June 30, 1942. W. H. COLES ET AL 2,288,394

SPRINKLING APPARATUS

Filed March 22, 1940

Fig. 3

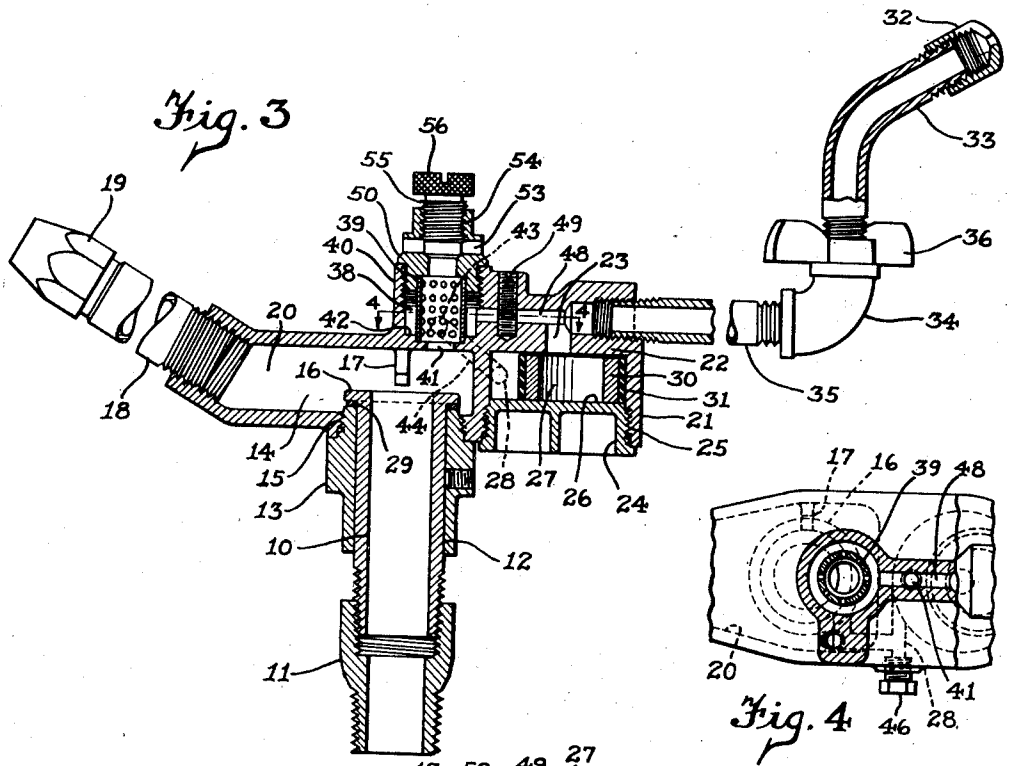


Fig. 4

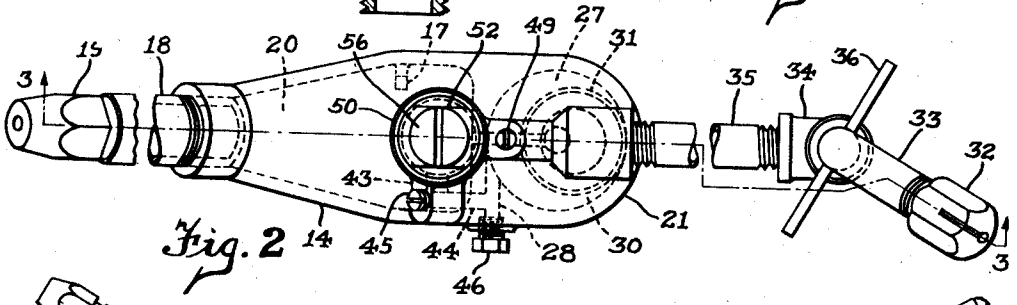


Fig. 2

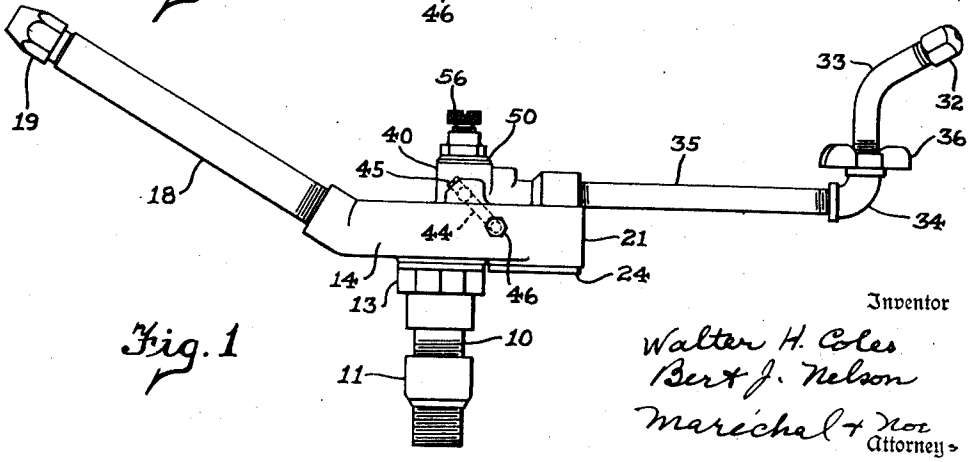


Fig. 1

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SPRINKLING APPARATUS

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7 Claims. (Cl. 239—69)

This invention relates to irrigation devices and more particularly to irrigation sprinklers having a rotatable distributing pipe.

One object of the invention is the provision of a sprinkler having a rotatable distributing pipe adapted to be slowly rotated and capable of operating under widely varying water pressures at a controlled slow rate of rotation.

Another object is the provision of a sprinkler of the character mentioned, in which the different parts to which access may be required for cleaning or repairing are adapted to be readily removed without requiring the entire disassembly of the sprinkler.

Another object is the provision of a sprinkler having a rotatable distributing head provided with a water chamber and vibration means adapted to impart an effective vibration to the head, which is also provided with a readily removable strainer in the path of the water flowing to the water chamber.

Another object of the invention is the provision of a sprinkler having a rotatable distributing head provided with a vibration device and a reaction device arranged to give a slow rotation to the distributing head, means being provided to by-pass the vibration device so that the rate of water flow through it can be readily controlled.

Another object of the invention is the provision of a rotatable sprinkler having vibration means adapted to vibrate the distributing head and operated by the whirling action of water flowing through a water chamber in the head, there being provision in the rotatable head for readily controlling the rate of whirl in the water chamber so that the vibration rate can be adjusted to a desirable value in accordance with the water pressure of the source of supply.

Other objects and advantages of the invention will be apparent from the following description, the appended claims and the accompanying drawing.

In the drawing, in which a preferred embodiment of the invention has been illustrated in the form of a sprinkler having a single main distributing nozzle and with both vibration and reaction means for controlling its rotation about a substantially vertical axis,

Fig. 1 is a side elevation of a sprinkler embodying the present invention;

Fig. 2 is a top plan view of the sprinkler shown in Fig. 1;

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is a horizontal section on line 4—4 of Fig. 3.

Referring more particularly to the drawing, in which the same reference numerals have been used to designate like parts in the several views, 10 designates a hollow supporting post having a pipe connection 11 at its lower end by means of which it may be readily connected to a water supply pipe. The post is provided with a cylindrical bearing surface 12 on which the supporting member 13 of a rotatable water distributing or sprinkler head 14 is carried. The supporting member 13 is preferably made separable from the main body of the head 14 and is provided with a threaded connection as indicated at 15 so that these parts may be readily secured together. The upper end of the supporting post 10 is outwardly flanged as shown at 16 and seats against a thrust washer 29 provided on the upper end of the member 13, the supporting post being held down, during operation, by the upward force on the head due to the water pressure. A stop projection 17 is integrally provided on the head 14, having its lower end spaced some little distance above the top of the flange 16 and permitting a limited amount of axial travel between the post 10 and the supporting member 13.

Extending from one side of the head 14 is a main distributing pipe 18 having a water distributing or sprinkling nozzle 19 arranged to supply a stream of water upwardly and substantially radially outwardly. The inner end of the pipe 18 is in free communication with the water passage 20 in the head.

The sprinkler head is provided with a substantially cylindrical wall 21 and a substantially horizontal wall 22 in which there is a central opening 23, and below the wall portion 22 is a readily removable closure disk 24 having screw threads 25 engaging threads on the wall 21. The closure disk has a flat upper surface 26, the surface 26 together with the walls 21 and 22 providing a cylindrical water chamber 27 which has a tangentially directed supply passage 28 leading to it so that water supplied through the passage 28 is caused to whirl in the chamber before leaving the chamber through the opening 23. Within the chamber is a ring 30 having a diameter preferably somewhat greater than the radius of the chamber and a height that is preferably only slightly less than the depth of the chamber. This ring is carried around with the whirling water and causes a rapid vibratory movement of the entire sprinkler head, preventing the head from sticking and keeping it free so that it may be

slowly revolved about a vertical axis under the reaction force created by a reaction nozzle to which the water is supplied after leaving the passage 23. The ring 30 is preferably of brass or other suitable metal, having an outer rubber layer 31 secured to the metal portion of the ring. The rubber surface gives a substantially frictionless rolling engagement of the ring against the outer cylindrical wall of the water chamber and reduces the wear on these parts.

The reaction nozzle 32 is slotted and discharges the water flowing through chamber 27 as a spray, and is carried on a reaction pipe 33 which screws into elbow 34 carried by a pipe 35 projecting substantially radially from the sprinkler head 14. The reaction nozzle 32 is directed at an upward angle and also at an angle to a vertical radial plane as will be apparent from Figs. 2 and 3. The angularity of the reaction nozzle with respect to a radial plane may be readily adjusted by loosening a wing nut 36 and turning the pipe 33. The wing nut 36 normally serves to hold the pipe 33 in any position of adjustment on the elbow.

The water supplied to the water chamber 27 comes from a strainer compartment 38 which is interposed between the water passage 20 of the head and the tangentially directed passage 28 leading into the water chamber. A cylindrical strainer 39, having openings of suitable size to prevent the passage of large bits of wood, rock, etc., that might be present in the water supply, is positioned in the compartment 38, the interior of the strainer being in free communication with the water passage 20 through an opening 41. The lower end of the strainer rests against an annular flange 42 which provides the passage 41. The strainer is spaced from the upwardly projecting annular wall portion 40 of the sprinkler head, the space between the strainer and the wall portion 40 forming an annular discharge passage in communication with a short radial passage 43. Extending from the short passage 43 is an inclined passage 44 which leads down to the passage 28. The passage 44 is preferably formed by boring the sprinkler head to establish communication between the short passage 43 and the passage 28 which extends parallel to it, the upper end of the passage 44 being closed by a screw 45, and the outer end of the horizontal passage 28 also being closed by a screw 46.

The sprinkler head is also provided with a passage 48 leading from one side of the strainer compartment and extending to the pipe 35 so as to form a bypass around the water chamber 27. This bypass may be entirely closed by a screw or valve 49 threaded in a vertical hole in the sprinkler head and adapted to extend into and block the passage 48. By adjusting the screw 49 outwardly, the passage 48 may be opened to any desired extent so that the rate of flow through the water chamber can be controlled to give any desired rate of movement of the ring 30. If the water pressure supplied to the sprinkler head is very high and all of the water flowing through the reaction nozzle 32 passes through the water chamber 27, the vibratory movement of the ring might be so extremely rapid that it would not give the desired vibratory effect on the head, and therefore, with such high pressures, the screw 49 is adjusted so that some of the water is bypassed around the water chamber and the rate of travel of the ring is thus reduced until it is small enough to give an effective vibratory movement to the sprinkler head. The speed of rotation of the head may be made very slow by having the reaction nozzle 32 extend at only a small angle from a radial plane, and with a slow speed of rotation the water will be thrown from the main nozzle 19 to its maximum extent. In case the water pressure of the supply is comparativelp low, the flow past the valve 49 is reduced and the angularity of the reaction nozzle with respect to a radial plane is increased to give the desired rate of turn.

The strainer is adapted to be readily cleaned without disturbing the connection between the sprinkler head and its support. As shown, the strainer is fixed to a readily removable cap 50 which is threaded in the upper end of the wall portion 40 of the sprinkler head. The strainer may thus be readily removed from the top of the head and replaced in position by a wrench engageable with the flat parallel surfaces 52. In accordance with the preferred construction illustrated, it is unnecessary to remove the strainer from its position in the sprinkler head for cleaning purposes, the cap 50 being provided with a horizontal passage 53 leading outwardly from a threaded passage 54 in which there is threaded an adjustable stud 55 having a head 56 that may be readily turned to adjust the stud. The stud may extend down far enough to entirely block off the passage 53, seating at its lower end, or may be moved upwardly to open the passage 53 and permit water to flow upwardly along the inner surface of the strainer and be laterally discharged from the sprinkler, thus cleaning out any accumulation that may collect on the inner or supply side of the strainer.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply passage, a distributing pipe extending substantially radially from the head and in free communication with said water supply passage, a water chamber in said head, a passage extending from the water supply passage to the water chamber, vibration means in the chamber operated by water flow through the chamber to vibrate the head, reaction means for distributing water from the chamber and rotating the head, means for bypassing water from the water supply passage to the reaction means independent of water flow through the water chamber, and adjustable means on said head operable to adjust the relative rates of flow from the water supply passage through the water chamber and through the by-passing means to change the rate of vibration imparted to the head.

2. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply pasage, a distributing pipe extending substantially radially from the head and communicating with said water supply passage, a water chamber in said head, a passage extending from the water supply passage to the water chamber, vibration means in the chamber operated by water flow through the chamber to vibrate the head, reaction means for distributing water from the chamber, a bypass around the water chamber and extending from the water supply passage to the reaction means, and means

operable to adjust the rate of flow through said bypass.

3. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply passage, a distributing pipe extending from the head and communicating with said water supply passage, a water chamber in said head, a passage extending from the water supply passage to the water chamber, a strainer between the water supply passage and the water chamber, means carried by said head and independent of said distributing pipe and adapted to be readily removed from said head to provide access to the strainer, vibration means in the chamber operated by water flow through the chamber to vibrate the head, and means for distributing water from the chamber.

4. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply passage, a distributing pipe extending from the head and communicating with said water supply passage, a water chamber in said head, a passage extending from the water supply passage to the water chamber, a strainer between the water supply passage and the water chamber, means carried by said head and independent of said distributing pipe and adapted to be readily removed therefrom to provide access to the strainer, vibration means in the chamber operated by water flow through the chamber to vibrate the head, reaction means for distributing water from the water chamber, and a controllable bypass around the chamber operable to adjust the rate of water flow through the water chamber to change the rate of vibration imparted to the head.

5. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply passage, a distributing pipe extending substantially radially from the head and communicating with said water supply passage, a water chamber in said head, a passage extending from the water supply passage to the water chamber and arranged to provide a tangential whirl of water in the chamber, vibration means in the chamber operated by the whirling action of the water to vibrate the head, reaction means for distributing water from the chamber, a bypass around the water chamber between the water supply passage and the reaction means, and an adjusting screw threaded in said head and having an end exposed for accessibility at the top of said head and operable to restrict flow through said bypass to any desired extent.

6. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply passage, a distributing pipe extending substantially radially from the head and communicating with said water supply passage, a water chamber in said head, a passage extending from the water supply passage to the water chamber and arranged to provide a tangential whirl of water in the chamber, vibration means in the chamber operated by the whirling action of the water to vibrate the head, said head having a top opening, a closure cap independent of said distributing pipe and removably carried in said opening, a strainer carried by said cap and interposed between the water supply passage and the water chamber, and means for distributing water from said chamber.

7. A sprinkler comprising a support, a head rotatably carried by said support and having a water supply pasasge, a distributing pipe extending substantially radially from the head and in free communication with said water supply passage, a water chamber in said head, vibration means in said chamber, a passage extending from the water supply passage to the water chamber, a hollow strainer having its supply space communicating with said water supply passage and positioned between the water supply passage and the water chamber, and adjustable means accessible from the outside of said head and independent of said distributing pipe and operable to open the supply space of the strainer directly to the outside of the head for flushing the strainer.

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