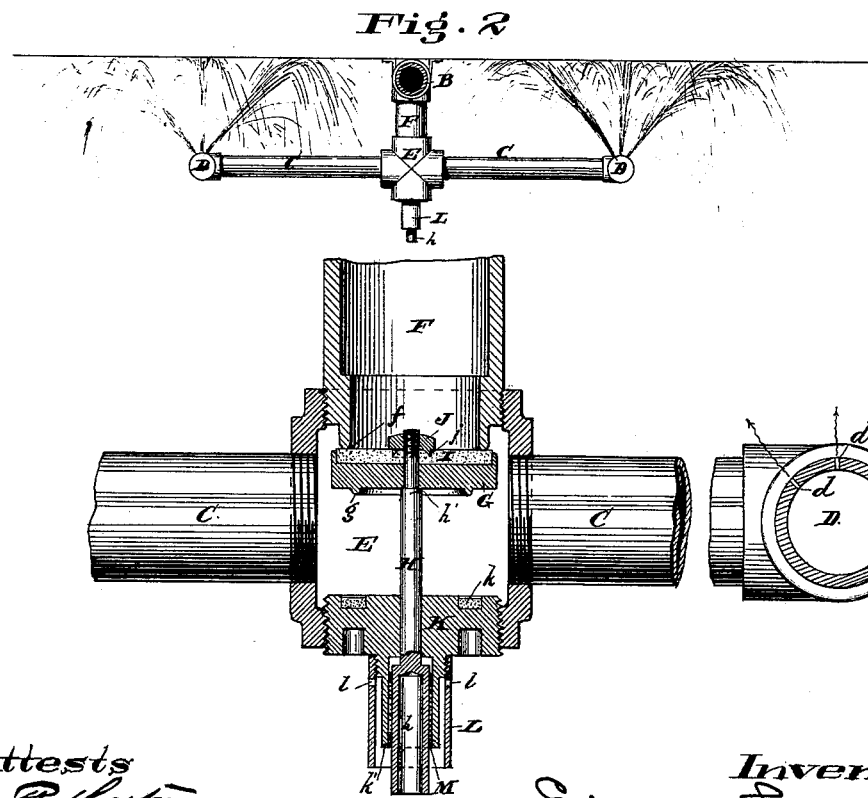
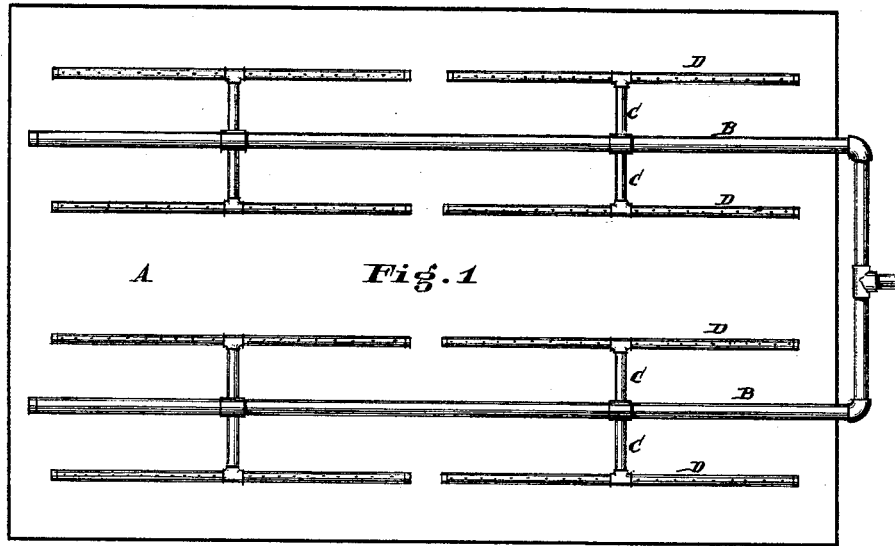


E. LEONARD.
Automatic Fire-Extinguishers.

No. 220,764.

Patented Oct. 21, 1879.



Attests
John Dolley Jr.

Fig. 3

Inventor
Edward Leonard
by his Attorneys,
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UNITED STATES PATENT OFFICE

EDWARD LEONARD, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN AUTOMATIC FIRE-EXTINGUISHERS.

Specification forming part of Letters Patent No. **220,764**, dated October 21, 1879; application filed July 29, 1879.

To all whom it may concern:

Be it known that I, EDWARD LEONARD, of the city and county of Philadelphia, and State of Pennsylvania, have invented new and useful Improvements in Automatic Fire-Extinguishers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to that class of fire-extinguishers in which pipes are arranged in a building in such a manner that the heat will cause one or more valves to open and admit the water, which is then automatically distributed into the building; and the nature of my invention consists in a system of distributing-pipes arranged in sections or divisions, each section or division having its own valve independent of the others, so that in case of fire at one end of a building the valve or valves at that point will be opened to admit the water, while those at the other end, where there is no fire, will remain closed.

It further consists in the peculiar construction and arrangement of parts, as will be hereinafter more fully set forth, and pointed out in the claims.

In the drawings, Figure 1 is a plan of my improved fire-extinguisher. Fig. 2 is a cross-section through the main of one section; Fig. 3, a section of the automatic valve.

A is a room, to the ceiling of which is secured the water-main B, which draws its supply from the city mains, tank on the roof, or other convenient source where the water is always under pressure.

From the main B the water is led off by feeders C C, and discharged into the room by the sprinklers D D. Leading from main B is a pipe, F, which is formed into a valve-seat, *f*, at its lower extremity, and which is secured within a cross, E.

Into either side of the cross E the feeders C C are secured, and to the outer end of said feeders the sprinklers D D are secured at right angles.

The water-valve G supports a non-adhesive-composition face, I, which presses against the seat *f* when the valve is closed. The under part of valve G has an annular projection, *g*. This valve G and face I are secured upon a valve-rod, H, by the nut J, which has an an-

nular knife-edge, *j*, on the bottom, the object of which is to press into the composition I, and force it tightly against the rod H, and thereby prevent leakage of water. From *h'* up the valve-rod is of small diameter, and hence a shoulder is formed at *h'*, against which the valve G rests.

The lower part of the rod H is formed into an inverted cup, *h*. The rod H may move vertically in a plug, K, which also has an inverted-cup projection, *k'*, the internal diameter of which cup is slightly greater than the external diameter of cup *h*. The plug K also carries an annular packing-ring, *k*.

A cylinder or safety-cap, L, is screwed onto the plug K, and has small openings *l* at its upper end, as shown.

The sprinkler D has a number of openings, *d d*, by which the water is thrown obliquely and upward, and also a number of holes, *d'*, by which the water is thrown vertically and upward.

At the upper part of the cup *h* or rod H there is a shoulder, which is pressed against the plug K when the cups *h* and *k'* are being soldered together, the purpose of which is to prevent any of the fusible solder running into the valve.

The operation is as follows: The valve G being forced up so that the face I is tight against the seat *f*, and the cup *h* within the cup K, and these two cups secured together by means of fusible metal or solder M, the water is kept in the mains B. Now, supposing a fire to break out, the heat will gradually increase until, by passing into the cup *h* and between the cup *k'* and cylinder or safety-cap L, it will melt the solder or fusible metal, and then, there being nothing to prevent the valve falling, it drops, this action being facilitated by the pressure of the water above the valve. The holes *l l* allow a free circulation of the heat in cap L. When the valve G is open the annular projection *g* rests upon the packing-ring *k*, and thereby prevents any water from escaping through the plug K, which would diminish the pressure in the sprinklers D D, and consequently lessen the throw of water from said sprinklers. As soon as the valve G has dropped the water from mains B and pipe F passes through the feeders C C and into the

sprinklers D D, from which it is discharged through the holes, as shown in Fig. 2.

The cylinder or safety-cap L may or may not be used; but when used its function is to prevent water from another section striking the cup *k'*, and thereby prevent the fusion of the solder taking place.

In putting the valve in place the cups *k'* and *h* are first secured together with the fusible metal or solder, and then the plug K screwed into the cross E until the face I of the valve G is tight against the seat *f*.

It will be noticed that my perforated distributing-pipes are arranged in sections or divisions, and each section or division has its own valve, independent of the others, so that in case of fire in any part of a building the valve or valves immediately affected will be opened automatically, and the water admitted and distributed through such sections or divisions, while the valves in other parts of the building will remain closed.

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

1. In a fire-extinguisher, a system of perforated distributing-pipes arranged in sections or divisions, connected to a common main, and each section or division provided with a valve held in place by fusible metal, which valve will open automatically when such metal is melted by heat, substantially as herein set forth.

2. In a fire-extinguisher whose distributor is composed of perforated sprinkling-pipes in detached sections, and in combination with said pipes, an automatic valve placed outside the main water-supply pipe, which will retain the water in the said main and prevent its flow to the perforated pipes until its seat, which is kept in position by a fusible solder, is released by increased temperature, and the water thereby allowed free passage to the perforated pipes of its respective section, where it may discharge upon the fire.

3. In a fire-extinguisher, in combination with an automatic valve, the section system

of perforated pipes as distributors, whether the same be employed vertically, horizontally, or obliquely, substantially as and for the purpose set forth.

4. The safety-cap L, to protect the fusible solder of a fire-extinguisher valve, substantially as shown and described.

5. In a fire-extinguisher, a valve adapted to open upon the melting of the fusible solder by which the same is held in place, in combination with a perforated sprinkler-pipe, said pipe being perforated in such manner as to throw water upward against the ceiling of the room in which said sprinkler is located, the whole forming an automatic fire-extinguisher, as shown and described.

6. In a fire extinguisher, the hollow cup *k'* formed in the valve-stem, in combination with the cylindrical cup L, to facilitate the melting of the fusible solder, substantially as shown and described.

7. A valve for an automatic fire-extinguisher in which the valve-rod H has a shoulder at the top of the cup *h*, which is pressed against the plug K for the purpose of preventing the fusible solder M from running into the valve, in combination with the cup *k'*, all constructed substantially as shown and described.

8. The plug K, provided at the bottom with the cup *k'*, and in the upper surface with the packing-ring *k*, to receive the flange *g* on the under side of the valve G, as and for the purposes set forth.

9. The combination of the valve G, having non-adhesive-composition face I and flange *g*, the shouldered stem H, having cup *h*, the plug K, with packing-ring *k* and cup *k'*, and the safety-cap L, having openings *l*, all constructed substantially as and for the purposes herein set forth.

In testimony of the foregoing specification I have hereunto signed my name this 25th day of July, 1879.

ED. LEONARD.

Witnesses:

W. C. STRAWBRIDGE,

JOHN JOLLEY, Jr.