R. R. SLATE & D. D. STAPLES.

DUST GUN.

APPLICATION FILED FEB. 18, 1918.

1,280,110.

Patented Sept. 24, 1918

2 SHEETS—SHEET 1.

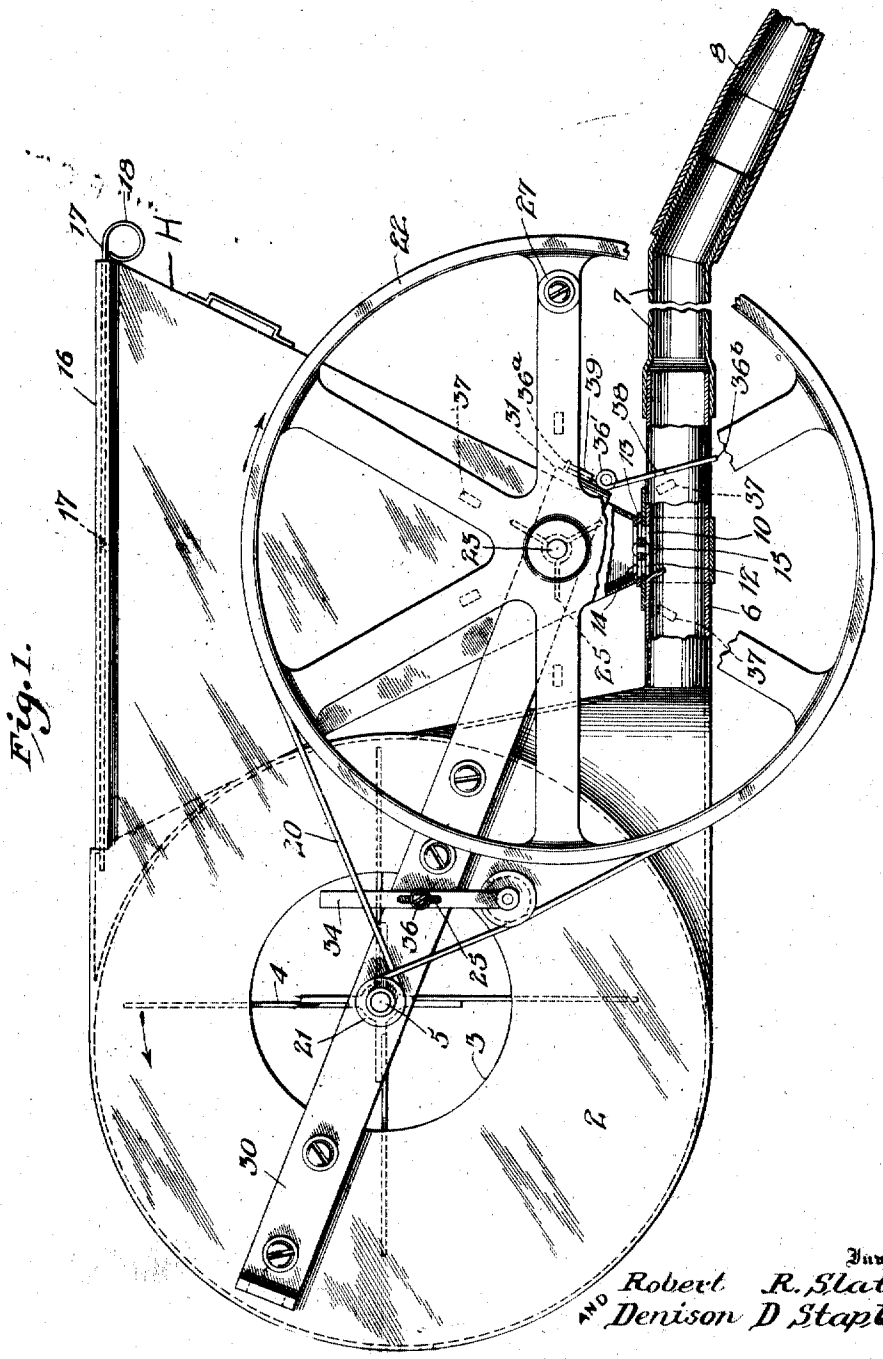


Fig. 1.

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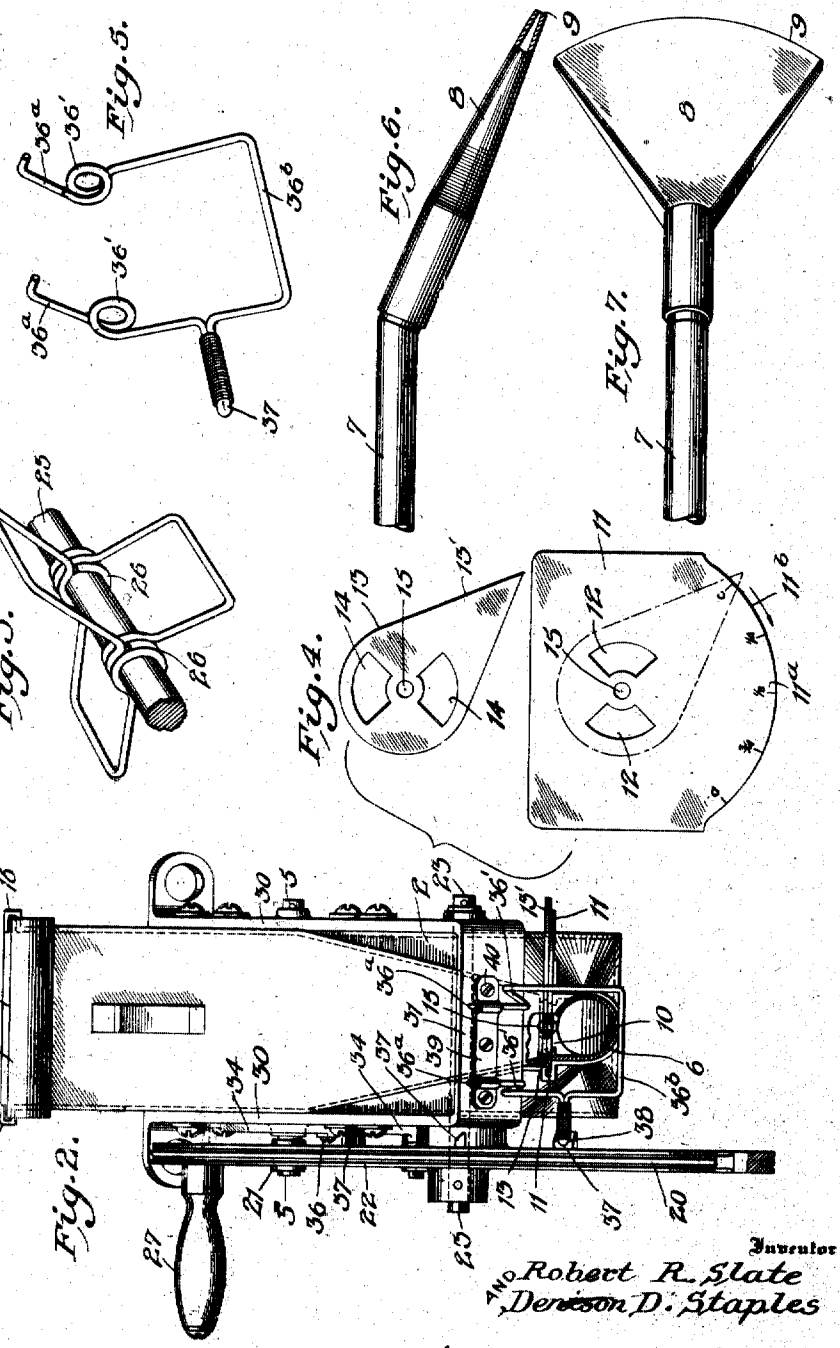
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UNITED STATES PATENT OFFICE.

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DUST-GUN.

1,280,110. Specification of Letters Patent. Patented Sept. 24, 1918.

Application filed February 18, 1918. Serial No. 217,903.

To all whom it may concern:

Be it known that we, ROBERT R. SLATE and DENISON D. STAPLES, citizens of the United States, residing, respectively, at South Boston, Halifax county, and at Richmond, Henrico county, State of Virginia, have invented certain new and useful Improvements in Dust-Guns; and we 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.

This invention relates to spraying apparatus and more particularly to that type of apparatus comprising a gun, which, by means of a blast of air, may be utilized to spray any suitable powder upon plants, bushes or other surfaces desired or in the eradication of pests or for the treatment of the plants or other objects.

It is one of the objects of the present invention to provide a simple, practicable, comparatively inexpensive, and compactly designed gun, and to provide one which will enable the operator to operate it with ease, facilitate the adjustment of the discharge of powder from the gun and which will permit the operator to have ready access to the interior of the magazine or container, when it is necessary.

It is another object of the invention to provide means easily within the view of the operator, whereby the amount of powder discharged may be regulated without necessitating the stopping of the device, while the adjustment is being made.

Another object of the invention is to provide a simple and practical agitator of such a type that little power will be consumed in its operation and which will insure the ready and free passage of the powder to the discharge through the outlet nozzle of the machine.

A further object of the invention is to provide means for preventing the damming or clogging of the discharge chute with the powder being discharged from the gun.

With these and other objects in view, as will be more fully set forth in the following specification, the invention consists of the construction, the parts, the combination, and in details particularly described hereinafter, one form of the invention being illustrated in the accompanying drawing, wherein,

Figure 1 is a side elevation of the dust gun partly broken away,

Fig. 2 is an end view of the same from the front,

Fig. 3 is a perspective view of the agitator,

Fig. 4 is a plan view of the feed control with the parts relatively separated,

Fig. 5 is a perspective view of the striker, and

Figs. 6 and 7 are respectively, an edge view and a plan view of the nozzle of the dust gun.

This dust gun is of the type adapted to be carried by the operator, through means of a strap or other suitable harness passed over the shoulders of the operator and connected to the device in any simple and suitable manner as most convenient. In its present embodiment, the apparatus comprises a substantially cylindrical fan box 2 having its sides provided with apertures 3 for the inlet of air during the operation of a suitable fan 4, which is secured upon a shaft 5 which, with the fan, is set eccentric to the axis of the cylindrical box 2 so as to provide for an increased operating efficiency in the discharge of the blast of air from the fan box 2 through a tangential discharge tube 6 which has a rounded end to telescopically receive the section 7 of a nozzle 8 which, as shown in Figs. 6 and 7, is substantially of segmental form and is tapered or flattened so as to produce a relatively narrow discharge mouth 9 of considerable length, this mouth being shown in the form of a segment for the efficient distribution of the dust or powder being discharged from the apparatus.

The discharge tube 6 is provided with a port at 10 at its upper side, upon which is superposed a valve disk or plate 11 having a plurality of segmental apertures 12 of suitable area, which are adapted to be covered or uncovered through means of a valve 13 which also is provided with a suitable number of segmental ports 14 and is pivoted centrally, as at 15, to the center of the fixed plate 11, the relative areas of the ports 12 and 14 being such that when in register with one another, a full and free discharge of material is permitted from a superposed hopper H, which substantially is in the form of an inverted triangular box having a width substantially equal to the width of the fan hous-

ing 2 and the rear side of which lies in close proximity to the cylindrical surface of the fan box 2, as shown in Fig. 1, so that these parts are compactly arranged and assembled and may be rigidly secured together to form a substantial structure. The sides of the box 2 and hopper H are shown as of one piece of sheet metal. Preferably, the entire top of the feed hopper or magazine H is open from side to side and from end to end so as to provide for the free access of the operator into the interior of the magazine, the top end of which is provided with a set of suitable guides 16 upon and between which there is providable a removable cover plate 17 which may be provided, at its forward, or outer end, with a finger ring or handle portion 18 to facilitate adjustment of the top plate.

It is one of the important objects of the present invention to provide for the ready control of the amount of powder discharged from the apparatus, by the adjustment of the regulator or valve member 13, and for that reason this latter is provided with a pointer portion 13′ projecting radially from one side of the valve member 13 and adapted to register selectively, with any of the series of graduations as 11^a formed adjacent an arcuate edge 11^b of the fixed valve plate 11 which is clearly shown in Fig. 2, as projecting on what will be the left-hand side of the dust gun so as to enable the operator to freely adjust the valve member 13 with his left hand while the device is in use in the spraying of powder. To secure the effectual closing of the passage-ways through the valve members to prevent the waste of material, the diameter of the segmental port 12 in the lower plate 11 is preferably less than the diameter of the coördinate passageway 14 in the movable member 13, so that when this latter is moved to positions to cover the port 12, these latter are entirely and effectually closed.

The fan shaft 2 may be driven by any suitable means, which as here shown, comprises a belt 20 extending over a pulley 21 fixed on the fan shaft and also passing over a large driving pulley 22 which is secured on a shaft 23 extending transversely across the lower portion of the hopper H so that an agitator mounted on the shaft may sweep through the material in the container and prevent it from damming or clogging, and thus insure its free passage through the open bottom of the magazine H and to the outlets of the regulating device or valve above described. It is desirable to provide a form of agitating device which will be easily operable with as little resistance as possible through the material, and will thereby require but little power to cause its operation and as shown in Fig. 3, the preferred form of the agitating device comprises a series of rectangular loops or bails, preferably of wire, as shown at 25, the side arms of the bails being provided with eyes or rings 26 embracing the main shaft 23, so that as the latter is rotated, through means of a crank handle 27 attached to the main wheel 22, the loops of the agitating device will sweep through the material and keep it loose, so that it will readily feed from the apparatus.

Rigidity of connection between the several components of the apparatus may be readily secured by the utilization of a substantially U-shaped frame having side arms 30 and a transverse cross-piece 31, this U-shaped member embracing the fan housing 2, and the magazine H, and being suitably secured to these parts, and forming as well, a substantial journal or bearing for the transverse shafts 5 and 23, and also providing a suitable means upon which may be mounted a belt-tightener comprising an idle roller journaled on the lower end of a bracket or slide 34, which is shown as slotted at 35 to receive a set screw or other clamping device 36 whereby it may be clamped against the surface of the side arm 30 of the main frame.

In order to overcome any tendency of the powder being discharged from the hopper H and into the discharge nozzle or tube members, from sticking to the interior wall of the discharge member, there is provided a suitable vibrating device which is adapted to be actuated so that it will intermittently strike or tap the side of the discharge tube 6 in a position somewhat near the outlet from the feed hopper, one form of this tapping or vibrating device being illustrated in Figs. 2 and 5 as comprising a substantially rectangular bow 36^b disposed to embrace the discharge tube 6, one of the side arms of which bow is disposed as shown in Fig. 2, so as to closely approach the surface of the tube, and the other side arm of which is provided with the lateral projecting portion 37 adapted to be engaged by one or more cam members 38, shown in Fig. 2, which are attached to the inside surface of the main drive wheel 22, so that as the cam members move against the adjacent tappet member 37 of the yielding bow 36^b the latter will be reciprocated laterally or transversely as to the discharge tube 6 and when the tappet member moves off of the moving cam, the resilient bow will spring back so that its side member adjacent the tube 6 will strike the latter a light blow sufficiently to break loose any of the adhering material. The bow is shown as provided at the ends of each of its side members, with loops 36′ providing their necessary resiliency for the bow, which may be connected at its ends 36^a by means of a transverse clamp plate 39 which is fastened by screws 40 to the transverse ends 31 of the U-shaped main frame.

From the foregoing it will be seen that by locating the main crank wheel on one side of the hopper, and disposing the adjustable pointer member of the valve 13 on the opposite side of the hopper, that the operator may continuously drive the main wheel and the rotation of its crank and at any time desired, may adjust the valve member 13 to control the amount of powder discharged from the gun. At the same time, while the crank wheel is being turned, the agitator comprising the set of bows 25 is rotated at the lower portion of the feed hopper to keep the material therein loose, and this material is prevented from adhering to the inner side of the discharge nozzles or tubes by the continuous vibration thereof during the operation of the crank wheel, because of the intermittent tapping of the sides of the discharge tubes through means of the vibrating device 36^b.

In the event that it should become necessary, the operator may remove the cover 18 of the feed magazine and pass his hand down into the interior thereof so as to have access to the agitating device 25 or to the valve members at the lower end of the feed hopper. By reason of the eccentric disposition of the hand wheel 4 within its housing 2, an ample draft of air may be readily forced through the discharge tube and nozzle at a minimum requirement of power from the operating crank wheel.

What is claimed is:

1. In a dust gun, a discharge tube and a feed magazine therefor, a laterally yielding spring bow embracing the tube and attached at its ends t the frame and adapted to tap the latter, and means for vibrating the bow.

2. In a dust gun, a discharge tube and a feed magazine therefor, a spring bow embracing the tube and attached at its upturned spaced ends to a fixed part of the device and having a laterally extended tappet, and a driven shaft having means for striking the tappet so as to cause one member of the bow to tap the side of the tube.

3. In a dust gun, a fan and its box, the latter having a tangential discharge tube, and a feed magazine disposed above and discharging into the tube, the magazine being disposed adjacent to and overhanging the periphery of the fan box to secure compactness of arrangement, and a U-shaped frame connecting the box and magazine the cross end of the frame being attached to the transverse end face of the magazine.

4. In a dust gun, a fan and its box, the latter having a tangential discharge tube, and a feed magazine disposed above and discharging into the tube, the magazine being disposed adjacent to and overhanging the periphery of the fan box to secure compactness of arrangement, and a U-shaped frame connecting the box and magazine and attached to the latter, and shafts journaled in said frame and extending across the box and magazine respectively, the upper portions of the sides of the box and magazine being continuous, the lower portion of the magazine being pyramidal and spaced from the fan box and resting in the bight of the frame.

5. In a dust gun, a discharge tube and a feed magazine to the bottom of which the tube is connected for communication, an agitator operative in the bottom of the magazine above the outlet to the tube, a shaft having a wheel and carrying the agitator, and means for jarring the tube to prevent the clogging of the powder being discharged, said means comprising a substantially rectangular bow having parallel side members coiled with eyes to form springs, the ends being extended for attachment to the magazine, and a side member of the bow having a laterally extending lug adapted for operative engagement with said wheel.

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