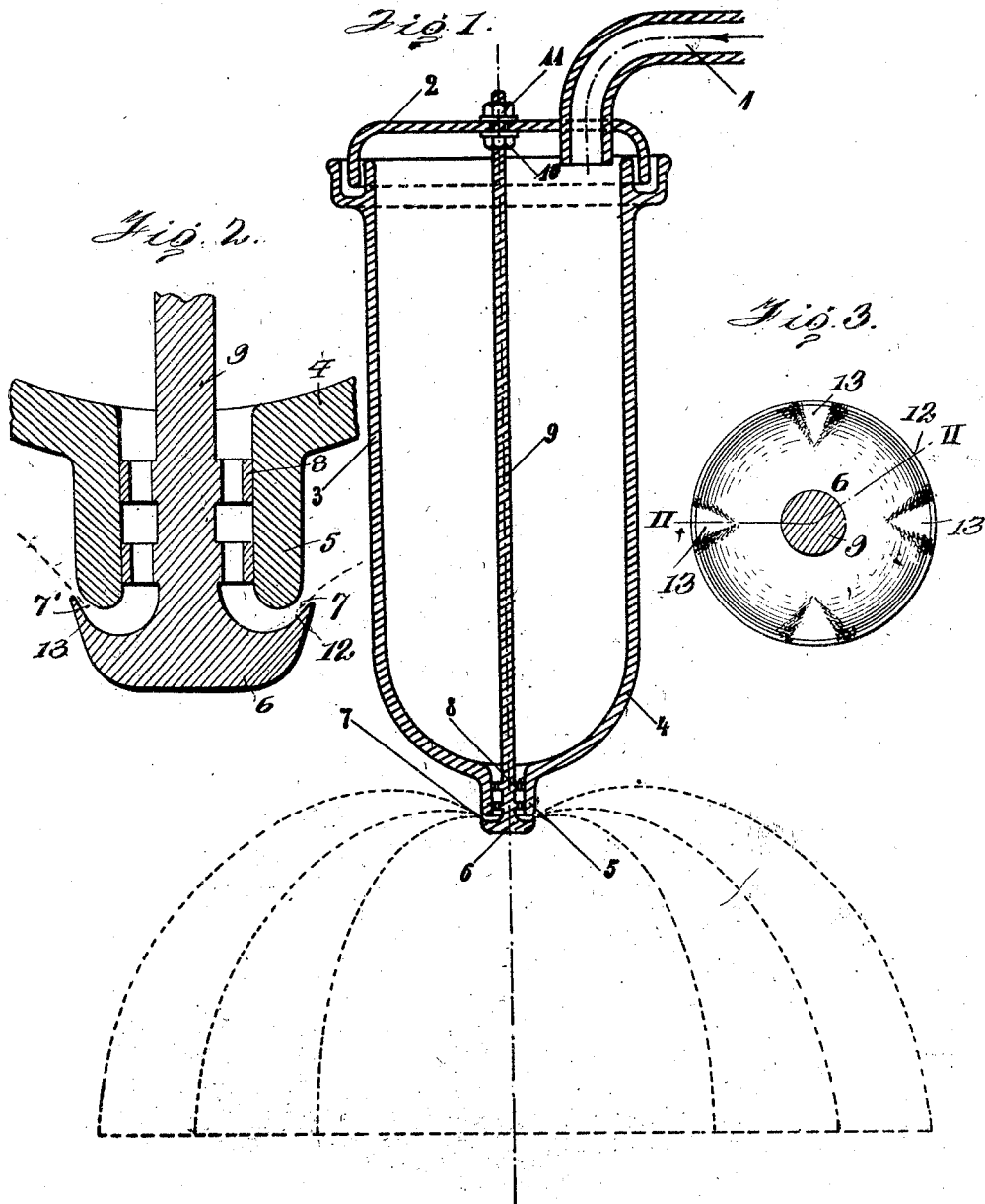


H. PAULING.
LIQUID DISTRIBUTING SPRINKLER.
APPLICATION FILED SEPT. 27, 1910.

1,002,748.

Patented Sept. 5, 1911.



WITNESSES:

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LIQUID-DISTRIBUTING SPRINKLER.

1,002,748.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed September 27, 1910. Serial No. 584,122.

To all whom it may concern:

Be it known that I, HARRY PAULING, a subject of the King of Saxony, residing at 84 Wilhelmstrasse, Gelsenkirchen, W., in the Kingdom of Prussia, German Empire, have invented a new and useful Improvement in Liquid-Distributing Sprinklers; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to liquid distributing sprinklers, and in particular to devices employed for spraying liquids into washing towers, acid towers, and the like, but in general also to devices suitable for any spraying purposes; and it comprises a nozzle, usually attached directly to the lower part of a liquid receptacle, having a shell, and an adjustable spraying head with a concavely curved upper surface located adjacent the lower edges of the shell and forming therewith an annular discharge passage, parts of said passage sloping upward at a steeper angle than the remainder of the passage, if desired, in order that from certain points in the discharge passage the liquid may be directed to a greater distance than from other points; all as more fully herein-after set forth and as claimed.

In many industrial operations it is necessary to sprinkle or spray liquids over surfaces of various kinds, and it is also usually essential that the distribution of the liquid be as uniform as possible. For example, it is usual in certain manufacturing processes involving the handling of gases to treat such gases in washing towers, acid towers, and the like, either to wash the gases free of certain constituents or to absorb the gases as completely as possible. Ordinarily this is accomplished by passing the gases through apparatus filled with inert filling material such as coke, pumice, pottery, etc., upon which the washing or absorbing liquid is sprayed. In order that such treating processes shall be efficient, it is necessary of course that the treating liquid be distributed as uniformly and regularly as may be over the inert material. The apparatus of the present invention is particularly adapted to secure this effective and uniform distribution of a treating liquid in processes similar to those just referred to, but it is also of general application in any connection where liquid is to be distributed in the form of a spray.

My spraying device delivers liquid in the

form of a sheet, veil, or bell; and it operates to the best advantage in connection with a supply reservoir in which the head or pressure of the liquid is caused to vary in any suitable way, as for instance by intermittent filling of the reservoir. For a given size and form of discharge opening, the spread of the bell or veil of liquid issuing from the nozzle of the device varies with the head of liquid supplied to it. By causing the head to alternately attain a maximum and a minimum, the spread of the liquid spray also thus attains a maximum and a minimum. In this way all portions of the surface served by the sprinkling device are uniformly supplied with liquid. In the device of the present invention I may also make provision for distributing spray over non-circular areas, as for example where treating towers of square or other polygonal cross-section are employed, thus requiring the treating liquid to be thrown farther in some directions than in others. Apparatus such as I have devised permits liquid to be thrown to the corners of such a tower as well as to the parts nearer the center.

Briefly described, my new liquid sprinkler comprises a conduit or shell which may be integral, if desired, with the liquid supply reservoir and through which passes the liquid to be sprayed, cooperating with a baffle member or spraying head positioned adjacent the outer edges of the shell and forming therewith an annular exit or discharge channel forming a radially extending passage from which the liquid to be sprayed emerges as a distinct sheet or film. The inner surface of the spraying head, which may be termed the working or baffle face, is concavely curved; so that, considering the device in vertical position, the baffle face extends outwardly and upwardly relative to the conduit or shell of the nozzle, and conforms more or less approximately in outline therewith, the walled discharge channel thus formed extending substantially to the outer edge of the inner surface or baffle face. By this means the sheet of liquid is positively controlled and maintained intact up to the very instant it leaves the spraying device. Where the device is intended for use with circular areas, the curvature of the concave baffle face may be uniform and symmetrical; but where non-circular areas are to be sprayed, I form the generally concave baffle face in such a manner that at certain point:

the annular discharge channel slopes upward at a sharper or steeper angle than at others, thus giving to the liquid issuing from each such point a trajectory of sufficient angular elevation to enable the liquid to reach the more remote portions of the surface to be sprinkled. It is desirable of course that the edge of the nozzle shell or conduit conform approximately in outline of the curvature of the baffle face.

In the accompanying drawings I have shown more or less diagrammatically certain embodiments of apparatus elements of which the present invention is capable.

In this showing, Figure 1 is a vertical section of a receptacle provided with the delivery or spray device, and suitable for use in spraying circular areas; Fig. 2 is a sectional elevation on a larger scale of a modified type of nozzle, the section being taken on the line II-II of Fig. 3. Fig. 3 is a plan of the spraying head shown in Fig. 2.

Referring to Fig. 1 of the drawings, 1 is a conduit leading from any suitable source of liquid supply, (not shown) which is best of an intermittently operating type, and passing through cover 2 of receptacle 3 having a rounded bottom 4 provided with an orifice forming a liquid outlet at substantially its lowest point. A short outlet conduit or shell 5 leads from the outlet, and in the present instance is shown as a flange integral with the receptacle, formed adjacent the outlet and projecting therebeyond. A mushroom-shaped spraying head 6 having a concave upper baffle surface forms an annular discharge passage 7 with the edges of the outlet conduit. Suitable centering means, as ribs 8, serve to guide supporting rod 9 which is secured to the spraying head and passes through the outlet conduit to the upper part of the receptacle. The upper end of the rod is best threaded, and the rod with the attached spraying head is secured to the receptacle cover by means of nuts 10 and 11 which permit longitudinal adjustment of the rod to vary the vertical width of the annular discharge passage.

In Figs. 2 and 3 is shown a modified type of nozzle for spraying non-circular areas where the effective sprinkling range of the nozzle must be greater in some directions than in others in order to reach the more remote portions of the area to be covered. The particular modification illustrated is adapted for use in square washing towers, but the changes necessary to adapt it to towers of other cross-sections are obvious. That portion of channel 7 shown at the right in Fig. 2 has the same angular direction as in Fig. 1, the curvature of the baffle face at 12 being substantially as before. At 7' however, the discharge channel is shown as extending upward at a steeper angle, the portions 13 of the baffle surface be-

ing curved upward more sharply than the remainder of the surface, thus increasing the angle of elevation of discharge at these points.

The operation of the sprinkler is sufficiently clear from the foregoing description. In practice, receptacle 3 should be fed by an intermittently acting source of liquid supply in such a manner that the head of liquid on the nozzle alternately rises and falls. In this way the bell of sprayed liquid issuing from the nozzle, indicated by the curved dotted lines in Fig. 1, alternately expands and contracts, insuring the uniform sprinkling of the surface in question. The thickness of the liquid sheet leaving the nozzle is easily regulated by adjusting the regulating nuts 10 and 11 to move the spraying head relatively to the outlet conduit and thus vary the vertical width of the annular discharge channel.

What I claim is:—

1. In a liquid-distributing device, a container adapted to hold liquid and provided with a discharge orifice, a baffle member positioned outside of said container adjacent said orifice and having an inner surface curved concavely relative to the edge of said orifice to form therewith a walled annular discharge channel extending substantially to the outer edge of said inner surface, portions of said channel sloping upward radially at a steeper angle than the remainder of the channel in order to secure different effective angles of discharge at different points on the periphery of said baffle member, and means for adjustably securing said baffle member at varying distances from the edge of said orifice.

2. In a liquid-distributing device, a receptacle for liquids having a discharge orifice in the lower part thereof, a conduit extending from said orifice and forming the shell of a spraying nozzle, a spraying head having a concavely curved upper surface conforming approximately in outline with the edges of said conduit and forming therewith a walled annular discharge channel, portions of said channel sloping upward radially at a steeper angle than the remainder of the channel in order to secure different effective angles of discharge at different points on the periphery of said spraying head, a rod attached to said spraying head and passing through said orifice, and means in the upper part of said receptacle for adjustably securing said rod and said spraying head in position.

3. In a liquid-distributing device, a spraying nozzle comprising a spraying head having a concave upwardly and outwardly directed curved baffle face, a cylindrical conduit or shell positioned with its edges in proximity to said curved baffle face so as to form therewith a walled annular discharge

channel extending substantially to the outer
edge of said baffle face, portions of said
channel sloping upward radially at a steeper
angle than the remainder of the channel in
5 order to secure different effective angles of
discharge at different points on the periph-
ery of said spraying head, and means for
supplying liquid to said conduit.

In testimony whereof, I have signed my
name to this specification in the presence of 1
two subscribing witnesses.

HARRY PAULING.

Witnesses:

MATHILDE K. HELD,
A. V. W. COTTER.