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W. VAN E. THOMPSON
HALF-CIRCLE SPRINKLER HEAD

3,085,754

Filed Oct. 4, 1960

Fig. 1.

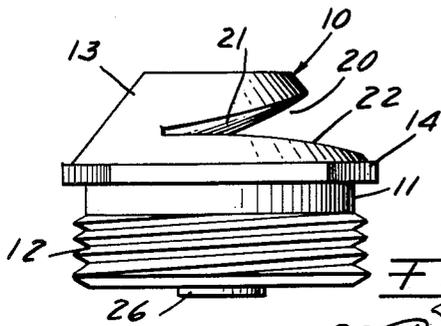


Fig. 2.

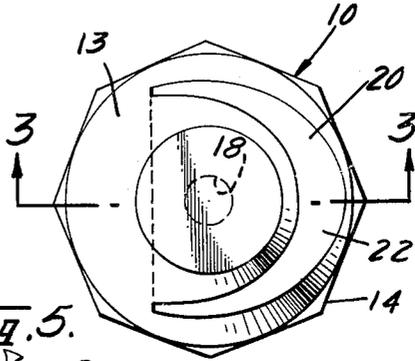


Fig. 5.

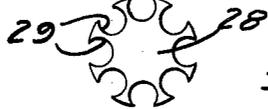


Fig. 4.

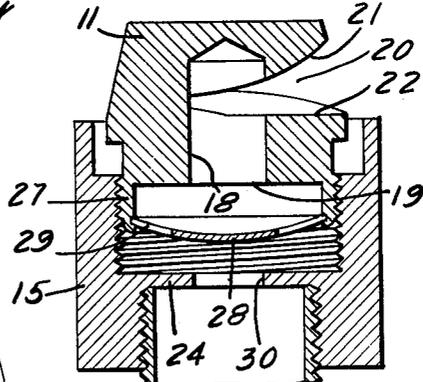


Fig. 3.

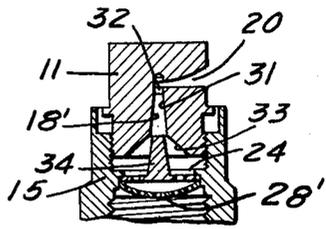
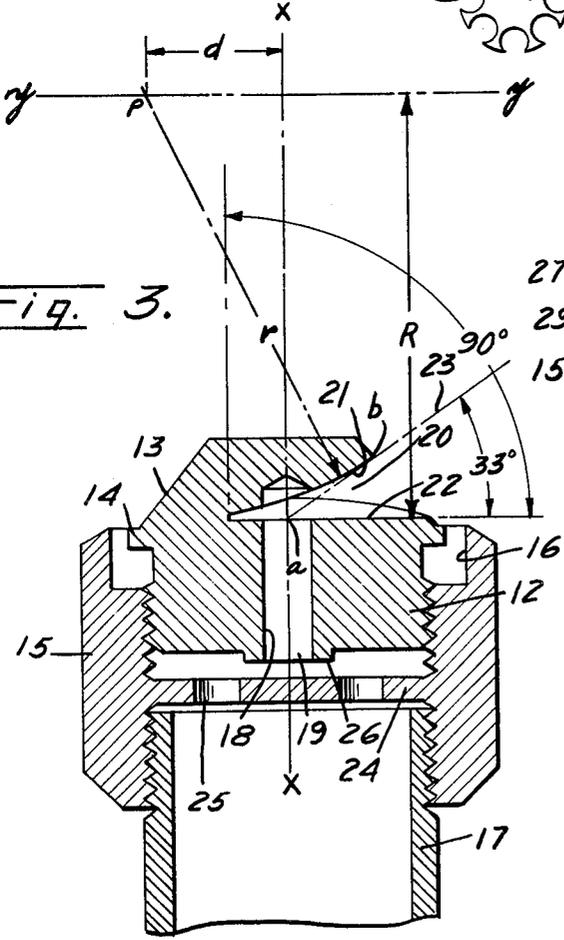


Fig. 6.

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3,085,754

HALF-CIRCLE SPRINKLER HEAD

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3 Claims. (Cl. 239-523)

The present invention relates generally to lawn sprinklers, and is more particularly concerned with half-circle sprinkler heads such as may be employed along the edges of lawns.

The present invention constitutes an improvement in sprinkler heads of the type disclosed in my United States Letters Patent No. 2,785,005, issued March 12, 1957.

In the above patent, I disclosed a half-circle sprinkler head wherein the spray issued from a diagonally directed spray outlet orifice in the form of a modified half-circle, the spray orifice extending upwardly and outwardly from a vertical inlet passage, and being defined by a spheroidal upper wall and a lower cylindrical wall. In the sprinkler head of the patent, it was contemplated that the distribution areas of the sprays would be arranged in overlapping relation.

The present invention in its broad concept seeks to obtain improved and better distribution of the sprayed water, particularly close in and under the sprinkler, and which is arranged to be mounted on a riser or supply pipe about six to eight inches above the ground.

Briefly, the sprinkler head, as more specifically described subsequently herein, differs primarily from the above patented structure in that the axis of the cylindrical wall extends horizontally or at right angles to the inlet passage axis.

A further object of the invention is to provide improved means for controlling flow of water through the nozzle openings.

Still another object is to provide a unique combination of support and head mounting of simple construction, wherein the head and support interconnected for axial relative movement which results in regulation of the flow and control of the spray.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

FIG. 1 is an elevational view of a sprinkler head embodying the features of the present invention;

FIG. 2 is a plan view of the same;

FIG. 3 is a sectional view, taken substantially on line 3-3 of FIG. 2, the head being shown as combined with a support;

FIG. 4 is a vertical section showing a modified arrangement;

FIG. 5 is a detailed view of a diffuser disc as utilized in the device of FIG. 4; and

FIG. 6 is a vertical section showing another modified form of the invention.

Referring now generally to the drawings, for illustrative purposes, the sprinkler head of the present invention, as generally indicated at 10, comprises a body 11 which is constructed with an externally threaded lower end portion 12 and an upper end head portion 13 of truncated conical configuration and associated at its base with a polygonal portion 14. The polygonal portion 14 is adapted to have a wrench or other tool applied thereto, and by means of which the sprinkler head may have its lower end portion 12 threadedly attached to the uppermost end of a coupling 15 which is provided with an annular end groove 16 for the admittance of the polygonal portion 14 therein. The opposite end of the coupling is internally threaded

to receive a threaded end of a riser pipe 17 which serves to support the coupled spray head above the ground surface and supply water thereto.

As shown in FIG. 3, the body 11 is provided on a central axis $x-x$ with a spray inlet passage 18, the lowermost end of this passage communicating with an inlet opening 19 and the uppermost end of the passage communicating with a spray orifice 20 opening into the conical face of the head portion 13.

The spray orifice 20 is machined or otherwise fabricated to provide an upper spheroidal wall 21 and a lower cylindrical wall 22 which are generated around an axis $y-y$ having right angle relation with respect to the axis $x-x$. The active surface of the spheroidal wall 21 constitutes a portion of a sphere generated with respect to a point p by a radius r of approximately $1.125r$. The cylindrical surface of the wall 22 is a portion of a cylinder generated by a radius R so that the center line of the cylindrical wall 22 will extend horizontally. The point p is displaced from the axis $x-x$ by a distance d which may be determined as follows:

An angle of 33° is drawn from the intersection point of the center line of the surface of wall 22 with the vertical axis $x-x$, as indicated at a . From point b , where the 33° line 23 intersects the conical surface of the head portion, a radius r is used to scribe an arc intersecting the axis $y-y$. This locates the point p and determines the distance d . Using the point p , and radius r , the surface of wall 21 may then be generated. The surface of wall 21 and the surface of wall 22 are carried rearwardly past the inlet passage 18. This arrangement of cooperating walls 21 and 22 in the discharge orifice 20 results in the breaking up of the stream of water received through the inlet passage 18 in such a manner that the distribution will be more effective, particularly close under the sprinkler.

In order to control the discharge from the sprinkler, the coupling 15 is provided intermediate its ends with a transversely extending baffle wall 24 which is interposed in the path of flow of water from the riser pipe to the inlet opening 19, a plurality of circumferentially spaced openings 25 being arranged in the baffle wall. These openings are shown as being outwardly spaced with reference to the spray inlet passage. Direct flow from the openings 25 to the inlet opening 19 is broken up and eddy currents avoided by providing an annular projecting flange 26 at the inlet opening 19. The body 11 and coupling 15 being threadedly interconnected, the flange 26 and baffle wall may be adjusted towards and away from each other, thus serving as valving members to control the flow.

A modified structure is shown in FIG. 4, wherein the body 11 on its lower end portion is provided with a peripheral skirt 27 which serves as a support for a diffuser disc 28 having spaced relation to the inlet opening 19. This diffuser disc, as shown in FIG. 5, is provided with a plurality of spaced peripheral notches 29 for flow of water in its passage from an axial opening 30 in the baffle wall 24 enroute to the inlet opening 19. The diffuser disc in this case acts to smooth out the flow and eliminate eddy currents in this form of the invention. Control of flow is accomplished in this case by axial adjustment of the body 11 to position the diffuser disc towards and away from the opening 30 in the baffle wall.

Another modified structure is shown in FIG. 6, which differs from the previously described structures of FIGS. 3 and 4 by having an inlet passage 18' in which there is a section 31 that is tapered in the direction of flow there-through. In this modification, it will be observed that the section 31 at its smaller uppermost end communicates with the spray orifice 20 through a cylindrical end section 32, while at its larger lowermost end the section

31 is in communication with an outwardly flared end section 33.

The baffle plate 24 is in this case formed as a separate piece and provided with a valve member in the form of an upstanding central projection 34 having a taper corresponding to that of the section 31 so as to permit a flow regulatory telescopic adjustment between the projection 34 and the section 31.

Relative adjusting movements are accomplished by screwing the body 11 inwardly or outwardly of the associated coupling 15. This arrangement enables a finer and closer adjustment to be obtained. For example, the arrangement may be readily designed so that three and one-half turns of the body 11 will be required in going from fully closed to fully opened positions. This modification also has the further advantage of providing a more direct flow with less turbulence.

A perforated cupped diffuser disc 28' is in this form of the invention positioned below the baffle plate, the disc being secured at its periphery to the wall of the coupling 15.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention, and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. In a part-circle sprinkler: a head member comprising a body having an inlet passage leading upwardly therein and communicating with a spray nozzle; a tubular support for said head adapted for connection to a fluid supply; annular projecting means on said head member surrounding the inlet end of said inlet passage for deflectingly diffusing the fluid at said inlet end; and a baffle wall in said support in the fluid flow path to said inlet passage ahead of said means, said wall having a plurality of circumferentially spaced flow openings therein outwardly spaced from said annular projecting means, whereby flow from said flow openings to said inlet end will be substantially radially inwardly, said wall being relatively movable towards and away from said inlet passage to control the fluid flow thereto.

2. In a part-circle sprinkler: a head member comprising a body having an inlet passage leading upwardly therein and communicating with a spray nozzle; a tubular

support for said head adapted for connection to a fluid supply; a baffle wall positioned adjacent the inflow end of said inlet passage, said wall having a flow opening therein positioned radially outwardly of said inflow end so that the flow will be generally radially inwardly from said flow opening to the inflow end of said inlet passage; means supporting said body and said baffle for relative axial movements to adjustably vary the proximity of said inflow end to said baffle wall for controlling the fluid flow to said passage; and an annular projecting flange positioned around said inflow end on said body for diverting the fluid from a direct entering flow path to said passage.

3. In a part-circle sprinkler: a head member comprising a body having an inlet passage leading upwardly therein and communicating with a spray nozzle, said passage at its inflow end being of enlarged diameter; a tubular support for said head adapted for connection to a fluid supply; a baffle wall positioned adjacent the inflow end of said inlet passage, said wall having a central flow opening therein; a diffuser disc carried by said body spanning said enlarged passage end, said disc having a solid central area surrounded by a plurality of peripheral openings outwardly spaced with respect to said central flow opening; and means supporting said body and said baffle for relative axial movements to adjustably vary the proximity of said disc central area to said baffle wall central flow opening for controlling the fluid flow to said passage.

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