

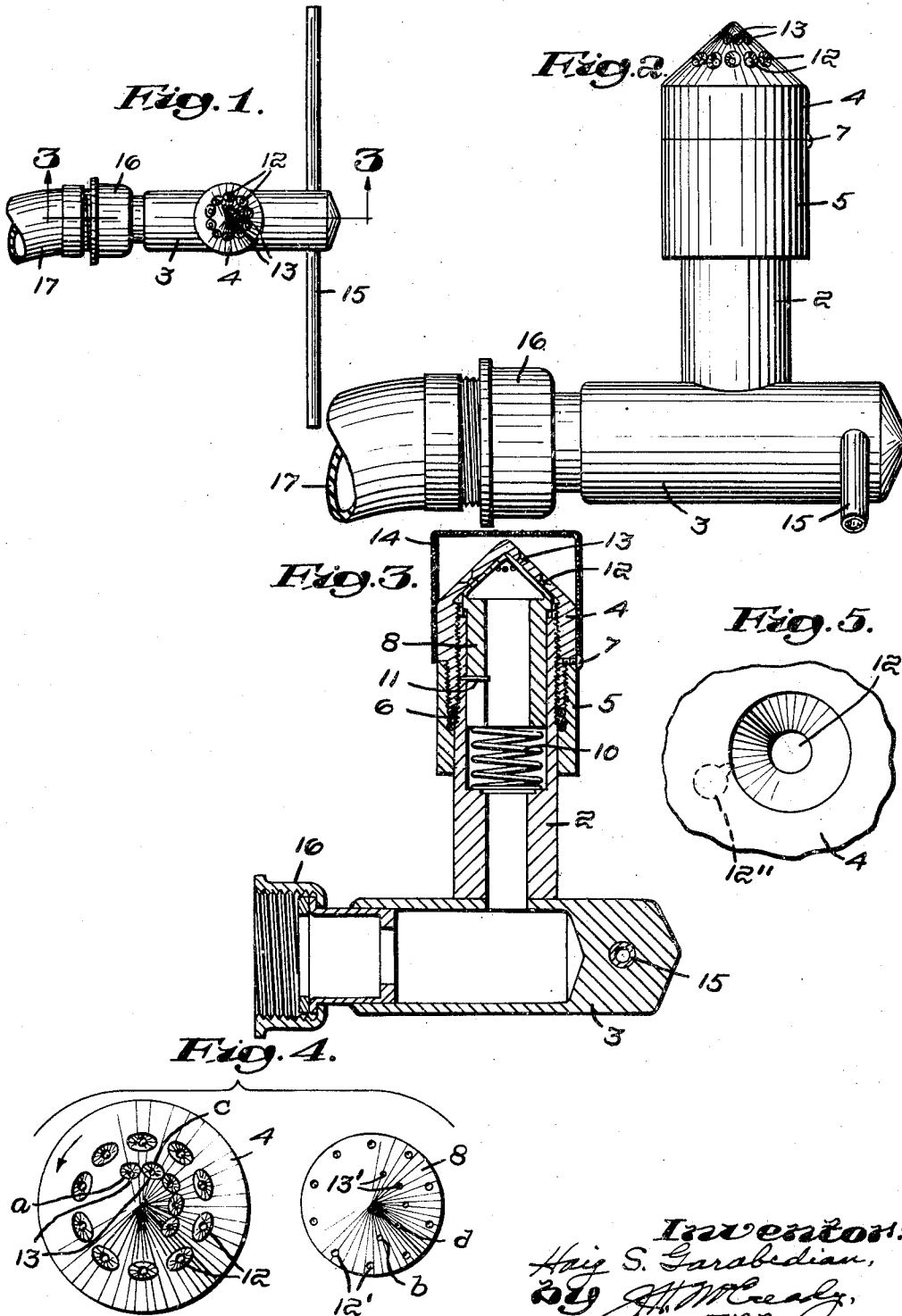
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2,493,719

VALVE CONTROLLED MULTIPLE OUTLET NOZZLE

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VALVE CONTROLLED MULTIPLE OUTLET
NOZZLE

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2 Claims. (Cl. 299-144)

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This invention relates to spraying apparatus and is more especially concerned with the nozzle structures of apparatus of this type intended primarily for use in spraying gardens, lawns, and the like.

It is the chief object of the invention to devise a spray nozzle of sturdy and substantial construction in which the volume and character of the spray, its direction, and the extent of the area sprayed can all be adjusted easily and quickly.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Fig. 1 is a plan view of an apparatus embodying this invention;

Fig. 2 is a side elevation, on a larger scale, of the device shown in Fig. 1;

Fig. 3 is a vertical, sectional view taken approximately on the line 3-3, Fig. 1;

Fig. 4 is a plan view of the nozzle cap and the plunger with which it cooperates; and

Fig. 5 is a view, on a large scale, of a nozzle aperture arrangement sometimes preferred.

Referring first to Figs. 1, 2 and 3, the construction there shown comprises a nozzle body 2 of hollow tubular form mounted, in this instance, on a stand, although it is also adapted for use in a nozzle designed to be held in the hand. Threaded on the upper end portion of the body 2 is a nozzle cap 4. In order to prevent leakage between this cap and the body, the lower or skirt portion of the cap is externally threaded to receive a sleeve 5 which is shouldered internally and a packing 6, Fig. 3, is mounted in the space between the internal shoulder on the sleeve and the lower end of the cap 4. This member 5 forms essentially a packing gland, and after it has been tightened up it may then be secured against rotation relatively to the cap by means of a small screw 7, threaded into a hole formed in the abutting surfaces of the two parts 4 and 5.

Preferably the upper end of the cap 4 is made of conical form and is apertured for the discharge of water or other liquid conducted to it through the body 2. Cooperating with this cap is a hollow plunger 8 fitting snugly, but slidably, within the body 2 and provided with a tapered head, also apertured and normally held in contact with the inner end wall of the cap 4 by means of a coiled spring 10. A pin 11, Fig. 3, anchored in the body 2 and extending into a ver-

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tical slot in the plunger, prevents rotation of the latter.

So far as the parts above described are concerned, the construction is much like that illustrated in my earlier Patent No. 2,380,513, issued July 31, 1945. The present invention, however, differs from my earlier construction in being better adapted for use on a stand. More importantly, however, it involves a novel arrangement of apertures by means of which the spray can be confined to a very small area, when desired; its direction, when confined to a more or less limited area, can be readily changed by a simple adjustment; and by making a further adjustment a large general area around the stand can be sprayed. For these purposes an important feature of this invention resides in the arrangement of apertures provided in the cap 4 and in the cooperating upper end portion of the plunger 8.

As best shown in Fig. 4, a circular series of ports, apertures, or orifices 12 is formed through the tapered end portion of the cap 4. Spaced radially inside of this series of apertures is another series 13, concentric with the series 12, but being semi-circular in extent. Also, as clearly shown in said figures, the apertures in the upper series 13 are staggered circumferentially with reference to those in the lower series 12. Both series are centered in the axis of the nozzle body 2.

In the upper end of the plunger 8 two corresponding series of apertures, indicated in Fig. 4 at 12' and 13', respectively, are formed, and these apertures are so spaced that they can all be made to register with the corresponding apertures in the cap. In the particular construction shown there are ten apertures in the outer or lower series and five in the upper series, although this number obviously can be varied within any practical limits desired.

In using the apparatus, and assuming that water under pressure is supplied to the nozzle structure through the stand 3, it will be evident that if all the apertures in the plunger and cap are in register, then a large area immediately surrounding the stand will be sprayed. If, now, it is desired to reduce the volume of the spray, that can be done by turning the cap 4 approximately 180° which will shut off the water completely from the upper holes 13 in the cap. This result is produced because a non-perforated area of the cap is covering all of the five upper holes 13' in the head of the plunger.

However, starting from this position, if the cap is turned counter-clockwise, Fig. 4, slowly, the first hole *a* in the upper row 13 will soon be

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brought into register with the end hole *b* in the upper row in the plunger 8. Because the inner or upper holes are staggered with reference to those in the lower or outer series, the water is now shut off from all of the latter holes and a single stream only of water can escape through the registered holes *a* and *b*. Thus a very small area only is sprayed, say a single bush.

If the cap 4 is given a further counter-clockwise rotative movement sufficient to bring the second hole *c* in the series 13 into register with the hole *b*, the aperture *a* then will be brought into register with the second hole *d* in the plunger and two streams of water will be directed through these two pairs of registered apertures but the water will be shut off from all of the other holes.

By making further step-by-step counter-clockwise adjusting movements of the cap 4, additional holes in the upper series 13' of the plunger can be brought into register, one at a time, with the holes 13, until all five of them are discharging water. Thus one or all, or any intermediate number of the cooperating apertures in the upper series 13 and 13' can be made to discharge water, as desired, and the area that will be sprayed will be correspondingly changed. This gives a control which often is highly desirable. Also, by varying the extent of register of the holes through which the water is being delivered, the character of the spray and its volume can be additionally adjusted. In some cases it will be found desirable to bevel the inner holes along one edge only as indicated, for example, at 12' in Fig. 5, so as to afford a further control of the volume and nature of the spray. And the same construction can be employed with all, or certain only, of the apertures, as desired. It is usually preferable to bevel the outer ends of the holes 12' and 13' very slightly, making the bevel extend completely around each hole.

When an exceedingly fine or mist-like spray is desired, it can be obtained by sliding a hood 14, Fig. 3, of woven wire screen over the cap 4, as shown in said figure.

The stand comprises a hollow tubular body 3 through which a small rod or tube 15 is slipped, its ends being bent downwardly, thus cooperating with the body to form a three-point support. The body 3 is equipped with one member 16 of a coupling adapted to cooperate with a companion coupling member on the hose 17.

While I have herein shown and described a preferred embodiment of my invention, it will be evident that the invention may be embodied in other forms while still utilizing the essential features of the invention.

Having thus described my invention, what I desire to claim as new is:

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1. In a spray nozzle, the combination of a hollow tubular body, a cap mounted on said body for adjustment around the axis of the body, a plunger mounted in said body, said cap and said plunger each having conical end portions, means holding the conical end of the plunger normally in contact with the correspondingly shaped internal end surface of said cap, the cap and the plunger each having two concentric rows of apertures in them, one row in each of said members being circular and the other row in each member extending only partway around the axis of said body, and the apertures in the inner row in each of said members being staggered with reference to those in the outer row whereby substantially all of the apertures in both the plunger and the cap may be brought into register with each other when desired, but the apertures in the shorter rows may be adjusted progressively into register with each other to the exclusion of the apertures in the outer row.

2. In a spray nozzle, the combination of a hollow tubular body, a cap mounted on said body for adjustment around the axis of the body, a plunger mounted in said body, means normally holding it in contact with the inner end wall of said cap, said cap and said plunger each having in it two series of apertures concentrically arranged, the apertures in the cap being positioned to register with those in the plunger, the inner series of apertures in both the cap and the plunger extending only partway around said axis and being staggered with reference to the apertures in the outer series whereby the cap may be adjusted to discharge water only through selected registering apertures of the inner series.

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