

(No Model.)

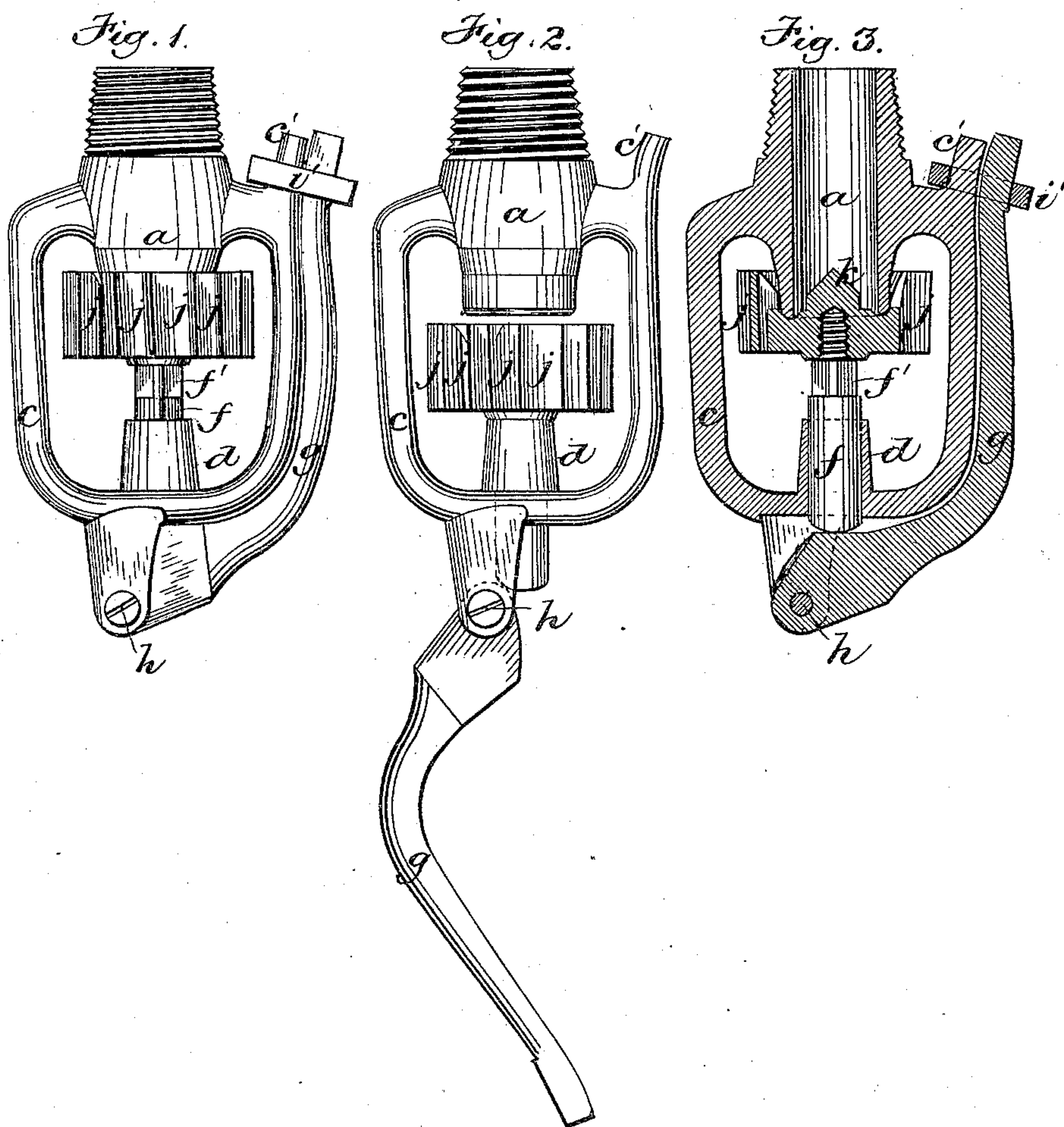
2 Sheets—Sheet 1.

A. M. GRANGER.

AUTOMATIC FIRE EXTINGUISHER.

No. 313,724.

Patented Mar. 10, 1885.



Witnesses.
H. H. Harrison
H. Brown.

Inventor
A. M. Granger
by M. H. Brown
Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

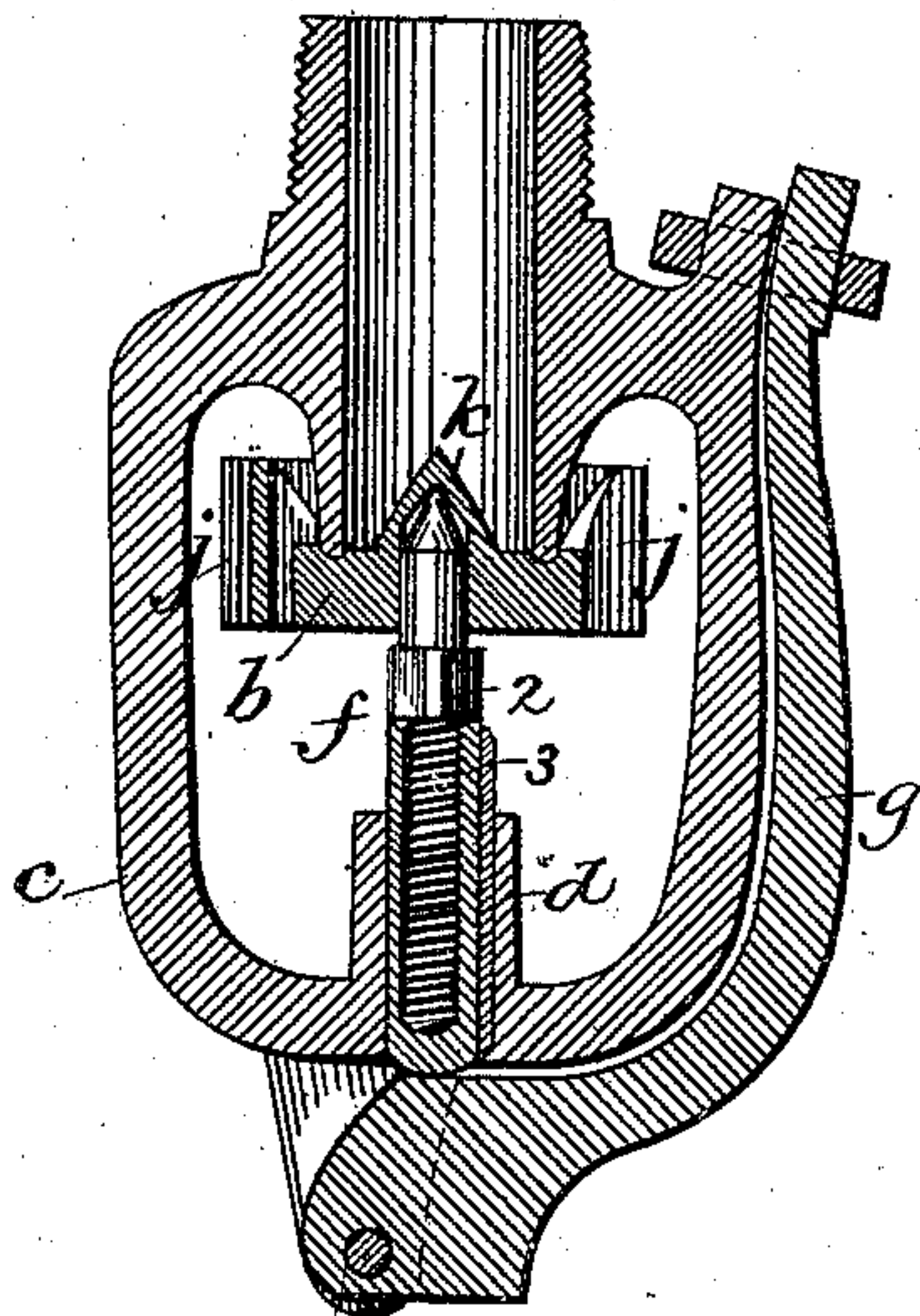


Fig. 8.



Fig. 6.

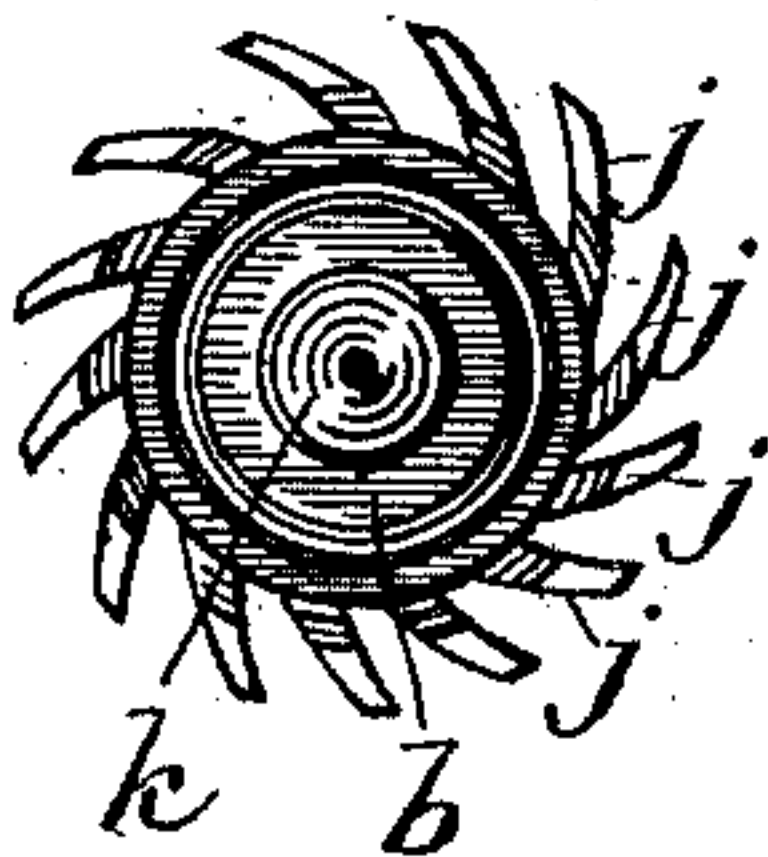
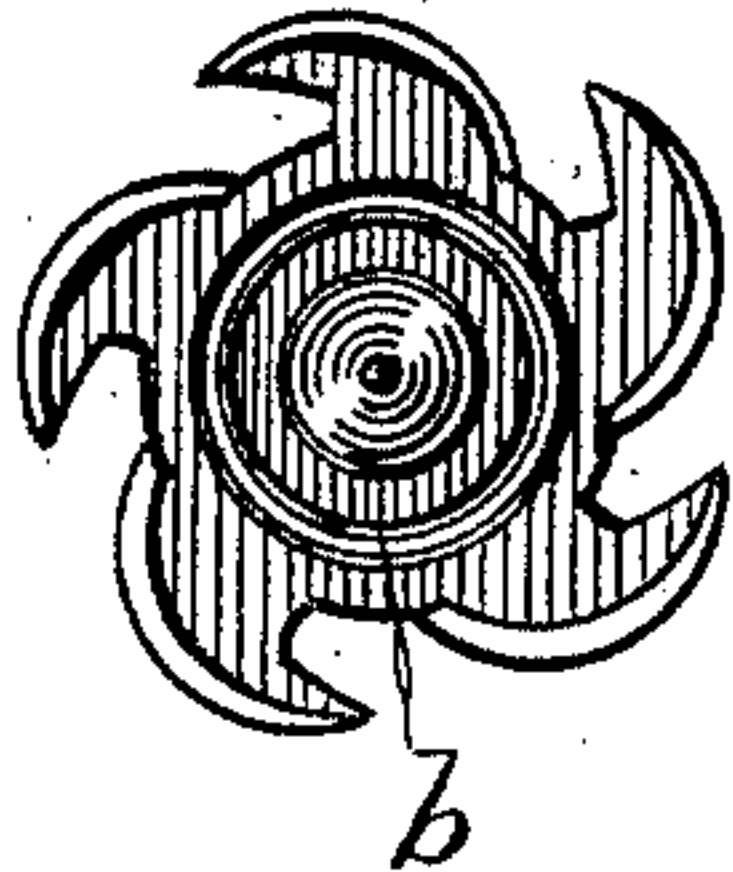


Fig. 9.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALMON M. GRANGER, OF MEDFORD, MASSACHUSETTS.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 313,724, dated March 10, 1885.

Application filed July 29, 1884. (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
5 Improvements in Automatic Sprinklers, 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 in position to
10 cover a nozzle communicating with a water-pipe by means of retaining devices secured by fusible metal, which gives way when the temperature rises to a sufficiently high point and releases the retaining devices, which in turn
15 release the valve, the latter dropping and allowing the water to escape, and then serving as a deflector to distribute the water over a considerable area.

The invention has for its object to provide
20 an improved form of valve and deflector, whereby a uniform and thorough distribution of the water may be effected.

The invention also has for its object to provide improved means for adjusting the valve
25 and pressing it firmly against its seat after the retaining device is in its valve-holding position.

To these ends my invention consists in the improvements which I will now proceed to
30 describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of an automatic sprinkler embodying my invention, the valve being held
35 to its seat. Fig. 2 represents a similar view, the valve being released and supported in position to serve as a distributor or deflector. Fig. 3 represents a sectional view. Fig. 5 represents a sectional view showing another
40 modification. Fig. 6 represents a top view of the combined valve and distributor. Fig. 8 is a plan of a fusible link which may be used with the device. Fig. 9 is a top plan view of the combined valve and distributor.

45 The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a nozzle adapted to be secured to a water-pipe and to serve as an outlet for the water. The outer end of
50 said nozzle is formed as a seat for the combined valve and distributor *b*, which, when

seated, prevents the water from escaping. The nozzle is provided with a yoke or frame, *c*, containing a socket, *d*, in which a stud, *f*, which supports the valve, is adapted to slide. 55

g represents a lever pivoted at *h* to ears formed on the frame *c*, and formed to bear against one side of said frame, as shown in Figs. 1 and 3. The frame has an arm, *c'*, with which the lever *g* may be connected by a fusible link, *i'*, said link holding the lever in the position shown in Figs. 1 and 3. When the lever is not held by the link, it depends from the frame, as shown in Fig. 2. The stud *f* bears on the lever at a point between the pivot
60 *h* and link *i'*. When the lever is held by the fusible link, it holds the valve against its seat on the nozzle *a*, and when the lever hangs downwardly it projects under the lower end of the stud. It will be seen, therefore, that
70 when the lever is moved from the position shown in Fig. 2 to that shown in Fig. 1 the portion against which the stud bears will act as a cam and will move the valve to its seat; hence the lever serves both to hold the valve to its seat
75 and to reseal the valve after it has been released, the convenience of this combination of functions being obvious. When the valve is lowered, its stud *f* may be directly supported by the cam portion of the lever *g*, or, if preferred, by the frame *c*, the stud having a shoulder or collar to bear on the upper end of the socket *d*. 80

I provide means whereby the valve may be adjusted so that after the valve has been
85 raised by the cam portion of the lever it may be additionally raised and pressed more firmly against its seat. To this end the stud *f* may be screw-threaded at its upper end, to fit a correspondingly-threaded socket in the valve, 90 as shown in Fig. 3, the stud having a prismatic portion, *f'*, to receive a wrench, the valve being raised by rotating the stud in the proper direction; or the stud may be made in two parts, 2 3, the one secured into the other, 95 as shown in Fig. 5, so that by turning the part 2 in the proper direction the stud may be elongated, and thus caused to raise the valve, the part 2 being adapted to turn loosely in a socket in the valve, while the part
100 3 and the socket in the frame *c*, in which it slides, are so formed that the part 3 cannot

rotate, this being accomplished, preferably, by making the part 3 and its socket prismatic in cross-section.

Instead of either of the above-described constructions, a screw, *i*, may be employed, said screw being inserted in the lever *g*, so that the lower end of the stud will bear upon it. When the screw is properly rotated, it will raise the stud and valve.

10 The valve and distributor is provided around its margin with tangential wings or blades, *j*, separated by thin apertures or slots. The escaping water from the nozzle acts on the blades in such manner as to rotate the distributor.

15 The wings project upwardly above the valve-surface, as shown in Fig. 3, and form a slotted wall around said surface, which deflects upwardly a portion of the water falling on the distributor. The valve-surface is preferably 20 provided with a central conical boss, *k*, which deflects the falling water outwardly, and thus facilitates the upward deflection caused by the upward extension of the wings.

As a result of the described construction of 25 the deflector, the water is converted into drops, and widely and uniformly distributed in all directions, so that all portions of the apartment within a given area surrounding the sprinkler are thoroughly and uniformly 30 wetted.

I do not limit myself to a rotary distributor. If desired, the distributor formed as described may be held so that it will not rotate, in which case the slots or openings between 35 the blades cause the water to escape tangentially in thin streams, and convert it into drops, which are thoroughly diffused.

When the stud and valve are connected, as shown in Fig. 3, they do not rotate, the water 40 escaping through narrow slots in spiral streams, which separate into drops. When the construction in Fig. 5 is employed, the distributor rotates independently of the stud.

It will be observed that when the lever *g* is 45 raised the pivot *h* of the lever is nearly under the stud *f*, the portion of the lever between the point of bearing of the stud and the pivot being nearly in line with the stud, so that the stud and said portion of the lever 50 act at great advantage in holding the valve to its seat. This arrangement enables a thin or slender and easily-fused link to hold the lever and valve with sufficient security, so that a quick release of the valve by dangerous in- 55 crease of temperature is assured without liability of breakage of the link by the strain imposed upon it by the water-pressure. The link is preferably rectangular in form, so that it may more readily release the lever when it 60 is broken by the required degree of heat, the end of the lever which is held by the link being also rectangular in cross-section for the same purpose. The socket in the valve which receives the stud *f* extends upwardly into the 65 conical boss *k*, so that the point of support of

the valve on the upper end of the stud is above the plane of the upper surface of the valve, against which the escaping water strikes. The result of this arrangement is that the valve rotates steadily and with the 70 minimum of friction, there being no binding of the wall of the socket on the stud, such as would be likely to occur if the point of support of the valve on the stud were below the plane of the upper surface of the valve. 75

It will be observed that the central socket of the rotating valve and distributor covers the stud on which it rotates. The socket is open only at the bottom, and thus there is little 80 chance for dust to collect therein. 80

I claim—

1. In an automatic sprinkler, a nozzle, a frame supported thereby, a valve in front of the nozzle, and a lever pivoted to the frame, said lever having a cam-surface which stands 85 in the line of movement of the spindle both when the lever is raised to hold the valve to its seat and depressed to allow the valve to separate from its seat, whereby the valve may be not only held against its seat when the 90 outer end of the lever is connected to the frame by a fusible device, but also moved to its seat by a movement of the lever, as set forth.

2. The valve and distributor having the central boss containing a socket extending above 95 the upper surface of the valve, combined with a supporting-stud entering said socket, as set forth.

3. The combination, in an automatic sprinkler, of a nozzle, a winged rotating valve in 100 front of said nozzle, a longitudinally-movable spindle supporting said valve, a frame secured to the nozzle, and a lever pivoted to the frame and supporting the spindle, the winged 105 valve being entirely separated from the nozzle when released by the lever, so that a laterally-unobstructed space is formed between the nozzle and valve for the free escape and distribution of water, as set forth.

4. The valve and distributor having tan- 110 gential wings or blades separated by slots, and having a socket in its lower surface, in combination with a loosely-fitting spindle, substantially as described.

5. In an automatic sprinkler, the combina- 115 tion, with the nozzle, of the supporting-frame, a vertically-movable spindle in the frame, a lever pivoted in the frame and serving as a support for said spindle, and a rotating valve having a socket in its central lower surface 120 resting on said spindle, all substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two sub- 125 scribing witnesses, this 25th day of July, 1884.

ALMON M. GRANGER.

Witnesses:

C. F. BROWN,
H. BROWN.