

A. B. BROWN.
VARIABLE NOZZLE.
APPLICATION FILED JUNE 13, 1914.

1,151,656.

Patented Aug. 31, 1915.

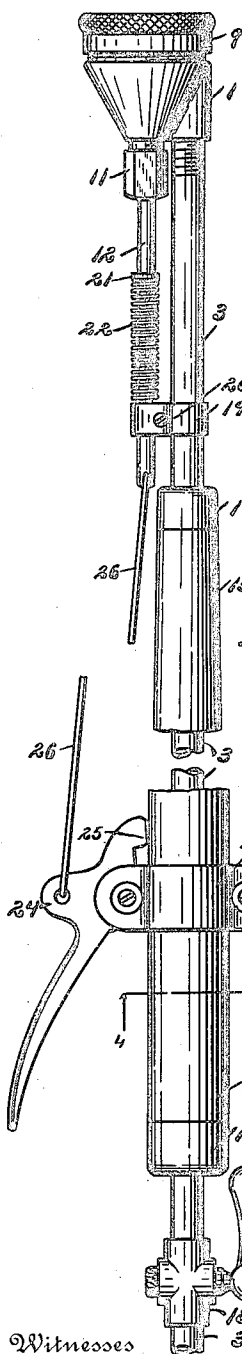


FIG. I

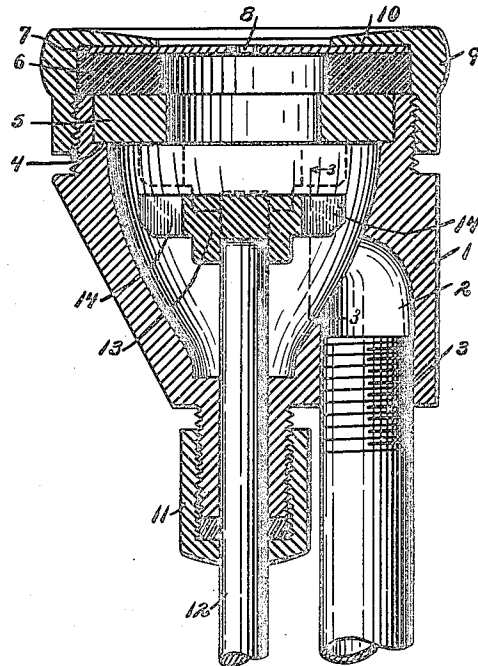


FIG. II

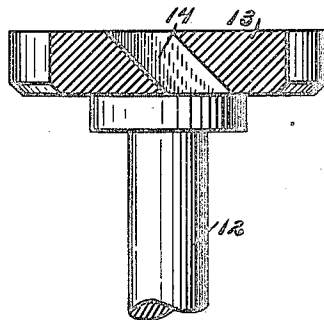


FIG. III.

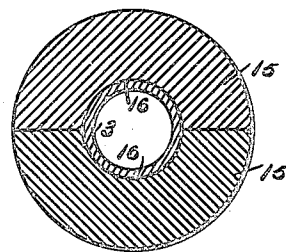


FIG. IV.

Inventor

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VARIABLE NOZZLE.

1,151,656.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALVAN B. BROWN, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Variable Nozzles, of which the following is a specification.

This invention relates to improvements in variable nozzles.

The objects of this invention are: First, to provide an improved variable nozzle which is adapted to deliver either a single long jet or stream or a fine whirling spray, and in which the character of the spray delivered can be varied between these two extremes. Second, to provide an improved form of spray rod which can be cheaply and economically produced, and which will not be sensibly affected by the spraying mixture.

Further objects, and objects relating to economies and details of structure and operation will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure constituting a preferred embodiment of my invention is illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a view in side elevation of my improved variable nozzle and spray rod, a part thereof being broken away. Fig. II is an enlarged longitudinal sectional view through my improved variable nozzle. Fig. III is an enlarged detail sectional view on the line 3—3 of Fig. II, showing in detail the inclined slots in the disk-like member. Fig. IV is a transverse sectional view on the line 4—4 of Fig. I, showing in detail the construction of the spray rod.

In the drawing, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Considering the numbered parts of the drawing, 1 is the nozzle body which is hollowed out to form a nozzle chamber therein and which is provided with an inlet passage

2 into which the upper end of the delivery pipe 3 is threaded. The upper end of the body 1 is provided with an inner annular shoulder 4 upon which the ring 5 rests, the top of said ring coming flush with the top of the nozzle body. The rubber gasket 6 rests upon the top of the nozzle body and upon the top of the ring 5, and a flat disk 7 is supported on top of this gasket, said disk being provided with a central aperture 8 through which the stream is delivered. The tip 9 is threaded upon the upper portion of the nozzle body and is provided with an inwardly projecting annular flange 10 engaging the top of the disk 7 to hold it seated upon the gasket 6.

The lower part of the nozzle body is provided with a stuffing box 11 in which the actuating rod 12 is reciprocally mounted. Secured to the upper end of the actuating rod 12 is the disk-like member 13 disposed in the chamber of the nozzle body, said disk-like member being provided with a pair of inclined slots 14.

The delivery pipe 3 to the upper end of which the nozzle is secured projects from the upper end of the spray rod which is formed of two half round strips of wood 15 in which half round channels 16 are provided. One of these strips of wood is disposed with the half round channel 16 uppermost and the face of the strip and the channel is covered with cement. A delivery pipe 3 is laid in said channel 16 and the other strip of wood 15, the face of which has also been covered with cement, is laid in place over the delivery pipe, the two pieces are clamped together and held clamped together until the cement has dried and set so that we have a spray rod, appearing in cross section as shown in Fig. IV, in which the delivery pipe 3 is cemented to and securely clamped between the two strips of wood 15. Ferrules 17 are provided at the upper and lower end of said spray rod to finish the same and protect the ends of the wood from the spraying mixture. Ferrules are also provided throughout the length of the spray rod as needed to strengthen same. The cut-off valve 18 is provided in the lower end of the delivery pipe.

The lower end of the actuating rod 12 projects through a bracket 19 which is clamped on the delivery pipe 3 by means of

bolt 20, the outer portion of said bracket having an opening receiving the lower end of the actuating rod 12.

A spring 22 is disposed on the actuating rod 12 and confined between the bracket 19 and the cotter pin 21 on the rod 12. This spring 22 normally presses the actuating rod 12 upward. A bracket 23 is clamped on the spray rod and an actuating lever 24 provided with a shoulder 25 abutting the side of the spray rod is pivotally mounted on said bracket 23. The lower end of the actuating rod is connected with said actuating lever by means of the wire 26.

From the description of the parts given above, the operation of the structure should be very readily understood.

The spraying liquid is delivered to the nozzle through the delivery pipe 3 and the inlet pipe 2, and with the parts in position shown in full lines in Fig. II, the spraying liquid passes into the upper part of the nozzle chamber around the edges of the disk-like member 12, as well as through the diagonal ports 14, so that the whirling action is comparatively small as compared with the volume of liquid passing through the nozzle and the liquid is forced out through the small aperture 8 in a narrow jet or stream which carries to a considerable distance and forms what is known as the long distance spray. This is used for reaching the tops of tall trees. However, for a good many kinds of work it is not necessary to have a stream that will carry so far and it is very desirable to provide a fine whirling spray which scatters considerably and for this purpose the actuating rod 12 is moved upward carrying the disk-like member 13 into the position shown in dotted lines in Fig. II. In this position the spraying liquid passes upward through the diagonal slots 14 which give a whirling motion to the liquid so that it passes out through the aperture 8 in the form of a whirling spray and makes a very effective spray for fruit trees. As the disk-like member 13 is withdrawn gradually from the position shown in dotted lines in Fig. II to the lower position, shown in full lines in said figure, the character of the spray will be changed gradually from that of a whirling spray to the single jet or stream. Thus I am able to vary the character of the jet delivered from the nozzle materially so as to adapt it to reach the tops of very tall trees or for ordinary spraying work on the lower branches where it is desired to cover a considerable area.

It will be noted that, when the member 13 is in its uppermost position the pressure of the liquid will tend to hold it in that position. When the disk-like member is in position against the lower face of the ring 5 the pressure of the liquid below it in the

nozzle chamber will press the disk against the face of the ring 5. This lessens the strain on the spring 22 which normally presses the actuating rod 12 upward tending to hold the disk-like member 13 in the uppermost position. The actuating rod 12 is actuated by means of the actuating lever 24 connected to the wire 26 and when the handle of said actuating lever is pulled toward the spray rod the actuating rod is pulled downwardly to withdraw the disk-like member 13 to its lowermost position. The spraying liquid is cut off by means of the valve 18.

The spray rod is formed as I have indicated above and the delivery pipe 3 cannot turn in said rod due to the fact that it is cemented securely thereto, the parts of the rod being securely cemented together, and the end thereof being covered with ferrules so that the spraying liquid cannot get at the rod or at the cement to loosen the same. This makes practically an integral structure which is light enough for spraying use and which at the same time has rigidity enough so that it will not bend under the weight of the nozzle so that it makes a very satisfactory and economical spray rod.

I have shown the disk-like member 13 provided with a pair of inclined slots 14. It will be apparent that the number of slots provided is not essential and that practically the same results could be secured with one inclined slot or by the use of more than one, the number which might be used depending largely upon the size of the disk-like member. It will also be apparent that it is not necessary to have inclined slots extending to the outer edge of the disk but that the same results can be secured by providing any sort of inclined ports passing through said disk-like member.

I am aware that the particular form of my invention that I have here shown may be varied considerably without departing from the spirit of my invention, and, therefore, I do not wish to be restricted to the same. I have found, however, that this particular form is to be preferred and, therefore, I desire to claim the same specifically, as well as broadly, as indicated by my appended claims.

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

1. In a spray nozzle, the combination of a nozzle body having a nozzle chamber therein and an inlet communicating with said nozzle chamber, a delivery pipe connected to said inlet, said nozzle body being provided with an inner annular shoulder, a ring seated on said shoulder, a gasket seated on said ring, a nozzle tip having a central discharge aperture therein threaded on the upper end of said nozzle body, an actuating

rod, a disk-like member carried by the upper end of said actuating rod within said nozzle chamber, said disk-like member being provided with a plurality of inclined ports 5 and having its upper surface adapted to contact with the lower surface of said ring, and means for reciprocating said actuating rod, all coacting substantially as described for the purpose specified.

10 2. In a spray nozzle, the combination of a nozzle body having a nozzle chamber therein, and an inlet communicating with said nozzle chamber, a delivery pipe connected to said inlet, said nozzle body being 15 provided with an inner annular shoulder, a ring seated on said shoulder, a nozzle

tip having a central discharge aperture therein threaded on the upper end of said nozzle body, a disk-like member provided with an inclined port and having its upper 20 surface adapted to contact with the lower surface of said ring, and means for moving said disk into and out of contact with said ring to vary the character of the spray discharged. 25

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

ALVAN B. BROWN. [L. S.]

Witnesses:

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