May 26, 1925. 1,539,331

H. M. SIEMANN

LAWN SPRINKLER

Filed March 12, 1923

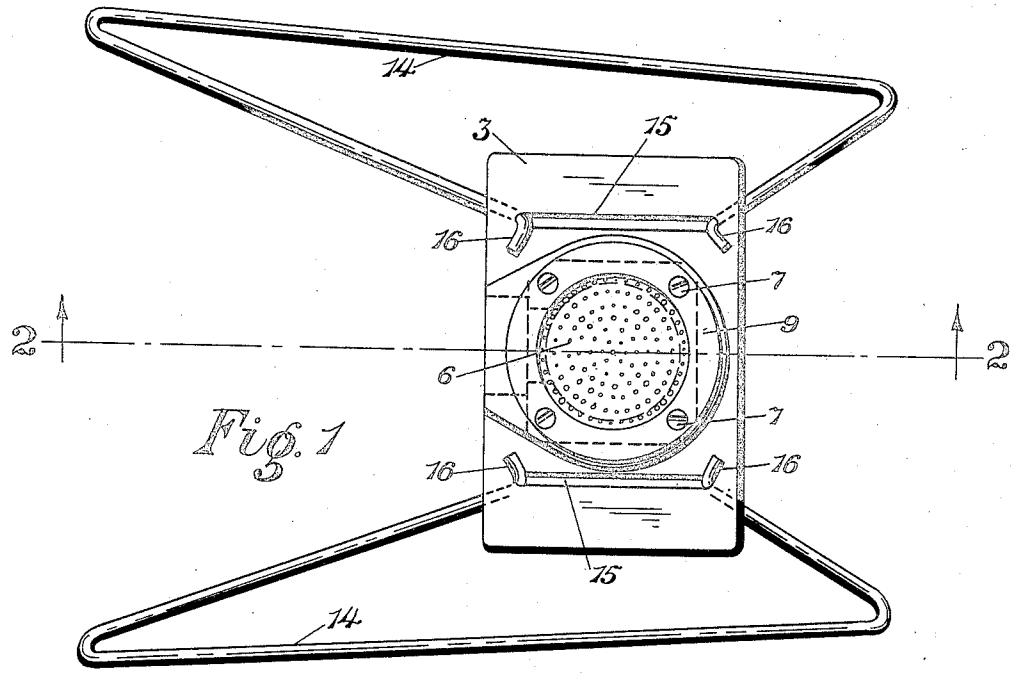


Fig. 1

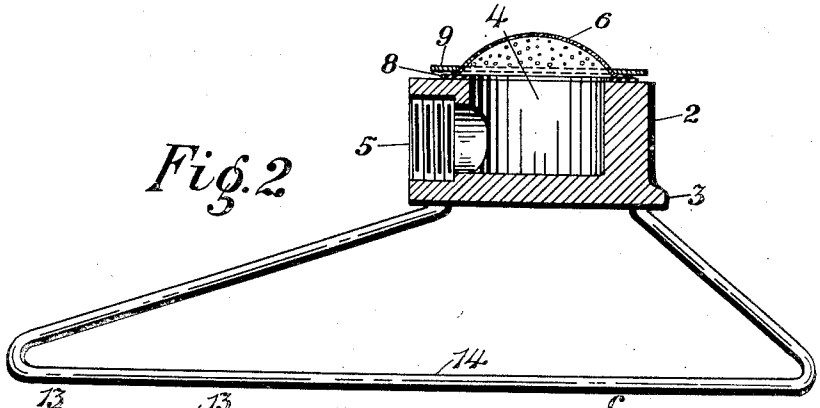


Fig. 2

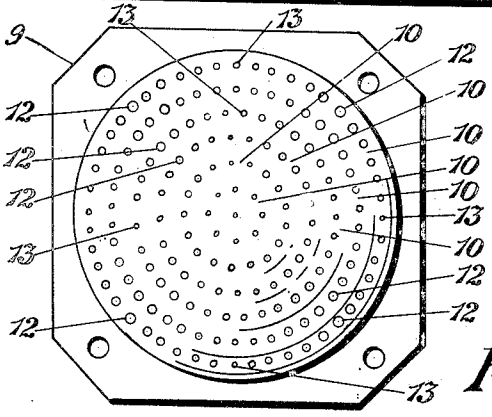


Fig. 3

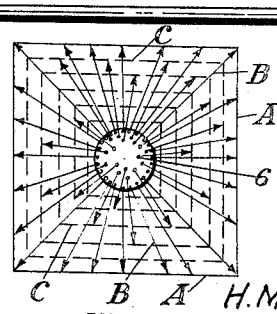


Fig. 4

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UNITED STATES PATENT OFFICE.

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LAWN SPRINKLER.

Application filed March 12, 1923. Serial No. 624,537.

To all whom it may concern:

Be it known that I, HENRY M. SIEMANN, citizen of the United States, residing at Fort Lupton, in the county of Morgan and State of Colorado, have invented certain new and useful Improvements in Lawn Sprinklers, of which the following is a specification.

My invention relates to lawn sprinklers and its principal object is to provide a sprinkler of simple construction which by an arrangement of openings of different diameters in a perforated spray-nozzle is adapted to irrigate a space bounded by one or more straight lines, over the entire area thereof.

Another object of the invention is to provide a sprinkler which in its operation will cover a tract bounded as stated hereinbefore, within its limits and thereby avoid trespassing on adjoining properties, and still another object is to provide a sprinkler of the above described type, the water-issue of which will cover every part of a square upon which it is centrally disposed.

Further objects of the invention reside in an improved construction of the nozzle per se and in a novel construction of the means which support it in its operative position.

With the above objects in view, my invention consists in the construction and arrangement of parts hereinafter more fully described with reference to the accompanying drawings which illustrate an embodiment of the invention in practical and commercial form.

In the drawings in the several views of which corresponding parts are similarly designated,

Figure 1 represents a top-view of my improved lawn sprinkler;

Figure 2, a longitudinal section taken on the line 2—2, Figure 1;

Figure 3, a top view of the perforated spray-head of the nozzle drawn to an enlarged scale; and

Figure 4, a diagrammatic view showing the relative sizes and directions of the jets of water issued from the nozzle in the operation of the sprinkler.

My invention consists in providing a nozzle in which apertures of progressively increasing diameters are arranged in a curved line lying in a horizontal plane for the ejection of water under pressure supplied through a conduit with which the nozzle is connected.

By forming the openings of largest diameter at opposite ends of this line and decreasing the sizes of the other openings progressively to a medial point between the end openings, the diverging jets of water ejected from the openings will correspondingly vary in length, and by properly proportioning the openings the jets may be caused to terminate in a straight line substantially parallel to the chord of the curve in which the apertures are arranged.

Furthermore, if apertures arranged as stated, are formed in four series in a circle with the largest openings at quadrant points thereof, the streams of water ejected through the apertures will terminate along the edges of a square, and if a number of such circles of apertures are arranged one above another in a convex surface and the diameters of corresponding apertures in the different circles are gradually decreased as they approach the apex of said surface, the jets of water will be thrown at gradually lessening distance from the boundary lines of the square and the entire area of the square will then be covered.

The above described arrangement of jet-openings in a nozzle of the required form constitutes the present invention and its embodiment as illustrated in the drawings will now be described.

The reference character 2 designates a nozzle consisting of a base plate 3, a superposed cylindrical chamber 4 having a lateral entrance 5 which is internally threaded for the connection of a screw-coupling at the end of a garden hose or other conduit, and a convex perforated and circumferentially flanged head or spray-plate 6 which is fastened upon the wall of the chamber by means of screws 7.

It is preferred to place a gasket 8 of elastic material between the flange of the plate and the wall of the chamber in order to provide a water-tight joint, and to clamp the flange upon the gasket by means of an annular plate 9 through which the screws are driven.

The arrangement of the perforations in the convex plate is best shown in Figure 3 of the drawings.

A plurality of circles 10 of equidistant apertures are formed in the convex surface at approximately equal distances apart. Each circle has four apertures 12 of largest diameter at quadrant points and from these points the diameters of the apertures decrease progressively to the medial points 13 at which the apertures of smallest diameter are formed.

The apertures in each circle corresponding to those of the larger circle immediately below it are of relatively smaller diameter so that the apertures in the different circles are progressively decreased in area in ratio to their distances from the apex of the spherical segment in which they are formed.

The nozzle is supported upon two diverging sled runners 14 preferably made of resilient wire.

The base has for its connection with the support parallel slots 15 and the ends of the wire of which the runners are composed are bent into hooks 16 which engage with the ends of the slots.

It will be readily apparent that by moving the hook-shaped ends of the wire runners together, which owing to the resiliency of the material is easily accomplished, the runners may be detached from the nozzle and the entire structure packed in compact arrangement for storage or transportation.

The advantageous result obtained in the operation of my invention is illustrated diagrammatically in Figure 4 of the drawings in which the lines A represent the boundaries of a square tract of land to be irrigated. The sprinkler being placed centrally of the square, the jets issued through the apertures of its nozzle have been indicated by arrows B and the lines at which they terminate inside the square by broken lines C.

It will be observed that the streams ejected through the apertures of largest diameter at the quadrant points of the largest circle of the nozzle, reach the corners of the square, that those issued through the other apertures of the same circle terminate in the lines between said corners at substantially equal distances from each other, and that the jets issued from the apertures in the other circles of the nozzle likewise terminate in the straight sides of squares which decrease in area in ratio to the distances of the circles of apertures to the center of the spherical segment in which they are formed.

It will thus be seen that the entire area of the square tract is evenly covered with water by the use of my improved sprinkler and that by regulating the force of the water, wetting of adjoining tracts is easily avoided.

In order to prevent the jets of water issued from the nozzle from interfering with each other, the apertures in each circle are preferably arranged in staggered relation to those of the next following circle as shown in the drawings.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a lawn sprinkler, a nozzle having jet-apertures of different sizes, radially arranged in a horizontal curve, two apertures of substantially equal diameter being at the ends of the curve and the other apertures decreasing in diameter progressively from said end apertures to a mediate point between them.

2. In a lawn-sprinkler, a nozzle having a convex surface and apertures of different sizes radially arranged in concentric horizontal curves in said surface, two apertures of substantially equal diameter being at the ends of each curve and the other apertures decreasing in diameter progressively from said end-apertures to a mediate point between them, and corresponding apertures of the curves decreasing in size proportionate to the decreasing distances of the curves to the apex of the convex surface.

3. In a lawn sprinkler, a nozzle having jet-apertures of different sizes radially arranged in a horizontal circle, the largest apertures of substantially equal diameter, being at equidistant points of the circle, and the other apertures decreasing in diameter progressively from said largest apertures to mediate points between them.

4. In a lawn-sprinkler, a nozzle having a convex surface and jet apertures of different sizes radially arranged in concentric horizontal circles in said surface, the largest apertures of substantially equal diameter, being at equidistant points of each circle and the other apertures decreasing in diameter progressively from said largest apertures to mediate points between them, and corresponding apertures of the circles decreasing in size proportionate to the decreasing distances of the circles to the apex of the convex surface.

5. In a lawn sprinkler, a nozzle having jet-apertures of different sizes radially arranged in a horizontal circle, the largest apertures of substantially equal diameter, being at quadrant points of the circle, and the other apertures decreasing in diameter progressively from said largest apertures to mediate points between them.

6. In a lawn-sprinkler, a nozzle having a convex surface and jet-apertures of different sizes radially arranged in concentric horizontal circles in said surface, the largest apertures of substantially equal diameter, being at quadrant points of each circle and the other apertures decreasing in diameter progressively from said largest apertures to mediate points between them, and corresponding apertures of the circles decreasing

in size proportionate to the decreasing distances of the circles to the apex of the convex surface.

7. In a lawn sprinkler, a nozzle having a convex surface and horizontal circles of jet apertures arranged in said surface in radial zones, the apertures in each zone decreasing in diameter proportionate to their decreasing distances from the apex of the surface, there being equidistant zones of apertures of largest diameter, and the apertures of the other zones decreasing in diameter progressively from said zones of apertures of largest diameters to mediate lines between them.

In testimony whereof I have affixed my signature.

HENRY M. SIEMANN.