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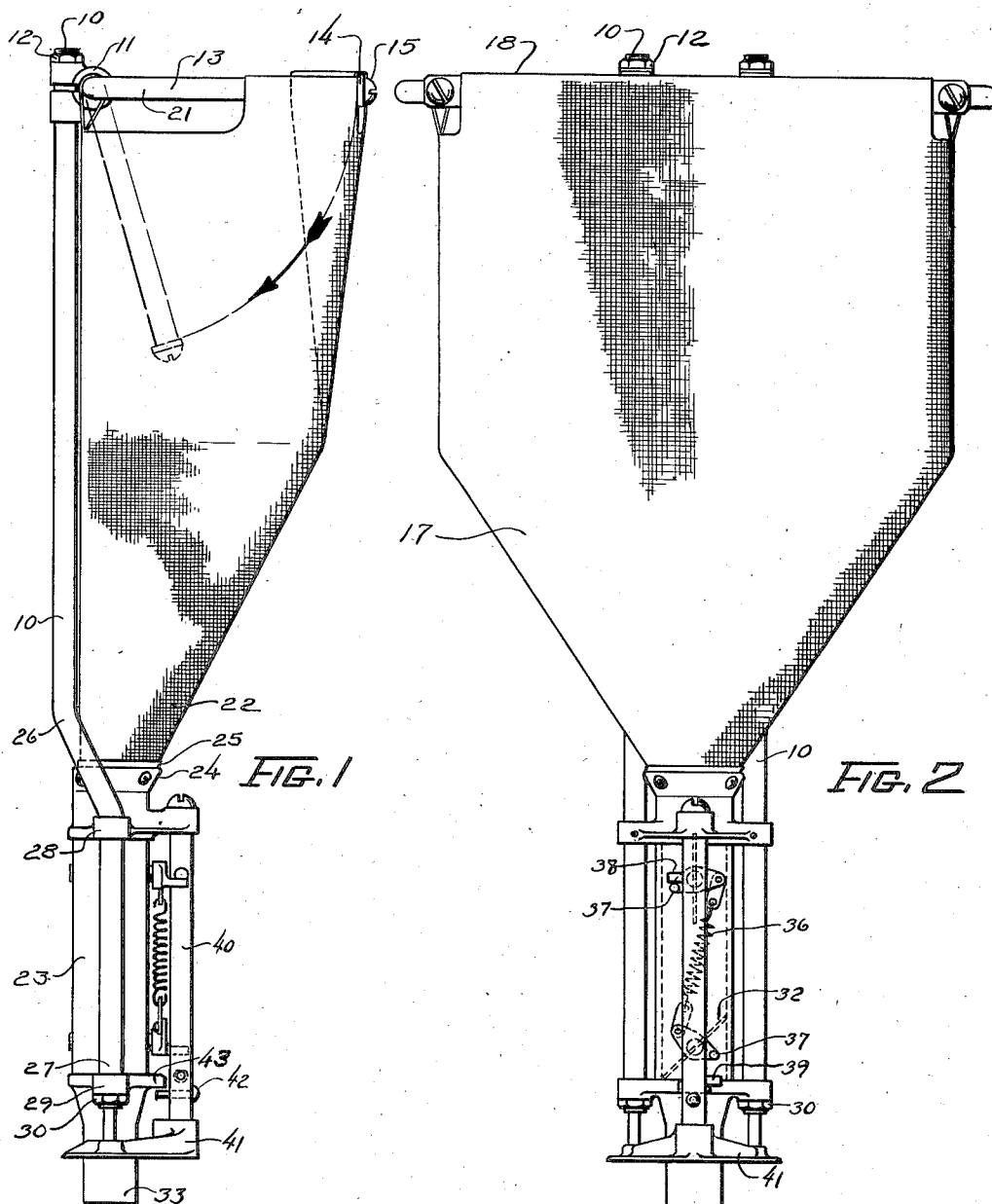
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2,043,318

FERTILIZER DEPOSITING APPARATUS

Filed April 29, 1933

2 Sheets-Sheet 1



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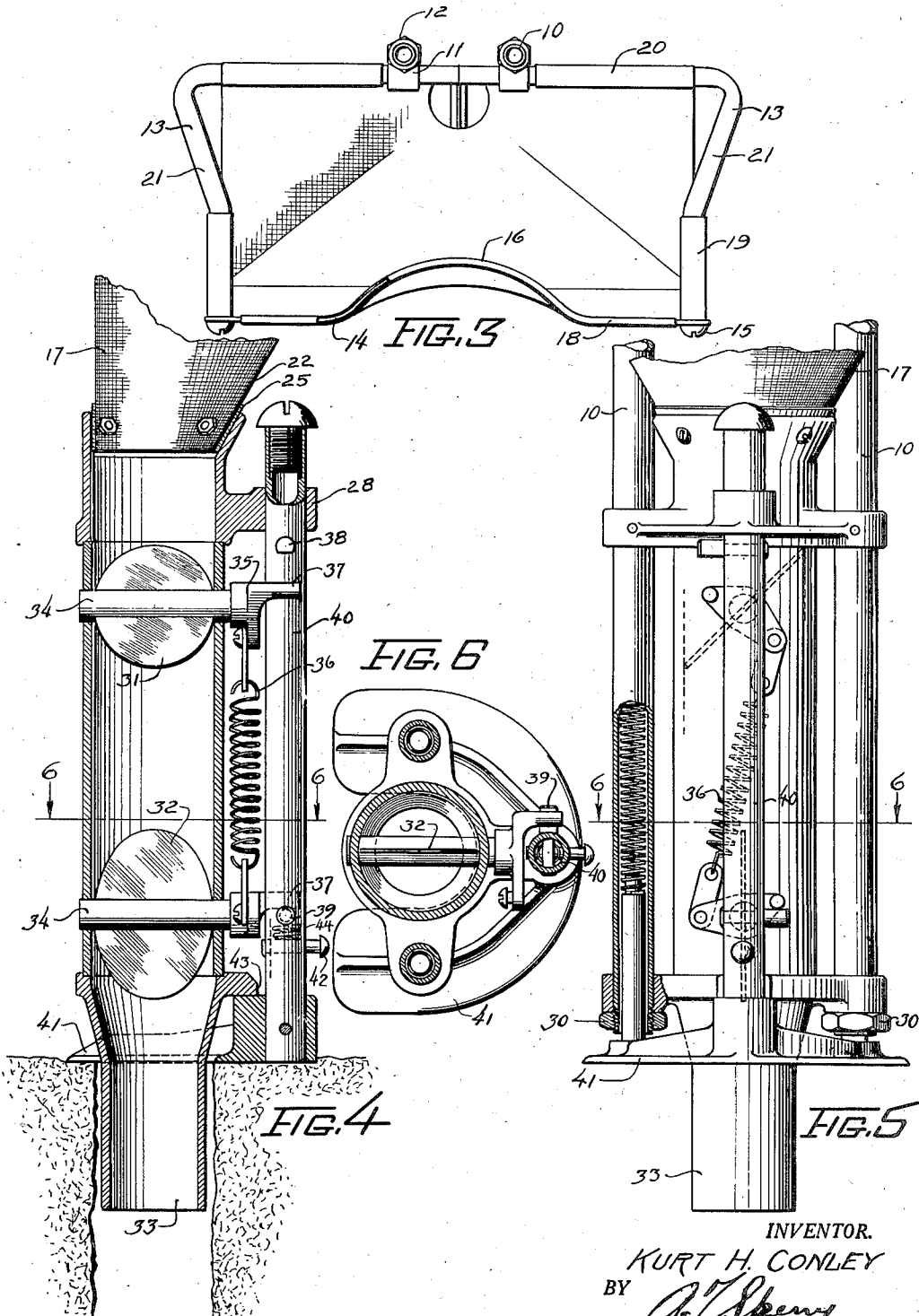
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Filed April 29, 1933

2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

2,043,318

## FERTILIZER DEPOSITING APPARATUS

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Application April 29, 1933, Serial No. 668,557

12 Claims. (Cl. 221-119)

This invention relates more particularly to fertilizer depositors of the type which deposit a material at some specific location as distinct from the general class of scattering apparatus.

It is, therefore, among the general objects of the invention to provide a simple, efficient and inexpensive device for depositing at a specific location a predetermined quantity of fertilizing material.

Another important object is to provide an apparatus for making a sub-soil deposit such that the fertilizer will be wholly deposited at a preferred definite location preferably in the neighborhood of the particular food absorbing portions of a tree's roots.

Another important object is to provide a device for depositing a predetermined amount of material as distinct from depositing apparatus which depend upon the accuracy and control of the operator for measuring at each use the quantity of material deposited.

Another object is to provide an instrumentality which is light and compact without the sacrifice of strength, durability and capacity, thus to provide ready portability while in use and also to provide minimum weight and size in shipment or transportation from one field of operation to another.

Numerous other objects, advantages and novel features will be apparent from a further consideration of this description and of the accompanying drawings.

Briefly and generally stated that form of the invention here described by way of illustration consists of a standard or support constituting a skeleton frame, the same being suggested as formed from round stock and supporting at its top a bag or hopper by the medium of a foldable member. The lower end of the standard construction is secured to a valve chamber body to the upper end of which the bag or hopper is secured. A discharge nozzle is preferably arranged in connection with the valve body so as to provide for an inserted deposit of the material rather than a mere discharge which might be scattered. An important feature of the invention is the valve mechanism and its operating means whereby the proper placing of the device coupled with its own weight acts to discharge a predetermined quantity of material beneath the ground surface. The structural details by which one preferred embodiment of the invention is accomplished will be hereafter referred to.

In the drawings:

Fig. 1 is a side elevation of a preferred form of the invention.

Fig. 2 is a front elevation of the same.

Fig. 3 is a top plan view.

Fig. 4 is a detailed vertical section of the valve chamber with the parts in material depositing position.

Fig. 5 is a detailed front elevation of the portion shown in Fig. 4 and

Fig. 6 is a section taken on lines 6-6 of Figs. 4 and 5.

From a consideration of the drawings it will be seen that economy of manufacture, lightness in weight and simplicity of operation are provided by a minimum number of parts the essentials of construction being provided by merely three parts namely, the standard or frame, the bag or hopper and the valve chamber and its valves and operating mechanism.

With respect to the frame, reference may be had to the numerals 10 which indicate a pair of supporting or frame rods preferably of hollow construction. The rods 10 extend in parallel from the valve body upwardly their upper ends being provided with clamping members 11 secured thereon by nuts 12. Each of the clamping members 11 receives one end of one of a pair of bag or hopper supporting handles 13 each of which are of right angularly disposed rod construction, their outer ends being joined by a cross bar 14 secured therebetween as by the screws 15. The center portion of the bar 14 may be depressed as at 16 so as to provide a recess or depression in the outline of the bag or hopper which may have the dual purpose of forming a configuration suitable to conform with a tree trunk or post against which the device may be rested or which may also conform with the body of an operator to facilitate his holding and operating the device.

I have herein referred to the fertilizer container as a bag or hopper. Obviously, the invention is not restricted to the form of such container and if desired a rigid hopper may be employed. However, I prefer to use a fabric or other pliable bag as indicated by numeral 17.

The bag 17, at least the lower end of which is of generally conical formation, may be conveniently supported from the rods 13 and bar 14 by the insertion thereof through tubular hems formed in the edge of the open mouth of the bag. The fold formed tunnel 18 receiving the bar 14 while the rear ends of the rods 13 are recessed through similar folds 19 and the opposite ends of the bars are received through folds 20. Intermediate the folds 19 and 20, the rods extend out-

wardly from the bag circumference so as to provide convenient hand grips 21. By this arrangement and through the use of flexible material for the bag it will be seen that when not in use the handles may pivot in their sockets formed by members 11 thus to fold to the dotted line position shown by the arrow in Fig. 1. By this movement it will be seen that the device may fold to peculiarly small dimensions for purposes of shipment and transportation. The lower end 22 of the bag as well as the lower ends of the supporting rods is secured to the valve body. The valve body, generally indicated by numeral 23 is of substantially simple cylindrical form, its upper end being flared as at 24, and receives therein a similarly formed cup of leather 25 which is bolted thereto and which in turn is joined to the neck 22 of the bag thus to provide a flexible and yet leak proof and durable juncture so as to provide a free passage for material from the bag to and through the valve chamber.

The lower ends of the rods 10 extend forwardly near their lower ends as by the bends 26 and their extremities 27 extend through and are coupled rigidly with the valve body 23 by reception through the apertures of flanges 28 and 29, nuts 30 acting to secure them rigidly in position thus to provide a strong, simple, easily assembled and durable combination of parts.

The valve body 23 is illustrated as being formed of a cylindrical central body, the flaring upper end and the slightly restricted depositing tube parts being secured in rigid assembly by the arrangement of associate parts. However, the specific detail of formation is a problem more directly of production. Suffice, it therefore, to consider the same as a unitary member either so cast or fabricated from various parts.

Within the cylindrical central body portion of the body 23 are disposed two spaced butterfly valves 31 and 32. The upper valve 31 controls the passage of material from the bag to the valve body while the lower controls the discharge of material from the apparatus through the discharge tube 33.

The stems 34 of the valves extend through the walls of the body 23 and each are provided with cross levers 35 the opposite end of each lever being joined by a spring 36 thus to maintain a normal tension urging both valves in closed position. The other end of each lever 35 is provided with a projection 37 each of which is in the path of upper and lower actuating pins 38 and 39 respectively which are carried by a reciprocating plunger 40 the upper end of which is slidable in the flange 28 while the lower end is secured to an operating shoe 41 which encircles the tube 33 and which is urged downwardly by the pin and spring construction shown in Fig. 5. The tubular formation of the rods 10 accommodates this arrangement of parts. It will be seen that this construction provides the upwardly-extending pins carried by the sides of the shoe 41, which fit into the lower tubular ends of the rods 10. The rods enclose therein the springs shown in Figure 5, which about the upper end of the pins carried by the shoe, and which, thus, tend to normally urge the shoe in its most downward position.

While the valve assembly including the valve actuating pins may be variously arranged to variously control the amount of discharge, a preferred arrangement is here shown by which the insertion of the discharge tube in a preformed receiving hole will automatically discharge an

amount of fertilizer measured by the capacity of the valve chamber between the valves thereof. The normal inoperative position of parts is shown in Fig. 2, with the shoe 41 extending downwardly through the spring pressure and thus the rod 40 in lowermost position, the upper valve will be held open against spring tension through the downward pressure of pin 38 on its arm 37. The same spring pressure acts to maintain closed the lower valve 32, the operating pin 39 for which is normally below and out of engagement with its arm 37. Thus normally the fertilizing material will fill the valve body to the point of the lower valve.

In operation when the discharge tube is inserted, preferably in a preformed hole but possibly by pressure the shoe 41 will be supported by the ground surface so that movement thereof upward with respect to the body and in opposition to its spring pressure, will take place. Such movement releases pin 38 from the cross lever of valve 31 and the spring pressure thereupon will close this valve as a continuation of the upward movement of rod 40, its pin 39 will raise projection 37 of the lever controlling the lower valve which will thus open emitting the material which has been lodged in the valve body, thus discharging automatically below the surface of the soil a measured quantity of fertilizing material. Means may be provided such as the push-pin 42 for rendering the valve mechanism positively inoperative when desired; thus avoiding accidental discharge of fertilizing material while the hopper is being refilled or while the device is being carried.

The pin 42 is held against accidental movement by a spring 44. When the pin 42 is moved inwardly as shown in Fig. 1, it lies in the path of the projection 43 of the lower end of the valve chamber 23 thus preventing relative movement of rod 40 with respect to the chamber. When the device is to be used, the pin 42 is moved outward as shown in Figure 4, thus permitting free movement of the part.

It will be understood from this description that various arrangements of the actuating means may be employed. For instance, if the upper valve be held open or removed, the deposit of material will be commensurate with the length of time the device is held in its inserted position. Conversely, if the upper valve is caused to be closed by the downward movement of the rod 40, the device may be adjusted to discharge an amount something less than the valve body capacity. Also, by a downward extension of shoe 41, the device may be arranged to discharge material upon the surface of the ground instead of beneath the surface. Thus, it will be seen that the invention is not confined to the structural details nor the adjustment of parts herein shown but numerous changes, modifications, adjustments and the full use of equivalents may be resorted to without departure from the spirit or scope of the invention as outlined in the appended claims.

Having thus set forth the nature of my invention, what I claim is:

1. In a fertilizing apparatus, a hopper, a valve chamber for controlling discharge of material therefrom, a control valve in said chamber, a discharge tube extending from said chamber and adapted for insertion in the ground and means for automatically discharging a predetermined quantity of material from said chamber upon insertion of said tube in the ground, said means

including a valve actuator partially encircling said tube and engageable with the ground upon insertion thereof.

2. In a fertilizing apparatus, a hopper, a valve chamber for controlling discharge of material therefrom, inlet and outlet valves in said chamber, a discharge tube extending from said chamber and adapted for insertion in the ground and means for automatically discharging a predetermined quantity of material from said chamber upon insertion of said tube in the ground, said means including a valve actuator having lost motion actuating connection with said valves, partially encircling said tube and engageable with the ground upon insertion thereof.

3. In a fertilizer distributor, the combination with a discharge control chamber and a hopper therefor, of a skeleton frame extending upwardly therefrom and terminating in handles which extend beyond the outline of the hopper to provide grasping sections and which cooperate with the frame to form a foldable hopper support.

4. In a fertilizer distributor, the combination with a discharge control chamber and a flexible bag hopper therefor, of a skeleton frame extending upwardly therefrom and terminating in handles which extend beyond the outline of the hopper to provide grasping sections and which cooperate with the frame to form a foldable hopper support.

5. In a fertilizer distributor, the combination with a discharge control chamber and a flexible bag hopper therefor, of a skeleton frame extending upwardly therefrom and terminating in pivoted handles which extend beyond the outline of the hopper to form grasping sections and which cooperate with the frame to form a foldable hopper support.

6. In a fertilizer distributor, a valve chamber, a flexible bag attached thereto, a skeleton frame extending upward from the chamber and handle means which extend beyond the outline of the hopper to form grasping sections at its upper end engageable with the open end of the bag to support it.

7. In a fertilizer distributor, a valve chamber, a flexible bag attached thereto, a skeleton frame extending upward from the chamber and handle means at its upper end engageable with the open end of the bag to support it, said handle means extending beyond the outline of the hopper to form grasping sections and be foldable to reduce the dimensions of the apparatus when the same is not in use.

8. A fertilizer depositor including a valve chamber having a discharge nozzle, a flexible bag attached thereto, a pair of rods extending from the chamber upwardly and a pair of handles pivotally secured to the upper end of said rods and engageable with the bag to support it in open position.

9. A fertilizer depositor including a valve chamber having a discharge nozzle, a flexible bag attached thereto, a pair of rods extending from the chamber upwardly and a pair of handles pivotally secured to the upper end of said rods and a cross bar carried by the handles and engageable with the bag to hold it in open position.

10. A fertilizer depositor including a valve chamber having a discharge nozzle, a flexible bag attached thereto, a pair of rods extending from the chamber upwardly and a pair of handles pivotally secured to the upper end of said rods and a cross bar carried by the handles and engageable with the bag to hold it in open position, the same being disposed to form a depression in one side of the bag mouth to conform it to the configuration of a tree against which the apparatus may lean.

11. A fertilizer depositor including a valve chamber having a discharge nozzle, a flexible bag attached thereto, a pair of rods extending from the chamber upwardly and a pair of handles pivotally secured to the upper end of said rods and engageable with the bag to support it in open position and ground engaging means associated with the valve chamber operable to automatically discharge material therefrom upon insertion of the nozzle in the ground.

12. A fertilizer distributor comprising a valve chamber having an inlet and an outlet valve with spring means for normally holding the former open and the latter closed, a discharge tube, a pair of rods extending upwardly from the chamber, a pair of handles pivotally mounted on said rods, a bag supported from said handles and opening into said chamber, a ground engaging valve actuator associated with said discharge tube and lost motion means connected therefrom to said valves for discharging from the chamber a predetermined quantity of material automatically upon insertion of the tube in the ground.

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