(No Model.) 2 Sheets—Sheet 1.

A. M. GRANGER.

AUTOMATIC SPRINKLER FOR FIRE EXTINGUISHERS.

No. 347,033. Patented Aug. 10, 1886.

Fig. 1.

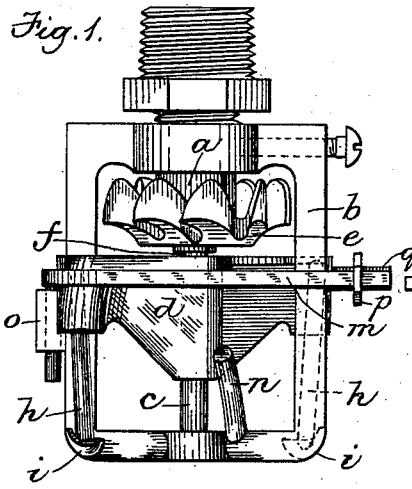


Fig. 3.

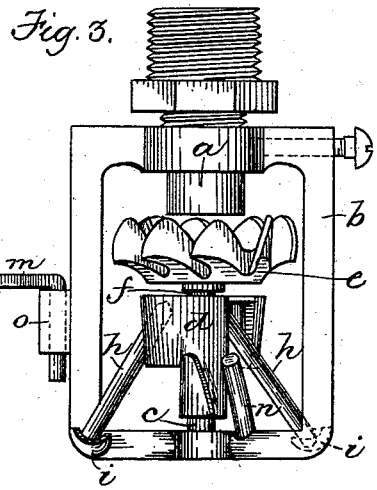


Fig. 2.

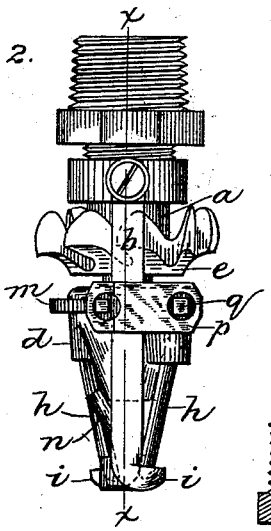


Fig. 4.

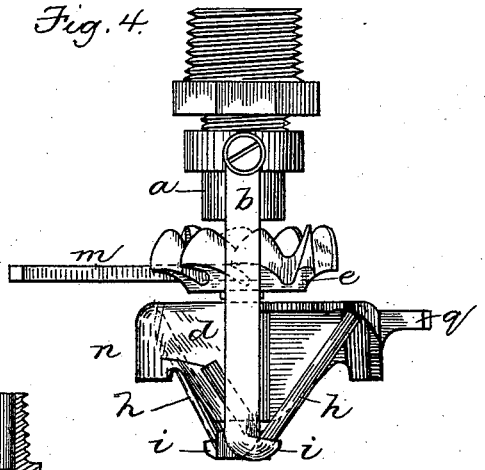
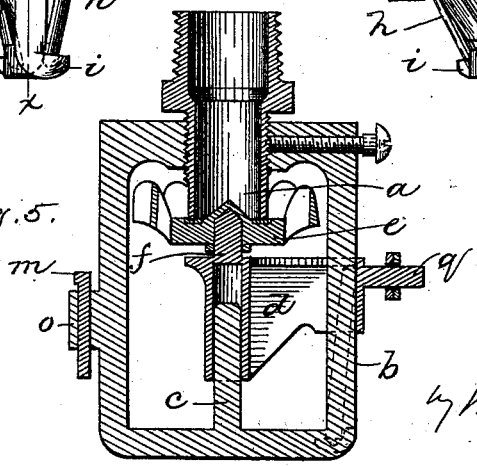


Fig. 5.



Witnesses.
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J. E. O'Connor

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(No Model.) 2 Sheets—Sheet 2.

A. M. GRANGER.

AUTOMATIC SPRINKLER FOR FIRE EXTINGUISHERS.

No. 347,033. Patented Aug. 10, 1886.

Fig. 6.

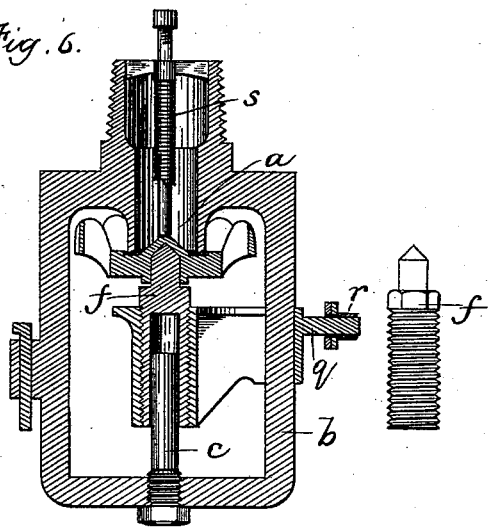
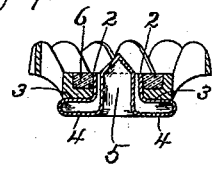


Fig. 7.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALMON M. GRANGER, OF MEDFORD, MASSACHUSETTS.

AUTOMATIC SPRINKLER FOR FIRE-EXTINGUISHERS.

SPECIFICATION forming part of Letters Patent No. 347,033, dated August 10, 1886.

Application filed August 17, 1885. Serial No. 174,539. (No model.)

To all whom it may concern:

Be it known that I, ALMON M. GRANGER, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Automatic Sprinklers for Fire-Extinguishers, of which the following is a specification.

This invention relates to that class of automatic sprinklers for fire-extinguishing purposes in which a valve is held against a water-discharging nozzle by means of a lever secured by a fusible solder or alloy, so that upon a dangerous increase in temperature in the vicinity of the sprinkler the lever and valve will be released.

The invention consists in the improvements hereinafter described in the devices for holding and supporting the valve, which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figures 1 and 2 represent elevations of my improved sprinkler, the valve being closed. Figs. 3 and 4 represent similar elevations, the valve being opened. Fig. 5 represents a vertical section on line *x x*, Fig. 2.

In the drawings, *a* represents a water-discharging nipple or nozzle, formed to be connected to a water-pipe.

b represents a frame secured to said nozzle, preferably by being screwed upon a threaded portion of the latter, as shown. To the lower portion of the frame is affixed a stud, *c*, on which a bar, *d*, extending across the frame, is adapted both to oscillate and move vertically, said bar having a socket which receives the stud *c*.

e represents the valve and distributer, which is constructed substantially as shown in my Letters Patent No. 313,734, and is therefore adapted to be rotated by the escaping water, the valve being mounted on a stud, *f*, affixed to the bar *d* and entering a socket in the under side of the valve.

h h represent rods or studs situated at opposite sides of the stud *c*, their lower ends being supported by socketed steps *i i* on the frame *b*, while their upper ends enter sockets in the outer ends of the bar *d* and support said bar and the valve *e*. The rods or struts *h h* are capable of oscillating on the steps *i i*, and as the height of their upper ends above said steps depends on the inclination of the rods or struts it follows that when they are in nearly a vertical position, as shown in Figs. 1 and 2, they will support the bar *d* and valve *e* at a higher point than when they are inclined outwardly, as shown in Figs. 3 and 4. When the rods or struts and bar are in the position shown in Figs. 1 and 2, they hold the valve seated against the end of the nozzle. The arrangement of the parts is such, however, that when the valve is seated the rods or struts are not quite vertical or in line with the pressure exerted on them by the water bearing against the valve *e*, but are slightly inclined outwardly, so that when the bar (which is held in the position last described by a lever, *m*,) is released the water-pressure will cause said rods or struts to swing outwardly, and thus support the bar and valve at a lower point, as shown in Figs. 3 and 4, the bar making a partial rotation on the stud *c* in moving from one position to the other. The valve is thus removed from the nozzle and held in position to be rotated by the escaping water, and thus distribute the latter. An arm or stop, *n*, on the frame *b*, arrests the bar *d* when it is sufficiently depressed. The lever *m*, which holds the bar *d* in its elevated position, is journaled at one end in a socketed boss, *o*, at one end of the frame and bears against one end of the bar *d*, and its other end is connected by a fusible link, *p*, with a stud or arm, *q*, formed on the opposite end of the bar. When the link *p* is ruptured by heat, it releases the lever *m* and allows the bar *d* to partially rotate and descend, as above described.

It will be seen that while the above-described devices hold the valve so that it must necessarily fall when the fusible device is ruptured, the strain on said fusible device is so light that there is no liability of its yielding or lengthening under the strain to such an extent as to impair the necessary close fit of the valve against the nozzle.

The lever may be secured to the frame at its swinging end, instead of to the bar.

The lever *m* may be dispensed with, and instead thereof an arm may be rigidly attached to or formed on the frame *b*, to co-operate with the arm *q* in holding the fusible link.

Instead of making the frame *b* and nipple *a* in two parts screwed together, to permit the

valve and distributer to be adjusted toward and from the nipple by rotating the frame *b*, I may make the nipple and frame in a single piece, and effect the adjustment of the distributer by threading the stud *f* and screwing it into a threaded socket in the cross-bar *d*, as shown in Fig. 6. The construction is somewhat cheapened by this modification.

The guiding-pin *e* may be made in a separate piece and screwed into the frame *b*, as shown in Fig. 6. The pin may therefore be nickel-plated at a small expense, and thus protected against corrosion. *s* represents a spring interposed between a bridge in the nipple and the valve and distributer, said spring being supported by a rod bearing on the distributer and sliding through the bridge. The spring serves to separate the valve from the nipple in a vacuum-sprinkler system, as described in my pending application, filed April 25, 1885, No. 163,423.

I prefer to place rings or keepers *r*, of yielding vulcanized rubber, on the ends of the lever *m* and arm *q*, to prevent the accidental sidewise removal of the link *p* from said arms. Said rings bear against the outer side of the link and not only keep the link in place, but also prevent the parts of the link from dropping off after their solder-joint has been separated by heat, the link being made of two overlapping pieces of hard metal soldered together, as described in my pending application filed August 3, 1885, No. 173,334. The parts of the link are thus preserved, so that they can be resoldered.

In Fig. 7 I have shown the valve and distributer provided with a diaphragm of peculiar form. Said diaphragm has a flange, 2, bearing against the margin of an annular opening in the distributer, and is bent outwardly to form a seat, 3, for the bottom of the distributer, then inwardly to form a bottom, 4. In the center of the bottom 4 is a socket, 5, which receives the stud *f*.

I prefer to make the diaphragm with the parts 2 3 4 5 by spinning up a single plate of metal, although it may be made in any other suitable way. The parts 3 and 4 constitute an elastic support or annular spring, which presses the valve against its seat. The part 2 is in contact with the inner margin of the lead packing ring or seat 6 in the upper surface of the valve and receives the pressure caused by the compression of said seat when it is introduced into its place, the diaphragm being firmly secured to the valve by said packing-ring.

I claim—

1. The combination of a nozzle, a supporting-frame secured thereto, rods or struts mounted to oscillate in end bearings on the supporting-frame, a bar pivoted on a stud on the supporting-frame and supported by the oscillatory ends of said rods or struts, a valve supported by said bar and movable therewith toward and from the nozzle, and a holding-lever for said bar secured by a fusible device, the arrangement being such that when the bar is held by said lever the rods or struts are held in position to seat the valve, and when the bar is released the struts swing outwardly and release the valve, as set forth.

2. The combination of a nozzle, a valve therefor, a supporting-frame, a cross-bar supporting said valve adapted to rotate and move vertically on a stud on the supporting-frame, swinging rods or struts interposed between said cross-bar and frame, and a holding-lever for said bar journaled at one end of the frame and secured at its other end by a fusible device, as set forth.

3. The valve and distributer having the metal diaphragm secured thereto and constituting a spring-support therefor, as set forth.

4. The valve and distributer having the central opening, and the packing ring or seat 6, surrounding said opening, combined with the elastic metal diaphragm composed of the flange 2, confined by said packing-ring, the annular spring portions 3 4, and the central socket, 5, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 13th day of August, 1885.

ALMON M. GRANGER.

Witnesses:
C. F. BROWN,
H. BROWN.