No. 849,938. PATENTED APR. 9, 1907.

W. S. THURLOW & W. G. FRASER.

AUTOMATIC SPRINKLER.

APPLICATION FILED APR. 17, 1905.

Fig. 1.

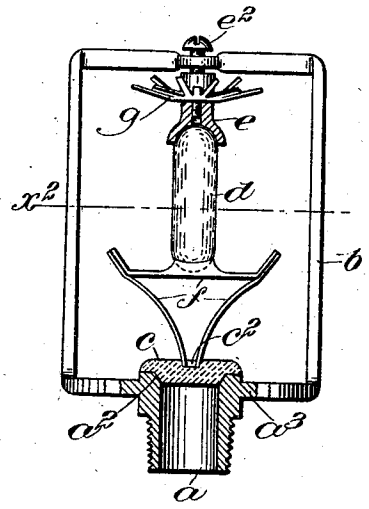
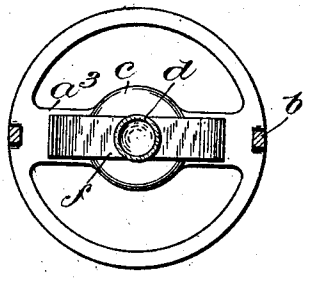


Fig. 2.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SPRINKLER.

No. 849,938. Specification of Letters Patent. Patented April 9, 1907.

Application filed April 17, 1905. Serial No. 255,927.

To all whom it may concern:

Be it known that we, WINFIELD S. THURLOW and WILLIAM G. FRASER, both citizens of the United States, and residents, respectively, of Boston, county of Suffolk, and State of Massachusetts, and of Somerville, county of Middlesex, said State, have invented an Improvement in Automatic Sprinklers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to an automatic sprinkler-head of the type in which a valve is maintained seated by a device destructible by heat, so that in case of fire the valve will be released, permitting the water to flow.

The object of the present invention is to obtain a sprinkler which will remain tight under all conditions, but which at the same time cannot fail to be released in case of fire. To these ends the invention is embodied in a sprinkler having a valve of combustible and non-corrosive material—such as celluloid, fiberoid, vaceloid, or any similar material—the said valve being held in place by a destructible strut of such a nature as to be ruptured when heated above a certain normal temperature, the said strut consisting of a hollow receptacle of fragile material containing a substance capable of expansion when heated—such, for example, as an expansible fluid or an explosive. The opening of the valve may be further assured by the addition of a fusible member which may consist of thin strips of sheet metal soldered together at the edges, the sheets of metal being so shaped that the member will collapse as soon as the solder softens. In this construction if the strut fails to break the valve will still be opened by the fusing of the intermediate member, and if both of these expedients fail the valve itself will ignite and burn or explode or be otherwise destroyed, thereby fully insuring the opening of the water-duct. Furthermore, the nature of the material is such that it will not corrode or otherwise become changed in such a manner as to cause the valve to stick to its seat.

Figure 1 is a vertical section of a sprinkler embodying the invention, and Fig. 2 a horizontal section on line x^2 of Fig. 1.

The sprinkler-head may be of the usual type having a screw-threaded nozzle-piece a for insertion into the pipe system, the said head terminating in a valve-seat a^2 and having a flange a^3 projecting beyond the said seat and affording a support for a yoke b, which in turn holds the destructible member which maintains the valve seated.

As herein shown, the valve c, which is of combustible or explosive material—such, for example, as celluloid—is held in position mainly by a strut d, which is capable of being ruptured when heated, the said strut preferably consisting of a closed tube of glass containing an expansible medium, such as a liquid, a gas, or an explosive substance. As herein shown, the strut consists of a closed glass tube containing compressed air, the strength of the tube and the compression of the air being so proportioned that the tube will be ruptured when heated to a certain degree of temperature. The said strut is held in its position by means of a follower e, which is acted upon by a screw e^2 in the yoke, so that in setting up the sprinkler the valve can be properly adjusted on its seat and very readily reseated by anybody. In addition to the strut d a fusible member f may be employed, the said member being herein shown as consisting of three pieces of sheet metal put together in approximately a triangular shape and joined by solder or other fusible material at the upper apices of the triangle. As indicated, the piece against which the strut d impinges may be provided with a concave seat in order to afford a lateral support for the strut. The valve c, as shown, is provided with an indentation c^2 to receive one apex of the triangular member f, so that when the valve is in place all the parts will be securely held against lateral movement.

By this construction the opening of the sprinkler in case of fire is positively assured, since the rupture of the strut d, which is the upper member and the most sensitive to heat, will open the valve, while if this member fails to be ruptured the fusing of the solder in the member f and the consequent collapse of said member will release the valve even if the strut remains unbroken. If both these means fail, or if the valve adheres to its seat, the valve itself will finally catch fire and be consumed, thus opening the water-passage.

The yoke b is as small and light as is consistent with the requisite strength to hold the

valve seated, and the flange a^3 is provided with large openings, as shown in Fig. 2, so that heat rising is not deflected away from the destructible parts. The valve-seat, as shown, is raised above the flange, so that any foreign substance which may collect on the flange will not interfere with the proper operation of the valve. The yoke also affords a support for a spraying device *g*, which is shown as having alternate long and short arms slightly inclined or slanted in the same direction, so as to impart a lateral or whirling movement to the impinging water. The spraying device is below the top of the yoke and is herein shown as held in position by the follower-screw e^2.

While the construction herein shown and described constitutes a practicable embodiment of the invention, it is obvious that modifications may be made in the construction without departing from the invention, while it is not intended to limit the invention to the combustible and explosive materials specified, since any materials having the characteristics mentioned may be used without departing from the invention.

What we claim is—

1. In an automatic sprinkler, the combination with the water-nozzle; of a highly-combustible valve seated in contact with the outlet of said nozzle; and means for maintaining said valve seated.

2. A sprinkler-head provided with a nozzle and a yoke; a valve-seat located at the outlet of the nozzle; a highly-combustible valve cooperating with said valve-seat; and a destructible strut supported by the yoke and engaging said valve, said strut being hollow and containing a material capable of expanding when heated.

3. A sprinkler-head provided with a nozzle and a yoke projecting beyond said nozzle; a valve-seat at the outlet of said nozzle; a highly-combustible valve seated thereon; a destructible hollow strut containing an expansive material constituting the main support for the said valve; and a secondary supporting member formed of a plurality of pieces of sheet metal joined at their edges by a fusible material.

4. A sprinkler-head provided with a valve-seat and a yoke; a combustible valve; a hollow strut containing expansible material capable of bursting said strut when subjected to heat; and a secondary supporting member also destructible by heat, said strut and said supporting member both contributing in maintaining said valve seated.

5. A sprinkler-head having a valve-seat and a yoke; a valve of highly-combustible material in direct engagement with said seat; and a hollow glass strut containing compressed air to coöperate with the yoke in maintaining the valve seated.

6. A sprinkler-head having a valve-seat and a yoke; a valve of highly-combustible material in direct engagement with said seat; a hollow glass strut containing compressed air; and a metallic strut made in separable parts connected by fusible material, substantially as and for the purpose described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WINFIELD S. THURLOW.
WILLIAM G. FRASER.

Witnesses:
MARGARET E. COVENERT,
HENRY J. LIVERMORE.