

F. D. HOUGHTON.
 DEVICE FOR USE FOR SPRAYING PURPOSES.

APPLICATION FILED OCT. 20, 1913.

Patented Feb. 8, 1916.

2 SHEETS—SHEET 1.

1,170,908.

Fig. 1.

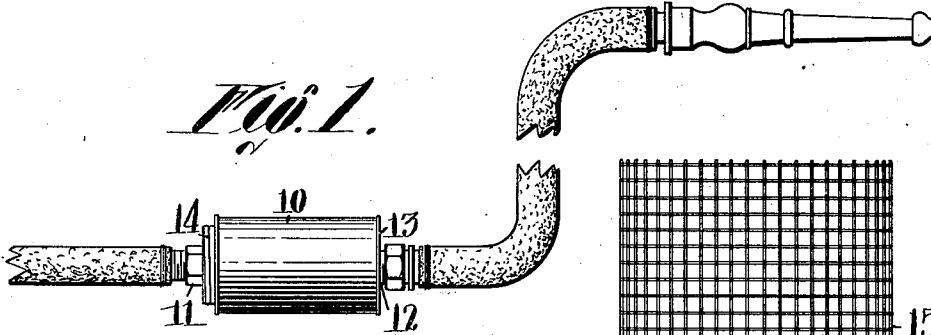
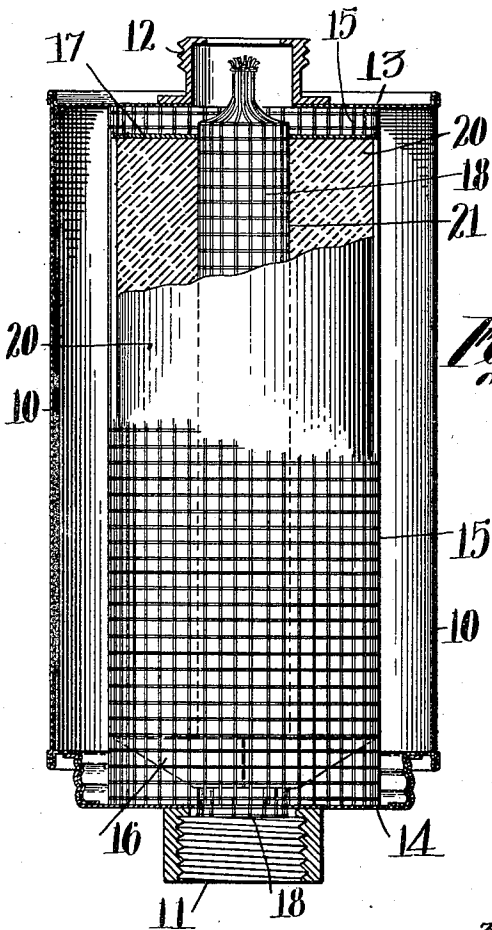


Fig. 2.

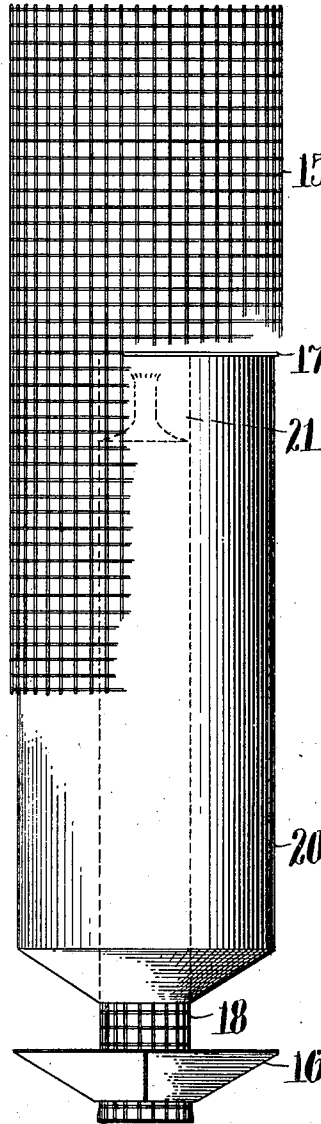
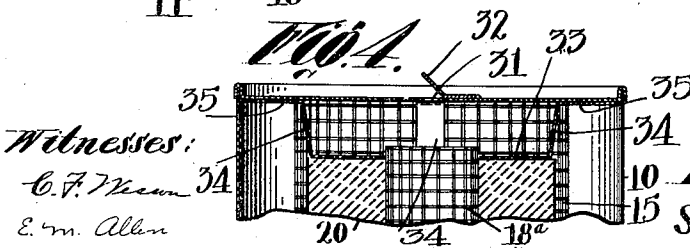


Fig. 3.



Witnesses:

C. F. McLean

E. M. Allen

Inventor:
 F. D. Houghton.
 by attorneys
 Southgate & Southgate

F. D. HOUGHTON.
 DEVICE FOR USE FOR SPRAYING PURPOSES.
 APPLICATION FILED OCT. 20, 1913.

1,170,908.

Patented Feb. 8, 1916,
 2 SHEETS—SHEET 2.

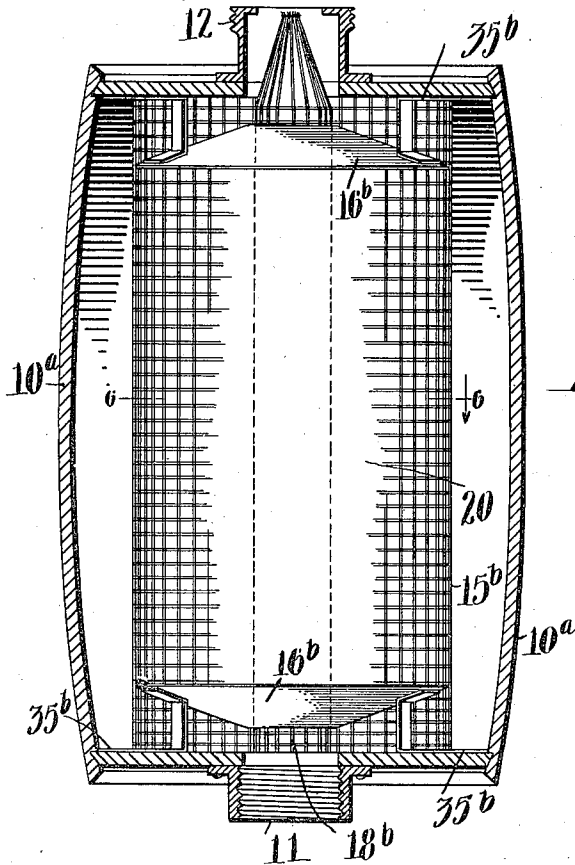


Fig. 5.

Fig. 6.

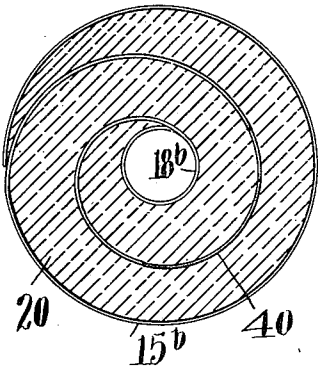
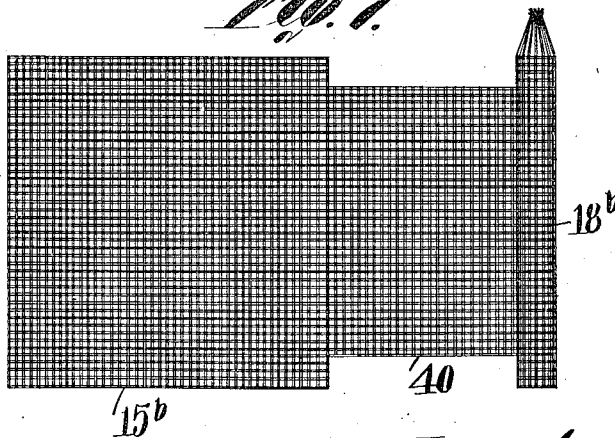


Fig. 7.



Witnesses:

C. F. Nisson
 E. M. Allen.

Inventor:
F. D. Houghton
 by attor^ys.

Southgate & Southgate.

UNITED STATES PATENT OFFICE.

FREDERIC D. HOUGHTON, OF WORCESTER, MASSACHUSETTS.

DEVICE FOR USE FOR SPRAYING PURPOSES.

1,170,908.

Specification of Letters Patent.

Patented Feb. 8, 1916.

Application filed October 20, 1913. Serial No. 796,241.

To all whom it may concern:

Be it known that I, FREDERIC D. HOUGHTON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Device for Use for Spraying Purposes, of which the following is a specification.

This invention relates to a device for holding a soluble or partially soluble insecticide, disinfectant, cleaning compound or the like, in such a manner that it can be dissolved and applied by the forcing of a stream of water therethrough.

The principal objects of the invention are to provide an inexpensive and simple construction for this purpose and especially to provide one of such character that the strength of the solution will not decrease as the material is gradually dissolved during the use of the device.

The invention also involves improvements in details of construction which will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a side view of a device constructed in accordance with this invention shown as applied to a hose in condition for use; Fig. 2 is a central longitudinal sectional view thereof on enlarged scale; Fig. 3 is a side elevation of the holder for the material to be dissolved with the parts partially separated; Fig. 4 is a side view partly in central section showing a modification; Fig. 5 is a longitudinal central section of another modification; Fig. 6 is a transverse section of the interior parts thereof; and Fig. 7 is a side view of the wire cloth portion partly straightened out.

Several devices have been invented for the purpose of holding soaps and other soluble material for the purpose of spraying trees, plants, buildings, etc. One of the difficulties with these devices, so far as I am acquainted with them, is the fact that the solid or viscous substance placed in the device is gradually dissolved so that its external surface decreases in area as it is used. Thus the longer it is used the weaker is the solution sprayed from it.

One of the objects of this invention is to provide an arrangement whereby the

strength of the solution will keep up even when the amount of material left in the device is very greatly decreased from the normal amount.

In the drawings, a cylindrical receptacle 10 shown as formed of thin sheet metal is arranged in the usual way with coupling sections 11 and 12 on the two ends constituting respectively, an inlet and an outlet, so that it can be inserted in the line of hose. The water passing through the hose will also pass through the device and dissolve the material therein. In the present case, however, the receptacle or can 10 is provided with a solid head 13 on which the outlet 12 is formed and with a removable cover 14 at the other end having an opening therein from which projects the inlet 11.

For the purpose of properly holding the material to be dissolved, a wire cage 15 is inserted in the can or receptacle, this cage preferably being of cylindrical form and of a length substantially equal to the inside length of the can. It is shown as open at the ends and is provided with two sheet metal plates 16 and 17 respectively, one being a flat plate spaced from the outlet end and the other conical at the inlet end and each fitting within the cage 15. Each of these plates also is provided with a central circular opening therethrough. In these openings is arranged a cylindrical tube 18 also of wire cloth or other material having openings therethrough for the passage of water. This cylinder projects at the ends through the openings in the metal plates 16 and 17 and when these parts are assembled, the central cylinder is located centrally in the outer cage and held in that position. Its ends project into the two couplings 11 and 12 so as to center the whole device. The end of the tube 18 is contracted to form a guide and a positive stop to the passage of large particles of soap or disinfectant. One or both of the plates 16 and 17 is made removable, the other one can be fixed to one or both of the cylinders 15 and 18 if desired. One is intended to be removed for the purpose of inserting the material to be dissolved. In the present case this is shown in the form of a cylindrical cake of solid disinfecting soap or the like 20 having a central

passage 21 therethrough for the reception of the cylindrical tube 18. The soap is also shown as having a conical end fitting the plate 16.

5 In assembling the parts, one of the metal plates is removed, the soap inserted, the cylindrical cage 18 inserted in the soap and the plate or plates placed at the ends of the soap inside the cylinder 15. These parts
10 then are handled as a whole and are inserted in the casing 10 and held therein by the replacement of the cover 14. Then the two couplings are secured to the ends of hose sections or if desired, one to a hose section and the other to a sill cock or nozzle.

15 The operation of the device is very simple, part of the water coming in through the inlet 11 engages the convex conical surface of the plate 16 and is forced outwardly into
20 the space between the cylinder 15 and the casing 10 so as to surround the soap. This water or solution then passes to the outlet through the space between the plate 17 and the end of the casing. The water which
25 enters centrally passes through the wire cloth tube 18 and dissolves the inner surface of the soap surrounding that tube. Both the outer and the inner streams of water unite to pass out into the hose through the out-
30 let 12.

One of the important things to be noticed is that as the soap wears away, both on its outside and on its inner surface, which surrounds the tube 18, the outer surface of the
35 soap will decrease in area but there is a substantially corresponding increase of area of the inner surface which is exposed to the current passing longitudinally through the tube 18. It will be seen, therefore, that as
40 the device is used there is no material tendency for the solution to grow weaker, which remedies a fault found in these devices as heretofore made so far as I am aware. This is true whether the soap is solid, viscous, or
45 in one or more pieces. In addition to this, the device is kept perfectly centered without the use of external centering devices and the water is distributed positively around the exterior of the soap as well as through
50 its center so that all parts are acted upon by the water. Moreover, the plates 16 and 17 protect the ends of the soap especially the one nearest the inlet from the rapid action of the entering water and thus add to
55 the durability and efficiency of the device. In this way the rapid solution of the ends of the cake of soap is avoided and it is found in practice that the soap does not decrease in length to any great degree while it is being
60 used up.

In Fig. 4 I have shown a modification in which the nozzle indicated in Fig. 1 is entirely dispensed with. In this case the inlet of the device is the same as in Fig. 2 but
65 the outlet is modified. The casing has a

fine outlet opening 31, or a row of them, for the stream of solution. Extending from this end of the casing to a point in front of this opening but somewhat spaced therefrom is a plate 32 in position to be engaged by the discharged solution and located angularly so as to distribute a fine spray. This plate is shown as formed of thin material so that it can be bent slightly back and forth to regulate the spray. In this form the outside
70 cage 15 is shown as centered by a flat plate or washer 33 having a plurality of arms 34 bent at right angles from its edges and then again bent to form projections 35 in a plane parallel to the plane of the plate. These
80 projections 35 engage the walls of the container and serve to center the end thereof. In this case the interior cage or tube 18^a is centered simply by extending through a hole on the plate.

Another way in which the invention can be employed is in the original packing of disinfectants and similar substances. For this purpose the barrel, keg or other container 10^a, (Figs. 5, 6 and 7) no matter what
90 its size, can be provided with screen devices similar to those heretofore described with the soap or other soluble substances in them in such condition that when the barrel or the like is received it is necessary only to
95 screw the hose on the two ends and use the contents in the manner heretofore described herein. In this way the receiver of the goods does not have to take the soap or the like out of the barrel. Although the forms
100 shown in the first four figures can be used in this case, I have shown them somewhat modified. The entire device for holding the soap or the like is made up of a single screen cloth having two portions 15^b and 18^b connected by a piece of woven cloth 40 integral with them. These are wound up in such
105 form that the connecting piece assumes a spiral form, as shown in Fig. 6. The end is connected to the edge of the outer member 15^b so as to constitute a wire cage as before. The ends are kept in place by two plates 16^b which in this case are both shown conical and these are provided with outwardly extending projections 35^b for the same purpose
110 as has been described hereinbefore. In this case the wire portion of the device can be surrounded inside and outside by paper or the like and the soap cast in it so as to fill the entire space between the inner tube 18^b and the outer cylinder 15^b. Then after one end of the barrel or the like is headed up, the soap and its container can be placed inside and the other head then put in. This permits the use of the device without un-
115 packing the soap, which is often of a disagreeable nature, and it also permits of the sending of the barrel back to the manufacturers to be refilled. It is to be observed that in all the forms shown the surfaces of 1

the soluble substance which come into contact with the water are maintained of substantially constant area so as to keep the strength of the solution substantially constant.

In all the forms shown, the holding device for the soap or the like can be removed from the container and refilled, either at the factory or elsewhere. In putting it back in the container it is easily put in place and centered and it is held in place by attaching the cover or heading up the barrel.

It is to be understood that although I have referred to this invention as used for soap and for spraying trees, plants, buildings, etc., yet I am aware of the fact that the invention can be used for various other purposes such as the application of paint and white wash to buildings or the distribution of ordinary soap for cleaning purposes and the spraying of disinfectants or insecticides not containing soap but containing other ingredients which render them solid or viscous at ordinary temperatures and yet soluble in water.

Although I have illustrated and described only three forms of the invention, I am aware of the fact that many other modifications can be made therein by any one skilled in the art without departing from the scope of the invention as expressed in the claims, therefore, I do not wish to be limited in these respects, but

What I do claim is:

1. In a device of the character described, the combination of a casing for receiving a stream of liquid solvent and for holding a soluble substance, and means for causing the stream of solvent to come in contact with two surfaces of the soluble substance one of which increases in area and the other decreases as the surfaces are worn away as long as any material part of said substance remains undissolved.

2. In a device of the character described, the combination with a casing and means for directing a stream of liquid solvent through the casing, of means for holding a soluble substance in position in the casing, and means for directing the stream of solvent over a plurality of surfaces of the soluble substance some of which diminish in area and the remainder increase as they are worn away, so as to keep them of substantially constant combined area as long as any of the soluble substance remains undissolved.

3. In a device of the character described, the combination with a casing for receiving and discharging a stream of liquid solvent, and means for holding a soluble substance in fixed position in said casing and for permitting access of the solvent to a plurality of surfaces of said substance, the surfaces to which the solvent has access be-

ing so located and arranged as to remain substantially of constant combined area during the dissolution of said substance.

4. In a device of the character described, the combination with a casing for receiving a stream of liquid solvent and discharging it therefrom, of a foraminous cage within the casing extending from one end to the other, a foraminous cylinder within the cage extending throughout the length of the cage, said cage and cylinder constituting means for holding a soluble substance in hollow form in fixed position in the casing and permitting access of the solvent to the inner surface of said substance, and means within the cage for assisting in directing the solvent from the inlet of said casing into contact with the outer surface of the soluble substance and out of contact with the end thereof, whereby the surfaces to which the solvent has access will remain substantially of constant combined area during the dissolution of said substance by the liquid solvent.

5. The combination, of a container for a solid or viscous but soluble substance, having an inlet and an outlet for water, and stationary means therein for directing water from the inlet both around and through the interior of a body of said solid or viscous substance to the outlet and in contact with the interior thereof as long as any of the substance remains undissolved, and for keeping the stream of water from striking the end of said body.

6. In a device for holding a soluble, solid or viscous substance, the combination of a casing having an outlet and inlet, a stationary support within the casing for holding said solid or viscous substance spaced from the walls of the casing, and means whereby a current of liquid passing from the inlet to the outlet will be caused to divide into two separate streams, one passing by the end of said substance out of direct contact with the end and in contact with the exterior of said substance and the other passing directly through said substance to the outlet.

7. In a device of the character described, the combination of a casing having an inlet and an outlet, of a cake of soluble substance within said casing, having a substantially cylindrical form and provided with a cylindrical longitudinal passage therethrough and also having a conical end located just opposite the inlet and a conical plate within said casing covering the conical end of said cake for preventing the access of the stream of liquid entering the inlet from said conical surface of the cake and directing part of said stream outside the cake.

8. In a device of the character described, the combination of a cylindrical casing having a central inlet at one end and a central outlet at the other, a fixed cylinder within

the casing spaced from the cylindrical walls thereof, a second cylinder within the first named cylinder centrally located therein, said cylinders having a space between them
5 for the reception of a soluble compound, and means located in the outer cylinder for centrally holding the inner cylinder within the outer cylinder and means projecting from the outer cylinder to hold it in the center
10 of the casing.

9. In a device of the character described, the combination of a casing, of a generally cylindrical form having a central inlet at one end and a central outlet at the other, a
15 fixed cylinder within the casing spaced from the walls of the casing, a tube within the cylinder located longitudinally thereof and extending from the inlet directly to the outlet, said cylinder and tube having a space
20 between them for the reception of a soluble compound and being provided with perforations therethrough to permit access of water to the soluble compound and a conical plate surrounding said tube at the inlet and
25 extending to the cylinder for preventing direct access of the entering stream of water to the end of the body of soluble material.

10. In a device of the character described,
30 the combination of a casing having an inlet at one end and an outlet at the other, a cage within the casing spaced from the walls thereof, a tube within the cage, said cage and the tube having a space between them
35 for the reception of a soluble compound and having perforations for permitting water to pass through their walls, and means at the inlet end for directing a portion of the water from the inlet along the end of the
40 cage to the exterior thereof, said tube being open at both ends to receive and discharge a stream of water.

11. In a device for holding a soluble, solid or viscous substance, the combination
45 of a casing having an outlet and inlet, a fixed support within the casing for holding said solid or viscous substance spaced from the walls of the casing, and means whereby a current of liquid passing from the inlet
50 to the outlet will be caused to divide so as to partly pass around the exterior of said substance and partly pass directly through it to the outlet, the outlet of said casing

being provided with a spraying opening and a plate spaced from the outlet opening and projecting into position for the stream to engage its edge and cause a spray.

12. In a device of the character described, the combination of a casing having an inlet and outlet at its ends, a perforated cage within said casing spaced from the exterior walls thereof but engaging the end walls, a perforated tube within the cage and extending from one end of the main casing to the other, a plate located between said perforated cage and tube near the inlet end and of conical form for directing part of the water from the inlet through the end of said cage into the space outside the cage, and a flat plate at the other end of said casing for holding the cage and tube centrally with respect to each other, said flat plate being spaced from the outlet end wall of the main casing.

13. In a device of the character described, the combination of a casing having an inlet and outlet at its ends, a perforated cage within said casing spaced from the exterior walls thereof but engaging the end walls, a perforated tube within the cage and extending from one end of the main casing to the other and centrally held therein, and a plate located between said perforated cage and tube near the inlet end and of conical form for directing part of the water from the inlet through the end of said cage into the space outside the cage.

14. In a device of the character described, the combination of a casing having an inlet and outlet, a perforated cage within the casing spaced from the walls thereof but engaging the end walls of the casing to hold it against displacement, a perforated tube within the cage extending from one end of the main casing to the other and centrally held therein, one end of said tube projecting beyond the end of the cage and into the outlet, and means for centering said tube within the cage.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

FREDERIC D. HOUGHTON.

Witnesses:

ALBERT E. FAY,
C. FORREST WESSON.