

G. E. HIBBARD.
 AUTOMATIC SPRINKLER HEAD.
 APPLICATION FILED JUNE 7, 1907. RENEWED APR. 6, 1909.

922,140.

Patented May 18, 1909.

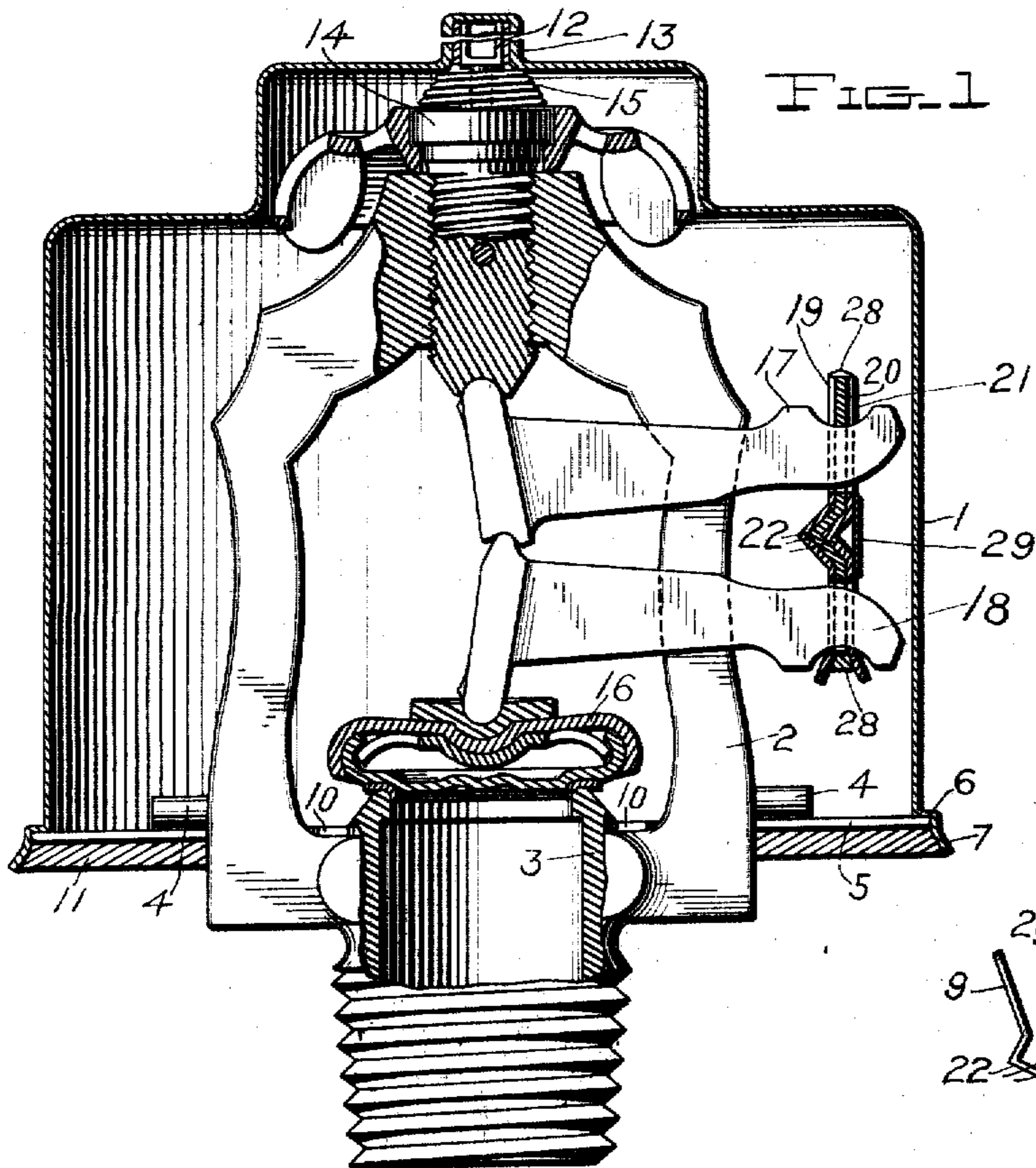


FIG. 1

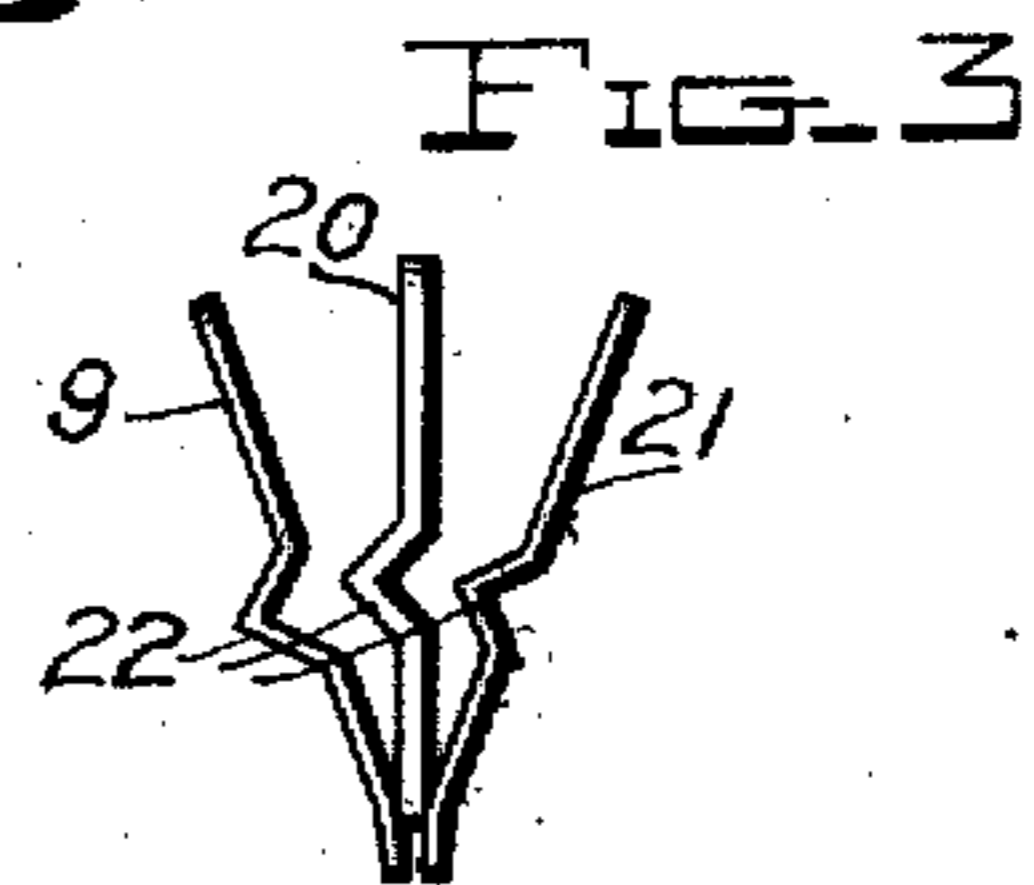


FIG. 3

FIG. 2

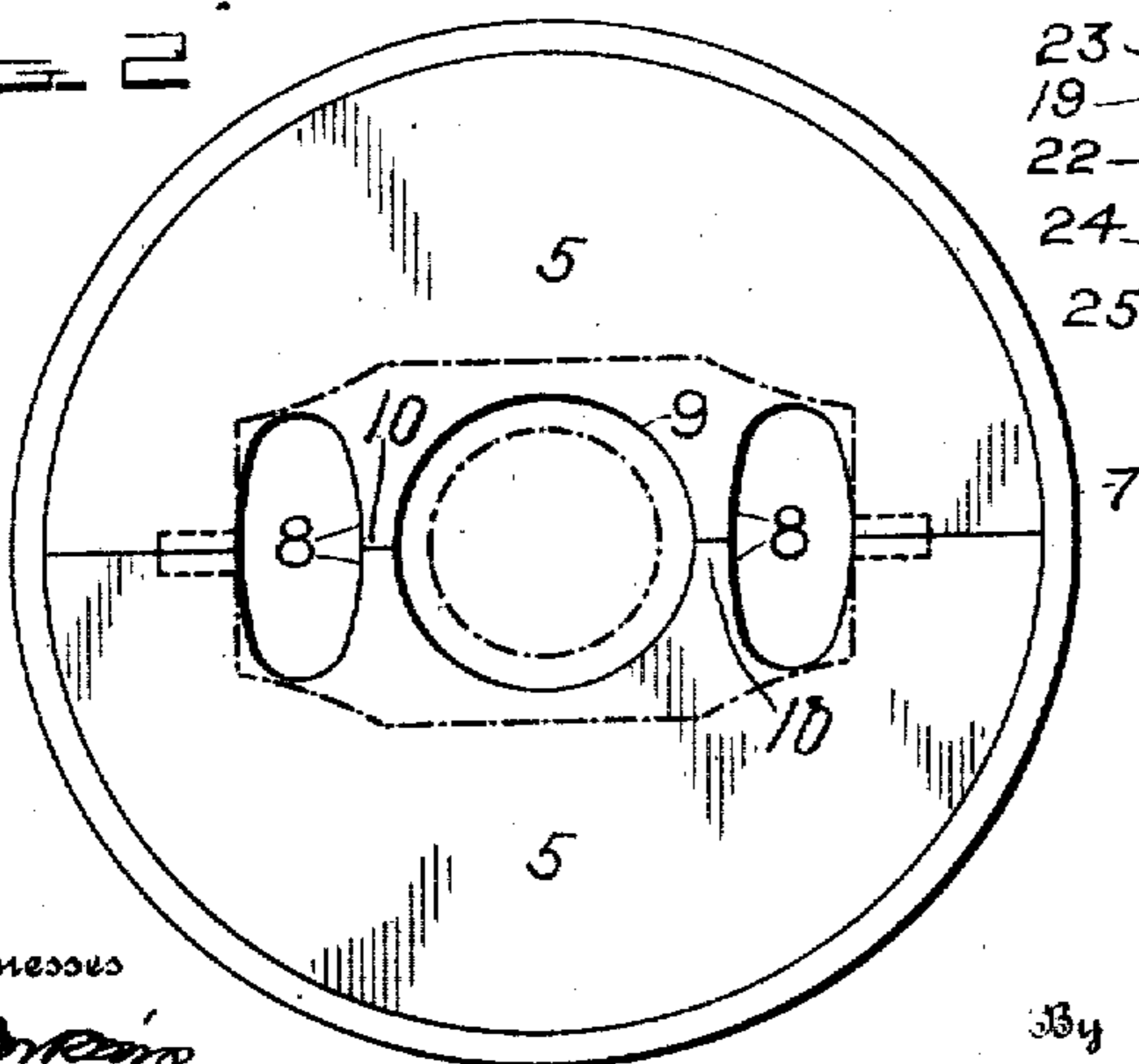


FIG. 4

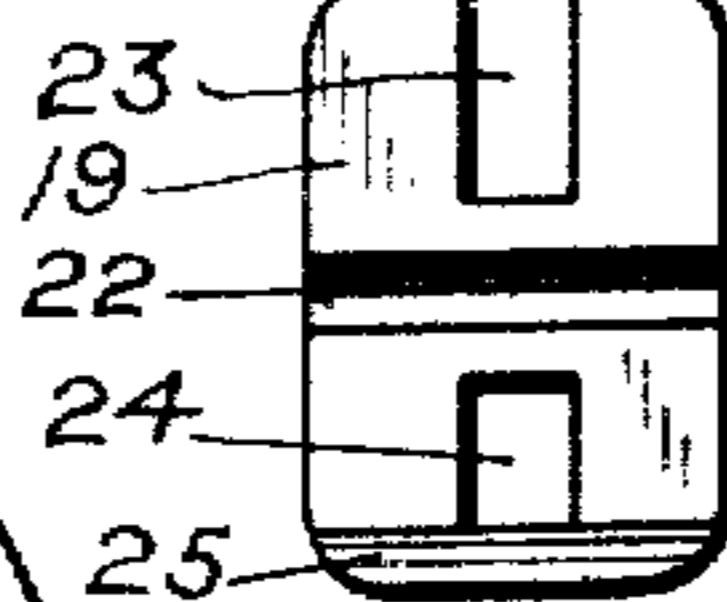


FIG. 5

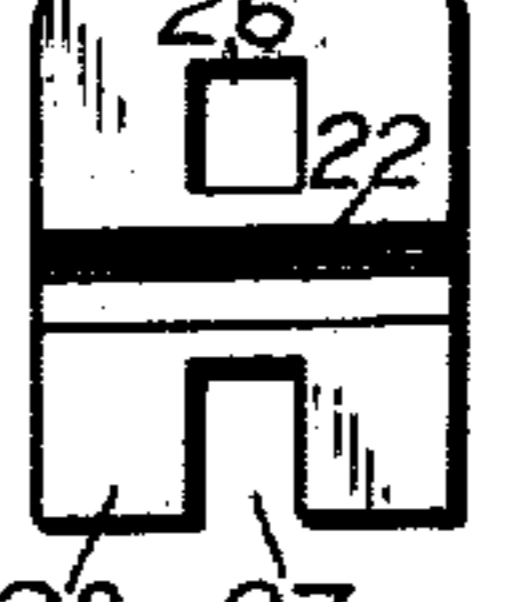
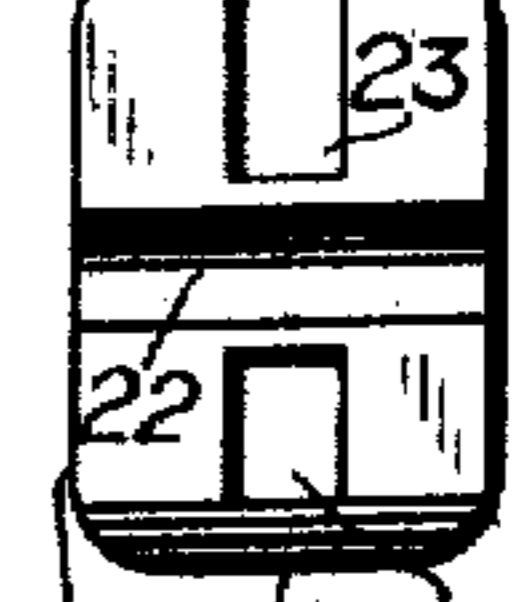


FIG. 6



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AUTOMATIC SPRINKLER-HEAD.

No. 922,140.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed June 7, 1907, Serial No. 377,674. Renewed April 6, 1909. Serial No. 488,293.

To all whom it may concern:

Be it known that I, GEORGE E. HIBBARD, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Sprinkler-Heads, of which the following is a specification.

My invention relates to automatic sprinkler heads employed in connection with the piping of fire-extinguisher systems erected for the protection of buildings.

One object of my invention is the particular construction of the fusible link, forming that element of the sprinkler head the integrity of which retains the valve of the sprinkler head closed, and the disintegration of which by heat frees the valve and permits the escape of the water in the heated locality.

Another object of my invention is the production of special devices for closing the mouth of the bell cover for the sprinkler head enabling the cover to be sealed entirely against the entrance of moisture or dirt, with the result of preserving all operating parts of the valve-holding device for any length of time in their original condition of readiness to yield to heat, regardless of external dust-laden or humid atmosphere.

I accomplish the stated objects by forming and associating the parts as illustrated in the accompanying drawings, of which—

Figure 1 represents, somewhat enlarged, a vertical section of the cover or bell, disclosing the internal devices some of which are also shown sectionally. Fig. 2 is a bottom plan view and shows the divided diaphragm closing the mouth of the bell. Fig. 3 illustrates the particularly constructed link by itself, its leaves being in the positions assumed when the adhering soft metal has melted and the link is disintegrating. Figs. 4, 5 and 6 are face or broadside views of the three leaves or plates which when assembled and soldered comprise the link.

The same number is used to refer to the same part throughout.

In Fig. 1, the bell or cover, the office of which is to keep out dust and dirt, is marked 1. It incloses all the parts and extends downwardly to a plane slightly above the junction of the frame 2 with nozzle 3 of the piping. From opposite sides of the frame project pins 4, and against these pins are placed the twin plates 5, 5, constituting together a circular diaphragm having its pe-

niphery seated in the annular shoulder 6 into which the flange 7 is fashioned at the mouth of the bell. It will be noted that plates 5 each possess a one-half part of two like elliptical openings 8 arranged at the sides of the middle circular opening 9, as they appear in Fig. 2 when the plates are together. The circular opening formed by the union of the plates fits around the nozzle 3, and the elliptical openings about the uprights of frame 2. The contour of the plates as described leaves two points 10 at the diametrical edge of each half plate which meet those of the companion plate immediately above the base of the frame as shown in Fig. 1. Thus, each plate has outerlying portions resting below the projecting pins 4, and points 10 arranged above the base of frame 2. Arranged in that manner, the plates are sufficiently held in position closing the mouth of the bell, and, yet, they are easily displaced. It is my practice, after the plates are in position, to pour over them melted wax as much as the flange of the cover will hold. The sheet of wax 11, see Fig. 1, successfully excludes the dust and moisture, and, at the same time effectually secures the plates in place. A very small rise in local temperature serves to run off the wax.

The bell itself is held by soldering the forked pin 12 into the nipple 13, the lower end of the pin being secured centrally in the top of adjusting screw 14 that has the usual threaded engagement with the frame. When the solder melts the cover is thrown off by the reaction of spring 15 shown as a compressed coil about the pin 12. That arrangement of parts is in accordance with Letters Patent of the United States granted to me January 26, 1904, No. 750,768.

Valve 16, the office of which is to close nozzle 3 of the piping, is held to its seat in the customary way by co-acting lever arms 17 and 18, the inner portions of which constitute a toggle joint arrangement extending from the adjusting screw 14 to the valve 16. The outermost hook-ends of the lever arms have their normal tendency to separate restrained by engagement with the link that is part of my present invention.

Three leaves or plates 19, 20 and 21, are taken to build up the link. Of these the outerlying plates 19 and 21 are usually thinner than the middle plate 20. All the plates have corresponding transverse bends 22 of the same size and adapted to fit into each

other as illustrated in Fig. 1. Outer plates 19 and 21, see Figs. 4 and 6, are provided with open recesses 23 extending from their upper edges downwardly toward the bends 22, and slots 24 below the bends. It is shown also that the lower edges 25 of the outer plates are bent outwardly from the plane of those plates. That peculiarity will be again referred to. In the middle plate the positions of the slot 26 and recess 27 are reversed as compared with the outer plates.

When the plates are assembled as illustrated, it is thought to be clear that the outermost end of lever arm 18 engages and passes through the slots in both outer plates below bends 22, while the like extremity of arm 17, the upper arm, passes through the slot of the middle plate. The plates being held to each other by the solder 28, the ends of the arms are prevented from separating and the valve 16 is kept to its seat. As usual, the office of the bends 22 is to relieve direct strain upon the solder which is necessarily more or less yielding.

Upon being released by the melting of the solder the plates separate with the movement of the engaged ends of the arms, the outer plates proceeding downwardly and the middle plate upwardly. It has been demonstrated by trial that where all the plates are of the same length, the seating of bends 22 one within another interposes considerable resistance occasionally to the prompt and complete disintegration of the link. To avoid this objection, I have constructed the middle link 20 shortest below the bend 22, see Figs. 1 and 3, and have turned the lower edges of the outer plates away from each other. Such construction results in permitting the upper edges of the outer plates 19 and 21 to swing outwardly away from each other when released, allowing the bends 22 to readily unseat themselves and the middle plate 20 to pass upwardly and away without hindrance. Fig. 3 best illustrates the effect of the outwardly turned lower edges of plates 19 and 21 in bringing about a wide separation of the upper portions of those plates and the easy disengagement of middle plate 20. The thin additional plate 29 shown in Fig. 1 as fixed across the hollow of bend 22 of outer plate 21 is a tag plate, upon which may be stamped the number, situation, or other data relating to the sprinkler head.

Having thus described my invention, and explained the mode of its operation, what I claim is—

1. In a sprinkler head, the combination with a cover, a diaphragm removably engaging the frame and adapted to close the mouth of the cover of a frame projecting into the cover, a valve, valve-holding devices including a solder joint and arranged between the said frame and the valve, the said cover and frame connected by a solder joint, and the

said joint between the cover and frame being independent of the solder joint governing the valve-holding devices.

2. In a sprinkler head, the combination with a bell or cover, of a frame, the cover having a soldered connection with the frame adapted to be released by heat, and a diaphragm comprising separable component plates constructed to removably engage the frame and close the mouth of the bell.

3. In a sprinkler head, the combination with a bell or cover, of a frame, the cover having a soldered connection with the frame adapted to be released by heat, and a diaphragm comprising duplicate semicircular plates constructed to removably engage the frame and close the mouth of the bell.

4. In a sprinkler head, the combination with a bell or cover, of a frame, the cover having a soldered connection with the frame adapted to be released by heat, a spring normally compressed between the bell and frame and operating to throw the cover off the frame, and a diaphragm constructed to removably engage the frame and close the mouth of the bell.

5. In a sprinkler head, the combination with a bell or cover having an expanding flange at its mouth, of a frame, the cover having a soldered connection with the frame adapted to be released by heat, a diaphragm adapted to removably engage the frame and close the mouth of the bell, and wax sealing covering the diaphragm exteriorly within the said flange of the bell.

6. In a sprinkler head, the combination with a bell or cover having an expanding flange at its mouth, of a frame, the cover having a soldered connection with the frame adapted to be released by heat, a diaphragm comprising separable component plates constructed to removably engage the frame and close the mouth of the bell, and wax sealing covering the diaphragm exteriorly within the said flange of the bell whereby the said plates are held in position.

7. In a sprinkler head, a link comprising outer and middle plates each having a recess and a slot and a transverse bend between the recess and slot, the said plates adapted to be soldered together with the said bends seated one within another, the slot of the middle plate being arranged above the said bend and the slots of the outer plates below the bend, and the said middle plates being shorter below the bend than the said outer plates, for the purpose described.

8. In a sprinkler head, a link comprising outer plates each having an edge bent away from the plane of the plate, and a middle plate, the said outer and middle plates having each a recess and slot and a transverse bend between the recess and slot, said plates adapted to be soldered together with the bends seated one within another, the slot of the middle

plate being arranged above the said bend and the slots of the outer plates below the bend, and the said middle plate being shorter below the bend than the said outer plates, for the purpose described.

9. In a sprinkler head, a link comprising outer and middle plates, each of said plates having a slot and a recess, said plates adapted to be soldered together and arranged whereby the slot of the middle plate registers with the recesses of the outer plates and the slots of the outer plates register with the recess of the middle plate, the said outer plates extending below the edge of the middle plate, for the purpose described.

10. In a sprinkler head, a link comprising outer plates each having an end portion bent away from the plane of the plate, and a middle plate, each of said plates having a slot and a recess the said bent ends closing said slots in the outer plates, said plates adapted to be soldered together and arranged whereby the slot of the middle plate registers with the recesses of the outer plates and the slots of the outer plates register with the recess of the middle plate, the said bent end of the

outer plates extending divergently below the corresponding end of the middle plate, for the purpose described.

11. In a sprinkler head, a link comprising outer and middle members adapted to be soldered together, the lower portions of said outer members arranged to extend below the edge of the middle member, for the purpose described.

12. In a sprinkler head, a link comprising outer and middle plates provided with openings and adapted to be soldered together, the lower ends of the outer plates extending below the edge of the middle plate, and the said ends of the outer plates being bent outwardly away from each other and from the middle plate whereby greater separation of the upper portions of the plates is permitted when the solder melts, for the purpose described.

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

GEORGE E. HIBBARD.

Witnesses:

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