

(No Model.)

W. S. GRAY.

SPRINKLER HEAD FOR AUTOMATIC FIRE EXTINGUISHING APPARATUS.

No. 514,220.

Patented Feb. 6, 1894.

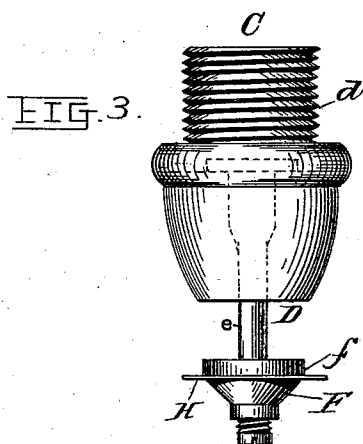
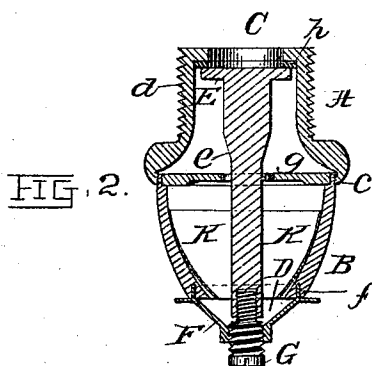
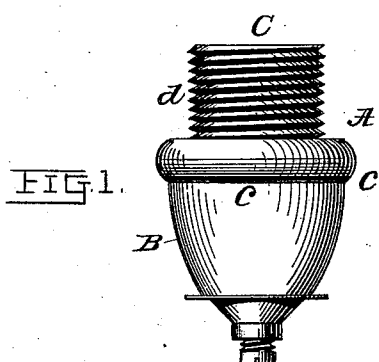
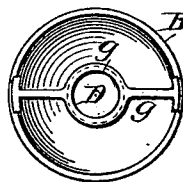


FIG. 4.



WITNESSES:

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SPRINKLER-HEAD FOR AUTOMATIC FIRE-EXTINGUISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 514,220, dated February 6, 1894.

Application filed August 6, 1892. Serial No. 442,302. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. GRAY, of the city of New York, in the county and State of New York, have invented a new and useful Improvement in Sprinkler-Heads for Automatic Fire-Extinguishing Apparatus, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

10 The object of this invention is to obtain a sprinkler head which shall be more permanently sensitive to rise of temperature, more certain and trustworthy in its action and therefore more efficient and satisfactory in practice.

The form of the device by which I have carried out my invention will now be described.

15 In the accompanying drawings Figure 1 shows the device in elevation, complete and closed, ready to be screwed to the extinguishing pipe. Fig 2, shows a vertical section through Fig. 1. Fig. 3, shows the device open, or with its deflector down, in position to distribute the extinguishing fluid. Fig. 4 is a view in plan of the interior of one part of the device detached from the other parts.

In said figures the several parts are indicated by reference letters as follows:

20 The letters A and B indicate, respectively, the two portions of the shell of the device into which it is divided, which parts are preferably united first by screw threads at *c*, and then further permanently secured together, at said point, by solder fusible only at a high temperature. The two parts A and B, are provided with holes or orifices at C and D, which orifices are closed respectively by the valve E and plug or cap F, in the following manner: The valve E has a long stem *e*, 35 tapped out at its end to receive a small screw G, provided with differential threads, the threads of finer pitch screwing into the valve stem *e* and the threads of a coarser pitch screwing into the plug F, tapped out to receive said threads. The plug F is provided with a short sleeve *f*, which projects into a recess, formed to receive it, in the part of the shell B, surrounding the orifice D. Said plug is also provided with a plate or disk H, of

suitable diameter to act as a deflector or distributor of the extinguishing water. The form of said deflector may be varied at will. Instead of being a flat disk, it may be corrugated, perforated, or otherwise, its shape not being a part of this invention. Across the interior of the device, near where the two parts A and B unite is inserted a perforated bar or guide *g* for the valve E and its stem *e*. The location of this bar limits the fall of the valve E, when opened. Within the part B is a bushing K, by which the diameter of the hole D, may be regulated readily by a change of the bushing.

The method of closing the sprinkler, and its method of automatic action will now be described.

With the parts constructed as above described, the stem of the valve E is first inserted through the hole in the bar *g*, when the valve E will rest on said bar, if the part B be held in a vertical position. The parts A and B, may then be screwed together by the threads *c*, as before described. The screw G may then be screwed into the plug F and entered also into the valve stem *e*, when the plug F may be pushed far enough for its sleeve *f*, to enter the recess formed for it in the part B, as shown in Fig. 2, said recess and said sleeve having been previously respectively, filled in and coated with solder fusible at a low temperature so that the parts being heated enough to soften the solder will firmly cohere and stick together as soon as the metal, preferably brass, shall become cool. Instead of the plug F, projecting into the shell B, a groove in the plug may receive the end of the shell and the parts be soldered together in said groove or recess. The screw G being then farther screwed in will sufficiently lengthen the valve stem *e*, to cause the valve E to press tightly against its seat around the hole C, and make a water tight joint at said point. Any suitable material may be used to form an inserted seat *h*, as may be desired—such as a non-corrosive metal or other durable and suitable material. The bushing K, may be of thin metal either sprung into place or permanently fastened as may be desired, and the part of the shell A,

provided with screw threads *d*, is preferably made of cast metal, the part B being preferably struck up of sheet metal, but may also be cast if desired.

5 It can now be readily seen that upon the out-break of a fire, where this sprinkler head may be used, that the solder holding the plug F to the part B, will fuse at the low temperature of the incipient fire which fusing of the
10 solder will cause the valve E to open under the pressure of the water on its face, and the valve will be forced against the bar *g*. The water passing all around the valve E will then pour out of the orifice D, and, distributed or
15 sprayed by the deflector H, will be showered upon a certain area of surrounding space and upon any fire that may be within such space.

Great difficulty has heretofore been experienced in keeping the operating parts of
20 sprinkler-heads free from dust and impurities floating in the air, which clog up the orifices for the escape of water, as well as the operating parts, and render the solder less sensitive to rise of temperature. These difficulties are obviated by hermetically closing
25 the shell of the sprinkler-head as herein described, thus preventing dust from entering the sprinkler-head, as well as preventing the escape of water or compressed air, contained
30 in the pipes to which the sprinkler is attached, should there be any leakage around the valve. The shell proper is made into the two parts A and B independently of the third part, the valve-closing and deflecting-plug F, not only
35 in order that the one part may be made of struck-up metal instead of cast, but in order that the valve E, its stem *e* and supporting bar *g*, may be placed in proper position before the two parts A and B are secured together, for, the diameter of the valve being
40 greater than that of the hole for its stem through the bar and also greater than that through the valve-seat, such construction will enable all the parts to meet in place or proper
45 position for final adjustment before the plug, or third part, F, is soldered in place with solder fusible at low temperature. It will be evident that this two-part construction permits of the bar *g* being located in either of
50 the parts A and B. It will be observed that the hole in the bar *g*, may be made considerably larger in diameter than the diameter of the valve-stem *e*, though smaller than the diameter of the valve E. There is an advantage in this construction, namely, that when
55 the extinguisher is discharged and the water impinges upon the deflecting-plug F, at the bottom of the valve stem *e*, the impact of the water causes said deflecting-plug to "wobble,"
60 which plug may be made of any suitable shape or corrugation to assist in the operation. This wobbling or rotation of the stem within its support will increase the scattering or spraying of the water and cause the water to be dispersed over a considerably larger area of space
65 than if no such "wobbling" were produced.

The advantage of having a sleeve or annular tongue *f*, soldered within a groove (said tongue and groove being either in the plug F or the shell B, respectively, as may be preferred) is
70 that a double surface of metal for the contact of the solder is obtained with but half the lap of metal required if the solder merely united two single surfaces. But this is not the only or principal advantage. Difficulty has always
75 heretofore been met with in the tendency of the soldered surfaces to "creep" or spring apart, due to the unequal contraction and expansion of the solder and the brass under variations of temperature where but a single line of
80 solder united two single surfaces. The tendency in such cases when once elongation or contraction takes place, is always to rupture the solder, and under such to-and-fro motions the solder is liable to, and frequently has in
85 practice, become ruptured or has allowed the valve to spring from its seat. My construction of the sleeve or annular tongue and groove obviates this difficulty and permits contraction and expansion to go on indefinitely without bringing any rupturing or
90 creeping strain upon the solder.

Having thus fully described my invention, I claim—

1. A sprinkler-head for the automatic extinguishment of fire, consisting of a hollow
95 shell formed of a middle part and two end-pieces or parts secured together, the portion comprising one end-part and the middle part containing a valve-seat, a valve and a bar or
100 stop to support the valve when open, the other end-part supporting the valve-stem and secured to the middle part by solder fusible at a low temperature, said three parts forming, together, a closed shell impervious to dust,
105 until the fusion of said solder, when the valve is released and the shell opened for the escape of the extinguishing water, substantially as set forth.

2. A sprinkler-head for the automatic extinguishment of fire having a shell perforated at one end and provided around such
110 perforation with an annular groove, in combination with a plug provided with a tongue or annular projection fitted into said groove
115 and soldered, within said groove, to said shell, for the purposes set forth.

3. A sprinkler-head for the automatic extinguishment of fire, consisting of a hollow shell formed of the following named parts:
120 an end-part and a middle-part secured together and containing a valve-seat, a valve and a bar or stop to support the valve when open, said middle part being also provided with an annular groove; and a deflecting-
125 plug provided with a tongue or annular projection fitting into said groove and soldered, within said groove, to said middle part; said three parts forming, together, a closed shell impervious to dust, substantially as and for
130 the purposes set forth.

4. A sprinkler-head for the automatic ex-

tinguishment of fire, consisting of an end-part and a middle part secured together and containing a valve-seat, a valve, and a bar or stop to support the valve when open; and another end-part forming a deflecting-plug or deflector; said valve being provided with a stem secured to said deflector by means of a bolt

or screw having differential screw-threads; substantially as set forth.

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Witnesses:

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