June 15, 1937. F. E. MARCY 2,083,851

SPRAYING NOZZLE

Filed Oct. 8, 1935

Fig. 1.

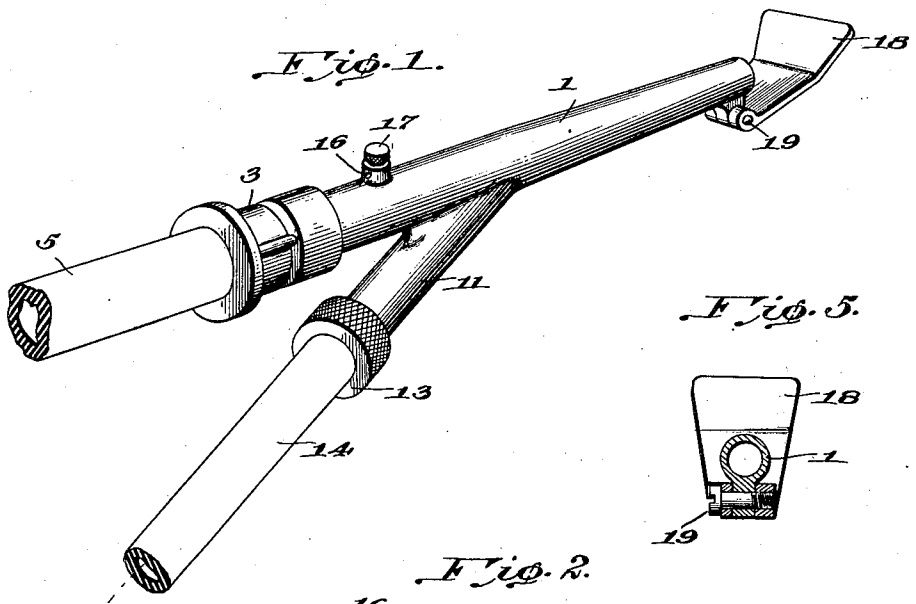


Fig. 5.

Fig. 2.

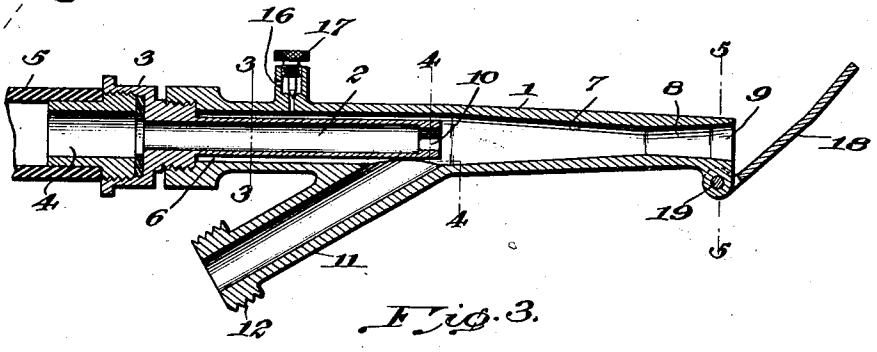


Fig. 3.

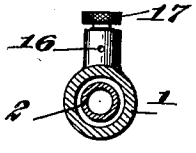
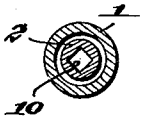
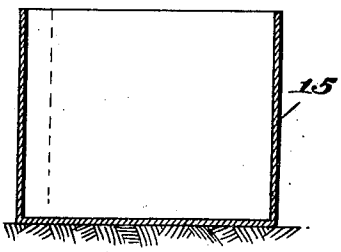


Fig. 4.





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SPRAYING NOZZLE

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2 Claims. (Cl. 299—140)

This invention relates to a spraying nozzle, and particularly to an aspirating nozzle that may be used for mixing liquid fertilizer or other treating agents with water as it is sprayed upon grass, plants or trees.

An object of this invention is to provide a spray nozzle of simple and economical construction which includes elements for regulating the concentration of the treating agent. An object is to provide a spray nozzle including an adjustable deflector plate for controlling the shape of the projected jet or spray. A further object is to provide a spray nozzle of the aspirating type in which the water passages are designed so that the nozzle is self-priming.

These and other objects and advantages of the invention will be apparent from the following specification when taken with the accompanying drawing in which:

Fig. 1 is a perspective view of an embodiment of the invention;

Fig. 2 is a longitudinal central section through the nozzle; and

Figs. 3, 4 and 5 are transverse sections taken on the respective planes indicated by lines 3—3, 4—4, and 5—5 of Fig. 2.

In the drawing, the reference numeral 1 identifies the main section of the nozzle, this section being threaded at the intake end to receive the coaxial, but shorter, inner nozzle 2 that has the usual coupling end 3 for receiving the complementary coupling member 4 on the end of a section of garden hose 5. The inner nozzle 2 is of less diameter than the bore of the main section 1, thus forming an annular chamber 6 at the inner end of the nozzle. The bore is preferably of circular cross-section throughout its length and, in front of the chamber 6, the inner wall sections 7, 8 are oppositely tapered to form a minimum diameter at a point spaced inwardly from the nozzle outlet 9.

This minimum diameter section is of circular cross-section while the outlet opening 10 of the inner nozzle 2 is of square cross-section. Treating liquid is introduced into the chamber 6 through a second inlet conduit or pipe 11 which, as shown, is preferably an integral part of the main nozzle section 1. The branch inlet 11 opens into the forward end of the suction chamber 6 and is inclined to the axis of the inner nozzle 2 and nozzle outlet 9 to provide a non-turbulent merging of the water stream and the treating liquid stream. The branch inlet 11 has a threaded outer end 12 for receiving the coupling unit 13 of a short hose section 14 which extends into a bucket 15 that is placed on the ground. An air inlet 16 is located at the top of the main section 1 and communicates with the central portion of the suction chamber 6 through a passage that is controlled by the valve 17.

A spray or deflecting plate 18 is mounted on the outer end of the nozzle by a pivot screw 19 which extends beneath and transversely of the nozzle outlet 9. The outer end of the plate is preferably given a slight upward inclination to permit the formation of a free jet, of circular cross-section, before the jet strikes the plate. The plate may be set at any desired angle to vary the size and shape of the flat spray, or it may be turned down to clear the water jet.

The general method of operation is that of an aspirating nozzle. The jet of water projected through the inner nozzle opening 10 creates a reduced pressure in chamber 6 by its passage through the venturi or reduced diameter section. The reduced pressure lifts the treating liquid upwardly from the container 15 and this liquid mixes with the water and is projected from the main nozzle. A dilution of the order of ten or twenty to one may be obtained by adjustment of the valve 16 to regulate the amount of air which enters the annular chamber 6.

The change in cross-section between the jet outlet 10 and the minimum diameter section results in a self-priming action that is not accompanied by a loss in efficiency or lifting power. The high capacity is due to the high velocity of the jet from the inner nozzle, and the self-priming is due to the sealing action produced by portions of the high velocity jet that strike the inner wall adjacent the restricted section. With cross-sections of the same shape, a small high velocity jet will not strike the wall of the bore to seal off the suction chamber 6, and a jet of sufficient diameter to give this sealing action will be of low lifting capacity after the nozzle is primed to fill the chamber 6 with liquid.

Other cross-sections may be used to obtain this self-priming action with a high velocity jet, or a baffle wire may be used to divert the jet against the walls of the restricted section when a round jet is used.

It is to be understood that the invention is not restricted to the particular embodiment herein described, and that changes may be made in the size, shape and relation of the several parts without departing from the spirit of my invention as set forth in the following claims.

I claim:

1. In a spray nozzle of the character described,

a main section having a bore extending therethrough terminating in a nozzle outlet at one end, an injector nozzle mounted in the inlet end of said bore axially of and spaced from the walls thereof, said injector nozzle having an outlet of angular cross-section terminating intermediate the ends of said bore and said bore tapering from a point adjacent said injector outlet toward the nozzle end thereof, an inlet branch integral with said main section and having a passage opening into said bore and converging therewith in the direction of the outlet end thereof, and means providing a single air inlet opening into the bore of said main section between the inlet end thereof and the junction of said inlet branch therewith.

2. In a spray nozzle of the character described, a main section having a bore extending therethrough terminating in a nozzle outlet at one end, an injector nozzle mounted in the inlet end of said bore axially of and spaced from the walls thereof, said injector nozzle having an outlet of angular cross-section terminating intermediate the ends of said bore and said bore tapering from a point adjacent said injector outlet toward the nozzle end thereof, an inlet branch integral with said main section and having a passage opening into said bore and converging therewith in the direction of the outlet end thereof, means providing a single air inlet opening into the bore of said main section between the inlet end thereof and the junction of said inlet branch therewith, and a deflector plate pivotally mounted at the nozzle end of said main section adapted to intercept the fluid stream emerging therefrom.

FRANK E. MARCY.