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APPLYING CHEMICALS TO PLANTS
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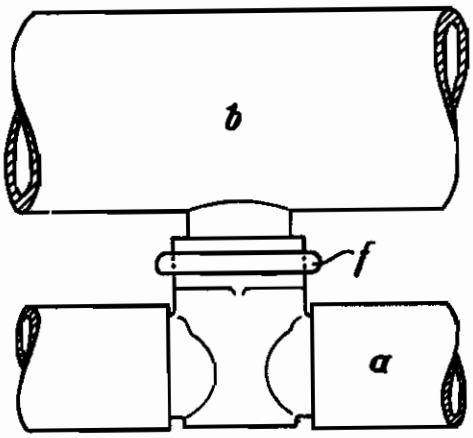

Fig. 1

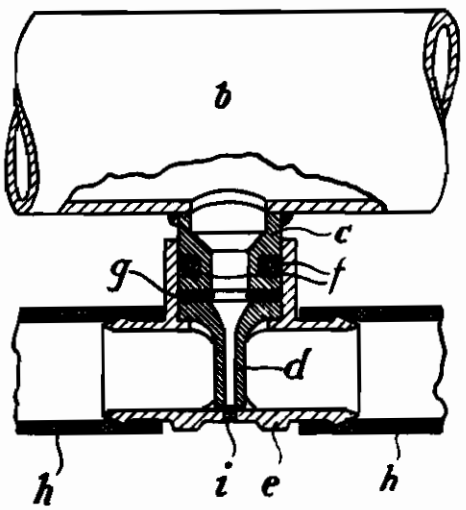

Fig. 2

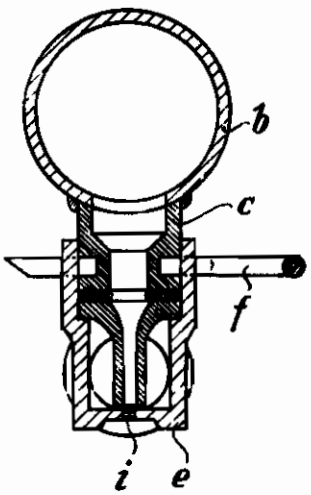

Fig. 3

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APPLYING CHEMICALS TO PLANTS

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This invention relates to a method and nozzle for spraying plants with chemicals to exterminate pests and kill weeds.

When destroying pests by wet spraying it is customary to use water as solvent and carrier of the chemicals and to apply under pressure the spraying solution formed through nozzles having small perforations so as to insure fine and uniform distribution.

This method is, however, open to several objections. In order to avoid clogging of the atomizing nozzles the diameter of their perforations cannot be smaller than 1.2 to 2 mm., and the production of a spray having the necessary fineness requires a minimum pressure for the spraying solution of approximately 5 to 6 atmospheres above atmospheric pressure. From these two factors, viz. pressure and sectional area of outlet, follows, in case of field spraying, a consumption of spraying solution per ha. which for most purposes amounts to 800 l. per ha. This average is generally accepted to simplify the proportioning of chemical additions to water. This known method suffers chiefly from the drawback of high consumption of water per ha., in view of the cost of transportation, and also from the defect that a spraying charge of 300 l. covers only 0.375 ha.

It is the object of the invention to propose a new method according to which water while remaining the carrier of the chemicals is used only to the extent of about 100 to 150 l. per ha. The chemicals hitherto in use are employed also, though in correspondingly higher concentration. In further accordance with the invention a foam forming substance of the kind used for instance for fire extinguishing purposes is added to the water mixed with the chemicals. The mixture obtained is then worked in known manner to produce air foam or, in the event of carbon dioxide preparations, chemical foam. The foam is applied to the plants to be protected or exterminated with the aid of compressed air in a finely dispersed condition and uniform manner.

The method according to the invention affords the advantage of reducing the water supply for field work to approximately one-fifth to one-eighth of present requirements, which means that a foam charge of 300 l. will cover about 2–3 ha. instead of 0.375 ha. A further advantage is that larger outlet perforations than for water spraying can be used, since the volume of the final spraying preparation, due to the formation of foam, increases from about 100 to 150 l. per ha. to about 2,000 l per ha., or 13 times. Compared with the accepted standard of 800 l. spraying solution per ha., the volume of foam sprayed according to the invention over the same area is 2½ times as great. Still another feature of the invention resides in effecting a saving, since the spraying of foam requires less power than that of water.

For the practical application of the method according to the invention the nozzles of the type hitherto employed in spraying liquids to exterminate pests are not well suited, because they clog up already at a slight contamination of the spraying solution and thereby interrupt operation.

In the known nozzles the spraying solution passes through a chamber fitted with helical channels so as to have a circulating motion on leaving the nozzle opening. These channels as well as the nozzle opening are quite narrow, which, in addition to the drawbacks mentioned, involves a considerable power requirement for spraying. The advantage of increased output combined with reduced water and power supply afforded by the invention would therefore be lost again if nozzles of the known type were used which clog up so easily and cause many interruptions in operation.

The invention provides therefore a nozzle without narrow cross section, in which also by suitable construction of the parts adjacent the nozzle opening the hitherto required ante-chamber is eliminated. Furthermore, the front side of the air nozzle together with the inner wall of the conduit containing the spraying medium form a gap surrounding the outlet opening like an annular disc and having the effect of allotting an unvarying amount of spraying medium to the outgoing air. Fine impurities can pass the nozzle without trouble, and coarse admixtures remain at the outer edge of the nozzle for the air without causing clogging. The nozzle according to the invention is, moreover, so constructed that it can be taken apart by a simple manipulation and easily cleaned.

One form of the invention is illustrated in the accompanying drawing, in which

Figure 1 is an external view of a nozzle for carrying out the invention;

Fig. 2, a longitudinal section thereof; and

Fig. 3, a cross section thereof.

The air required for spraying the medium flowing through a pipe *a* is guided to the nozzle at slight overpressure through a conduit *b*. The nozzle substantially comprises three parts, viz. the body portion *c* firmly united with the air conduit *b*, the mouthpiece *d* and the casing *e* sur-

rounding parts *c* and *d*. The parts are held together by a hairpinlike member *f* which passes through corresponding bores in the upper portion of the casing *e* and rests in an annular groove on the outside of the body member *c*. The two free ends of the pin *f* are wedge-shaped, as indicated in Fig. 3. Between the body member *c* and the mouthpiece *d* an elastic packing is provided whose thickness is so dimensioned that at the insertion of the pin *f* the parts of the nozzle are elastically forced together under slight pressure. The casing *e* forms part of the piping *a* made up of hose members *h* which connect the various nozzles of the spraying device and are simply pushed over the casing *e*, whereby a watertight connection is established. In the casing *e*, in the extension of the longitudinal axis of the mouthpiece *d*, an outlet opening *i* is formed. Between the front side of the mouthpiece *d* and the inner wall of the casing *e* a gap is provided which surrounds the outlet opening *i* like an annular disc.

Both the air and the spraying medium are fed to the nozzle at very slight overpressure, so that the outlet surface may be made large and hose clips at the joints be dispensed with.

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