

No. 616,056.

Patented Dec. 13, 1898.

W. S. LANGFORD.
AUTOMATIC FIRE EXTINGUISHER.

(Application filed Sept. 15, 1897.)

(No Model.)

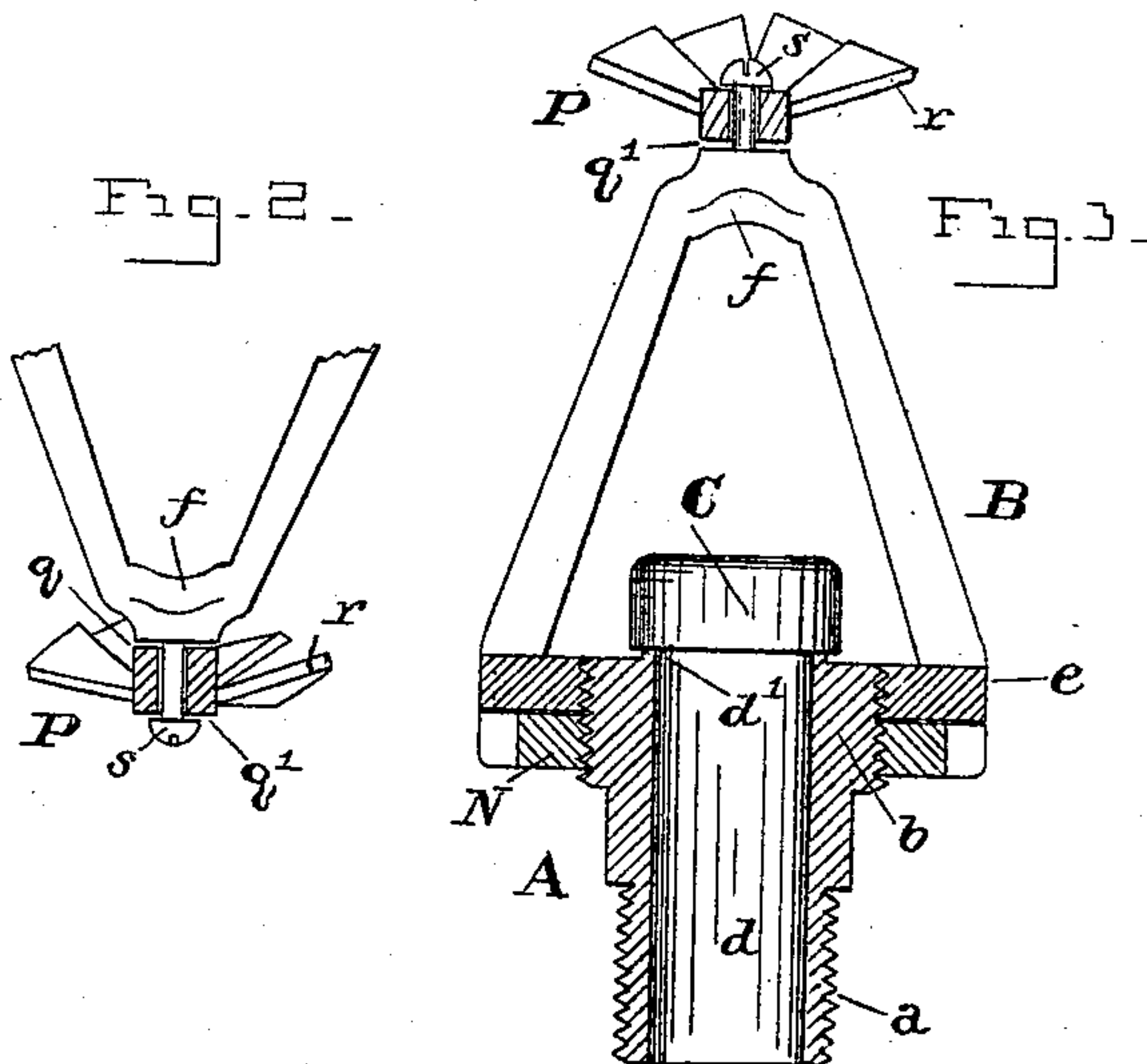
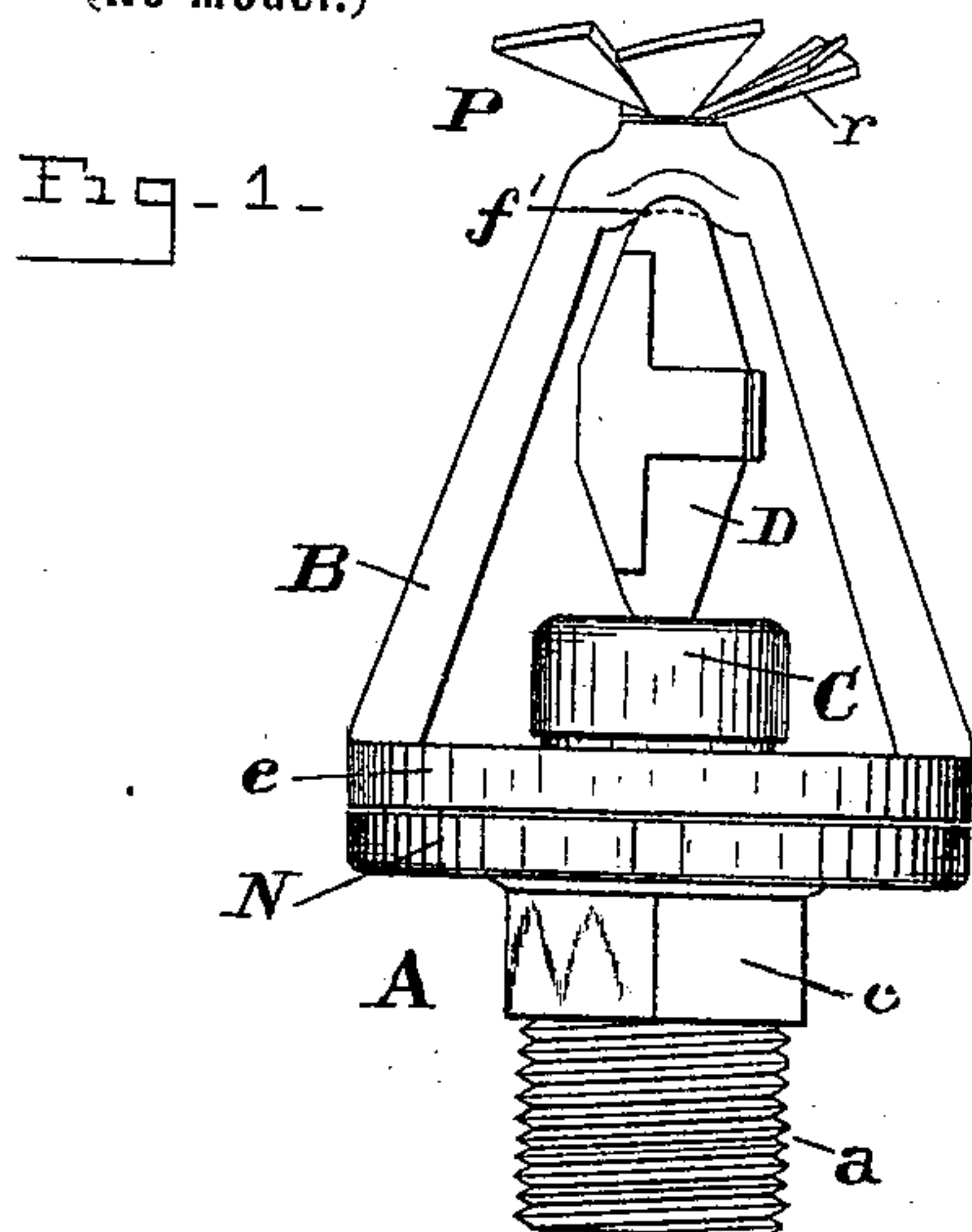


Fig. 4.

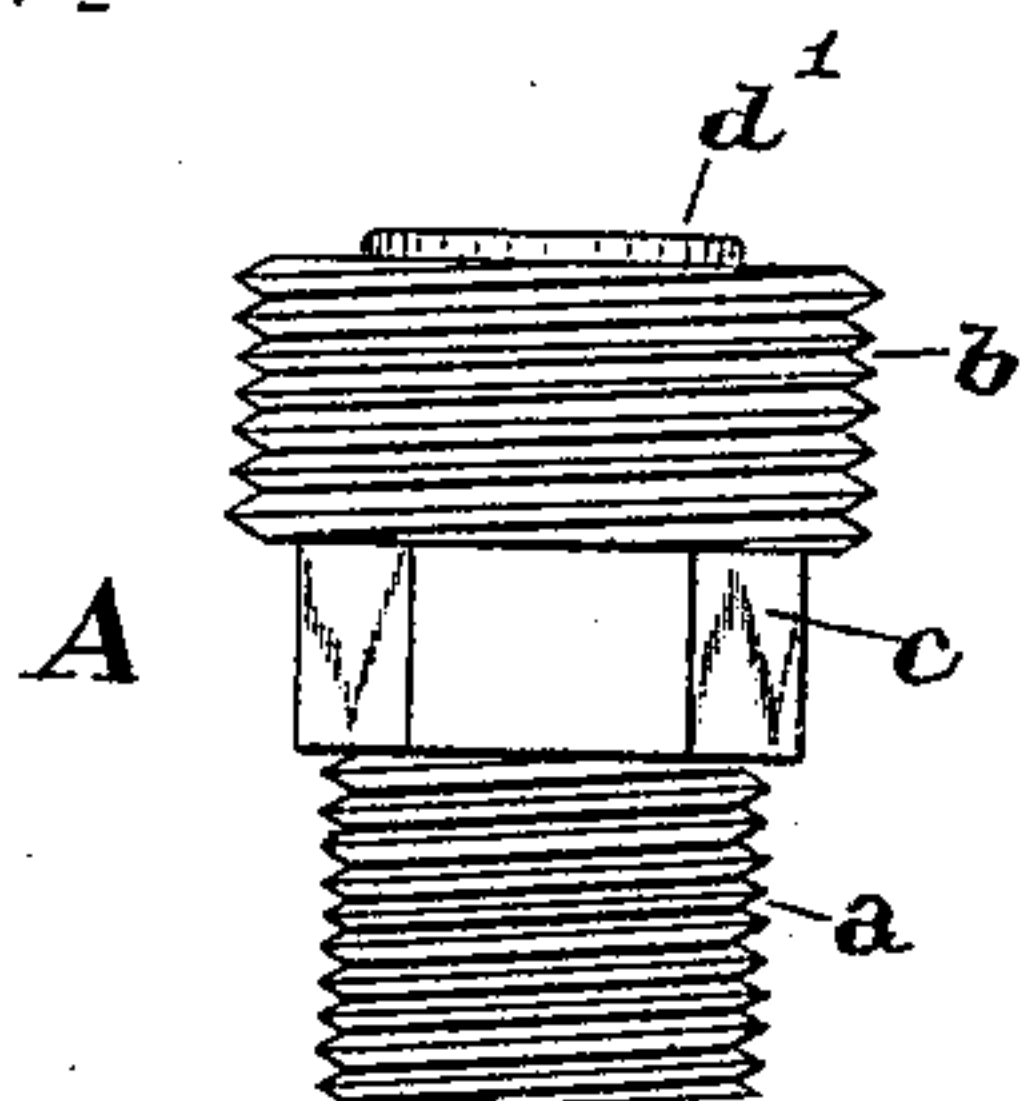


Fig. 5.

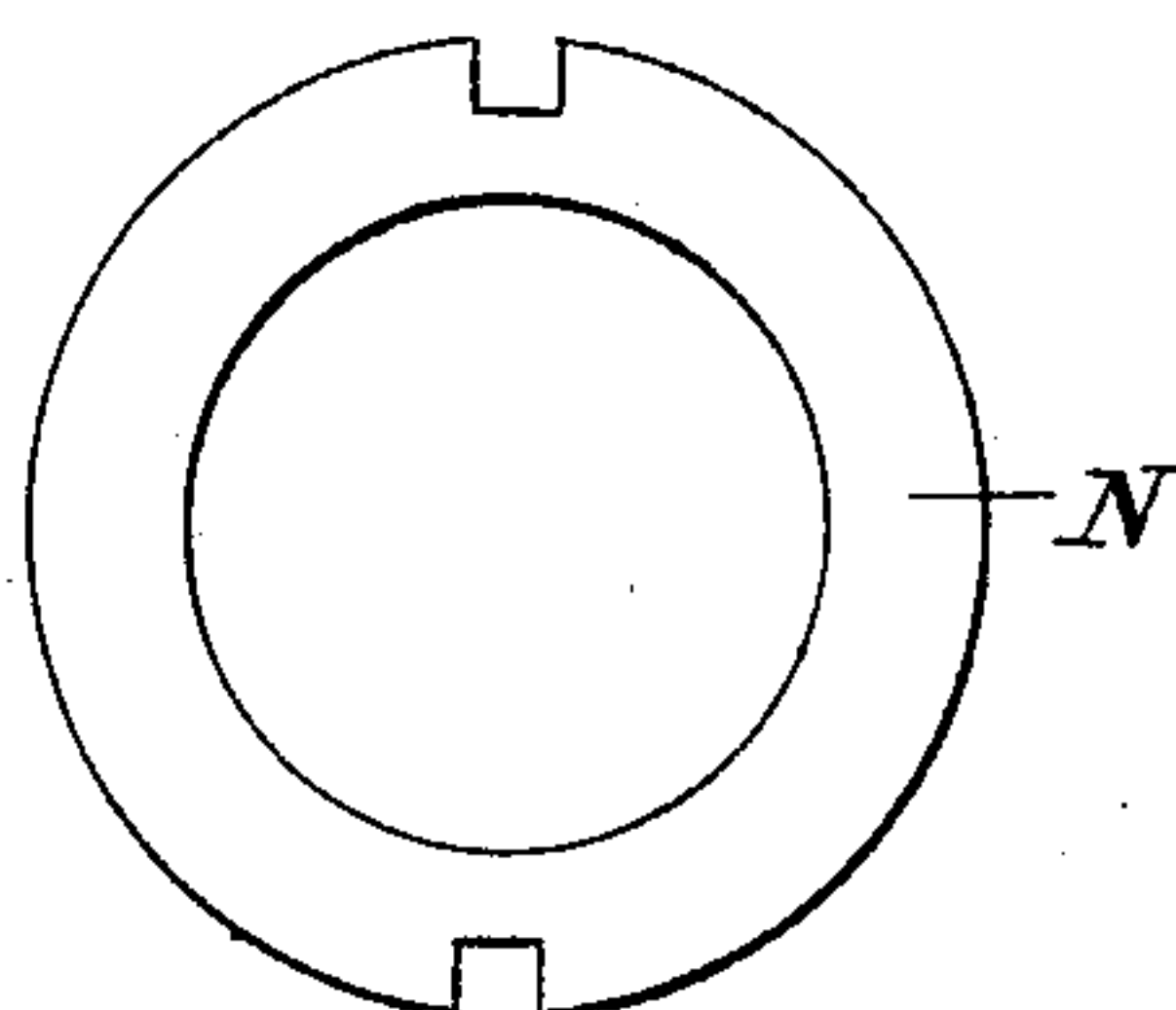


Fig. 6.

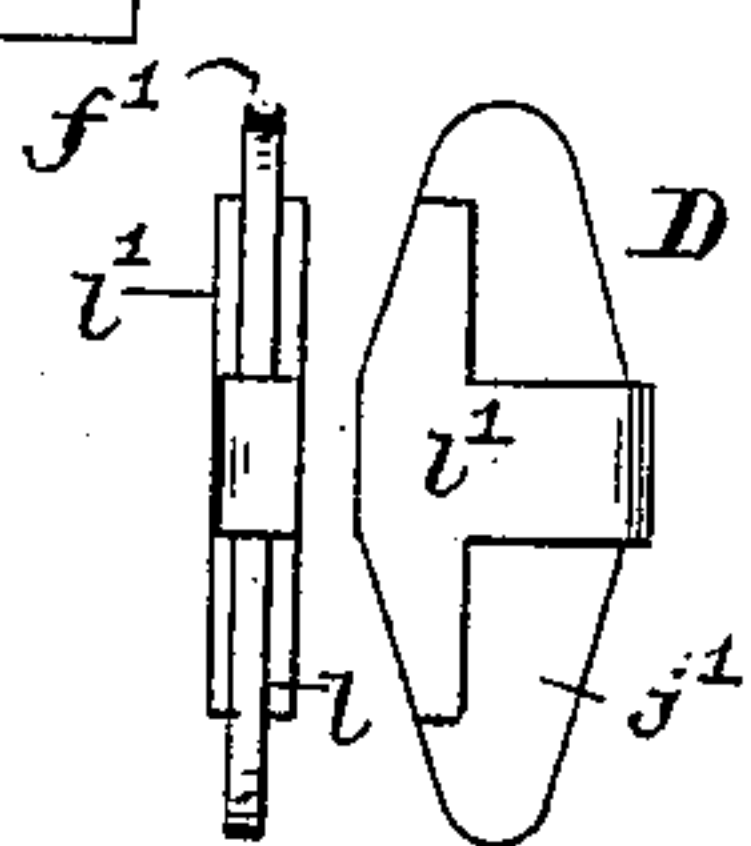


Fig. 7.

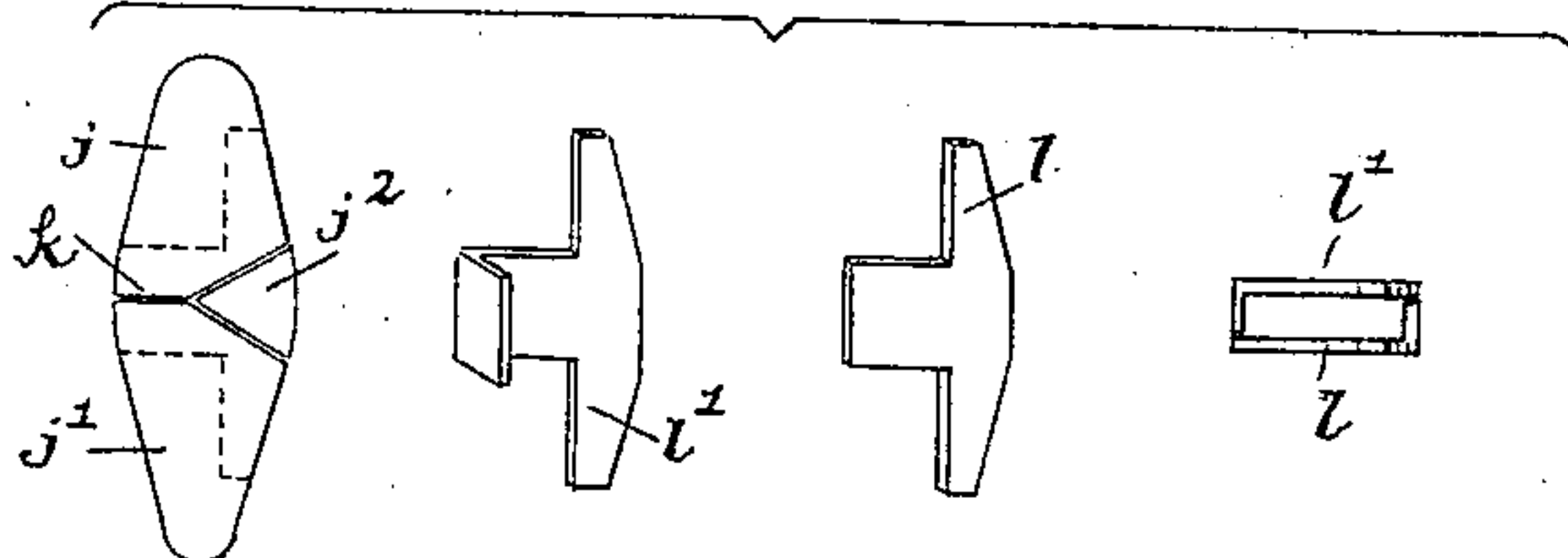


Fig. 8.

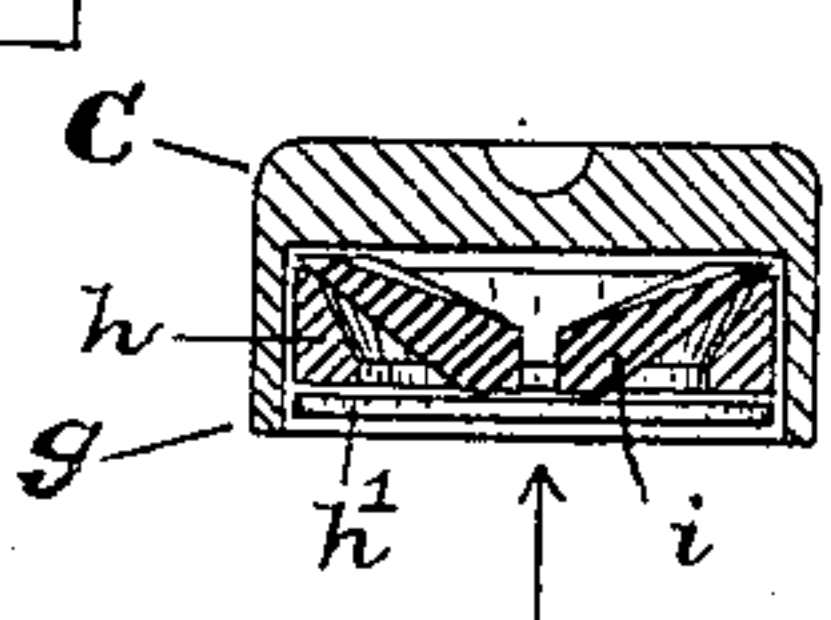


Fig. 9.

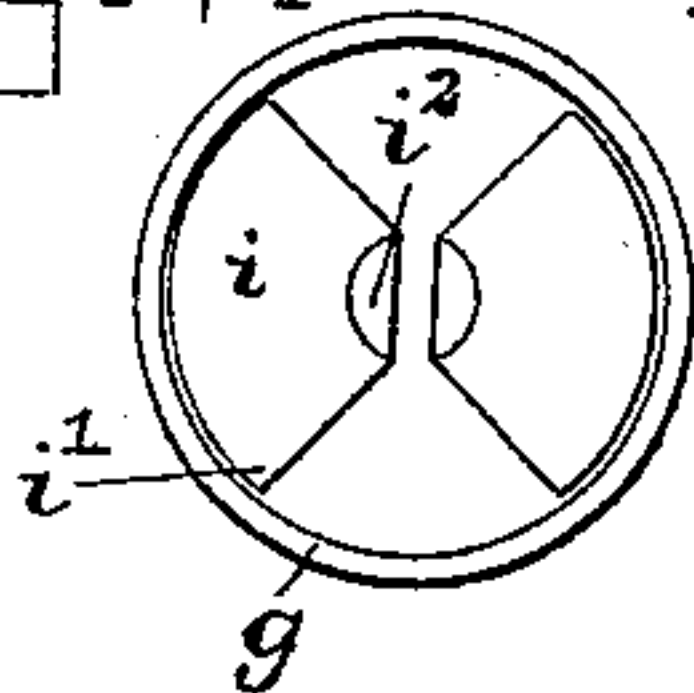


Fig. 10.

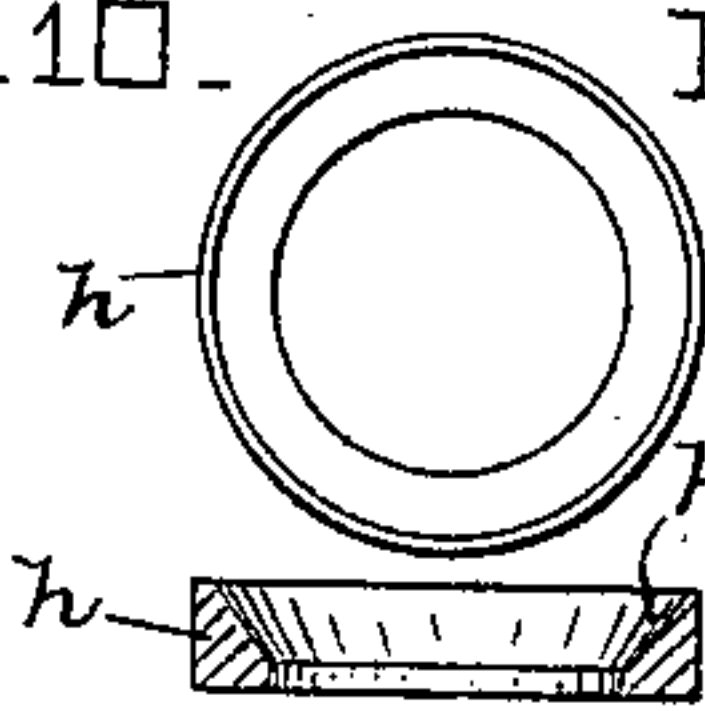
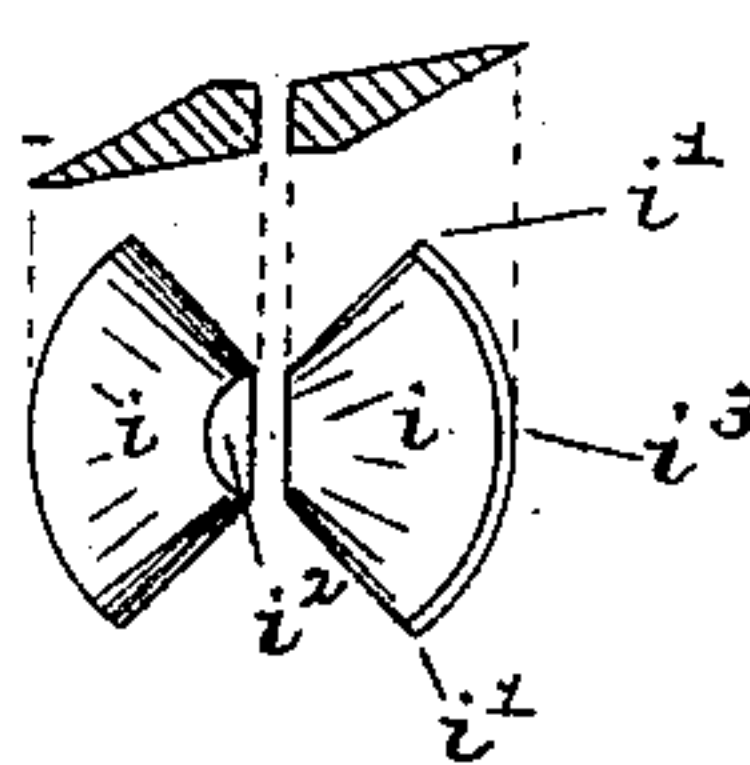


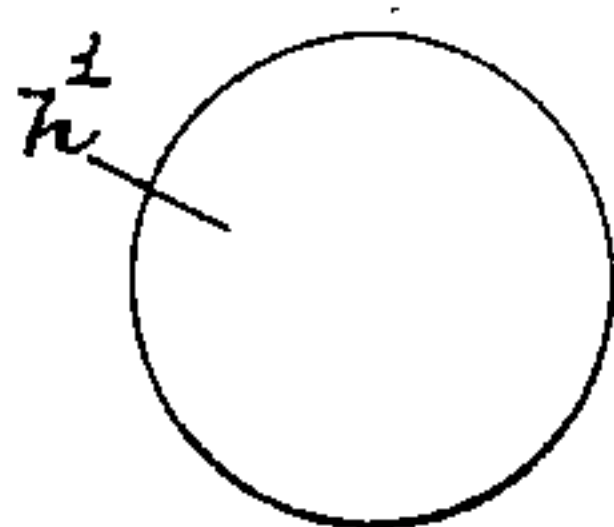
Fig. 11.



WITNESSES

Charles B. Mann Jr.
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Fig. 12.



INVENTOR

Wm S. Langford
By Chas B. Mann

ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM S. LANGFORD, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO WILLIAM H. GOUGH, OF SAME PLACE.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 616,056, dated December 13, 1898.

Application filed September 15, 1897. Serial No. 651,708. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. LANGFORD, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Automatic Fire-Extinguishers, of which the following is a specification.

This invention relates to automatic fire-extinguishers for storehouses and other places of the class known as "sprinklers."

Some of the objects of the invention are to provide a construction that will allow water under pressure to be maintained in the sprinkler without liability of leakage at the valve, to provide an improved form of valve wherein the constant pressure of the water will operate to keep the valve tightly to its seat, to provide an improved fusible support and trip for holding the valve to its seat, to provide an improved locking-nut that is independent of the frame, and to provide a reversible water-distributor that may be used either as an upward or a downward distributor.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my automatic sprinkler device, showing all the parts in position. Fig. 2 is a view of the top of the frame and showing the distributor in section and in reversed position from that shown in Fig. 1. Fig. 3 is an elevation of the sprinkler, showing certain parts in section. The support and trip for the valve is not shown in this view. Fig. 4 is a side view of the barrel. Fig. 5 is a view of the locking-nut. Fig. 6 shows two views of the fusible valve-support and trip. Fig. 7 shows four views of parts comprising the fusible valve-support and trip. Fig. 8 is a diametrical section of the valve parts. Fig. 9 is a bottom view of the valve-cap and levers, the ring-valve being removed. Fig. 10 shows two views of the ring part of the valve. Fig. 11 shows reversed views of the valve-levers and also projected sectional views of same. Fig. 12 is a view of the gasket part of the valve.

The letter A designates the barrel, having at one end a screw-thread *a* for attachment to a water-pipe, a wrench-grasp *c*, adjoining said end, a screw-head *b* at the other end and of larger exterior diameter than either the

first-named screw or wrench-grasp, a water-passage *d* through the barrel, and a circular valve-seat *d'* around the passage on the head end.

The frame B has a well-known yoke shape and has a ring-base *e*, which takes on the large screw-head *b* of the barrel. At its point end, on the inner side, the yoke-frame has a thin edge *f*. A valve-cap C covers the valve proper and takes over the circular valve-seat *d'*, and the fusible support and trip D has one end resting on the valve-cap, and the other end has a slight groove or notch *f'*, which engages the thin edge *f* on the yoke-frame. This device D keeps the valve-cap to its position until the occurrence of a fire.

The valve-cap C has a cavity which contains the several valve parts and a circular rim or edge *g*, which surrounds the said valve-seat *d'*. The valve comprises the ring *h* and the thin disk or gasket *h'*, of aluminium or other suitable non-corrosive material, which covers the water-passage *d* and rests on the circular valve-seat *d'*. The ring *h* fits snugly within the circular rim *g* of the cap and has slight movement up and down therein. It has its upper inner surface beveled, as at *h*². Small levers *i* (in the present instance two) are within the cavity of the cap C. These levers are shown in Figs. 8, 9, and 11, and are segment-shaped in one view and also are somewhat wedge-shaped in section. The two points *i*¹ at the ends of the curve constitute fulcrum-points, and the center point *i*² constitutes the long arm of the lever acted on by the thin disk or gasket, while the curve at *i*³ constitutes the short arm of the lever and acts on the bevel *h*² of the ring. It will now be seen that the thin non-corrosive disk or gasket will be pressed by the liquid-pressure in passage *d*, and thereby the gasket will yield a little and be dished at its center and pressed on the center points *i*² of the two levers. This will tilt the levers and cause the curved parts at *i*³ to force the ring *h* toward the gasket and toward the valve-seat *d'* on the barrel, and thereby as long as the cap C does not yield the liquid-pressure in passage *d* will keep the valve tightly to its seat.

The fusible device D, which holds the valve-cap to its seat, has a body composed in the

present instance of three sections $j j' j^2$. The two end sections $j j'$ are alike and at the center and at one side, as at k , abut against each other for a distance less than one-half the cross-width. At the center and opposite side the two end sections form a V-notch, which extends inward a distance more than one-half the cross-width. The central section j^2 is V-shaped and fits in the V-notch just described.

These three sections are bound together by two suitably-shaped bands $l l'$ and readily-fusible solder. These bands when placed in position, as shown, may partly or completely encircle the three sections. The encircling shape which the two bands $l l'$ assume is seen in the right-hand view of Fig. 7. Solder that is fusible at a moderate temperature—say 160° Fahrenheit—is applied to confine the bands.

The thrust-line or line of compression which the device D must sustain is longitudinally through the center. When the solder is fused by the heat of a fire, the embrace of the bands $l l'$ will be relaxed, the V-shaped section will slip out of position, and the two end sections will tilt on their abutting point at k . This operation constitutes the "trip" action, which releases the valve-cap C and allows the water to discharge through the passage d .

It is important in this class of "sprinkler" fire-extinguishers to make provision that will prevent leaks at the valve. One of the features which I have provided to this end is a locking-nut N, wholly independent of the frame, but serving to prevent a rotary movement of the frame on the large end of the barrel. The locking-nut is also on the screw-thread of the large end of the barrel, and said nut may be taken off over the wrench-grasp c and screw end a . In adjusting the parts to their position when the frame B has been turned on the screw-head b until the support D is compressed tightly between the yoke end f and the valve-cap C, thereby pressing the said valve-cap hard over the valve-seat d' , said frame is then "locked" or secured from turning backward by bringing the locking-nut N into use. By turning this nut on the head b so that the nut will press against the ring-base e the frame will be prevented from rotary movement by the vibration from any cause and from loosening the support D, and is thereby kept tight, and no leakage at the valve will occur.

I provide a revoluble distributor P, that is adapted to be reversed. This distributor has a central seat-bearing q on one side and a similar one q' on the other side. It is provided with a number of blades r , each of which is twisted similar to the form approximately of a propeller-blade; but all the blades are bent or curved upward from the central hub, thus forming a sort of dished affair. The blades at one side of the distributor therefore form a concave and the other side a convex. This distributor is held by a pivot-screw s at the point end of the yoke-frame,

so as to receive the stream of water that will flow from the passage d when the valve-cap C is removed. It will be seen that the water striking against the convex side of the distributor in the position shown in Figs. 1 and 3 will be deflected laterally and upward. When the distributor is reversed, as shown in Fig. 2, the stream of water will strike against the concave side and be deflected laterally and upward. The peculiar construction of this distributor has the effect in practice to distribute the water over a greater area than any other form known to me.

From this description the operation of the improved sprinkler will be understood.

The foregoing description has reference to water as the element to extinguish the fire; but it is obvious this sprinkler device may be used with any other liquid or solution suitable.

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

1. The combination in a sprinkler fire-extinguisher, of a screw-threaded barrel having on its end a valve-seat; a frame having a ring-base screwed on said barrel; a valve-cap having a cavity and a circular rim surrounding the valve-seat; a flexible disk within said cavity and resting on the valve-seat and closing the passage through the barrel; mechanism inclosed in the cavity of the valve-cap and coacting with the said flexible disk, whereby the water in the barrel-passage pressing on the flexible disk will cause said mechanism to press the rim of said flexible disk tightly to the valve-seat; and a fusible support interposed between a part of the frame and the said valve-cap.

2. The combination in a sprinkler fire-extinguisher of a barrel having a water-passage; a frame attached to the barrel; a valve-cap having a cavity which contains a valve consisting of a ring and a disk covering the water-passage, levers having ends at the center resting on the said disk, and ends acting on the said ring; and a fusible support and trip holding said valve-cap in closed position.

3. The combination in a fusible fire-extinguisher of a barrel having a water-passage; a frame attached to the barrel; a valve device closing the water-passage; and a fusible support and trip composed of three sections—the two end sections abutting against each other only at one side of the longitudinal central thrust-line and forming a V-notch on the other side, and the middle section having a V shape and fitted in said notch, and bands partly encircling said three sections and confined by readily-fusible solder.

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

WILLIAM S. LANGFORD.

Witnesses:

CHAPIN A. FERGUSON,
CHARLES B. MANN, Jr.