Feb. 11, 1941. A. C. HOFFMAN 2,231,422

SPRINKLER

Filed May 17, 1939

Fig. 1.

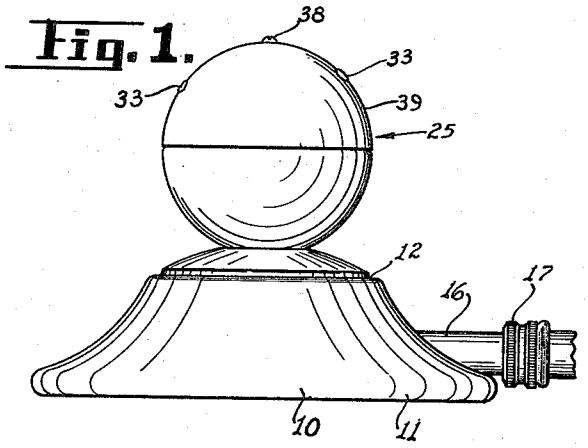



Fig. 3.

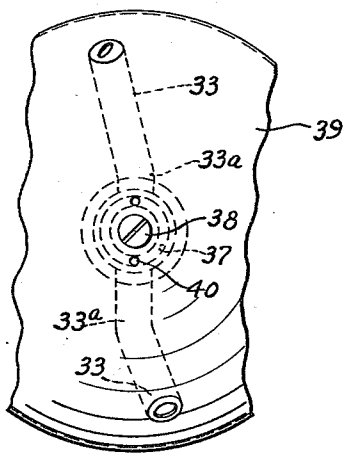



Fig. 2.

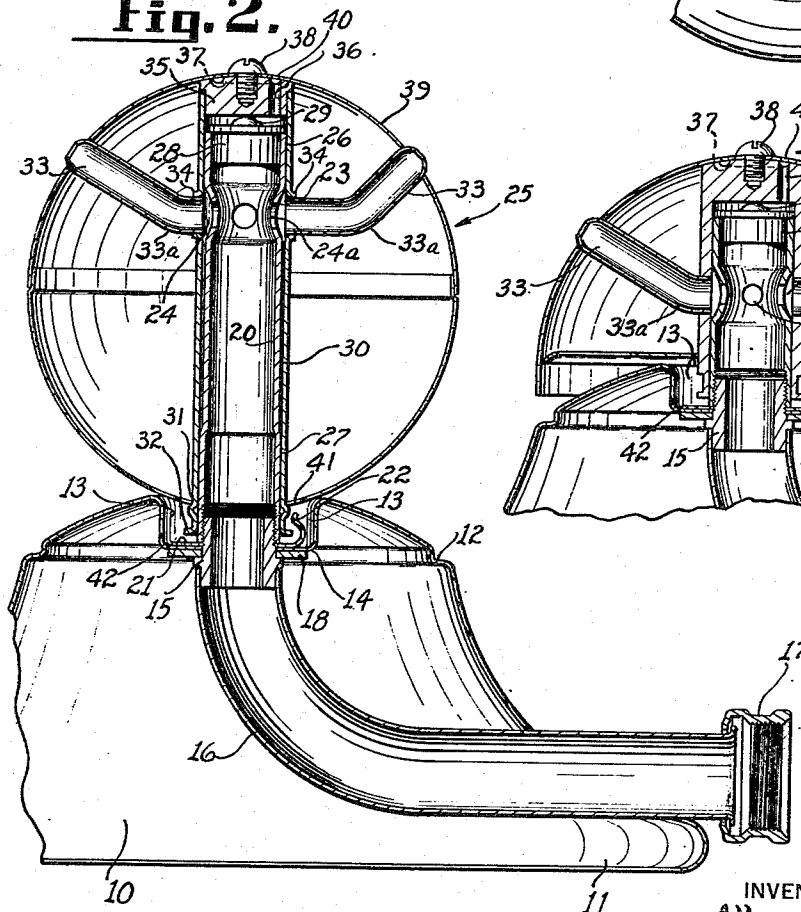



Fig. 4.




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## SPRINKLER

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12 Claims. (Cl. 299—69)

This invention relates to sprinklers and in its present embodiment is adopted for use as a water sprinkler for lawn or garden irrigation. Other specific adaptations of the inventive principles hereof will, of course, suggest themselves to those skilled in the art to which the invention pertains.

It is among the general objects of the invention to provide a sprinkler of novel and simple construction which lends itself to economical manufacture, while providing a device designed for improved efficiency, effectiveness and serviceable life.

Another general object is to provide in an efficient and effective sprinkler an improved appearance whereby the device while retaining all its virtues of utility provides an attractive object, both while in use and at rest, so that its permanent positioning will enhance, rather than detract from the general appearance of a lawn or garden.

It is among the more specific objects of the invention to provide in a rotary head sprinkler an improved head to spindle assembly which seeks to achieve an improved bearing relationship between parts while utilizing a minimum number of parts and permitting economical manufacturing methods to be employed in the production of such parts.

Another object is to provide in such a device for a readily assembled combination which may also be readily disassembled for inspection or cleaning with minimum effort and without requiring the use of tools or mechanical skill.

A further important object of this invention is to provide in a sprinkler of the character set forth, a shield or husk which imparts grace of contour to the device and which also serves as a protector from moving parts and as a balancing medium which reduces vibration and enhances efficiency.

Another object is to provide, in a rotary head sprinkler for the delivery of liquid with an improved spray pattern designed to increase the area served by the device and to enhance its even distribution in the form of a desirable spray.

Other objects and features of the invention will be apparent from a consideration of the following specification taken in conjunction with the accompanying drawing in which

Fig. 1 is a side elevation of one form of the present invention;

Fig. 2 is a vertical section through that form of the invention shown in Fig. 1;

Fig. 3 is a fragmentary top plan view of the device of both Figures 1 and 4 and showing by dotted lines the positions of the discharge spouts; and

Fig. 4 is a view similar to that of Figure 2 depicting another form of the same invention.

While the specific form of the invention as shown in the drawing is hereinafter described in detail, it may be said in general that the device comprises a stationary hollow spindle closed at its upper end and having apertures in its walls for the discharge therethrough of the fluid to be sprinkled. The outer walls of the spindle form one or more bearing surfaces for a rotary head which may slip freely over the spindle being preferably retained against accidental removal by a retainer here shown in the form of a self-releasing spring detent. The head rests upon and is supported by the closed end of the spindle, a bearing knob is preferably provided to receive wear between parts and to reduce the area of frictional contact. Discharge spouts are carried by the head, their inner ends being in communication with the fluid supplied through the spindle. The spouts are bent to impart rotary movement to the head, but unlike present day sprinklers, the invention contemplates that the angle of their discharge end as well as the structure of the end opening may be different so that different areas will be reached by the fluid from each spout and the character of the spray may be individual for each spout. An important feature of the invention is the provision of a housing shell, shield or husk carried by the head and enclosing the spouts and serving not only to give grace and beauty to the device, but also to serve the very practical purpose of a guard housing for the spouts and to balance the head and to present a smooth airflow surface for the device.

Referring now specifically to the drawing, that form of the invention therein depicted includes a base 10 which in conformity to the artistic design of this form of the invention is preferably of substantially conical form pressed from sheet metal and has an inwardly curving lower supporting flange 11, an encircling strengthening bead 12 and a cylindrical depression 13 at its apex, the floor 14 of the depression being apertured to receive therethrough a flanged connector 15. A supply pipe 16 is soldered or otherwise secured to the connection 15 and extends through one side wall of the base, being preferably provided with a suitable hose coupling 17.

The connector may be provided with a washer 18 which bears against the lower face of the floor 14 while the threaded end of the connector ex-

tends through the apertured floor and receives the threaded lower end of the stationary hollow spindle 20. A second washer 21 carrying a spring detent 22 may be mounted upon the upper face of the floor 14 and is secured in position by engagement between the lower end of the spindle 20 and the floor 14.

The spindle 20 is hollow and is provided with a portion 23 of reduced diameter which reduces the area of contact between the spindle and the rotatable head 25 later to be described. The portion 23 is further reduced to form an annular channel 24 of arcuate cross section. At the channel 24 the wall of the spindle is pierced by apertures 24A adapted to deliver therethrough fluid from the pipe 16 to the rotatable head as hereinafter described. On either side of the reduced portion 23, the spindle forms upper and lower bearing surfaces 26 and 27, respectively. The upper end of the spindle is closed as by a flanged cap 28 having a bearing knob 29 adopted to receive the weight of the rotatable head.

The head, as an assembly including its various parts, is indicated as a whole by the numeral 25, and includes a cylindrical sleeve-like body portion 30 slidable and rotatable fitting the spindle and bearing upon and being retained in proper alignment by the surfaces 26 and 27. The lower end of the cylindrical body 30 of the head assembly 25 is provided with a bead 31 and terminates with a flange 32, the flange lying normally under the detent 22 so as to restrain the head from accidental displacement from the spindle. The spring detent, however, is self releasing upon application of predetermined pressure so as to permit removal from or application to that position on the spindle as shown. By this arrangement it will be noted that assembly or disassembly of head and spindle may be readily performed without the use of tools or mechanical skill.

Intermediate the ends of the body sleeve it is provided with one or more (here shown as two) flanged apertures and one or more discharge spouts 33 are secured to the flanges 34 of the apertures in communication with the channel 24 of the spindle 20 the spouts are angled as at 33A so that fluid pressure passing therethrough will impart a rotary motion to the head. In the present device, the outer ends of the spouts are directed at different angles from the horizontal so that each will direct a flow of fluid at its own angle so that each may sprinkle an individual circular area. By reference to Fig. 3 it will also be noted that the spout ends may have, or be formed to provide, nozzles of different characteristics so that each spout may discharge its fluid as different type of spray. In the drawing, the left hand spout is directed at a medium angle and is constructed to form a relatively even round stream while the right hand spout is disposed at a greater angle and its end forms a flattened or fan-like spray. Thus in combination, the two spouts give a combination of spray characteristics adopted to provide a maximum of spray coverage. Obviously, many combinations of spout angles and/or nozzle characteristics may be employed to suit the exigencies of any given situation.

The upper end of the body 30 of the head 25 is closed as by a cap 35 which rests upon the knob 29 thus the knob supports the weight of the head assembly and acts as a thrust bearing therefor. Obviously, the knob may be avoided permitting the plane surfaces to contact or the bearing knob may be carried by the cap 35 instead of the cap 28. The cap 35 is provided with a vent 36 leading from the space between cap 28 and cap 35 and communicating with a circular groove 37 on the outer face of the cap 35. This arrangement precludes the build up of pressure between the spindle and the head which might result from leakage of fluid past the bearing surface 26 and might then tend to lift the head from its proper bearing upon the knob 29.

Secured to the cap 35 of the rotary head assembly as by a screw 38 in a decorative, protecting and balancing husk or shield 39 apertured as at 40 to permit escape of fluid from the groove 37 and also apertured as shown to permit the discharge from the discharge spouts which, if desired, may contact the husk and engage the aperture walls, as shown.

In that form of the invention shown in Figures 1 and 2 the husk is in two parts and forms a sphere. The lower hemispherical section encircles the lower end of the sleeve 30 and is supported by the bead 31. The edge of the opening which encircles the sleeve is cut away on opposite sides as at 41 to permit discharge of fluid from the inside of the sphere and to permit assembly of the lower hemisphere over the flanges 34 of the sleeve 30. An aperture 42 in the depression 13 is provided to preclude accumulation of fluid therein. The two halves of the spherical husk of Figures 1 and 2 are preferably merely removable fitted together so as to permit removal of the upper hemisphere to give access to the spouts without disassembly of other parts of the device.

As shown by Figure 4, the invention is not limited to the specific configuration of the husk shown in Figures 1 and 2. In Figure 3 the husk 45 is semispherical having a reinforcing flange 46. In the first instance, the appearance is that of a sphere balanced upon a conical base while in the second instance, the contour of the husk blends into the lines of the base. In either instance it will be noted that this utilitarian device is transposed into an attractive piece which by the use of contrasting color effects may be rendered highly decorative. By the use of chromium finish or other reflecting surface, these devices take on the appearance and attractiveness of a gazing globe which may be as desirable for a lawn or garden ornament as for the useful function of the sprinkler.

It wil further be noted that in the depiction of the invention in Figure 4 the sleeve 30 is shown as formed as a screw machine product as distinct from the sleeve of Figure 2 which is shown as a drawn tubing. Obviously both devices are susceptible of manufacture by either manufacturing procedure and the invention is in no way limited to structural details here set forth as illustrative of commercially successful forms of the invention.

Numerous changes, modifications and the full use of equivalents will suggest themselves and may be utilized in carrying out the present invention, but it is understood that changes, modifications or the use of equivalents will not be constructed as a departure from the spirit or scope of the appended claims.

I claim:

1. In a sprinkler, the combination with a stationary hollow spindle, of a rotary sprinkler head slidably and rotatably mounted thereon, and means to prevent build up of fluid pressure from effecting longitudinal movement of said head with respect to said spindle, and a readily releasable detent engageable with said head to pre-

vent accidental displacement of said head from said spindle.

2. In a sprinkler, the combination with a hollow stationary spindle having a fluid discharge port and a closed end, of a rotary head having a bearing end mounted upon said spindle and supported at all times by said closed end, a knobular bearing member between said end and head to receive the weight of said head, said head having an extended fluid discharge arm means communicating with the port of said spindle, the bearing end of said head having an annular groove in its outer surface and a vent hole connecting the groove with the interior of said head, and a shell-like husk member secured to said bearing end of the head and extending to the ends of said arms as a support, said husk member having one or more openings through its wall in communication with said annular groove and serving as a fluid pressure release means.

3. In a sprinkler, the combination with a hollow stationary spindle having a fluid discharge port and a closed end, of a rotary head mounted upon said spindle and supported at all times by said closed end, said head having fluid discharge means communicating with the port of said spindle and a fluid pressure vent adjacent the closed end of the spindle to prevent the build up of pressure between the head and said closed end and a readily releasable detent for restraining said head from accidental displacement from said spindle.

4. A sprinkler as set forth in claim 1 in which the head carries one or more discharge spouts and a decorative and protecting husk.

5. In a sprinkler including a stationary spindle and a rotary head mounted thereon, a base supporting said spindle and having annular depression surrounding said spindle and forming a pocket adapted to receive therein the lower end of the rotary head and a releasable detent within said pocket for releasably engaging said lower end.

6. In a sprinkler the combination with a base having a depression forming a pocket, a stationary spindle supported by said base and extending from the pocket thereof in spaced relation to the side walls of said pocket so as to provide an annular space in said pocket around said spindle, and a rotary spout carrying head including a cylindrical sleeve-like body mounted on said spindle and extending into said annular space and a releasable detent in said annular space releasable engageable with said sleeve-like body.

7. In a sprinkler the combination with a base having a depression forming a pocket, a stationary spindle supported by said base and extending from the pocket thereof in spaced relation to the side walls of said pocket so as to provide an annular space in said pocket around said spindle, and a rotary spout carrying head including a cylindrical sleeve-like body mounted on said spindle and extending into said annular space, said sleeve-like body terminating at its lower end in a flanged portion and a releasable detent in said annular space releasable engageable with said flange.

8. In a sprinkler including a base, a stationary spindle mounted on said base, a rotary head mounted on said spindle and a plurality of discharge spouts carried by said rotary head, the combination with said head and spouts of a rigid protecting shell rigidly secured to said head and extending about said spouts and head and engaging said spouts near the ends thereof to form a rigid connection between the ends of said spouts and said head.

9. In a sprinkler including a base, a stationary spindle mounted on said base, a rotary head mounted on said spindle and a plurality of discharge spouts carried by said rotary head, the combination with said head and spouts of a rigid protecting shell rigidly secured to the upper end of said head and extending about and engaging said spouts near the ends thereof to the lower end of said head to form a rigid connection between the ends of said spouts and said head.

10. In a rotary head garden sprinkler having a base with a stationary spindle thereon provided with a water discharge opening and a rotatable head fitting closely about the spindle and having water distributing spouts carried thereby and communicating with said opening, the combination of means for balancing the head and supporting the spouts comprising a shell rotatable with the head and extending over said head and about the spouts and engaging said spouts near the discharge ends thereof.

11. In a rotary head garden sprinkler having a base with a stationary spindle thereon provided with a water discharge opening and a rotatable head fitting closely about the spindle and having water distributing spouts carried thereby and communicating with said opening, the combination of means for balancing the head and supporting the spouts comprising a substantially spherical shell rotatable with the head and extending over said head and about said spouts and engaging said spouts near the discharge ends thereof.

12. In a rotary head garden sprinkler having a base with a stationary spindle thereon provided with a water discharge opening and a rotatable head fitting closely about the spindle and having water distributing spouts carried thereby and communicating with said opening, the combination of means for balancing the head and supporting the spouts comprising a substantially hemispherical shell rotatable with the head and extending over said head and about said spouts and engaging said spouts near the discharge ends thereof.

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