(No Model.)

T. HOLMES.

AUTOMATIC SPRINKLER.

No. 495,337. Patented Apr. 11, 1893.

Fig. 1.

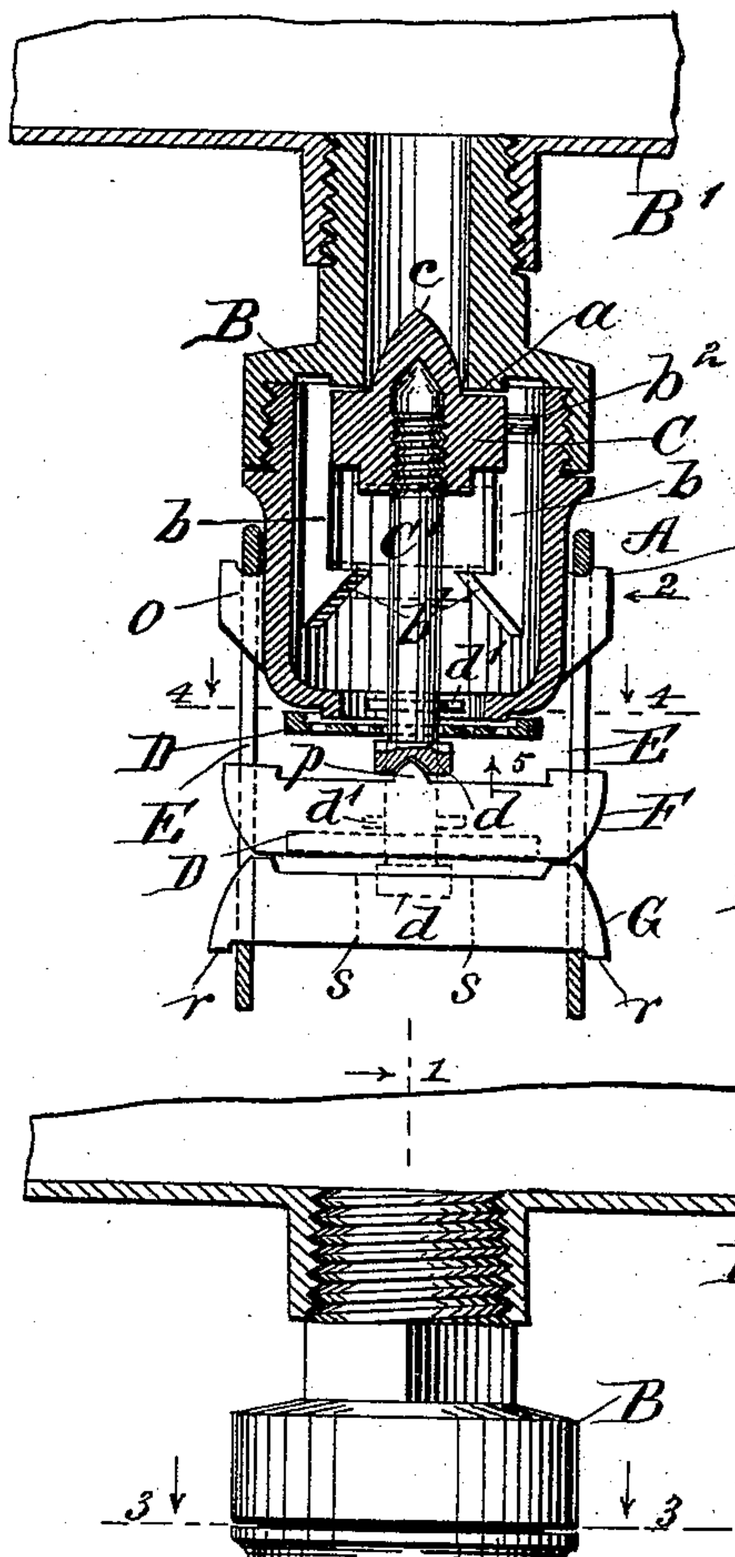


Fig. 8.

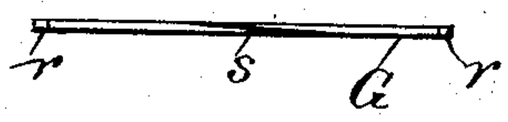


Fig. 2.

Fig. 4.

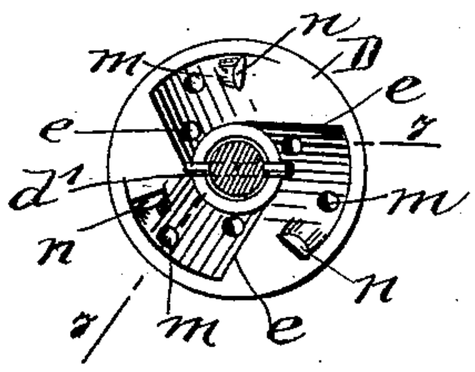


Fig. 5.

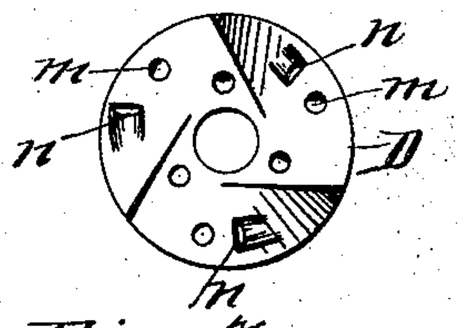


Fig. 6.

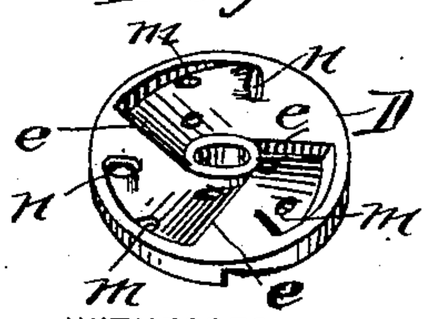


Fig. 7.

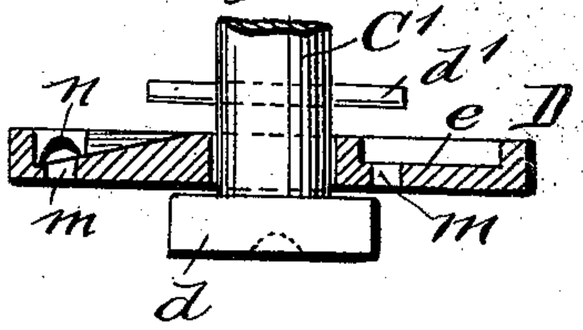
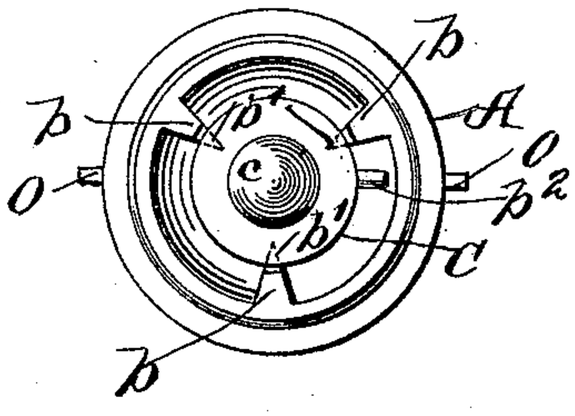


Fig. 3.



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THOMAS HOLMES, OF CHICAGO, ILLINOIS.

AUTOMATIC SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 495,337, dated April 11, 1893.

Application filed October 20, 1892. Serial No. 449,486. (No model.)

To all whom it may concern:

Be it known that I, THOMAS HOLMES, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Automatic Sprinkler, of which the following is a full, clear, and exact description.

This invention relates to improvements in a class of sprinkling devices employed to extinguish fires in a building, by distributing water from an elevated point in a room where fire exists, upon all objects below the sprinkler, and has for its object to provide a novel sprinkler which is adapted for adjustment to discharge water jets, by abnormal heat in a room wherein the device is located, and attached to a water supply under pressure.

A further object is to produce an automatic sprinkler of novel and simple form, that will be set to discharge water jets under pressure, when flame or heat surrounds it which is sufficient to melt fusible metal, and which in operation will spray water laterally and in all directions below it, by a rapid rotation of one of its parts, due to water pressure.

To these ends my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional view of the improvement, on the line 1—1 in Fig. 2. Fig. 2 is a side view of the novel device, opposite the arrow 2, in Fig. 1. Fig. 3 is a plan view of the device with parts removed, above the line 3—3 in Fig. 2. Fig. 4 is a plan view detached, of a turbine sprinkling wheel located below the line 4—4 in Fig. 1, and which is a feature of the improvement. Fig. 5 is a reverse plan view of the part shown in the previous figure, or taken opposite the arrow 5, in Fig. 1. Fig. 6 is a perspective view detached, of the novel sprinkling wheel. Fig. 7 is an enlarged angular sectional view of the turbine sprinkling wheel and a broken engaged part, the section being represented by the line 7—7 in Fig. 4; and Fig. 8 is a lower edge view of a coupling bar which is an important feature of the invention.

The improved automatic sprinkler, consists essentially of a cylindrical shell A, that is converged and centrally apertured at its lower end, the upper end portion being externally threaded for the reception of an internally threaded enlargement on the lower end of the cap piece B, that is secured thereby on the shell or water chamber A, with a water-tight joint. Above the part which removably connects with the chamber A, the cap B, is reduced in diameter and externally threaded to adapt it for a secure connection with a water supply pipe or tank B′, show in part in Figs. 1 and 2. The cap piece B, is longitudinally and axially perforated to produce a water passage through it, from the source of water supply to the chamber A, and has a valve seat *a*, formed on the inner top surface of the enlarged lower portion as shown in Fig. 1.

Within the chamber A, three or more vertical guide ribs *b*, are formed, which extend from the upper end of said chamber to near its bottom, and on the lower ends of the ribs inwardly projecting toes *b′*, are produced, forming level shoulders that are in the same horizontal plane when the device is in use. A valve C, is provided that has a conical axial projection *c*, on its upper surface, and a true level radial face at the base of said cone, which face is designed to have a water-tight contact with the valve seat on the cap piece B. The diametrical enlargement of the valve to produce the face mentioned, is so proportioned that its cylindrical body will loosely fit between the ribs *b*, so as to be permitted to slide longitudinally of the chamber A, between the valve seat above and the toes *b′* below, the latter limiting the fall of the valve, and a pin b^2 projects therefrom between the toes of the ribs.

A cylindrical stem C′, is centrally screwed to the valve head C by its threaded upper end, and projects below it of a length that will locate the lower end portion of the stem outside of the chamber A, it extending through the aperture in the bottom wall of the latter, to receive a disk-like turbine water sprinkler D. The part D is shown plainly in the detached Figs. 4, 5, 6 and 7, consisting of a circular plate of proper thickness and diameter, centrally perforated to fit loosely upon the stem

C′, whereon it is sustained free to rotate by the head-like enlargement *d*, of the stem, which forms its lower terminal, and limited in its upward movement on said stem by cross pin *d′* in the stem near the top face of the disk. The upper surface of the turbine disk D, is radially excavated from points near the central perforation, to others near its edge, said depressions being all sloped laterally in the same direction, thereby producing the radial shoulders or water abutment walls *e*, shown plainly in Figs. 6 and 7.

Any suitable number of spray perforations *m*, are formed in the disk body D, and are adapted to throw water jets in different directions when the disk is rotated, some of the perforations being diagonally produced as at *n*, in Figs. 6 and 7, these latter mentioned perforations being so inclined to the plane of rotation as to throw streams of water downwardly and rearwardly away from the shoulders or abutment walls *e*, so as to assist in producing a rapid rotary movement of the disk when water under pressure is made to engage the top face of the latter.

Two lugs O, are oppositely formed on the outer side of the chamber A, for the loose support of two pendent links E, which are slotted longitudinally at their transverse centers for a proper length, leaving integral portions near each end of each link, as indicated in Fig. 1.

There is a cupped cavity centrally formed in the lower side of the head on the valve stem C′, wherein the teat *p*, that projects from the upper edge of the saddle bar F, loosely seats when the parts are assembled. The bar F, is of such a thickness and length as will allow its end portions to pass loosely through the slots in the pendent links E, and project slightly beyond their outer sides, these ends being curved from top edge to bottom edge so as to prevent the latter named edge from engaging the bottom of the slots in the links if the saddle bar is slid downwardly and the links are in parallel perpendicular planes.

Below the saddle bar F, a coupling bar G, is placed; which latter has its body made of a thickness which will permit it to freely pass at the ends within the slots of the links E, and the ends are curve cut from the top edge to the bottom edge, so as to throw the points of bearing between the saddle bar and coupling bar, near the inner faces of the pendent links. Hook-like projections or lips *r*, are formed on the lower edge of the coupling bar G, at its ends, which lips are adapted to lock over the outer faces of the pendent links E, when the coupling bar is introduced within the link slots, and its longest or lower portion extends through said links as shown in Fig. 1, the lower edge of the piece G, resting upon the lower terminal of the slots in the links to form a base for the saddle bar F.

The coupling bar G, may be made entirely of fusible metal, but by preference is composed of two pieces of brass or other metal that is not melted at a low temperature and which are lap folded between the ends as represented at S in Fig. 8, the lapped parts being also defined by dotted lines in Fig. 1. Where the parts of the coupling bar have contact a solder joint is produced of a metal which will fuse at a temperature below that of boiling water, many well known fusible alloys that will form a solder being adapted for the purpose.

It will be seen, that when the several parts of the device are arranged as has been explained, the valve stem C′, may be adjusted longitudinally, so that there will be a watertight joint effected between the valve C and cap piece B, and also render the connection of the pendent links E, saddle bar F, and coupling bar G, stable, by means of its enforced contact with the teat *p* on the saddle bar.

Any desired number of the improved sprinkling devices may be placed on one or more water supply pipes in a room to be protected from fire, and the water pressure introduced within the cap pieces B of said devices, the valve C, preventing its entrance into the chamber A, below said valve while the parts remain intact.

When an open destructive fire is started from any cause in the room having the automatic sprinklers arranged in it as stated, the increase of temperature in the upper portion of the room, will soon reach a degree that will melt the solder joint S which holds the two pieces of the coupling bar G together; and as the saddle bar sustains the pressure of water in the supply pipe B′, and furthermore is adapted to have a wedging action outwardly upon the top edge of the coupling bar, it will be evident that as soon as the latter is separated into two pieces, the saddle bar will slide downwardly, and push the pendent links E, outwardly, thus causing the complete displacement of the parts of the coupling bar, and allowing the valve C with its depending stem C′ and turbine disk D, to fall until the valve rests on the toes *b′*, of the ribs *b*. As a free flow of water through the chamber A, results from the lowered adjustment of the valve C, the force of the water escaping below, will cause a rapid rotation of the turbine disk D, on which it will impinge, and as the latter named part is numerously perforated and adapted by its formation to rotate under water pressure, it will be apparent that a copious and wide spread spraying distribution of water will result throughout a room that is provided with the novel sprinkling apparatus, and in which heat of abnormal degree due to conflagration is evolved.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automatic sprinkler, the combination with a water chamber having an open lower end and provided with guide ribs having inwardly projecting toes, of a valve mounted in the chamber, a valve stem secured to the valve and projecting through the lower

end of the chamber, a sprinkler secured to the lower end of the stem, slotted pendent links on opposite sides of the chamber, a coupling bar having its ends projecting through the links and movable by abnormal heat, and a saddle bar above the coupling bar and upon which the valve stem rests, substantially as described.

2. In an automatic sprinkler, the combination with a water chamber, a valve therein, a stem secured to the valve and projecting through the chamber, and a sprinkler on the end of the stem, of slotted links pendent on opposite sides of the chamber, a coupling bar having its ends projecting through the links and movable by abnormal heat, and a saddle bar above the coupling bar and having its ends rounded from top to bottom and projecting into the slotted links, substantially as and for the purpose set forth.

3. In an automatic sprinkler, the combination with a chamber provided with lugs on opposite sides, a valve in the chamber and provided with a stem projecting through one end of the same, and a sprinkler on the end of the stem, of slotted links suspended from the lugs of the chamber, a coupling bar having its ends curved and projecting into the links and provided with lips on its lower edge, and a saddle bar above the coupling bar and having curved ends projecting into the links and provided with a teat on its upper edge with which the valve stem engages, substantially as described.

4. In an automatic sprinkler, the combination with a cylindrical water chamber having spaced ribs therein and inwardly-projecting toes on said ribs, a cap piece attachable to the top of the chamber and also to a water supply above, a valve seat within the upper end of the cap piece, an upwardly-closing valve loosely engaging the guide ribs and having a depending stem screw-connected to the valve center, and a perforated and turbine-formed disk held to rotate on the projected lower end of the valve stem, of slotted links hung from opposite lugs on the water chamber, a transverse saddle bar loosely engaged with the valve stem and also with the slotted links, and a coupling bar below the saddle bar, engaging at its ends with the slotted links and removable by abnormal heat, substantially as described.

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