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OSCILLATING LAWN SPRINKLER

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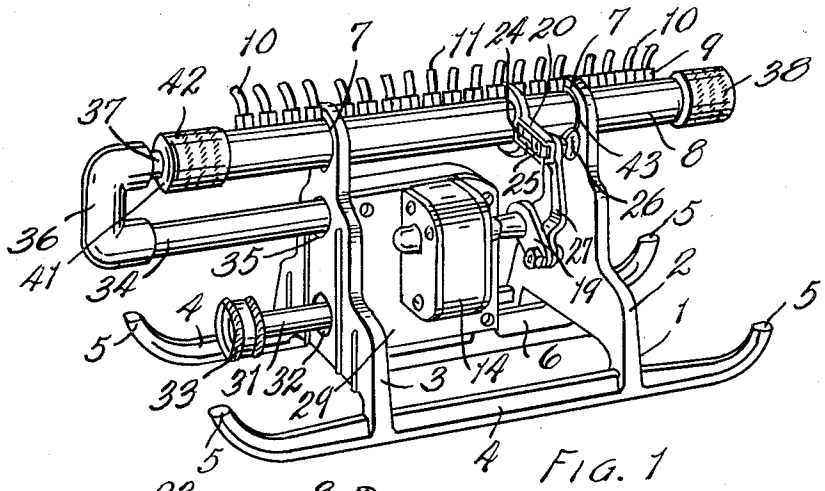


FIG. 1

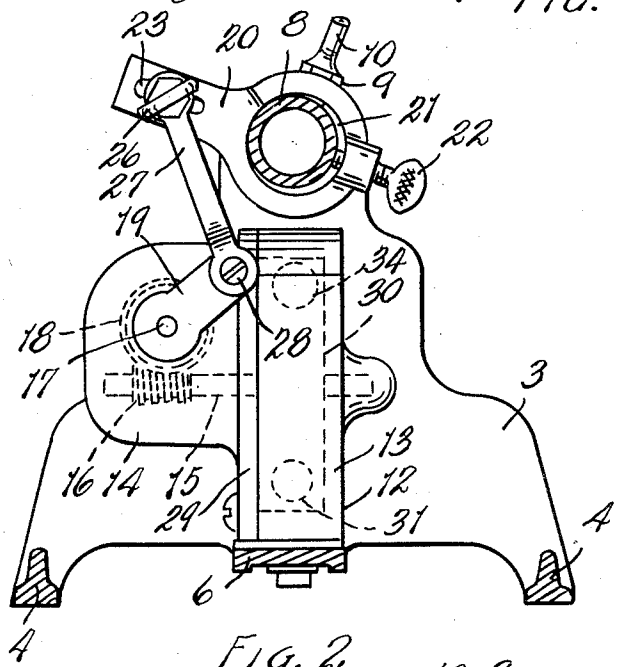


FIG. 2

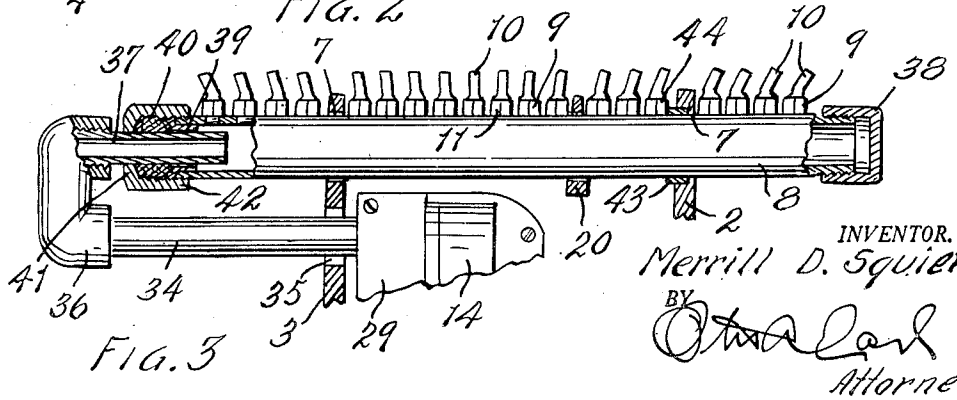


FIG. 3

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OSCILLATING LAWN SPRINKLER

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4 Claims. (Cl. 299—67)

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This invention relates to improvements in lawn and garden sprinklers.

The main objects of this invention are:

First, to provide a sprinkler which covers a relatively large area and at the same time one which is portable and compact.

Second, to provide a sprinkler in which the spray pipe may be angularly adjusted relative to the operating mechanism to permit the desired direction of the spray and to permit use close to a sidewalk or building or the edge of a lawn or garden.

Third, to provide a sprinkler which is efficient in operations under a wide range of pressures.

Fourth, to provide a structure having these advantages which may be economically produced and one in which the operating parts are well protected.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a side perspective view of a sprinkler embodying my invention.

Fig. 2 is an enlarged vertical transverse section.

Fig. 3 is a fragmentary side elevational view of the sprinkler illustrating the spray pipe mounting and the delivery connection thereto, portions of the spray pipe and support being broken away in vertical cross section.

The embodiment of my invention illustrated comprises a support designated generally by the numeral 1 and including a pair of spaced plate-like uprights 2 and 3 having conecting runner-like base members 4 formed integrally therewith, these base members 4 having upturned ends 5 which permit the sprayer to be dragged along on the ground. The uprights are further connected by the centrally disposed longitudinal bar 6. Desirably these support parts are formed as an integral light metal alloy casting such for example as that known commercially as "tensaloy".

The uprights 2 and 3 are provided with openings 7 at their upper ends through which the spray pipe 8 is arranged. This spray pipe 8 is provided with a plurality of nozzles 9 arranged in alignment, the nozzles 9 having tips 10 which are disposed in alignment but which are arranged in two series in that the nozzles at each side of the central nozzle 11 are bent in increasing degree and pointing oppositely, thereby increasing the distribution area and insuring a very uniform coverage and to a considerable degree reducing end thrust.

The water motor designated generally by the numeral 12 comprises a rotor casing 13 with a laterally projecting gear box portion 14. The

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motor is mounted on the longitudinal bar 6 between the uprights. The motor shaft 15, indicated by dotted lines in Fig. 2, is provided with a worm gear 16 disposed in the gear housing portion 15. The driven shaft 17 is arranged at right angles to the driving shaft and is provided with a worm gear 18 meshing with the worm 16 of the driving shaft.

The driven shaft projects from the gear box portion of the casing and is disposed parallel to the spray pipe. The driven shaft is provided with a crank arm 19 at its outer end. An arm 20 is disposed on the spray pipe between the uprights and between adjacent nozzles. This arm 20 is provided with an opening 21 receiving the spray pipe, the arm being secured to the spray pipe by means of the thumb screw 22. This connection permits the angular adjustment of the spray pipe and its nozzles relative to the arm, thereby determining the oscillating stroke or position of the nozzles.

The arm 20 is provided with a longitudinal slot 23 and has a channel 24 on one side receiving the nut or slide block 25 of the connecting pin 26 which is in the form of a thumb screw for convenient adjustment.

The connecting rod 27 is connected to the crank by means of the crank pin 28 and to the arm by this pin 26. This permits not only the angular adjustment of the spray pipe but of a substantial variation in its oscillating stroke. The connections for the drive shaft to the spray pipe are all between the uprights and desirably adjacent to one of them as is illustrated so that these lighter parts are effectively protected.

The motor casing or housing includes a removable side plate 29 which carries the gear box portion of the motor casing so that access is afforded to the rotor indicated by the dotted lines 30. A supply pipe 31 extends through an opening 32 in the upright 3 and is provided with a coupling 33 adapted to facilitate the attachment of a hose.

The discharge pipe 34 of the motor is arranged through an opening 35 in the upright 3 and is connected by the U-shaped coupling 36 to the delivery pipe 37 disposed axially of the spray pipe to project into the same and to constitute a journal for the front end of the spray pipe. The front end of the spray pipe is rotatably mounted or swiveled upon the delivery pipe 37 by means of a combined packing and bearing consisting of the sleeve 39 which quite loosely embraces the pipe section 37. The packing 40 is arranged between the flanged ends of the sleeve 39 and the flange 41 of the gland 42, the packing being supported by the gland so that it may be adjusted to provide a water seal and to compensate for such wear as may result.

The packing material is a relatively hard lubricant bearing material. The opening 7 of the rear upright 2 is provided with a combined radial

and axial thrust bearing 43 with which the adjacent nozzle 44 coacts to sustain the end thrust on the spray pipe. This arrangement provides a selfaligning bearing support for the spray pipe and avoids the necessity for great accuracy in the manufacture of the parts. The rear end of the spray pipe is provided with a closure cap 38.

I have illustrated and described my invention in a highly practical commercial embodiment thereof. I have not attempted to illustrate or describe structural details which I contemplate. The motor details are not illustrated but the motor is desirably that of my application for patent filed April 25, 1946, Serial No. 664,863.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a sprinkler, the combination of a support comprising a pair of spaced uprights, integral runner-like base members having upturned ends, and a central longitudinal bar connected between said uprights, said uprights having openings at their upper ends, a spray pipe disposed through said openings, and provided with a series of longitudinally spaced nozzles positioned in a line therealong, a combined radial and thrust bearing disposed in the opening of the rear upright, one of said nozzles being in thrust sustaining engagement with the front end thereof, a water motor comprising a casing mounted on said longitudinal bar between said uprights and having a driving shaft disposed transversely relative to the spray pipe and provided with a worm disposed within the casing, a driven shaft projecting from said casing and provided with a worm gear coacting with said worm on said driving shaft, a crank on the outer end of said driven shaft, an arm positioned on said spray pipe between adjacent nozzles and between said uprights and having an opening therein receiving said spray pipe and provided with a set screw whereby the spray pipe may be angularly adjusted relative to the arm to direct the spray nozzles, said arm having a longitudinal slot, a connecting rod pivotally connected to said crank and provided with a pin adjustable in said slot whereby the stroke of the spray pipe may be adjusted, water supply and discharge pipes for said motor disposed through one of the uprights between said rails and said spray pipe, the discharge pipe having a delivery portion projecting into the front end of the spray pipe and constituting a bearing spindle, and a combined packing and bearing unit for said spindle.

2. In a sprinkler, the combination of a support comprising a pair of spaced uprights, a base member and a longitudinal bar extending between and connected to said uprights, at least one of said uprights having a bearing, a spray pipe projecting through said uprights and disposed in said bearing, a water motor comprising a casing mounted on said longitudinal bar between said uprights and having a driving shaft disposed transversely relative to the spray pipe, a driven shaft projecting from said casing disposed in parallel relation to the spray pipe, a crank on the outer end of said driven shaft, an arm positioned on said spray pipe between said uprights and having an opening therein receiving said spray pipe and provided with a set screw whereby the spray pipe may be angularly adjusted relative to the arm to direct the spray, said arm having a longitudinal slot, a connecting rod pivotally connected to said crank and provided with a pin adjustable in said slot whereby the stroke of the spray pipe may be adjusted, and water supply and discharge pipes for said motor disposed through one of the uprights between the top and bottom thereof, the front end of said spray pipe being rotatably supported on the delivery end of said motor discharge pipe.

3. In a sprinkler, the combination of a support comprising a pair of spaced uprights, a runner-like base member connecting said uprights, and a longitudinal bar extending between and connected to said uprights, a spray pipe rotatably mounted on said uprights and provided with a series of longitudinally spaced nozzles positioned in a line therealong, a water motor comprising a casing mounted on said longitudinal bar between said uprights and having a driving shaft disposed transversely relative to the spray pipe and provided with a worm disposed within the casing, a driven shaft projecting from said casing and provided with a worm gear coacting with said worm on said driving shaft, a crank on the outer end of said driven shaft, an arm disposed on said spray pipe between adjacent nozzles and between said uprights and adjustably connected to said spray pipe whereby the spray pipe may be angularly adjusted relative to the arm to direct the spray nozzles, said arm having a longitudinal slot, a connecting rod pivotally connected to said crank and provided with a pin adjustable in said slot whereby the stroke of the spray pipe may be adjusted, and water supply and discharge pipes for said motor, said spray pipe having a swivel connection to said discharge pipe.

4. In a sprinkler, the combination of a support comprising a pair of spaced uprights, a base member and a longitudinal bar connecting said uprights, one of said uprights having a bearing opening therein, a spray pipe rotatably supported on said uprights disposed through said opening, a water motor mounted on said longitudinal bar between said uprights, a discharge pipe for said motor having a delivery portion axially aligned with and projecting into the forward end of said spray pipe and constituting a journal therefor, a combined packing and bearing for the forward end of said spray pipe whereby it is rotatably mounted on said delivery portion, a combined radial and thrust bearing for said spray pipe mounted in said bearing opening of said upright, said spray pipe being provided with a series of longitudinally spaced nozzles, one of which coacts with the forward end of said bearing on said upright to sustain the axial thrust of the spray pipe, and operating connections for said spray pipe to said motor whereby the spray pipe is oscillated.

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