

A. B. HULL.
 SPRAYING NOZZLE.
 APPLICATION FILED MAR. 31, 1908.

936,537.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

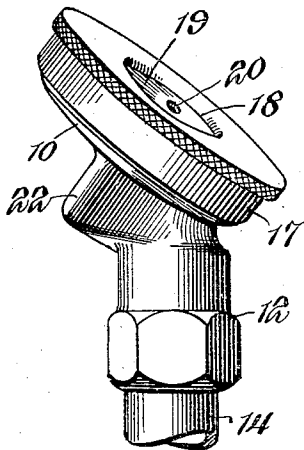


Fig. 2.

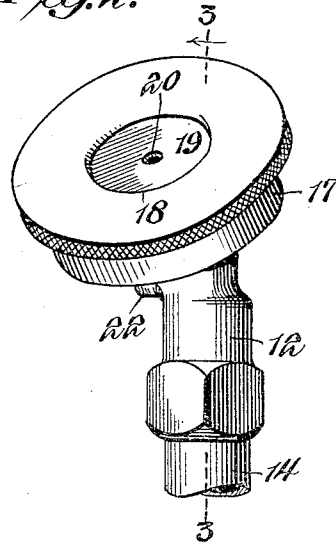


Fig. 3.

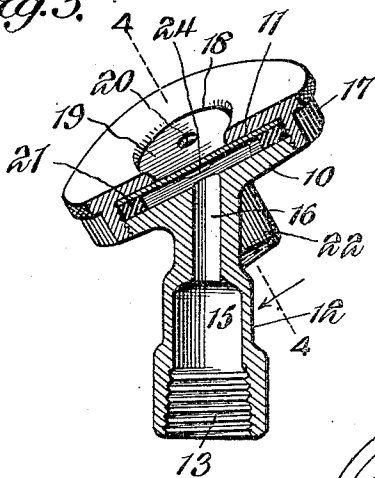


Fig. 4.

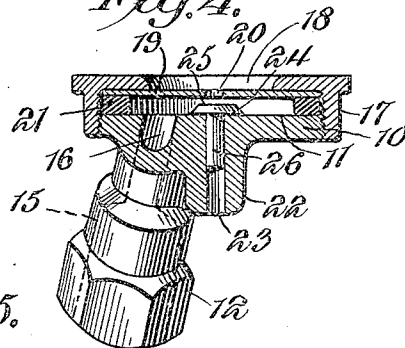
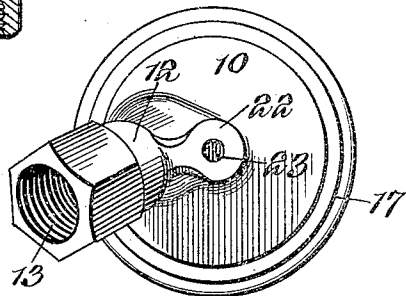


Fig. 5.



Witnesses

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By

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2 SHEETS—SHEET 2

Fig. 6.

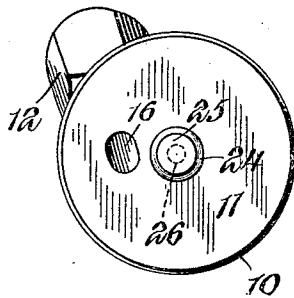


Fig. 7.

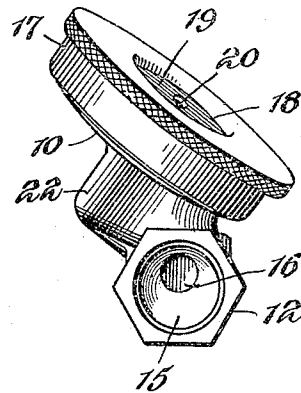


Fig. 8.

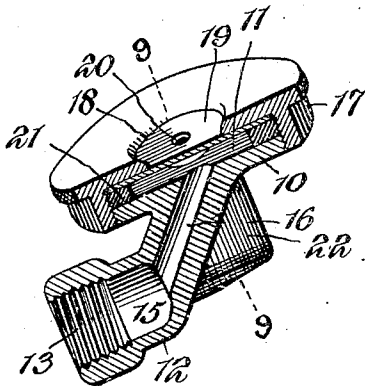
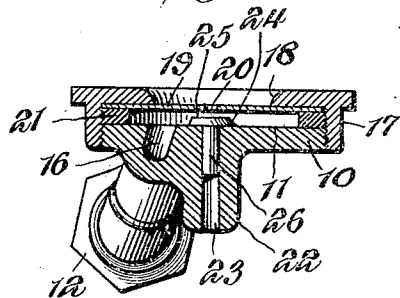


Fig. 9.



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UNITED STATES PATENT OFFICE.

ARTHUR B. HULL, OF GASPORT, NEW YORK.

SPRAYING-NOZZLE.

936,537.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed March 31, 1908. Serial No. 424,365.

To all whom it may concern:

Be it known that I, ARTHUR B. HULL, a citizen of the United States, residing at Gasport, in the county of Niagara and State of New York, have invented a new and useful Spraying-Nozzle, of which the following is a specification.

This invention relates more particularly to improvements in that type of spraying nozzle disclosed in Patents No. 848,995, dated April 2, 1907, No. 858,811, dated July 2, 1907, and co-pending application, Serial No. 378,568, filed June 12, 1907, and the primary object of the present invention is to provide a simple and novel structure in which all the good features of the former sprayers above noted are retained, while additional advantages are obtained in that it permits the fine spray or mist to be better directed to different sides of the trees, plants and foliage, under the leaves, etc., and furthermore permits the production of a stream of heavier spray that can be delivered and directed a greater distance from the nozzle in order to reach the higher branches and the foliage that is out of the range of the finer spray or mist.

Another object is to provide a novel structure in which the chamber contracting and wear preventing plug is located wholly outside the supply channel and is so arranged that it is readily accessible in order that it can be removed and replaced by a new one whenever such change becomes necessary or desirable.

Two embodiments of the invention are illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of one form of construction. Fig. 2 is a similar view at right angles to Fig. 1. Fig. 3 is a sectional view on the line 3—3 of Fig. 2. Fig. 4 is a sectional view on the line 4—4 of Fig. 3. Fig. 5 is a bottom plan view of the structure. Fig. 6 is a face plan view with the cap removed. Fig. 7 is a side elevation of a modified form of structure. Fig. 8 is a sectional view therethrough. Fig. 9 is a sectional view on the line 9—9 of Fig. 8. Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed in Figs. 1-6 inclusive, a single piece body is provided comprising a head 10 that is in the form of a disk peripherally threaded and having a

flat front face 11. The body furthermore has projecting from its rear side a coupling 12, in the form of an elongated neck that has its free end interiorly threaded, as shown at 13 to receive the end of the usual support and conduit 14 by means of which the insecticide or other material is delivered to the nozzle and also by means of which said nozzle is directed in its work. It will be observed by reference particularly to Figs. 1, 2 and 3 that the coupling 12 is arranged at an angle to the head disk 10 and is so related thereto that the flat front face 11 of said head disk is disposed obliquely to the longitudinal axis of the coupling in such a way that a line drawn on the flat face of the head disk intersecting the center thereof as well as the longitudinal axis of the channel and the coupling would form an acute angle with another line drawn on the said face perpendicular to the axis. Extending longitudinally through the coupling 12 is a supply channel comprising an enlarged inlet portion 15 and a contracted discharge portion 16, this channel being substantially straight and opening through the front face 11 of the body, being disposed obliquely thereto. Threaded upon the periphery of the head disk 10 is the usual cap 17 having a central opening 18 behind which is placed a disk 19 provided with a central discharge orifice 20, the disk constituting in effect the front wall of the cap. Interposed between the marginal portion of said disk and the head 10 is a packing washer 21. The head 10 furthermore has a central rearwardly extending projection 22. It is located at one side of the coupling 12, and has a centrally disposed socket 23 that is open at both ends, and is alined with the discharge orifice 20. A plug of harder material than the body is provided and comprises a head 24 located against the front face 11 and having a flat front face 25 disposed in rear of and spaced from the discharge orifice 20. This head carries a stem 26 that is located in the socket. It will be evident that this structure embodies the advantageous features of the sprayers disclosed in the above identified patents and co-pending application. In addition thereto it has the following advantages. When attached to the end of a spray rod or pipe 14, the spray is directed at a peculiar angle that gives the operator an opportunity to direct such spray under the foliage, on top of it or sidewise

in opposite directions. This latter is desirable when spraying small fruit trees, as with a small tree when spraying with a nozzle, which directs the spray directly away from the sprayer, an operator can touch only one side of the tree, but with the present arrangement, it is possible to spray three sides. Moreover the nozzle is peculiarly adaptable for spraying vineyards. When employed for this purpose, it is held stationary with respect to its support, and is situated so as to have the angle on an upward incline and throw the spray against the under side of the foliage. Moreover the nozzle can be used on trailing rods or supports for spraying potatoes and small crops of a similar character, the nozzle being held close to the ground under the edge of the foliage.

In spraying ordinary orchard trees, high tops and branches are frequently found that cannot be reached by the ordinary spray. This will be readily understood when it is considered that the spray produced with the structure as disclosed is in the form of a perfect mist that will merely float where the air carries it and all spraying operations therefore have to be done with the wind, or in other words so that the currents of air will carry the spray into the tree. In other words, the spray from the nozzle is only driven a few feet by the force behind it, and the resistance of the atmosphere soon allays this force or motion. With the present nozzle, by removing the cap, it is possible to throw a straight stream and properly direct it to the top branches, and this stream will be broken into very small particles by the resistance of the atmosphere when it is forced out by high pressure. With a pressure of say twenty-five pounds to the square inch, it is possible to throw a comparatively solid stream through the supply channel 16, but when the pressure is increased to about one hundred pounds, the stream forced through the said channel is broken into very small particles. Consequently it will be noted that the nozzle may be converted so that the fine mist-like spray can be produced or a heavier spray that will be carried farther away from the nozzle and can be directed a considerable distance. With this construction, furthermore while the supply channel is in effect the same as in the former construction, and produces the same results in that it delivers a stream forwardly and obliquely to the front face of the body in order to produce the necessary rotary action in the chamber, said supply channel can be more easily produced, and may be smooth in order to reduce resistance to the flow of the liquid. It will also be noted that in this nozzle, the chamber contracting and wear preventing plug 24 has its stem 26 located wholly outside the supply channel 16. It

is, however, as securely held in place, and it can be removed by inserting a punch or other device in the outer end of the socket 23 without the necessity of even detaching the nozzle from the supply pipe.

The angles of inclination of the nozzle head to the supply pipe or coupling are immaterial, and can be varied to a very considerable degree without departing from the spirit or scope of the invention. In fact for some purpose, the outer end of the coupling may be disposed at an angle of ninety degrees, as illustrated in Figs. 7, 8 and 9. The structure in this embodiment is substantially the same as that already described, and consequently the same reference numerals have been applied thereto, the only difference being that the outer end of the coupling is disposed at substantially ninety degrees to the front face 11 and the contracted discharge portion 16 of the supply channel is disposed in angular relation to the enlarged portion 15. It is therefore believed that inasmuch as a detail description of this structure would be almost a reiteration of what has already gone before, with the exceptions above noted, such detail description is unnecessary.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. A spraying nozzle comprising a body having a head provided with a front face, and means on its rear side for attaching a support and conduit thereto and maintaining the front face of the head in oblique relation to the longitudinal axis of the support and conduit, said body having a supply channel therethrough provided with a single straight discharge portion, said discharge portion of said channel opening through said front face at one side of its center and disposed obliquely thereto, and a removable cap covering the front face and spaced therefrom forming an interior chamber, said cap having a central discharge orifice, whereby the nozzle may be caused to produce a single solid stream upon the removal of the cap.

2. A spraying nozzle comprising a single piece body having a head provided with a front face and having on its rear side a projecting coupling for attaching a support and conduit to the body, said coupling being adapted to maintain the front face of the head in oblique relation to the longitudinal

axis of the support and conduit, said body having a supply channel that extends through the coupling and provided with a single straight discharge portion that opens through the front face of the head at one side of its center, and being disposed obliquely thereto, and a removable cap covering the front face and spaced therefrom so as to form an interior chamber, said cap having a central discharge orifice, whereby the nozzle may be caused to produce either a fine spray or a single solid stream.

3. A spraying nozzle comprising a body having a head provided with a front face and having a coupling projecting from its rear side for attaching a support and conduit, said coupling being disposed in angular relation to the head and adapted to maintain the front face of the latter in oblique relation to the longitudinal axis of the support and conduit, said body having a single supply channel extending through the coupling and head, the discharge portion of said channel being of less cross sectional area than the inlet portion and opening through the said front face at one side of its center, and in oblique relation thereto, and a removable cap covering the front face and spaced therefrom so as to form an interior chamber, said cap having a central discharge orifice, whereby the nozzle with the cap in place is caused to produce a spray, and when the cap is removed a solid stream is ejected through the single discharge portion of the channel.

4. A spraying nozzle comprising a body having a head provided with a front face, and means on its rear side for attaching a support and conduit to said body and maintaining the front face in oblique relation to the longitudinal axis of said support and conduit, said body having a substantially straight supply channel extending there-through and opening through the front face at one side of its center, said channel being disposed obliquely to said front face, and a cap covering the front face and spaced therefrom forming an interior chamber, said cap having a central discharge orifice.

5. A spraying nozzle comprising a single piece body having a head provided with a substantially flat front face, and a coupling projecting from its rear side for attaching a support and conduit to said body and adapted to maintain the front face in oblique relation to the longitudinal axis of said support and conduit, said body having a substantially straight supply channel extending through the coupling and head and opening through the front face at one side of its center, said channel being disposed obliquely to said front face, and a cap covering the front face and spaced therefrom, said cap being secured to the body and having a central discharge orifice.

6. A spraying nozzle comprising a body having a connecting coupling and a front face, and a channel leading from the coupling and having a discharge portion that opens through the said front face at one side of the center, said front face having an inclination with respect to the channel such that a line drawn on the said front face and intersecting the center thereof and the longitudinal axis of the channel, would form an acute angle with a line drawn on said front face perpendicular to said axis, and a cap covering the front face of the body and having a front wall spaced therefrom, said wall being provided with a discharge orifice.

7. A spraying nozzle comprising a body having a front face, and a coupling projecting from its rear side at one side of the center, said coupling and body having a substantially straight channel extending there-through and opening through the front face of the body at one side of its center, the longitudinal axis of the channel being disposed obliquely to the front face and said channel delivering a stream obliquely to and forwardly from said face, and a cap covering the front face of the body and having a front wall spaced therefrom and provided with a discharge orifice.

8. A spraying nozzle comprising a body having a substantially flat front face, and a coupling projecting from its rear side at one side of the center, said coupling and body having a substantially straight channel that opens through the front face, said front face having an inclination with respect to the channel such that a line drawn on the front face and intersecting the center thereof and the longitudinal axis of the channel would form an acute angle with a line drawn on said face perpendicular to said axis, the discharge portion of the channel being of less diameter than the inlet portion, and a cap secured to the body and covering the front face thereof, said cap having a front wall spaced from the front face and provided with a discharge orifice.

9. A spraying nozzle comprising a body having a front face and a supply channel opening therethrough at one side of the center, a cap covering the front face and having a front wall spaced therefrom, said wall being provided with a central discharge orifice, said body furthermore having a socket opening through its front face and through the rear side exteriorly of the supply channel, and a plug located in said socket and normally closing the socket.

10. A spraying nozzle comprising a body having a front face and a supply channel opening therethrough at one side of the center, a cap covering the front face and having a front wall spaced therefrom, said wall being provided with a central discharge orifice, said body furthermore having a

socket opening through its front face and through the rear side exteriorly of the supply channel, and a plug having a head located on said front face in rear of the discharge orifice and having a stem located in and closing the socket.

11. A spraying nozzle comprising a single piece body having a substantially flat front face and a rearwardly extending coupling disposed in angular relation to said front face, said body having a rearwardly extending central projection provided with a socket, a cap secured to the body and having a front wall, spaced from the front face of said body and provided with a central dis-

charge orifice, and a plug having a head interposed between the face of the body and front wall of the cap and having a stem located in the socket of the projection, said body and coupling being provided with a supply channel that opens through the front face and has its discharge portion disposed obliquely thereto.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ARTHUR B. HULL.

Witnesses:

G. S. CLARK,

A. J. SMITH.