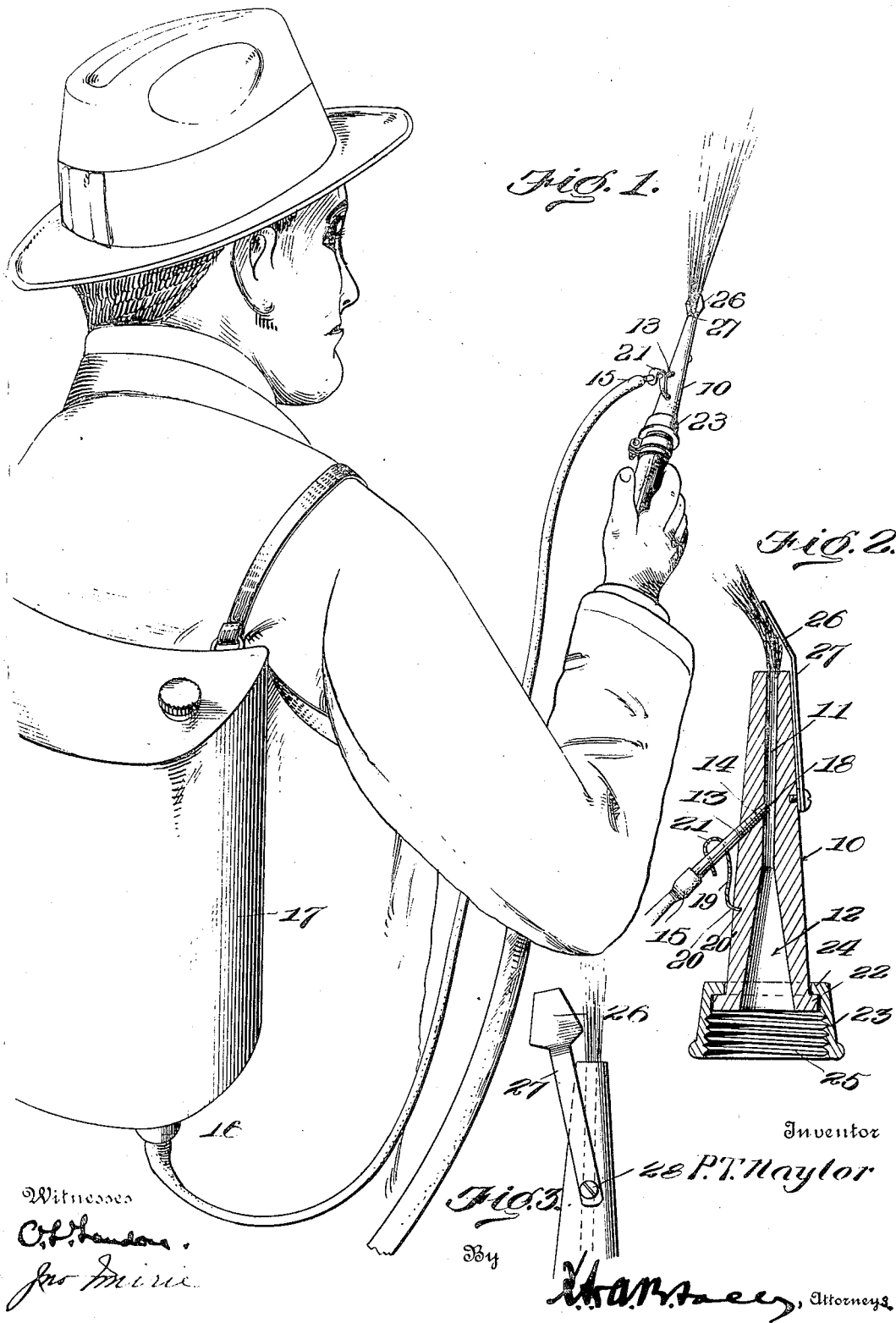


P. T. NAYLOR.  
SPRAYING NOZZLE.  
APPLICATION FILED JAN. 12, 1914.

1,138,500.

Patented May 4, 1915.



Witnesses  
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Fig. 3.  
By

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# UNITED STATES PATENT OFFICE.

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## SPRAYING-NOZZLE.

1,138,500.

Specification of Letters Patent.

Patented May 4, 1915.

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*To all whom it may concern:*

Be it known that I, PERRY T. NAYLOR, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Spraying-Nozzles, of which the following is a specification.

The present invention is directed to new and useful improvements in spraying apparatus and has particularly reference to sprayers which are designed for applying insecticide and similar chemical compounds to trees, shrubs and the like.

The principal object of my invention is to provide a novel form of keeper for holding the inlet tube in the proper position with respect to the nozzle of the device.

The above and additional objects are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification and then more particularly pointed out in the claims which are appended hereto and form a part of this application.

With reference to the drawings wherein there has been illustrated the preferred embodiment of this invention as it is reduced to practice and throughout the several views in which similar reference characters designate corresponding parts. Figure 1. is a perspective view illustrating the sprayer of this invention in use; Fig. 2. is a longitudinal section taken through the spraying nozzle; and Fig. 3. is a detail view of a portion of the nozzle illustrating particularly the deflecting plate which is employed in transforming the stream of water into a fan-like sheet.

Proceeding now to the description of the drawings and referring particularly to Fig. 2, in which the relative arrangement of the several parts of the invention is best illustrated, the numeral 10 designates as an entirety the nozzle. This nozzle is in general outline substantially similar to the ordinary form of hose nozzle, being preferably cast from a relatively cheap metal. The nozzle tapers toward its forward terminal and is provided with a longitudinally extending bore or passage 11 which is of relatively

small diameter. This passage 11 is of uniform diameter from the forward terminal to the approximate center of the member 10. The rear portion of the passage, however, is cored to produce a substantially conical chamber, indicated at 12. It will be seen that as the water enters the chamber 12 it will encounter a gradually increasing resistance due to the increasing restriction of the passage through the nozzle. It is apparent therefore that as the water passes through the forward part of the nozzle, that is through the passage 11, its velocity will be relatively high. The purpose in thus shaping the passage to the nozzle is to obtain the highest possible velocity of the water as it passes that point of the nozzle at which the chemical inlet tube is introduced.

The chemical inlet tube which, as previously set forth, is provided for feeding the insecticide or other chemical compound into the nozzle consists in the preferred embodiment in a metallic tube 13. The inner terminal of this tube is threaded and inserted in a diagonally extending threaded bore 14 which is formed in the nozzle 10 as best shown in Fig. 2. A rubber tube 15 is applied to the outer terminal of this member 13 and is connected, as at 16 in Fig. 1, to a suitable container 17 in which the desired chemical compound is stored. It may be well at this point to explain briefly that while the container 17 is preferably of such design that it may be strapped to the back of the operator, the nozzle of this invention does not depend for its merit on a container of this design. If it be found expedient a stationary container may be employed in connection with the hose.

From the foregoing description and upon reference to Fig. 2 it will be seen that the inlet tube 13 may be threaded to project its inner terminal indicated at 18 any desired distance into the passage 11. Inasmuch as this inner terminal of the inlet tube 13 extends diagonally into the passage 11 the water passing through the nozzle will, of course, upon encountering the terminal of the member 13 be deflected somewhat and owing to its relatively high velocity will create a partial vacuum at the open end 18.

Consequently the compound will be sucked through the tube 15 and into the passage 11 as long as the water is passing through the nozzle. The proportion of compound to the volume of water which it is desired to employ in producing the spraying mixture may, of course, be regulated by threading the member 13 farther into the passage 11 or withdrawing it therefrom so as to vary the extent of the vacuum created and hence increase or decrease the suction through the inlet tube.

As a means for holding the member 13 in the desired adjusted position, there has been provided a resilient keeper 19. This member 19 consists in a resilient strap of metal which is bent as at 21 to produce a substantially hook-shaped outline. In the neck and bill of this hook are formed registering apertures or openings which receive the tube 13. The free terminal 20 of the shank of the hook is reduced and pointed for insertion in a diagonally directed bore formed in the nozzle, as at 20'. It will, of course, be obvious that the bill, due to the resiliency of the member 19, tends to spring away from the neck of the hook, and as a consequence the neck and bill will bind against the tube, thus holding this member against rotation until the operator compresses the hook portion to move the bill toward the neck.

In order to provide for the ready attachment of the nozzle to any ordinary hose terminal, the rear end of the member 10 has been formed in the preferred embodiment with an outwardly extending flange 22. This flange 22 is received within a coupling sleeve 23 and is held against withdrawal therefrom by an inwardly directed annular flange 24 which is formed on this member 23 at its outer terminal. The coupling 23 is, of course, internally screw-threaded, as at 25, and is applied to a mating coupling such as is customarily provided for the terminal of a hose length.

The details of construction and operation of the nozzle of this invention being thus described, the description of the deflecting plate will be taken up as next in order. This deflecting plate, as previously described, is designed to transform the ordinary stream which issues from the nozzle into a fan-like spray, and consists in a body plate 26 and a stem 27, both of which are formed of relatively light sheet metal. This body plate 26 may be of any desired shape but is preferably of the configuration shown in Fig. 3. The stem 27 is swingingly attached as by a screw 28 to the nozzle so that the body plate may be swung into or out of operative position. When the member 26 is in operative position the stem 27 extends longitudinally of the nozzle. Upon

reference to Fig. 2 it will be noted that the body plate of the deflector extends at an angle to the stem 27, being directed to extend across the normal path of the issuing stream. By forming the deflector plate of relatively light sheet metal the operator may quickly bend the body plate to change the angle which it bears to the longitudinal access of the nozzle thereby enabling him to regulate the nature of the sheet of water.

Before concluding the description of my invention I desire to direct particular attention to the fact that the mixing nozzle is constructed with marked simplicity, being composed as it is of four elements, namely a body portion 10, a coupling sleeve 23, an inlet tube 13, and a resilient keeper 19 for holding the inlet tube in adjusted position. Among other advantages obtained by this extremely simple construction are that it may be cheaply manufactured, may be readily attached to any form of garden hose, and will not be likely to get out of order as is the case with most of the more complicated mixing devices. It is again to be noted that the mixing nozzle is absolutely independent of the container 17 so that without detaching the nozzle from the hose a new supply of insecticide or the like may be brought into use by merely detaching the member 15 from the nozzle 13 and attaching the tube of a full container.

In reduction to practice I have found that the form of my invention illustrated in the drawings and referred to in the above description as the preferred form is most efficient and practical; yet realizing that the conditions concurrent with the adoption of my device will necessarily vary, I desire to emphasize the fact that various minor changes in details of construction, proportion and arrangement of parts may be resorted to when required without sacrificing any of the advantages of my invention as defined in the appended claims.

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

1. A mixing device of the character described including a nozzle, an inlet tube threaded through the wall of the nozzle, there being a socket formed in the outer face of the nozzle adjacent the point at which the tube enters the nozzle, and a keeper for holding the tube in adjusted position, said keeper consisting of a metallic strap substantially hook-shaped in configuration and provided with aligned openings formed in its bill and neck portions for the reception of the tube, the free terminal of the shank of the hook being reduced and pointed whereby the said terminal may be inserted in the said socket.

2. The combination with a tubular member having a socket formed in its outer face

and a conductor leading through the wall of the tubular member into the interior thereof, of a keeper for holding the conductor in operative relation to the tubular member, said keeper consisting of a substantially hook-shaped metallic strap having aligned openings formed in its bill and neck portions for the reception of the conductor, the

shank of the hook having a reduced terminal portion seated in the said socket.

In testimony whereof I affix my signature in presence of two witnesses.

PERRY T. NAYLOR. [L. s.]

Witnesses:

ARTHUR B. ANDERSON,  
CLARENCE B. MIZE.