

No. 625,594.

Patented May 23, 1899.

J. M. OLDHAM.
PNEUMATIC SPRAYER.

(Application filed May 14, 1898.)

(No Model.)

Fig. 1.

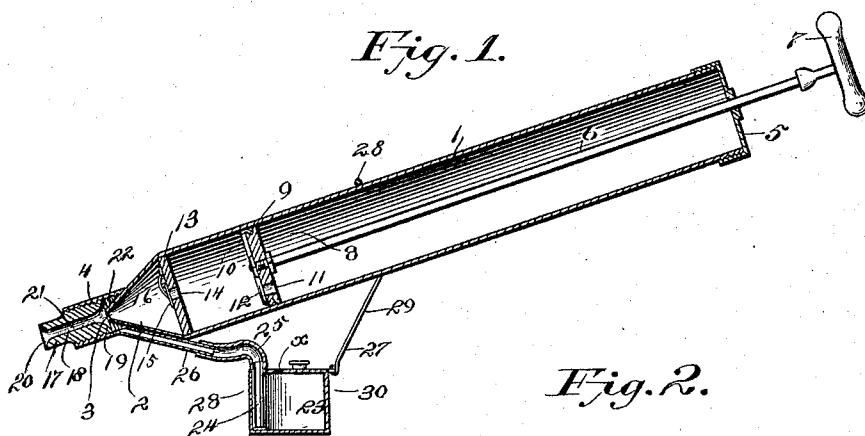


Fig. 2.

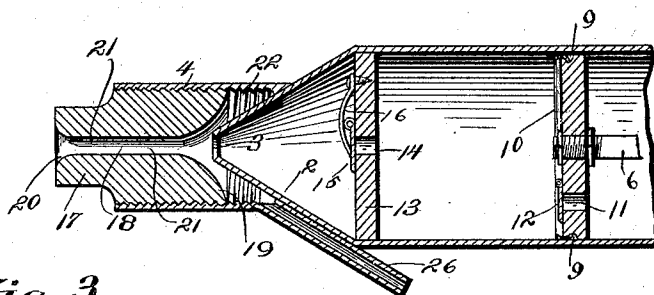


Fig. 3.

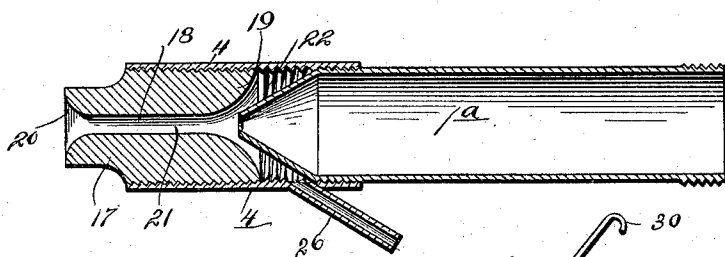
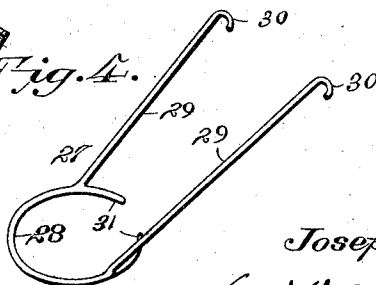


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC SPRAYER.

SPECIFICATION forming part of Letters Patent No. 625,594, dated May 23, 1899.

Application filed May 14, 1898. Serial No. 880,675. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. OLDHAM, a citizen of the United States, residing at Afton, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Pneumatic Sprayers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to sprayers, the object of the same being to provide a device of this character which is especially adapted to be used for spraying all kinds of vegetables, fruits, trees, vines, and the like, as well as animals, for the destruction of bugs, mites, and other vermin which attack the same.

A further object of the invention is to provide a sprayer by means of which a light and heavy spray may be thrown with equal force and the same distance and in a direct line from the center of the device.

A still further object is to provide means whereby the quantity of the spray may be regulated without affecting its force or deflecting it in any way.

The invention consists in a pneumatic sprayer embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 represents a central longitudinal sectional view through a sprayer constructed according to my invention. Fig. 2 is a similar view of the forward end of the cylinder on an enlarged scale. Fig. 3 is a similar view of a modified form of the invention. Fig. 4 is a detail view of the supporting-bracket employed.

Like reference letters and numerals indicate like parts in the different views.

The cylinder 1 is formed with a tapering or cone-shaped front end 2, having a contracted aperture 3 at the apex thereof and secured to its outer surface an internally-screw-threaded tube 4, which is concentric with the cylinder 1. The opposite end of the cylinder has secured to it a head or cap 5, through which passes a centrally-located piston-rod 6, hav-

ing a handle 7 upon its outer end and carrying a piston 8 upon its inner end. The said piston is provided with a peripheral groove 9, in which fits a band 10, of leather or other suitable packing material, provided for the purpose of forming a close joint between the piston and the inner surface of the cylinder. The said piston 8 has extending through it at one point a slot or opening 11, which is controlled by a flat valve 12 upon the outer or lower end of the piston, the said valve serving to close the opening 11 upon the down or forward stroke of the piston and to open the same upon the rearward stroke thereof. At the point of connection between the main portion of the cylinder 1 and the tapering or cone-shaped end 2 thereof is a diaphragm 13, the same being located upon the inside of the cylinder and provided with a central opening 14, controlled by a valve 15 upon the lower side thereof, which valve is normally held in closed position by means of a spring 16. The valve 15 serves to prevent the suction of air or of the spraying material back into the cylinder 1 upon the rear stroke of the piston 8, but permits the free passage of the compressed air through the opening 14 upon the forward stroke of said piston. Fitting within the tube 4 is a nozzle 17, the same being provided with external screw-threads adapted to engage the threads on said tube, whereby said nozzle may be adjusted relative to the aperture 3 in the tapering end 2 of the cylinder, and having a central opening or passage 18 extending therethrough. The rear or inner end of the nozzle is outwardly curved, as shown at 19, and the sides of the opening 18 diverge at their outer ends, as shown at 20, the central portion of the opening 18 being cylindrical. By reason of the fact that the rear end of the nozzle 17 is curved outwardly from the opening 18 therein an annular chamber 22 is formed between the extreme forward end of the tapering portion 2 of the cylinder 1 and the rear end of said nozzle, the sides of said chamber converging from its outer end inwardly.

Adjustably secured to the cylinder 1 is a receptacle 23 for containing liquid insecticide or other material to be sprayed, the same having a pipe 24 leading from the bottom thereof upwardly and connected through a flexible

tube 25 with a pipe 26, which leads into the chamber 22, as clearly shown. The said receptacle 23, having a suitable vent *x*, is held in place upon the cylinder 1 by means of a bracket 27, (shown in detail in Fig. 4 of the drawings,) and consisting of a single strip of wire bent at a point intermediate of its ends, forming a loop 28, adapted to embrace the cylinder 1, having diverging spring-arms 29 leading from said loop, the outer ends of said arms being formed with hooks or lateral projections 30, which are adapted to fit and be held in suitable openings in the receptacle. Between the arms 29 and the loop 28 of said bracket are inwardly-extending offsets or shoulders 31, which serve to enable said loop to tightly grip or engage the outer surface of the cylinder 1 throughout the greater portion of its circumference and to enable the spring-pressure on the arms 29 to be exerted from that point independent of the loop 28.

From the foregoing description it will be seen that upon the rearward movement of the piston 8 through the actuation of the piston-rod 7 the valve 12 will be opened and the valve 15 closed, permitting the free passage of said piston through the cylinder without the formation of air-cushions or the packing of air in the cylinder. Upon the opposite movement of the piston 8 the valve 12 will be closed, the valve 15 opened, and a jet of air forced through the opening 14 in the diaphragm 13 and through the contracted aperture 3 in the tapering end 2 of the cylinder out through the opening 18 in the nozzle 17. The passage of the air through the nozzle creates a vacuum in the chamber 22 and causes a suction of the spraying material from the receptacle 23 up through the pipe 24, flexible tube 25, and pipe 26 into the nozzle 17. By the force of the air which it meets in the opening 18 the said material is ejected with considerable force in the form of spray out through the diverging outer end of said opening. The quantity of the liquid sprayed may be regulated by adjusting the position of the nozzle 17 in the tube 4, this adjustment being effected by the provision of the screw-threads on the two engaging parts. For example, if it is desired to spray but a small quantity of liquid the nozzle 17 will be screwed inwardly until the rear end thereof lies in comparatively close relation to the tapering end 3 of the cylinder 1. The passage of the liquid into the nozzle, however, will be through the chamber 22, whose sides converge and whose forward end, adjacent to the opening 18, is narrower than its outer end, adjacent to the point of connection of the pipe 26 therewith. This enables a small quantity of the liquid to be drawn from the receptacle 23, but does not diminish the force with which said liquid is ejected from the nozzle 17. In the passage of the liquid through the cylindrical portion 21 of the nozzle 17 it is not permitted to expand or contract, and it therefore receives the full force of the air ejected from the cylinder 1 through the aper-

ture 3. As it reaches the outer flaring end 20 of the opening 18, however, it is permitted to expand, and it is therefore ejected with great force in the form of spray.

Ordinarily it will be considered desirable to have the receptacle 23 located in the position in which it is shown in Fig. 1 of the drawings—that is, upon the under side of the cylinder 1 at a point near the forward end thereof. In case it is desired, however, to spray the liquid upwardly it will be important to change the relative location of the receptacle 23 with respect to said cylinder, so as to have it farther from the nozzle 17 upon one side of the cylinder or upon the top thereof. This adjustment may be readily effected by means of the bracket 27. (Illustrated in Fig. 4 of the drawings.)

In the modified form of my invention illustrated in Fig. 3 of the drawings I have shown the cylinder 1^a of substantially the same form as the cylinder 1 except that the relative size of said cylinder with respect to the nozzle 17 is much smaller. Furthermore, there is provided upon the forward end of said cylinder 1^a external screw-threads 32, with which are adapted to engage internal screw-threads upon a sleeve 33, within which the nozzle 17 fits and by means of which the relative position of the cylinder 1^a and said nozzle may be regulated.

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

1. In a sprayer, a cylinder, a piston therein, and an adjustable nozzle upon the end of said cylinder, as and for the purpose set forth.

2. In a sprayer, a cylinder having a tapering end with a contracted aperture therein, a piston on the inside of said cylinder, a tube concentric with said cylinder, secured to the tapering end thereof, an adjustable nozzle therein, and a supply-pipe for spraying material communicating with said tube.

3. In a sprayer, a cylinder having a nozzle at the forward end thereof, a reciprocating piston therein, a receptacle for spraying material communicating with said nozzle, and a bracket whereby said receptacle is adjustably mounted on said cylinder, the same comprising a wire bent at a point intermediate of its ends forming a loop adapted to embrace said cylinder, and diverging spring-arms leading from said loop and formed with hooks upon their outer ends adapted to fit within openings in said receptacle, as and for the purpose set forth.

4. In a sprayer, a cylinder having a tapering end with a contracted aperture at the apex thereof, a reciprocating piston in said cylinder, a tube concentric with said cylinder, secured to said tapering end, a nozzle adjustably mounted in said tube having an opening extending therethrough which is cylindrical at a point intermediate of its ends, is flaring at its outer end and is formed with

outwardly-curved walls at its rear end, the
said outwardly-curved walls and the apex of
the tapering end of said cylinder forming an
annular chamber whose sides converge, a re-
5 ceptacle for spraying material, and a pipe
connecting said receptacle with said chamber,
as and for the purpose set forth.

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

JOSEPH M. OLDHAM.

Witnesses:

MARY A. OLDHAM,

PETER J. QUINT.