June 26, 1934. E. G. MUNZ 1,964,269

SPRAY HEAD

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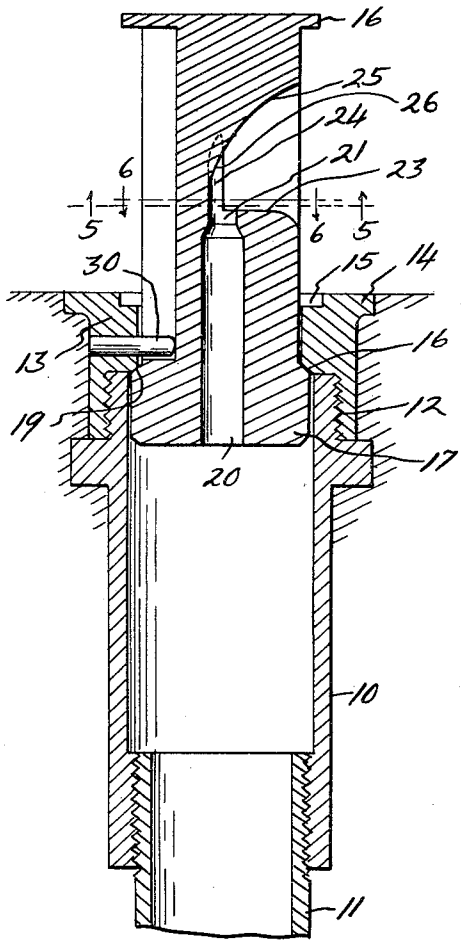


Fig. 1.

Fig. 2.

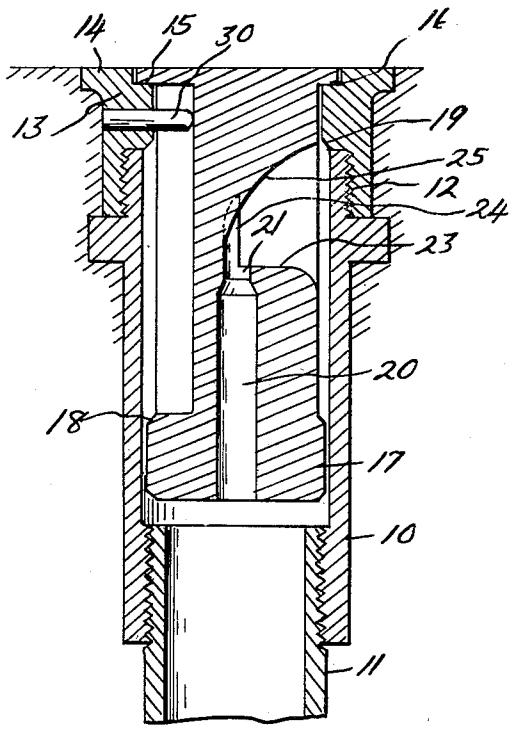
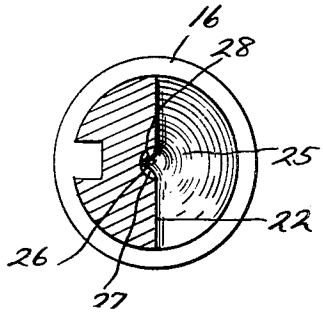


Fig. 5.



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SPRAY HEAD

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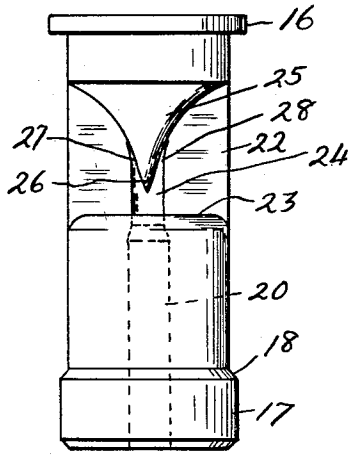
Fig. 1.



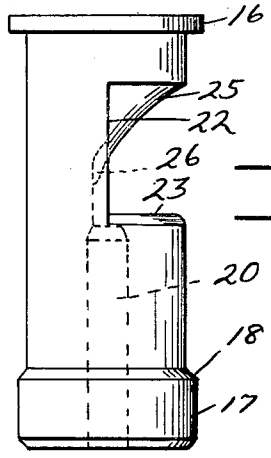


Fig. 3.

Fig. 4.

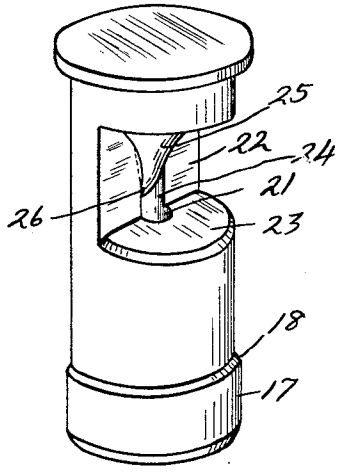
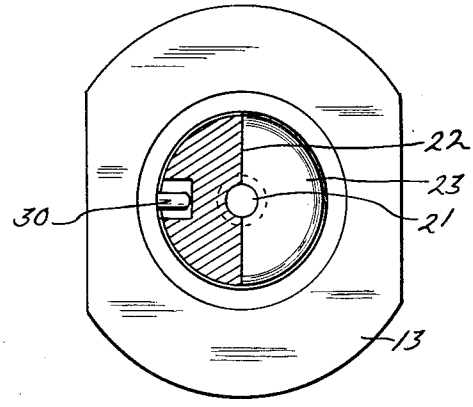


Fig. 6.



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Patented June 26, 1934 1,964,269

UNITED STATES PATENT OFFICE

1,964,269

SPRAY HEAD

Elmer G. Munz, Detroit, Mich.

Application December 21, 1931, Serial No. 582,457

4 Claims. (Cl. 299—18)

This invention relates generally to irrigating apparatus and has particular reference to spraying devices especially designed for use as a permanent fixture in lawn spraying systems.

The invention concerns itself more particularly with a spraying device of the type having a casing adapted to be embedded in the ground and having a nozzle slidably mounted in the casing for movement from a position within the latter flush with the ground to a position spaced above the ground.

One of the principal objects of this invention is to improve generally spraying devices of the type set forth in the preceding paragraph by simplifying the construction of the several parts involved and by reducing the number of such parts to a minimum.

The present invention contemplates minimizing the number of parts involved as well as materially reducing the cost of manufacture by forming the nozzle of one piece construction and fashioning the latter in such a manner as to render machining of the same unnecessary.

A further object of this invention consists in the provision of a spraying nozzle which, in addition to possessing the foregoing advantageous features, is also more efficient in operation as will be more fully hereinafter set forth, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 is a longitudinal sectional view through the spraying device showing my improved nozzle construction;

Figure 2 is a view similar to Figure 1 showing the parts in a different position;

Figure 3 is a side elevational view of the nozzle shown in Figures 1 and 2;

Figure 4 is a fragmentary perspective view of a portion of the nozzle;

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 1;

Figure 6 is a sectional view taken on the line 6—6 of Figure 1; and

Figure 7 is a front elevational view of the nozzle.

As will be observed from Figure 1 of the drawings, my improved spraying device comprises a tubular casing 10 adapted to be embedded within the ground and communicating at the lower end with a suitable water supply pipe 11. The upper end of the casing 10 is threaded as at 12 for detachably receiving a suitable collar 13 terminating at the upper end thereof in a radially outwardly extending flange 14 adapted to be embedded within the ground with the top surface thereof flush with the corresponding surface of the ground. The aforesaid surface of the collar is counterbored concentric with the opening therethrough to form an annular seat 15 adapted to engage the enlarged head on the nozzle when the latter is in the position shown in Figure 2 for supporting the same flush with the top surface of the collar and ground.

The nozzle selected herein for the purpose of illustration is of the type commonly referred to in the art as the half-spray design and is freely slidably mounted within the casing 10 for movement by hydrostatic pressure from the position shown in Figure 2 to the position thereof illustrated in Figure 1. As hereinbefore stated, it is one of the objects of this invention to reduce the number of parts of the nozzle to a minimum and this is accomplished in the present instance by forming the nozzle of one piece construction. While it is possible to secure the foregoing result by casting the nozzle in one piece, nevertheless, I prefer to forge the same from brass or similar metals since, by so doing, machining of the nozzle is practically eliminated and the cost of manufacture is accordingly reduced.

The enlarged head portion aforesaid on the nozzle for engaging the seat 15 on the casing to support the nozzle in its inoperative position within the casing is in the form of a flange 16 extending radially outwardly from the upper end of the nozzle and having a thickness substantially equal to the depth of the counterbored recess in the collar so as to assume a position flush with the top surface of the latter when the nozzle is in the position shown in Figure 2. In order to limit the extent of upward movement of the nozzle relative to the casing and at the same time to form a seal between the casing and nozzle for preventing water under pressure from escaping out of the former past the latter, I form an enlargement 17 on the lower end of the nozzle having an annular seat 18 adapted to engage a corresponding annular seat 19 on the collar when the nozzle is in its operative position shown in Figure 1. In the aforesaid position of the parts, the water under pressure flows through a bore 20 in the lower portion of the nozzle and is discharged from the nozzle through the restricted delivery end 21 of the bore in the manner to be presently set forth.

In order to convert the water under pressure issuing from the delivery end 21 of the bore into a half spray, the nozzle is in effect transversely recessed adjacent the upper end thereof to provide a slot having an inner wall 22 arranged

in a plane parallel to the axis of the nozzle and extending through said axis. The lower edge of the wall 21 terminates in a laterally outwardly extending surface 23 projecting at right angles from the aforesaid wall and forming the bottom wall of the slot. As will be observed from Figure 1, the delivery end of the passage 21 extends through the surface 23 and the inner surface of the wall 22 is provided with an axially extending recess 24 therein forming a continuation of the inner half of the passage 21.

Depending from the upper wall of the slot and extending laterally outwardly from the wall 22 is an inverted conical segment 25 having the apex 26 thereof extending into the upper end of the recess 24 and terminating at a point above the surface 23 in alignment with the delivery end of the passage 21. The apex of the segment 25 serves to divide the upper end of the recess 24 into two passages 27 and 28 extending on opposite sides of the apex and gradually merging into the general plane of the wall 22 as the sides of the segment taper outwardly. In addition to the side walls of the conical segment tapering outwardly in their usual manner, they are also curved inwardly slightly as shown in Figure 3 so as to provide for securing a more efficient spraying of the water.

In order to maintain the slot and conical section in predetermined relationship to the casing during operation of the nozzle, suitable means is provided upon the collar for slidably engaging the nozzle to prevent rotation of the latter relative to the casing. In the present instance, the aforesaid means comprises a pin 30 extending laterally inwardly from the collar for engaging a longitudinally extending recess formed in the wall of the nozzle opposite the conical section 24.

Operation

Assuming that the nozzle is in its inoperative position shown in Figure 2 and that water under pressure is caused to flow through the supply pipe 11, it will be noted that the water in attempting to enter the casing 10 will strike the lower portions of the nozzle and immediately raise the same to its operative position shown in Figure 1. When the nozzle has assumed the latter position, the water is compelled to flow upwardly into the bore 20 in the nozzle whereupon it is discharged through the restricted delivery passage 21 into the transverse slot hereinbefore described. The water issuing from the restricted delivery end of the bore strikes the apex of the conical segment directly above the same and is transformed by the segmental conical surface into a semi-circular spray. As will be apparent from Figure 3, the walls of the conical segment curve gradually outwardly from the apex of the segment so as to relieve the impact of the water against the walls of the segment and thereby minimize any tendency for the water to splash upon striking the segment with the result that maximum spraying efficiency is obtained.

What I claim as my invention is:

1. A sprinkler comprising a nozzle having a transverse slot therein intermediate the ends thereof forming spaced opposite walls and a connecting wall, one of said first-named walls formed with a longitudinally extending passage therethrough having the median axis thereof coincident with the general plane of the connecting wall and the latter having a groove therein forming a continuation of the passage, and means extending from the other of said first-named walls and projecting into said groove for transforming the stream of water issuing from the passage into a spray.

2. A sprinkler comprising a nozzle having a transverse slot therein intermediate the ends of the same forming spaced opposite walls and a connecting wall, one of said first-named walls formed with a longitudinally extending passage therethrough establishing communication between the slot and a source of water under pressure and having the median axis thereof coincident with the general plane of the connecting wall, said last-mentioned wall having a groove therein forming a continuation of the passage, and an inverted substantially conical-shaped segment extending from the other of said first-named walls toward the delivery end of the passage and having the apex thereof projecting into said groove in alignment with the passage whereby the stream of water issuing from the latter is transformed by said segment into a spray.

3. A sprinkler comprising a nozzle having a transverse slot therein intermediate the ends of the same forming spaced oppositely arranged walls and a vertical connecting wall extending through the median axis of the nozzle, one of said first-named walls formed with a longitudinally extending passage therethrough establishing communication between the slot and a source of water under pressure and having the median axis thereof coincident with the general plane of the connecting wall, said latter wall having a groove therein forming a continuation of the passage, and an inverted substantially conical-shaped segment formed integral with the other of said first-named walls and projecting toward the opposite wall with the apex thereof extending into the groove in the path of the stream of water issuing from the passage.

4. A sprinkler comprising a nozzle having a transverse slot therein intermediate the ends of the same forming spaced oppositely arranged upper and lower walls and a connecting side wall, said lower wall formed with a longitudinally extending passage therethrough having the median axis thereof coincident with the general plane of the connecting wall and establishing communication between the slot and a source of water under pressure, said connecting wall having an upwardly extending groove therein forming a continuation of the passage, and an inverted substantially conical-shaped segment depending into the slot from the upper wall of the latter with the apex thereof extending into the groove in alignment with the delivery end of the passage and having outwardly and upwardly curved side walls merging into the general plane of the connecting wall.

ELMER G. MUNZ.