March 15, 1927. 1,621,204

C. F. HUMPHREY

SPRINKLER

Filed Dec. 23, 1924

Fig. 1

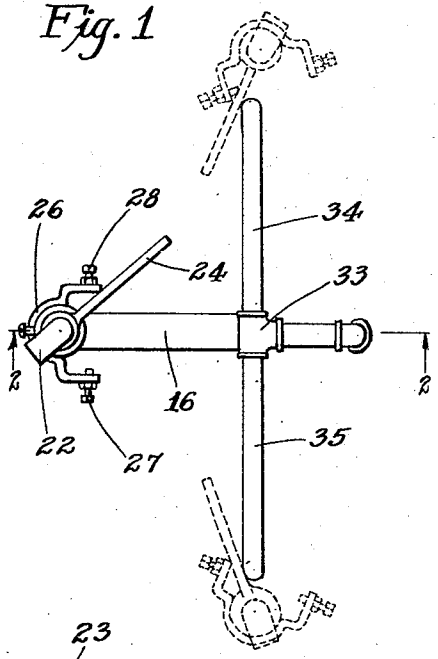
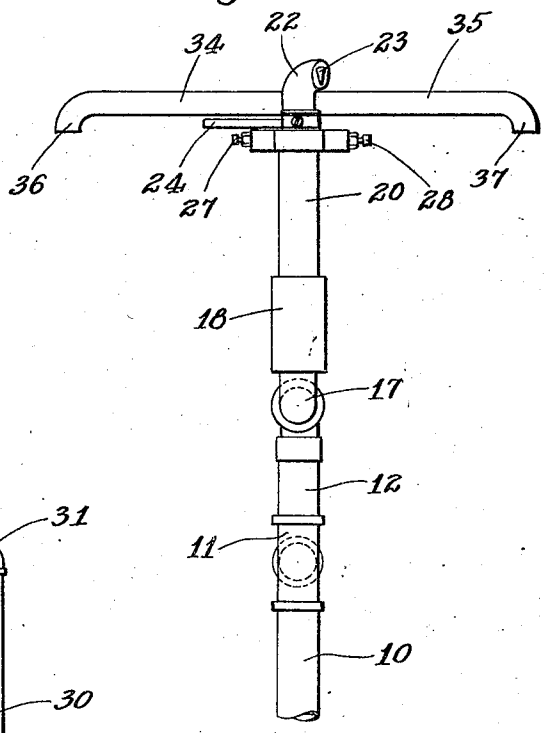


Fig. 3



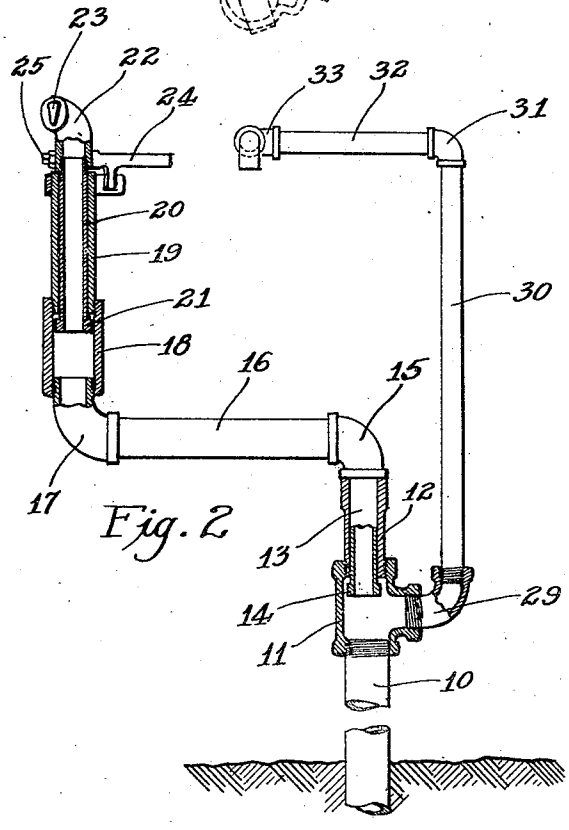


Fig. 2

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UNITED STATES PATENT OFFICE.

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SPRINKLER.

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This invention relates to improvements in sprinklers.

It is an object of the invention to provide an improved sprinkler to irrigate lawns, gardens, and the like, which will have a movable nozzle, whereby a stream of water may be played over a portion of a circle.

A further object of the invention is to provide an improved sprinkler having a standard upon which a member is pivotally mounted, which member carries a pivoted nozzle adapted to engage stops, the whole being so arranged that upon the discharge of water through the nozzle, the member and nozzle carried thereby will be caused to swing upon the standard and to engage the stops so that the direction in which the nozzle discharges the water may be changed, thus producing an oscillatory movement of the member and nozzle carried thereby upon the standard.

With the foregoing and other objects in view which will be made manifest in the following detailed description and pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a top plan view of the improved sprinkler, the extreme positions of the nozzle being indicated in dotted lines;

Fig. 2 is a vertical section taken substantially on the line 2—2 of Fig. 1; and

Fig. 3 is a front elevation of the sprinkler.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the improved sprinkler consists of a standard 10, which may constitute a water pipe or other similar conduit. Upon the standard 10 a T 11 is mounted. A nipple 12 is threaded into the T above the standard 10 and a member 13 is rotatable therein. The member 13 is provided with an enlargement 14 which prevents withdrawal of the member 13 through the nipple 12. The upper end of the member 13 is threaded into an elbow 15. A suitable pipe section 16 is threaded into the elbow 15 and carries an elbow 17 upon which a nipple 18 is mounted. Another nipple 19 is threaded into the nipple 18 and a member 20 similar in construction to the member 13 is rotatable therein. The member 20 is provided with an enlargement 21 which prevents withdrawal of the member 20 from within the nipple 19.

A nozzle 22 is threaded on to the upper end of the member 20. This nozzle is provided with a triangular or V-shaped orifice, as indicated at 23. Because of the fact that the edges of the orifice adjacent the bottom are close together, the friction of the water being discharged through the orifice adjacent the bottom is greater at that point than adjacent the top of the orifice. The result is that the particles of water discharged through the orifice adjacent its bottom are not discharged with as great a velocity as the particles of water discharged through the orifice adjacent the top thereof. This causes certain of the drops of water to fall and strike the ground adjacent the sprinkler as well as at a considerable distance therefrom, so that all of the ground over which the sprinkler is adapted to play is equally irrigated. An arm 24 is secured to the nozzle 22 by means of a set screw 25 and is adapted to cause rotation of the nozzle 22 with respect to the nipple 19. A bracket 26 is secured upon the nipple 19 and has adjustable set screws 27 and 28 which are adapted to engage the arm 24 and adjustably limit its movement.

An elbow 29 is threaded into the T 11 and carries a rod 30. This rod also supports an elbow 31 to which is secured a pipe section 32. Upon the forward end of the pipe section 32 there is disposed a T 33, from which pipe sections 34 and 35 extend. The outer ends of the pipe sections 34 and 35 are bent downwardly, as indicated at 36 and 37 respectively. The down-turned portions of the pipe sections 34 and 35 provide stops engageable by the arm 24.

The operation of the sprinkler is as follows: When water is discharged through the standard or conduit 10, it passes upwardly through the member 13 through the pipe section 16, through the member 20 and is discharged through the nozzle 22. When the nozzle 22 bears an angular relation with respect to the pipe section 16, as shown in Fig. 1, the reaction from the discharge of water through the nozzle exerts a force upon the pipe section 16 which causes the pipe section to swing toward the stop 36. The rate at which the pipe section 16 swings depends upon the angularity of the nozzle 22 and the pipe section 16. If the direction in which the water is discharged from the nozzle 22 is substantially perpendicular to the axis of the pipe section 16, the movement of the

pipe section 16 and nozzle mounted thereon is a maximum. The speed of the movement of the pipe section 16 varies from this maximum speed to zero movement when the nozzle discharges the water in a direction parallel or in line with the axis of the pipe section 16. The angular relation with which the nozzle 22 may bear with respect to the pipe section 16 may be adjusted by means of the adjustable set screws 27 and 28. When the pipe section 16 swings toward the pipe section 34, the arm 24 engages the stop 36. This stops the movement of the pipe section 16 and the nozzle 22, and rotates the nozzle 22 upon the nipple 19 to assume the position indicated in dotted lines adjacent the top of Fig. 1. By thus rotating the nozzle 22, the reaction from the discharge of water causes the pipe section 16 and the nozzle 22 to move in an opposite direction. The arm 24 eventually engages the stop 37 and swings the nozzle 22 into its original position. In this manner, as may be readily understood, the nozzle is caused to oscillate over a portion of a circumference. Obviously, the pipe sections 34 and 35 may be bent so as to cause the nozzle to oscillate over any portion of a circumference which may be greater or less or equal to a half circle.

The member 13, elbows 15 and 17, pipe section 16 and nipples 18 and 19, although in reality are separate pieces, constitute a single member which is rotatable upon the standard 10 and upon which a nozzle is rotatably mounted. Obviously, the arm 24 may be made integral with the nozzle 22, if desired; and also the bracket 26 may be made integral with the nipple 19, if desired. The frame composed of the rod 30, the pipe section 32, and the pipe sections 34 and 35 may be made of a single solid piece, if so desired.

From the above it will be readily understood that an improved sprinkler is provided which may be easily and quickly constructed from conventional plumbers' supplies.

The improved sprinkler entirely does away with gears, which have sometimes heretofore been employed for producing certain types of rotary sprinklers. These gears have the disadvantage of easily and quickly becoming worn because of small particles of sand in the water and because of the fact that they frequently rust. The improved sprinkler is free from these disadvantages and has because of its simplicity of construction a longer life than the aforementioned sprinklers provided with gears.

It will be understood that various changes in the detail of construction may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A sprinkler comprising a standard, a tubular member rotatably mounted upon said standard, a nozzle rotatably mounted upon said tubular member, said nozzle being rotatable about an axis other than the axis of rotation of said tubular member and being disposed to discharge a stream in a direction other than parallel to the axis of rotation of said tubular member, means for supplying fluid to the interior of said tubular member so as to be discharged through said nozzle, an arm carried by said nozzle, and stops mounted upon the standard engageable by said arm whereby upon the discharge of fluid through said nozzle the tubular member will be caused to swing upon said standard until said arm engages upon one of said stops, and thereupon the nozzle will be partially rotated so as to produce movement of said tubular member in the opposite direction until the other stop is engaged.

2. A sprinkler comprising a standard, a tubular member rotatably mounted upon said standard, a nozzle rotatably mounted upon said tubular member, said nozzle being rotatable about an axis other than the axis of rotation of said tubular member and being disposed to discharge a stream in a direction other than parallel to the axis of rotation of said tubular member, means for supplying fluid to the interior of said tubular member so as to be discharged through said nozzle, an arm carried by said nozzle, stops mounted upon the standard engageable by said arm whereby upon the discharge of fluid through said nozzle the tubular member will be caused to swing upon said standard until said arm engages upon one of said stops, and thereupon the nozzle will be partially rotated so as to produce movement of said tubular member in the opposite direction until the other stop is engaged, and means providing stops upon said tubular member for limiting the rotational movement of said nozzle.

3. A sprinkler comprising a standard, a tubular member rotatably mounted upon said standard, a nozzle rotatably mounted upon said tubular member, said nozzle being rotatable about an axis other than the axis of rotation of said tubular member and being disposed to discharge a stream in a direction other than parallel to the axis of rotation of said tubular member, means for supplying fluid to the interior of said tubular member so as to be discharged through said nozzle, an arm carried by said nozzle, stops mounted upon the standard engageable by said arm whereby upon the discharge of fluid through said nozzle the tubular member will be caused to swing upon said standard until said arm engages upon one of said stops, and thereupon the nozzle will be partially rotated so as to produce movement of said tubular member in the opposite direction until the other stop is engaged, and means

providing adjustable stops upon said tubular member providing adjustable limits for the rotational movement of said nozzle.

4. A sprinkler comprising a standard, a tubular member mounted upon said standard for rotation about a vertical axis, a nozzle mounted upon said tubular member for rotation about a different vertical axis, said nozzle being arranged to discharge other than a vertical stream, means for supplying fluid to said tubular member so as to be discharged through said nozzle, an arm carried by the nozzle, and stops mounted upon the standard engageable by said arm whereby upon discharge of fluid through said nozzle, the tubular member may be moved causing the arm to engage the stops and oscillate the nozzle to produce oscillation of said tubular member.

5. A sprinkler comprising a standard, a tubular member mounted upon said standard for rotation about a vertical axis, a nozzle mounted upon said tubular member for rotation about a different vertical axis, said nozzle being arranged to discharge other than a vertical stream, means for supplying fluid to said tubular member so as to be discharged through said nozzle, an arm carried by the nozzle, stops mounted upon the tubular member engageable by said arm, and stops mounted upon the standard engageable by said arm whereby upon discharge of fluid through said nozzle, the tubular member may be moved causing the arm to engage the stops and oscillate the nozzle to produce oscillation of said tubular member.

In testimony whereof I have signed my name to this specification.

CHARLES F. HUMPHREY.