

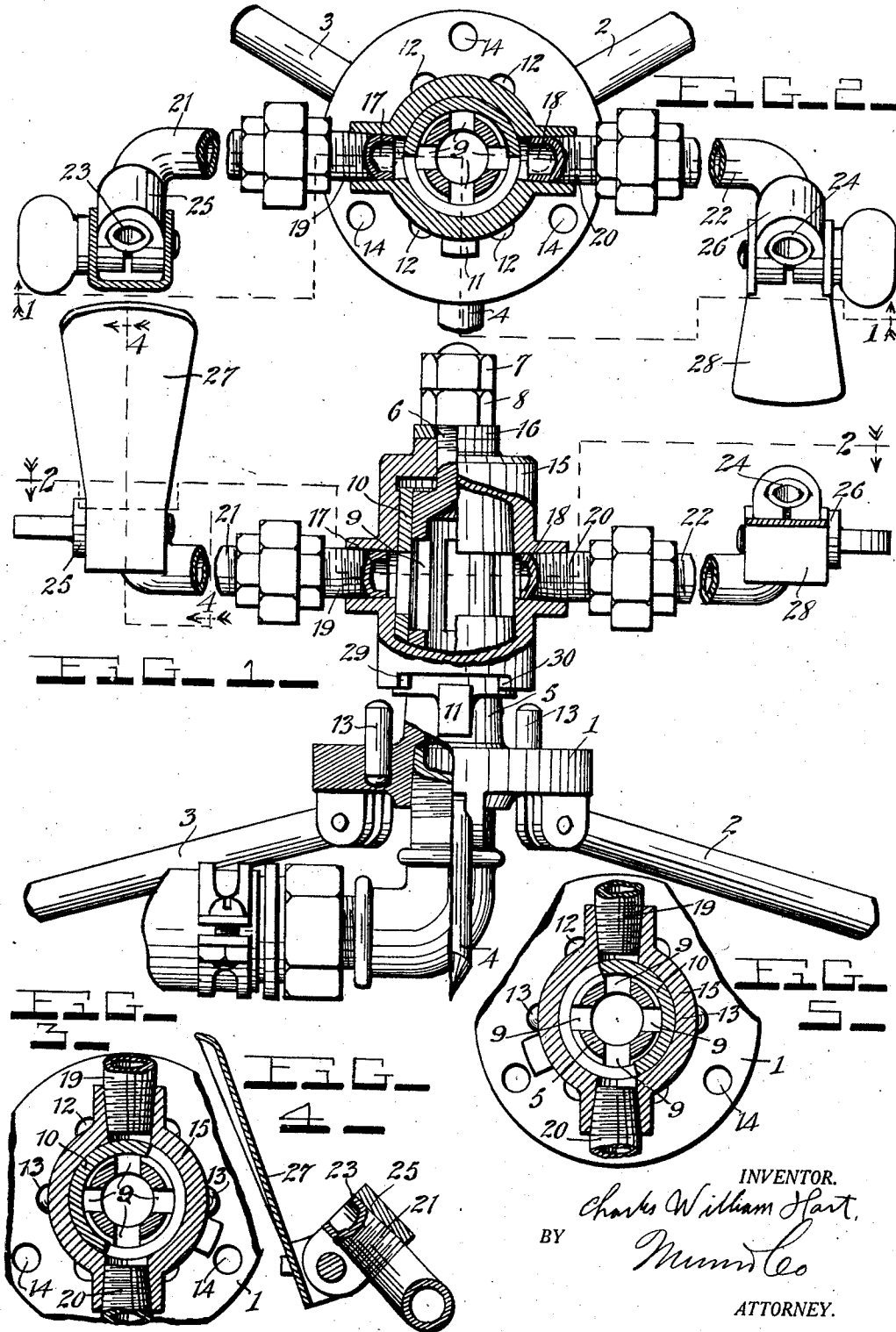
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LAWN SPRINKLER

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UNITED STATES PATENT OFFICE.

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LAWN SPRINKLER.

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To all whom it may concern:

Be it known that I, CHARLES W. HART, a citizen of the United States, and a resident of Rexford, in the county of Lincoln and State of Montana, have invented a new and Improved Lawn Sprinkler, of which the following is a full, clear, and exact description.

This invention relates to a lawn sprinkler. The invention has for an object the provision of a simple, compact, durable and efficient mechanism whereby the sprinkler will act automatically and periodically to vary the position of the spray nozzles, said action taking place in response to the reaction of the water as it leaves the nozzle and effecting a periodic adjustment of the water valves in the manner hereinafter described.

Another object concerns the provision of a mechanism involving the use of a minimum number of parts of such simple construction as to require little care and attention.

A further object concerns the provision of means whereby the angular travel of the nozzle supporting elements can be adjusted as desired.

A still further object concerns the provision of a new and improved form of spray plates which can be readily attached to or removed from the nozzles.

Another object concerns the provision of a construction of valve mechanism composed of a minimum number of parts which can be readily disassembled for inspection and repair in cleaning.

The invention is illustrated in the drawings, of which—

Figure 1 is a section taken on the line 1—1 of Fig. 2;

Fig. 2 is a section taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken through the valve;

Fig. 4 is a section taken on section line 4—4 of Fig. 1; and

Fig. 5 is a section similar to Fig. 3 showing the valve sleeve in another position.

The form of the invention shown in the drawings is a preferred form, although it is understood that modifications in the construction and arrangement of the parts and in the character of the materials used may be adopted without departing from

the spirit of the invention as set forth in the appended claims.

In general, this invention comprises a sprinkler, preferably in the form of a tripod, having a supporting or base plate on which a valve spindle is mounted. This valve spindle projects forwardly from the base plate and is connected to the water supply pipe. The spindle is apertured and acts as a support for a valve sleeve which is frictionally mounted thereon and rotatable with respect thereto. This valve sleeve is adapted, in turn, to be embraced and frictionally engaged with a valve casing. The sleeve and the casing are both adapted to rotate with relation to the spindle. The sleeve and the casing are held on the spindle by means of clamping nuts fastened to the upper end of the spindle, said upper end being threaded. The casing is supplied with the usual water pipes on the ends of which nozzles are located. The nozzles, of course, as usual, are disposed at right angles to the main portion of each pipe so that the reaction of the water in leaving the nozzle will give a turning movement to the pipes. A clamp is adjustably disposed on the end of each nozzle and each clamp supports a spray plate which projects beyond the nozzle and across the axial line of the nozzle, intercepting the flow of water and directing it up into a broader, flatter stream or spray. These clamps are adjustable on the nozzle so that the spray plates just mentioned can be adjusted to direct the water at any desired angle.

Although the valve sleeve and the casing are both rotatable on the spindle they are, nevertheless, independently rotatable. On the base plate of the tripod a plurality of projections, such as pins, are disposed which can be located at various points on the plate. The lower end of the valve sleeve is provided with a lug or projection which, as the valve sleeve rotates, will come in contact with one of these pins so that the movement of the sleeve will cease. The valve casing, however, will continue to move for a given distance, at which time a shoulder formed on the valve casing will encounter another portion of the lug on the valve sleeve so as to interrupt the continued movement of the casing. At or before this movement, however, the relative movement which is taking place between the casing and sleeve has caused the reversing of

the direction of flow of the water through the pipe so that the reaction of the water leaving the new pipe will cause the casing and the sleeve to be rotated in the opposite direction.

5 This rotation in the opposite direction will continue until the lug on the sleeve engages the first pin encountered in its new motion, whereupon the sleeve will stop and the casing will continue for an angle of movement,

10 when another shoulder on the casing will encounter the lug. At this time, again, the water reversal has taken place and motion in the opposite direction takes place. This action is automatic and continuous. By disposing

15 the pins on the base plate of the tripod further apart in an angular respect, the arc of movement of the sprinkler arms or pipes can be regulated as desired. In fact, if the pins are removed entirely and the nozzles are

20 disposed to point in opposite directions, as in the case of an ordinary sprinkler, the arms will move continuously in one direction.

As shown in the drawings, the invention comprises a tripod base plate 1 to which suitable adjustable legs 2, 3 and 4 are attached.

25 This tripod is provided with a valve spindle 5, preferably conical in shape, which projects upwardly therefrom. The upper end 6 of the spindle 5 is threaded to receive clamping nuts 7 and 8. The spindle is provided

30 with suitable ports or apertures such as 9. This spindle is adapted to act as a support or seat for a hollow valve sleeve angular in shape. This sleeve is numbered 10 and

35 is provided with an opening cut in one side forming an angle of 180°. The lower end of this sleeve is provided with a lug or projection 11 which, as the sleeve rotates on the spindle, is adapted to swing over the base

40 plate 1. This base plate, in the arc of travel of the lug, is provided with holes 12 into which pins such as 13 may be inserted as desired; the idea being that the lug will encounter the pins 13 in any direction of this

45 movement, and when this encounter takes place the movement of the valve sleeve will cease. Certain other holes 14 are provided on the base plate at a greater distance from the center of the plate so as to receive the

50 pins at the path of movement of the lug 11 when they are not intended to be effective.

Frictionally supported over the sleeve 10 is a valve casing 15 open at the bottom and provided at the top with an aperture through

55 which the threaded end 6 of the spindle 5 projects. A washer 16 is disposed between the clamping nuts 7 and 8 in the top of the casing 15. This casing is provided with two

60 ports 17 and 18 located on opposite sides thereof into which threaded nipples 19 and 20 of sprinkler pipes 21 and 22 are introduced. These sprinkler pipes have their

65 ends open at right angles to form nozzle portions 23 and 24. Clamping sleeves 25 and 26 are adjusted on the nozzle portions 23 and

24 and are provided with spray plates 27 and 28. These plates project forward from the nozzles and across the axis of flow of the water therefrom at an angle to intercept the flow and break up the continuity of the

70 stream. By reason of the fact that the clamping sleeves 25 and 26 are adjustable on the nozzle the stream can be directed in any desired direction.

It will be noted that the slotted portion of

75 the valve sleeve 10, when disposed in the normal position shown in Fig. 2, will leave the ports 17 and 18 partly open so that water can flow through the spindle, through the sleeve and into both ports. This will cause the

80 water to flow in both pipes and be discharged from both nozzles. By the operator imparting a slight movement to the casing to move it from this mid position one port will be

85 closed more than the other, producing an unbalance in the fluid reaction, whereupon rotation will commence. Further rotation will entirely close one port until the lug 11

90 encounters a pin. If continuous rotation is desired the nozzles are adjusted to point in opposite directions and the sleeve is disposed in its halfway position, shown in Fig. 2, and

95 the pins 13 are disposed in the holes 14 instead of in the holes 12. It will be noticed that, as shown in the sections in Figs. 2, 3 and 5, the conical slope of the spindle is slightly different from that of the inner surface of the valve sleeve so as to form a chamber

100 therebetween into which the liquid can be forced, whereby its pressure will tend to hold the valve sleeve upward against the inner surface of a casing so that the friction

105 between the valve sleeve and the spindle is considerably reduced, the water also acting as a lubricant.

However, if one of the pins 13 is located in one of the holes 12, then the rotation of the lug 11 will, in due time, cause it to encounter the pin which will interrupt the

110 movement of the sleeve 10. This interruption of the sleeve 10, however, will not stop the rotation of the casing 15 and it will continue to rotate, and in so doing will alter the relation of the sleeve 10 with respect to the

115 ports 17 and 18 so that one port will commence to be closed and, consequently, water will be shut off from this port and allowed to flow freely through the other. This

120 motion of the casing will continue until one of the shoulders 29 and 30 (see Fig. 1) engage with the upper portion of the lug 11, at which instant the motion of the casing will stop. However, at this instant, or just

125 prior thereto, the relation of the valve sleeve 10 to the ports 17 and 18 has been so established that water will commence to flow out of the other nozzle and will be interrupted in the nozzle previously in use so that the back kick of the water will start the sprinkler

130 arms or pipes moving in the opposite di-

rection. This opposite movement will continue until the lug engages a pin in this opposite direction of movement, whereupon a similar action takes place, causing a reversal of the mechanism again.

It is perfectly obvious that I have provided a simple, efficient and compact mechanism composed of a minimum number of simple parts so associated that the automatic operation takes place with certainty, and that the parts, because of this simple association, can be very readily assembled and disassembled for cleaning, inspection and repair. Essentially, the fundamental apparatus comprises the spindle, the valve sleeve and the casing in conjunction with the lug on the sleeve, and adjustable means on the base plate to interrupt the motion of the sleeve at predetermined intervals.

What I claim is:—

1. A lawn sprinkler, which comprises a base portion, a valve spindle thereon and having ports therein, a valve sleeve mounted on the spindle and having a port, a valve casing mounted on the sleeve and having oppositely arranged ports, said sleeve and casing both being rotatable on the spindle and the casing rotatable with respect to the sleeve, and means on the base to engage the sleeve to interrupt its motion at predetermined points in its travel.

2. A lawn sprinkler, which comprises a base portion, a valve spindle thereon and having ports, a valve sleeve mounted on the spindle and having a port, a valve casing mounted on the sleeve and having oppositely arranged ports, said sleeve and casing both being rotatable on the spindle and the casing rotatable with respect to the sleeve, means on the base to engage the sleeve to interrupt its motion at predetermined points in its travel, and means on the sleeve and on the casing to interrupt the motion of the casing with respect to the sleeve after the sleeve has been stopped.

3. A lawn sprinkler, which comprises an apertured valve spindle, a valve sleeve thereon, said sleeve being ported, a valve casing rotatable on the sleeve, said casing having ports disposed on opposite sides thereof, the relation of the ports in the casing and the sleeve being such that when one port in the casing is entirely closed by the sleeve the

other is open, nozzleed pipes connected to the ports in the casing, the reaction of the water leaving the nozzles tending to rotate the pipes and the casing, the frictional engagement of the valve sleeve with the casing causing it to be rotated therewith, a base plate on which the spindle is mounted, adjustable stop means on the base plate alined in the path of movement of the sleeve, and means on the sleeve to engage said last-mentioned means to interrupt the motion of the sleeve at given points in its travel whereby the relation of the ports in the sleeve and the casing can be altered to effect a reversal of the motion of the mechanism.

4. A lawn sprinkler, which comprises a rotatable valve casing and a rotatable valve sleeve frictionally engageable and both rotatably mounted on a common spindle, a base on which said spindle is mounted, a projection on the sleeve, adjustable stop means on the base plate to engage with the projection to interrupt the motion of the sleeve, means tending to move the valve casing as long as water is flowing from the sprinkler, and means on the valve casing engageable with the projection on the sleeve at predetermined points in the relative movement of the casing with respect to the sleeve to interrupt the relative movement therebetween.

5. A lawn sprinkler, which comprises a spindle mounted on a base plate, a valve sleeve rotatable thereon, a valve casing frictionally engageable with the sleeve and rotatable therewith and thereon, said spindle, sleeve and casing having ports, the ports of the spindle and sleeve wholly or partially registering all the time with each other and the ports of the casing alternately registering with the ports of the sleeve and spindle, nozzle pipes connected to the casing and disposed to cause the rotation of the casing due to the reaction of the water leaving the nozzles, a lug on the lower end of the valve sleeve, pins on the base plate to engage the lug to stop the motion of the valve sleeve, and shoulders formed on the casing adapted to engage another portion of said lug to interrupt the relative movement between the casing and the sleeve.

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