

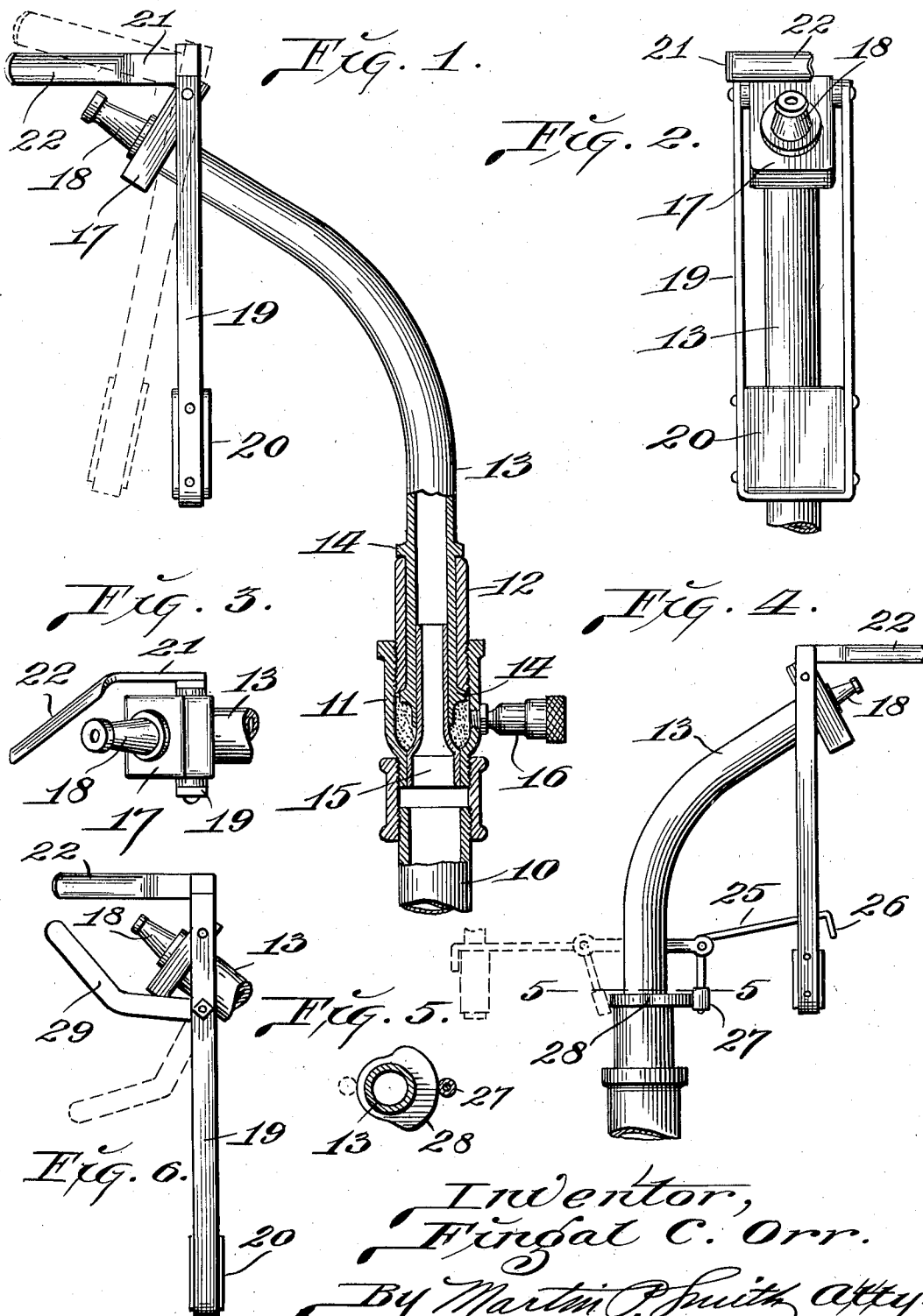
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SPRAY NOZZLE

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UNITED STATES PATENT OFFICE.

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SPRAY NOZZLE.

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My invention relates to a spray nozzle that is especially designed for use in connection with the sprinkler systems for lawns, gardens, golf courses, orchards or the like and also for sprinkling systems that are installed in and upon buildings as a protection against fire.

The principal objects of my invention are, to generally improve upon and simplify the construction of the existing forms of sprinkling spray nozzles; to provide a spray nozzle that will automatically utilize the force of the water or liquid passing there-through; to impart an intermittent or step by step rotary movement to the nozzle so that the latter will effectually distribute the discharged water over a considerable area and, further, to provide a spray nozzle that may be easily and cheaply produced and installed, wholly automatic in its operation and very effective in performing its intended functions.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which:

Fig. 1 is an elevational view of a spray nozzle of my improved construction with a portion thereof in vertical section.

Fig. 2 is a front elevational view of the upper portion of the improved spray nozzle.

Fig. 3 is a plan view.

Fig. 4 is an elevational view of a modified form of the spray nozzle.

Fig. 5 is a horizontal section taken on the line 5-5 of Fig. 4.

Fig. 6 is an elevational view of a further modified form of the spray nozzle.

Referring by numerals to the accompanying drawing which illustrate a practical embodiment of my invention, 10 designates the upper end of a vertically disposed supply pipe to which is secured a reduction nipple 11 and screw seated in the upper end of said nipple is a short tubular member 12.

Arranged to rotate freely within member 12 is the lower end of a curved tubular member 13, having flanges 14 at the ends of member 12, and secured in the lower end of a nipple 11 and extending upwardly into the lower portion of member 13 is a tubular member 15.

The space between the lower portion of nipple 11 and 15 is filled with a suitable lubricant that is introduced through a grease cup 16 and the latter being seated in nipple 11.

This lubricant, in addition to forming a packing to prevent leakage of water through the rotating joint, thoroughly lubricates the bearing surfaces between the member 13 and members 12 and 15.

The upper end of member 13 carries a hollow block 17, from the outer face of which projects a jet nozzle 18.

Pivoted to the upper portion of block 17, is the upper end of a stirrup 19, the lower end of which carries a weight 20 so that said stirrup and weight constitute a pendulum that swings freely upon the block 17.

Secured to and projecting forwardly from one of the arms of the stirrup 19, and at its upper end, is an arm 21, the forward portion 22 of which is bent laterally so that it normally occupies an inclined plane that crosses the path of travel of the jet of water that issues from nozzle 18.

The inner face of this member 22 which may be termed a vane, is substantially spoon-shape with its concave face presented toward the end of nozzle 18.

Where the form of spray nozzle as just described is used, the jet of water issuing from nozzle 18 impinges against the concave surface of vane 22, and the pressure resulting from such impingement, imparts rotary motion to member 13 and the parts carried thereby.

As soon as member 13 gains sufficient impetus or speed of rotation, the pendulum-like member will swing outward under centrifugal force, and as such action occurs, vane 22 will move upwardly out of the path of travel of the jet of water, with the result that the member 13 will tend to stop rotating and said pendulum and vane will return to their normal positions.

The movements just described will then be repeated and, as a result, member 13 and parts carried thereby will be intermittently rotated upon supply pipe 10 and as vane 22 moves upward out of the path of travel of the jet of water from nozzle 18, a full stream or jet of water will be discharged and thrown a considerable distance away from supply pipe 10 and while the jet of water impinges against vane 22, said jet

will be spread or diffused in spray form and fall to the ground within a limited or relatively small radius about the pipe 10.

In the modified construction illustrated in the Figs. 4 and 5, a bell crank 25 is pivoted on the lower portion of member 13 and the outer end of said bell crank terminates in a hook 26 that is adapted to engage the lower portion of the pendulum and restrain the same against outward swinging movement.

The inner lower end of the bell crank carries a roller 27 that rides on the edge of a cam 28 that is secured to a fixed part of the device, for instance, the upper portion of member 12.

While roller 27 is on the lobe or high portion of the cam, hook 26 is held out of engagement with the pendulum and the latter may swing freely as hereinbefore described.

When roller 27 rides onto the low portion of the cam bell crank 25 will swing into position so that hook 26 engages the lower portion of the pendulum and holds the same so that vane 22 is retained in position directly in the path of travel of the jet of water, and as a result, the member 13 and parts carried thereby will rotate until roller 27 rides onto the lobe of the cam and the change of position of the bell crank 25, disengages hook 26 from the pendulum.

Thus the device may be caused to sprinkle throughout an arc of relatively long radius and through an arc of much shorter or limited radius while circumscribing a complete circle about the supply pipe.

Such arrangement may be advantageously used adjacent to the edge of a lawn, garden or orchard.

In the modified arrangement illustrated in Fig. 6, a vane 29 is advantageously positioned on the opposite side of the pendulum from the vane 22 and which adjustable vane may be elevated to the position shown in Fig. 6 so that it will move into the path of travel of the jet of water when the lower portion of the pendulum swings outward.

Such arrangement tends to spray the stream or jet of water issuing from the nozzle 18.

A spray nozzle of my improved construction is relatively simple, may be easily and cheaply produced, is entirely automatic in operation and is particularly adapted for spraying water onto lawns, gardens, orchards, golf courses and the like.

It will be understood that minor changes in size, form and construction of the various parts of my improved spray nozzle may be made and substituted for those herein described without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a spray nozzle, a jet nozzle mounted for rotation on a vertical axis and discharging a stream at an angle to its axis of rotation, a pendulum pivotally connected to said jet nozzle, and a vane carried by said pendulum and normally occupying a position in the path of travel of the jet of water that issues from said jet nozzle whereby the force of the impingement of the jet of water from said nozzle against said vane will impart rotary motion to said jet nozzle.

2. In a spray nozzle, a jet nozzle mounted for rotation on a vertical axis and discharging a stream at an angle to its axis of rotation, a pendulum pivotally connected to said jet nozzle, and a member carried by said pendulum and normally occupying an inclined position across the path of travel of the jet of water that issues from said jet nozzle whereby the force of the impingement of the jet of water from said nozzle against said angularly positioned member will impart rotary motion to said jet nozzle.

3. The combination with a jet nozzle mounted to rotate on a vertical axis and to discharge a stream at an angle to its axis of rotation, of a weighted swinging member associated with said nozzle and adapted to swing under the influence of centrifugal force resulting from the rotation of said jet nozzle and an inclined vane carried by said swinging member and adapted as the latter swings to move across the path of travel of the jet of water issuing from said jet nozzle whereby the force of the impingement of the jet of water against said inclined vane will impart rotary movement to said jet nozzle.

4. The combination with a jet nozzle mounted to rotate on a vertical axis and to discharge a stream at an angle to its axis of rotation, of a weighted member pivotally mounted on said jet nozzle so as to swing radially relative to the axis of said nozzle and an inclined vane carried by said weighted member and adapted as the latter swings to move into and out of the path of travel of the jet that issues from said nozzle whereby the force of the impingement of the jet of water against said inclined vane, will impart rotary movement to said jet nozzle.

5. The combination with a jet nozzle, of a pivotally mounted pendulum weighted vane associated with said jet nozzle mounted to rotate on a vertical axis and to discharge a stream at an angle to its axis of rotation, and normally positioned to be engaged by the jet of water issuing therefrom to impart rotary movement to said jet nozzle, said pendulum being adapted to be actuated by centrifugal force to intermittently move said vane out of the path of the jet.

In testimony whereof I have signed my name to this specification.

FINGAL C. ORR.