

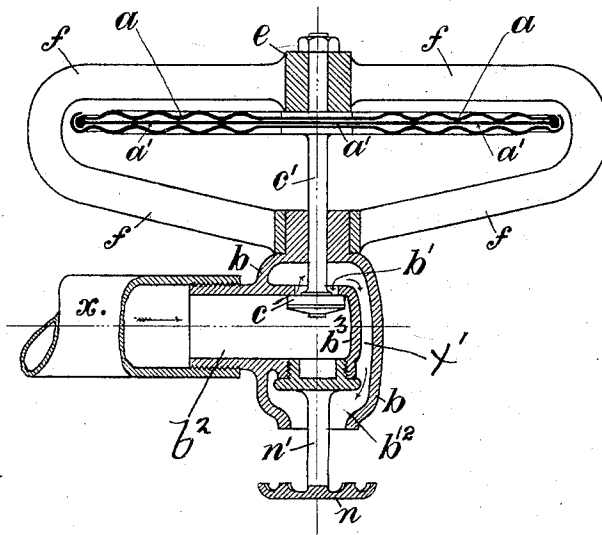
No. 607.988.

Patented July 26, 1898.

J. H. R. DINSMORE.
FIRE EXTINGUISHING SPRINKLER.

(Application filed Oct. 26, 1897.)

(No Model.)



Witnesses.

John F. Townsend

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UNITED STATES PATENT OFFICE.

JOHN H. R. DINSMORE, OF LIVERPOOL, ENGLAND, ASSIGNOR TO WILLIAM HENRY DAVIES, OF MANCHESTER, AND JOHN EDWARD LEES, OF ROMILEY, ENGLAND.

FIRE-EXTINGUISHING SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 607,988, dated July 26, 1898.

Application filed October 26, 1897. Serial No. 656,431. (No model.) Patented in England August 10, 1895, No. 15,083.

To all whom it may concern:

Be it known that I, JOHN H. R. DINSMORE, engineer, a subject of the Queen of Great Britain and Ireland, residing at Liverpool, England, have invented certain new and useful Improvements in Fire-Extinguishing Sprinklers, (for which I have received a patent in England, No. 15,083, dated August 10, 1895,) of which the following is a specification.

This invention has reference to fire-extinguishing sprinklers and to that type of such sprinklers wherein when a fire takes place a valve connected with a pressure-water service-pipe is automatically opened by the heat of the fire and supplies and sprays the water onto it and when the fire is extinguished automatically closes by the reduction of temperature and stops the supply of water.

According to the present invention a sprinkler of this kind is so contrived, constructed, and adapted to act that the valve will be operated at a low temperature, that it will remain open for some time after the fire has been extinguished, so as to obtain what may be called an "after supply" of water, and that it will not be strained or put out of action by any temperature that the apparatus is subjected to, while at the same time it will be highly sensitive—that is, will come into action very quickly after the temperature of its atmosphere or the heat radiated upon it reaches such a temperature as it is desired to act under.

This invention is illustrated in the accompanying drawing, which is a longitudinal section, and the invention will be now described with the aid of this drawing.

The parts of the apparatus are combined with and carried on a pressure-water service-pipe *a*. In connection with this pipe *a* there is a valve-case *b*, to the interior of which the pressure-water is directly admitted. In the vertical axis of this valve-case there is an opening *b'* for the passage of water, and this opening is controlled by a lift-valve *c*, whose axis is coincident with that of the case *b* and its aperture and which is adapted to open inward of the case, it being normally pressed upon its seat by the pressure of water within

the case *b*, which bears directly upon it. Above this valve-case there is a diaphragmatic device *a*, the plane of which is at right angles to the axis of the valve and the axis of which is coincident with the axis of the valve. This diaphragmatic device consists of two practically-parallel annularly-corrugated disks, the peripheries of which are soldered or otherwise suitably fastened, and within it there is inclosed a pad *a'* of absorbent material, such as blotting-paper, which is charged with a small quantity, say a teaspoonful, of volatile liquid—viz., hydrocarbon—which evaporates at a temperature of from 95° to 120° Fahrenheit. This device, therefore, constitutes a hermetically-closed vessel of extended surface and capable of large distension. One of these corrugated disks is directly connected with the valve *c* from its center by the valve-stem *c'*, while the other diaphragm is fixed to a base-block *e*, rigidly supported from the valve-case *b* by an arm or arms *f*. Thus there is a practically rigid connection between the valve-case and the base or frame, by which the diaphragmatic device *a* is carried. In connection with the valve-case and directly under the opening *b'*, through which the discharge of water from it takes place, there is provided the water sprayer or distributor *n*, which is centrally carried from the valve-case by the stem *n'*.

The apparatus will be disposed in a room or space at the upper part near the ceiling in the usual way, with the axis of the water-discharge part of the valve-case vertically disposed. Under quiescent conditions the diaphragmatic device *a* will be collapsed and the valve *c* kept upon its seat by the pressure of water in the valve-case *b*. When a fire takes place and the temperature of the atmosphere about the apparatus is raised to a certain point, or heat is radiated onto the device *a*, so as to heat it and evaporate the fluid within it, pressure is created in the device *a*, and, acting upon the diaphragm, causes the device to distend and to press the valve *c* off its seat against the pressure of water acting upon it, and so to open the orifice *b'* and admit of free discharge of water. This water

strikes in its discharge the distributing-disk n and is broken up and sprayed or distributed upward and outward and then falls.

To open the valve c to give an area of opening round the valve equal to the bore of the orifice b' , only a small movement would be required; but to secure the "after flow" of water—that is, a continued supply of water after the fire has been extinguished—the valve is adapted to be opened to a very large excess of the amount above referred to, and to obtain this excessive opening the disks of the device a are made corrugated, and by the corrugations a comparatively large distention can take place without straining the joints or structure of the device. Then after the fire is over the device begins to cool; but the valve having been opened to the excessive degree described a considerable time elapses between the commencement of the closing and complete closure, so that the "after discharge" of water is secured. Further, as the water sprayed by the apparatus tends to temper the heat of the device a , and as only a small quantity of volatile fluid is used in the device, the continuous action of the fire or heat upon it does not create a pressure which will cause it to be strained or burst.

It will be seen that the sprinkler-casing b has a lateral nipple b^2 . This is extended inwardly and is closed at its inner end within the casing b by the wall b^3 , leaving a narrow space x' between it and the outer wall of the

casing. Openings are formed in this inner extension above and below and in line with each other, and into the lower opening the head on the stem of the distributor is screwed. The discharge-opening for the outer casing b is in line with these openings.

What is claimed in respect of the herein-described invention is—

In combination with the valve-case, the diaphragm, the valve with its valve-stem connected therewith, the distributor with its stem arranged axially in line with and below the valve and its stem and a casing b having a laterally-extending nozzle with an inwardly-extending portion closed at its end by a wall b^3 so as to leave a space x' between it and the wall of the casing, the openings in the upper and lower parts of said inner extension, the said distributor having a head screwed into the lower opening of said extension, and the valve seated around the opening in the upper wall of the extension, the said openings together with the discharge-opening from the casing being axially in line, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN H. R. DINSMORE.

Witnesses:

ERNEST R. ROYSTON,
JOHN H. WALKER.