

Oct. 22, 1935.

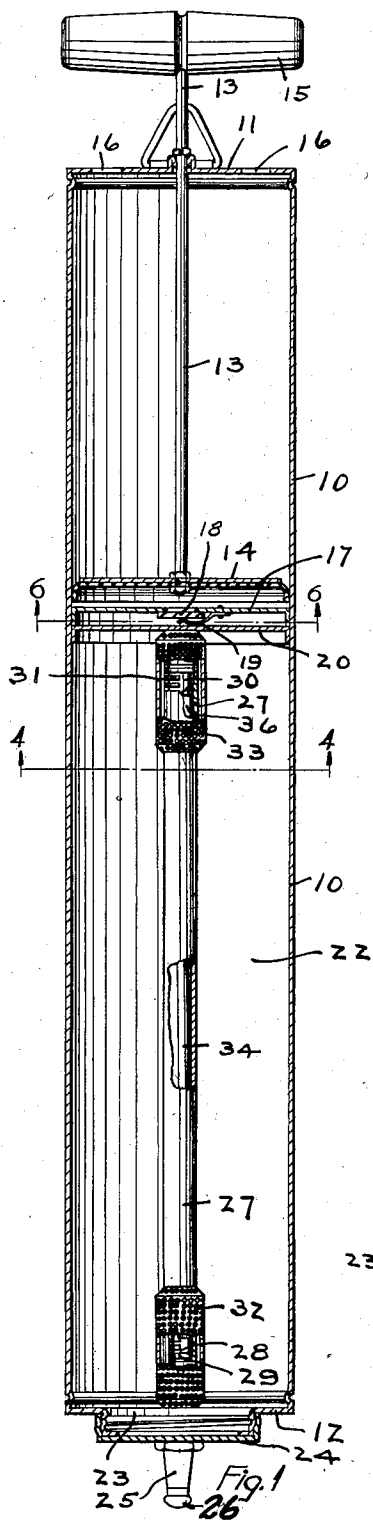
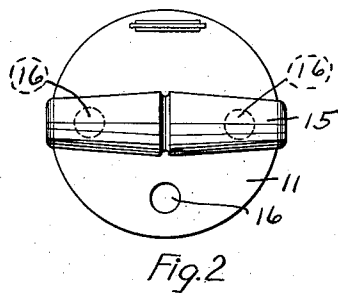
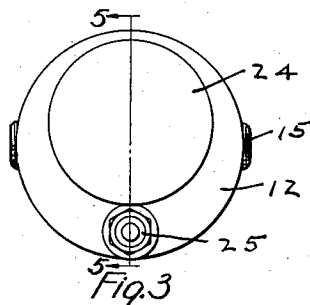
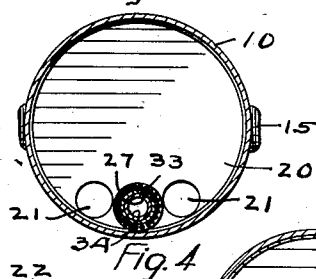
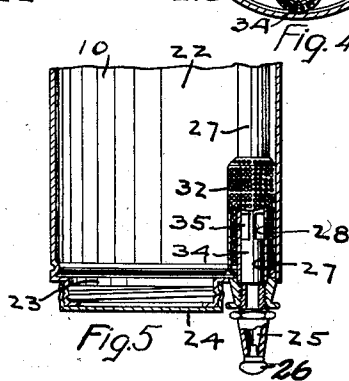
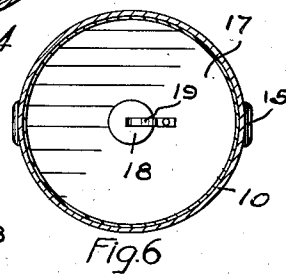
J. A. JOHNSON ET AL

2,018,525

DUST APPLICATOR

Filed Nov. 21, 1934

2 Sheets-Sheet 1



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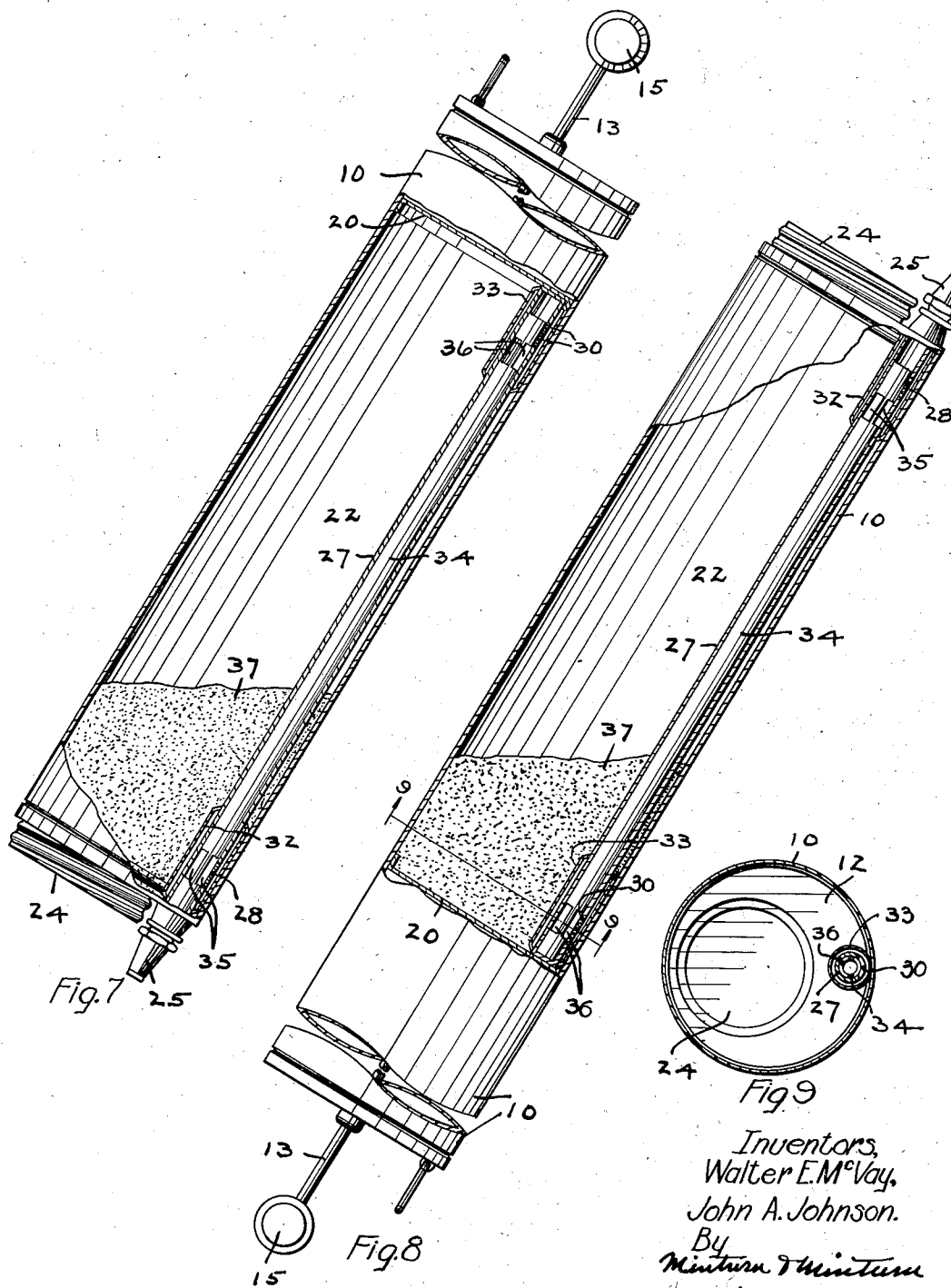
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DUST APPLICATOR

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UNITED STATES PATENT OFFICE

2,018,525

DUST APPLICATOR

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Application November 21, 1934, Serial No. 754,010

7 Claims. (Cl. 43—147)

This invention relates to a powder applicator and has for its primary object the provision of means for use in directing powder both downwardly and upwardly. There are many conceivable uses of the invention, one being to apply insecticide in powder form to vegetation and another use being to project powder upon a fire in order to extinguish it.

Dust applicators or dusters have heretofore been used but in the known construction thereof, the dust must always be directed downwardly or horizontally and no provision is made for permitting the dust to be projected upwardly. In many cases it is just as essential to have an upwardly directed projection as it is a downward one. For example, in applying dust to the under sides of leaves of shrubbery, the dust must be projected upwardly and again in many cases where the device is to be used as a fire extinguisher, fires start in elevated positions such, for example, as on draperies about windows, about flues, etc. In such cases it therefore becomes necessary when using a powder to have some means for projecting the powder upwardly to the desired point of application.

Our invention provides in one device means permitting the projection of the dust both downwardly and upwardly as may be desired, as well as horizontally.

A further important object of the invention is to provide an improved organization of parts especially adapted for use in directing the powder both upwardly and downwardly. A further object is to provide a very simple mechanism which will be non-clogging and automatically operable in the hands of inexperienced users and which will remain durable over long periods of time.

Further objects and advantages will become apparent to those versed in the art in the following description of the invention as illustrated in one particular form in the accompanying drawings, in which

Fig. 1 is a central transverse longitudinal section through a device embodying our invention;

Fig. 2, an end elevation;

Fig. 3, an opposite or discharge end elevation;

Fig. 4, a vertical transverse section on the line 4—4 in Fig. 1;

Fig. 5, a detail in longitudinal section of the discharge mechanism;

Fig. 6, an elevation of an air control valve;

Fig. 7, a side elevation in partial section of a device embodying our invention directed downwardly;

Fig. 8, a similar side elevation but directed upwardly, and

Fig. 9, a transverse section on the line 9—9 in Fig. 8.

Like characters of reference indicate like parts throughout the several views in the drawings.

In the particular form herein shown and described, we provide a barrel 10 having a rear end closure 11 and a discharge end closure 12. A piston rod 13 slidably passes through the closure 11 and connects by its inner end with a plunger or piston 14 which slidably engages with the inner wall of the barrel 10 in the usual and well known manner whereby inward movement of the rod 13 causes the outer edge of the piston to engage snugly with the barrel wall to compress air forwardly of the piston and upon the reverse or outward travel of the rod 13, to permit air back of the piston to travel around the piston so as to have air in front thereof for compression upon the return stroke. A handle 15 is fixed on the outer end of the rod 13 outside of the closure 11. The closure 11 is provided with air inlets 16, here shown as three in number, although the number is immaterial so long as there is sufficient opening to permit the passage of the required volume of air therethrough.

The length of the rod 13 is made to be such that when it is carried to its full permissible length within the barrel 10, the piston 14 will be terminated at some such position as indicated in Fig. 1 which is here shown as less than half the length of the barrel 10 from the end 11. This terminal position of the piston 14 may, of course, be varied as desired. In any event immediately forward of this terminal position of the piston 14 is fixed a wall 17 across the barrel 10 having some sort of a valved opening therethrough. In the form herein shown, we place a valve member 18 across an opening in the wall 17 and yieldingly retain the member 18 thereover by means of a spring 19 fixed by one end to the wall 17 and bearing substantially centrally of the member 18. Preferably, although not necessarily so, a second wall 20 is placed immediately forward of the first wall 17 as a means of protecting and keeping powder away from the valve in the wall 17. This wall 20 is provided with openings therethrough, here shown as two in number.

The chamber within the barrel 10 thus defined between the wall 20 and the forward closure 12 is that which is to receive and carry the powder to be projected. This chamber 22 is charged through an opening 23 in the end 12 which is normally closed by a screw cover 24. The open-

ing 23 is eccentric of the end 12 to permit the carrying of a nozzle 25 by the end below the cover 24. This nozzle 25 is normally closed at its outer end when not in use by a plug 26 slidably entering therein to be frictionally retained.

The passageway through the nozzle 25 communicates by its inner end with the interior of a tube 27 which is carried in fixed relation within the barrel 10 adjacent the side and parallel to the axis thereof. This tube 27 extends inwardly to terminate at the wall 20 and has its inner end closed. On the under side, that is the side of the tube 27 adjacent the wall of the barrel 10, is an opening 28 spaced inwardly a short distance from the interior end of the nozzle 25. This opening 28 is here shown as being divided by a plurality of transverse bars 29 causing the opening to be in reality a plurality of slits.

On the same under side of the tube 27 adjacent the wall of the tube 10 is a second opening 30 spaced a trifle forward of the wall 20. This opening 30 is here shown as also being divided by a plurality of transverse bars 31 causing the opening to be in reality a plurality of transverse slits. The total effective area of the opening 30 is preferably made to be larger than that of the opening 28. A screen 32 surrounds the tube 27 at its forward end to be spaced outwardly somewhat from the opening 28 and to define an annular chamber between the inside of the screen and the tube 27. Likewise a screen 33 surrounds the rear end of the tube 27 in spaced relation therefrom over the opening 30.

We provide a valve member automatically operating under the influence of gravity to selectively close the openings 28 and 30 depending upon the position in which the barrel may be placed. In the form herein shown, this valve member assumes the form of a tube 34 which is slidably carried within the tube 27. This tube 34 is somewhat shorter than the tube 27 so that it may be slid from one end to the other of the tube 27 as the telescoping tubes may be tilted. Openings 35 and 36 are respectively provided near the ends of the tube 34 so as to permit lateral entrance into the tube. The length of the tube 34 and the positions of these openings 35 and 36 are so arranged in respect to the tube 27 and its openings 28 and 30 that when the barrel 10 is rocked to have the nozzle 25 directed downwardly as in Fig. 7, the tube 34 will, under the influence of gravity, slide downwardly to have the opening 35 register with the opening 28 in the tube 27. The opening 35 is so arranged circumferentially of the tube 34 that regardless of the circumferential rotation of the tube 34, there will always be a major part of the opening 35 registering in this position with the opening 28. At the same time the opening 36 in the other end of the tube 34 has been carried downwardly out of register with the opening 30 in the tube 27 to have a closed portion of the tube 34 across the opening 30 in the tube 27 thereby closing over the opening 30.

In this position of the barrel 10, Fig. 7, powder 37 within the chamber 22 drops downwardly so that the screen 32 is then surrounded by the powder which may sift through the screen to reach the opening 28 and the opening 35 to then travel axially of the tube 34 and out through the nozzle 25. This movement of the powder is forcibly created by means of pressure built up in the chamber 22 by the powder upon reciprocating the piston 14. While the tube 34 is sufficiently free to travel longitudinally within the tube 27

as the barrel may be rocked to set up that travel, the powder 37 does not tend to clog or fill in between the two tubes but serves rather as a lubricant therebetween. In the operation of the device as above indicated, the nozzle 25 being directed downwardly, the projected powder is of course sent in the same direction.

Now in order to project the powder upwardly, all that is required is to turn the barrel 10 upwardly as indicated in Fig. 8 to have a nozzle 25 pointed upwardly. With the barrel thus positioned, the tube 34 will have shifted to the position as indicated in Fig. 8 wherein the opening 36 in the tube 34 then registers with the opening 30 in the tube 27 while the opening 35 in the other end of the tube 34 has been carried out of register with the opening 28 in the tube 27 thereby causing a closed side wall portion of the tube 34 to cover over the opening 28. Under these conditions the pressure then built up in the chamber 22 will cause the powder 37 to enter the tube 34 through its inner end opening 36 and no powder will enter at the end toward the nozzle 25. It is thus to be seen that regardless of the position of the barrel 10 causing the powder to rest at either end of the chamber 22, that powder will always surround a part of the discharging tube which is then open. Of course it is to be seen that where the opening is provided for the travel of the powder from the chamber 22 from one end only of the discharging tube, then when the barrel is rocked to an oppositely inclined position, the powder below that opening would not be discharged and air only would escape.

Attention is particularly called to the fact that the barrel can be placed at no position in which both valves will be closed at the same time, and the powder will thus have access to the discharge tube at all times. When the barrel is held in a horizontal position one or the other of the valves may be open or both valves partially open, but this will not interfere with the operation as the powder will at all times have access to the discharge tube.

While we have herein shown and described our invention in the one particular form, it is obvious that the structure may be varied without departing from the spirit of the invention and we, therefore, do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

We claim:

1. In a dust applicator, a chamber adapted to receive dust, means for applying pressure to the dust, said chamber having a discharge opening, means providing a passageway communicating with said opening from the ends of the chamber, and means automatically closing off the passageway from the upper chamber end in either case upon upward or downward tilting of the chamber.

2. In a dust applicator, a chamber adapted to receive dust, means for creating a pressure in the chamber, a dust conductor extending along the chamber and having an opening therein toward each end to receive dust from the chamber, and means shiftable by gravity selectively closing and opening said openings in alternate relation as the chamber may be rocked to have the upper opening closed and the lower opening open.

3. In a dust applicator, a dust carrying chamber having an opening therefrom at each end thereof, and slidable means automatically covering and uncovering said openings as the chamber

may be tilted, said means being arranged in relation to the openings whereby the lower opening remains open while the upper opening is closed.

4. In a dust applicator, a dust carrying chamber, a dust conductor along the chamber, said conductor having an intake opening at one end of the chamber and an intake opening at the other end, and a member slidable along the conductor under the influence of gravity to cover and uncover said openings in alternate relation whereby the uppermost opening is always covered as the chamber may be tilted upwardly and downwardly.

5. In a dust applicator, a dust carrying chamber, means for creating a pressure in the chamber, a dust conductor along the chamber having openings therein affording passages from respective ends of the chamber to the conductor, the opening toward the discharge end of the conductor being of less area than that of the other opening, a screen over each opening in spaced relation from the conductor, and a member slidable over said openings under the influence of gravity, said member being proportioned in relation to the spacing apart of said openings to alternately cover and uncover them upon tilting of the chamber to always have the then upper opening covered and the lower opening uncovered.

6. In a dust applicator, a dust carrying chamber, means for creating a pressure in the chamber, a dust conductor along the chamber having openings therein affording passages from respective ends of the chamber to the conductor, the opening toward the discharge end of the conductor being of less area than that of the other opening, a screen over each opening in spaced relation from the conductor, and a member slidable over said openings under the influence of gravity, said member being proportioned in relation to the spacing apart of said openings to alternately cover and uncover them upon tilting of the chamber to always have the then upper opening covered and the lower opening uncovered, said member being a tube telescoping with the conductor.

7. A dust applicator comprising an air compressing chamber, a dust carrying chamber, check valved intercommunicating means between the chambers, said dust chamber having two discharge openings, one at each end thereof, a conductor interconnecting said openings, a discharge nozzle at one end of the conductor, and a gravity influenced slide valve operating in inverse manner at each of said openings.

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