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W. W. BOWERS

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SPRINKLER HEAD

Filed Aug. 22, 1929

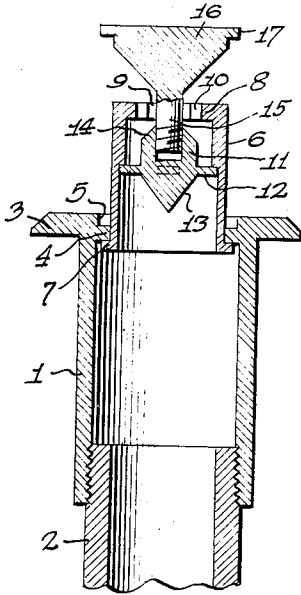


Fig. 1.

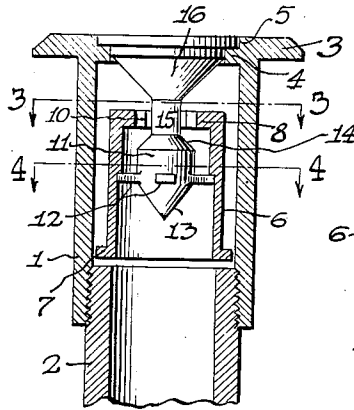


Fig. 2.

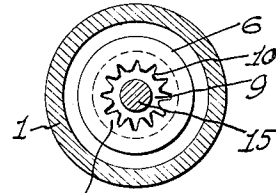


Fig. 3.

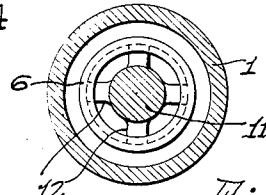


Fig. 4.

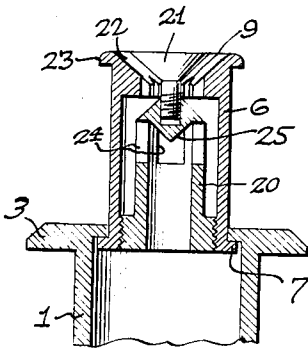


Fig. 5.

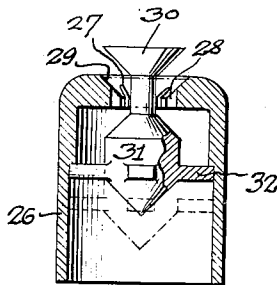


Fig. 6.

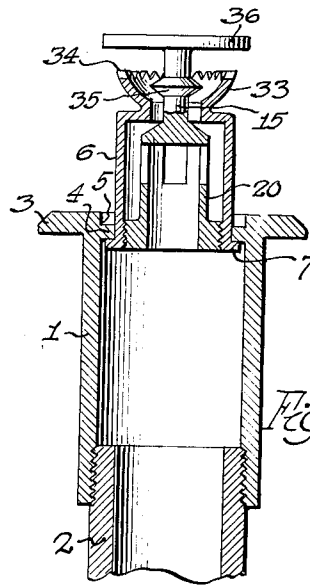


Fig. 7.

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## SPRINKLER HEAD

Application filed August 22, 1929. Serial No. 387,608.

This invention relates to lawn sprinkling systems and more particularly to a construction and arrangement of discharge nozzle for use in connection with such systems.

5 An object of the present invention is to provide a discharge nozzle particularly adapted for use in connection with lawn sprinkling systems and which nozzle is simple in construction and efficient in operation, the  
10 construction providing an extended spread of the spray so that each nozzle will water a wide area, and will operate automatically to open and close the nozzle and will be operated by  
15 water pressure to project the nozzle above the ground surface and will be retracted when pressure is turned off, to lie flush with ground surface where it will not interfere with the  
20 mowing of the lawn. A further object is to provide a nozzle arrangement whereby a stream of comparatively large volume is directed through the discharge opening of the  
25 nozzle and in passing, is divided into minute streams, which streams are in turn deflected outwardly, forming an annular wall of water of extended diameter, each small stream having  
30 sufficient body and force to cause a wide spread after striking a conical deflector properly located in the path of said streams. A further object is to provide a construction  
35 which is such that a minimum retardation of the water in issuing from the nozzle, is secured, thereby securing a maximum force to the released water and at the same time securing  
40 a finely divided spray of maximum area. Further, to provide a self cleaning nozzle, the cleaning effect being due to the volume of the stream issuing from the discharge opening  
45 and due to the construction, the small degree of necessary restriction of this opening in order to secure the desired spray or mist effect and spread.

With the above and other ends in view, the invention resides in the construction, arrangement and combination of parts, all as hereinafter set forth and more particularly pointed out in the appended claim, reference being had to the accompanying drawings, in which—

50 Figure 1 is a longitudinal axial section through a device illustrative of an embodi-

ment of the invention and showing the valve open;

Fig. 2 is a like view with the parts shown in inoperative position and the valve closed;

Figs. 3 and 4 are transverse sections upon 55 the lines 3—3 and 4—4 respectively, of Figure 2;

Fig. 5 is a view similar to Figure 1, showing a modified construction;

Fig. 6 is a sectional view showing a further 60 modified construction; and

Fig. 7 is a longitudinal section through another form of the device.

As illustrated in Figure 1 of the accompanying drawings, the device comprises a 65 tubular casing head 1 provided with internal screwthreads at its lower end so that it may be screwed upon the upper end of a stand pipe 2 forming part of the underground water supply system, the upper end of said casing  
70 being provided with a wide circular flange 3, which, when the device is installed, lies flat upon the surface of the ground, and is also formed with an inwardly projecting rib 4 and an exterior groove 5 in its upper end. With-  
75 in the casing 1 and free to slide therein and be projected through the open upper end of the casing, is a tubular nozzle head 6, said head being formed with an outstanding annular flange 7 to engage beneath the rib 4  
80 and limit the outward movement of the head under the influence of water pressure within the casing 1. The nozzle head is tubular but has an upper end wall 8 provided with an axial water discharge opening 9, the circular  
85 wall of which is formed with grooves 10 with alternating ribs providing a toothlike edge for the discharge opening, and within this nozzle head, a spreader 11 is rigidly secured by means of laterally extending arms 12, said  
90 spreader having a conical lower end 13 below the spider in the axis of the head and a beveled shoulder 14 at its upper end.

A stem 15 is screwed into an axial screw-threaded opening in the upper end of the 95 spreader and extends axially through the discharge opening 9 with a conical deflector head 16 integral with its outer end with the conical lower face of the head directly opposite the discharge opening so that water 100

passing through said opening and divided into separate small streams by the grooves 10 in the wall of the opening, which grooves extend parallel with the axis of the head and therefore direct these streams directly outward so that they will impinge directly upon said conical face and be deflected outwardly thereby.

The deflector head 16 is also formed with an edge flange 17 to engage within the groove 5 of the casing 1 when the water pressure is turned off and the nozzle head and deflector fall, said deflector thus forming a cap or closure to tightly close the upper open end of the casing 1, and exclude dirt from the interior of the device when not in use, the upper surface of the deflector lying flush with the upper surface of the flange 3 on the casing 1, so that a lawn mower may pass over the device without injury.

The discharge opening between the stem 15 and wall of the opening may be of considerable area to permit of the passage therethrough, of a comparatively large volume of water, and as the passage through the nozzle head is not materially restricted, the water will be forced through this opening under substantially full pressure, the conical spreader 11 not materially hindering the flow. Any obstruction which may get into the nozzle head will, therefore be quickly forced out through the open discharge opening due to the volume and pressure of the water forced therethrough when the water is turned on. Further, beyond the discharge opening there is nothing to block the forcing out of the obstruction as the deflector is positioned a considerable distance outwardly from the point where the water leaves the nozzle head, said deflector simply providing a deflecting surface to change the direction of travel of the large number of small streams into which the flow is divided in passing through the grooves 10 which are parallel to the longitudinal axis of the head.

Because the discharged stream is broken up or divided into a number of small streams, the force or pressure of each stream is maintained and when these streams strike the deflector, they strike with great force and are simply deflected from their true course which is parallel of the axis of the discharge opening. Therefore these streams will be projected to a much greater distance than they could be if given a spiral motion or if the discharge opening be restricted very materially, which restriction would cut down the force.

These streams in striking the conical deflector are simply spread, forming a conical thin wall of water which will cover a large area due to the fact that the flow is mainly diverted from its true course rather than restricted.

In Figure 5 of the drawings a modified construction is shown in that a tubular member

20 is substituted for the spreader 11, said member supporting the conical deflector 21 with an annular space 22 between the face of the cone and a similar surface formed on the end wall of the nozzle head 6, the upper end of which head is provided with an annular rib 23 which forms a stop to engage the upper face of the casing flange 3. The tubular fixed member 20 is also formed with lateral openings 24 to permit the water to flow therethrough, an axial conical projection 25 on the inner side of the end wall of the member serving to direct the water through these openings 24. The wall of discharge opening 9 around the stem of the deflector is formed with grooves 10 the same as in the previously described construction, these grooves being straight grooves extending parallel with the axis of the head.

In Figure 6 a construction is shown wherein the casing head 1 is dispensed with, a tubular nozzle head 26 is screwed directly upon the end of a stand pipe of the system, this head being formed with a discharge opening 27 in its upper end, the wall of said opening being serrated or grooved as at 28 and also formed with a seat 29 for a conical valve 30, the stem of which passes through the discharge opening and is connected at its inner end with a spreader member 31 of conical form carried by a spider 32 which is slidable within the nozzle head, being limited in its upward movement by a shoulder 33 on the head wall. When the water pressure is off, the spreader and its spider will drop, bringing the conical deflecting valve member 30 to its seat 29 and closing the discharge opening. When water pressure is turned on, the deflector 30 will be lifted away from its seat and the minute streams formed by the grooves 28, will strike the conical head 30 and be deflected outwardly.

The construction shown in Figure 7 is very similar to the construction shown in Figure 5, except that the upper end of the nozzle head 6 is formed with a cup 33 having a serrated edge 34 and on the stem 15 within the cup is a double conical deflector 35 and a closure disk 36 is formed on the upper end of said stem, said disk being spaced from the upper edge of the cup and of greater diameter than the cup and head so that when the head drops into the casing, said disk will seat upon and close the upper open end of the casing. Water passing through the tubular fixed member 20, passes out around the stem 15 through the discharge opening and striking the deflector 35 is deflected outwardly against and over the serrated edge of the cup, being divided into fine streams thereby and spread out over a large area of ground.

Obviously the operation of the several constructions shown, is substantially the same in each, and other modifications falling within the terms of the appended claim are con-

templated. Having thus fully described my invention, what I claim is:—

5 The combination with a tubular casing having an open upper end, a tubular nozzle head slidable in said casing, said head having  
an axial discharge opening in its upper end  
and an internal annular shoulder, a spreader  
10 in the axis of said nozzle head and slidable longitudinally thereof and comprising a cylindrical body having a downwardly projecting  
contracted lower end and a contracted upper  
end, said body having arms extending  
radially therefrom to engage the wall of said  
head and guide said spreader therein and to  
15 engage said annular shoulder of said head for limiting the upward movement of said  
spreader, a stem extending from said upper  
contracted end of said spreader and through  
said discharge opening in the upper end of  
20 said head, and a deflector on said stem spaced from said discharge opening by said stem  
and presenting a conical deflecting surface to the water issuing from said discharge opening.

25 In testimony whereof I affix my signature.

WILLIAM W. BOWERS.

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