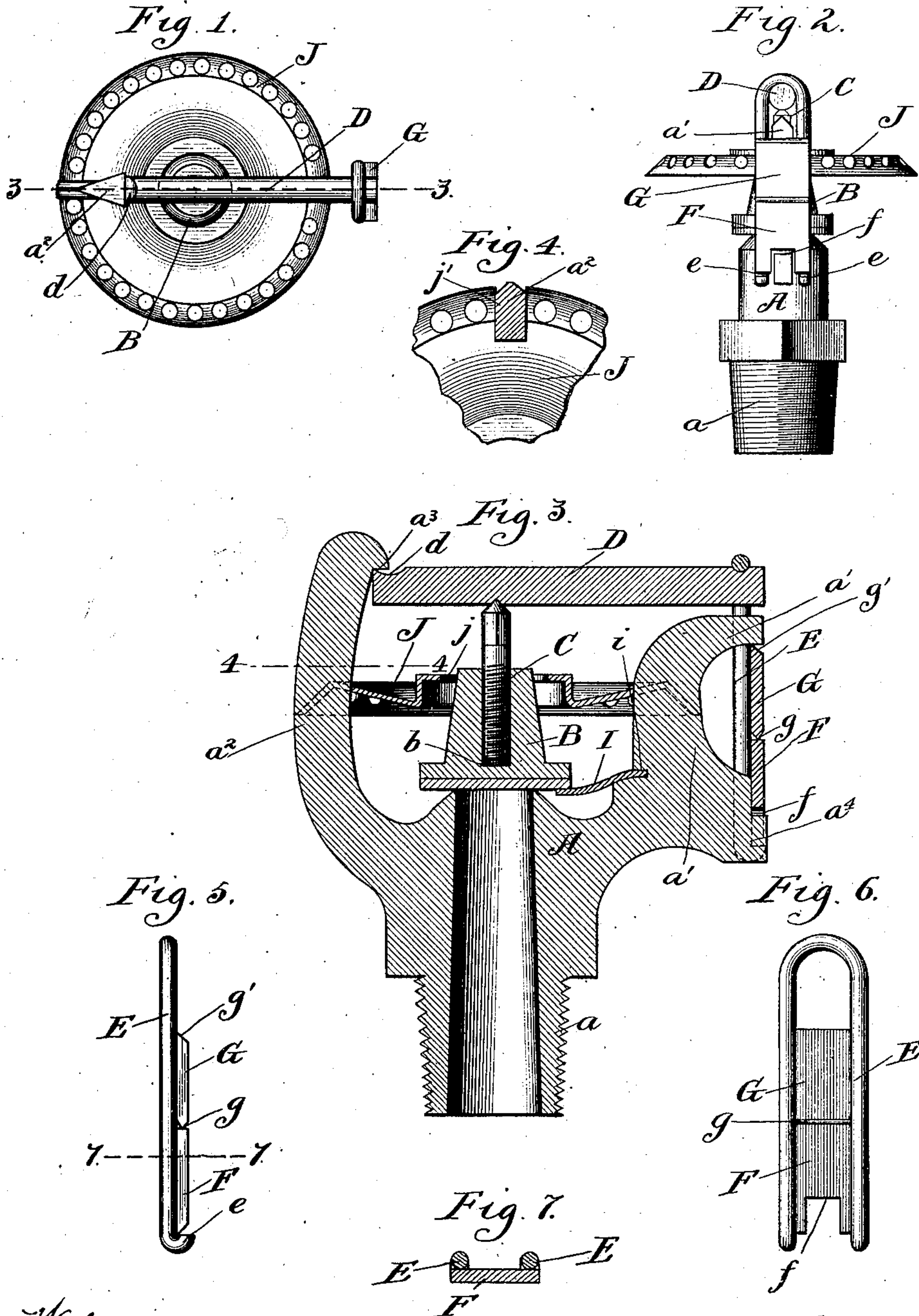


(No Model.)

A. F. NAGLE.
AUTOMATIC SPRINKLER.

No. 447,004.

Patented Feb. 24, 1891.



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AUTOMATIC SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 447,004, dated February 24, 1891.

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To all whom it may concern:

Be it known that I, AUGUSTUS F. NAGLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Sprinklers, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan of a sprinkler embodying my invention; Fig. 2, a side elevation of the same; Fig. 3, a vertical section of the same, taken on the line 3 3 of Fig. 1; Fig. 4, a detail plan section taken on the line 4 4 of Fig. 3; Fig. 5, an edge elevation of the fastening-link detached; Fig. 6, a side elevation of the same; and Fig. 7, a section of the same, taken on the line 7 7 of Fig. 5. Figs. 1 and 2 of the drawings are upon one scale, and the remaining figures upon another and enlarged scale.

My invention relates to the sprinklers which are employed in automatic fire-extinguishing apparatus, and which, as is well known, are applied to the distributing-pipes in the rooms of a building and are closed by devices which are automatically released by the heat produced by a fire.

The invention consists in certain special fastening devices for holding the nozzle cap or valve in its normal position, and also in a light spring arranged to assist in the removal of this cap when released by the breaking of the fastening devices.

I will describe in detail the construction and operation of a sprinkler embodying my invention in practical form, and will then point out definitely in claims the special improvements which I believe to be new and wish to secure by Letters Patent.

The sprinkler to which my improvements are applied, and which is shown in the drawings, is in all its main features of known construction, and hence requires only brief description of these main parts in the present instance.

In the drawings, A represents the main portion or body of the sprinkler, which is adapted to be secured in the pipes in the usual way. This part of the device contains

a central nozzle *a* and branching arms *a'* *a*², which extend outward and upward from opposite sides, respectively, of the central portion. The nozzle is closed by an outer cap or valve B, the head of which is provided with a threaded recess *b*, in which is fitted a screw-pin C, and when the parts are in place, as seen in Fig. 3, a lever D passes across the outer end of this pin, and, being fastened at its respective ends, thereby holds the cap in place upon the nozzle. The inner end of this lever is caught under a notch *a*³ at the extremity of the arm *a*², and a slight recess *d* is made at this end of the lever itself, so as to provide a knife-edge bearing between the lever and arm. The outer end of the screw-pin C is preferably conical, and its seat in the lever D is then similarly shaped, this construction being for the purpose of facilitating the turning of the screw-pin to properly adjust the parts for closing the nozzle. The outer end of the lever D is connected to the arm *a'* by an open link E, the upper or closed end of which is passed over the outer end of the lever, while the lower end is secured to the arm, as will now be described. The arm *a'* is forked or branching at the side, as seen in Fig. 3, and the ends of these forks project within the link when in operative position. The lower arm of this fork is cut away so as to provide a narrow ledge or seat *a*⁴ at its lower extremity, as seen in Figs. 2 and 3. The free ends of the open link E are bent outward and upward slightly, so as to provide on each a small plane surface or seat *e*, as seen in Fig. 5. When these parts are in the position for fastening the cap to the nozzle, the link looping over the outer end of the lever extends down about even with the lower portion of the arm *a'*, and the latter projects within the former sufficiently to bring the narrow ledge or seat *a*⁴ just outside the plane of the link, the latter being arranged with its bent projections in front, as seen in Figs. 2 and 3. In this position the link is secured in place by means of two small plates F and G. The lower plate F is provided with a notch *f* in its lower end, which receives the projecting seat *a*⁴ of the arm, so that on each side of the latter this plate F is

seated on the projections *e* at the lower ends of the link. The upper edge of this plate is plane, as seen in Figs. 3 and 5, and the upper plate *G* rests thereon, its lower edge *g* being beveled on each side to provide a central knife-edge for its bearing on the upper end of the plate *F*. The upper end of this plate *G* is provided with an outer bevel *g'*, so as to provide a knife-edge at its extreme inner line, which is fitted under the upper member of the fork on the arm *a'*, and has a bearing against the same, as seen in Fig. 3. These two plates *F* and *G* are soldered to the link against which they rest, the solder being applied on each side of the round bars of the link, but only so much solder being used as is sufficient to practically fill the small angles between the plane surfaces of the plates and the link-bars, as seen in Fig. 7. It is evident that the thickness of the solder will therefore be very slight at any point, but at the same time the plates will be held with sufficient strength to the link on account of the length of the solder-lines, which extend along almost the entire length of the link. In preparing these devices for use it is desirable to apply the plates *F* and *G* to the link and solder them thereto before applying this fastening to the sprinkler, so that they will be connected to form practically a single piece, as seen in Figs. 5 and 6. A small short spring *I* is fastened to one of the arms of the sprinkler-body, being shown in the drawings as secured to the arm *a'* by inserting one end in a notch *i* cut on the inside thereof. This spring extends inward a little beyond the circumference of the cap and stands out a little beyond the orifice of the nozzle, so that when the cap is pressed upon the latter in its closing position, as seen in Fig. 3, this spring will be somewhat depressed or bent inward. A distributor *J* of circular form is mounted in front of the nozzle, being provided with a circular opening *j* to receive the cap and with notches *j'* in the edge thereof on opposite sides to receive the arms *a'* *a''*, by which it is held in place. In applying these devices, so as to prepare the sprinkler for application to the pipes, the screw-pin is turned into the cap nearly or quite to its limit. The cap is then applied to the nozzle and the lever placed in position, its inner end arranged underneath the notch at the end of the arm *a''*. The link prepared as shown in Figs. 5 and 6 is then applied by slipping the looped end over the outer end of the lever and turning the link inward until it is brought into position shown in Fig. 3 with the retaining-plates just underneath the upper fork of the arm *a'*. The screw-pin is then turned,

so as to set it outward against the lever until the parts are all tightly strained, the cap being at the same time forcibly held to the nozzle, this being the position of the parts shown in Fig. 3.

Now when the sprinklers are applied to the pipes in the usual way and a fire occurs the plates *F* and *G* are quickly released from the link, first, because the lines of solder are very thin and consequently quickly melted, and, secondly, because the bearings of the plate *G* being in different planes the leverage strain upon them will tend to break the joint between the two plates by turning them outward at this point, and, obviously, as soon as these plates, which act as levers, are released the cap will also be released and water will be driven out through the nozzle. The spring *I* being under strain will assist in removing the cap, having a tendency to flip the latter off from the nozzle as soon as the retaining devices are released, thereby overcoming any tendency of the cap to stick upon the nozzle, owing to long standing or any other cause. This fastening is very strong and secure for reasons stated above and at the same time is very sensitive, so that the desired operation will be certain before a fire gains much headway in a room in which the sprinklers are placed.

In some of the details of construction herein shown and described modifications may be made, and I therefore do not wish to be understood as limiting myself to all of the special details herein shown and set forth.

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

1. In an automatic sprinkler, the closing-cap, in combination with the retaining-lever, the open fastening-link *E*, the arm *a'*, and the retaining-plates *F* *G*, soldered to the link and having a bearing at the upper portion of the said arm, substantially as and for the purposes specified.

2. In an automatic sprinkler, the retaining-lever *D*, in combination with the open link *E*, provided with offsetting seats *c*, the arm *a'*, provided with the seat *a''*, the fastening-plate *F*, provided with the recess *f* at its lower end, the plate *G*, having a knife-edge bearing at its upper and lower ends, the former in a plane within that of the latter, and both plates soldered to the link, substantially as and for the purposes specified.

AUGUSTUS F. NAGLE.

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