventing the partially-melted solder from

hardening by reason of contact with the water, as is sometimes the case in some sprinklers when the valve begins to open.

In order that the sprinkler may be readily removed, I have provided notches 30 in the side of its base portion and a reduced neck portion 31 on the nipple. To this a special form of wrench is adapted having prongs to straddle the neck and a prong or spur to engage the notch in the side of the base. By this wrench the sprinkler can be turned readily and removed and the wrench will be held firmly by the sprinkler in case the workman for any reason should desire it to remain in contact while some other work is being performed.

In forming the valve, in order to secure the expansion effect in the highest degree and at the same time produce a durable valve, I form said valve from rolled metal, taking a cylindrical bar or piece and coring out the interior to form the shell and at the same time shaping the exterior. The valve is thus made entirely without joints or soldered seams, and this is of material advantage in a valve designed to be expansible and in which the walls have movement, as were the walls formed separately and joined at their edges there would be liability of the joint cracking or working loose under the great pressure these valves must stand.

In Figs. 4 and 5 my preferred form of strut is shown. This is designed to secure a double effect. It has the parts 25' 26', having the shoulders 27^x engaged by the hooked fingers 26^a. In this case the part 26 is bent so as to throw the contact-point between fingers 26^a and 27^x more out of line than in the former case, and in addition to this the part 25' has a reduced upper end at 60, forming shoulders 61, over which fit the fingers 62 of the locking-key 63, and these fingers are held by hooks 64 on the upper end of the part 26'. The key fits down along the face of the part 25', which thus lies between the key and the part 26', and these three parts are held together by solder in the conical openings 64 in the key and part 26'. By this construction each of the parts 25' 26' has a tendency to spring aside the moment the solder holding them is melted, thus rendering the strut more sensitive.

I claim—

1. A sprinkler comprising a valve-seat, the hollow expansible valve having upper and lower flexible walls and a flanged mouth in one flexible wall engaging the valve-seat and of the full diameter thereof and a bearing on the opposite wall for engaging the holding-strut, the yielding body portion of said valve extending laterally and annularly about the central bearings and free from contact with the sprinkler frame or base along its yielding walls, substantially as described.

2. In combination in a sprinkler, the frame, the distributor, the valve and the strut consisting of the two parts 25' 26' pivotally en-

gaging each other at their lower ends, the
part 25' having the shoulders 61 at its upper
part and the part 26' the hooks 64, and the
key having fingers 62 fitting over the shoul-
5 ders 61 and held by the hooks 64, said parts
being soldered together, substantially as de-
scribed.

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

CHARLES NERACHER.

Witnesses:

HENRY E. COOPER,
WALTER DONALDSON.