Oct. 16, 1951 M. SCHLONAU ET AL 2,571,768

SPRAY NOZZLE WITH ADJUSTABLE DEFLECTOR

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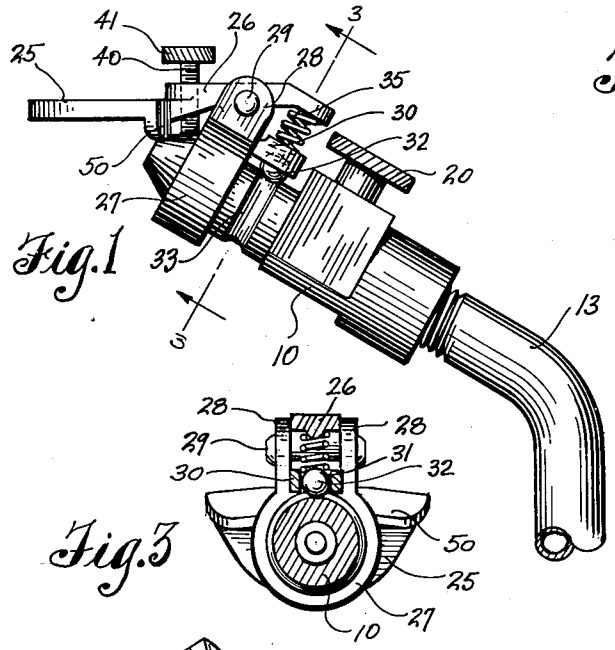


Fig. 1

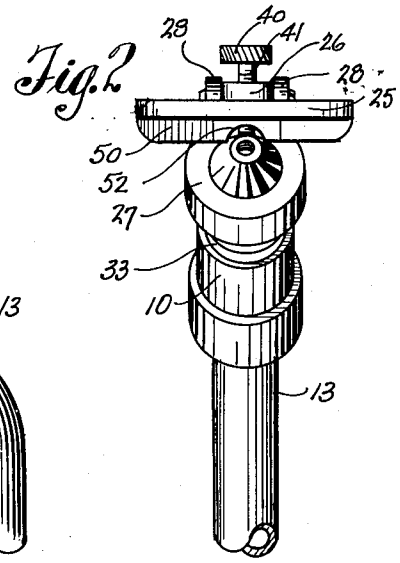


Fig. 2

Fig. 3

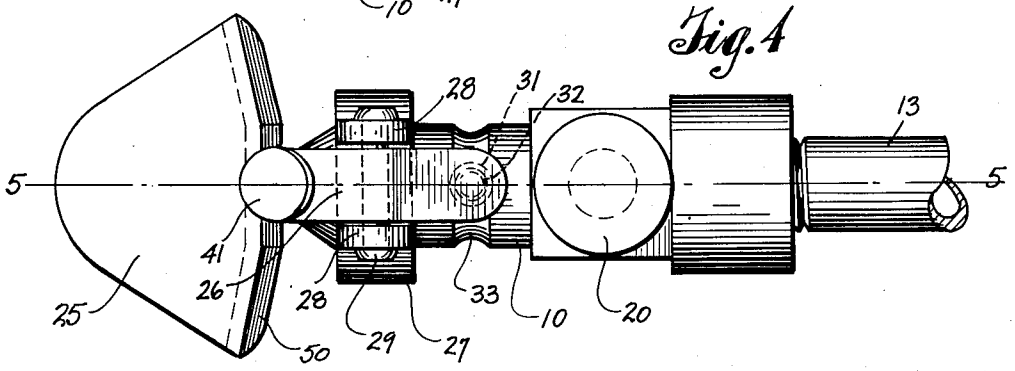


Fig. 4

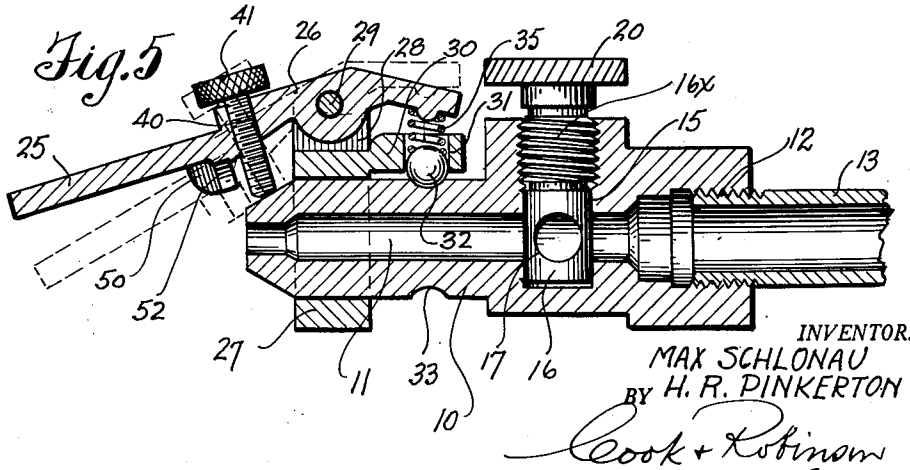


Fig. 5

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SPRAY NOZZLE WITH ADJUSTABLE DEFLECTOR

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2 Claims. (Cl. 299—129)

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This invention relates to devices of those kinds known generally as spray nozzles. More particularly it has reference to improvements in spray nozzles designed for use in sprinkler systems that are like or similar to that disclosed and described in my co-pending application, filed on November 14, 1944, under Serial No. 563,330, now abandoned, which comprises a main water supply line from which branch pipes extend in various directions and at their outer ends are equipped with adjustable spray nozzles.

It is the principal object of this invention to provide an improved form of spray nozzle that may be used to great advantage in sprinkling systems where the character of the spray is important and where its direction of discharge may be required to be changed from time to time.

It is also an object of the invention to provide a spray nozzle with which a spray forming and spray deflecting plate of novel character is adjustably associated, and which, by an angular adjustment thereof relative to the direction of discharge of water from the nozzle, will change the degree of fineness of the spray, and by rotative adjustment about the nozzle axis, will effect change in the general direction of discharge of the spray.

It is a further object of my invention to provide means for easily effecting and retaining changes in adjustment or position of the spray forming plate.

Yet another object is to provide means directly associated with the nozzle for controlling the volume of water delivered therethrough.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of connection, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a side view of a spray nozzle embodied by the present invention; showing it as applied to a water supply pipe.

Fig. 2 is an elevation of the nozzle as seen from the discharge end, with parts set as in Fig. 1.

Fig. 3 is a cross-sectional detail on line 3—3 in Fig. 1.

Fig. 4 is a somewhat enlarged top view of the spray nozzle.

Fig. 5 is a longitudinal section taken on line 5—5 in Fig. 4.

Referring more in detail to the drawings—

In its preferred form of construction the present spray nozzle comprises a metal body portion 10, generally round in cross section, and formed longitudinally with a water channel 11 which at one end is counterbored and threaded, as at 12, for mounting the nozzle on a water supply pipe, or the like, as shown; the pipe being

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designated by reference numeral 13. At the discharge end of the nozzle, the passage 11 is reduced in diameter, as shown best in Fig. 5, to give greater velocity to the stream as discharged.

Formed in the body 10, transversely of the channel 11 and passing through it, is a bore 15 in which a valve 16 is rotatably fitted. The valve has a passage 17 therethrough that may be brought into and from registration with the passage 11 to control the flow of water. The valve has a stem portion 16x that is threaded into the bore 15, to hold the valve in place, and at its outer end the stem is equipped with a knurled nut 20 for the rotatable adjustment of the valve.

The plate designed to form and determine the direction and character of the spray, is designated in its entirety by reference numeral 25. It comprises a flat plate of metal, substantially triangular in form, as shown in Fig. 4, and equipped at the base of the triangle with a supporting arm 26. The plate is supported by a collar 27 that is fitted for rotation about the round outer end portion of the nozzle body; the collar, as noted in Fig. 3, being formed with two circumferentially spaced wings 28—28 between which the arm 26 extends and through which wings and arm a pin 29 is extended to pivotally mount the arm.

To retain the collar against displacement from the body 10, it is formed with an integral arm 30 that extends from between the wings toward the mounting end of the body as best shown in Fig. 5. Formed in this arm is a hole 31 in which a ball bearing 32 is fitted. The ball engages in a groove or channel 33 that encircles the nozzle body, and is held in the groove by a coiled spring 35 that bears at one end against the ball and at its other end bears against the under side of the inner end portion of the arm 26. The spring thus has the dual purpose of holding the ball bearing in place and also holds the arm 26 and plate 25 in a set position of adjustment.

It will be understood by reference to Figs. 4 and 5, that the arm 26 is so attached to the collar that the flat under surface of the plate 25 will normally be disposed in the line of delivery of water from the nozzle as seen in Fig. 1, and by reason of its angular position will cause the water to be deflected therefrom as spray. The character of the water spray and the angle of spread to opposite sides of the nozzle may be changed by changing the angle of the plate 25 relative to the line of delivery, and the direction of delivery of spray can be changed by adjusting the collar 27 and plate 25 about the axial line of the nozzle. For example, with the plate 25 set as in Fig. 1, the spray will be directed downwardly and forwardly. If the collar 27 should be rotated in either direction, the spray would be directed

laterally in accordance with the direction and extent of the adjustment. Likewise, if the plate **25** should be adjusted by turning the collar through 180°, then the spray would be directed upwardly.

To change the angular adjustment of the plate **25**, I have applied an adjusting screw **40** directly through the arm **26**, forwardly of the pivot pin **29**. This screw bears at its inner end against the conically tapered end surface of the nozzle body. At its outer end the screw is equipped with a knurled turning nut **41**. By an inward or outward rotary adjustment of this screw **40**, the plate **25** will be raised or lowered accordingly, as from the full line to the dotted line position shown in Fig. 5, thus to control the spread of the spray as well as its character or degree of fineness.

To use the device, it is fixedly mounted on the water supply pipe **13** as shown. The pipe **13** may be held in fixed position by any suitable means. The water supplied by pipe **13** is turned on by opening the valve **16**, and volume flow may be regulated by rotatable adjustment of the valve between open and closed positions. The direction of delivery of spray from the nozzle is determined by the rotatable adjustment of the plate **25** about the axial line of the spray body. Rotation is effected merely by grasping the collar and turning it about the body. The pressure of spring **35** against ball **32** retains the collar at a set position. The character of the spray produced, and its spread, is regulated by the angular adjustment of the plate **25**, accomplished by turning the adjusting screw **40**.

One of the features of the invention resides in providing the spray plate **25** with a flange **50** across its base end, and projecting below the plane of the bottom surface of the plate, as seen in Figs. 1 and 2. This flange has a cut-out or recess **52** in alignment with the water stream, as shown in Fig. 2, so as not to interfere with the water delivery or nozzle adjustment. The particular advantage of this flange is that it prevents backward delivery of spray from the plate **25**, particularly when nozzle adjustments are being made. The flange also confines the maximum spread of spray to a definite angle. It has been found desirable to form the plate **25** with a rounded nose as shown in Fig. 4, and to incline the opposite end portions of the flange **50** forwardly from the central recessed portion.

The particular advantages of a spray nozzle of this kind are that the angular spread of the spray can be regulated; the angular deflection can be changed to meet conditions, and the direction of delivery can be changed through a complete circle about the axis of delivery. The device is especially useful in spraying or sprinkling systems where a plurality of nozzles are grouped to cover a designated area in which some spots or parts may require more or less water or finer spray than others. Spray nozzles of this kind may be made in various sizes, to meet requirements, and of various materials. They are especially useful in sprinkler systems made according to the disclosures of my previously mentioned application.

Having thus described my invention, what we claim as new therein and desire to secure by Letters Patent is—

1. A spray nozzle of the character described comprising a body formed with a longitudinal channel counterbored and threaded at one end for fixedly mounting the nozzle on a water supply pipe for discharge of water through the nozzle channel; said body having a cylindrically formed outer end portion terminating in a conically tapered end surface, and formed at a distance spaced from its end with an encircling channel, a collar fitted to the cylindrically formed portion for rotatable adjustment thereabout, said collar having an arm extended inwardly therefrom across said annular channel and equipped with a circular hole therethrough, spaced outwardly extending ears on the collar, a flat spray forming and deflecting plate formed with a mounting lever arm extended therefrom between said spaced ears and over said hole equipped arm, a pivot pin mounting said lever arm between said ears to adjustably support said plate angularly across the path of delivery of water from the nozzle, a ball bearing fitted in said circular hole to follow in the body encircling channel, a coiled spring disposed under compression to bear against said ball and said lever arm at the inside of its pivotal mounting, and a thumb screw threaded through said lever arm at the outside of its pivotal mounting and engaged against said conical surface and adjustable to change the angular disposition of the plate relative to the line of delivery of water from the nozzle.

2. A spray nozzle comprising a body formed with a longitudinal channel and adapted for fixed mounting at its inner end on a water supply pipe, or the like, for discharge of water through said channel; said body having a cylindrical outer end portion formed with an encircling channel, a collar fitted to said cylindrical portion between the end of the body and channel for rotatable adjustment thereabout, a spray forming and deflecting plate having a mounting lever arm extending therefrom and across said collar and channel and pivoted to said collar for adjustable support of said plate across the path of delivery of water from the nozzle, a thumb screw threaded through the lever arm and engaging the body and adjustable to change the angular adjustment of the plate, said collar having an arm extending therefrom across said channel and formed with an opening therethrough, a ball bearing contained in said opening and seated in said channel permitting rotatable adjustment of the collar while retaining it against longitudinal movement on the body; and a coiled spring seated upon said ball to retain it engaged in the channel and bearing against said mounting lever of the spray deflecting plate to yieldingly retain adjustment of the plate as established by the thumb screw.

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