

Feb. 9, 1943.

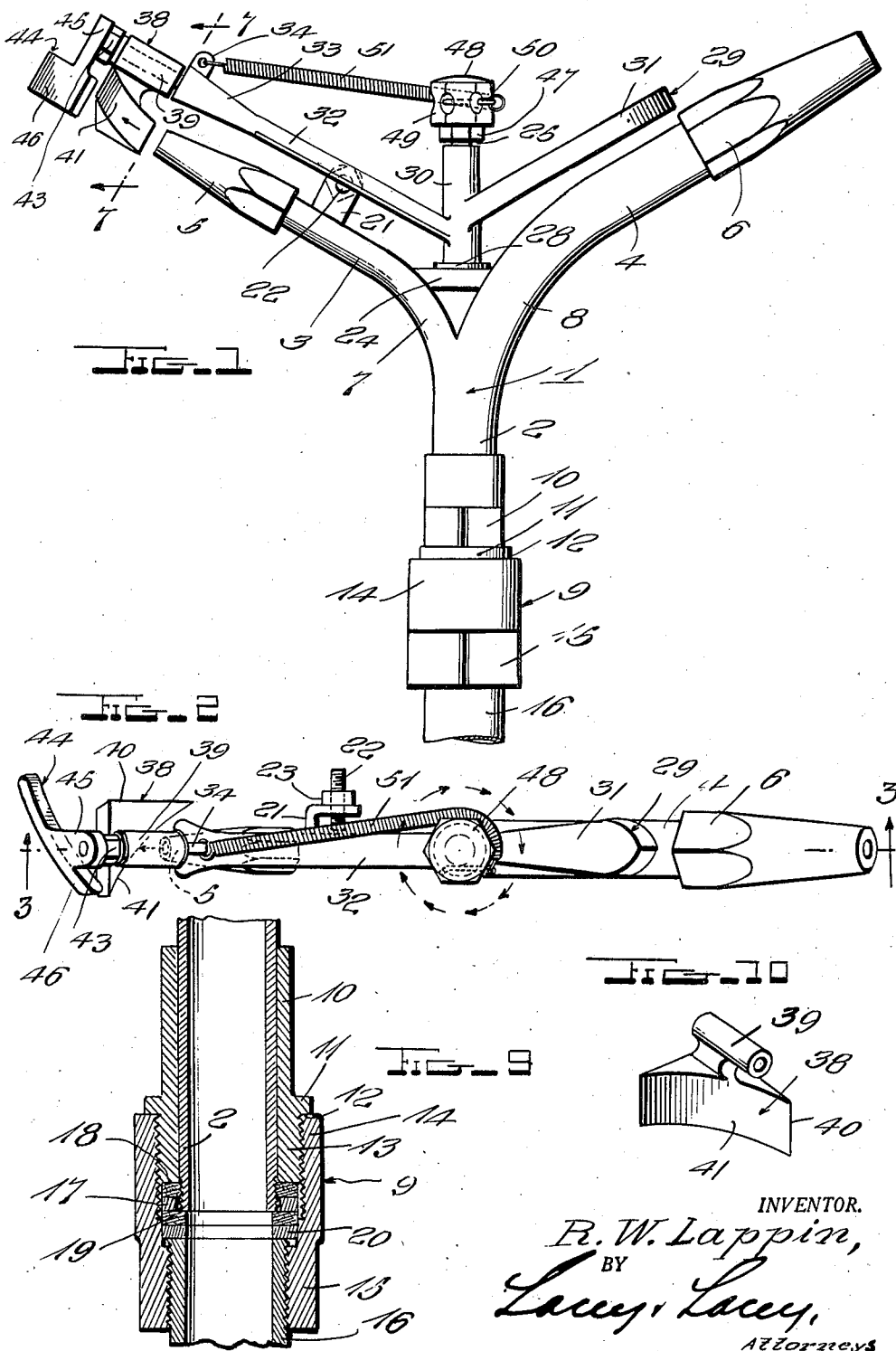
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LAWN SPRINKLER

Filed May 19, 1941

2 Sheets-Sheet 1



INVENTOR.
R. W. Lappin,
BY
Lacey, Lacey,
Attorneys

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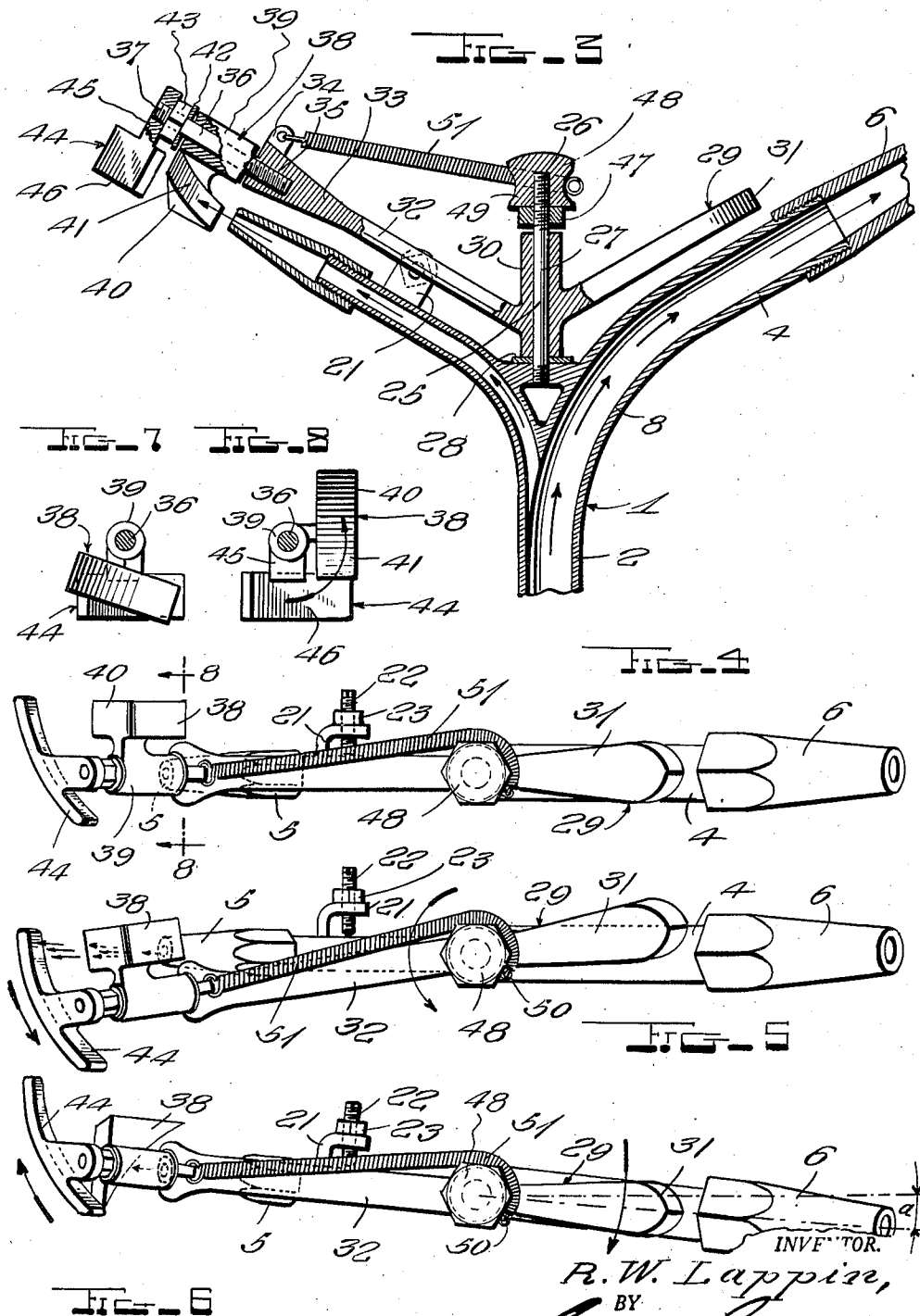
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Attorneys

UNITED STATES PATENT OFFICE

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LAWN SPRINKLER

Ralph W. Lappin, Salina, Kans.

Application May 19, 1941, Serial No. 394,203

2 Claims. (Cl. 299—69)

This invention relates to irrigating devices and more particularly to an improved sprinkler.

One object of the invention is to provide a sprinkler having means for imparting step by step rotative movement to the body employed for assuring effective diffusion of water throughout a complete circle.

Another object of the invention is to provide a sprinkler which is so constructed that, with a given amount of pressure, maximum distribution of water throughout a maximum area of distribution will be assured.

A further object of the invention is to provide a device of this character which may be adjusted so that the speed of rotation of the body may be varied.

And still another object of the invention is to provide a sprinkler which employs but few working parts with the result that wear will be reduced to a minimum.

Still other objects of the invention, not specifically mentioned hereinbefore, will become apparent during the course of the following description.

In the drawings forming a part of this application:

Figure 1 is a side elevation of my improved sprinkler,

Figure 2 is a top plan view of the device,

Figure 3 is a vertical transverse sectional view on the line 3—3 of Figure 2 looking in the direction of the arrows, the diverting block being shown in its lowermost position,

Figure 4 is a top plan view of the invention and showing the diverting block in raised position,

Figure 5 is a top plan view of the device and showing the diverting block in raised position and showing the driving arm swung away from inoperative position to a position it will assume preliminary to a driving stroke,

Figure 6 is a top plan view showing the device as it would appear upon completion by the driving arm of the driving stroke,

Figure 7 is a detail sectional view on the line 7—7 of Figure 1,

Figure 8 is a detail sectional view on the line 8—8 of Figure 4,

Figure 9 is an enlarged vertical sectional view showing the coupling or mounting structure for the body, and

Figure 10 is an enlarged detail perspective view of the diverting block.

In the drawings similar numerals of reference

will be seen to designate like parts throughout the views.

Referring now more particularly to the drawings, the numeral 1 indicates in general the body of my improved sprinkler. The body 1 is of substantially Y-shape and includes a stem 2 and diverting branches 3 and 4, the branch 3 being relatively small with respect to the branch 4. The body 1 will, of course, preferably be cast or otherwise formed from a single piece of metal. Screwed on the outer end of the branch 3 is a nozzle 5. A nozzle 6 is similarly screwed on the outer end of the branch 4. The nozzle 6 is, of course, of considerably larger diameter than the nozzle 5. It is desired at this point to call attention to the fact that the branches 3 and 4 divert from the stem 2 in easy arcs, said arcs or curved portions being shown at 7 and 8. In view of the fact that the arcs or curved portions 7 and 8 curve gently, minimum opposition to flow of liquid under pressure will be offered with the result that the water will be permitted to project to the maximum distance from ends of the nozzles 5 and 6.

As best seen in Figure 9, the stem 2 is rotatably mounted in a coupling which is shown generally at 9. The coupling 9 includes a sleeve 10 which surrounds the lower end portion of the stem. The sleeve 10 is formed with a radial flange 11 which defines a shoulder 12, said sleeve being also formed, beneath the shoulder 12, with a thickened externally threaded portion 13 which is screwed into the internally threaded upper end of the coupling, said upper end being shown at 14. The coupling 9 also includes an internally threaded lower end portion 15 which receives the threaded upper end of a discharge pipe 16. The lower end portion of the stem 2 is externally threaded and is screwed into a metal bushing or retaining ring 17 which is disposed within the coupling 9 between the ends of the pipe 16 and the threaded portion 13. Disposed between the ring 17 and the lower end face of the threaded portion 13 is a packing ring 18. A packing ring 19 abuts the lower end of the stem and cooperates with the packing ring 18 for preventing leakage from the coupling. A bearing ring 20 is disposed between the ring 19 and the upper end of the pipe 16 and defines an abutment for the packing ring 19. It will thus be seen that the stem 2 is freely rotatable within the coupling 9 but is prevented from displacement therefrom by the ring 17.

Suitably secured to the branch 3, rearwardly of the nozzle 5, and offset at one side of said

branch is a stop plate 21, said stop plate extending upwardly at right angles from the branch and being apertured near its upper end to receive a set screw 22 which is screwed through the aperture at right angles to said stop plate. A lock nut 23 is carried on the set screw 22 for the purpose of locking said screw in a desired adjusted position.

As best seen in Figures 1 and 3 of the drawings, the body 1 is formed, between the branches 3 and 4, with a mounting web 24, and screwed into the mounting web and extending vertically therefrom is a stem 25. As will be seen in Figure 3, the stem is threaded at its lower end and is threaded near its upper end, as shown at 26. The central portion of the stem is unthreaded, as shown at 27. Overlying the upper surface of the web 24 and surrounding the stem is a bearing washer 28.

In order to impart step by step rotative movement to the body, I provide a driving arm which is indicated generally at 29. The driving arm includes a hub or mounting sleeve 30 which is swingingly mounted on the stem 25. Said driving arm is cast in one piece and includes a counter-weight 31 and an arm element 32, said arm element being gradually enlarged toward its outer end, as shown at 33 and being formed at said outer end with an apertured lug 34. As clearly seen in Figures 1 and 3 of the drawings, the element 32 is disposed in parallel spaced relation to the branch 3 of the body above said branch. When in normal position, the element 32 overhangs the branch 3 throughout its length, the element, in this position, being held in said overhanging position by the set screw 22. Formed in the enlarged outer end 33 of the element 32 is a socket 35 and screwed into the socket is a mounting bolt 36, said mounting bolt having a threaded outer end portion 37. Swingingly mounted on the bolt 36 is a diverting block 38, said diverting block including a body sleeve 39 and a block element 40, said block element having an arcuate diverting surface 41. The operation of the diverting block will be set forth in more detail hereinafter. Surrounding the bolt 36 and engaging the end of the diverting block is a washer 42. Screwed on the threaded portion 37 of the bolt is a nut 43 which limits the diverting block against displacement from the bolt. Screwed on the remainder of the threaded portion 37 is an operating block 44 which includes a lug 45 and an arcuate angularly disposed operating element 46.

Screwed on the threaded portion 26 of the stem 25 is a retaining nut 47 and screwed on the remainder of the threaded portion 26 and locking the retaining nut 47 in place is a cap 48, said cap having an angular groove 49 therein. Carried on the cap 48 and extending chordally therethrough is an eye bolt 50 and connected between the eye bolt 50 and the apertured lug 34 on the element 32 is a retractile spring 51, said spring having its inner end portion extending partially about the cap within the groove 49.

The operation of my improved lawn sprinkler will now be described. After water has been turned into the pipe 16, said water will flow through said pipe into the coupling 9 and into the stem 2 of the body 1. The water will, of course, be under the usual pressure carried in conventional water mains. After entering the stem 2 the water will flow upwardly through the branches 3 and 4 and will discharge through the nozzles 5 and 6. In view of the fact that the

branch 4 is relatively large, a greater portion of the water will pass therethrough than will pass through the branch 3. The curve 8 will, of course, permit passage of water through the branch with a minimum amount of obstruction.

As stated, water will pass through the branch 3 and discharge from the nozzle 5. The stream of water under pressure discharging from the nozzle 5 will cause rotation of the body about the coupling in a manner now to be described. In Figures 2, 4, 5 and 6, a cycle of operation is shown. In Figure 1 the driving arm element 32 is shown in a position overhanging the branch 3 and with the block element 40 of the diverting block 38 in lowermost position. In this position, the arcuate surface 41 confronts the open end of the nozzle 5. Also, the element 32 will be in contact with the set screw 22. In this position water will impinge against the surface 41 and will be diffused laterally by the element 40. The pressure of the water against the surface 41 of the block 38 will cause said block to swing upwardly to the position shown in Figures 4 and 8. When this takes place, the stream of water from the nozzle will impinge against the operating element 46 of the operating block 44. In view of the fact that the operating element 46 is angularly disposed and is arcuate in contour, the stream of water will be diverted upon contact with the said element 46. Pressure of the water against the arcuate surface will, as shown in Figure 5, have the effect of urging the operating block 44 away from the stream of water from the nozzle, thus swinging the driving arm to the position shown in Figure 5 and against the tension of the spring 51. When the stream of water discharging from the nozzle has caused the operating block 44 to swing the driving arm clear of said stream, the spring 51 will urge said driving arm back to its original position and into contact with the set screw 22. The impact caused by contact of the driving arm with the set screw 22, when said driving arm is moved back to normal position by the spring 51, will move the entire body through a few degrees. It should, of course, be understood that as soon as the driving arm has been moved out of the stream, the diverting block will again swing down to operative position so that, when the driving arm has returned to normal position, said diverting block will again be ready to receive the stream from the nozzle 5. From the above description, it will be seen that the operation of the invention will be continuous, so long as water is flowing under pressure through the stem 2. In other words, repeated swinging of the driving arm out of the stream, by pressure of said stream, and return of said driving arm to inoperative position, under tension of the spring, with resultant impact, will cause the body to rotate about the coupling slowly and progressively step by step. The counter-weight 31 will provide a balance on each side of the stem 25 so that undue wear on the stem will be eliminated. If necessary, the counter-weight may be used as a handle to start operation. In other words, the counter-weight may be grasped and swung for starting rotative movement of the body.

It is desired to call attention to the fact that the larger stream of water, flowing from the nozzle 6, will irrigate an outer circular area while the water through the nozzle 5, which will be a much smaller stream, will irrigate an inner circular area and will, of course, cause rotation of the sprinkler in the manner set forth hereinbefore.

It is also desired to mention that, in view of the

fact that there are no sharp angles, friction will be reduced to a minimum with the result that maximum throw of water with a given pressure will be assured. Moreover, as will be seen, the angle of the stream with respect to the ground is quite small, with the result that the stream will be kept close to the ground and thus will not be affected to any great extent by wind or air currents. Maximum effect from the diffusion of water will thus be assured.

As will be understood, the driving arm moves through but a small arc with the result that wear of the moving parts will be reduced to a minimum.

The invention is characterized by the utmost simplicity in construction and efficiency in operation. It is obvious that minor departures from the structure hereinbefore described may be made without departing from the scope of the invention.

It is believed that further description of the invention is unnecessary.

Having thus described the invention, what is claimed as new is:

1. A sprinkler including a rotatable body, and means swingingly mounted on the body for imparting step by step rotative movement to the body, said means including a striking arm, a diverting block swingingly connected with the striking arm, an operating block fixed to the striking arm outwardly of the diverting block, said diverting block being positioned to receive a stream of

fluid under pressure from the body and being swung out of said stream by the pressure of the stream for exposing the operating block to said stream, pressure of fluid against said operating block swinging the striking arm on the body, and means for urging the striking arm into contact with the body.

2. A sprinkler including a rotatable body having a branch, a nozzle on the branch, stop means on the branch, a web carried by the body, a stem on the web, a driving arm swingingly connected with the body and having a hub swingingly mounted on the stem, said driving arm including an element engageable with the stop means, a diverting block, means swingingly connecting the diverting block in spaced relation to the outer end of the nozzle, an operating block connected with said last-mentioned means outwardly of the diverting block, said diverting block receiving a stream of liquid under pressure from the nozzle for diverting said stream to irrigate an area, the force of said stream swinging the diverting block clear of said stream for exposing the operating block to receive said stream thereagainst for swinging the driving arm away from the stop means, a cap on the upper end of the stem, and a spring connected between the cap and the outer end of the driving arm and urging the driving arm into engagement with the stop means for imparting rotative movement to the body.

RALPH W. LAPPIN.