No. 792,309. PATENTED JUNE 13, 1905.

C. E. BUELL.

AUTOMATIC SPRINKLER.

APPLICATION FILED FEB. 18, 1896.

Fig. 1.

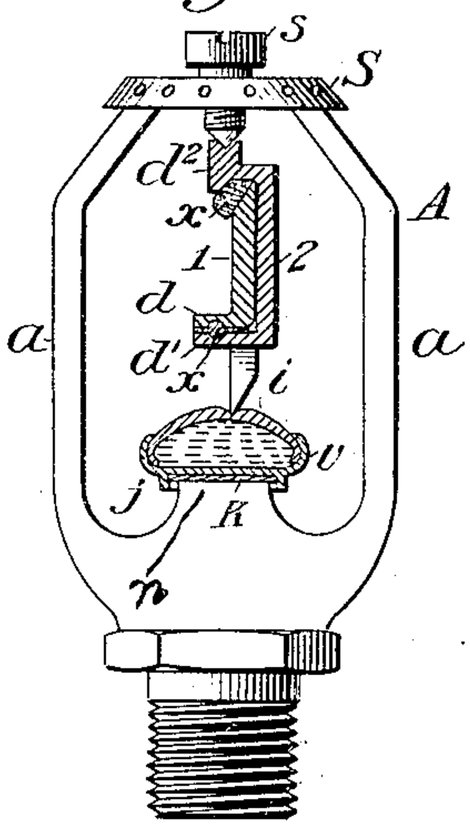


Fig. 2.

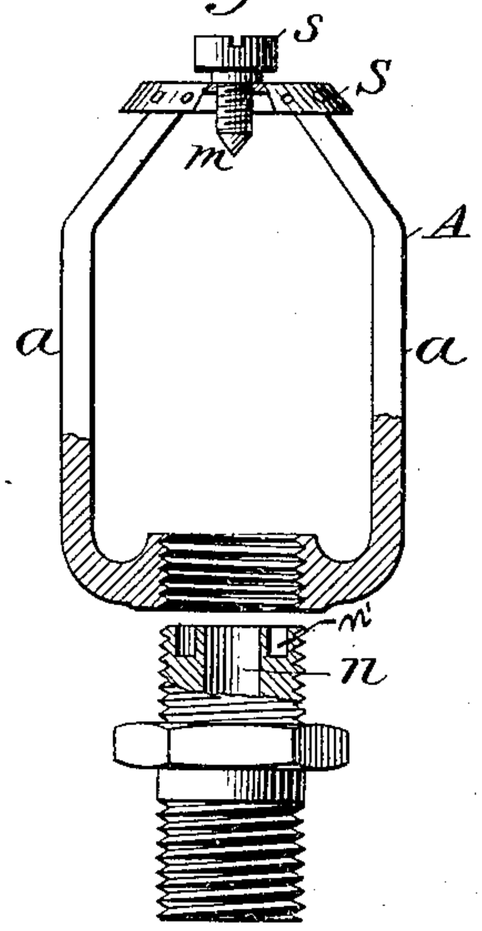


Fig. 3.

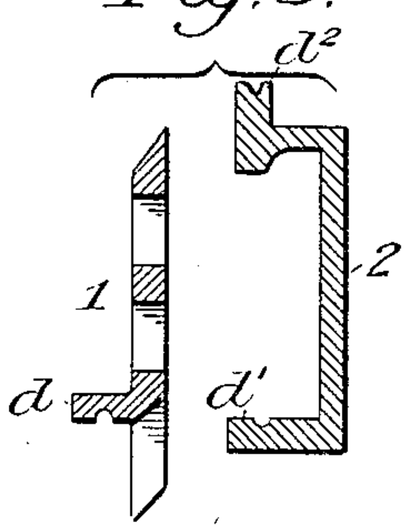


Fig. 4.

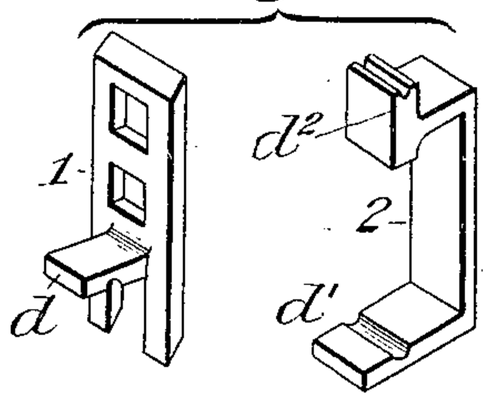


Fig. 5.

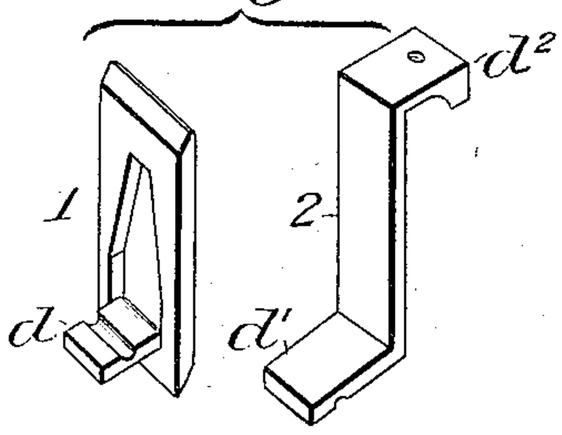


Fig. 6.

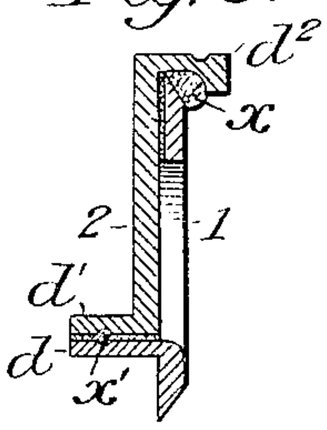
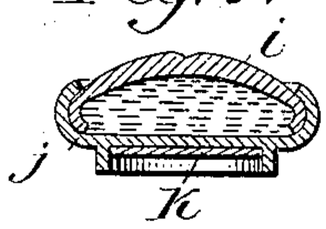


Fig. 7.



Witnesses.

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No. 792,309. Patented June 13, 1905.

UNITED STATES PATENT OFFICE.

CHARLES E. BUELL, OF NORTH PLAINFIELD, NEW JERSEY, ASSIGNOR TO GENERAL FIRE EXTINGUISHER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

AUTOMATIC SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 792,309, dated June 13, 1905.

Application filed February 18, 1896. Serial No. 579,807.

To all whom it may concern:

Be it known that I, CHARLES E. BUELL, of North Plainfield, Somerset county, State of New Jersey, have invented Improvements in Automatic Sprinklers, of which the following is a specification.

My invention consists, primarily, in the combination with an automatic sprinkler having a valve closing its outlet that is held to its seat by a fusible fastening of a thermally-expanded material in operative relation to the removable parts of the sprinkler that is adapted to generate pressure against the said valve and removable parts when the said expanded material is acted upon by heat, substantially as hereinafter set forth.

In the accompanying drawings, Figure 1 shows a sprinkler made in accordance with my invention. Figs. 2, 3, 4, 5, 6, and 7 show details and parts of such a sprinkler. Fig. 1 shows a sprinkler made according to my invention, having a fusible support for holding the thermally-expanded valve over outlet *n* of the sprinkler. Fig. 2 shows the frame and outlet of the sprinkler in cross-section to better illustrate the construction of the parts. Figs. 3, 4, 5, 6 show details of the fusible support, and an enlarged view in Fig. 7 shows the valvular construction with its contents adapted to generate pressure by heat and to act as a thermal engine to destroy adhesion that may be present between the valve and its seat and to dislodge and accelerate the removal of the released fusible support.

In Fig. 1 a sprinkler is shown which comprises a spreader S, supported above the outlet *n* by arms *a a*, an expanding-valve V normally closing outlet *n*, which is held to its seat by a fusible fastening consisting of the members 1 and 2, joined to form a fusible strut in a well-known way. The valve V is shown consisting of parts *i* and *j*, forming a valve which can be called "elliptical." The edge of the lower half *j* is turned to hold the upper half *i* more closely joined. The space between the parts *i* and *j* is filled with a material which will remain inert until acted upon by heat above normal temperatures, when it will melt and will expand, causing a strain upon the assembled parts to give a thrust to the members 1 and 2 of the soldered support when the melting-point of the solder is reached, thus causing the released parts to be quickly removed out of the structure. The valve V thus constructed is a thermally-actuated motor having its piston-like part *i* closely fitting in the cup-like part *j* and adapted to be moved and expanded under the pressure of the melted contents of said valve. Such an expanding-valve is a heat-actuated motor that is adapted to force the fusible support upward in the direction of the spreader S and to cause the flexible seated portion of part *j* to be forced out of its normal shape and disrupt any adhesion between the part *j* and the end of nozzle *n*, on which it rests. The layer of material K also serves to prevent adhesion.

Fig. 2 shows the frame and body of the sprinkler adapted to be secured together by screwing the body into the frame part and with a groove *n'* formed around the nozzle *n*, the said groove *n'* being intended to be filled with a thermally-expanded contents that under the action of heat will generate a pressure against the valve V, that is placed over the outlet *n*, thus overcoming any tendency to adhesion of the valve to its seat after the fusible fastening has been released. A further adjustment can be made by the use of the screw *s*, which runs through the spreader S.

The expanding-valve V of Fig. 1 is shown enlarged in Fig. 7. The contents of the valve V and of the groove in nozzle *n* can be paraffin or a compound containing paraffin or such other material as will be expanded under the action of heat before becoming fully melted.

The part *j* of the expanding-valve V can be of elastic material and the generated pressure will force the center of the part *j* down into the nozzle slightly, so that when the strut is unsoldered and gives way there will be a movement that will tend to rupture adhesion between the valve and its seat. The strut consists of the supported member 2 and the sup-

porting member 1, grooved as shown in Figs. 3, 4, 5, at the points d, d', and d^2, and soldered along their contacting surfaces and at the points x x'. The members 1 and 2 can be ventilated, as shown, to be the more readily heated. By the arrangement shown a strut of great strength and readily fused is formed with advantages over those heretofore used.

By the employment of a material that will gradually expand by the heat of an incipient fire and gradually generate a pressure against the removable parts, advantages are gained over the use of explosives which act suddenly when the firing-point is reached, when such construction is used as herein shown.

I claim—

1. An automatic sprinkler having a valve covering its outlet, a fusible fastening that embodies a lever mechanism for forcing said valve to its seat, and a confined body of expanding material in the assembled structure of the sprinkler that is adapted to exert a strain upon the moving parts thereof when acted upon by a heat of a lower temperature than that required to release the fusible fastening.

2. An automatic sprinkler having an unobstructed outlet, a valve closing said outlet, a thermally-removable support for said valve, and an expanding body in the assembled structure for exerting pressure against the moving parts that is adapted to be expanded by a less temperature than that which is required to remove the fusible fastening.

3. A sprinkler having its valve held to its seat by a fusible fastening, an expanding body in the structure of the sprinkler that is adapted to produce pressure against the movable parts of the sprinkler at a temperature below that required to discharge the fusible fastening.

4. A sprinkler having a valve held to its seat by a fusible fastening, the said valve comprising an expanding shell, or hollow body having an easily melted and expanding contents and adapted to produce pressure against the fusible fastening when acted upon by a temperature lower than that required to discharge the fusible fastening when the same is new; the said contents of the valve being inert in its unmelted state.

5. A sprinkler having a valve covering its outlet, a fusible fastening supporting the valve, and a confined body of material within the structure that is adapted to expand at a temperature less than that which is required to discharge the fusible fastening and to exert a not-previously-present pressure against the removable parts of the device.

6. An automatic sprinkler having its outlet normally closed by a two-part valve, a fusible expanding substance within said valve and a fusible support for holding said valve to its seat.

7. A sprinkler having its valve held to its seat by a fusible fastening that comprises a lever mechanism, a thermally-expansible member adapted to be put in operation by a temperature less than that required to melt the fusible fastening, the said expansible member being adapted to remain inert until acted upon by the heat of an incipient fire, and which will, in its normal operation, generate a pressure against the removable parts of the device.

8. A sprinkler having its outlet held normally closed by a valve that is secured by a fusible fastening, a confined thermally-expansible body in the structure adapted to remain inert and passive until acted upon by the heat of an incipient fire, and in its normal operation to generate a pressure against the removable parts of the sprinkler at a less temperature than is required to melt the fusible fastening.

9. A sprinkler having a valve normally closing its outlet that is held to its seat by a fusible fastening, a thermally-expanded material in operative relation to the said valve that is adapted to gradually expand when subjected to abnormal temperatures and to generate a pressure for giving a thrust to the valve and support, substantially as set forth.

10. A sprinkler having a motor-like valvular device normally closing its outlet which has a contents of material that is inert at ordinary tempertures and that is adapted to gradually generate pressure against the movable parts of the sprinkler at a predetermined temperature in contradistinction to an explosion, and a fusible supporting member in operative relation to said valvular device.

11. A sprinkler having its outlet held closed by a valvular device which comprises a thermomotor, and a fusible member in operative relation to the said thermomotor.

12. A sprinkler having its outlet held closed by a valvular device that comprises an elastic member adapted to give a thrust to the released fusible devices, a gradually-expanding contents in said valvular device, a receptacle for a thermally-expanded material in the structure that is adapted to forcibly lift and dislodge the valve from its seat, and a fusible support in operative relation to the said valvular device.

13. A sprinkler having an outlet normally closed by a valvular device comprising a fusible contents that, in its normal operation gradually generates a pressure against the removable members of the sprinkler when subjected to heat, and a fusible support for said valvular device that comprises a supporting member and a supported member in such relation to each other as to involve leverage in the fusible support for lessening the strain upon the solder; the whole arranged and operating substantially as described.

14. A sprinkler having its outlet held normally closed by a gradually-operated thermal motor, and a fusible member in operative relation to said thermally-actuated motor.

15. An automatic fire-extinguisher having a valve and a valve-seat, one of said members having a flexible bearing, and means for releasing the valve and giving the said flexible bearing an inward movement to buckle the same.

16. An automatic fire-extinguisher having a valve and valve-seat, one of said members having a flexible bearing and means for giving said flexible bearing an inward movement to buckle the same.

17. An automatic fire-extinguisher having a valve and valve-seat, one of said members having a flexible bearing, and means for giving the said flexible bearing an inward movement to buckle the same when the valve is released.

18. An automatic fire-extinguisher having a valve and valve-seat, one of said members having a flexible bearing, means for releasing the valve and means for giving the said flexible bearing an inward movement to buckle the same when the valve is released.

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Witnesses:
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