March 15, 1960 J. A. ROYER 2,928,608

ADJUSTABLE STOP FINGER UNIT FOR REVERSIBLE SPRINKLERS

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Fig. 1

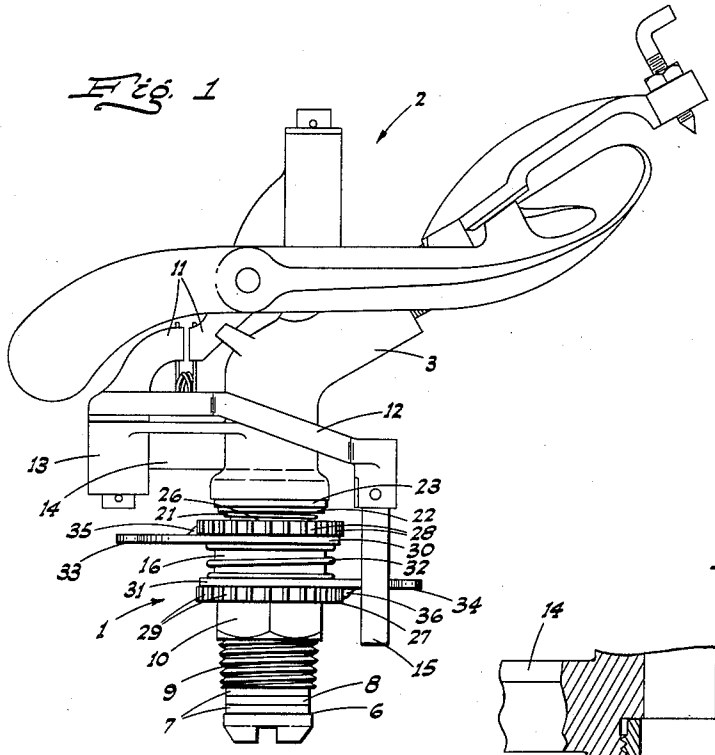


Fig. 2

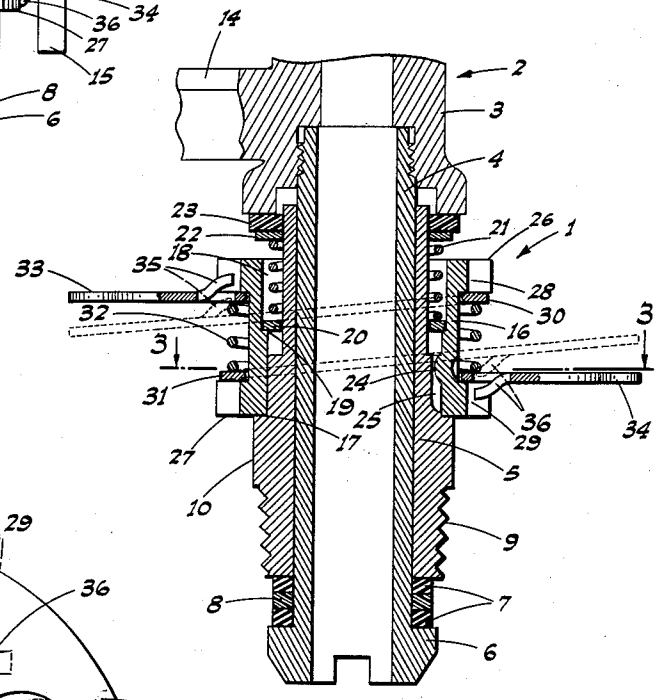
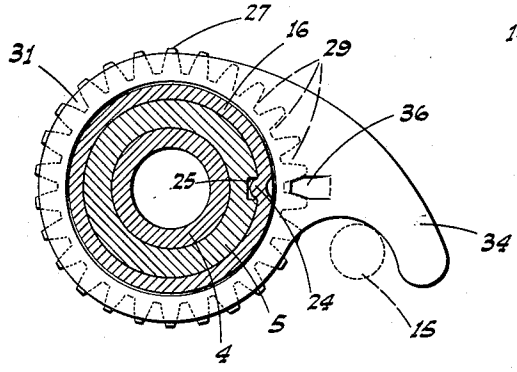


Fig. 3



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ADJUSTABLE STOP FINGER UNIT FOR REVERSIBLE SPRINKLERS

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9 Claims. (Cl. 239—230)

This invention relates in general to sprinklers for watering lawns or gardens, and in particular is directed to an improvement in a sprinkler of the automatically reversible type; i.e. one which runs alternately clockwise and counter-clockwise, through an arc of movement of less than 360 degrees, whereby to sprinkle less than a full circle area.

A sprinkler of the type to which the present invention is adapted is shown in United States Patent No. 2,816,798, and includes a rotary sprinkler unit having reversing mechanism thereon, and a stationary mount on which the sprinkler unit is turnable. Such mechanism is responsive to movement of a generally horizontally and reversibly swingable trigger pin depending from the rotary sprinkler unit adjacent but clear of the mount, and the latter supporting a pair of outwardly projecting circumferentially spaced stop ngers between which the trigger pin travels upon rotation of such sprinkler unit. Upon the trigger pin being engaged and relatively moved by each stop finger, such mechanism is caused to function and reverses the direction of travel of the sprinkler unit.

The stop fingers are adjustable to alter the circumferential spacing thereof whereby to predetermine the arc of travel of the sprinkler unit, and it is the primary object of the present invention to provide a novel stop finger unit, for the purpose described, wherein the circumferentially spaced stop fingers are readily and conveniently manually adjustable yet normally positively maintained in set position and against accidental rotational displacement.

It is also an object of the invention to provide an adjustable stop finger unit which is designed for ease and economy of manufacture of the components; simplicity of assembly; and long trouble-free service.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is an elevation of an automatically reversible rotary type sprinkler embodying the present invention; the adjustable stop finger unit being shown in full lines.

Fig. 2 is an enlarged sectional elevation showing the adjustable stop finger unit and adjacent or related parts of the sprinkler unit mount.

Fig. 3 is a sectional plan view taken on line 3—3 of Fig. 2.

Referring now more particularly to the drawings and to the characters of reference marked thereon, the adjustable stop finger unit, hereinafter described in detail, is indicated generally at 1 and is shown as arranged on an automatically reversible sprinkler having a rotary sprinkler unit 2 illustrated somewhat diagrammatically in Fig. 1. Such sprinkler unit 2 includes a rotary, water passage head 3 threaded at its lower end onto the upper end of a tubular depending spindle 4.

The spindle 4 extends downwardly in rotatable relation through a fixed tubular body or mounting sleeve 5;

the lower end of the spindle 4 projecting below said mounting sleeve 5 and there being formed with a radial shoulder 6. A washer assembly surrounds the spindle 4 between the radial shoulder 6 and the lower end of said sleeve; such assembly including vertically spaced rubber washers 7 having a plastic washer 8 therebetween. The spindle 4 is maintained against downward displacement in the mounting sleeve 5 in the manner as will hereinafter appear.

Such mounting sleeve 5 is threaded at its lower end, as at 9, so that such sleeve may be threadingly engaged with the upper end of a water supply standpipe (not shown) which may be of either stationary or portable type. Above the threaded portion 9 of the sleeve 5, the latter is formed with a nut 10 to which a wrench may be applied.

The reversible sprinkler unit 2 includes reversing mechanism shown in part at 11, and which mechanism is responsive to a horizontally and reversibly swingable arm structure 12 pivoted at one end in connection with a boss 13 held in standoff relation to the head 3 by a bracket 14. From the boss 13, the arm structure 12 extends in clearance relation and to the opposite side of the rotary head 3, and such arm structure is provided, at the end opposite said boss 13, with a depending trigger pin 15. Such trigger pin is disposed adjacent but outwardly of the upper portion of the mounting sleeve 5.

A vertical collar 16—which comprises a primary element of the stop finger unit 1—surrounds the mounting sleeve 5 above the nut 10, and such collar normally rests, at its lower end, on an upwardly facing annular shoulder 17 formed on such sleeve.

Starting at a point above the shoulder 17, the tubular spindle 4 is decreased in outside diameter while the collar 16 is increased in inside diameter whereby to form an annular pocket 18 open to the upper end of said collar 16. Short of the bottom of the annular pocket 18 the collar 16 is internally shouldered, as at 19, and a stop washer 20 rests on such shoulder 19 in surrounding relation to the spindle 4.

The washer 20 provides a bottom stop for a helical compression spring 21 disposed in the annular pocket 18 in surrounding relation to the adjacent portion of the spindle 4; such compression spring 21 extending above the upper end of the collar 16 and bearing against a metallic washer 22 which in turn engages a plastic washer 23. The plastic washer 23 abuts the lower end of the rotary head 3 to permit of non-dragging rotation of the latter; the plastic washer 8 between the rubber washers 7 likewise permitting the spindle 4 to relatively freely rotate with said head 3.

By reason of the above described assembly, the tubular spindle 4 is maintained—under the force of the compression spring 21—against downward displacement in the mounting sleeve 5 and with the adjacent washers 7 and 8, and 22 and 23, in proper engagement.

At a point in the circumference thereof and adjacent its lower end, the vertical collar 16 is provided with an inwardly deformed detent 24 which engages in an upwardly opening vertical groove 25 in the mounting sleeve 5; such arrangement preventing rotation of the collar 16 relative to said mounting sleeve 5 yet permitting the collar to be manually moved upwardly against the compression of spring 21 until the detent escapes the groove.

The collar 16 is formed—at its upper end—with an annular radially outwardly projecting gear-like flange 26, while a similar flange 27 is provided on the lower end of said collar; the flanges 26 and 27 thus providing a plurality of vertically opening circumferentially spaced notches, the upper notches being indicated at 28 and the lower notches at 29.

An upper ring 30 and a lower ring 31 surround the

collar 16 in normal engagement with the upper flange 26 and the lower flange 27, respectively. The rings 30 and 31 are normally maintained in such flange-engaging positions by a helical compression spring 32 which surrounds said collar 16 and abuts at the ends against the related rings.

The rings 30 and 31—which have relatively loose-play relation on the collar 16—are each formed with an outwardly projecting stop finger; such stop fingers being indicated at 33 and 34, respectively.

A dog 35 is struck upwardly from the ring 30 while another dog 36 is struck downwardly from the ring 31; the dog 35 normally engaging in one of the notches 28, while the dog 36 normally engages in one of the notches 29. This effectively latches the fingers 33 and 34 in selective positions of rotative adjustment; such fingers being circumferentially spaced and disposed on opposite sides, and in the path of travel, of the depending trigger pin 15. Thus, when the sprinkler unit 2 is travelling in one direction, the trigger pin 15 engages and is relatively moved by one of the stop fingers which reverses such sprinkler unit. A similar action occurs when the sprinkler unit 2 travels in the opposite direction and engages the other finger. In this way the sprinkler unit 2 is caused to alternately run clockwise and counter-clockwise through an arc of less than 360 degrees, and the extent of which arc is predetermined by the setting of the fingers 33 and 34.

When it is desired to change the setting of such fingers, to alter the arc of travel of the sprinkler unit 2, the upper finger 31 is depressed until the dog 35 escapes the engaged notch 28, and the lower finger 34 is raised until the dog 36 escapes the engaged notch 29, as shown in dotted lines in Fig. 2. With the dogs free of the notches, the fingers 33 and 34 can be adjusted in their circumferential spacing to change the arc of movement of the sprinkler unit 2. After the fingers are so adjusted, they are released, and under the force of the compression spring 32 the dogs 35 and 36 re-engage in adjacent notches 28 and 29, respectively, to hold the new setting of the fingers. Not only can the fingers 33 and 34 be readily, quickly and conveniently manually circumferentially adjusted, as above described, but when in any adjusted position are positively latched by means of the dogs 35 and 36 against accidental circumferential displacement.

In addition to maintaining the collar 16 non-rotatable on the mounting sleeve 5, the arrangement of the detent 24 and groove 25 permits the collar 16—together with the parts carried thereby—to be manually slipped upwardly on said sleeve 5 until the detent 24 is free of the groove 25. This then permits the mounting sleeve 5 to be rotated free of the collar 16 as when such sleeve is being threaded into a water supply standpipe. Further, the arrangement of the detent 24 and groove 25 facilitates initial assembly of the collar 16 on the mounting sleeve 5.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful and upon which Letters Patent is desired:

1. In an automatically reversible sprinkler which includes a rotary sprinkler unit journaled on and upstanding from a fixed mount, a reversing trigger element depending from said sprinkler unit laterally of the mount, and an adjustable stop finger unit on the mount including outwardly projecting circumferentially spaced stop fingers disposed on opposite sides of said trigger element and in the path of movement thereof; said stop finger unit comprising a pair of rings from which corresponding stop fingers project, means supporting the rings in surrounding relation to and for rotative adjustment about the mount, and means between the mount and each ring manually releasably latching the latter in a selective rotative position; the rings being movable toward each other by the respective fingers, and a compression spring engaged between the rings yieldably resisting said movement; the corresponding latching means being released upon such movement of each ring so as to then permit rotative adjustment thereof to another selective position.

2. A device, as in claim 1, in which the latching means for each ring comprises an annular member non-rotatable relative to and surrounding the mount on the side of the ring opposite the spring, said member having a plurality of circumferentially spaced recesses therein and the spring urging the ring against such member, and a dog on the ring normally engaged in a selected one of said recesses.

3. A device, as in claim 2, in which each annular member is of gear-like form; the recesses being the notches of the gear-like members.

4. In an automatically reversible sprinkler which includes a rotary sprinkler unit journaled on and upstanding from a fixed mount, a reversing trigger element depending from said sprinkler unit laterally of the mount, and an adjustable stop finger unit on the mount including outwardly projecting circumferentially spaced stop fingers disposed on opposite sides of said trigger element and in the path of movement thereof; said stop finger unit comprising a collar surrounding the mount in non-rotatable relation, annular flanges projecting outwardly from the collar in vertically spaced relation, a pair of rings on the collar between the flanges, a helical compression spring on the collar between the rings, the spring normally urging the rings against the adjacent flange, each ring having one of the stop fingers radiating therefrom, and manually releasable latch means between each ring and the adjacent flange.

5. A device, as in claim 4, in which the latch means comprises a dog on each ring extending toward the adjacent flange, and the latter having a plurality of recesses into one of which the dog engages.

6. A device, as in claim 5, in which each ring has loose play on the collar whereby to permit ready vertical movement of the ring, by the related stop finger, in a direction to withdraw the corresponding dog from the recess in which said dog is engaged.

7. In an automatically reversible sprinkler which includes a rotary sprinkler unit journaled on and upstanding from a fixed mount, a reversing trigger element depending from said sprinkler unit laterally of the mount, and an adjustable stop finger unit on the mount including outwardly projecting circumferentially spaced stop fingers disposed on opposite sides of said trigger element and in the path of movement thereof; said stop finger unit comprising a collar surrounding the mount in non-rotatable relation, annular flanges projecting outwardly from the collar in vertically spaced relation, a pair of rings on the collar between the flanges, a helical compression spring on the collar between the rings, the spring normally urging the rings against the adjacent flange, each ring having one of the stop fingers radiating therefrom, the annular flanges each being of gear-like form to provide a plurality of circumferentially spaced notches, and a dog on each ring extending toward and normally engaging in a selected notch of the adjacent flange.

8. In an automatically reversible sprinkler which includes a rotary sprinkler unit journaled on and upstanding from a fixed mount, a reversing trigger element depending from said sprinkler unit laterally of the mount, and an adjustable stop finger unit on the mount including outwardly projecting circumferentially spaced stop fingers disposed on opposite sides of said trigger element and in the path of movement thereof; the mount being a fixed vertical sleeve, and said stop finger unit compris-

ing a collar surrounding the sleeve, means between the sleeve and collar normally preventing rotation of the latter, annular flanges projecting outwardly from the collar in vertically spaced relation, a pair of rings on the collar between the flanges, a helical compression spring on the collar between the rings, the spring normally urging the rings against the adjacent flange, each ring having one of the stop fingers radiating therefrom, and manually releasable latch means between each ring and the adjacent flange.

9. A device, as in claim 8, in which the means between the sleeve and collar comprises an inwardly extending detent on the latter, the sleeve having a relatively short vertical groove in which the detent normally seats, the

sleeve being of reduced diameter above the groove so that the latter is open at its upper end, the collar being slidable upwardly on the sleeve to cause escape of the detent from said groove, and a compression spring on the sleeve between the sprinkler unit and collar yieldably resisting such upward movement of the collar.

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