J. P. CAMPBELL.

SPRINKLER.

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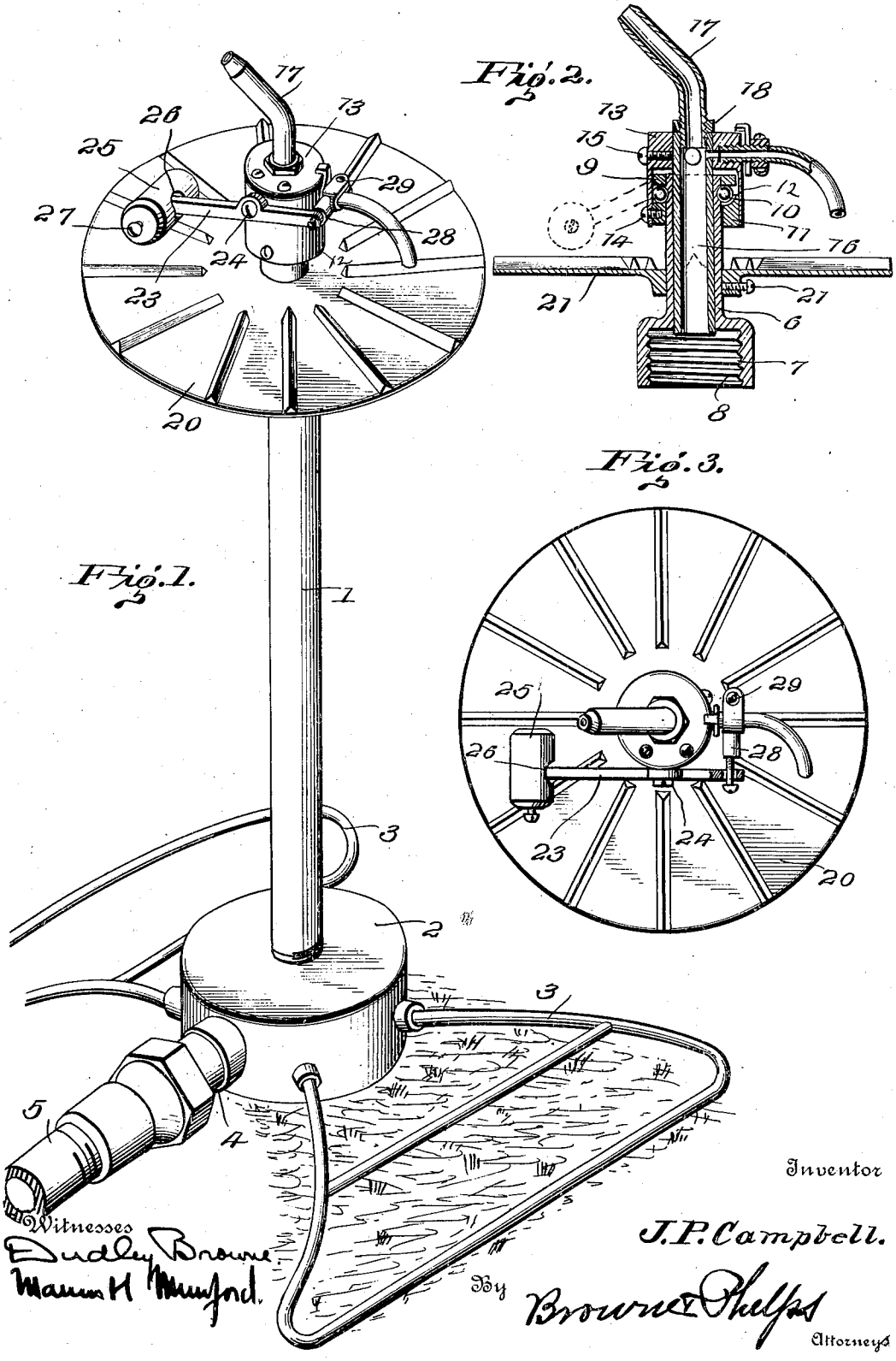

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SPRINKLER.

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To all whom it may concern:

Be it known that I, JOHN P. CAMPBELL, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Sprinklers, of which the following is a specification.

My invention relates to certain new and useful improvements in sprinklers designed to be used for irrigation and other similar purposes wherein it is desirable to cover uniformly as large an area as possible with water.

One object of my invention is to provide a device of this character in which a main stream is thrown from the nozzle as a solid stream, that is to say is not broken up at the nozzle, whereby the stream will be thrown to a greater distance than is possible were it so broken at the nozzle.

By my invention I further provide a secondary stream which is adapted to cover the area within that covered by the main stream, said secondary stream operating to rotate the nozzle of the main stream.

A further object of my invention is to provide a device of this character in which the passages therethrough are entirely unobstructed, so that the device will operate on a much lower pressure than is possible with sprinklers in which the discharge is broken up at the discharge orifice.

A further object of my invention is to provide a means for automatically controlling the speed of rotation of the sprinkler, so that it will rotate at the proper speed to give the maximum sprinkling effect in spite of changes that may occur in the water pressure.

A further object of my invention is to provide a sprinkler simple and cheap in construction, efficient in operation and not likely to get out of order. Furthermore, to have it so constructed that it will not be likely to become clogged up with sediment, pipe scale, or other matter that may be in the water.

With the foregoing and other objects in view my invention consists in certain constructions, combinations and arrangements of parts, the preferred form of which will be first described in connection with the accompanying drawings, and then the invention particularly pointed out in the appended claims.

Referring to the drawings wherein the same part is designated by the same reference numeral wherever it occurs, Figure 1 is a perspective view of the preferred form of my sprinkler mounted upon a suitable support; Fig. 2 is a central longitudinal section of the sprinkler head shown in Fig. 1 and, Fig. 3 is a top plan view of the device.

For the sake of illustration I have shown my invention as mounted upon a vertical pipe 1, mounted upon a base 2 provided with legs 3 extending from the side thereof, the vertical pipe 1 being suitably connected within the base to a pipe 4, to which can be secured the end of the hose 5 to supply water to the vertical pipe.

The preferred form of my sprinkler comprises a tube 6 formed at its lower end, with a portion 7 preferably enlarged as shown and provided on its interior with threads 8, whereby it can be threaded to the pipe to which it is to be connected, such as the pipe 1 shown in the drawing.

The tube 6 is provided at its upper end with an outwardly extending flange 9, which forms the upper side of a raceway for the balls 10, the lower side of the raceway being formed by a ring 11 connected to a sleeve 12, the upper end of which is formed into a head 13, which extends over the end of the tube 6. The ring 11 is preferably secured in position in the sleeve 12 by means of the screws 14, as shown.

Secured in the head 13 by any suitable means, as the screw 15, is a pipe 16 which extends down through the tube 6 to the enlarged portion 7 thereof, and forms the water conduit from the enlarged portion 7 to the angularly disposed main nozzle 17, which is threaded into the upper end of the pipe 16. 18 designates a lock nut which I may use to secure the main nozzle from rotation.

19 designates a secondary nozzle threaded into an opening in the side of the head 13, there being formed an opening through the pipe 16 in line with the opening in the head into which the pipe 19 is threaded, whereby a secondary stream can pass from the pipe 16 out through the secondary nozzle 19. This secondary nozzle is bent into the form of an elbow and is turned at an angle so as to form a re-action element and rotate the head 13 and with it the pipe 16 and the main nozzle 17. As shown, the secondary nozzle 19 discharges obliquely and downwardly onto a circular disk 20 fast on

the tube 6, the same being shown as secured in position by a set screw 21. This plate may, as shown, be provided with radially disposed ribs 22, against which the stream of water discharged from the secondary nozzle 19 strikes to augment the rotating effect on the head and to distribute the water from said nozzle, though it is evident, if desired, that this plate can be entirely omitted, and the re-active effect of the stream on the atmosphere be relied on.

It is desirable, in order to produce the best effect, that the speed or rotation of the sprinkler be maintained uniform, and for this purpose I have shown the head as provided with a means whereby the angle of the re-action nozzle 19 may be varied according to the speed of rotation of the head, and in the form of invention shown this governor comprises a lever 23, pivoted at 24 to the head 13, one end of the lever having a weight 25 secured thereon, said weight being preferably adjustable on the lever as by having the end of the lever pass through a hole 26 in the side of the weight and providing a set screw 27 extending through the weight and into the opening to clamp the weight in its adjusted position on the lever. As a means for connecting the opposite end of the lever from that carrying the weight to the re-action nozzle 19, I have shown the nozzle as being provided with a clip formed at one end into a tube 28, and split at its other end portion whereby the nozzle will be encircled and the split ends drawn together by a screw 29, so as to securely clamp the clip on the re-action nozzle. Into the open end of the tube there loosely extends a screw 30, which is threaded into the end of the lever 23. It is to be noticed that the weight in its normal position as shown in Figs. 1 and 2 is below the pivot 24 of the lever, so that as the head 13 is rotated centrifugal force will tend to raise the weight into the plane of the pivot 24. This through the screw 30 will operate to turn the nozzle down or toward its vertical position, so that the stream of water therefrom will strike the re-action plate 20 at a more obtuse angle and decrease the re-action effect. It is to be understood however that where no re-action plate is used but the re-active effect of the atmosphere is depended on, the re-action tube may be arranged so as to be moved either up or down from the horizontal plane of rotation of the inner end of the tube to decrease the re-active effect and produce the uniformity of speed of rotation desired.

It is to be observed that the main nozzle 17 will throw a stream of water the maximum distance, and that the stream will leave the nozzle solid, thus sprinkling an area beginning at some considerable distance away from the sprinkler. The stream from the re-action nozzle 19 will however, either by striking the plate 20 and being thrown horizontally therefrom, or by directly throwing the water into the air, cover the remainder of the area between the inner edge of the area covered by the main sprinkler and the sprinkler itself.

I am aware that considerable variation is possible in the details of construction herein shown and described, without departing from the spirit of my invention, and I do not intend to limit myself thereto, except as pointed out in the following claims, in which it is my intention to claim all the novelty inherent in the structure shown and described as broadly as the state of the art will permit.

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

1. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle secured to and extending from the top of the head, a re-action nozzle also carried by the head and extending from the side thereof, and means for supplying water under pressure to the head.

2. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle also carried by the head and means for varying the effective angle of the re-action nozzle in accordance with the speed of rotation of the head.

3. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle also carried by the head, a stationary spraying plate supported to be impinged upon by water from the re-action nozzle, and means for supplying water under pressure to the head.

4. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle also carried by the head, a stationary plate supported to be impinged upon by water from the re-action nozzle, means for varying the angle of the re-action nozzle and the plate in accordance with the speed of rotation of the head, and means for supplying water under pressure to the head.

5. A sprinkler comprising a tube, a head rotatably mounted in one end of the tube, a pipe carried by the head and extending down into the tube, a main nozzle extending out from the head and connected to the tube, a re-action nozzle also carried by the head and connected to the tube means whereby the re-action angle of the nozzle can be varied, and means for supplying water under pressure to the head.

6. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle in the

form of an elbow-shaped tube extending from the side of the head, and means for automatically varying the angle between the plane of rotation and the direction of the re-action tube, in accordance with the speed of rotation of the head.

7. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle extending out from the side of the head, a pivoted lever mounted on the head, a weight mounted on one end of the lever and a connection between the other end of the lever and the re-action nozzle whereby the direction of flow from the re-action nozzle may be governed by the speed of rotation of the head.

8. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle also carried by the head, a spraying plate provided with radial ribs fixedly mounted in position to be impinged upon by the stream from the re-action nozzle, and means for supplying water under pressure to the head.

9. A sprinkler comprising a tube, a head rotatably mounted upon the tube, a main nozzle on the head, a re-action nozzle also carried by the head, a plate in position to be impinged upon by the stream of water from the re-action nozzle, and means for automatically varying the angle made by the stream on the plate, in accordance with the speed of rotation of the head.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN P. CAMPBELL.

Witnesses:

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