

(No Model.)

2 Sheets—Sheet 1.

F. G. JAHN.
AUTOMATIC SPRINKLER HEAD.

No. 461,634.

Patented Oct. 20, 1891.

Fig. 1

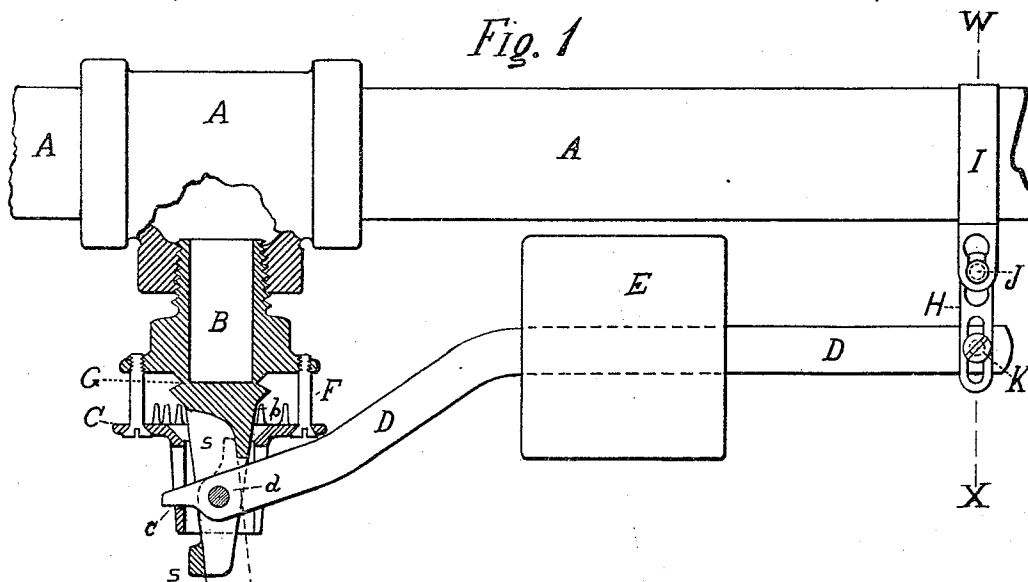


Fig. 2

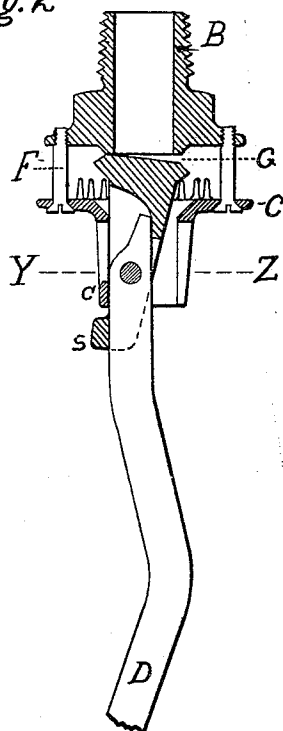
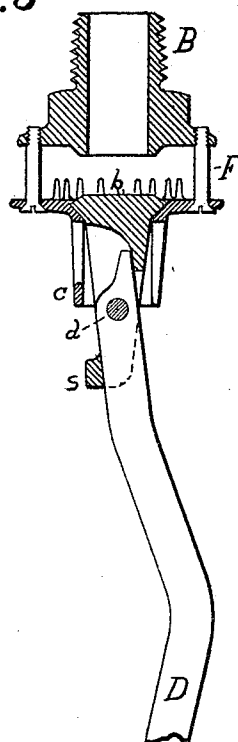


Fig. 3



Witnesses:

William B Riddle
Felix Kirchner.

Inventor:

Frederick George Jahn

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Fig. 4

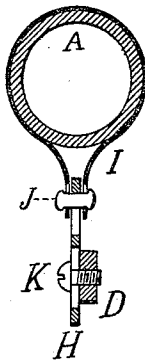


Fig. 5

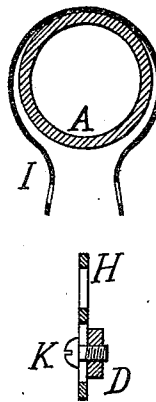


Fig. 7

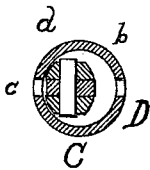
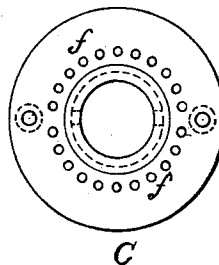


Fig. 6



Witnesses:
Albrecht Jahn
Emil Jahn.

Inventor:
Frederick G. Jahn.

UNITED STATES PATENT OFFICE.

FREDERICK GEORGE JAHN, OF NEW YORK, N. Y.

AUTOMATIC SPRINKLER-HEAD.

SPECIFICATION forming part of Letters Patent No. 461,634, dated October 20, 1891.

Application filed April 29, 1889. Serial No. 308,989. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK GEORGE JAHN, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Improvement in Automatic Sprinkler-Heads, of which the following is a specification.

My invention relates to automatic sprinkler heads or valves used in connection with a system of pipes and a water-supply for extinguishing fires, said heads or valves being brought into operation at a certain degree of heat by the parting of a joint or link secured by an alloy melting at the desired temperature.

The automatic sprinklers heretofore used consist of a perforated plug or valve-body, the opening being closed by a valve or stopper and the joints rendered tight either by grinding the valve to its seat or by the use of padding. The valve is held to its seat by a lever or system of levers, which is secured through the medium of fusible alloy or solder to a frame forming part of or attached to the plug or valve-body. When the alloy melts, the valve is released and the sprinkler operates. In order to throw off the lever after the melting of the alloy and release the valve, either a spring is used or the natural elasticity of the metal is made to serve. When the valve opens, the issuing fluid strikes a distributing plate or disk, which distributes it in the form of spray. The said distributor is generally attached to or supported by the frame of the sprinkler, and consists of a plate or disk provided with elevations, depressions, perforations, and sometimes with a raised, perforated, or serrated rim.

With the exception of the distributing-plate, my sprinkler is constructed on an entirely different principle from those now in use, and a number of faults to which the latter are subject are avoided in my invention.

The objections to the sprinklers heretofore used are the liability to leakage between the valve and its seat, the breaking or giving way of the fusible alloy under the continual strain, the risk of the valve sticking fast in consequence of corrosion or the weakening of the spring, and the liability to accidental opening or disarrangement from external causes.

The object of my invention is to prevent leakage from the sprinkler-head, decrease the strain on the fusible alloy, and, while making sure of a quick and positive discharge in case of fire, provide against accidental release or disarrangement. This I attain by doing away with a joint in the valve altogether, making the valve-body and valve of one piece, which is broken when the valve is required to open at the proper place by the inertia of a weight or weighted lever released by the melting of the fusible alloy. In order to cause the piece to separate at the desired point, there is a deep sharp groove or notch cut in, weakening thus the cross-section at that place and enabling the sudden blow of the falling weight or lever to readily part the metal where desired. The broken-off piece, which has the weighted lever then hanging to it, drops downward a short distance, thus opening the valve. The water or liquid issuing from the aperture strikes the distributing-plate below and is dispersed in the form of spray. By the use of a weight the necessity of relying on the uncertain action of a long compressed or strained spring, as in other sprinkler-heads, is avoided. At the same time the strain on the fusible alloy in my device is reduced to a minimum, which is of great importance, as the alloys of a low melting-point used for this purpose are very brittle and have little strength.

In the accompanying drawings, Figure 1 represents the device as connected with a system of piping, part being shown in cross-section. Figs. 2 and 3 are cross-sections showing in two successive stages the relative position of the different parts after release. Fig. 4 is a transverse section on the line W X, Fig. 1, representing the releasing device when in its normal state. Fig. 5 is a section at the same place after the melting of the fusible alloy, showing the weighted lever released. Fig. 6 is a plan view of the upper surface of the distributing-plate; and Fig. 7 is a horizontal sectional view on the line Y Z, Fig. 2.

The main part of the device is the valve-body B with its extension or valve part b. This body B is made with a screw-thread on its upper part, and in Fig. 1 is shown inserted in a fitting forming part of a system of pipes

connected with a water-supply. A hole, tube-like part, or cylindrical cavity extends down in said body B, the part *b* being a cover for said part or hole, the bottom of the hole being in
 5 about the same horizontal plane as the deepest part of the annular groove or cut G on the outside. The said groove is cut in so deep that the metal at its smallest section is still
 10 strong enough to stand any pressure that the sprinkler is liable to be subjected to from the interior. At the same time the sharp cut so weakens the metal at that point that a sudden blow will cause a fracture. To the part
 15 or cover *b* is or may be hinged by the pivot-pin *d* the lever D. The outer end of this lever is supported from the pipe by the fusible joint, as will be subsequently described, and the short end rests upon a fulcrum *c*, forming
 20 part of the distributor-plate C. The plate C is attached to the body B by two screws F F, and while its upper surface is for the purpose of distributing the water or liquid in the form of spray its lower part (shown in horizontal section in Fig. 7) forms a support and
 25 guide for the lever D. The two slots on opposite sides prevent any lateral displacement of said lever, and owing to the support at *c* there is no possibility of a break at G in consequence of pressure within or without as long
 30 as the arm or lever D is sustained at its outer end. The support for the lever preferably consists of the band I, surrounding the pipe A, the pin or rivet J, and the link H, which is secured to the end of the lever D by the screw
 35 K. A slot in the link H permits adjustment up and down. The object of this is to facilitate the insertion of the pin J into the button-hole-like slots in the ends of the strip I and the link A. The band I is bent to a
 40 shape, as shown in Fig. 5, and placed over the pipe. When the pin J is inserted, the ends of the band I will be held, after being sprung together, by the heads on said pin J. After adjusting the link H and tightening the
 45 screw K the parts will have the relative position shown in Fig. 4. The pin or rivet J is made of an alloy melting at the temperature at which the valve is desired to act. When
 50 this degree is reached, the said pin J melts, and, as shown in Fig. 5, the ends of the band I spring apart, while the link H, and consequently the lever D, is released, permitting the latter to swing downward. On said lever
 55 D is placed a weight E, which preferably can slide freely on the lever. As represented in Fig. 1, it is placed at some distance away from the end of the lever D. The object of this is to reduce the pull or strain on the fusible pin J as much as possible. When, however, the
 60 latter melts and the released lever swings downward, the weight E naturally slides toward the end of said lever until arrested by the projection or the lever formed by the above-described link H and screw K or otherwise. The lever D, together with the weight
 65 E, swings downward with increasing velocity. When in the position represented by the dot-

ted lines in Fig. 1, the end pivoted in the part *b* being in contact with the stops *s s*, the motion of the lever D in relation to the part *b* is
 70 suddenly arrested. The weighted lever, however, in consequence of its inertia, continues its motion and the sudden strain or shock causes a break at the weak place G, as shown in Fig. 2. The broken-off part *b*, together with the
 75 weighted lever hanging to it, then drops off and falls downward until stopped by the distributing-plate C. The weighted lever comes to a rest with its center of gravity under the center of support, as shown in Fig. 3, and the
 80 sprinkler operates. The liquid from the pipe issues from the aperture in the body B, left by the breaking away of the cover or part *b*, and falls on the top surface of the part *b*, (that was formerly the bottom of the hole,) and, continuing over the surface of the
 85 distributing-plate C, is broken into spray by the pins *f f*.

Other styles of distributing-plates may obviously be used. Likewise, instead of the releasing device, as above described, other arrangements may be used. Thus, a pair of U-shaped links, soldered together with the fusible alloy and similar to those used in connection with other sprinkler-heads, may serve to
 90 suspend the end of the lever from the pipe instead of the fusible pins; also, instead of using the sprinkler-pipe as a point of suspension for the end of the lever, the latter may be secured to another point—as, for instance, a hook in the ceiling above. By having the
 95 end of the bore or tube in the body B closed by metal integral with the tube or body (as the cover or part *b*) the sprinkler is kept from leaking and fluid can only issue when the cover *b* is broken away. The cover *b* can be
 100 cast integral with the metal of the sprinkler-head.

It will be understood that when I use the word "cover" I mean the part that closes the opening in the tube or bore of the sprinkler-head through which the fluid escapes.

I claim—

1. A tube or the like having a cover at one part composed of material that is integral with the material of said tube, said cover being adapted to be automatically detached from the tube by drawing it outward and away from the tube, combined with means, substantially as described, for detaching the
 115 cover from the tube, substantially as described.

2. A tube or the like having a cover at one part composed of material that is integral therewith, combined with a weight connected with said cover for detaching said cover from the tube automatically by drawing it outward and with connections between said cover and weight to connect them, substantially as described.

3. A tube or the like having a cover at one part that is integral with the material of the tube, combined with a weight connected with said cover and a fusible support or connection
 130

for holding said weight suspended, whereby when the weight is released it will break the cover from its tube, substantially as described.

5 4. A tube or the like having a cover at one part that is integral with the material of the tube, combined with a lever connected to said cover and with a weight carried by and adapted to slide on said lever, substantially as described.

10 5. A tube or the like having a groove to reduce its thickness at one part and a cover or the like to close one part of the tube, combined with a weight connected with said tube to break the tube at said groove, substan-
15 tially as described.

6. A sprinkler-head having a fluid passage or bore whose end is closed by material integral therewith and an annular groove in said bore, combined with a distributor-plate beneath said bore and a weight connected to said closed end of said bore, whereby the material closing the end of the bore will be broken away from the bore by the falling of the weight and will be caught by and rest upon the distributor-plate, substantially as described.

FREDERICK GEORGE JAHN.

Witnesses:

WILLIAM B. RIDDLE,
FELIX KIRCHNER.