May 28, 1935. E. E. LORD 2,003,052

SPRINKLER HEAD

Filed Oct. 17, 1933

Fig. 1.

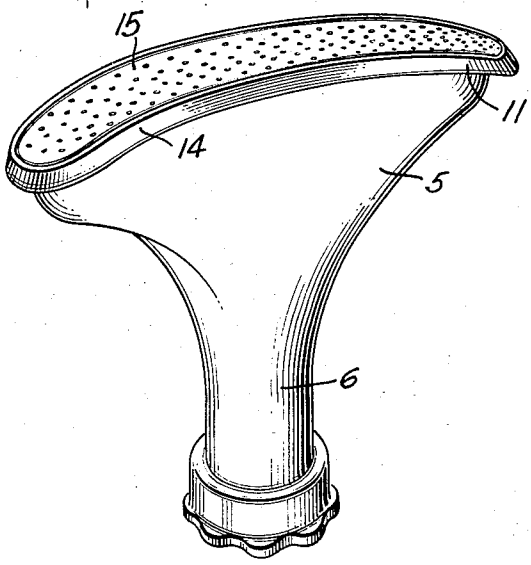


Fig. 2.

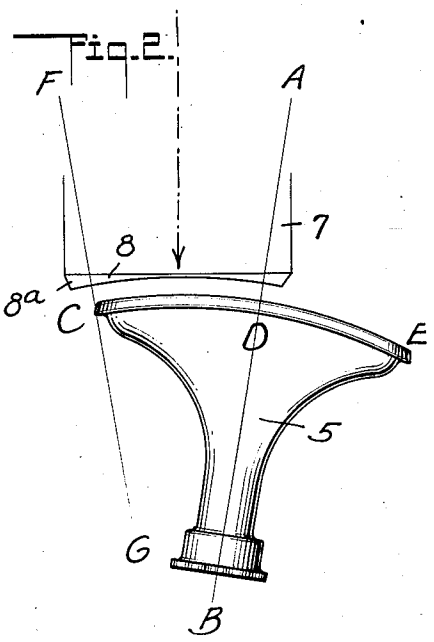


Fig. 3.

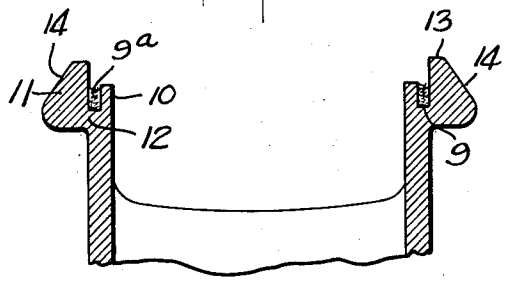


Fig. 4.

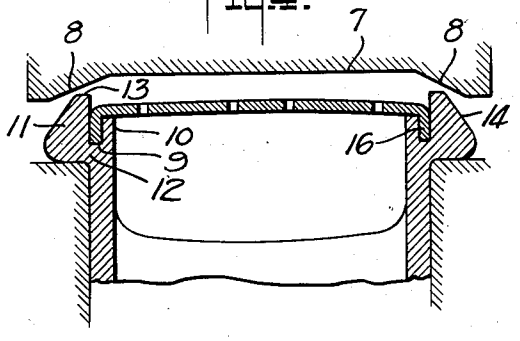
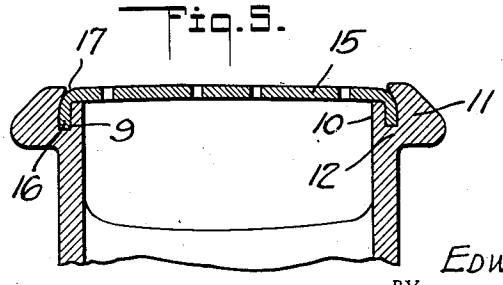


Fig. 5.



INVENTOR.
EDWARD E. LORD

BY
Mann, Anderson, Stanley, Foster & Liddy
ATTORNEYS.

Patented May 28, 1935

2,003,052

UNITED STATES PATENT OFFICE

2,003,052

SPRINKLER HEAD

Edward E. Lord, Pasadena, Calif., assignor of one-half to J. D. Ross, Pasadena, Calif.

Application October 17, 1933, Serial No. 693,977

2 Claims. (Cl. 299—141)

This invention relates to sprinkler heads and the method of manufacturing same, and has for one of its essential objects the provision of a method in which the perforated spray plate may be quickly and effectively attached to the nozzle or body of the head in a manner that will positively prevent leakage of water around the marginal edge of the plate.

A further object of the invention is to provide a sprinkler head whose nozzle is so formed that during the swaging or upsetting operation, which occurs during the step of attaching the spray plate to the nozzle, the material of the nozzle will not be fractured or injured in any manner.

For a more complete disclosure of the nature and objects of the invention, reference may now be had to the accompanying specification and drawing, in which latter

Figure 1 is a perspective of a nozzle produced by my improved method;

Figure 2 is a schematic view in elevation, showing the position of the nozzle during the swaging operation;

Figure 3 is a transverse section through the head;

Figure 4 is a view similar to Figure 3, showing the spray plate in position preparatory to the swaging of the marginal wall of the head over the marginal portion of the spray plate;

Figure 5 is a transverse section through the finished nozzle.

In Figure 1 of the drawing, I show a fan shaped spray nozzle 5 having a water intake branch 6 adapted to be connected in the usual manner with a hose, not shown. The spray end of said nozzle is of an elongated ovate form in plan and same is longitudinally curved to describe an arc of circle, the medial portion of which coincides with an axial line A—B drawn through the nozzle as shown in Figure 2, so that the distance from C to D in the arc of the circle thus described is the same as that from D to E. In Figure 2, I show the nozzle 5 in a position such as it would occupy when presenting same to a vertically reciprocating swaging die 7, the latter having parallel spaced apart inclined swaging faces 8—8, and a corresponding connecting face 8a. These swaging faces 8—8 are arcuate in form, the same as the corresponding part of the spray end of said nozzle. It will be observed that the die 7 is so proportioned as to come in striking contact with one-half only of the spray end of the nozzle during the swaging operation.

The spray end of the nozzle 5 is formed with a vertical U-shaped groove 9 of elongated-ovate form in plan. This groove is defined by an inner short wall 10 of uniform thickness throughout and a wall 11 of greater breadth than said wall 10. The wall 11 extends laterally of a joinder wall 12 and same is of reduced thickness in the direction of its free edge 13 so as to provide the prominently flared outer surfaces 14, the angle of which is considerably greater than that of the swaging faces 8—8 and 8a, so that when the latter approach the surfaces 14, the reduced portion of the wall 11 will be cammed inwardly, as will be appreciated on reference to Figure 4. Now it will be noted that due to the gradual reduction in the thickness of the wall 11 the part of increased thickness thereof resides in the immediate vicinity of the joinder 12 and that due thereto the free edge portions of said wall 11 may be cammed over and inwardly, or swaged without any material strain being placed upon the said joinder 12. It is in view thereof that I am able to prevent fracturing of the nozzle structure such as might weaken same or cause leakage of water from the structure, let us say immediately at said joinder 12.

The spray plate 15 consists of a single piece of thin sheet brass, the general shape in plan of which is ovate and in such agreement with the general contour of the spray end of the nozzle as to rather snugly fit into the space bounded by the wall 11. Same is formed with a continuous angular flange 16 adapted to be received in the continuous ovate groove 9, and same is of a depth calculated to bring the free edge of the wall 10 in abutment with the under surface of the aforesaid spray plate 15. This brings the upper face of said plate 15 slightly below the free edge of the wall 11.

I have now described the essential structural features which characterize the nozzle 5 and shall therefore proceed to described the operation necessary to permanently attach the plate 15 to the spray end of said nozzle. In the groove 9, Figure 3, I place a quantity of water-proofing compound or cement 9a, after which the plate 15 is applied so as to assume the position shown in Figure 4. I then position the nozzle 5 beneath the reciprocal swaging die 7 so as to present one-half only of the spray end of the nozzle to said die. It will be noticed that in so doing, a line F—G drawn diagonally through the die passes through the inclined face of the flange 11 as indicative of the diagonal line of force that is applied to the flange 11 as the die descends on a straight vertical line, thus swaging the reduced

portion of the flange 11 over and inwardly and securely upsetting same against the portion 17 of said plate 15. After I have thus attached one-half of the plate 15 to the spray end of the nozzle as just described, I turn the nozzle around one hundred eighty degrees and proceed with the operation as before. It is to be understood that during the operation of attaching the plate 15 to the nozzle, a rigid table or suitable support is employed upon which the half portion of the nozzle which is directed presented to the die 7 may firmly rest. I find that by swaging first one-half of the wall 17 against the marginal portion of the plate 15, and then the other, the plate may be permanently attached to the nozzle in a very uniform manner and in a way which prevents warping of buckling of the plate.

What I claim as my invention is:

1. A spray nozzle having a substantially U-shaped groove defined by spaced apart inner and outer walls, the breadth of the outer wall being sufficiently greater than that of the inner wall to cause the free edge of the former to extend an appreciable distance beyond the free edge of the inner wall, and a spray plate of uniform thickness having a continuous marginal flange seated in said groove, the said inner wall having its free edge abutting the under side of said plate and the said outer wall being swaged inwardly and brought into close engagement with the outer face of the plate marginally thereof to thereby firmly force and confine the inner face of said plate against the free edge of said inner flange, the outer flange being of a gradually increasing thickness in the direction of the bottom of said groove and being connected with the inner wall by a laterally extending joinder wall so that the maximum wall thickness of the nozzle is located in the plane of a straight line drawn through the joinder wall and at right angles to the axial center of the nozzle.

2. A spray nozzle comprising a body having an ovate groove defined in part by spaced apart inner and outer walls, the latter being of greater breadth than the former and connected therewith by a laterally extending joinder wall, the outer wall being of gradually increasing thickness toward said joinder wall, a spray plate of uniform thickness having an ovate flange extending into said groope, the groove containing a fluid waterproofing material, and the outer wall having its portion of lesser thickness swaged over and inwardly against the spray plate so as to snugly force the inner surface of the plate against the edge of said inner wall and apply pressure against the waterproofing fluid material to displace same into the joints between the flange and the walls of the groove.

EDWARD E. LORD.