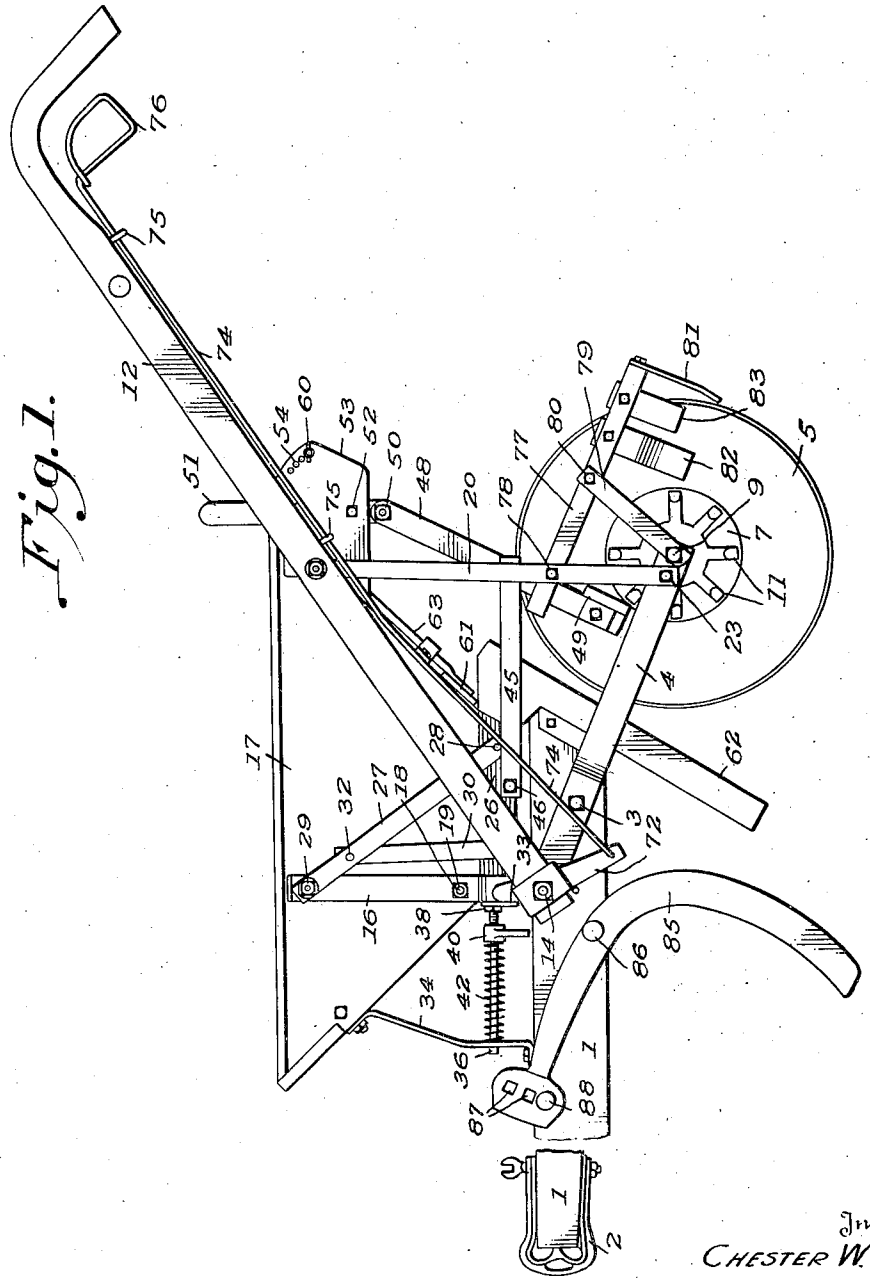
Jan. 11, 1944. C. W. TODD 2,338,882

GUANO DISTRIBUTOR

Filed March 1, 1940 3 Sheets-Sheet 1

Fig. 1.




Inventor
CHESTER W. TODD

By Milans & Milans
Attorneys

Jan. 11, 1944. C. W. TODD 2,338,882

GUANO DISTRIBUTOR

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Fig. 2.

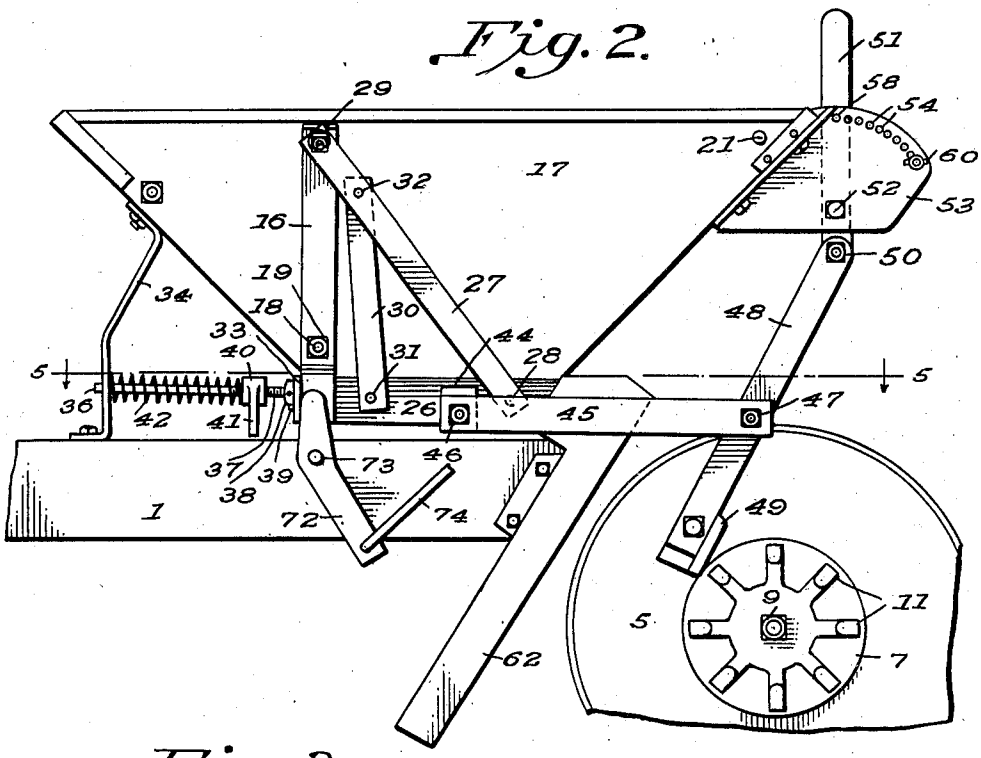
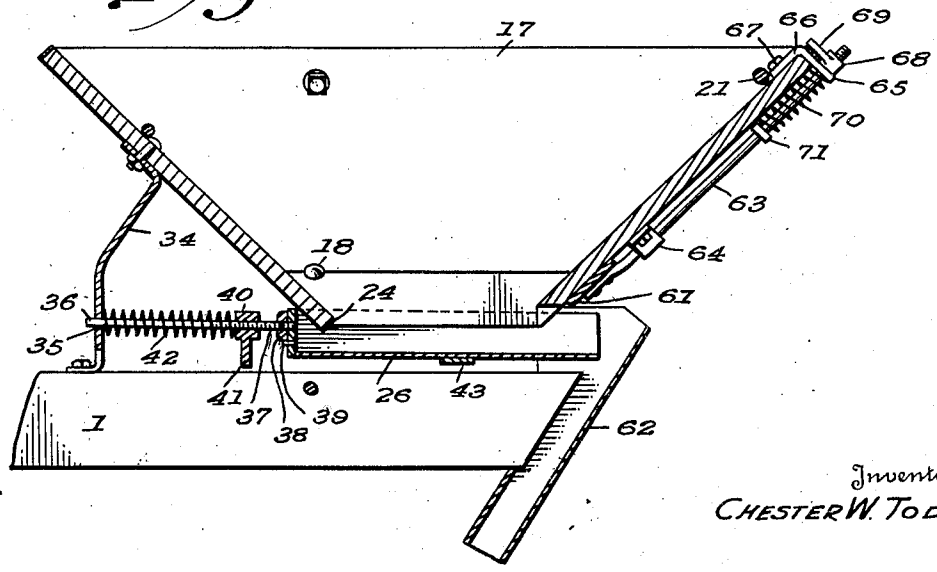



Fig. 3.




Inventor
CHESTER W. TODD

By Milans & Milans
Attorneys

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Fig. 4.

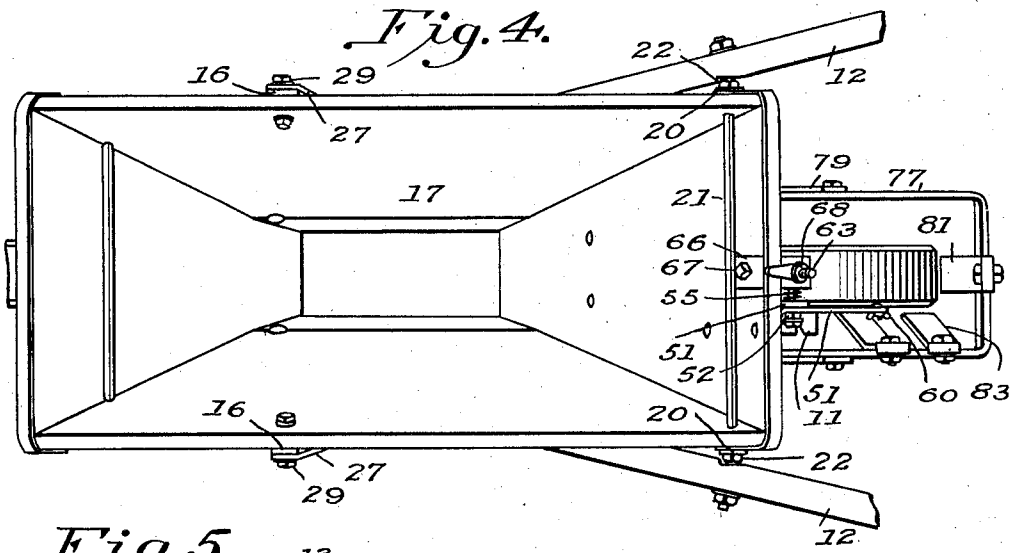



Fig. 5.

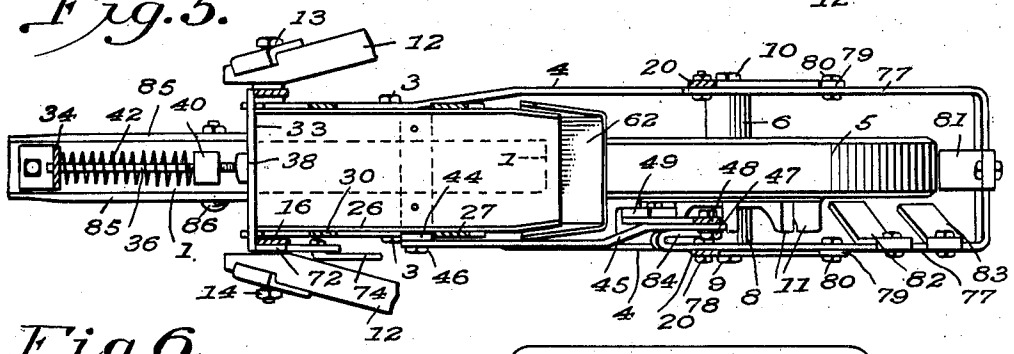



Fig. 6.

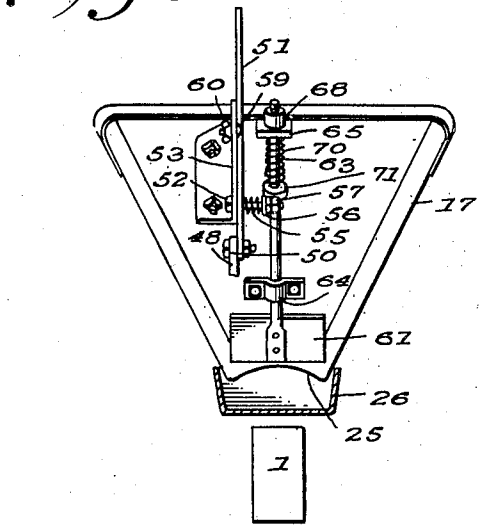
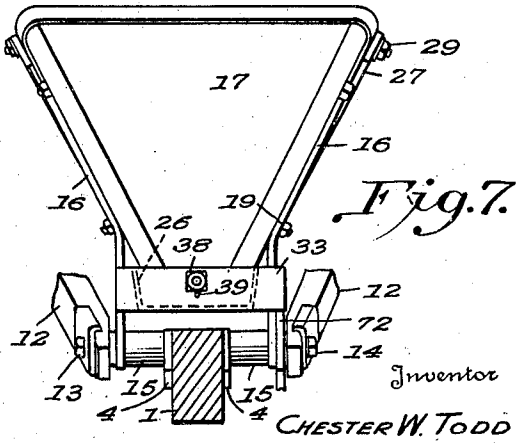



Fig. 7.




Inventor

CHESTER W. TODD

By Milans & Milans

Attorneys

Patented Jan. 11, 1944

2,338,882

# UNITED STATES PATENT OFFICE

2,338,882

## GUANO DISTRIBUTOR

Chester W. Todd, Ashford, Ala.

Application March 1, 1940, Serial No. 321,794

6 Claims. (Cl. 221—142)

My invention relates to new and useful improvements in guano distributors of the vibrator type and has for its principal object the provision of a device of the character described which will rapidly and effectively distribute the guano over the desired surface or into a furrow.

A further object of the invention consists in the provision of a hopper provided with a movable bottom which is hung or supported so that a horizontal movement as well as a vertical movement of the rear end may be imparted thereto, the bottom being operated through means engaged by a spider carried by and operable with the distributor supporting wheel.

Another object of the invention resides in the provision of a spring-controlled member for returning the hopper bottom to its normal position after having been operated by the rotation of the spider carried by the wheel, means further being provided for adjusting the spring of the member.

A still further object of the invention consists in the provision of novel means for adjusting the stroke or movement of the hopper bottom, said means being within easy reach of the operator.

Another object of the invention resides in the provision of what might be termed a cleaning assembly which removes dirt from the supporting surface of the supporting wheel and one side face thereof, said assembly preventing dirt from falling on or clogging on the spider which operates the hopper bottom.

Other objects of the invention reside in the provision of what might be termed a vibration check for temporarily stopping the movement of the hopper bottom and the provision of means for adjusting the gate which controls the passage of material through an opening in the material-receiving hopper.

With the above and other objects in view, which will appear as the description proceeds, my invention consists in the novel details of construction, and arrangement of parts, described in the following specification and claims and illustrated in the accompanying drawings, and while I have illustrated and described the preferred embodiments of the invention, as they now appear to me, it will be understood that such changes may be made as will fall within the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevation.

Fig. 2 is a fragmental side elevation with parts removed and other parts broken away.

Fig. 3 is a fragmental longitudinal vertical section through the hopper, hopper bottom, and discharge chute or shoe.

Fig. 4 is a fragmental top plan with parts removed and parts broken away.

Fig. 5 is a horizontal section on the line 5—5 of Fig. 2 looking in the direction of the arrows.

Fig. 6 is a fragmental rear end view of the hopper and parts connected thereto; and

Fig. 7 is a fragmental front elevation of the hopper and parts connected thereto.

In the drawings 1 indicates a beam having a clevis 2 connected to its forward end and to which a desired propelling means may be attached. Secured to each side face of the beam 1, by means of a bolt 3 and nut carried thereby, is a rearwardly extending and downwardly inclined bar 4, the lower ends of which form a support or bearing for a supporting wheel 5, the supporting wheel having a hub 6 extending from one face and a plate 7 secured to the opposite face, the plate in turn having a projecting hub portion 8. A bolt 9 extends through the hub portions 6 and 8 and through openings formed in the arms 4 and a nut 10 is received on the bolt 9 as more clearly illustrated in Fig. 5 of the drawings. The bolt 9 forms a support for rotatably mounting the wheel 5 between the bars 4. This axle bolt goes through a bushing which forms the wheel bearing. Formed integral with the plate 7 are outwardly extending arms or projections 11 which with the plate 7 form what I have termed a spider for operating the hopper bottom to be later described.

Handles 12 are secured to the beam 1 by means of bolt 13 and nut 14, the bolt 13 also passing through the upper ends of the bars 4. Spacer sleeves are shown at 15 received on the bolt 13 and the inner ends of these sleeves engage the outer faces of the bars 4, as shown more clearly in Fig. 7 of the drawings. The outer ends of the sleeves 15 engage inner faces of upwardly extending bars or standards 16 which are secured to the hopper 17 by means of bolts 18 and nuts 19. Connected to the bars 4, adjacent their rear ends, and supported thereby are vertically extending bars or standards 20 which are secured to the hopper 17 through means of a transversely extending rod 21 which is threaded on its opposite ends to receive nuts 22. Bolts and nuts 23 are shown for connecting the lower ends of the bars or standards 20 to the bars 4. From the above it will be seen that the hopper is supported by the bars or standards 16 and 20.

As shown quite clearly in the drawings the

hopper is formed with what might be termed side and end inclined walls forming at the bottom an opening 24 and the lower edge of the rear end wall is curved as shown at 25 more particularly in Fig. 6 of the drawings to more readily permit discharge of the material onto the hopper bottom or pan shown at 26 and which is mounted as shown, more clearly in Fig. 3 of the drawings, beneath the hopper opening 24.

A bar 27 is connected at 28 to each side of the hopper bottom or pan 26 and the upper ends of these bars 27 are pivotally connected on bushings to the bars 16 and hopper 17 by means of nuts and bolts shown at 29. As shown more particularly in Figs. 1 and 2 of the drawings the lower ends of the bars 27 are connected adjacent the rear end of the hopper bottom or pan 26 and for supporting the bottom or pan adjacent its forward end I provide bars or braces 30 having their lower ends connected at 31 to the bottom or pan 26 and their upper ends connected to the bars 27 at 32, the bars 27 being thus rigidly connected with the hopper bottom or pan 26. As shown in Figures 2 and 3 of the drawings, the pivotal connections of the bars 27 to the hopper 17 are positioned in the vertical plane of that end portion of the bottom or pan near the closed end thereof when the bottom or pan is in normal position, and the distance of said pivotal connections above the bottom or pan is approximately the same as the length of the bottom or pan. The front end of the pan or bottom 26 is formed with lateral extensions 33 which normally engage the forward edges of the lower ends of the bars or standards 16 as shown more clearly in Figs. 2, 5 and 7 of the drawings.

Positioned between the upper surface of the beam 1 and the forward end of the hopper 17 is a brace 34 which is provided with an opening 35 to slidably mount the forward end of a rod 36, the rear end of the rod being threaded as shown at 37 and connected to the forward end of the hopper bottom or pan 26. A lock nut is shown at 38 and is held against rotation by pin 39. A nut 40, having the lever portion 41, is mounted on the threaded portion 37 of the rod 36 and positioned between the rear face of the brace 34 and forward face of the nut 40 is a coiled spring 42. The tension of the spring 42 may be adjusted by the nut 40 through engagement of the lever 41 and it will be seen that the coiled spring 42 normally holds the hopper bottom or pan 26 in its rearward position with the lateral extensions 33 in engagement with the edges of the bars or standards 16.

A strap 43 is secured to the bottom face of the hopper bottom or pan 26 and at one end is formed with the upwardly extending portion 44 to which one end of a bar 45 is pivotally connected on a bushing at 46. The opposite end of the bar 45 is pivotally connected on a bushing at 47 to a lever 48 having at its lower end a shoe or contact plate 49 adapted to be engaged by the arms or projections 11 of the operating spider carried by the wheel 5. The upper end of the lever 48 is in turn pivotally connected on a bushing at 50 to the lower end of a hand lever 51 which is pivotally connected at 52 to a plate 53 having adjacent its upper edge openings 54 which are arranged in arcuate formation as shown more clearly in Fig. 2 of the drawings. A bolt forms the pivotal connection 52 and received on this bolt is a coiled spring 55 which engages the outer face of the hand lever 51, a washer 56 engaging the opposite end of the coiled spring and being held in position by lock nuts 57. The hand lever 51 is formed on its inner face with a projection 58 which is adapted to be received in the openings 54. The coiled spring 55 normally holds the hand lever 51 with the projection 58 in one of the openings 54, but by engaging the upper end of the lever 51 the lever may be forced away from the plate 53 against the tension of the spring 55. The hand lever may then be adjusted to the desired position and the projection 58 received in any one of the desired openings 54. A bolt 59 is received in the outer-most opening 54 and on this bolt is a wing nut 60. The head of the bolt 59 forms a stop for the rearward movement of the hand lever 51, and by removing the wing nut 60 the bolt 59 may be placed into any one of the openings 54 thereby providing means for adjusting the throw of the hand lever 51.

An adjustable gate 61 is provided for regulating the discharge of material from the hopper bottom or pan 26 into a discharge shoe shown at 62. Secured to the gate 61 is a rod 63 slidably mounted in a guide 64 and extending through arm 65 of plate 66, secured to the rear wall of the hopper 17 at 67. The opening formed in the arm 65 is of sufficient size to allow sliding movement of the rod. The upper end of the rod 63 is threaded and receives a nut 68 having a lever portion 69. A coiled spring 70 surrounds the rod 63 between the bottom of the arm 65 and a shoulder 71 formed on the rod. This is more clearly shown in Figs. 3 and 6 of the drawings. The coiled spring 70 normally has a tendency to force the rod 63 and gate 61 downwardly, but this downward movement is limited by the nut 68 as will be appreciated. By adjusting the nut 68 on the threaded end of the rod the position of the gate may be adjusted to in turn regulate the discharge of the material from the hopper or from the hopper bottom or pan.

When in operation the arms or projections 11 of the spider will be engaged with the shoe 49 on the lever 48 to operate the hopper bottom or pan 26 through the bar or link 45. It will be appreciated that at times it will be desired to temporarily check the operation or vibration of the bottom or pan 26 or to permit backing of the distributor. I provide means for doing this. At 72 I have shown a lever pivotally connected on a bushing at 73 and the upper end of this lever engages one of the lateral projections 33 of the bottom or pan 26 as shown more particularly in Figs. 1, 2 and 5 of the drawings. Connected adjacent the lower end of the lever 72 is one end of a rod 74 which extends upwardly through the guides 75 and parallel with the bottom edge of one of the handles 12. The upper end of the rod is formed with a loop or hand grip 76. By pulling upwardly on the rod 74 the lever 72 will be swung on its pivot 73 so that the upper end of the lever engaging with the lateral extension 33 will force the bottom or pan forwardly against the action of the coiled spring 42. This movement of the bottom or pan draws on the bar or link 45 to in turn swing the lower end of the lever 48 forwardly into a position so that the arms or projections 11 of the spider will not contact with the shoe 49. When thus positioned the wheel 5 may be rotated without operating the hopper bottom or pan 26 and the movement of the distributor may be reversed or, in other words, moved rearwardly.

As previously stated I provide an assembly for

cleaning the supporting edge portion and one side face of the wheel 5. This assembly includes a rearwardly extending frame 77 which straddles the wheel 5 as shown more clearly in Figs. 4 and 5 of the drawings. The arms of this frame are secured to the upwardly extending bars or standards 20 at 78 and braces 79 are interposed between the lower ends of the arms 4 and the frame, as shown more particularly in Fig. 1 of the drawings. The lower ends of the braces are carried by the bolt 9 and the upper ends of the braces are connected to the arms of the frame as shown at 80. Secured to the outer end of the frame 77 is a depending blade 81 which will scrape the mud or dirt from the supporting edge of the wheel and secured to one of the arms of the frame are depending blades 82 and 83, the lower ends of which will remove dirt from the face of the wheel 5 to which the spider is connected. It will be noted that the blade 82 is of greater length than the blade 83 and the purpose of this will be readily apparent. The edge of the blade 82 will tend to discharge the mud or dirt towards the periphery of the wheel and then the blade 83 will remove such mud or dirt from adjacent the periphery of the wheel. The forward end of that arm of the frame, to which the blades 82 and 83 are attached, is bent inwardly as shown at 84, more particularly in Fig. 5 of the drawings, and forms a contact surface or guide for the lever 48. This positions the lower end of the lever 48 so that the shoe 49 will be properly contacted by the arms or projections 11 of the operating spider.

At 85 I have shown a furrow opener of usual formation connected to the beam 1 at 86. This furrow opener is provided at its upper end with openings 87 to receive a bolt 88 which passes through the beam 1. By passing the bolt through the different openings the pitch of the furrow opener may be adjusted. This is standard construction and for which no claim of invention is made.

From the above detailed description it is thought that the construction of my improved form of distributor will be clearly understood as well as the operation thereof. Referring more particularly to Figs. 1 and 2 of the drawings it will be noted that I have shown the parts positioned so that the distributor may be moved over the ground without discharge of the guano or other fertilizer being used. The shoe 49, on the lower end of the lever 48 is shown positioned so that it will not be engaged by the arms or projections 11 of the operating spider. When it is desired to distribute the guano or other fertilizer the upper end of the hand lever 51 will be engaged and the lever pushed laterally to disengage the pin or projection 58 from the upper or inner-most opening 54. The hand lever will then be drawn rearwardly, the desired extent, and this movement will swing the upper end of the lever 48 forwardly and the lower end of the lever or link rearwardly so that the shoe 49 will be positioned to be engaged by the arms or projections 11 of the operating spider. When the desired adjustment is secured the lever 51 is released and the spring 55 will force the pin or projection 58 into the desired opening 54. As the distributor is drawn over the ground the rotation of the wheel 5 will bring the successive arms or projections 11 into contact with the shoe 49 and move the lower end of the lever inwardly. This movement will force the bar 45, attached to the hopper bottom or pan 26, forwardly and the pan or bottom being swung from the pivot points 29 will be moved horizontally as well as vertically due to the supporting members 27 and 30 and the change in the connecting points. The throw of the pan or bottom is adjusted by the movement of the lever 48 and 51 in the manner previously described and as the pan or bottom 26 moves forwardly it places the spring 42 under tension. When the arms or projections 11 ride from contact with the shoe 49 the coiled spring 42 returns the pan or bottom to its original position and in this movement the lateral projections 33 impact with the edges of the bars or uprights 16 to give a sudden stop to the pan or bottom which discharges the material on the pan or bottom into the shoe 62. I am aware that horizontally movable pans or bottoms, for hoppers, have been provided but with my improved form of hanger for the pan or bottom not only will a horizontal movement be given thereto, but a vertical movement of rear end as well. With the lower end of the lever 48, and the shoe 49 carried thereby, positioned to be operated by the spider, at times it is desired to temporarily stop or check movement of the hopper bottom or pan and in my improved form of distributor this can be done by drawing upwardly on the rod 74 by engagement of the loop or hand-hold 76. When the rod is drawn upwardly it swings the lever 72 on its pivot 73 and swings the upper end of the lever forwardly. As the upper end of the lever engages the lateral extension 33 the pan or bottom 26 will be moved forwardly and in doing this draw on the bar 45 to swing the lower end of the link or lever forwardly into a position that the shoe 49 will not be engaged by the spider. This will temporarily stop movement or vibration of the pan or bottom 26 and at the same time, if desired, the whole distributor may be drawn backwardly. The parts may be returned to their original positions by releasing the loop or hand-grip 76, the coiled spring 42 forcing the pan or hopper bottom rearwardly. As previously stated the tension of the spring 42 may be adjusted by the nut 40.

As previously stated the discharge of the material from the hopper 17 may be adjusted by regulating the position of the gate 61. The gate will be held in its adjusted positions by the coiled spring 70. It is thought that the construction and advantages of my wheel cleaning assembly will be clearly understood. The dirt is taken off of the supporting surface of the wheel as well as that face of the wheel to which the operating spider is connected. The dirt removing blades at the side of the wheel are so positioned to remove the dirt on a level with the center of the wheel.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A fertilizer distributor including a hopper having a discharge opening, a movable bottom for the hopper positioned beneath the discharge opening, a rod connected to the bottom, a guide for the rod, a spring supported by the rod between the bottom and guide, means mounted on the rod for adjusting the tension of the spring, and means for reciprocating the bottom against the action of the spring, the spring returning the bottom to its normal position.

2. A fertilizer distributor including a hopper having a discharge opening, a movable bottom for the hopper positioned beneath the discharge

opening, a rod projecting from one end of the bottom, a guide for the rod, a spring carried by the rod between the bottom and guide, means carried by the rod for adjusting the tension of the spring, lateral extensions on the bottom, and means engageable with one of the lateral extensions for operating the bottom relative to the hopper against the tension of the spring, the spring returning the bottom to its normal position.

3. A fertilizer distributor including a hopper having a discharge opening, a movable bottom for the hopper positioned beneath the discharge opening, means pivotally connected to the hopper at the upper part thereof and rigidly connected with the bottom for normally supporting the same in a horizontal position, and means for reciprocating the bottom longitudinally of the discharge opening, the pivotal connection of said supporting means to the hopper being positioned in the vertical plane of that end portion of the bottom near its closed end when the bottom is in normal position, and the distance of said pivotal connection above the bottom being approximately the same as the length of the bottom, whereby upon reciprocation of the bottom substantially longitudinally of the discharge opening, vertical movement will be imparted to the open end of the bottom while the closed end thereof is maintained in substantially its normal horizontal plane.

4. A fertilizer distributor including a hopper having a discharge opening, a movable bottom for the hopper positioned beneath the discharge opening, means for supporting the bottom from the hopper normally in substantially a horizontal position and means for reciprocating the bottom longitudinally of the discharge opening, said supporting means including a pair of bars pivotally connected at their upper ends to the hopper at opposite sides and at the upper part thereof and at their lower ends connected to the bottom adjacent the open end thereof, said bars being disposed diagonally with respect to the sides of the hopper, and a pair of brace members extending at an angle to said bars, each brace member being connected at its upper end to one of said bars at the upper end portion thereof and connected at lower end to the bottom, the pivotal connections of said bars to the hopper being positioned in the vertical plane of that end portion of the bottom near its closed end when the bottom is in normal position, and the distance of said pivotal connections above the bottom being approximately the same as the length of the bottom, whereby upon reciprocation of the bottom substantially longitudinally of the discharge opening, vertical movement will be imparted to the open end of the bottom while the closed end thereof is maintained in substantially its normal horizontal plane.

5. A fertilizer distributor including a hopper having a discharge opening, a movable bottom for the hopper positioned beneath the discharge opening, means for supporting the bottom from the hopper normally in substantially a horizontal position and means for reciprocating the bottom longitudinally of the discharge opening, said supporting means including a pair of bars pivotally connected at their upper ends to the hopper at opposite sides thereof at the upper part of the same, and at their lower ends rigidly connected to the bottom at opposite sides of the same, said bars extending upwardly and conforming to the slope of the side walls of the hopper, the pivotal connections of the bars to the hopper being located in the vertical plane of that end portion of the bottom near its closed end when the bottom is in normal position, and the distance of the pivotal connections of the bars above the bottom being approximately the same as the length of the bottom, whereby upon reciprocation of the bottom substantially longitudinally of the discharge opening, vertical movement will be imparted to the open end of the bottom while the closed end thereof is maintained in substantially its normal horizontal plane.

6. A fertilizer distributor including a supporting frame, a hopper on the frame having a discharge opening, a movable bottom for the hopper positioned beneath the discharge opening, means pivotally connected to the hopper at the upper part thereof and rigidly connected with the bottom for normally supporting the bottom in a horizontal position and for reciprocation longitudinally of the discharge opening, the pivotal connection of said supporting means to the hopper being positioned in the vertical plane of that end portion of the bottom near its closed end when the bottom is in normal position, and the distance of said pivotal connection above the bottom being approximately the same as the length of the bottom, whereby upon reciprocation of the bottom substantially longitudinally of the discharge opening, vertical movement will be imparted to the open end of the bottom while the closed end thereof is maintained in substantially its normal horizontal plane, mechanical means for imparting longitudinal movement to the bottom in one direction, spring means for returning the bottom to normal position, a stop portion on the supporting frame, and a part on the bottom impinging against the stop portion when the bottom is snapped back to normal position by the spring means.

CHESTER W. TODD.