

(No Model.)

A. H. WORREST.

FERTILIZER FEEDER ATTACHMENT FOR GRAIN DRILLS.

No. 355,671.

Patented Jan. 4, 1887.

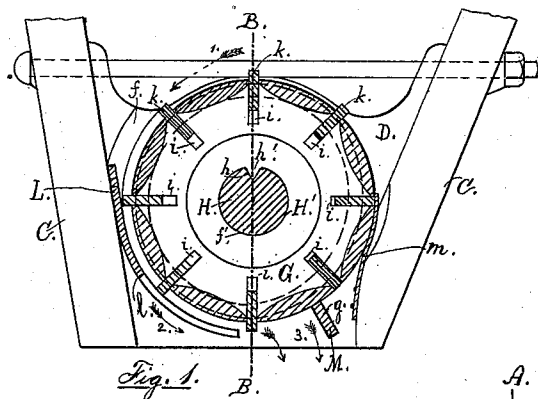
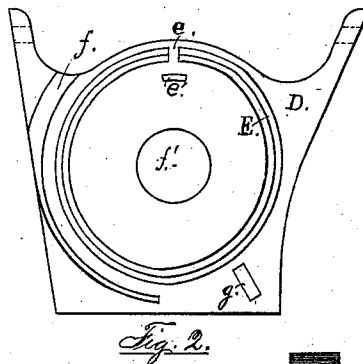
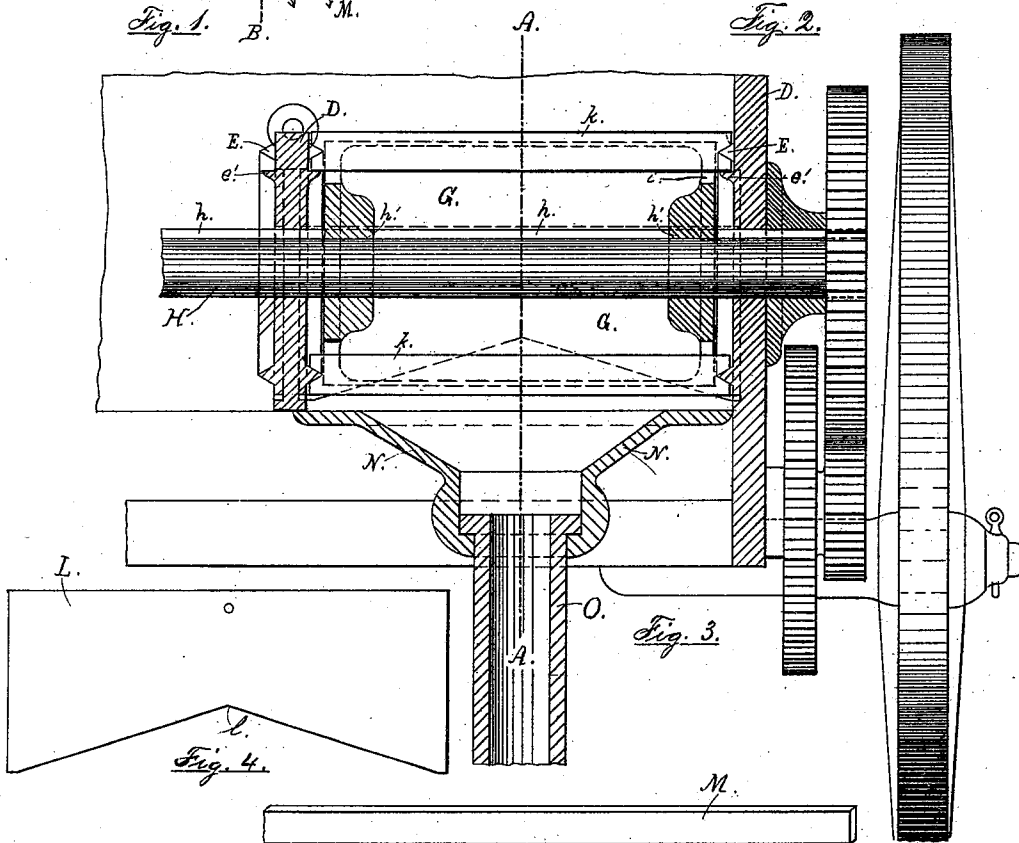
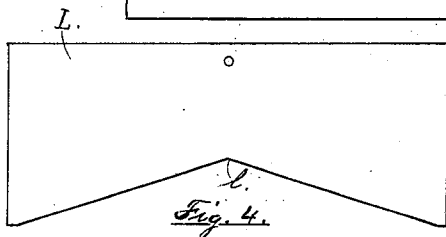


Fig. 5.

Alfred H. Worrest INVENTOR

WITNESSES:
E. M. Stone,
Wm. J. Mingle

BY J. P. M. Kulp
E. P. Turner
ATTORNEYS

UNITED STATES PATENT OFFICE.

ALFRED H. WORREST, OF LANCASTER, PENNSYLVANIA.

FERTILIZER FEEDER ATTACHMENT FOR GRAIN-DRILLS.

SPECIFICATION forming part of Letters Patent No. 355,671, dated January 4, 1887.

Application filed August 20, 1886. Serial No. 211,375. (No model.)

To all whom it may concern:

Be it known that I, ALFRED H. WORREST, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Fertilizer Feeder Attachments for Grain-Drills and Fertilizing-Machines; 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.

This invention relates to an improved force-feed for fertilizers, to be used in connection with grain-drills.

It also relates to that class which contains rotating cylinders with transverse slots for feed-slides to work in, said slides being adapted to move out from the surface of the cylinder into the hopper of the machine, carrying from said hopper a portion of the material fed to the discharge-outlet, and moving back automatically into the cylinder after the discharge is made.

The said invention further consists in the special construction of the cylinders, and the general arrangement of the several parts it acts in combination with, which is such as to avoid flat surfaces of the moving parts coming together, thus preventing in a large degree the friction which occurs from the gummy tendency of all fertilizing material.

It further consists in providing a novel feed-distributing plate which shall maintain a regular and even flow of the material, and also commences to feed as soon as the machine is started.

It still further consists of the combination of the specially-constructed cylinders with transverse slots and reciprocating feed-slides with a partition which is especially adapted to fit between each set of cylinders, with raised cam-curves on its sides to reciprocate the feed-slides and central openings, forming intermediate bearings for the shaft, thus allowing the machine to be made as long as desired by duplicating the number of cylinders used.

It further consists in the combination of the specially-constructed cylinders with transverse slots and reciprocating feed-slides with

a scraper-bar, said bar presenting a cutting-edge toward the cylinders, but not coming in contact with the same, so as to take from the surface of the cylinders any material which may adhere, yet avoiding the friction which would occur if it came in contact.

The mechanism is illustrated in the accompanying drawings, similar letters referring to similar parts.

Figure 1 represents a sectional end elevation of a portion of the hopper containing the feeding device through the line A A, Fig. 3; Fig. 2, a side elevation of one of the partitions which fit between the ends of each pair of feed-cylinders; Fig. 3, a longitudinal sectional view through the line B B of Fig. 1; Fig. 4, a side elevation of one of the regulating feed-plates; Fig. 5, a perspective side and top view of a section of the scraper-bar.

In Fig. 1, C C are the sides of the hopper of the machine. Arranged at suitable distances apart between these sides, and flush with the bottom edge, are partitions D, their number being regulated by the length of the machine desired. On each side of the same are raised V-shaped cams E, Fig. 2, through the upper part of which, and on each side of the partition D, the slot *e* is cut. Under these slots are lugs *e'*. Recessed grooves *f* are cut on each side of the partition D to receive the ends of the regulating feed-plates L, and through the center are the circular openings *f'*, which serve as bearings for the shaft H. There is also a rectangular opening, *g*, in the partitions in the lower corner for the scraper-bar M to pass through. Between these partitions, when fast to the sides C C of the hopper, are the cylinders G, which rotate by means of the shaft H, revolving in the bearings *f'* of the partitions D. This shaft H, which is as long as the whole machine, passing through all the partitions D and cylinders G, has a suitable key-seat, *h*, cut its entire length, and in the center of the ends of the cylinders are openings *h'*, fast in which are feathers to fit the key-seat *h* in the shaft H. The cylinders G, on their outer periphery, are provided with a number of transverse slots, *i*, cut their entire length parallel with their axis, and projecting through their ends in radial lines with the center a portion of their diameter. In these slots, which serve

as guides for the same, work the feed-slides *k*. These slides have cut in each end V-shaped grooves, adapted to fit the V-shaped cams *E* on each end of partition *D*.

5 I am aware that cylinders with reciprocating feed-slides have been used for this purpose before; but as the device itself is old they all had reference to their special construction in combination with some other equally specific
10 element, and to the best of my knowledge none have attempted to produce a means to lessen the friction which occurs from the gummy tendency of all fertilizing material between flat surfaces. My whole construction
15 of cylinders, slides, and partitions has especial reference to this particular point. For instance, my cylinders are hollow, and the segments of their outer periphery, between the feed-plate slots, are oval in shape on the under
20 side, cutting the metal away from the edges until they are as thin as the work required will allow, the cross-section in Fig. 1 fully showing this construction. This principle of
25 reducing the bearing-surface in contact with the feed-slides is carried out in the whole internal arrangement of said cylinders.

My feed-slides *k* are also intended to fit comparatively loose in the slots *i*, as I have learned
30 by experience that with my cylinders hollow what little material passes the slides *k* by their being loose in the slot *i* on the upper side of the cylinder will as readily fall through
35 others on the under side. Cylinders, disks, or shaft with reciprocating feed-plates heretofore used for this purpose have sometimes had their
40 slide-slots cut through the solid metal, and the slide fitting close in them to prevent any material passing said slides. To this principle
45 of construction I make no claim, as it creates the excessive friction which I avoid. For the same reason I construct my partitions
50 *D* with raised V-shaped cams on their sides semicircular and semi-oval in form, the apex of this V shape alone coming in contact with
55 the ends of the cylinder, as shown in Fig. 3, instead of two flat surfaces, as heretofore. When the cylinders are in position on the shaft
60 *H* and between the partitions *D*, the feed-slides *k*, with the grooves in their ends, project through and above the surface of the cylinder the greater portion of its revolution and
back flush with the surface during the remainder of the same.

The construction of the feed-regulating plate *L* is shown in Fig. 4, and it will be seen
55 that in its lower side is an angular opening with its apex at *l*. The ends of this plate are intended to fit in and be held firmly by the recessed grooves *f* in the partition *D*. The
60 scraper-bar *M* is as long as the whole machine, and passes through the hole *g* in all of the partitions.

When constructed as described, the operation of the combined elements is as follows:
65 The cylinder *G* being in position for work, as shown in Fig. 1, and said cylinder being rotated by the shaft *H* in the direction of arrow

1, the feed-slides *k*, which are projected through the surface of the cylinder at this point by the cam-curves on the partitions *D*, carry with
70 them a portion of the fertilizing material in the hopper, when these slides reach the upper edge of the regulating-plate *L*, which is bent in a circle to suit the arc of their travel. All the material which is gathered between the
75 outer surface of the cylinder *G* and the inner surface of the regulating-plate *L* is carried at the same speed at which the cylinder revolves by the feed-slides *k*, the said regulating-plate having the angular opening in its lower side,
80 (shown in Fig. 4,) the apex of which is at *l* in Fig. 1. It is by means of this opening that the plate *L* regulates the flow of the material fed by the cylinder *G*, as follows: As the material contained in the space between the two
85 slides *k* reaches the apex of the angular opening *l* it begins to fall through this opening in the direction of the arrow 2, and as the cylinder *G* revolves the material is forced off the angular edges of this opening, so as to maintain
90 a gradual and regular flow or feed. The distance of the slides *k* apart is such that as soon as one is through feeding from the lower end of the plate *L* the slide following has just
95 commenced to feed through the apex of the angular opening *l*, and as the material is at all times being forced from some part of the angular opening in this plate, the material will begin to feed as soon as the machine is started. As these feed-slides *k* pass the lower end of
100 the plate *L* they move in flush with the surface of the cylinder *G* before they reach the scraper-bar *M* in the opening *g* through the partition *D*, and remain in until they pass the leakage-spring *m*, which is of flexible metal
105 and lies against the cylinder *G*, its whole length between the partitions *D*, its lower edge, being fast to the side *C*, preventing the leakage of material from the hopper.

The bar *M* is adjusted at such an angle to
110 the axis of the cylinder *G* as to present a stout cutting-edge to the same, and cleans from its surface all the fertilizing material which may adhere, and deposits in the direction of the arrow 3 in the concentrating-funnel *N*, (shown
115 in Fig. 3,) to the bottom of which is attached a hose, *o*, ordinarily used for that purpose.

The object of the slots *e* in the upper part of the cam *E* on the partitions *D* is that the feed-plates *k* may be placed in or removed from the
120 cylinder *G* through them. The lugs *e'*, which are directly under the slots *e*, keep the plates from falling down out of their proper position.

The shaft *H* is propelled by suitable gearing on the outside of the machine, as usual,
125 and is not here shown.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a force-feed device for fertilizer-drills, the hollow cylinder *G*, with transverse slots
130 adapted to receive the reciprocating feed-slides *k*, the inside edges of said slots, where in contact with said slides, being reduced, so as to lessen the friction, in combination with the

partitions D, on which are the raised cam-curves E, adapted to receive the ends of the slides *k*, substantially as set forth and described.

5 2. The combination of the hollow cylinder G, with transverse slots adapted to receive the reciprocating feed-slides *k*, with the stationary regulating feed-plate L, on the lower edge of which is the angular opening with its apex at
10 *l*, said opening controlling the feed, substantially as set forth and described.

3. The combination of the hollow cylinder G, with transverse slots adapted to receive the reciprocating slides *k*, with the movable
15 scraper-bar M, said bar presenting a sharp corner to the surface of the cylinder, but not in

contact with the same, substantially as set forth and described.

4. The combination of the partitions D, provided with raised V-shaped cam-curves on its sides, with the regulating feed-plate L and the scraper-bar M, which it is adapted to receive, and the flexible metallic leakage-guard *m*, when applied and operated substantially as set forth and herein described. 25

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

ALFRED H. WORREST.

Witnesses:

GEO. A. LANE,

J. MILTON WANNER.