(No Model.)

E. A. KNOOP.

SPRINKLER.

No. 595,778. Patented Dec. 21, 1897.

Fig. 2.

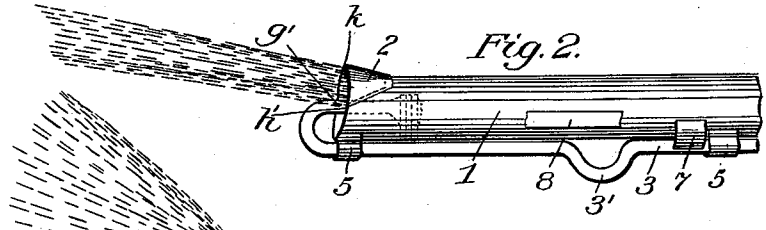


Fig. 3.

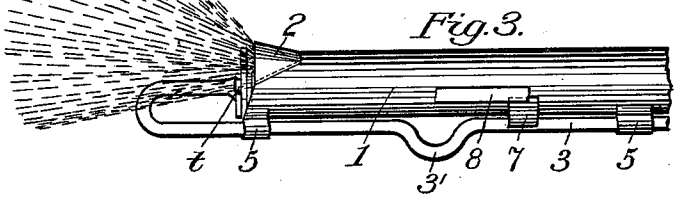


Fig. 1.

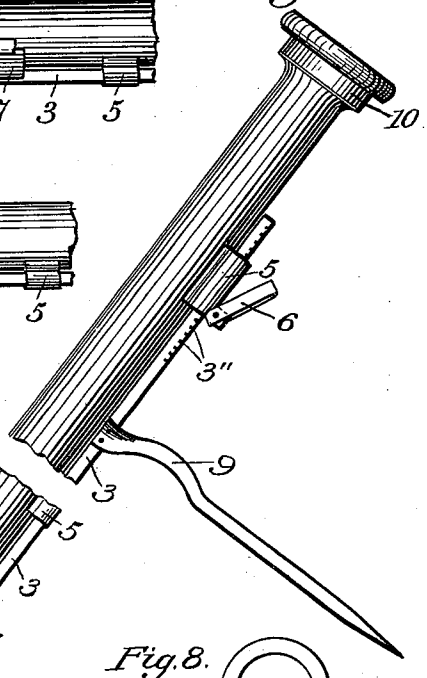


Fig. 4.

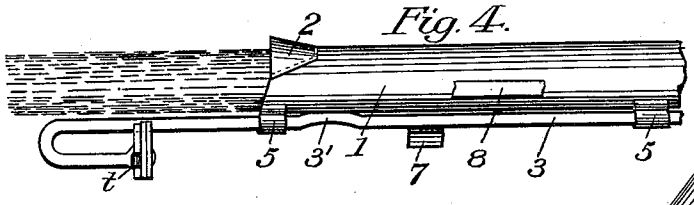


Fig. 5.

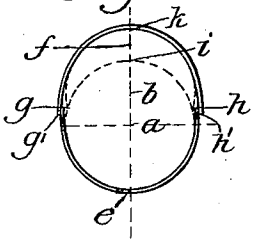


Fig. 6.

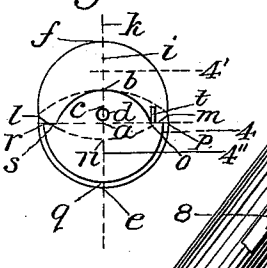


Fig. 8.

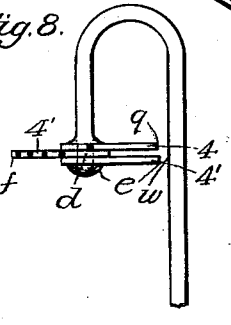


Fig. 7.

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UNITED STATES PATENT OFFICE.

ERNEST A. KNOOP, OF MONTEREY, CALIFORNIA.

SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 595,778, dated December 21, 1897.

Application filed January 6, 1897. Serial No. 618,167. (No model.)

To all whom it may concern:

Be it known that I, ERNEST A. KNOOP, a citizen of the United States, residing at Monterey, in the county of Monterey and State of California, have invented a new and useful Nozzle for Spraying Water, Chemicals, and the Like, of which the following is a specification.

The object of my invention is to provide a nozzle by the use of which injury to hose may be avoided and by which plants may be watered without wetting the foliage.

My invention consists of a nozzle and a wire to which an adjustable stopper is connected. It differs from other nozzles principally in the following respects, to wit: First, the water under pressure is not forced through a contracted nozzle, but is allowed to follow its course unchecked through a nozzle of even larger diameter than that of hose; second, the water in striking a stopper after leaving the nozzle is spread in such a way that it falls in a gentle umbrella-shaped sheet, thus preventing damage to plants; third, the nozzle is of sufficient length for the operator to reach the ground, thus preventing any foliage from getting wet, if so desired; fourth, by reason of an adjustable stopper the water may be thrown as a fine spray or as a jet to considerable distance; fifth, in not checking the flow of water in the nozzle all the water which the hose will admit can be employed, thus saving much time.

In the accompanying drawings, Figure 1 is a broken side view of the complete nozzle in operation; Fig. 2, a detail view of the end of the nozzle with the stopper drawn in, so as to throw water as a jet. Fig. 3 is a detail view with the perforated center plate of the stopper turned for the purpose of making a fine spray. When so adjusted, it may be used as a stationary lawn-sprinkler. Fig. 4 is a detail view with stopper disengaged, allowing the water to flow out unobstructed. Fig. 5 represents an end view of the mouth of the nozzle enlarged. Fig. 6 shows the stopper enlarged, (without the wire,) giving the corresponding sizes and shapes of the three plates comprising the same. Fig. 7 is the enlarged center plate of the stopper, showing perforations and scalloped edge, which aid in distributing spray. Fig. 8 represents side view of the enlarged stopper with a wire passing through it. The two outside plates of same are fastened to the wire, leaving middle one free to revolve.

1 is a tube two or two and one-half feet long, preferably of brass. The inside diameter is about one-eighth of an inch larger than that of the hose to which it is to be attached, thus reducing the pressure of water to some extent before reaching the outlet.

2 is a flaring lip expanding the mouth of the nozzle by one-fourth the diameter of tube. The lip overlaps the detached portion of the end of the nozzle, so as to leave the edges of said cut (represented by dotted lines in Fig. 2) free, allowing water to pass out in a perfectly smooth stream.

3 is a wire sliding in clamps 5 5 5. The lower end has a turn long enough to allow the stopper 4 to be drawn in past lip 2. It also has a crook 3′, which prevents drops from running down the wire when the nozzle is held in elevated position.

4 4′ 4″ are three metal-plates of different shapes and sizes comprising a stopper which is intended to spread the water.

5 5 5 are clamps for holding the wire in position.

6 is a stirrup hinged to upper clamp and intended to catch in segments 3″ to hold the stopper in any position.

7 is a metal tongue fastened to the wire to keep the same from turning as long as the former is under guide 8, which is fastened to the tube.

9 is a wire fastened to wire 3. It is intended as a finger-hold to manipulate the stopper or to stick into the ground when the nozzle is desired as a lawn-sprinkler, as in Fig. 3.

10 is a coupling.

In Fig. 5, *a* is center of circle *e g i h*, representing end of the tube before any portion of the end has been removed. *b*, being midway between *a* and *i*, is the center of the semicircle *g k h* with same radius, the intersection of which two circles marks the place where the cut *g i h* is taken out of the end of the tube in a flaring shape, as indicated by dotted lines, Fig. 2. This removed portion of the tube is about one-half of the diameter of tube in length. *g′ k h′* is an end view of the lip, which is not fitted in the cut, but must be soldered on so as to overlap, leav-

ing the edges of the cut free to allow the water to pass out in a perfectly smooth stream without coming in contact with the lip. In the construction of the mouth of the nozzle it must be observed that after cutting out the portion *g i h* the corners at *g* and *h* are pressed out so as to give the mouth an oval shape. Further, it is necessary that the mouth end of the lip should stand at right angles to the wire, while the end of the tube is cut in a slanting shape, as shown in cuts 1 2 3 4.

In Fig. 6, *a* is center of semicircle *l e m*, with the same radius as *a e* in Fig. 5. Then taking *e b* as the radius, *e* is the center of the semicircle *l b m*, which two semicircles form plate 4, Fig. 8, which is fastened to the wire with *e*, almost touching the same in *w*. *c*, being midway between *a* and *b*, is the center of the semicircle *l f m*, with a radius equal to *a e*. *f* is the center of the semicircle *l n m*, with a radius equal to *e b*. The latter two semicircles form the movable plate 4′, Fig. 8, which is perforated, as shown in Fig. 7, *u j v*. Plates 4 and 4″ are of equal size. *d* is a hole through which the end of wire passes. It is midway between *a* and *c*. Plate 4″ is in its lower portion a trifle smaller than 4. The upper portion is cut out on a line running through center *a* in the manner shown in Fig. 6, *r s* and *o p*. *t* is a projection on plate 4′ to stop the same when turned, as in Figs. 1 or 3, by striking against the edges *r s* or *o p*, respectively. Projection *t* must be equal in length to the distance between *a* and *c*, commencing at the line running horizontally through *a*. The position of said plates must be at right angles to the tube, and in their position to the wire *e* and *g* must almost touch the same at *w*, Fig. 8.

In the practical use of my nozzle the stopper is brought to within about one-half inch of mouth, if a gentle spreading flow of water is desired. If water is to be thrown to a distance, as a jet, the stopper is drawn to just a trifle within mouth. Owing to the flaring shape of lip, the distance may be increased by drawing stopper in accordingly. If a fine spray is desired, plate 4′ is turned so as to offer a larger resistance. The farther the stopper is drawn in the finer will be the spray. If no spray of any kind is desired, the wire is pushed out until the tongue is released from under the guide, when the stopper may be disengaged by turning the wire.

I claim as my invention—

A tube, having a bore of uniform diameter, the mouth of which is expanded by a flaring lip and into which is fitted a movable stopper, composed of one or more plates, substantially as described and operated in the manner set forth.

ERNEST A. KNOOP.

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