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W. BIRRELL

1,921,020

WATER MOTOR FOR SPRINKLERS

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Fig. 1

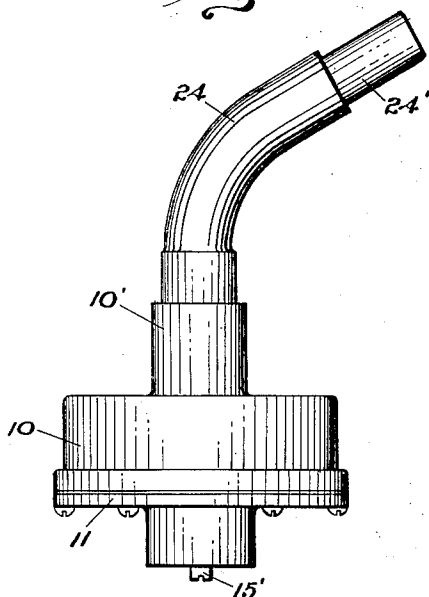


Fig. 2

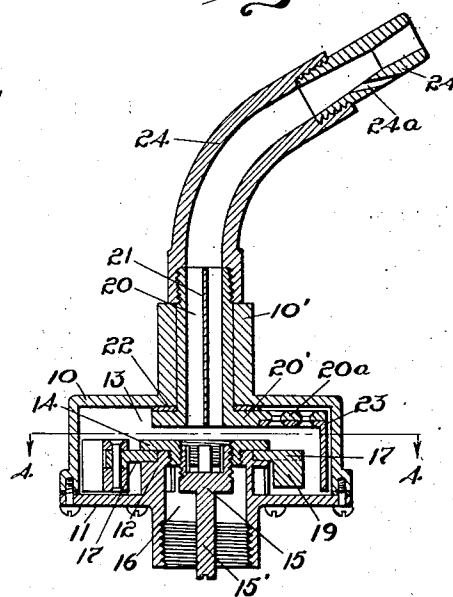


Fig. 3

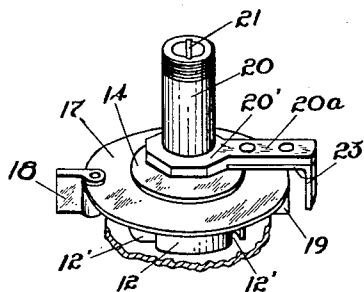
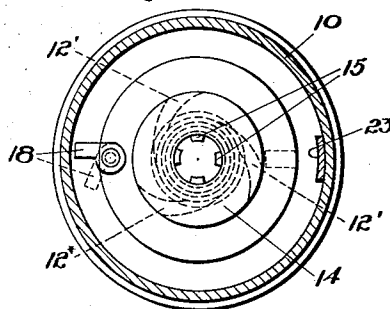


Fig. 4



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WATER MOTOR FOR SPRINKLERS

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Serial No. 483,515

4 Claims. (Cl. 299—67)

My invention relates to water motors for sprinklers, and more particularly to a motor adapted to be operated by a fluid under pressure for intermittently driving another member.

In order to illustrate and explain my invention, I have shown one embodiment thereof as applied to a sprinkler such as is used on a golf course for sprinkling the greens, the nozzle being intermittently moved about its axis and throwing a stream of water out over a large area of lawn, but this is considered only one use to which my invention can be put.

Among the salient objects of my invention are: to provide in a water or fluid motor, a rotor mounted to be revolved within a housing and having a hinged vane member thereon adapted to strike another member every time it makes a revolution and thus intermittently to move said other member a step forward, said striking member or element being adapted to yield sufficiently to pass the struck member; to provide in a device of the character referred to, means for regulating the flow of the operating fluid to the rotor; to provide in a device embodying the invention and used for operating a sprinkler nozzle, a passage to the nozzle and a passage for sufficient fluid to turn the rotor; and, in general, to provide a simple, practical and efficient fluid operated motor for intermittently driving a sprinkler or other member.

In the drawing, Figure 1 is a side elevation of a motor embodying my invention;

Figure 2 is a vertical sectional view there-through;

Figure 3 is a perspective view of the rotor removed, also showing the driven member; and

Figure 4 is a horizontal sectional view at line 4—4 on Fig. 2.

Referring now in detail to the drawing, 10 designates a top housing, having a bearing extension 10', and detachable bottom 11, having a central annular extension 12, extending up into the chamber 13, within said housing. Screwed into the top of said central annular extension is an annular member 14, having a central threaded opening, into which is screwed from the bottom, a slotted control element 15, having a stem 15' by means of which it can be screwed up into said member 14, to regulate the size of the inlet openings from the connecting chamber 16, up into the main chamber 13, said openings being the slots cut out of the control element 15. The annular extension 12, is provided with a plurality of tangentially disposed side outlets 12' around its side for the discharge of water there-

through for operating a rotor 17, constituting a washer-like plate rotatably mounted on the extension 12, and held in place by the overlapping edge of the annular member 14, as will be clear from Figs. 2 and 3. The rotor 17 has pivotally connected therewith a water wing or vane constituting an impact member 18, which can swing freely from its radial position, as seen in Fig. 4, said rotor also has on the opposite side a web member or vane 19, which serves to balance the rotor and also to assist in propelling the rotor. The rotor is freely supported and in a measure is a floating rotor impelled by the discharge of the water or other fluid through the tangential outlets or nozzles 12'. The force of the water up through the nozzle also creates a jet action which tends to entrain the water from the chamber 13 up through the nozzle. Mounted up through the bearing extension 10', to revolve therein is a sleeve 20, having a central web 21 therein to prevent the water passing there-through from whirling. A disc like head or flange 20' is formed on the inner end of said sleeve 20, with washer 22. At one side of said head is an arm or extension 20^a, to which is secured an angle plate or member 23, which turns down into the path of the impact member 18, as will be clear from Figs. 2, 3 and 4. To the upper end of the sleeve 20, the discharge nozzle 24 is screwed, and turns with said sleeve 20, as it is intermittently impelled by the striking of the impact member 18. Said impact member, it will be understood is thrown out into its radial position, as seen in Figs. 3 and 4, in full lines, by the water pressure and when it hits the member 23, which moves the nozzle a step forwardly, it yields or swings to the position indicated in light broken lines in Fig. 4, to pass said member 23. This intermittent hitting of said member 23 drives the nozzle step by step around its axis of rotation.

The mechanism thus described will operate to sprinkle a complete circular area of lawn, for the nozzle has a full swing around its axis. The nozzle has the usual discharge tip 24', this discharge tip also showing the side discharge port 24^a used in some cases to sprinkle the inner area and within the larger area covered by the main discharge.

The bottom 11 has an internally threaded portion 11' for connecting said device to a supply pipe, not shown. The size of the pipe and the pressure are taken into consideration in the adjustment of the control element 15, and the adjustment of this member inwardly or out-

wardly determines the size of the slot openings leading from the receiving chamber 16, up through to the nozzle 24.

I do not limit my invention to details shown for explanatory purposes, except as I may be limited by the hereto appended claims.

I claim:

1. In a device of the character referred to, in combination, a housing, means for connecting a water pipe thereto, a discharge nozzle revolubly connected into said housing in alinement with said water pipe, an annular rotor revolubly mounted concentric with said water pipe, whereby water from said water pipe will pass out through said nozzle, a vane on said rotor for rotating it by water impact, means for deflecting water under pressure against said vane for driving said rotor, a part revoluble within said housing and connected to turn said nozzle, and a pivoted vane forming an impact element yieldingly connected to said rotor and adapted to yieldingly strike and pass said part for moving said nozzle.

2. A water motor for sprinklers including a cylindrical housing, means for connecting a water supply pipe into the bottom thereof, a discharge nozzle rotatably connected through the top wall thereof in alinement with said water pipe, said nozzle having a part within said housing extended to one side and downwardly toward the bottom thereof, said nozzle being fixedly mounted for rotation about its axis, a rotor mounted concentrically within said housing and having a plurality of vanes mounted on the edge thereof, one of said vanes being hingedly connected and extended into the path of said downwardly extending part on said nozzle, whereby said hingedly connected vane strikes

said part and yields to pass, the other vane being shorter, and means for directing water against said vanes for driving said rotor.

3. A water motor for a sprinkler including a housing, a sprinkler nozzle having one end rotatably mounted through the top wall of said housing and open to receive water through its attached end, means through the bottom wall of said housing for connecting a water supply and in open alinement with said nozzle, whereby water through said bottom passes directly through said nozzle, a rotor rotatably mounted around the inner end of the water supply connection, concentric therewith, to turn therearound, said rotor having vanes connected therewith and projecting therefrom, means for discharging water under force laterally from said water supply connection to strike said vanes and rotate said rotor, and cooperating means between said rotor and said nozzle for rotating said nozzle as said rotor is rotated.

4. In a water motor of the character shown and described, a housing having a nozzle rotatably mounted through its top wall and having means for connecting a water supply through its bottom wall in direct alinement with said nozzle, means for regulating the amount of water passing from said supply connection to said nozzle, a rotor rotatably mounted around said supply connection and having vanes around its edge means for discharging water laterally from said supply connection to strike and rotate said vanes and rotor, and cooperating means between said rotor and said nozzle for causing said nozzle to rotate during its discharge of water received from said supply connection.

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