(No Model.)

R. W. NEWTON.

AUTOMATIC SPRINKLER.

No. 478,809. Patented July 12, 1892.

Fig. 1.

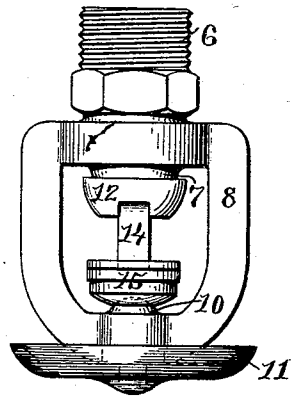


Fig. 2.

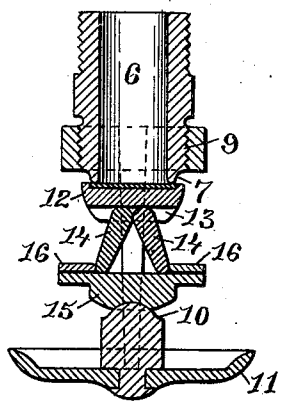


Fig. 3.

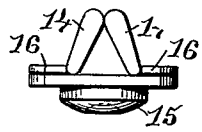


Fig. 4.

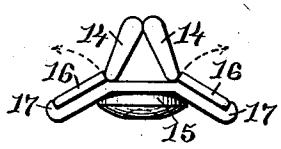
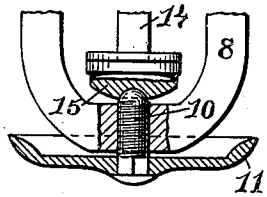


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT W. NEWTON, OF PROVIDENCE, RHODE ISLAND.

AUTOMATIC SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 478,809, dated July 12, 1892.

Application filed September 18, 1891. Serial No. 406,104. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. NEWTON, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Automatic Sprinklers; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in the construction of automatic sprinklers adapted to be secured to a system of pipes in such a manner that on the outbreak of a fire the automatic sprinklers will open and distribute water or other fire-extinguishing fluid over and around the fire.

The object of this invention is to construct an automatic sprinkler so that the force of the water or other fluid in the system of pipes or the sudden increase of pressure caused by the water-hammer will be resisted by metal thrusts and the least possible strain exerted on the solder.

Another object of this invention is to construct the sprinkler so that the valve may be readily removed or tightened when the sprinkler is in place.

Another object of this invention is to construct the sprinkler so that none of the moving parts will move in slides, guides, or bearings, on or in which such parts are liable to stick.

Another object of the invention is to construct an automatic sprinkler that will open promptly when the fusing-point of the solder is reached and that is not affected by corrosion or the collection of impurities on the parts required to be released.

To these ends the invention consists in the peculiar and novel construction more fully set forth hereinafter.

Figure 1 is a side view of my improved automatic sprinkler. Fig. 2 is a vertical section of the same. Fig. 3 is an end view of the thrust-block by which the valve is held in place. Fig. 4 is a modified form of the thrust-block; and Fig. 5 is a view, partly in section, of the end of the yoke, showing the deflector secured to the screw-threaded thrust-pin.

Similar numbers of reference designate corresponding parts in all the figures.

When a building is protected against fire by a system of automatic sprinklers, the safety of the building, as well as its contents, depends on the prompt and reliable action of each sprinkler. Corrosion, fly-specks, dust, and the condensation of vapors on such parts of an automatic sprinkler that have to pass by each other or turn one in the other will cause most of the sprinklers heretofore constructed either to stick and refuse to open or to only partially open. Such sprinklers increase the loss by fire and often give the fire such a start that the conflagration cannot be arrested by other sprinklers.

Practical tests have demonstrated that all automatic sprinklers should have the valve and the parts by which the valve is held in place examined and cleaned from time to time. It is important that a sprinkler shall be so constructed that this examination and cleaning can be done by any fairly-intelligent person, and preferably without the use of tools or wrenches, as these are liable to distort and injure the parts.

In the drawings, 6 indicates the nipple of the automatic sprinkler, having on one end a screw-thread adapted to connect the sprinkler with the usual pipe-fitting of the system of distributing-pipes forming the sprinkler protection. The opposite end of this nipple is provided with the annular valve-seat 7. The yoke 8 may be cast in one piece with the nipple or it may be made separate, provided with a screw-threaded collar, and secured on the screw-threaded portion 9 of the nipple 6. When the yoke 8 is made in one piece with the nipple 6, the thrust-pin 10 is screw-threaded in the lower part of the yoke 8 and the deflector-disk 11, secured to the thrust-pin 10, as shown in Fig. 5, forms a convenient handle by which the thrust-pin can be turned and adjusted. When the yoke 8 and the nipple 6 are made in one piece, the thrust-pin 10 is secured in or made in one piece with the yoke 8 and is adjusted by turning the deflector-disk 11 with the yoke 8 on the screw-threaded portion 9. The outlet is closed by the valve 12, which may be simply a substantial metal disk having a true face to bear on the valve-seat, or it may be provided with a special valve-disk of such metal, or composition of metal, or other material, as may be

required. I prefer to provide the under side of the valve 12 with the groove 13 to form a guide for the arms 14, the upper ends of which bear against the valve 12. These arms 14 are set in the oblique directions shown in Figs. 2, 3, and 4, their upper ends touching each other and the lower ends, set apart, bear on the thrust-block 15 and against the plates 16, which are secured to the thrust-block by a solder fusible at a low temperature.

In Fig. 3 the upper surface of the thrust-block 15 forms a straight plane. The plates 16 are soldered to this plane surface. When the temperature in which the sprinkler is located has risen to or nearly to the fusing-point of the solder, the plates 16 are pushed outward by the arms 14.

In the modified form shown in Fig. 4 the central surface of the thrust-block 15 is on a horizontal plane. The sides or ends are at an angle to such horizontal plane and their outer ends are turned up to form the ribs 17. The plates 16 are secured by solder to the inclined faces of the thrust-block and bear against the ribs 17. When in this form, the solder is heated to or nearly to the point of fusion. The plates 17 are forced outward, as is indicated in broken lines, thus subjecting the solder to a tearing strain. The ribs 17 may be dispensed with while the inclined direction of the opposite sides to which the plates 16 are secured is maintained, and in such a construction the plates 16 will be pushed down the inclined plane when the solder is heated.

In practice I prefer to secure the arms 14 together at their upper end and to the thrust-block 15 at their lower end by the same solder by which the plates 16 are secured, so that the thrust-block 15, the plates 16, and the arms 14 form one connected part. This arrangement facilitates the handling of these parts and their adjustment in the sprinkler. It protects these parts against corrosion, and the accumulation of dirt, dust, or condensation of vapors does not affect the prompt and reliable working of the devices. The solder, when heated to or nearly to the fusing-point, acts as a lubricant, and the parts slide more readily on each other.

The thrust-block 15 has a concaved seat on its under side where it rests on the thrust-pin 10.

I will now describe the operation of my improved automatic sprinkler. To secure the valve, the valve 12 is placed on the outlet 7. The thrust-block 15, with the arms 14, is now placed on the valve, and the thrust-pin 10 is brought in contact with the thrust-block by turning the deflector 11 with or without turning the yoke 8, as either one or the other form of thrust-pin is used. When the pressure is put on the system and the valve is not perfectly tight, a slight turn will make it tight. When the system is to be inspected and the fire-extinguishing liquid has been drawn off by turning the deflector, the valve and the combined thrust-block and arms 14 can be readily removed. As these are the only operative parts, they can be readily examined, cleaned, and replaced without the use of any tools and without any injury to any part of the sprinkler. When, now, a fire takes place and the parts of the sprinkler are heated to or nearly to the fusing-point of the solder, the pressure on the valve, acting on the arms 14, moves the plates 16, which are no longer held by the solder, and instantly the fire-extinguishing liquid rushes from the outlet.

An extended experience and careful observation show that in accidental fires there are currents of heated air flowing through the upper portion of the rooms and not a general gradual rise in the temperature. One side of an automatic sprinkler is usually more quickly affected than the other. Under such conditions my improved automatic sprinkler will have one of the plates 16 released before the other; but the valve in this condition will be as completely released as when both plates are released simultaneously. In all cases I find that the thrust-block will rock on the thrust-pin and that all the parts between the thrust-pin and the outlet are thrown sidewise and the outrushing water is equally distributed in a fine spray in all directions. As there are no sliding parts, and when the sprinkler is released by heat, all the parts are thrown through space without contact with the yoke or any other part. The instantaneous release and full opening of the outlet is always secured in case of a fire. Practical tests demonstrate that the release is instantaneous and always complete, owing to the peculiar construction of the detached thrust-block, the oppositely-inclined arms 14, and the plates 16.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automatic fire-extinguisher, the combination, with the outlet, a valve for closing the outlet, and a frame supporting a thrust-pin, of a device intermediate the thrust-pin and the valve consisting of two oppositely-inclined arms, a thrust-block, and plates secured by solder, adapted to hold the valve in place until one or both of the holding-plates are released by heat, as described.

2. In an automatic fire-extinguisher, the combination, with the outlet and the valve for closing the outlet, of a yoke or frame having at its lower end a deflector and a thrust-pin adjustable toward and from the outlet, a thrust-block, two oppositely-inclined arms interposed between the thrust-block and the valve, and plates secured to the thrust-block by solder, as described.

3. A device for holding the valve of an automatic fire-extinguisher or sprinkler against the outlet-opening, consisting of a block, to one surface of which the ends of two oppo-

sitely-inclined arms and two thrust-plates are secured by solder fusible at a low temperature, as described.

4. The combination, with the nipple 6 and valve-seat 7, of the yoke 8, the thrust-pin 10, and deflector 11, of the thrust-block 15, the plates 16, secured by solder to the upper surface of the same, the oppositely-inclined arms 14, and the valve 12, adapted to hold the valve to its seat until released by heat, as described.

5. In an automatic fire-extinguisher or sprinkler, the combination, with the nipple 6 and the valve-seat 7, of the valve 12, provided with the slot 13, the arms 14, having their upper ends resting in the slot 13, the thrust-block 15, the plates 16, secured to the thrust-block by solder, the yoke 8, the deflector 11, and the thrust-pin 10, adapted to force the valve to its seat, as described.

6. In an automatic fire-extinguisher or sprinkler, the combination, with the nipple 6 and the outlet surrounded by the valve-seat 7, of the yoke 8, the deflector 11, and the thrust-pin 10, provided with the rounded end supported by the yoke, the thrust-block 15, having a cavity on its lower part adapted to receive the rounded end of the thrust-pin, the plates 16, secured to the thrust-block by solder, the oppositely-inclined arms 14, bearing on the thrust-block at the spread ends and in the groove 13 of the valve 12 at the ends placed close together, and the valve 12, the whole adapted to force the valve to its seat or release the same and to be released automatically by heat, as described.

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