

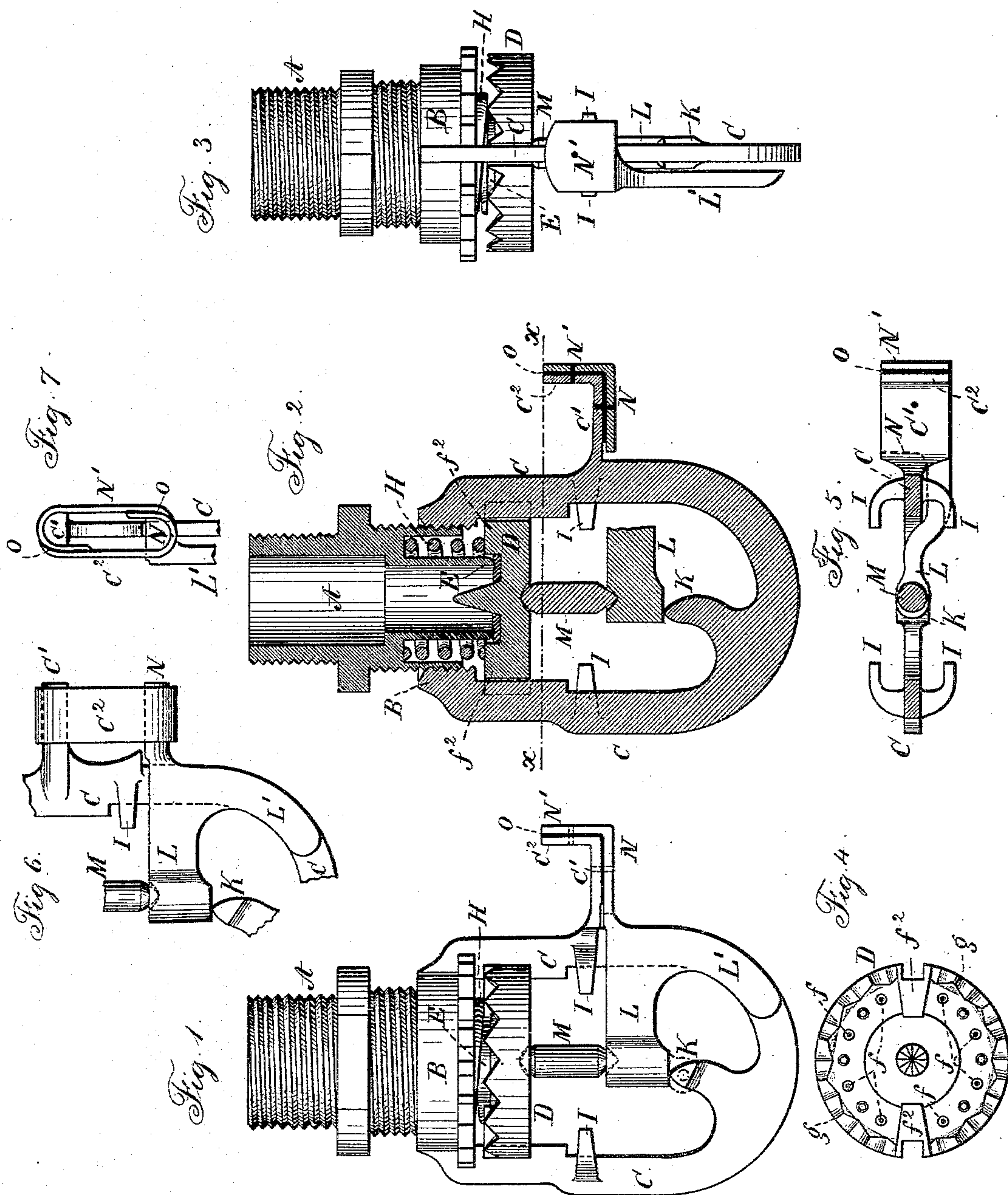
(No Model.)

W. HARKNESS.

AUTOMATIC FIRE EXTINGUISHER.

No. 356,874.

Patented Feb. 1, 1887.



Witnesses:  
J. Staib  
Chas. H. Smith

Inventor:  
William Harkness  
per Lemuel W. Ferrell atty



# UNITED STATES PATENT OFFICE.

WILLIAM HARKNESS, OF NEW YORK, N. Y.

## AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 356,874, dated February 1, 1887.

Application filed November 2, 1885. Serial No. 181,601. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HARKNESS, of the city and State of New York, have invented an Improvement in Automatic Fire-Extinguishers, of which the following is a specification.

This invention relates to that class of automatic fire-extinguishers in which a valve is held to the end of the water-supply pipe by a fusible support that softens and gives way by an increase of temperature.

The present invention consists in the combination, with the automatic valve, of a lever pivoted to the frame and having a column or strut between the lever and the valve, and nearly in line with the pivot, so that the hammering or ram action of the water in the pipes may be taken upon the pivot, and very little strain comes upon the outer end of the lever where it is held to the frame by fusible solder, and when this solder softens by the increase of heat the lever and its strut fall entirely away, and the valve opens by the action of a spring in addition to the pressure of the water.

In the drawings, Figure 1 is an elevation of the automatic valve complete. Fig. 2 is a vertical section of the same. Fig. 3 is an elevation at right angles to Fig. 1. Fig. 4 is a detached plan of the valve. Fig. 5 is a sectional plan below the line *xx*, Fig. 2. Fig. 6 is a detached elevation of the lever and part of the frame and a modification in the soldered device for holding the lever, and Fig. 7 is an elevation at right angles to Fig. 6.

The screw-coupling A is to be connected to the water-supply pipe at the upper end, and upon the lower end is screwed the ring B of the frame C, and D is the valve that is pressed tightly against the tubular seat E at the lower end of the coupling A. This valve D is to be perforated, as at *f*, and provided with serrations *g* around the edge, as in my Patent No. 323,578; but it is formed with bridges *f*<sup>2</sup> for the lower end of the spring to rest upon; and I prefer to make use of a helical spring, H, preferably within an annular cavity around the tubular seat E and pressing upon the valve, so that when the valve is liberated the said spring H will cause it to separate from the seat and open fully, and when the valve falls it is received upon the fingers I, projecting from

the frame C at a sufficient distance below the tubular seat E to support the valve and cause it to act as a deflector in scattering the water or other fire-extinguishing liquid. Upon this frame C is a pivotal projection, K, upon which rests one end of the lever L, and between this lever L and the under side of the valve D is a column or strut, M. This lever L is weighted by the hanging outer end, L', and it has upon it an arm, N, that is connected by fusible solder with an arm, C', projecting from the frame C. This connection may be direct, as seen in Figs. 1, 2, 3, and 5, there being vertical plates C<sup>2</sup> and N' at the ends of the arms C' and N, respectively, so that the fusible solder at O, between the plates C<sup>2</sup> and N', will hold the lever L in its proper position against the frame, with one end resting upon the pivotal projection K.

I prefer to make use of the fusible solder in such a position that when it softens by the action of heat one of the metal surfaces will slide away from the other, for which reason the plates C<sup>2</sup> and N' are made use of, instead of depending alone upon the solder between the arms C' and N.

Under some circumstances it is advantageous to separate the arms C' and N a distance from each other, as seen in Figs. 6 and 7, and to make use of separate plates C<sup>2</sup> and N' joined together in the form of a link by fusible solder at O, so as to slip said link upon the arms C' and N.

It is now to be understood that when the parts are placed in their proper position, as seen in Figs. 1 and 2, the ring B is screwed upon the coupling A until the tubular seat E, pressing upon the valve D, renders the same water-tight, and in this position the parts will remain until the heat of the apartment where they are located rises sufficiently to soften the fusible solder O, and allow the lever L to swing upon the pivotal projection K and fall entirely away from beneath the valve D. This valve will then open by the action of the spring H and the pressure of the water. This valve is not liable to leak, because the ram action of the water due to the opening and closing of faucets is taken in nearly a straight line through the column M and lever L upon the pivotal projection K.

If desired, the plates C<sup>2</sup> N' may be perforated,



as seen in Fig. 2, for the fusible solder to pass into the perforations and increase the strength of the soldering.

A hinge may take the place of the pivotal support K, as shown by dotted lines in Fig. 1.

The bridges  $f^2$  upon the valve D press against the lower end of the spring H, and being above the surface of the valve the spring is not liable to fall down into the path of the water, especially as the upper end of the spring binds upon the metal to hold the spring up.

I am aware that pivoted levers held by fusible solder and struts have been used to hold the valve in an automatic fire-extinguisher; but in consequence of the lever having a fixed pivot-pin and the strut or valve-stem sliding through a fixed guide the parts are liable to become rusty or obstructed by foreign substances. In my device the lever and the strut fall entirely away without any obstruction when the solder melts.

I am also aware that a helical spring has been used to open the valve.

I claim as my invention—

1. The combination, with the tubular seat E and valve D, of a ring, B, frame C, and pivotal projection K, formed in one, the weighted lever L, resting upon the pivotal projection K within the frame and nearly in line with the

center of the valve, the strut M between the lever L and valve D, and the arms C' and N, and fusible solder, substantially as set forth.

2. The combination, with the tubular seat E and valve, of a frame and ring screwed upon the coupling to the water-pipe, a pivotal projection within the frame nearly in line with the axis of the valve resting upon the said projection, a strut between the same and the valve, the arms C' and N upon the frame and lever, respectively, and the plates C<sup>2</sup> and N', connected together by fusible solder and holding the arms C' and N in their proper relative positions, substantially as set forth.

3. The combination, with the automatic valve in a fire-extinguishing apparatus, of a tubular valve-seat upon the end of the water-pipe coupling and an annular recess around such tubular seat, a spring within the annular recess acting upon the valve to open the same, a frame screwed upon the coupling, and a support therein for the valve, substantially as set forth.

Signed by me this 30th day of October, A. D. 1885.

WILLIAM HARKNESS.

Witnesses:

GEO. F. PINCKNEY,  
WILLIAM G. MOTT.