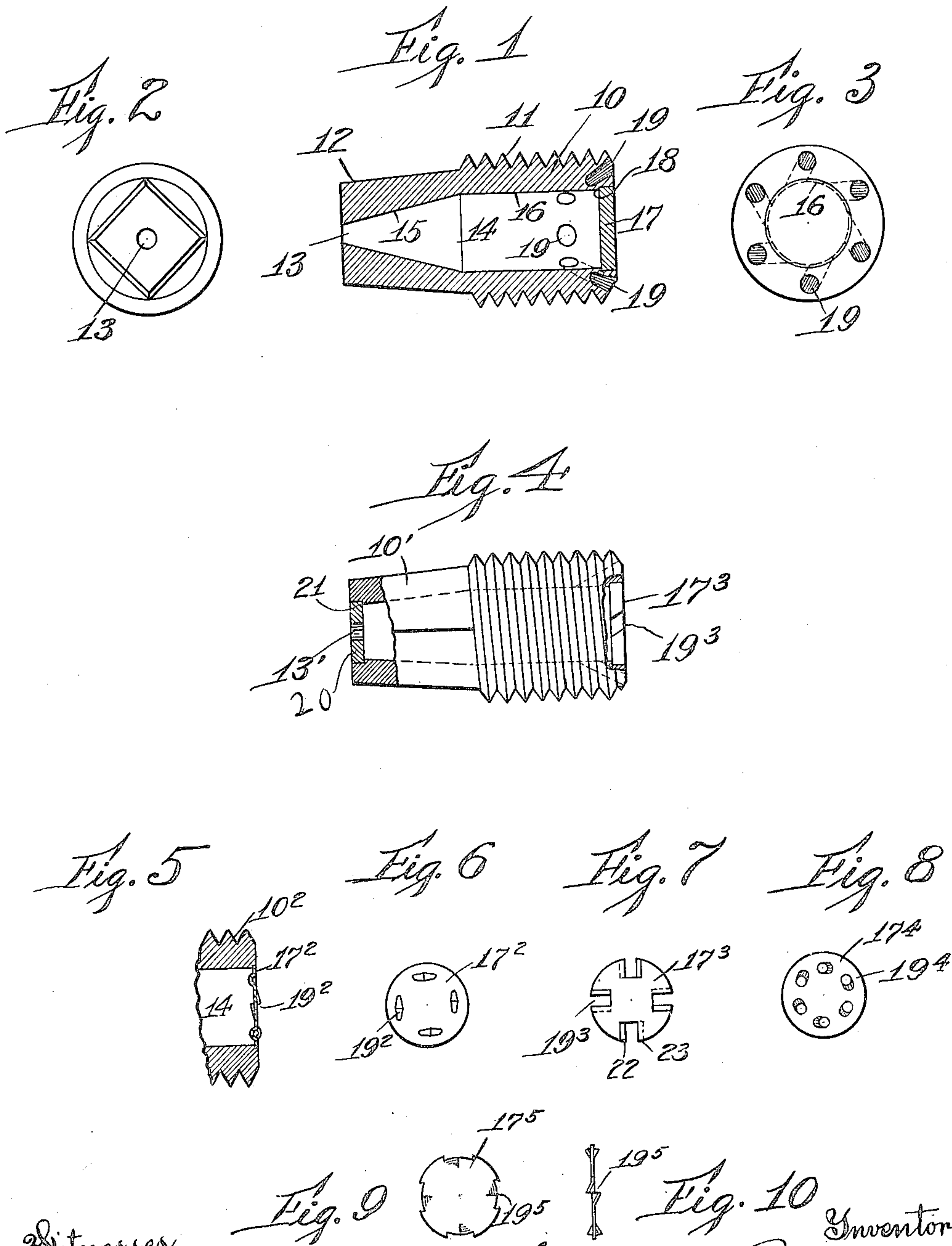


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 SPRAY NOZZLE.  
 APPLICATION FILED MAR. 7, 1910.

985,505.

Patented Feb. 28, 1911.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## SPRAY-NOZZLE.

985,505.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed March 7, 1910. Serial No. 547,877.

*To all whom it may concern:*

Be it known that I, LEWIS A. BRINKMAN, residing in Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Spray-Nozzles, of which the following is a specification.

The present invention relates to spray nozzles which are capable of use for various purposes, such, for example, as the spraying of fruit trees in orchards.

The principal object of the invention is to produce a nozzle which shall be efficient in operation and cheap to manufacture.

The invention will be best understood upon reference to the following description taken in connection with the accompanying drawings, and its scope will be particularly pointed out in the appended claims.

In the drawing, Figure 1 is a longitudinal vertical section of a nozzle constructed in accordance with my invention; Figs. 2 and 3 are end views taken from the outlet and inlet ends of the nozzle, respectively; Fig. 4 is a side elevation of the nozzle of the previous figures provided with a modified outlet opening; Fig. 5 is a sectional view similar to Fig. 1, illustrating a modification of the inlet end of the nozzle; and Figs. 6, 7, 8, 9 and 10 are views of different apertured disks for use in the nozzle.

Throughout these figures, like characters refer to like parts.

In carrying out my invention, I preferably use a metal plug 10 having an exterior thread 11 and a squared head 12 and bore out the same so as to provide a relatively small outlet opening 13 and an interior chamber 14. The interior walls of the chamber 14 are preferably conical at 15 and cylindrical at 16, as illustrated, but this particular shape of the walls is not essential to the successful operation of my device.

In the preferred form of the invention, the inlet end of the plug 10 is closed up by a solid disk 17, seated against a slight shoulder 18 and having its outer face flush with the rear end of the plug. The inlet openings 19 extend through the body of the plug 10, as clearly illustrated in Figs. 1 and 3, and are given a direction inclined to the axis of the nozzle and substantially tangential to the cylindrical portion of the chamber 14. Obviously, the angular disposition of these, as well as their number, may be varied as desired.

In operation, the nozzle is screwed into a

suitable pipe or fixture, through which the liquid to be sprayed is to be forced. The squared head 12 is provided so that a wrench may be applied in screwing the nozzle in position, but obviously some other means might be provided for securely gripping the nozzle as it is screwed into position. As the liquid passes through the inlet openings 19, it is given a rotary swirling motion in the chamber 14 and issues from the outlet opening 13 in a spray. This swirling motion is brought about by the particular direction of the inlet openings 19. Where it is desired, the nozzle may be provided with an apertured wearing plate at its outlet end. Such a plate 20 is shown in Fig. 4, where it is seated against a shoulder 21 at the outlet end of the plug 10<sup>1</sup> and is provided with an outlet opening 13<sup>1</sup>. Except for the disk 17<sup>3</sup> and the plate 20, the nozzle of Fig. 4 is the same in construction as that illustrated in Figs. 1, 2 and 3.

In the modified form of the invention illustrated in Fig. 5, the intake end of the plug 10<sup>2</sup> is not provided with openings 19 as illustrated in Fig. 1, but instead openings 19<sup>2</sup> are provided in the disk 17<sup>2</sup>. These openings may be variously made, different forms being illustrated in Figs. 6, 7 and 8. In the form illustrated in Figs 5 and 6, the metal is forced in opposite directions, leaving a passage between them, as clearly illustrated. This provides a circular opening through which the liquid passes and impinges against the interior wall of the chamber 14. These openings 19<sup>2</sup> are so positioned that the liquid passing through them strikes the interior wall at an angle and is thus given its swirling motion, the same as in the case of Fig. 1. In the case of the disk 17<sup>3</sup> illustrated in Fig. 7, the openings 19<sup>3</sup> are provided by cutting into the disk from its periphery at the desired number of points and leaving the opposite edges 22 and 23 substantially parallel and beveled. By reason of the bevel, the liquid is given a tangential motion as it passes through these openings and the necessary swirl is imparted to it. In the case of the disk 17<sup>4</sup> illustrated in Fig. 8, similarly inclined openings 19<sup>4</sup> are provided. These are practically circular in cross-section and the axis of each opening is inclined to the plane of the disk in the same way as the beveled edges 23, 24 of the openings 19<sup>3</sup> of Fig. 7. Consequently, as the liquid passes through the



disk 17<sup>4</sup>, it also partakes of the same swirling motion as in the case of the other disks and of the structure of Fig. 1. In the case of the disk 17<sup>5</sup>, illustrated in Figs 9 and 10, the openings 19<sup>5</sup> are provided by cutting the disk radially for a short distance from its periphery and bending the adjacent portions on each side of the cut in opposite directions so as to provide a beveled opening through which the liquid passes. In this way, the oppositely bent portions provide a beveled opening similar to that provided by the beveled edges of the openings 19<sup>3</sup> of the disk 17<sup>3</sup>.

15 In constructing my device, it is obvious also that the inlet openings 19 may be supplemented by openings in the disk, as clearly illustrated in Fig. 4, where the disk 17 of Fig. 1 is replaced by the disk 17<sup>3</sup> of Fig. 7.

20 From the above, it will be seen that I have provided a nozzle of very simple construction which can be readily made and assembled. The parts of the nozzle may be made of any suitable material according to the character of the liquid to be used. In certain instances, I preferably employ a malleable iron plug and brass disks, both inlet and outlet, where the latter is used, while in other instances the parts are preferably all brass.

30 What I claim as new and desire to secure by Letters Patent of the United States is:—

1. A spray nozzle consisting of an integral body having its interior bored out so as to

form a chamber, a disk closing one end of said chamber, a plurality of angularly spaced inlet openings each extending through the material of the body adjacent to the periphery of the disk in a direction tangential to the chamber walls formed by said body and inclined to the axis of the nozzle, and an outlet opening at the opposite end of the chamber from said disk, whereby the liquid is given a swirling motion as it enters and passes through said chamber and is issued therefrom in a spray.

2. A spray nozzle consisting of an exteriorly threaded plug having its head squared and its interior bored out so as to form a chamber, a disk closing one end of said chamber, a plurality of angularly spaced inlet openings each extending through the material of said plug adjacent to the periphery of the disk in a direction tangential to the chamber walls formed by said body and inclined to the axis of the nozzle, and an outlet opening at the opposite end of the chamber from said disk, whereby the liquid is given a swirling motion as it enters and passes through said chamber and is issued therefrom in a spray.

In witness whereof, I hereunto subscribe my name this 1st day of March, 1910.

LEWIS A. BRINKMAN.

Witnesses:

CAROLYN WEBER,  
MABEL R. HUNTER.