

Sept. 18, 1956

J. T. PORTER

2,763,512

ADJUSTABLE SPRINKLER

Filed June 20, 1955

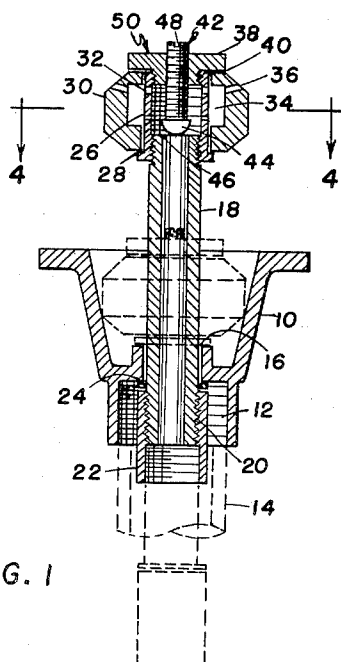


FIG. 1

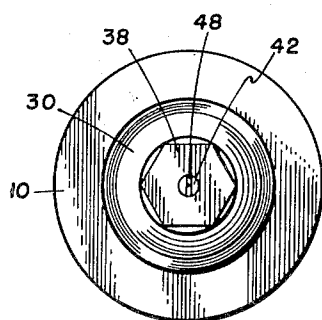


FIG. 2

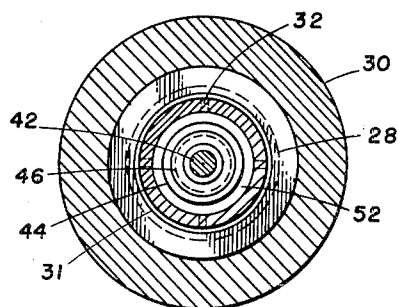


FIG. 4

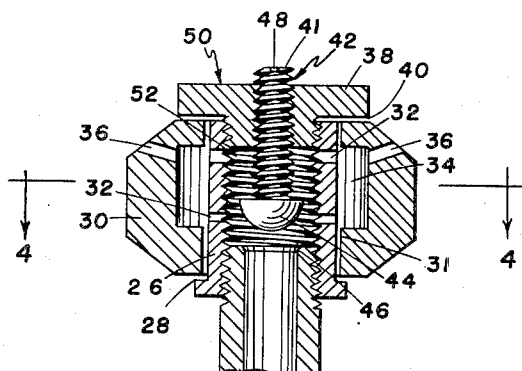


FIG. 3

INVENTOR.
JAMES T. PORTER

BY

Knox & Knox

1

2,763,512

ADJUSTABLE SPRINKLER

James T. Porter, San Diego, Calif.

Application June 20, 1955, Serial No. 516,385

1 Claim. (Cl. 299—69)

The present invention relates generally to rotatable sprinklers and more particularly to a rotatable sprinkler having an adjustable flow controlling valve element inside the head.

The primary object of this invention is to provide a rotatable sprinkler head in which the volumetric flow of water through the head is controllable.

Another object of this invention is to provide a valve for a pop-up sprinkler and which is exteriorally accessible for adjustment, the necessary adjustment being possible without dismantling the valve or removal of any parts therefrom.

Another object of this invention is to provide a satisfactory closure or shut-off means for a pop-up type sprinkler.

Another object of this invention is to provide a valve for a pop-up sprinkler which is adapted for fabrication from many different materials, so that the choice of material can be according to the dictates of availability and price considerations, the exact sizes and proportions being matters easily determined to suit particular conditions and needs.

Another object of this invention is to provide a valve for a pop-up sprinkler which is practicable and inexpensive to manufacture.

Finally, it is an object to provide a sprinkler of the aforementioned character which is simple, and convenient to operate, and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claim, and illustrated in the drawing which form a material part of this disclosure and wherein similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing, and in which:

Fig. 1 is a cross-sectional view showing the sprinkler in operating position. The dotted outline showing non-operating position.

Fig. 2 is a top view of the sprinkler.

Fig. 3 is an enlarged cross-sectional view of the rotatable head.

Fig. 4 is a sectional view at the line 4—4 of Fig. 3.

Referring first to Figure 1, this sprinkler includes a cup shaped body 10, made of metal or other suitable material, and having a reduced diameter at its lower extremity. The cup has an internally threaded inlet bore 12 in said lower extremity to engage supply pipe 14. Above the threaded inlet bore, in axial alignment with but of a smaller diameter than said bore, is an opening 16 provided for the insertion of a hollow stem 18. The opening 16 and hollow stem 18 are so arranged as to be in non-rotary axially sliding relationship.

The lower extremity of said hollow stem 18 is provided with external threads 20 to receive an internally threaded cylindrical lower collar 22. A sealing gasket

2

24 is mounted externally of the stem 18 and compressed between an internal shoulder on the cup 10 and the upper end of the collar 22, thereby substantially prohibiting leakage of water between said opening 16 and hollow stem 18.

The upper extremity of said hollow stem 18 is provided with external threads to receive a collar 26, said collar having at its lower extremity a flange 28 which acts as a support for the rotatable head 30. Said collar 26 is provided with internal threads to engage with external threads of the upper extremity of said hollow stem 18. The collar 26 is also provided with a plurality of perforations 32 radially disposed about the periphery of said collar in order that the water passing through the hollow stem 18 may be admitted into the chamber 34 of the rotatable head 30. The head 30 is provided with an axially disposed bore 31 of sufficient diameter to allow free rotation thereof about the collar 26 but small enough to inhibit axial tilting. Said bore 31 is enlarged in diameter a slight distance inward along the axis from upper and lower extremities of said rotatable head to form the aforementioned chamber 34. Said chamber is of sufficient volume to allow equal pressure distribution to a plurality of discharge ports 36 along the upper angle of the rotatable head 30. Said discharge ports 36 extend from the chamber 34 to the surface of the upper portion of the rotatable head 30 in an oblique manner so as to provide an upward trajectory of the stream of water, and at the same time provide a torsional force about the axis of the rotatable head 30 causing a rotation of said head. The rotatable head 30 is held on said collar 26 by a retaining plug 38. Said retaining plug 38 is provided with external threads to engage internal threads of and be in axial alignment with said collar 26. The upper portion of said retaining plug 38 is of an expanded diameter of sufficient proportions to extend outward beyond the outer periphery of said collar 26, thereby providing an upper bearing shoulder 40 to prevent an upward motion of said rotatable head 30 and to effectively seal the upper extremity of said collar 26. The threaded portion of said retaining plug 38 being of such length as to allow a substantial separation between the lower extremity of said plug 38 and the upper extremity of said hollow stem 18 thereby forming a compartment 52, allowing equal pressure distribution to the perforations 32 in said collar 26. Said retaining plug 38 is provided with an axially disposed, threaded opening to receive the threaded stem 41 of a valve element 42, and is so shaped exteriorally as to allow application of means of tightening. Said valve element 42 is provided with a hemispherical head 44 at its lower extremity. The stem 41 is to allow said head 44 to be adjusted to the required spacing above the outlet port 46 comprising a suitably bevelled portion at the inner periphery of the upper extremity of said hollow stem 18. The outlet port 46 also constitutes a valve seat when the flow is to be completely stopped. The upper extremity of said valve element 42 is provided with a screw driver slot 48 as a means of adjusting said valve element so that said head 44 is moved toward and away from the outlet port and valve seat 46, thereby adjusting the flow of water to the rotatable head 30.

In use, the sprinkling device operates in the following manner. When water supply enters supply pipe 14 and proceeds upward through the hollow stem to the lower extremity of the retaining plug 38, the pressure exerted by the water against said retaining plug 38 raises the entire sprinkler assembly 50, with relationship to the body 10, to the operating position as shown in Figure 1. While the sprinkler assembly 52 is in said operating position the sealing gasket 24 is held with sufficient pressure against the lower lip of opening 16 to substantially pro-

hibit leakage of water between the walls of said opening 16 and the hollow stem 18. The flow of water passes by the valve head 44 into the compartment 50, which has a volumetric capacity sufficient to allow equal pressure distribution to the plurality of perforation 32 in said flanged collar 26. The water enters chamber 34 and escapes through discharge ports 36, whose angularity provides both a desirable trajectory for the water leaving said discharge ports 36, and a tangential force causing rotation of the head 30. The valve screw 42 may be adjusted to vary the proximity of the valve head 44 to the outlet port 46, thereby varying the flow of water from the hollow stem 18 to the compartment 52. This variation of flow governs both the trajectory of the water stream leaving the discharge ports 36 and the speed with which the rotatable head 30 rotates.

When the water supply entering supply pipe 14 is shut off, the pressure holding sprinkler assembly 50 in operating position is exhausted through said discharge ports 36, and said assembly 50 is allowed to drop under the force of gravity due to the previously mentioned free sliding relationship of the hollow stem 18 in the body 10. The cup shaped body 10 acts as a receptacle for the upper extremity of sprinkler assembly 50 while said assembly 50 is in non-operating position.

As mentioned above, the outlet port 46 functions as a valve seat when it is desired to shut off flow completely in a particular sprinkler. This is extremely useful and desirable when the conditions in different portions of an installed sprinkler system vary due to a change in planting or for other reasons. The instant invention provides an economical and convenient means for shutting off individual sprinklers.

The operation of this invention will be clearly comprehended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It will be obvious that all said objects are amply achieved by this invention.

Further description would appear to be unnecessary.

It is understood that minor variation from the forms of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

In a sprinkler: a hollow stem having means for connection with a source of pressurized water; said stem having one end constituting an outlet port; a collar secured to said one end; a sprinkler head rotatively mounted on said collar; a member fixed on said collar and having an expanded portion defining a bearing shoulder retaining said sprinkler head on said collar; a valve element having an imperforate head; and means for mounting said valve element on said member for adjustment of said head toward and away from said outlet port to vary flow therethrough, said means for mounting comprising a solid stem on said valve element threaded into said member and extending axially of said hollow stem and outlet port, said solid stem on the valve element having a tool-receiving deformation on the end thereof remote from said imperforate head, said deformation being accessible for adjustment from the exterior of said sprinkler and said outlet port constituting a valve seat for said imperforate head in one position of the valve element, whereby flow through said port can be completely stopped when desired.

References Cited in the file of this patent

UNITED STATES PATENTS

203,069	Pennington	Apr. 30, 1878
214,778	King	Apr. 29, 1879
1,078,432	Hadden	Nov. 11, 1913
1,919,245	Munz	July 25, 1933
2,360,203	Cox	Oct. 10, 1944
2,610,089	Unger	Sept. 9, 1952
2,625,411	Unger	Jan. 13, 1953