

(No Model.)

4 Sheets—Sheet 1.

L. B. BERRIEN.
PLANTER.

No. 425,364.

Patented Apr. 8, 1890.

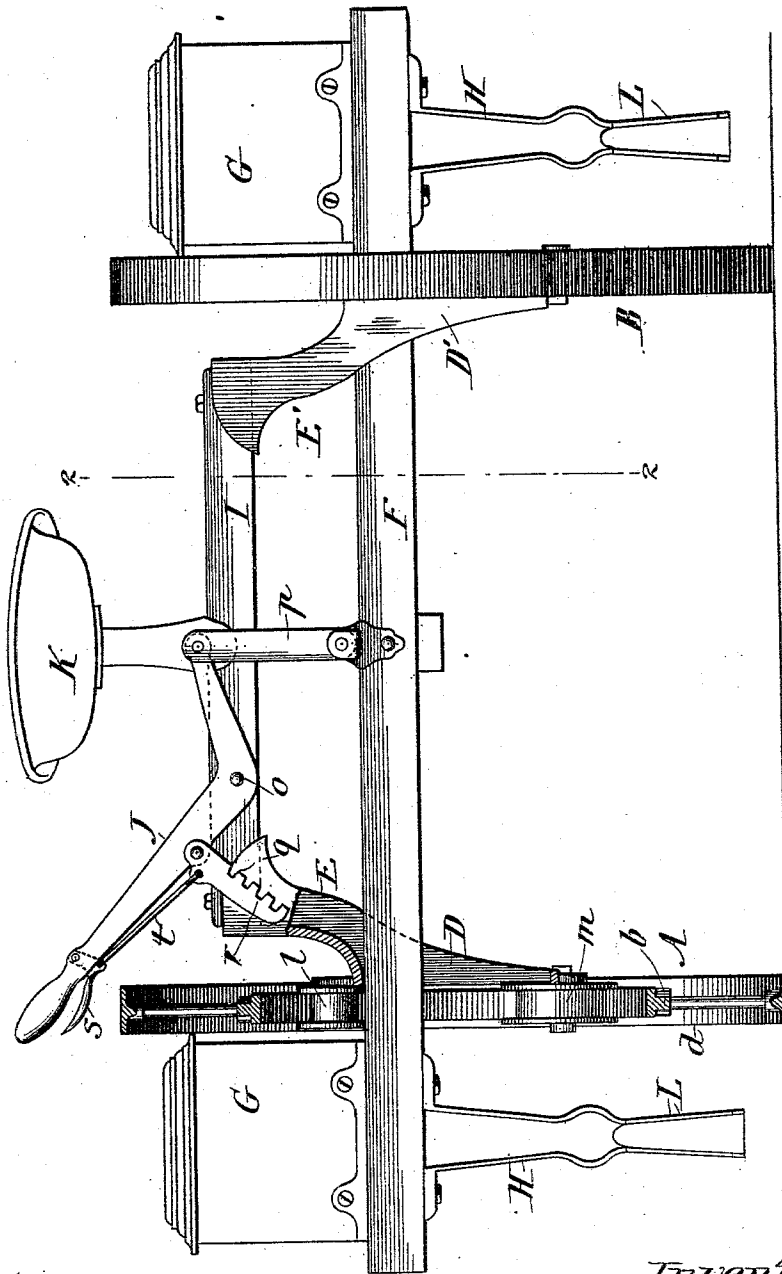


Fig. 1

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A. H. Adams.

Inventor:
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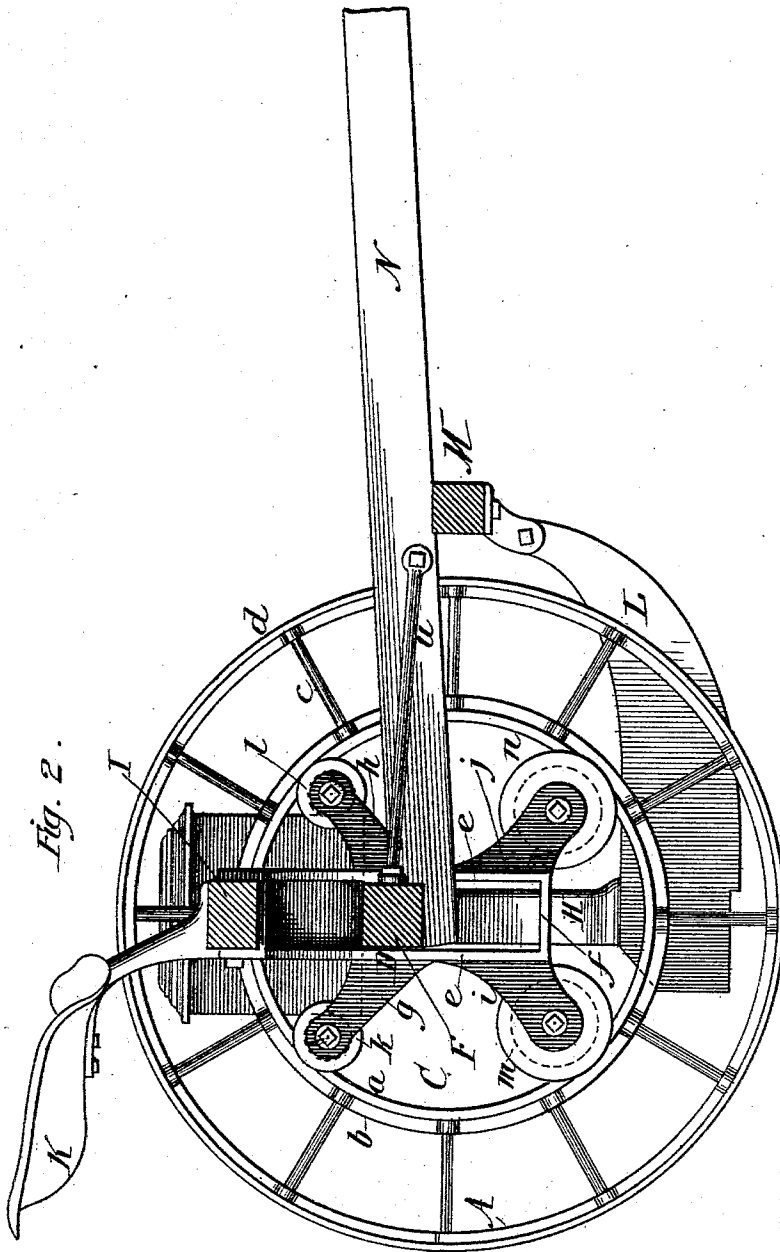
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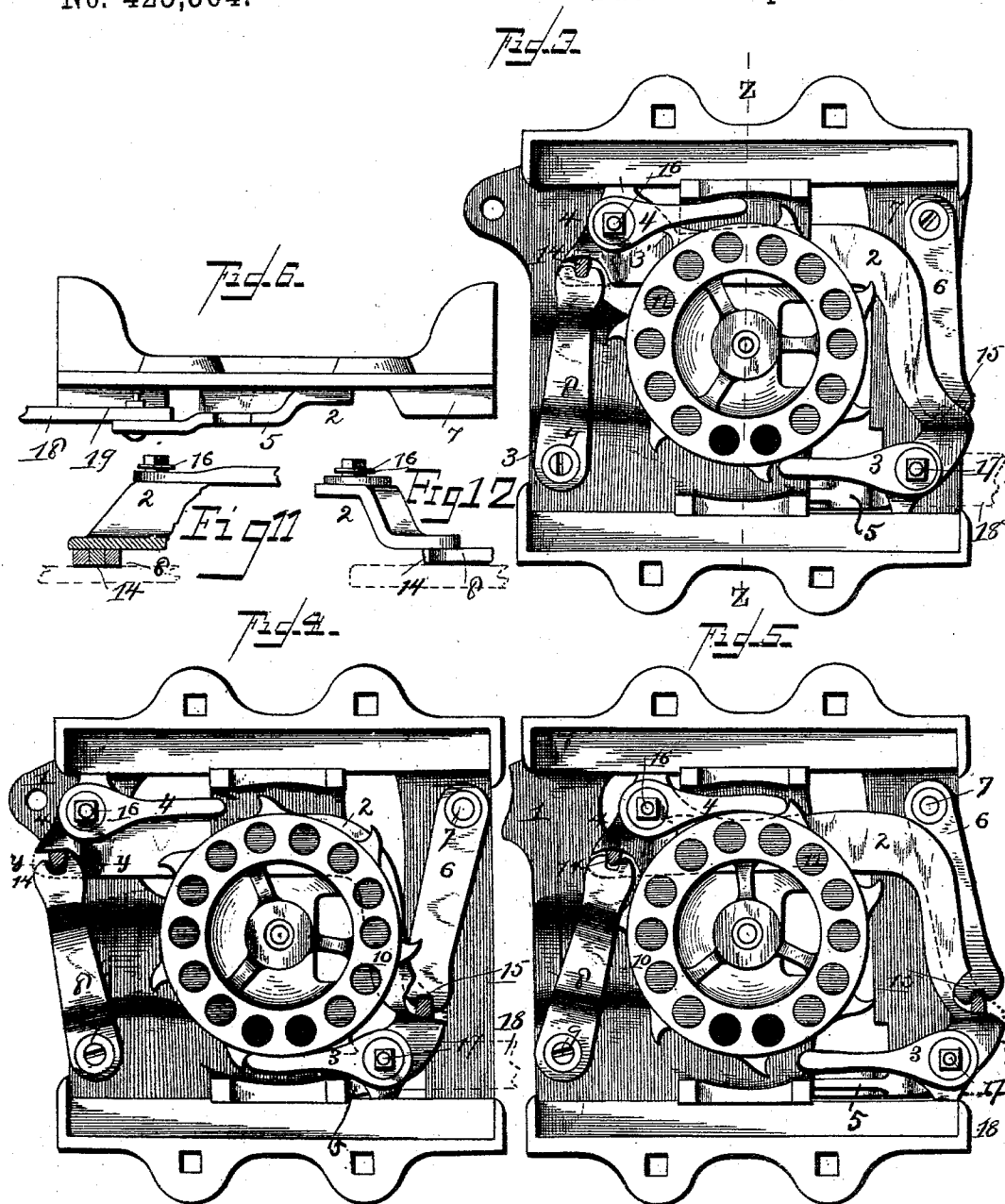
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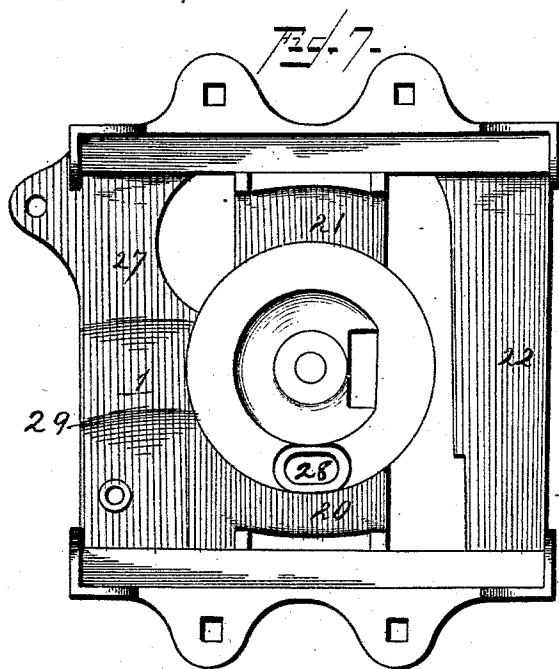
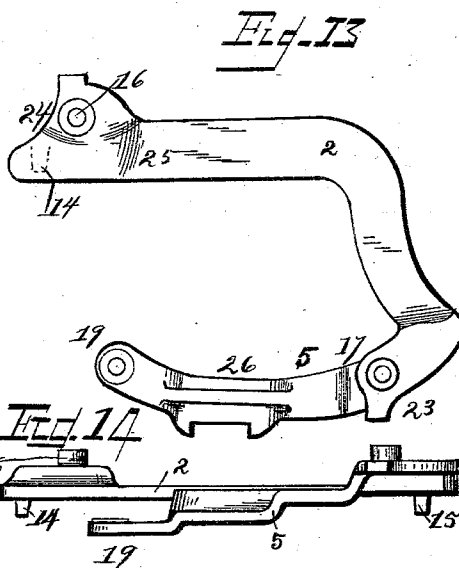
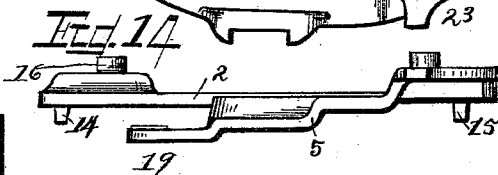
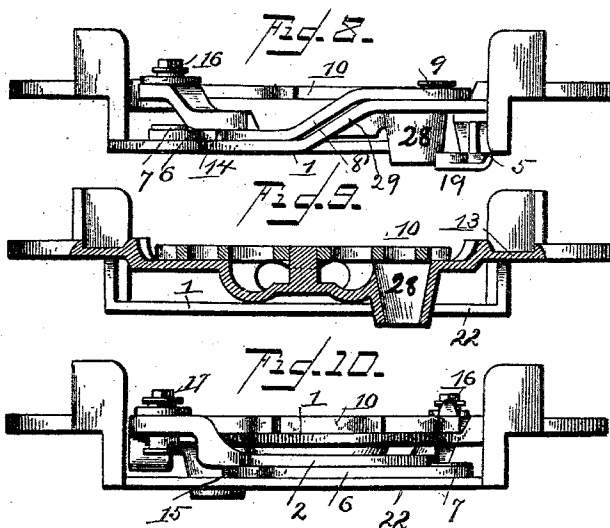
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UNITED STATES PATENT OFFICE.

LEONARD B. BERRIEN, OF PEORIA, ILLINOIS, ASSIGNOR TO THE AVERY
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PLANTER.

SPECIFICATION forming part of Letters Patent No. 425,364, dated April 8, 1890.

Application filed August 8, 1888. Serial No. 282,239. (No model.)

To all whom it may concern:

Be it known that I, LEONARD B. BERRIEN, residing at Peoria, in the county of Peoria and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Planters, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a rear elevation, some parts being shown in section. Fig. 2 is a vertical section at line 2 of Fig. 1, looking to the left. Figs. 3, 4, and 5 are plan views of the dropping mechanism used in connection with the seed-boxes, Figs. 4 and 5 showing said devices in the positions occupied at the ends of the movements of the shake-bar, and Fig. 3 showing those occupied at the half-way point. Fig. 6 is a side view of the parts in Fig. 3. Fig. 7 is a top plan view of the base-plate of the dropper. Fig. 8 is a side view of Fig. 3, looking from the left. Fig. 9 is a cross-section on line *z z*, Fig. 3. Fig. 10 is a side view of Fig. 3, looking from the right. Fig. 11 is a partial section on line *y y*, Fig. 4. Fig. 12 is a partial side view of the parts in Fig. 11, looking from the left. Figs. 13 and 14 are a top view and a side view of the rectilineally-moving pawl carrier or slide.

This invention relates to improvements in planters, it pertaining to features in the construction and arrangement of the parts by which the dropping of the seed is effected from the seed-boxes and in the means for supporting the runners and seed-boxes.

It relates particularly to planters having vertically-adjustable runners and dropping devices arranged in peculiar relations to the wheels and frames.

In the drawings, A B represent the two wheels of a planter, the central part C of each wheel being open.

a is an annular ring of metal, provided, as shown, with a flange *b*, to which the inner ends of short spokes *c* are secured, the outer ends of the spokes being secured to the rim *d* of the wheel.

DD' are two guides—one for each wheel—*e e* in Fig. 2 being two side walls of the guide D, and *f* the lower end of the guide D. Extending upward from these guides are brackets or supports E E'.

g h i j are four arms extending out from the guide D.

k, l, m, and *n* are four flanged wheels or rollers supported on pins or bolts near the outer ends of the arms *g h i j*. These wheels or rollers are so arranged that the ring *a* engages with them. The flanges of the rollers extend over the ring *a*, as shown in the drawings. The other wheel B is constructed in the same manner as the wheel A, and the guide D' in form is the same as the guide D, and this guide D' is provided with arms and rollers corresponding with those described for the guide D.

F is a bar which extends through the guides D D' and through the central openings in the wheels.

G G are seed-boxes.

H H are seed-tubes connected with the bar F.

I is a short bar supported at the upper ends of the supports E E', to which it is bolted.

J is a lever pivoted at *o* to the bar I.

p is a link, the upper end of which is pivoted to the short arm of the lever J, and the lower end is loosely connected with the bar F.

q is a rack on the support E.

r is an arm pivoted to the lever J and provided with a series of teeth to engage with the notches in the rack *q*.

s is a thumb-piece connected with the arm *r* by the rod *t*.

K is a seat.

L are the runners pivoted at their forward ends to a cross-bar M, connected with the tongue N.

u is a brace-rod, the forward end of which is connected with the tongue, and the other end is connected with the bar F. A second brace-rod is to be used on the other side of the machine; but it is not seen in the drawings.

The operation of this part of my invention is as follows: In Fig. 1 the bar F and runners are shown at their highest point. They can be lowered by means of the lever J, the runners being allowed to enter the ground to the required depth. When the planter is in motion, the wheels will rotate on the rollers *k l m n*. The planter has no axle. I thus bring the wheels in line transversely with the

runners, and hence, if the ground be uneven, the wheels and runners will maintain constantly the same relative position to each other, which is not the case with the usual construction.

I am aware of the fact that machines for sowing broadcast have been employed in which use was made of wheels open at the center, in combination with a seed-box extending across the machine and projecting through the said wheels, and with supports therefor which held the seed-box stationary relatively to the wheels, and I do not claim such devices as my invention; but they are not at all adapted to carry out the ends at which I aim. I provide a construction having the seed-receptacles, the seed-droppers, the guide-tubes, and the ground-opening devices so supported and arranged that they can be accurately adjusted in relation to the ground, whereby I can successfully meet all the conditions that are experienced in the field. When not in use, all the parts can be thrown up away from the ground. When in use, the runners, tubes, and seed-boxes can be arranged to plant the seed shallow or deep, as required, and by having the wheel-frame and the seed-box frame or support arranged to vibrate around substantially one and the same axis I obviate the necessity of the two separate frames used in other planters—one in the rear for the wheels and the other in front for the seed-boxes—and which are usually hinged together so as to follow the undulations of the ground.

The parts D E I constitute what may be regarded as a wheel-frame, and the part F and its adjuncts may be regarded as a frame or support for the seed-boxes or for the runners, and both frames or sets of parts are arranged to vibrate about the wheel-axes.

I prefer to have the boxes, tubes, and runners all carried by the one support and situated in relation to each other and to the wheels as shown; but there can be variation in this respect, and some of the features shown in regard to those parts, both as to their construction and relative location, can be dispensed with and others retained without departing from the invention.

Of course the preferred plan is to have the runners arranged in relation to the wheels as shown—that is, so that they open the ground at points on the transverse lines through the points of contact of the wheels with the ground or adjacent to said points of contact. As shown, the boxes and the runners are mainly between the front and rear edges of the wheels, in which respect also there can be variation, though it is desirable for some of the purposes aimed at to have them near the center of the wheels.

In Figs. 3, 4, and 5 I have shown improved dropping devices to be used with the planter shown or with others, such as are now well known. In these figures, 1 represents the lower frame or base plate which supports the

seed-dropping devices. The base or bed plate has the upper section 20 and 21, for supporting the dropping-plate and the pawl ends, and the depressed or lower sections 24 and 27, for supporting the pawl-slide, there being a dropping-tube at 28. There is an open space under the sections 20 and 21, and extending from that at 22 to that at 27, the latter rising at 29 and joining with that at 21, said open space permitting the pawl-carrier to be situated below the dropping-wheel.

One of the objects of the present invention is to so construct and arrange the parts of an intermittently-acting dropper having pawls for actuating a toothed wheel that the driving-bar can be placed on a line away from that which joins the axes of the two droppers, and at the same time prevent the binding or cramping which tends to occur as soon as the driving-bar is thus taken away from the central line and keep the pawls under such arrangement that they shall at all times in ordinary movement travel as nearly rectilinearly as possible.

There is demand for planters which can be used interchangeably, either for drilling by means of constantly-moving delivery devices or for intermittently dropping a number of seeds to produce hills. The drilling is most advantageously accomplished by means of a bevel-gear and a shaft situated on the central transverse line of the droppers—that is, on the line joining the axes of the two dropper-plates. The presence of this drilling mechanism in this part of the machines precludes the use of the reciprocating driving-bar unless it be placed eccentrically or tangentially in relation to the dropper-plates; but, as said above, placing it as last described induces a lateral binding of the pawl-slide. To avoid this binding and cramping of the pawl-support, the pawls have in some constructions been taken off from the bar or frame which extends from the inner side of the dropper-plate to the outer side thereof, and which reciprocates rectilinearly, or nearly so, and they have been placed upon pivoted pawl-carriers—that is to say, arms or links have been each at one end pivoted to the base or bed plate or casting, (the pivoted ends being at diametrically-opposite corners of said casting,) and the other ends have had the pawls pivoted directly thereto. Under such circumstances the pawls always move in circular paths around the pivots which fasten the pawl-carriers to the base-plate. This circular movement of the pawl is disadvantageous, for, as is well known, the desideratum is to have the pawls move as nearly rectilinearly as possible. Securing the pawls to the pivoted pawl-carriers, as in the earlier construction last referred to, positively prevents attaining such a rectilinear movement. Again, in said earlier constructions, the bar or frame extending from the inner to the outer side of the dropper-plate does not act as a pawl-carrier, but merely as a connecting-

link between the two isolated pivoted pawl-carriers. I overcome the disadvantages incident to these earlier constructions and provide a means for avoiding the lateral binding or cramping which naturally arises from the eccentric arrangement of the driving-bar, as follows:

2 represents a pawl-carrying slide adapted to move substantially rectilinearly at the points where the pawls are applied. To it directly at 16 and 17 are pivoted the pawls 3 and 4, one upon one side of the dropping-plate and the other upon the other side.

18 is the driving-bar, applied to the slide or pawl-carrier at one side by means of a pivot at 19, or it may be applied at 16 in the ordinary way. As soon as the said bar exerts a thrust or a pull upon the pawl-carrier, the latter tends to move laterally, and if free would bind against the parts which guide it, if said parts are sufficiently close to it, and if they are at any distance away it and its pawls would be thrown out of the proper working position by such thrust or pull of the driving-bar. To avoid this, I employ guide-arms or thrust-links, as at 6 and 8. These are pivotally connected to the base-plate at 7 and 9, and also are connected to the rectilinearly-moving pawl-carrier. As shown, the connection is effected by means of a pivot-lug at 14 and 15 on the pawl-carrier for each link and a recess at the end of the link. Instead of this, use may be made of any equivalent connection, such as a pivot passed through apertures in the link and in the pawl-carrier. When these links are present, the pawl-carrier is held properly, and at the same time the pawls are not thrown materially out of rectilinear paths. It will be noticed that the connection between the links and the pawl-carrier 2 is remote from the connection or axis of union of the pawl-carrier 2 with the pawls 3 and 4, respectively. This prevents the pawls from being carried in circular paths around the link-pivots. Were the parts rigid between the pivots 7 and 17 or 9 and 16 the heels of the pawls would be at all times carried on a circular path inward toward or outward from the axis of the dropper-plate; but, owing to the flexible connection at the intermediate points at 14 and 15, the heels of the pawls are allowed to remain out at a substantially uniform distance from the center of the dropper-plate. The lines between the pivots 7 and 17 and 9 and 16 always lie inside of the pivots at 15 and 14, although the distances vary slightly, and this variability provides the flexibility necessary to keep the pawls in rectilinear paths. The parts are of course so related that the throw of the pawl is short, so that there shall not be too much variation in the distances between the pivots at 14 and 15 and the lines which join the points 7 and 17 and 9 and 16; hence I wish the construction herein to be distinguished from the earlier ones in which the pawl-carriers were pivoted bars, as I maintain

a movement of the pawls which is practically rectilinear, as has been common, notwithstanding the presence of the links or guide-bars 6 and 8, pivoted to the base-plate, and, as said above, this is irrespective of the particular form of connection at 14 and 15 between the parts 6 and 8 and the pawl-carrier 2, inasmuch as an ordinary pivot may be used in such connection with the same results. This way of pivoting is well known, and is illustrated in earlier patents—as, for instance, in the patent to Brown, No. 215,207, dated May 13, 1879—that is to say, pivoting the pawl-carrying slide to a bar which is pivoted to the base-plate. This reciprocating pawl-carrier 2 is supported on the depressed parts 22 and 27 of the bed-plate 1. It has two pawl-supporting parts 23 and 24, which hold the pawls properly to have their ends moved on the elevated sections 20 and 21 of the bed-plate. The arm 25 connects these parts 23 and 24, and it extends around two sides of the wheel-center. 26 is a bar integral with the part 25, but lying on the opposite side of the center. This pawl-slide does not lie below the links 6 and 8 and depend therefrom, but is above them, and is arranged to bear down toward the bed-plate. When the slide is below the links 6 and 8 and is supported therefrom, it depends for support on the bolts or pins which hold it, whereas when it is arranged as herein shown separate pivots or bolts and nuts are not necessary at 14 and 15, as the pivots can be integral with the slide 2 or with the links 6 and 8, and even if separate pivot-bolts and nuts were employed at these points they would not be subjected to the same strain and tendency to be loosened that they would be if the slide were below the links and suspended therefrom by such bolts and their nuts, as the latter in such case alone carry the slide. Having the pivots which connect the links and the slide integral with one or the other of the said parts avoids any increase in the number of the parts in the machine.

It will be understood that the seed-boxes G G, Figs. 1 and 2, are provided with dropping devices of the class illustrated in Figs. 3, 4, and 5, or their equivalents, and also a shake-bar of the character of that at 18, pivoted at 19 or at 17, in the ordinary way, is used to operate one or both of the droppers, and that it can be actuated by hand or automatically by any of the means known at the date of my invention. Numerous ways of mounting such devices on the parts, as the bar F, (shown in Figs. 1 and 2,) are well known, and in this respect preference can be followed; and it will be understood that there are numerous details incident to planters which can be used in connection with the parts in said Figs. 1 and 2, but which need not be herein described.

The bar 26 opposite to the part 25 operates the valve in the seed-tube H in the usual manner; but the construction of the slide 2

in this respect is better than that in which the valve-operating part is on the same side as the bar 25 or its equivalent, as I am enabled thereby to apply the shake-bar to the end of the valve-bar, as shown in Fig. 6. To permit this, the link 8 is bent up and pivoted to the upper section 20 of the base-plate, a link sufficiently long being thus allowed and a free space procured below the base-plate for the valve-operating bar 26 and for the attachment of the shake-bar.

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

1. In a corn-planter, the combination of the centrally-open wheels, the wheel-frame, the runners outside of the wheels, and the runner support or frame extending through the wheels, said runners and their support or frame being vertically adjustable relatively to the wheel-frame and arranged to vibrate around the wheel-axis, substantially as set forth.

2. In a corn-planter, the combination of the centrally-open wheels, the vertically-stationary frame mounted on said wheels, the seed-boxes, the runners outside of said wheels and arranged to open the ground on or near the transverse lines of the points of contact of the wheels, and a vertically-adjustable frame or support for the rear ends of said runners carried by the aforesaid stationary frame and extending through the wheels, substantially as set forth.

3. In a corn-planter, the combination of the centrally-open wheels, the seed-boxes, the runners, the frame between and extending through the wheels for supporting adjustably the rear ends of the runners, and a supplemental support for the front ends of the runners connected with said frame, substantially as set forth.

4. In a corn-planter, the combination of the centrally-open wheels, the frame-work between and extending through the wheels, the seed-boxes outside of the wheels, the runners, also outside of the wheels, and means, substantially as described, for bringing the runners into and out of contact with the ground.

5. In a corn-planter, the combination of the centrally-open wheels, the wheel-frame, the seed-boxes outside of the wheels, and the seed-box support or frame extending through the wheels, said seed-boxes and their support or frame being vertically adjustable relatively to the wheel-frame and arranged to vibrate around the wheel-axis, substantially as set forth.

6. The combination of the centrally-open wheels, the frame-work between and extending through the wheels, the seed-boxes on said frame on the outer sides of the wheels and between the front and rear edges thereof, and means for adjusting said boxes vertically in relation to said wheels, substantially as set forth.

7. In a corn-planter, the combination of the draft-frame, the wheels open at the center,

the vertically-adjustable seed-boxes on the outer sides of the wheels, and the means passing through the wheels for supporting the seed-boxes on the said frame, substantially as described.

8. The combination of the wheels open at the center, the frame which is stationary relatively to the wheels, the seed-boxes on the outer sides of the wheels, and the vertically-adjustable support extending through the wheels for the said seed-boxes and carried on the said stationary frame, substantially as set forth.

9. In a corn-planter, the combination of the centrally-open wheels, the frame-work between the wheels and supported thereon, the seed-boxes and runners both outside of the wheels, the support which carries both the seed-boxes and the runners and which extends through the wheels, and means, substantially as described, for simultaneously adjusting both the runners and the seed-boxes in relation to the wheels, as set forth.

10. In a corn-planter, the wheels A B, each having an open center, in combination with a frame supported by and within the wheels; an adjustable bar, as F, which passes through the open wheels and carries the seed-boxes, seed-tubes, and runners, and a lever for raising and lowering the bar F, substantially as specified.

11. The combination of a frame or base 1, a pawl-carrier 2, substantially rectilinearly-moving pawls 3 and 4, pivoted to the pawl-carrier, guide-links 6 and 8, pivoted to the plate 1, and a rotating seed-plate 10, substantially as and for the purposes specified.

12. The combination, with the base-plate, the toothed seed-wheel, the pawls, and the reciprocating carrier to which the pawls are pivoted, of the two separate guide-links pivoted to the base-plate on opposite sides of the seed-wheel, and also pivotally or loosely connected to the pawl-carrier on lines other than the axes of the pawl-pivots, substantially as set forth.

13. The combination, with the base-plate, the toothed wheel, the pawls, and the reciprocating carrier, of the separate links pivoted to the base-plate on opposite sides of the seed-wheel, and also pivotally or loosely connected to the carrier at points outside the lines which join the pawl-pivots and the link-pivots that are secured to the bed-plate, substantially as set forth.

14. The combination, with the bed-plate, the toothed wheel, and the reciprocating carrier, of the two separate links pivoted to the bed-plate on opposite sides of the seed-wheel and connected pivotally or loosely to the carrier, and the pawls mounted directly upon the carrier independently of said links, said pawls having their axes of vibration situated at a distance from the axes of the pivots or connections between the carrier and said links, substantially as set forth.

15. The combination of the dropping-wheel

10, the sliding pawl-carrier 2, having the connecting-bar 25 extending from one pawl-pivot to the other, the links 6 and 8, pivotally connected to the pawl-carrier, and the base-plate 5 having sections 22 and 27 below the said slide 2, substantially as set forth.

16. The combination of the dropping-wheel, the base-plate having the elevated section, as at 20 21, to support the wheel, and the lower 10 sections, as at 22 27, the reciprocating pawl-carrier 2, having the connecting-bar 25 extending from one pawl-pivot to the other and situated above and adapted to bear down toward the said lower sections of the bed-plate, 15 and the links pivoted to the pawl-carrier, substantially as set forth.

17. The combination, with the dropping-

wheel 10, the pawls, and the links 6 and 8, of the pawl-carrier 2, having the pawls pivoted thereto at points diametrically opposite relative to the wheel and formed with the bar 25, 20 connecting the pawl-pivots, and with the valve-operating bar 26 opposite the said bar 25, substantially as set forth.

18. The combination, with the bed-plate, the 25 dropping-wheel, and the pawls, of the links pivoted to the bed-plate and the reciprocating pawl-carrier situated above the bed-plate, or a part thereof, and above the links, substantially as set forth.

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