

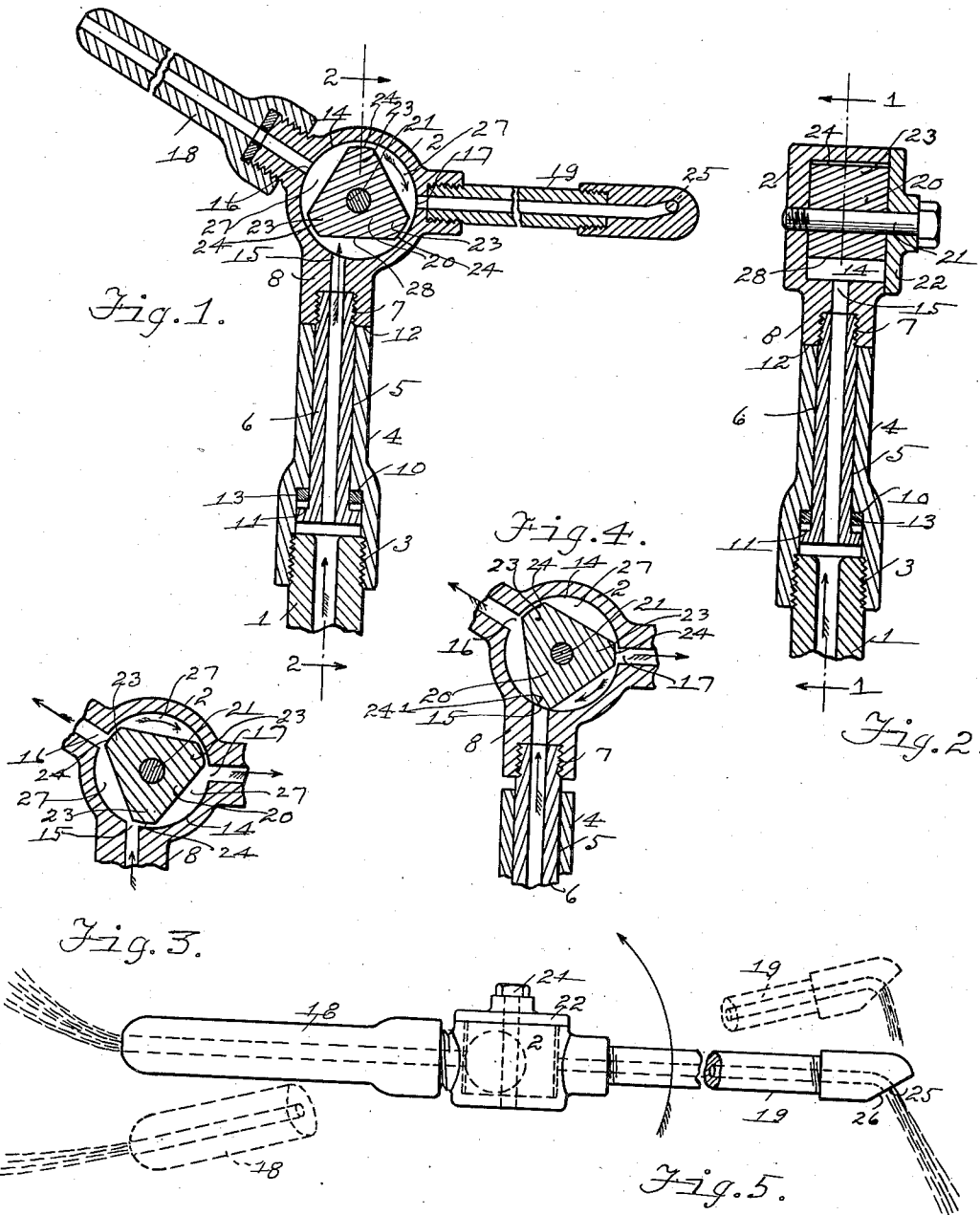
July 14, 1936.

C. O. WILSON

2,047,348

WATER SPRINKLER

Filed Aug. 7, 1935



Witness:
Geo. L. Chapel

INVENTOR.
Charles O. Wilson
BY
Rice and Rice
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,047,348

WATER SPRINKLER

Charles O. Wilson, Muskegon, Mich.

Application August 7, 1935, Serial No. 35,144

5 Claims. (Cl. 299—69)

The present invention relates to water sprinklers; and its object is to provide in a sprinkler having a horizontally rotatable sprinkler head improved means for automatically and intermittently retarding the rotation of said head to vary the extent of the area sprinkled and the amount of water delivered thereto.

This and any other and more specific objects hereinafter appearing are attained by, and the invention finds preferable embodiment in, the illustrative sprinkler structure particularly described in the body of this specification and illustrated by the accompanying drawing, in which:

Figure 1 is a vertical sectional view of a sprinkler structure taken on line 1—1 of Figure 2;

Figure 2 is a vertical sectional view thereof taken on line 2—2 of Figure 1;

Figure 3 is a vertical sectional view of a portion of the same taken on said line 1—1 but showing the valvular member thereof in a different turned position;

Figure 4 is a vertical sectional view of said structure taken on a plane corresponding to said line 1—1, but showing a modified construction of said member turned to another position and showing the sprinkler head raised;

Figure 5 is a top plan view of the structure illustrating its action in different turned positions of said valvular member.

In the embodiment of the invention illustrated by this drawing, a sprinkler is shown which has a vertical pipe 1 through which water under pressure flows into and through a sprinkler head 2. The pipe has, threaded at 3 thereon, an upward extension 4 in whose cylindrical bore 5 the tubular downwardly extending portion 6 bears its upper end being threaded at 7 in the boss 8 of said head.

The pipe 1 (i. e. its extension 4) has an annular shoulder or horizontal rotative bearing 10 and the head (i. e. its tubular portion 6) has a corresponding annular shoulder or horizontal rotative bearing 11 below the pipe's shoulder. The head 2 is thus mounted on the pipe 1 for horizontal rotative movement and also for limited axial or vertical movement to a lowered position shown in Figures 1 and 2 in which it is supported at 12 by the upper end of the pipe's portion 4, and to a raised position shown in Figure 4 in which it is stopped by the contacting of said shoulders, a washer 13 between said shoulders being desirably provided.

The head 2 has a horizontally axial circular chamber 14 with angularly spaced openings 15 leading from the pipe and 16, 17 leading to the

horizontally extending (or approximately horizontally extending) nozzles 18, 19. A valvular member 20 in the chamber coaxial therewith and freely rotatable about its mounting pivot pin 21 (extending through the removable cover 22 of the chamber and threaded in its opposite side), is rotated by the flow of water through the pipe and the chamber's inlet opening 15, the axis of said member's rotation being laterally offset from the direction of said flow as shown.

This valvular member is desirably triangular, and preferably equilaterally triangular, in transaxial section as shown, thus forming three angularly spaced peripheral portions 23 adjacent the curved inner surface of the chamber, these portions at their extremities being formed concentric with the said axis and spaced inwardly therefrom as shown at 24 to form passages between them and said surface; but some of these extremities may extend into sliding contact with said surface as shown at 24¹ in Figure 4.

In the illustrated construction, said nozzles 18, 19 extend oppositely from the head, the nozzle 19 having its discharge vent 25 directed through its vertical side 26 so that the head is rotated by water pressure in the usual manner. The other nozzle 18 preferably extends somewhat upwardly from the head so as to throw the water farther therefrom. If the valvular member 20 be in the turned position seen in Figure 1, some of the water flowing through the inlet opening 15 into the chamber and rotating this member in the direction of the arrows will be discharged through outlet opening 16 and nozzle 18, and some of the water will pass the extremities 24 and be discharged through the outlet opening 17 and the nozzle 19.

When by the rotation of the valvular member one of said extremities is brought into registration with any of said openings, especially with the inlet opening 15, the flow of water through the head will be thus retarded so that the pressure of the water will raise the head to the position shown in Figure 4, in which the shoulders or rotative bearings 10, 11 are brought into contact thus increasing the friction between the pipe, i. e. its shoulder 10, and the head, i. e. its shoulder 11. This increased friction retards the head's rotation which results in throwing the water farther radially from the pipe.

When the valvular member is in the turned position seen in Figure 1 in which said extremities are not in registration with the openings 15, 16, 17, the water passing around said extremities is not thus retarded and the head falls to the position

tion shown in Figures 1 and 2 thus separating the shoulders or rotative bearings 10, 11 so that the head may rotate more rapidly whereby the water is discharged on a less area about the pipe.

5 In Figure 5, the nozzles as shown in solid lines are in a position in which the head is being rapidly rotated, the valvular member being at that moment in a position (as that shown in Figure 1) in which the flow through the head is unretarded. As indicated by the direction of the spray issuing from the nozzles, a less circular area is thus sprinkled than when the head and nozzles are being more slowly rotated and are momentarily in the position shown in dotted lines, at which time the valvular member is in a turned position retarding the flow and the spray extends farther from the head thus sprinkling a wider area.

When the valvular member shown in Figure 4 is in the turned position seen in that view, its extremity 24¹ acts positively as a valve to momentarily close the inlet opening 15. This creates greater friction between said shoulders than that exerted by the form of said member shown in Figures 1 and 3 and a consequently slower rotation of the head which rotation nevertheless continues by virtue of the head's momentum.

It will be seen that there is a constant fluctuation in the operation of this sprinkler as the valvular member's rotation alternately retards the flow and permits unretarded flow of water through the nozzles. A pair of nozzles as shown seems desirable although only a single nozzle may be necessary.

It will be seen that a valvular member triangular in cross section permits a wider passage 27 along its sides than is possible with any member otherwise polygonal in transaxial section, and that such a member thus triangular equilaterally has a more steady and uniform rotation under the pressure of the stream of water than if otherwise triangular; and that such an equilaterally triangular member will turn by gravitation to the position of rest seen in Figure 1 in which a side 28 thereof is directly transverse the direction of the flow.

It will also be seen that the rotation of the valvular member causes the retarded and non-retarded flow of the water through the nozzle or nozzles in regular sequence.

It is manifest that the shoulders 10, 11 need not be actually separated in any case from each other or from the washer 13 therebetween, because although always in contact the friction between them is increased by a slight upward movement of the head and decreased by a downward movement thereof.

The invention being intended to be pointed out in the claims, is not to be limited to or by details of construction of any particular embodiment thereof illustrated by the drawing or hereinbefore described.

I claim:

1. In a water sprinkler: a vertical pipe for water under pressure having a horizontal bearing; a sprinkler head mounted on the pipe for horizontally rotative movement and for limited vertical movement and having a hollow horizontal rotative bearing, a nozzle extending radially and rearwardly for causing the head to rotate by the passage of water therethrough and an axially horizontal circular chamber with angularly spaced openings from the pipe and to the nozzle respectively; a valvular member in the chamber

rotatable about an axis concentric with the chamber's axis laterally offset from the direction of the flow of water from the pipe into the chamber so that said member is rotated by said flow, said member having angularly spaced peripheral portions adjacent the curved inner surface of the chamber adapted to retard the flow of water through at least one of said openings in one turned position of said member and to permit comparatively unretarded flow of water through said opening in another turned position of said member, the head being adapted to be raised to a position wherein said bearings frictionally contact each other by water pressure increased by the movement of said member into its first-mentioned position and for the purpose of increasing friction between the pipe and the rotating head thus to retard the rotation of the head.

2. In a water sprinkler: a vertical pipe for water under pressure having a horizontal bearing; a sprinkler head mounted on the pipe for horizontally rotative movement and for limited vertical movement and having a hollow horizontal rotative bearing, a nozzle extending radially and rearwardly for causing the head to rotate by the passage of water therethrough and an axially horizontal circular chamber with angularly spaced openings from the pipe and to the nozzle respectively; a valvular member in the chamber rotatable about an axis concentric with the chamber's axis laterally offset from the direction of the flow of water from the pipe into the chamber so that said member is rotated by said flow, said member being triangular in transaxial section but with the extremities of its portions adjacent the curved inner surface of the chamber formed concentric with said axis and adapted to retard the flow of water through at least one of said openings in one turned position of said member and to permit comparatively unretarded flow of water through said opening in another turned position of said member, the head being adapted to be raised to a position wherein said bearings frictionally contact each other by water pressure increased by the movement of said member into its first-mentioned position and for the purpose of increasing friction between the pipe and the rotating head thus to retard the rotation of the head.

3. In a water sprinkler: a vertical pipe for water under pressure having a horizontal bearing; a sprinkler head mounted on the pipe for horizontally rotative movement and for limited vertical movement and having a hollow horizontal rotative bearing, a nozzle extending radially and rearwardly for causing the head to rotate by the passage of water therethrough and an axially horizontal circular chamber with angularly spaced openings from the pipe and to the nozzle respectively; a valvular member in the chamber rotatable about an axis concentric with the chamber's axis laterally offset from the direction of the flow of water from the pipe into the chamber so that said member is rotated by said flow, said member being triangular in transaxial section but with the extremities of its portions adjacent and spaced inwardly from the curved inner surface of the chamber formed concentric with said axis and adapted to retard the flow of water through at least one of said openings in one turned position of said member and to permit comparatively unretarded flow of water through said opening in another turned position of said member, the head being adapted to be raised to a position wherein said bearings frictionally contact each

other by water pressure increased by the movement of said member into its first-mentioned position and for the purpose of increasing friction between the pipe and the rotating head thus to retard the rotation of the head.

4. In a water sprinkler: a vertical pipe for water under pressure having an annular shoulder; a sprinkler head mounted on the pipe for horizontally rotary movement and for limited vertical movement and having an annular shoulder below the pipe's shoulder, a nozzle extending radially and rearwardly for causing the head to rotate by the passage of water therethrough and an axially horizontal circular chamber with angularly spaced openings from the pipe and to the nozzle respectively; a valvular member in the chamber rotatable about an axis concentric with the chamber's axis laterally offset from the direction of the flow of water from the pipe into the chamber so that said member is rotated by said flow, said member being equilaterally triangular in transaxial section but with the extremities of its portions adjacent and spaced inwardly from the curved inner surface of the chamber formed concentric with said axis and adapted to retard the flow of water through said openings in one turned position of said member and to permit comparatively unretarded flow of water through said openings in another turned position of said member, the head being adapted to be raised to a position wherein said shoulders frictionally contact with each other by water pressure increased by the movement of said member into its first-mentioned position and for the purpose of increasing friction between the relatively rotat-

ing shoulders thus to retard the rotation of the head.

5. In a water sprinkler: a vertical pipe for water under pressure having a horizontal bearing; a sprinkler head mounted on the pipe for horizontally rotative movement and for limited vertical movement and having a hollow horizontal rotative bearing, a nozzle extending radially and rearwardly for causing the head to rotate by the passage of water therethrough and an axially horizontal circular chamber with angularly spaced openings from the pipe and to the nozzle respectively; a valvular member in the chamber rotatable about an axis concentric with the chamber's axis laterally offset from the direction of the flow of water from the pipe into the chamber so that said member is rotated by said flow, said member being triangular in transaxial section but with the extremities of its portions adjacent the curved inner surface of the chamber formed concentric with said axis, one of said extremities being in sliding contact with said surface and another of said extremities being spaced therefrom and adapted to retard the flow of water through at least one of said openings in one turned position of said member and to permit comparatively unretarded flow of water through said opening in another turned position of said member, the head being adapted to be raised to a position wherein said bearings frictionally contact each other by water pressure increased by the movement of said member into its first-mentioned position and for the purpose of increasing friction between the pipe and the rotating head thus to retard the rotation of the head.

CHARLES O. WILSON.