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M. A. BARNES.

SPRAYING NOZZLE.

APPLICATION FILED MAY 4, 1907.

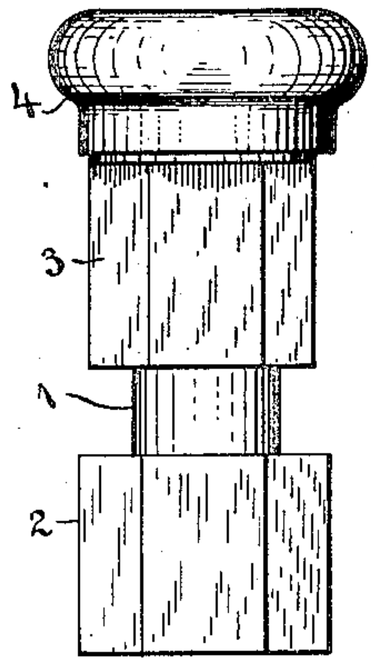

Fig. 1.

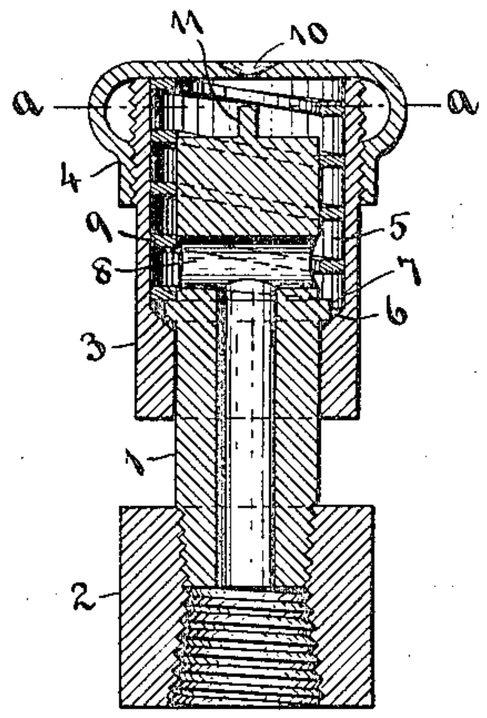

Fig. 2.

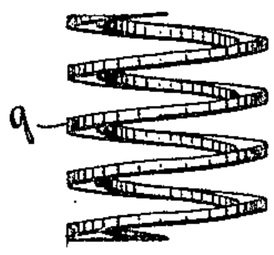

Fig. 3.

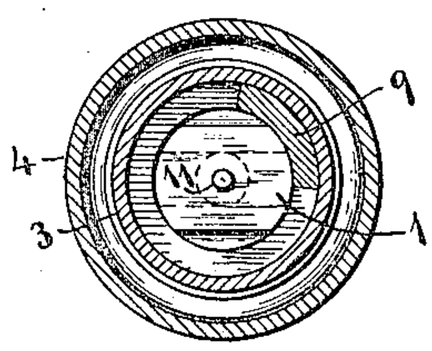

Fig. 4.

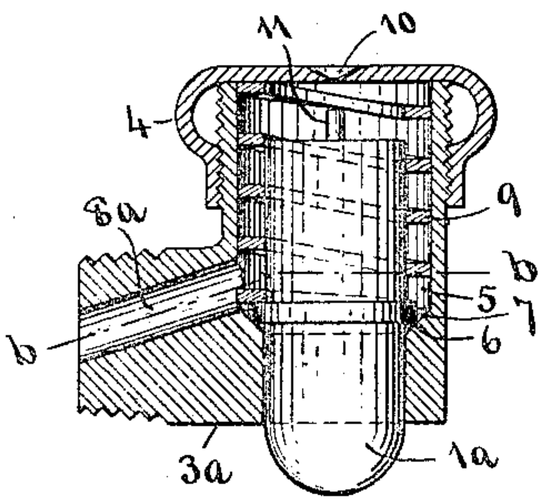

Fig. 5.

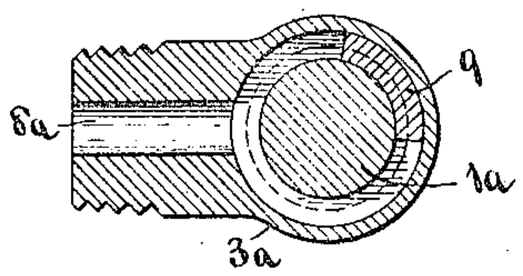

Fig. 6.

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SPRAYING-NOZZLE.

No. 887,302. Specification of Letters Patent. Patented May 12, 1908.

Application filed May 4, 1907. Serial No. 371,885.

To all whom it may concern:

Be it known that I, MELVIN A. BARNES, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Spraying-Nozzles, of which the following is a specification.

This invention relates to improvements in nozzles employed for spraying trees, plants, shrubbery, or the like, with liquid insecticides or other solutions; and my object is to provide a simple and effective spraying nozzle, which, when in use, may be readily manipulated to clear the passageways therethrough from accumulations or deposits of sediment, coagulations, etc., contained in the liquid solutions.

I attain my object by constructing the nozzles in the manner illustrated in the accompanying drawings; in which—

Figure 1 represents a complete nozzle, in side elevation; Fig. 2, a vertical section thereof; Fig. 3, a detail showing a spring coil employed in the nozzle; Fig. 4, a transverse section on the line *a*—*a* in Fig. 2; Fig. 5, a vertical section of a different form of the nozzle; and Fig. 6, a transverse section thereof on line *b*—*b* in Fig. 5.

Like numerals indicate like parts in the several views.

The nozzle as shown in Figs. 1 to 4 consists of a spindle 1, provided at one end with a coupling 2, of hexagonal form, by which to connect the nozzle with a spraying tube or hose. This spindle passes into the interior of a barrel 3, through a reduced opening at one end of said barrel, the spindle and barrel at this point having a sliding fit so that the spindle will be longitudinally movable within the barrel. The opposite or outer end of the barrel is closed by a screw cap 4; said screw cap being knurled around its outer periphery, and the barrel being made preferably of hexagonal form to facilitate the application and removal of the cap.

The spindle is spaced from the inner walls of the barrel, thereby providing an annular space 5, which is terminated at the inward end by a beveled seat 6, engaged by the enlargement 7 upon the spindle, whereby a liquid tight joint is formed between the spindle and the barrel when the spraying liquid is passing through the nozzle. This enlargement 7 is preferably formed with a right angled edge where it engages the seat 6, in order to insure a perfect engagement with the seat, since this right angled edge will cut through sediment or the like deposited upon the seat, where a beveled seating surface would be held away from the seat by said deposits.

The projecting end of the spindle is made hollow, by providing it with a central bore leading from the coupling 2 to the cross bore 8, positioned on the inward side of the enlargement 7, so as to deliver liquid passing through the spindle into the space 5. In the annular space 5 I place a spiral spring 9, formed preferably with flat coils of the same width as the space, said spring resting upon the enlargement 7 at one end and against the cap 4 at the other end, and forming a spiral passageway around the spindle from the inlet duct 8 to the outer end of the barrel, whereby the liquid is given a swirling motion so that, as it issues from the central discharge orifice 10 in the cap, it will spray out in all directions.

At the end of the spindle is a pin 11 of the same diameter as the orifice 10, which pin is adapted to be pushed through said orifice to clear it from obstructions, when a longitudinal movement is imparted to the spindle with reference to the barrel. The cap is made flat on its interior surface, and the end of the spindle surrounding the pin 11 is also a flat surface of considerable area, so that when the spindle is pushed against the cap it will act to crush and disintegrate accumulations of sediment, etc., within the nozzle, so that such deposits may pass out through the discharge orifice. Furthermore, the coils of the spring 9 are so spaced apart that, when compressed by the outward travel of the spindle, sediment or other deposits contained within the passageways between the coils will be crushed and broken up to such an extent that they will also pass out through the discharge orifice, when the parts of the nozzle assume their normal position. This spiral spring, therefore, serves three purposes; first, as a crusher, to break up and disintegrate sedimentary deposits accumulating in the nozzle; second, to give the swirling motion to the liquid as it passes through the nozzle, to produce the spraying effect; and third, as a guide for the spindle within the barrel. Under usual pressures, the liquid pressure alone in the barrel acting upon the enlargement 7 will be sufficient to hold said enlargement upon the seat 6 to prevent leakage around the projecting end of the spindle; and, there-

fore, the spring is not required for this purpose.

When, in operating the nozzle in spraying trees, or the like, the passageways through the nozzle become clogged, the nozzle is placed with its cap against a limb or other stationary object, and the spindle pushed upward; thereby compressing the coils, and forcing the pin 11 through the orifice 10. By reciprocating the spindle in the barrel thus one or more times, the sedimentary deposits will be effectually broken up and all passages cleared.

In Figs. 5 and 6, I have shown my invention as applied to another form of nozzle, in which barrel 3^a is provided with a lateral offset, to receive the coupling, having an inlet duct 8^a, the spindle 1^a in this case being made solid and projecting a short distance beyond the point where it passes out through the opening at the end of the barrel. In all other respects the construction and arrangement of parts is the same as that before described. In operating this nozzle, to clear it from sedimentary deposits, the end of the spindle 1^a is placed against a limb, or other stationary object, and the barrel pressed toward the spindle, thereby causing the spindle to travel outwardly to compress the spring and project the pin 11 through orifice 10.

I have thus shown my invention as applied to two forms of nozzle. It will be readily understood, however, that other forms and arrangements of the device may be constructed without departing from the spirit of my invention.

What I claim and desire to secure by Letters Patent is—

1. A spraying nozzle comprising a barrel having a reduced opening at one end and a cap at the other end provided with a discharge orifice, a spindle movable longitudinally within the barrel and spaced from the inner walls thereof, said spindle passing out through said opening and having an enlargement within the barrel to limit the outward motion, a spiral spring positioned between the cap and said enlargement in the space surrounding the spindle, the coils of said spring being of the same annular width as the space and forming a compressible spiral passageway therethrough, and a supply duct leading into said space.

2. A spraying nozzle comprising a barrel having a cap at one end provided with a discharge orifice, a spindle movable longitudinally within the barrel and spaced from the inner walls thereof, said spindle having an enlargement on its periphery within the barrel, a spiral spring having flattened coils surrounding the spindle in the space between the cap and said enlargement, said coils being of the same annular width as the space, a supply duct leading to said space, and means for actuating the spindle to compress the spring whereby solid particles lodging in said space will be disintegrated sufficiently to pass through the discharge orifice.

3. A spraying nozzle comprising a barrel having a cap at one end provided with a discharge orifice, a spindle movable longitudinally within the barrel and spaced from the inner walls thereof, said spindle being provided with a pin at one end adapted to pass through the discharge orifice and having an enlargement on its periphery within the barrel, a spiral spring surrounding the spindle in the space between the cap and said enlargement, the coils of said spring being of the same annular width as the space, a supply duct leading to said space, and means for actuating the spindle to compress the spring and project the end of the spindle against the cap with the pin projecting through the discharge orifice, whereby solid particles lodging in the space around and over the spindle will be disintegrated sufficiently to pass through the discharge orifice.

In testimony whereof I have affixed my signature, in presence of two witnesses.

MELVIN A. BARNES.

Witnesses:
M. E. VERBECK,
A. S. DIVEN.