

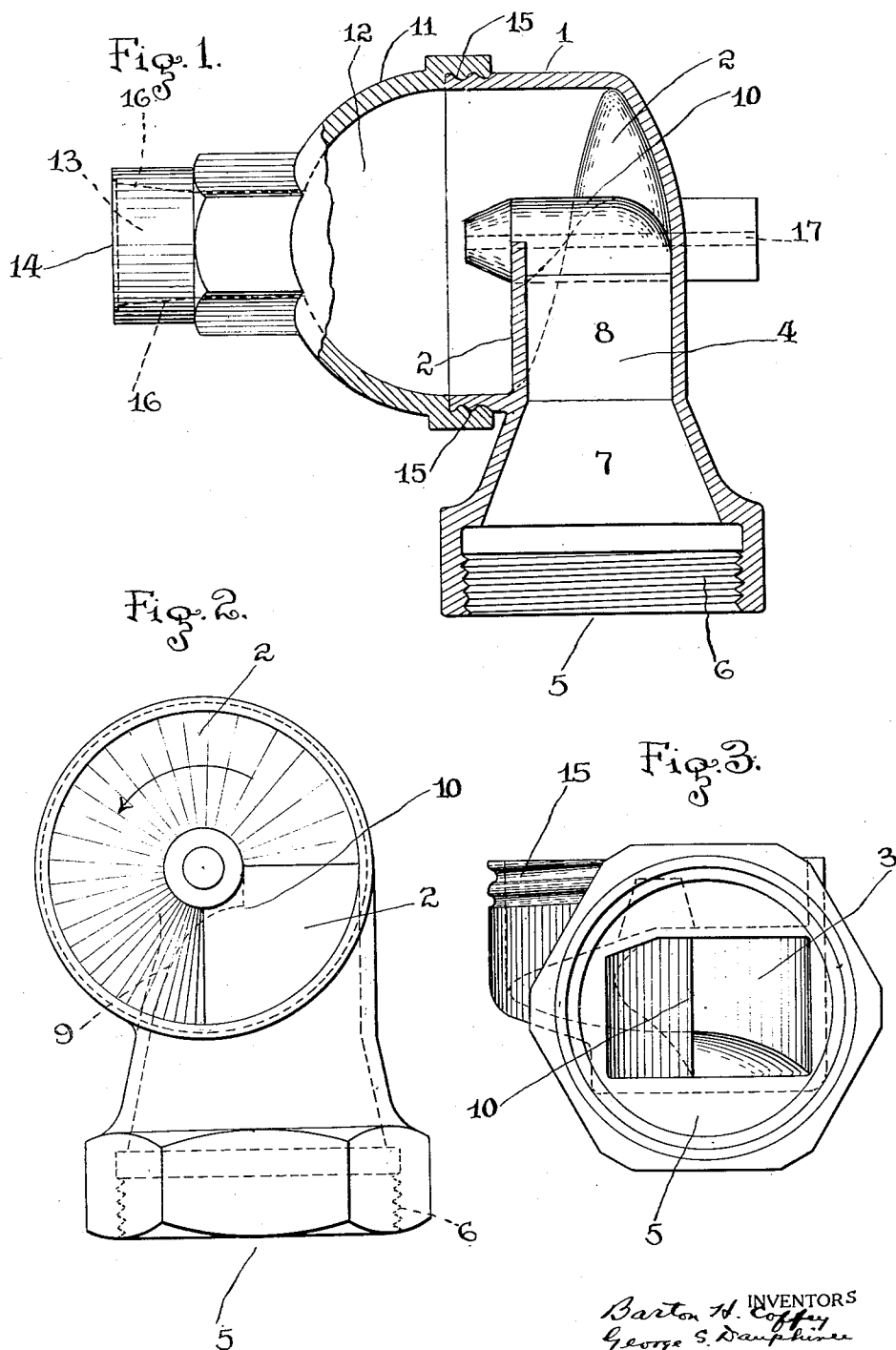
Aug. 23, 1927.

1,639,685

B. H. COFFEY ET AL

SPRAY NOZZLE

Filed Aug. 30, 1924



Barton H. Coffey INVENTORS
George S. Dauphinee
BY Andrew Smith
ATTORNEY

Patented Aug. 23, 1927.

1,639,685

UNITED STATES PATENT OFFICE.

BARTON H. COFFEY, OF ELIZABETH, NEW JERSEY, AND GEORGE S. DAUPHINEE, OF NEW YORK, N. Y.

SPRAY NOZZLE.

Application filed August 30, 1924. Serial No. 735,118.

Our invention relates to improvements in spray nozzles.

The improved nozzle is particularly adapted for use in spraying water for atmospheric cooling.

An object of our invention is to produce a simple and efficient device of the character described, a further object of our invention is to provide a nozzle which will produce a high narrow spray cloud and a further object of our invention is to provide a nozzle having a water passage of large area which will not ordinarily be obstructed by foreign substances in the water and which will produce a high narrow spray cloud even at relatively low pressure.

We accomplish these objects by the device illustrated in the accompanying drawings, in which:

Figure 1 is a vertical section of the improved nozzle,

Figure 2 is a plan view of the base section, and

Figure 3 is an end view of the same.

Similar characters of reference refer to similar parts throughout the several views.

In the base section 1 of the nozzle we provide an ascending spiral or helical waterway 2, a tangential orifice 3 thereto, an inlet passage 4 and an entrance port 5 provided with threads 6 by which the nozzle may be attached to a water-main or other suitable source of water supply. The inlet passage 4 preferably merges from a round section 7 to a rectangular section 8. A side wall 9 of the rectangular section converges toward the opposite side wall and terminates in a lip 10, which forms the side of the rectangular orifice 3 to the ascending spiral waterway 2 which we may call the swirl chamber.

Above this swirl chamber we provide a cap 11 which contains the vortex chamber 12, throat 13 and mouth 14.

The cap 11 may be attached to the base section 1 by means of threads 15.

The water is admitted to the nozzle at the entrance port 5 and passes through the inlet passage 4 where the stream lines of the portion of the water adjacent the converging wall 9 are forced to make an angle with the axis of the entering water and at the same time the velocity of the whole mass is increased by reason of the decreased section of the water-way. The water issues through the contraction orifice 10 producing a con-

tracted jet of maximum contraction and maximum velocity at a point beyond the orifice 3. By our novel construction, therefore, we attain an opening of larger size than that of the jet issuing from the orifice 10 where- by foreign substances of relatively large size are permitted to pass through the orifice and the danger of clogging or obstructing the water-way thereby is minimized.

The water thus enters the ascending spiral water-way 2 at high velocity and is driven to the peripheral section thereof by centrifugal force and ascends to the vortex chamber 12.

The area of the vortex chamber 12 is of progressively decreasing size and as the diameter of the chamber 12 decreases the velocity of the rotation increases. The centrifugal force exerted upon the rotating water produces within the vortex chamber 12 a central cone which is empty and devoid of water. We preferably provide a vertical vent 17 communicating with this empty central cone. The water from the vortex chamber 12 enters the throat 13 in the form of a thin hollow jet which rises on the wall of the throat 13 and issues at the mouth 14 in a high narrow cone of finely divided spray.

We find in practice that the height of the spray cone is increased by slightly flaring the wall 16 of the throat 13 as shown by dotted lines in Figure 1.

We have found in practice that the best result is attained by providing a throat 13 having its smallest diameter equal to the width of the orifice 10.

Having thus described our invention what we claim is:

In a spray nozzle the combination of an inlet passage having unequally converging side walls, one of the walls terminating in a lip, whereby said inlet is contracted, a helical waterway operatively connected to said inlet passage, a vortex chamber communicating with said waterway, means axially of said helical waterway to admit air to said vortex chamber, and a throat leading from said vortex chamber, said throat having a flared mouth.

In testimony whereof, we have signed our names to this specification this 29 day of August, 1924.

BARTON H. COFFEY.
GEORGE S. DAUPHINEE.