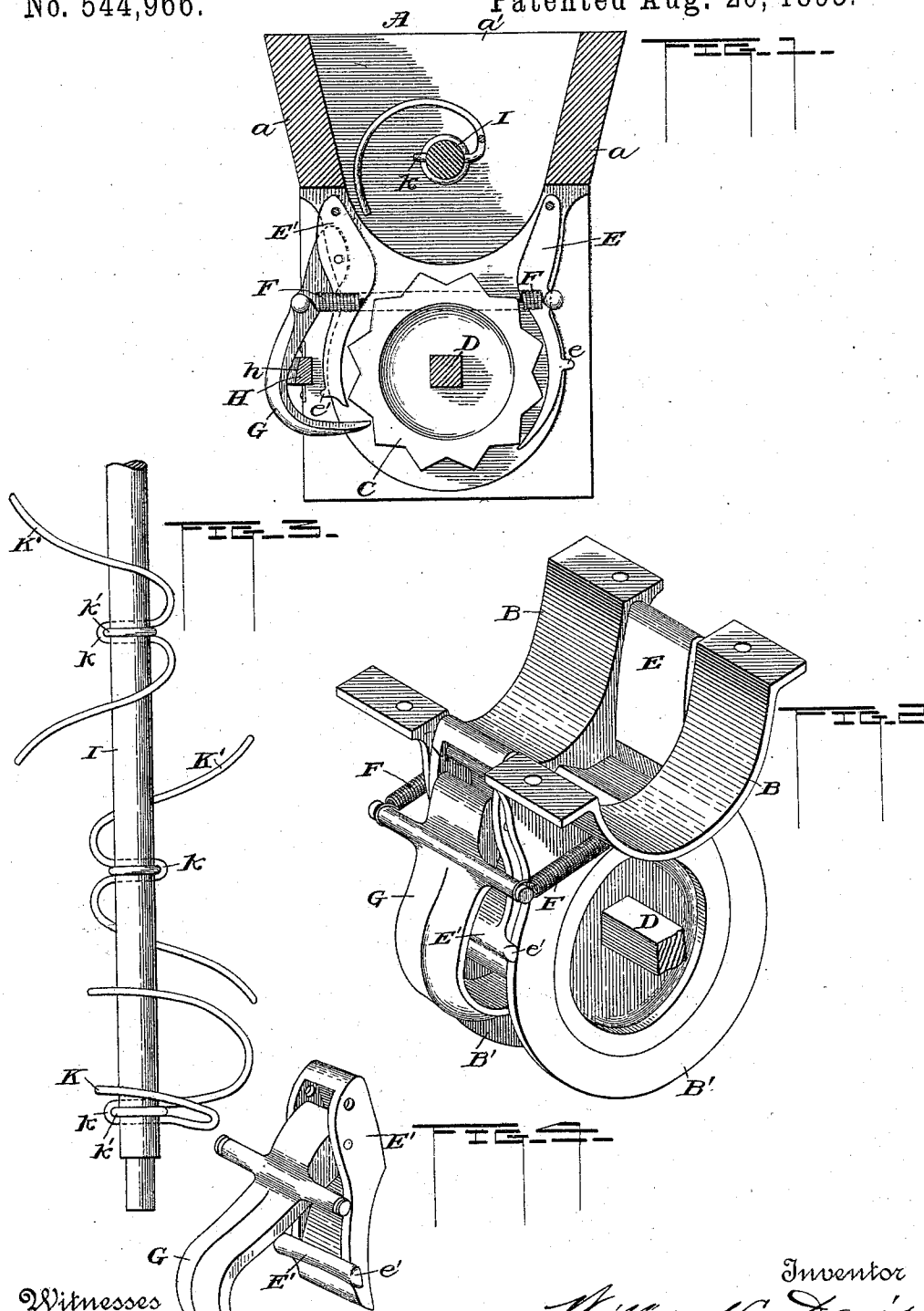


(No Model.)

W. H. DAVIS.
FERTILIZER DISTRIBUTER.

No. 544,966.

Patented Aug. 20, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM H. DAVIS, OF LEXINGTON, INDIANA, ASSIGNOR OF ONE-HALF TO
FRANCIS M. CAMPBELL, OF SAME PLACE.

FERTILIZER-DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 544,966, dated August 20, 1895.

Application filed June 14, 1895. Serial No. 552,754. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DAVIS, a citizen of the United States, residing at Lexington, in the county of Scott and State of Indiana, have invented certain new and useful Improvements in Fertilizer-Distributers; 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 machines or devices for distributing fertilizers, but more particularly to such devices as are employed in connection with grain-drills, though, of course, I do not desire to be restricted in the application of the invention, as it is adapted for separate use—that is, apart from the ordinary grain-drill or other similar machine with which it may be advantageously employed.

The objects of the invention are to provide improved means for feeding fertilizers, particularly fertilizing material of a granular nature, to prevent clogging and breaking the machine, to insure a regular and uniform feed, and to provide means for this kind of work, which shall be simple in construction, inexpensive in manufacture, and efficient and durable in use.

The invention will first be described with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of the description.

Referring to the drawings, in which similar letters of reference are used to denote similar parts, Figure 1 is a sectional end elevation through a hopper having my improvements thereto attached, the feed-wheel being shown in side elevation. Fig. 2 is a perspective view of the hopper-bottom plates, feed-wheel, and attachments detached from the hopper. Fig. 3 is a plan of a portion of the agitator-shaft, showing the agitators thereon; and Fig. 4 is a perspective view of the rear guard and scraper detached.

I have shown in the accompanying drawings only a portion of the hopper and a single feed-wheel with the attachments co-operating therewith, but it will be understood, of course,

that any desired number of feed-wheels may be employed, properly arranged upon a shaft journaled in suitable bearings therefor and extending through the hopper, or from end to end thereof, the hopper being of any desired length or made up, if desired, of a number of sections with divisions between the several feed-wheels. Inasmuch as the several feed-wheels and attachments and the construction of the hopper-bottom, or that portion of the hopper below which each feed-wheel is journaled, is the same in each instance, a specific description of one of the series will be a sufficient description of all.

The hopper A may consist simply of suitable front and rear boards or pieces *a a*, connected by end pieces *a'*, either with or without intermediate partitions or division-boards and open at both top and bottom, the bottom proper about each feed-wheel being formed by concave metallic plates *B B*, having pendent flanges *B' B'*, which, together with front and rear guard-plates, form a feed-wheel casing, the said flanges having openings through which the feed-wheel shaft freely passes. To the lower edges of the side pieces *a a*, or underneath the hopper A, may be secured one, two, or any desired number, at suitable intervals, of concave or semicylindrical plates *B B*, which are constructed in pairs and have depending vertically-disposed flanges or ring-shaped plates *B' B'*, between which the feed-wheel *C* revolves. The wheel or wheels *C* are fixed upon a shaft *D*, which extends longitudinally of the hopper from end to end thereof through the circular openings in the pendent ring-shaped plates or flanges.

The shaft *D* is preferably made square or polygonal in cross-section, so that the wheels may be merely slipped thereon and prevented from rotating independently of the shaft without other fastening means.

The wheels *C* may be of the form shown or of any preferred construction. They are preferably peripherally recessed or corrugated so as to provide suitable cavities or cups to receive the fertilizing material for distribution.

In front of each wheel is placed a pendent swinging plate or cut-off *E*, having a concave face or surface arranged in close proximity

to the periphery of the wheel, but not in contact therewith. A similar plate E' is also pivoted and arranged to work in the rear of the wheel for a similar purpose. These plates may be suitably pivoted at their upper ends to and between the flanges B' B' of the metallic bottom plates B B, and are provided below their pivots with lateral projections or lugs *e e'*, respectively, which are adapted to rest upon the edges of the ring-flanges B' B' and serve as stops to prevent the concaved guards or cut-offs E E' from moving inward sufficiently to contact with the periphery of the feed-wheel. These guards are each of sufficient width to span the space between the side plates or flanges B' B' incasing the feed-wheel, and are adapted to be forced toward the wheel with a yielding pressure, and are held in close proximity to the corrugated periphery of the wheel in such manner that should any rigid substance pass into the depressions or cups in the wheel and be forced between the same and the concave face of the guard it may escape without injury to or breaking the guard or other part of the machine, said guards being adapted to yield to rigid substances and to automatically resume their normal positions when the same shall have escaped from the machine. In order to sustain the guards or cut-offs in proper position with capacity to yield and automatically return to normal position I preferably employ a coiled or other suitable spring or springs F, connecting the two concaved guards arranged upon opposite sides of the feed-wheel, so that by means of a single spring or a pair of springs both concaves may be held normally but yieldingly in proper position to regulate the flow and insure a uniform feed, by preventing the passage of any more material than may be properly contained within the depressions or cups formed in the periphery of the wheel, and at the same time may readily yield to any rigid or unyielding substance and thereby prevent breakage.

In sowing or distributing fertilizers of a more or less tenacious or sticky nature the periphery of the feed-wheel often becomes clogged or coated to such an extent as to interfere seriously with the work of the machine. To provide for such contingencies I have devised a yielding scraper G, which may be arranged in rear of one of the guards and is adapted to be used or not, as occasion may require, without rendering it necessary to remove it or necessitating the use of an additional spring. The scraper G is preferably hinged or pivoted at its upper end to the rear guard or concave E', below the pivot of the latter, in such manner that its lower end may rest upon or be held in contact with the periphery of the feed-wheel, so as to scrape off any adhering substance and keep the periphery of the wheel smooth and clean.

One end of the spring F, which forces the front of the concave or cut-off E toward the feed-wheel, is preferably fastened to the

scraper G below its pivot, as shown clearly in Fig. 1, so that the spring may act directly upon the scraper and indirectly upon the rear guard E', the force of the spring being exerted upon the guard through the pivotal connection of the scraper therewith, so that a single spring serves to force both guards and the scraper with a yielding pressure toward the periphery of the feed-wheel.

In order that the scrapers may be moved and held out of contact with the periphery of the wheel I provide a cam-bar H, which may extend the length of the hopper between the scraper or scrapers and rear guard or guards, and is provided with a cam surface or surfaces *h*, whereby when the bar is slid endwise such cam will engage and force the scraper rearward out of contact with the periphery of the wheel without interfering with the operation of the guard, the latter being still retained in the proper position by the force of the spring acting thereon through the scraper, which is pivoted thereto below the pivot of the guard. A reverse movement of the cam-bar will release the scraper and permit the latter to move forward under the force of the spring into contact with the periphery of the feed-wheel.

Motion may be imparted to the feed-wheel shaft in any proper manner by the use of suitable belts or gearing, and by means of a belt or pinion on the feed-wheel shaft engaging a similar pinion on the agitator-shaft I, the latter may be caused to revolve simultaneously with the former. On the agitator-shaft I, which passes longitudinally through the hopper and is arranged to revolve above the feed-wheels, may be placed suitable agitators for stirring and loosening the fertilizing material and feeding the same to the feed-wheels. Any desired number of agitators may be employed, according to the number of feed-wheels used.

In Fig. 3 I have shown a portion of the agitator-shaft provided at one end with an agitator K, such as may be employed at each end of the shaft, and between the ends of the shaft with agitators K' K', such as are used when a series of feed-wheels are employed. As will be seen, the agitators consist of metallic rods or wires, each of which is bent centrally so as to form a loop *k*, which passes through an opening in the shaft I and is secured by a key-wire or other suitable fastening *k'*, the wire passing through the eye formed by the projecting end of the loop *k* and thence around the shaft to which it is secured, thereby securing the agitator to the shaft.

The outer end or arm of the agitator-wire K, at each end of the shaft adjacent to the end of the hopper, is bent in the same direction as the inner arm, while the intermediate agitators K', between which the intermediate feed-wheel works, have their arms bent so as to flare right and left toward adjacent feed-wheels and project slightly over the opening in the hopper-bottom above the feed-wheel,

whereby the agitator-arms are adapted to draw the material toward the feed-wheel opening from both sides. They are preferably secured to the shaft alternately on opposite sides thereof, so that they may overlap each other over the feed-wheel.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with the feed-wheel, and the vertically disposed side-plates or flanges of the hopper-bottom between which said wheel may revolve, of the pivoted guard-plate closing the opening between said side flanges above and in front of the feed-wheel and having a pendent concave portion arranged to work in close proximity to the periphery of said wheel, a stop for limiting the movement of said guard-plate toward the wheel and means for sustaining said plate in its normal position with a yielding pressure tending to force it toward the wheel, substantially as described.

2. The combination with the bottom-plates of the feed-hopper having the pendent disk-like flanges, the feed-wheel and means for revolving the same, of the front and rear guard-plates each pivoted at one end and having a pendent concave portion arranged to work in close proximity to the periphery of said wheel, and to close the opening between said flanges in front and in rear of the wheel and a spring connecting the two guard-plates so as to exert a force tending to draw them together toward the periphery of the wheel, substantially as described.

3. In combination with the feed-wheel having a corrugated periphery, the front guard-plate pivoted at one end and having a pendent concave portion arranged to work in close proximity to the periphery of said wheel, a scraper also pivoted at one end and having its free end arranged to bear upon the periphery of the wheel opposite the guard-plate and a spring connecting said scraper and guard-plate and adapted to yieldingly sustain the same in operative position with respect to said wheel, substantially as described.

4. The combination with the feed-wheel and the vertically disposed side-plates between which said wheel may revolve of a pair of guard-plates, one in front and the other in rear of the wheel, each having a concave portion arranged to work in close proximity to the periphery of said wheel and to span the space between said side-plates, and a spring arranged to yieldingly sustain both of said guard-plates in operative position with respect to said wheel, substantially as described.

5. In combination with the feed-wheel and the side plates between which it is adapted to revolve, the front and rear guard plates each pivoted at one end and having a pendent concave portion arranged to work in close proximity to the periphery of said wheel, a scraper pivoted at one end to the rear guard-

plate below the pivot of the latter, and a spring adapted to hold the scraper and both guard-plates in operative position with respect to said wheel, substantially as described.

6. In combination with the feed-wheel and the side plates between which it is adapted to revolve, the front guard-plate pivoted at one end and having a pendent concave portion arranged to work in close proximity to the periphery of the wheel, the rear guard-plate similarly arranged in respect of said wheel and the scraper pivoted to the latter guard-plate below the pivot of said plate, and springs connecting the front plate with said scraper on opposite sides of the wheel so as to sustain both plates and the scraper in operative position, substantially as described.

7. In combination with the feed-wheel and the rear guard-plate pivoted at one end and having a pendent concave portion facing the periphery of said wheel, the scraper pivoted to said guard-plate below the pivot of the latter, the spring arranged to hold said scraper and guard in operative position relatively to said wheel; and means for moving the scraper out of contact with the wheel without moving the guard or interfering with the function of the spring in sustaining the guard in operative position, substantially as described.

8. The hopper-bottom and feed-wheel casing comprising a pair of concave or semi-circular plates adapted to be attached to the open bottom of the feed hopper, each having at their adjacent edges a pendent disk-like portion or flange with an opening therein through which the feed-wheel shaft may pass; said flanges being separated sufficiently to permit the feed-wheel to be interposed and revolve between them, and a pair of depending concave plates pivoted between said flanges, one in front and the other in the rear of said feed-wheel, so as to close the opening between the flanges in front and in rear of the wheel, and means for forcing said guard-plates toward the periphery of the wheel with a yielding pressure, substantially as described.

9. In combination with the hopper having the semicylindrical or concave metallic bottom-plates; the latter provided with pendent ring-shaped plates or flanges, the feed-wheel fixed upon a shaft which extends through the openings in said ring-shaped flanges so that the wheel may revolve between said plates, and a pair of guard-plates arranged in front and rear, respectively, of the periphery of said feed-wheel, each guard having a pendent concave portion arranged to work in close proximity to the periphery of the feed-wheel, so as to close the openings between the pendent flanges of the bottom-plates above the feed-wheel and yieldingly guard and direct the material issuing from the hopper, substantially as described.

10. In a fertilizer distributor, the combination with the agitator shaft, of the agitator consisting of a metallic rod or wire bent into

the form of a loop at its center and having curved or spiral end portions flaring right and left from the loop; said loop being passed through an opening in the agitator shaft and
5 locked thereto by a key-wire passing through the projecting portion of the loop and thence around the shaft, substantially as described.

11. In combination with the corrugated feed-wheels and the bottom plates having
10 pendent flanges between which said wheels work, the pivoted guards placed in front and rear of the periphery of each wheel between said flanges, springs connecting said guards so as to sustain the same in normal position, and
15 the agitator shaft provided with spiral rods

or wires arranged at each side of said feed-wheels and flaring both ways from the point of attachment thereof to the agitator shaft, each agitator being provided centrally with a loop which passes through the agitator shaft, 20 a key-wire passing through the projecting portion of the loop and thence around the shaft, substantially as described.

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

WILLIAM H. DAVIS.

Witnesses:

DENNIS MEAGHER,
LOUIS E. HARDY.