

Aug. 3, 1926.

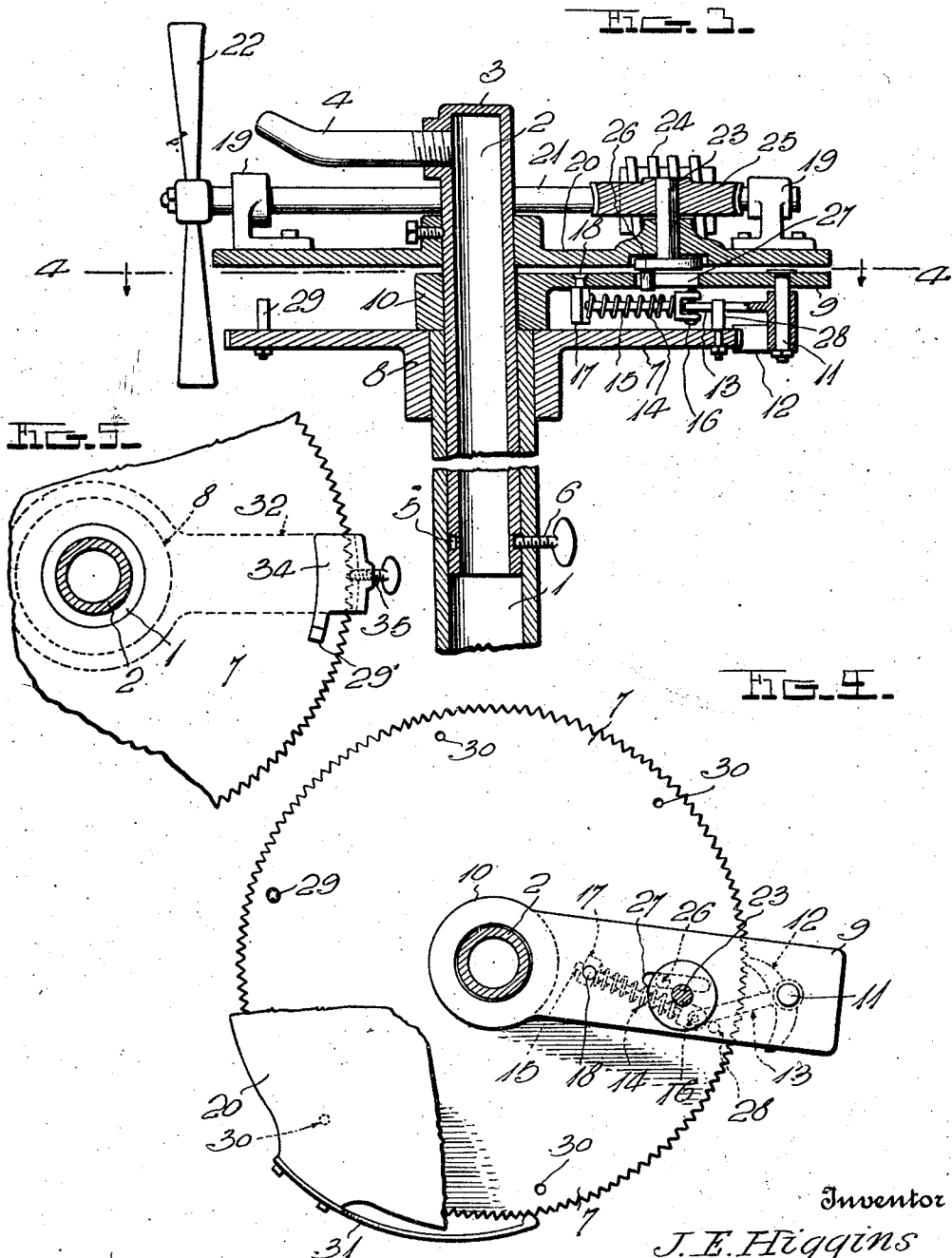
1,594,729

J. E. HIGGINS

SPRINKLER

Filed April 13, 1925

2 Sheets-Sheet 2



Witness
H. Woodards

Inventor
J. E. Higgins

334 *H. B. Wilson & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH E. HIGGINS, OF GRAND ISLAND, NEBRASKA.

SPRINKLER.

Application filed April 13, 1925. Serial No. 22,827.

My invention relates to improvements in sprinklers of the type used primarily for lawns and gardens, and one object is to provide a new and improved sprinkler which, while setting stationarily at one point, may be made to sprinkle the ground around such point, for an arc of any desired length, unique provision being made whereby after moving in one direction and sprinkling the desired arc of ground, the device will automatically reverse, move in the other direction and re-sprinkle the same, this action occurring repeatedly as long as the water is supplied to the sprinkler head or nozzle.

Another object of the invention is to provide a novel arrangement whereby the device may be adjusted to sprinkle either a short arc or a long arc, as occasion may demand. In fact, in most instances, the device is so adjustable that its arc of travel may be varied to a wide range of distances.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawings.

Figure 1 is a top plan view.

Figure 2 is a side elevation.

Figure 3 is a vertical sectional view on line 3—3 of Fig. 1.

Figure 4 is a horizontal sectional view on line 4—4 of Fig. 3.

Figure 5 is a detail horizontal section showing a different type of adjustable trip which may be used for reversing the operating means of the sprinkler head or nozzle.

Figure 6 is an edge view of the parts shown in Fig. 5.

In the drawings above briefly described, which may be considered as disclosing the preferred form of construction, the numeral 1 designates a tubular standard rising from an appropriate base (not shown) and provided at its lower end with any suitable type of coupling (not shown) for connecting it with an ordinary garden hose. The upper end of this standard rotatably receives a tube 2 having its upper end closed as indicated at 3 and provided with an appropriate nozzle 4. The tube may well be mounted in any desired manner in the standard 1, but for illustrative purposes, I have shown it provided with an external circumferential groove 5 which receives the

inner end of a screw 6 passing through the standard.

A ratchet wheel 7 has its hub 8 suitably secured to the upper end of the standard 1, and above this wheel, an oscillatory arm 9 is provided, said arm having a hub 10 free to move about the tube 2. Pivoted to this arm by a bolt or the like 11, is a reversible double-ended pawl 12 which may be provided with any preferred means for yieldably holding it in either of its operative positions with respect to the teeth of the ratchet wheel 7. Obviously, when one end of the pawl engages the teeth, said pawl may thrust in one direction against the wheel 7, whereas disposition of the other end of said pawl, in contact with the teeth, will allow said pawl to thrust in the other direction.

In the preferred form of construction, the pawl 12 is provided with a rigid arm 13 with which an appropriate spring device 14 is operatively connected to exert its power to yieldably hold the dog in either operative position, and to also complete its movement toward such position, after it has been moved slightly beyond a neutral or dead center point. In the present showing, the spring 14 surrounds a rod 15 which at 16 is pivoted to the arm 13, said rod passing slidably through an appropriate guide 17 carried by the arm 9. This guide is preferably pivoted to the arm 9 as at 18.

Mounted in appropriate bearings 19 on an upper plate 20 which is secured to the tube 2, is a shaft 21 having a propeller 22 located to be rotated by the water discharged from the nozzle 4. This shaft drives a vertical shaft 23, preferably by means of a worm 24 and a worm gear 25, and the lower end of said shaft 23 carries a wrist pin 26 which is received in a slot 27 in the arm 9. By means of the shaft 23, wrist pin 26 and slot 27, the top plate 20 and the arm 9 are connected, but this connection is such that they may have relative movement. As the shaft 23 is rotated, its wrist pin 27 swings the arm 9 in a direction to cause its pawl 12 to click idly over the teeth of the ratchet wheel 7, while the shaft 23 is making half a revolution. Then, the wrist pin has a tendency to swing the arm 9 in the opposite direction, but the arm cannot so move on account of engagement of the pawl 12 with the ratchet wheel. The result is, that the plate 20 and shaft 23 move with respect to

the arm 9, the tube 2 being the pivot and turning with said plate, so as to swing the nozzle 4 to a different position. It will thus be seen that as the shaft 23 continues to rotate, the plate 26 will be turned in one direction in a step-by-step manner, so as to cause the nozzle 4 to direct a spray of water over the lawn or garden with which the device is used.

Novel provision is made for reversing the position of the pawl 12 and thus causing the plate 20 to be moved in a step-by-step manner in a reverse direction, when said plate has been turned to the desired extent in the first mentioned direction. In the present showing, two stop pins 28 and 29 are carried by the wheel 7 for this purpose. When plate 20 and the arm 9 have advanced around the ratchet wheel to such an extent as to cause either of these pins to strike the arm 13, the next advancement of the parts 20 and 9, will move said arm 13 and the spring 14 to or slightly beyond a dead center position, so that the spring then immediately acts to reverse the position of the pawl 12. Operation of the wrist pin 26 will then cause the arm 9 and plate 20 to swing in the reverse direction from that in which they were previously traveling. The pins or trips 28 and 29 are by preference relatively adjustable, and in Fig. 4, I have shown a plurality of openings 30 in the wheel 7, with any one of which the pin 29 may be engaged. Thus, the distance which the plate 20 and associated parts will travel before being reversed, may be readily controlled, with obvious advantages.

The part designated at 31, is a spring dog secured to the plate 20 and yieldably yet forcibly engaging the teeth of the ratchet wheel 7, so as to hold said plate 20 and associated parts in each position to which they are advanced, while the pawl 12 is clicking idly over the teeth of said wheel 7, to obtain a new grip thereon.

In Figs. 5 and 6, I have disclosed a different type of adjustable trip which may be considered as usable instead of the adjustable pin 29. In this construction, an arm 32 underlies the ratchet wheel 7 and is formed with a hub 33 which is free to turn about the hub of said wheel, but is held against vertical movement thereon. The outer end of the arm 32 is directed upwardly and inwardly as indicated at 34 to receive the peripheral portion of the wheel 7, and this portion 34 is provided with a trip 29' for co-action with the arm 13. To hold this trip and its carrying means in any desired adjusted position, a set-screw 35 is threaded through the outer end of the arm 32 for engagement with any of the teeth of the ratchet wheel 7.

By providing the novel construction shown and described or a substantial equivalent thereof, a sprinkling device is provided

which is simple and inexpensive, yet is highly efficient and desirable and may be readily adjusted to sprinkle an arc repeatedly of practically any desired length.

As excellent results are obtainable from the details disclosed, they are by preference followed. However, within the scope of the invention as claimed, numerous modifications may be made.

I claim:

1. A sprinkler comprising a support, a ratchet wheel fixedly mounted thereon, water spraying means rotatably connected with said support and provided with a plate projecting horizontally over said ratchet wheel, a floating pawl carrier between said projecting plate and said ratchet wheel, a reversible pawl mounted on said floating pawl carrier, co-acting means on said projecting plate and said carrier acting in conjunction with the pawl and ratchet wheel for alternately moving the carrier in one direction and said plate in the same direction about an axis, and driving means for the last mentioned means, including a propeller adapted to be operated by the water discharged from the spraying means; together with means for repeatedly reversing the aforesaid pawl automatically.

2. A structure as specified in claim 1; said reversing means comprising a pair of spaced trips carried fixedly.

3. A structure as specified in claim 1; said reversing means comprising a pair of spaced trips carried fixedly, said trips being relatively adjustable.

4. A sprinkler comprising a support, a ratchet wheel fixedly mounted thereon, water spraying means rotatably connected with said support and provided with a plate projecting horizontally over said ratchet wheel, a floating pawl carrier between said projecting plate and said ratchet wheel, a pawl mounted on said floating pawl carrier, co-acting means on said projecting plate and said carrier acting in conjunction with the pawl and ratchet wheel for alternately moving the carrier in one direction and said plate in the same direction about an axis, and driving means for the last mentioned means, including a propeller adapted to be operated by the water discharged from the spraying means.

5. A sprinkler comprising a support, a ratchet wheel fixedly carried thereby, spraying means connected with the support for rotation about an axis concentric with said ratchet wheel, said spraying means having a projecting plate disposed over said ratchet wheel, a floating pawl carrier between the plate and ratchet wheel, a pawl mounted on said carrier and engaging the teeth of said ratchet wheel, a vertical shaft rotatably carried by said plate and having an

eccentric operatively connected with said pawl carrier to act in conjunction with the pawl and ratchet wheel and alternately effect movement of said carrier and said plate in the same direction, and driving means for said shaft mounted on said plate and including a propeller adapted to be operated by the water discharged from the spraying means.

10 6. A sprinkler comprising a support, a ratchet wheel fixedly carried thereby, spraying means rotatably connected with the support co-axially with the ratchet wheel and extending above the latter, said spraying
15 means having a plate spaced above said ratchet wheel, a floating pawl carrier between the plate and ratchet wheel, co-acting means on the plate and carrier for relatively moving them, driving means for said
20 co-acting means mounted on the plate and adapted to be driven by the water discharged from the spraying means, a reversible pawl mounted on said carrier for engagement with said ratchet wheel to hold the carrier
25 against retrograde movement, said pawl having a reversing member and a spring device acting thereon to hold the pawl in either of its operative positions, and spaced trips carried fixedly to be alternately engaged by opposite sides of said reversing
30 device of the pawl, to actuate the same.

7. A structure as specified in claim 6; said trips being carried fixedly for relative adjustment.

35 8. A sprinkler comprising a support, a ratchet wheel fixedly carried thereby, spraying means rotatably connected with the support co-axially with the ratchet wheel and extending above the latter, said spraying
40 means having a plate spaced above said support, a floating pawl carrier between the ratchet wheel and plate, water driven means mounted on said plate for relatively moving the latter and the carrier, a reversible
45 double-ended pawl pivoted on a vertical axis to said carrier and co-acting with the ratchet wheel to hold the carrier against retrograde movement, said pawl having a hori-

zontal reversing arm extending inwardly substantially toward the axis of the ratchet wheel, a spring device connected with the inner end of said reversing arm and connected also with the pawl carrier, said spring device being operable at opposite sides of a dead center position to hold the pawl in either of its operative relations with the ratchet wheel, and spaced trips carried fixedly to alternately engage opposite sides of said reversing arm.

9. A sprinkler comprising a tubular water-conducting standard, a ratchet wheel rigidly secured to the upper end of said standard, a vertical tube swiveled in the upper end of said standard and projecting above said ratchet wheel, said tube having a nozzle at its upper end, a horizontal plate rigidly secured to the tube and spaced upwardly from the ratchet wheel, a pawl-carrying arm between the plate and ratchet wheel having an opening through which the aforesaid tube passes, a short vertical shaft rotatably carried by said plate and having an eccentric at its lower end operatively connected with said pawl-carrying arm to effect relative movement of said arm and plate when the shaft is driven, driving means for said shaft mounted on said plate and including a propeller adjacent the aforesaid nozzle, a reversible double-ended pawl carried by the outer end of said arm and pivotally connected thereto on a vertical axis for engagement with the ratchet wheel to hold the pawl-carrying arm against retrograde movement, said pawl having an inwardly extending reversing arm, a spring device connected with the two arms and active on either side of a dead center position to hold the pawl in either of its operative relations with the ratchet wheel, and spaced trips carried by said ratchet wheel for alternate engagement with opposite sides of said reversing arm.

In testimony whereof I have hereunto affixed my signature.

JOSEPH E. HIGGINS.