

(No Model.)

2 Sheets—Sheet 1.

J. HILL.
AUTOMATIC FIRE EXTINGUISHER.

No. 466,414.

Patented Jan. 5, 1892.

Fig. 1.

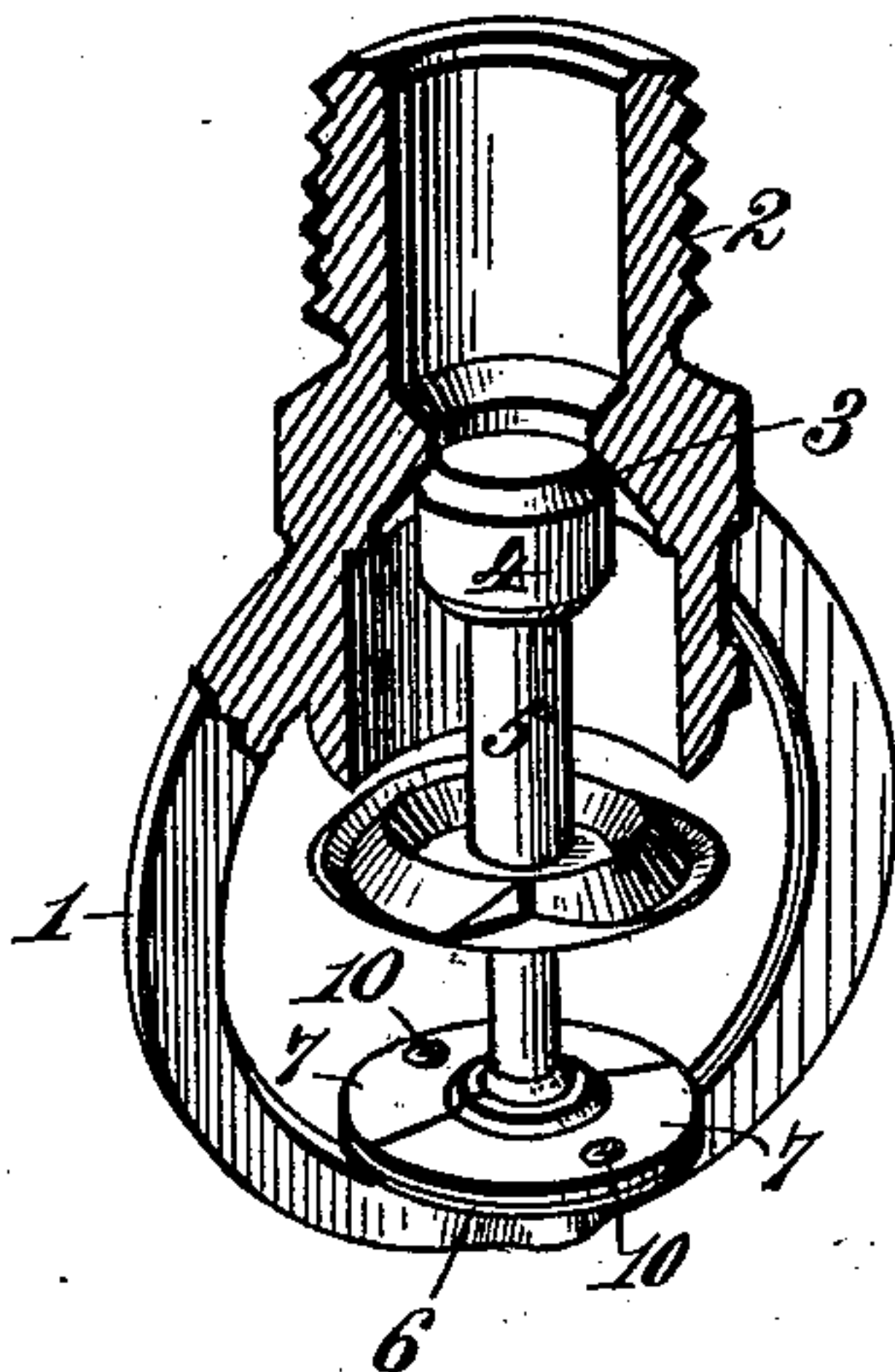


Fig. 2.

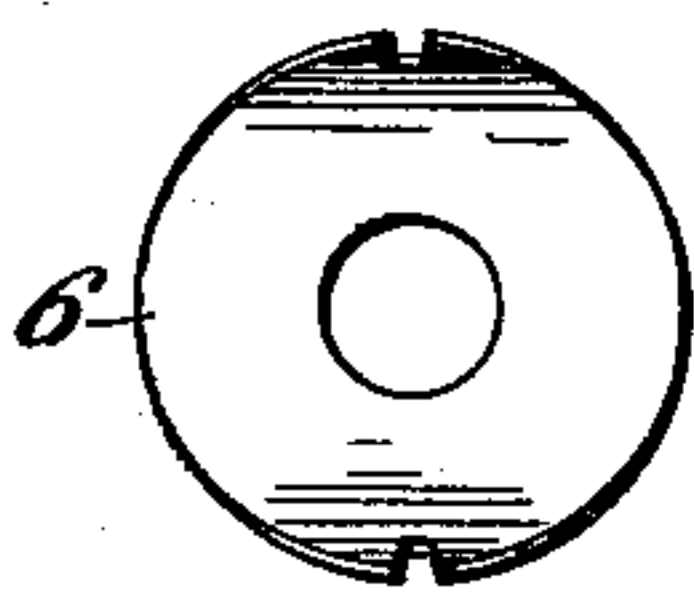


Fig. 3.

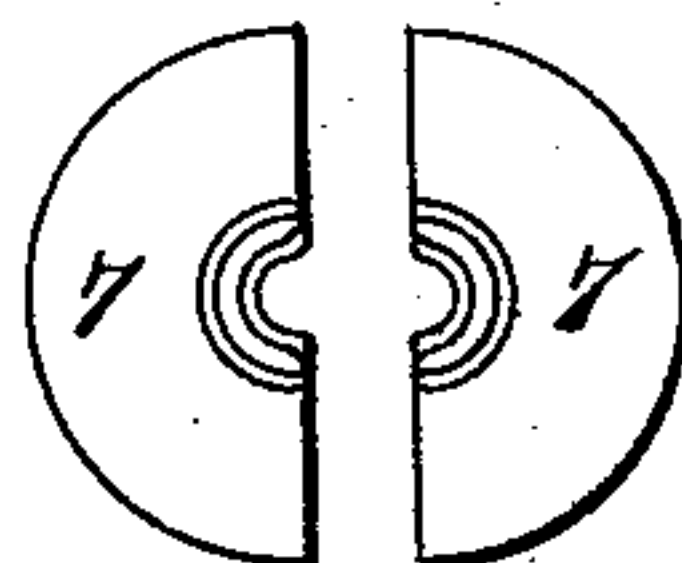


Fig. 4.

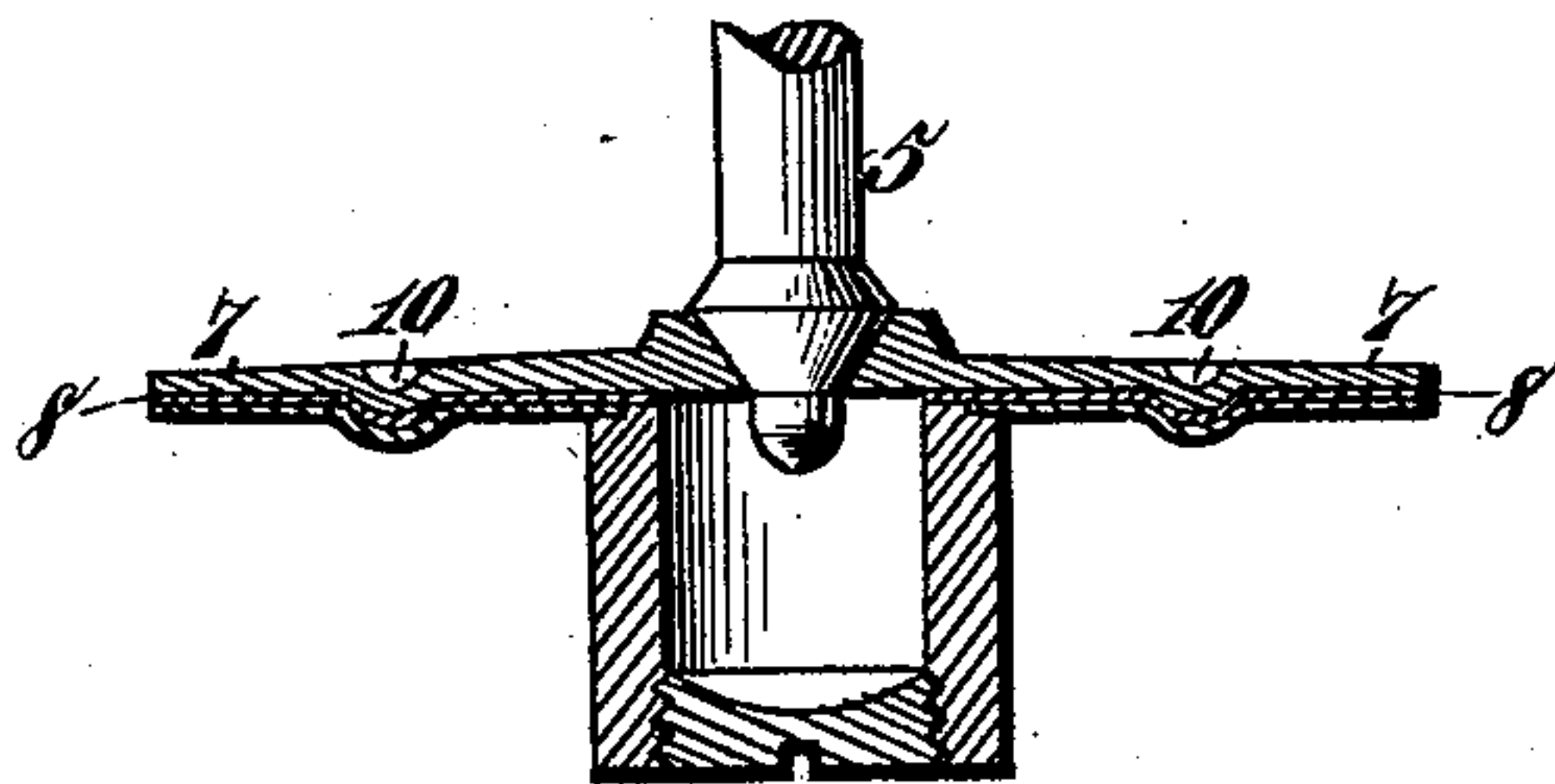


Fig. 6.

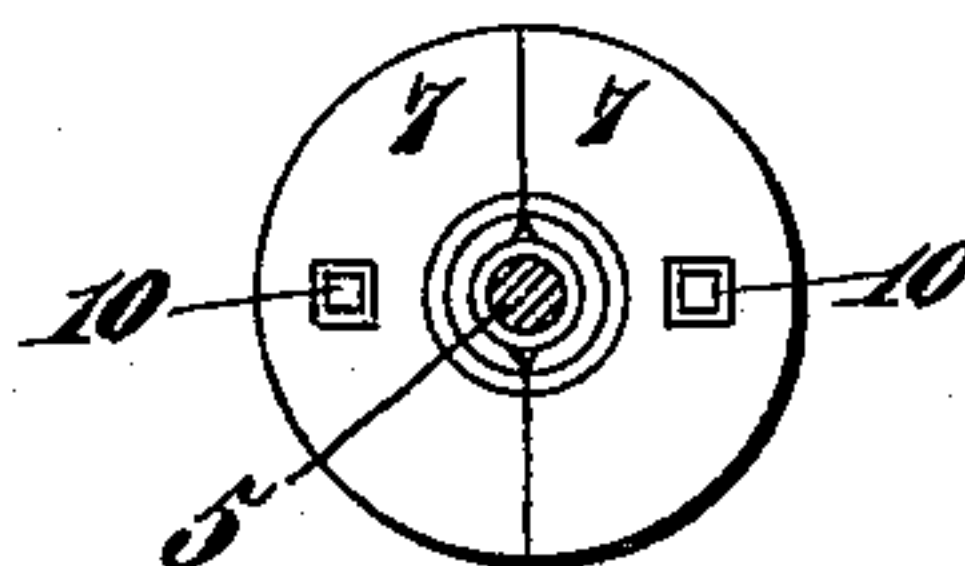


Fig. 7.

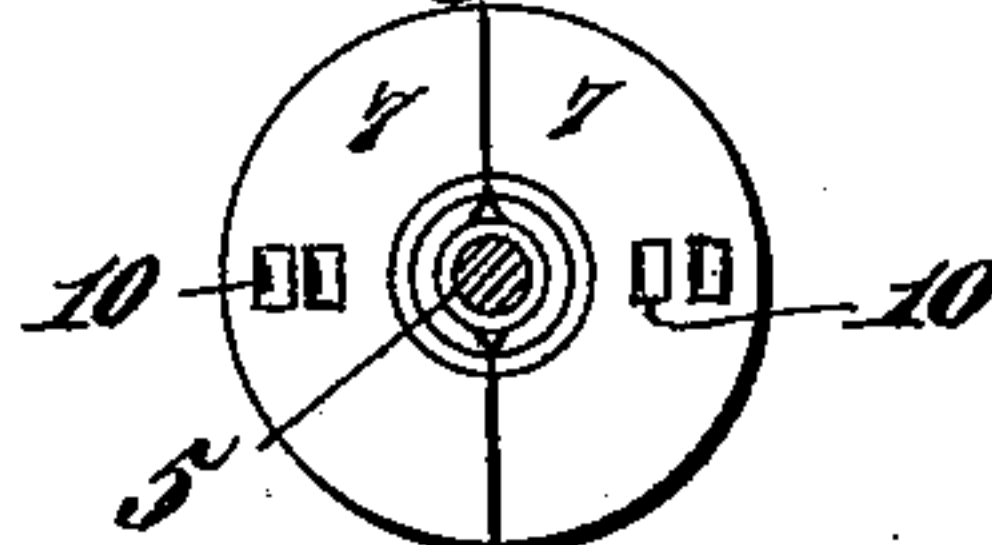


Fig. 8.

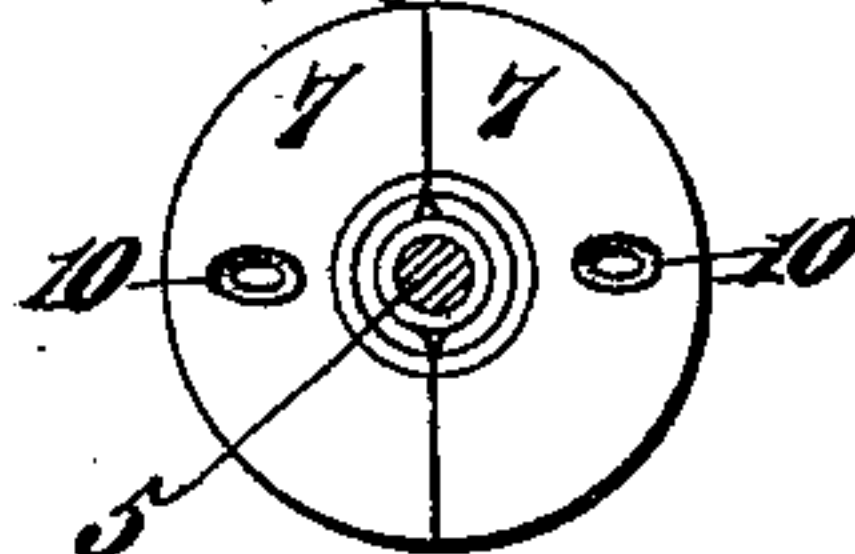
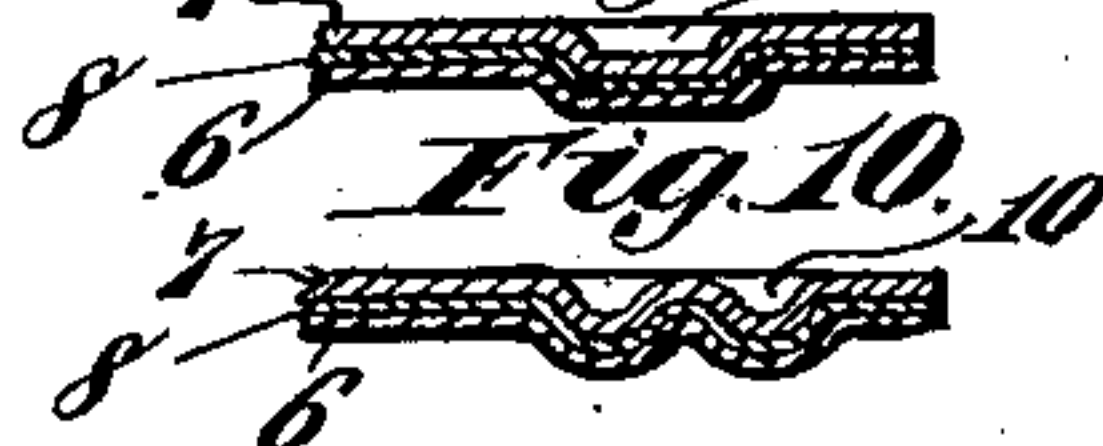


Fig. 9, 10.



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Fig. 11.

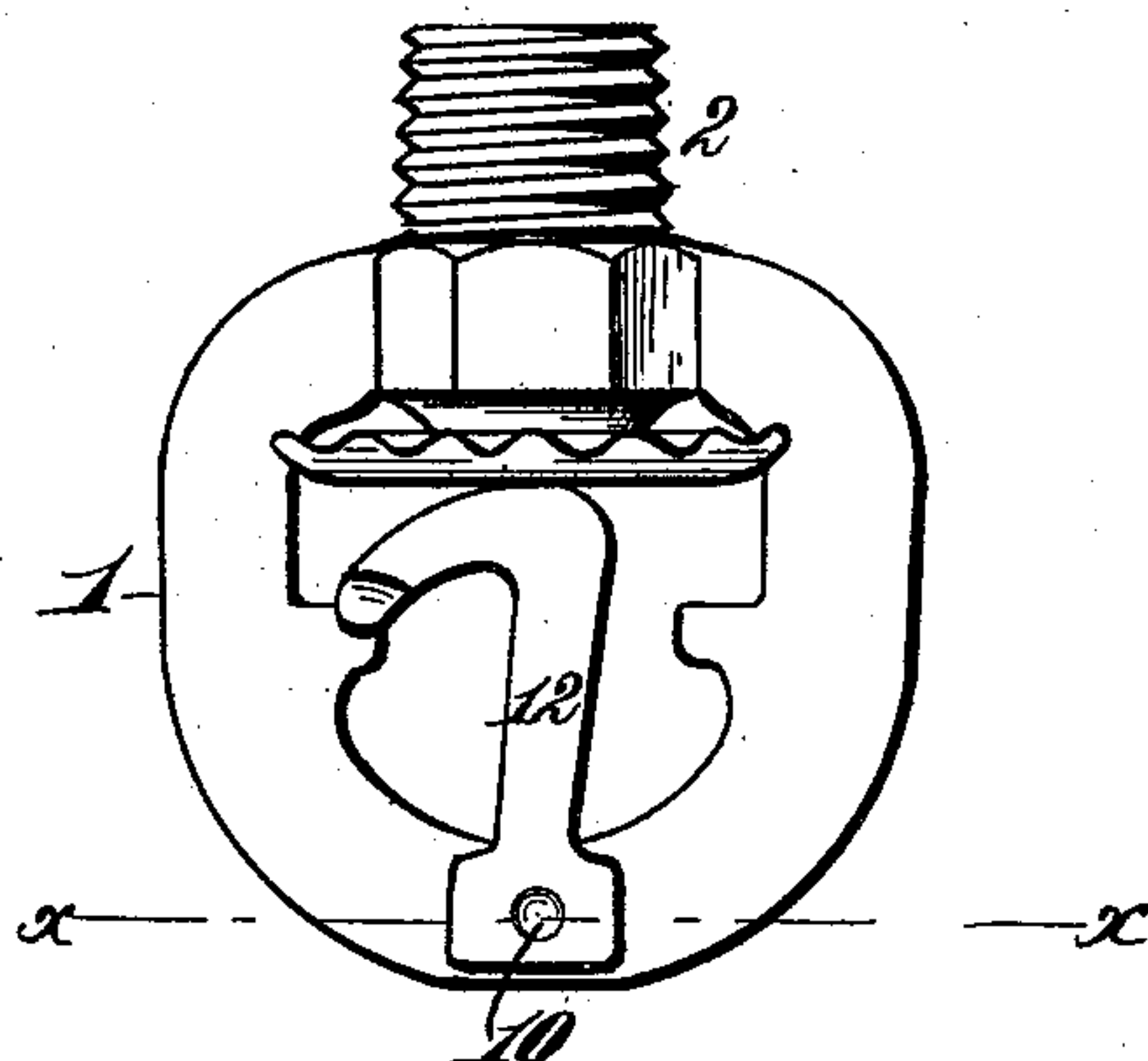


Fig. 12.

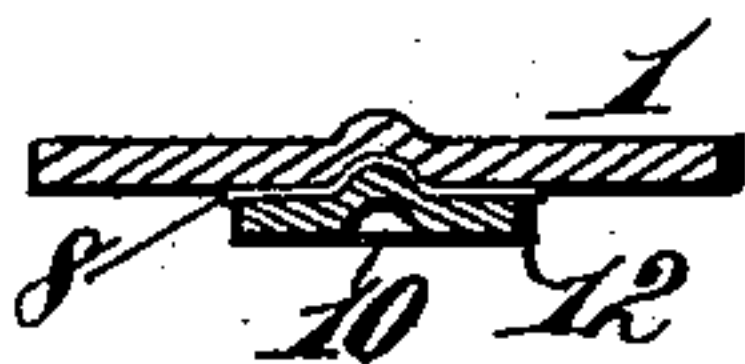


Fig. 13.

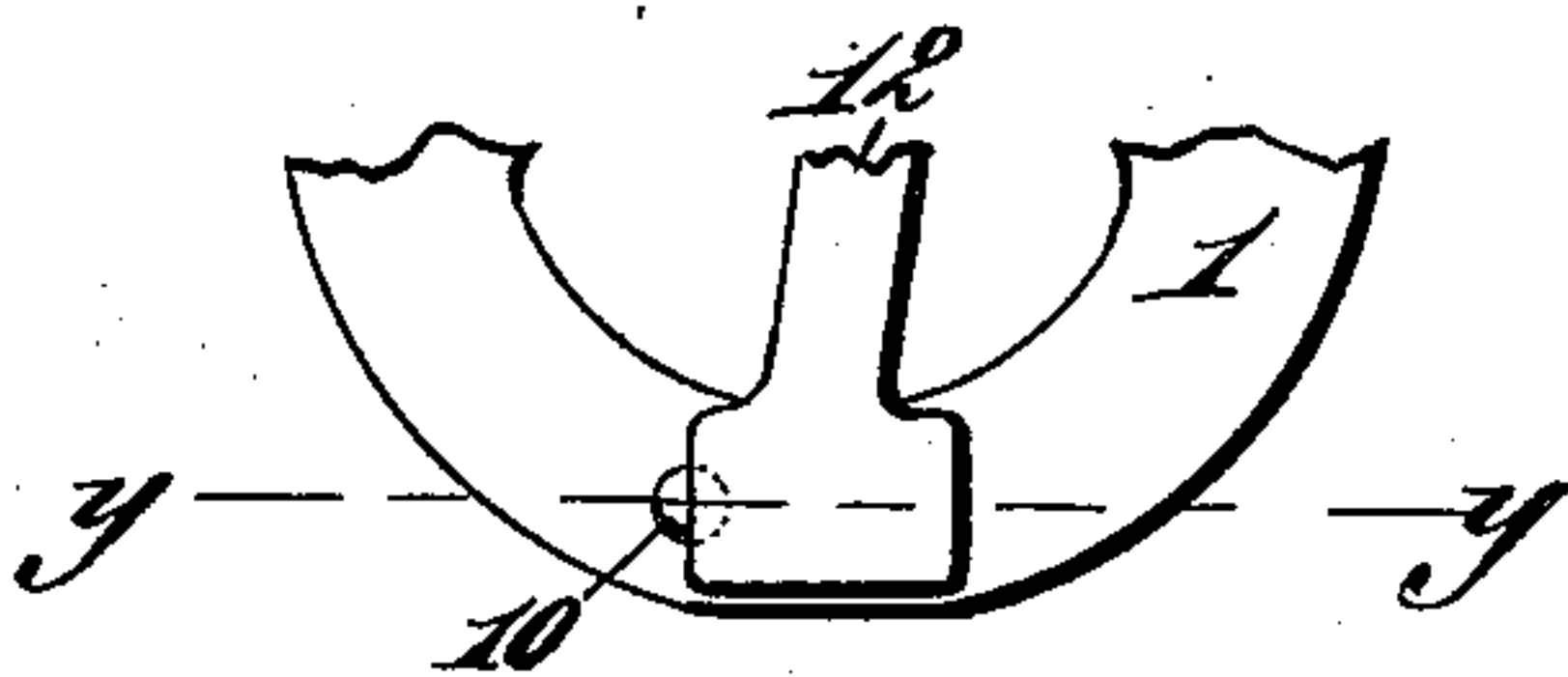


Fig. 14.



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UNITED STATES PATENT OFFICE.

JOHN HILL, OF COLUMBUS, GEORGIA.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 466,414, dated January 5, 1892.

Application filed August 9, 1890. Serial No. 361,548. (No model.)

To all whom it may concern:

Be it known that I, JOHN HILL, a citizen of the United States, residing at Columbus, in the county of Muscogee and State of Georgia, have invented new and useful Improvements in Automatic Fire - Extinguishers, of which the following is a specification.

This invention relates to that type of automatic fire-extinguisher heads or sprinklers wherein a valve is held to its seat by a solder-joint of fusible metal or other material for confining the extinguishing-fluid until such time as the valve is liberated by the fusion of the solder-joint, an example of such automatic fire-extinguisher head or sprinkler being described and shown in Letters Patent No. 329,312, issued to me October 27, 1885. In this type of fire-extinguisher head or sprinkler the valve-support comprises parts soldered together in such manner that when the solder-joint fuses the parts comprising the valve-support give or slide one upon the other with a shear-like action. During the time that the solder-joint is intact and the valve is held to its seat there is a constant shearing strain on the movable part that sustains the valve on its seat, in consequence of which the solder-joint is weakened. It has heretofore been proposed to resist this shearing strain and strengthen the solder-joint by providing the parts comprising the valve-support with interlocking teeth or serrations on the adjacent or contiguous faces, such teeth or serrations also acting to laterally separate the parts of the valve-support when the solder-joint is fused for the purpose of promptly releasing the valve and permitting the escape of the extinguishing-fluid. In all prior constructions, however, the teeth or serrations are first made in the parts comprising the valve-support, and then the toothed or serrated parts are soldered together to sustain the valve and valve-stem, and subsequently the valve is tightened against the solder-joint to accurately seat such valve and close the fluid-delivery orifice of the fire-extinguisher head or sprinkler. This has been found very objectionable, in that a screw-adjusting device must be employed for seating and tightening the valve against the solder-joint after the latter has been formed, for otherwise the valve and solder-joint would not be in correct relative

position for the practical closure of the fluid-delivery orifice and for the practical application of the parts to secure the end in view. In the former constructions the adjustments must be made to accommodate the interlocking engagement of the teeth or serrations; or, in other words, the adjustment must be effected after the teeth are interlocked and after the solder-joint is formed, and this necessitates the employment of a screw-adjusting mechanism to tighten the valve.

The objects of my invention are to avoid the employment of screws or toggles for tightening the valve against a previously-formed solder-joint, to provide novel means whereby the valve is first accurately seated and tightened and subsequently the solder-joint provided and indented to resist the shear strain, and, finally, to provide novel means for strengthening a solder-joint to resist the shear strain of the parts comprising the valve-support, whereby the solder-joint and the interlocking of the parts by depressions or indentations is made to suit the conditions required, after the valve has been accurately seated and tightened, in contradistinction to soldering together the toothed or corrugated parts of the valve-support to sustain the valve and its stem, and subsequently tightening the valve against the solder-joint. These objects are accomplished in the manner and by the means hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional perspective view of a fire-extinguisher head or sprinkler embodying my invention. Fig. 2 is a detail plan view of the stationary part of the valve-support. Fig. 3 is a similar view of the movable part or parts of the valve-support. Fig. 4 is a detail sectional view showing the stationary and movable parts of the valve-support united together in accordance with my invention. Fig. 5 is a top plan view of the same, showing the valve-stem in section. Figs. 6, 7, and 8 are detail views similar to Fig. 5, showing modifications. Figs. 9 and 10 are detail sectional views showing different forms of depressions or indentations in the layer of solder which constitutes the solder-joint. Fig. 11 is a side elevation of a modified construction of fire-extinguisher head or sprinkler em-

bodilying my invention. Fig. 12 is a sectional view of the same, taken on the line xx , Fig. 11. Fig. 13 is a broken view of the lower portion of the yoke or frame, Fig. 11, showing a modification. Fig. 14 is a sectional view taken on the line yy , Fig. 13.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates the yoke or frame of a fire-extinguisher head or sprinkler of the general construction exhibited in my Letters Patent hereinbefore alluded to. This yoke or frame is provided with a screw-threaded neck 2, adapted to be tapped into a pipe or other conductor for conveying the fire-extinguishing fluid, as usual. The neck is provided internally with a valve-seat 3, upon which is seated a valve 4, carried by a stem 5, which may carry a distributor, as usual. The valve-support for the valve comprises a stationary part or platform 6, rigidly attached to or forming a part of the yoke or frame, while the movable part or parts of the valve-support comprises two semicircular sections 7, adapted to be united to the stationary part or platform 6 by a solder-joint 8, composed of a layer of solder of any material suitable for the conditions required.

By the term "solder" I mean any material usually employed in automatic fire-extinguishers which on fusing releases the valve.

In practice the valve is held tightly to the valve-seat by the lower end of the valve-stem, being supported by the movable parts or sections 7, which are united to the stationary part or platform 6 through the medium of the solder-joint. In the continued use of this device the solder is liable to weaken under the continued strain to which it is subjected by the continued elastic tension upon the valve in such manner that the valve may be released at a temperature not intended, or below that at which the solder-joint should release for the discharge of the fire-extinguishing fluid. The wedge action of the lower end of the valve-stem, which lies between the movable parts or sections 7, tends to produce a shear action, by which the two movable parts 7 may be forced laterally on the stationary part or platform 6 should the solder uniting such parts weaken sufficiently. This wedge action is proportioned to the pressure of the water or extinguishing-fluid upon the head 9 of the valve.

It will be obvious from the foregoing that where the valve of the fire-extinguisher head or sprinkler is sustained by a movable part adapted to slide on a stationary or other part or platform, a shear strain is constantly present, and therefore in time the joint is weakened. To resist this shear strain and strengthen the solder-joint I form the solder layer which unites the parts with a depression thrown into engagement with one of the parts of the valve-support after the valve has

been properly seated and after the solder-joint has been perfected or formed. The depression in the layer of solder which unites the parts comprising the valve-support may be varied as to form and location.

In Figs. 1 to 10 the movable part of the valve-support is formed with depressions or indentations 10, and the stationary part or platform 6 is formed with a corresponding depression or indentation in such manner that a portion of the metal of the movable part is thrown into engagement with the recess or cavity in the stationary part, and in the formation of such depressions or indentations the layer of solder is depressed and thrown into engagement with the stationary part or platform 6 of the valve-support.

In practice I produce the depressions or indentations by means of a suitable implement having dies or punches which will depress the metal without forming perforations therein, and this is effected after the valve has been accurately seated on the valve-seat, and after the solder-joint has been produced to unite the movable and stationary parts to the valve-support.

When I employ the stationary part or platform 6, Figs. 1 to 10, the soluble solder interposed between such platform and movable part or parts 7 is melted, and a union being effected the interior of the valve-stem 5 is inserted in its seat between the semicircular parts or sections 7, in which position the valve will have been properly and accurately adjusted to its valve-seat 3 to effectually close the discharge-orifice of the extinguisher head or sprinkler. After this has been accomplished, I produce the depressions or indentations by means of a suitable implement having dies, as hereinbefore explained. I may form these depressions or indentations in any desired shape, either circular or semicircular, as shown in Figs. 6 and 8, or they may be of an elongated form, as shown in Fig. 7. The depressions or indentations may be of any required number, the main object being to form the layer of solder with the depression or indentation which engages a stationary part of the valve-support to unite the movable and stationary parts comprising the valve-support.

The important feature of my invention resides in first accurately seating the valve and closing the fluid-discharge orifice and soldering together the stationary and movable parts comprising the valve-support by an interposed layer of solder and subsequently depressing or indenting the layer of solder to form a depression or indentation which engages the stationary part of the valve-stem. By this means I am able to provide practical and perfect fire-extinguisher heads or sprinklers having means to resist the shear action and strain on the movable parts of the valve-support, which results cannot be attained by the interlocking engagement of the parts comprising the valve-support as heretofore constructed, owing to the difficulty, if not im-

possibility, of properly adjusting the valve relatively to the interlocked parts of the valve-support after the solder-joint is formed.

5 In my invention I first adjust the valve and tighten it in its seat and subsequently provide the solder-joint with the indentation or depression to resist the shear strain on the movable part of the valve-support, whereby the depression or indentation is made to fit or
10 accommodate the adjustment or suit the conditions required after the solder-joint has been formed and after the valve has been accurately seated. This is not possible where the parts of the valve-support are formed
15 with toothed surfaces prior to being soldered together as heretofore.

In the modifications, Figs. 11, 12, 13, and 14, I exhibit my invention in another type of fire-extinguisher head or sprinkler. In this
20 construction the movable part of the valve-support is composed of an elbow-lever 12, having its forked end supported upon one arm of the yoke or frame 1 and its lower end united to the yoke or frame by a solder-joint,
25 such yoke or frame thus constituting the stationary part of the valve-support. After the solder-joint is formed and the valve is seated, the depression or indentation 10 (one or more) is formed in the manner hereinbefore ex-
30 plained. I may indent the yoke or frame at one edge of the elbow-lever to form the depression or indentation in the solder and cause it to engage the front shearing-edge of the lever, as in Figs. 13 and 14.

I do not confine my invention to any particular kind or type of fire-extinguisher head or sprinkler, for, obviously, the improvement is applicable to any fire-extinguisher head or sprinkler where valve-supporting parts held by a solder-joint are subjected to shearing
35 strain. 40

I make no claim in this application to any feature of invention shown, described, or claimed in an application for Letters Patent filed by me upon the 24th day of April, 1890, 45 Serial No. 349,350, for improvements in automatic fire-extinguishers.

Having thus described my invention, what I claim is—

In an automatic fire-extinguisher, the combination, with a suitable head or sprinkler
50 and a valve seated in the head or sprinkler to close the discharge-orifice, of a valve-support comprising a movable and a stationary part and an interposed layer of solder, said movable and stationary parts being formed with
55 depressions after the parts are soldered together to depress the layer of solder and cause a depression in said solder layer to enter the corresponding recess or cavity in the station-
60 ary part of the valve-support, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN HILL.

Witnesses:

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J. A. RUTHERFORD.