(No Model.) 4 Sheets—Sheet 1.

J. KAYLOR.

CHECK ROW CORN PLANTER.

No. 340,511. Patented Apr. 20, 1886.

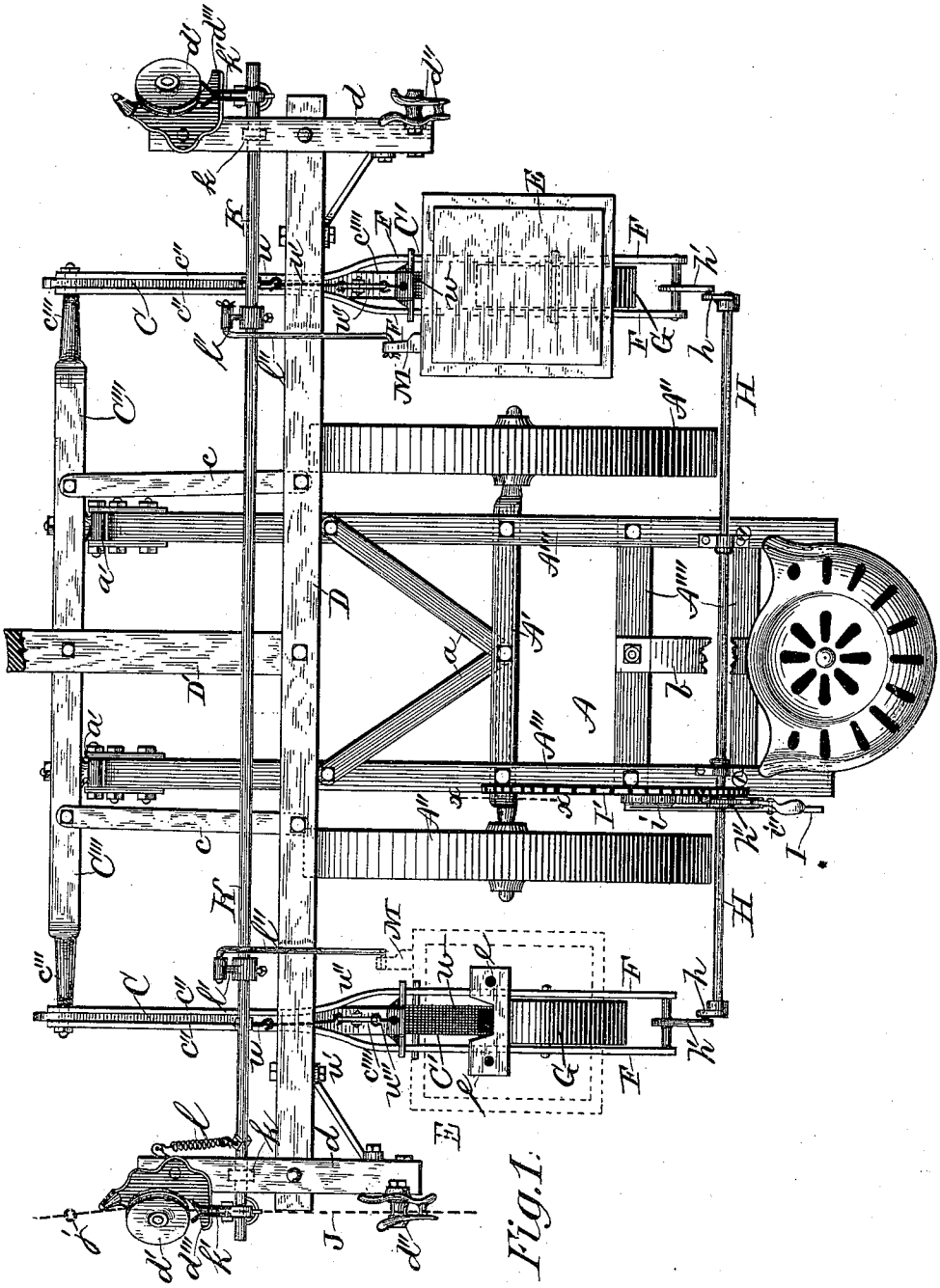


Fig. 1.

Witnesses:
Wm. H. Rowe,
H. W. Richards

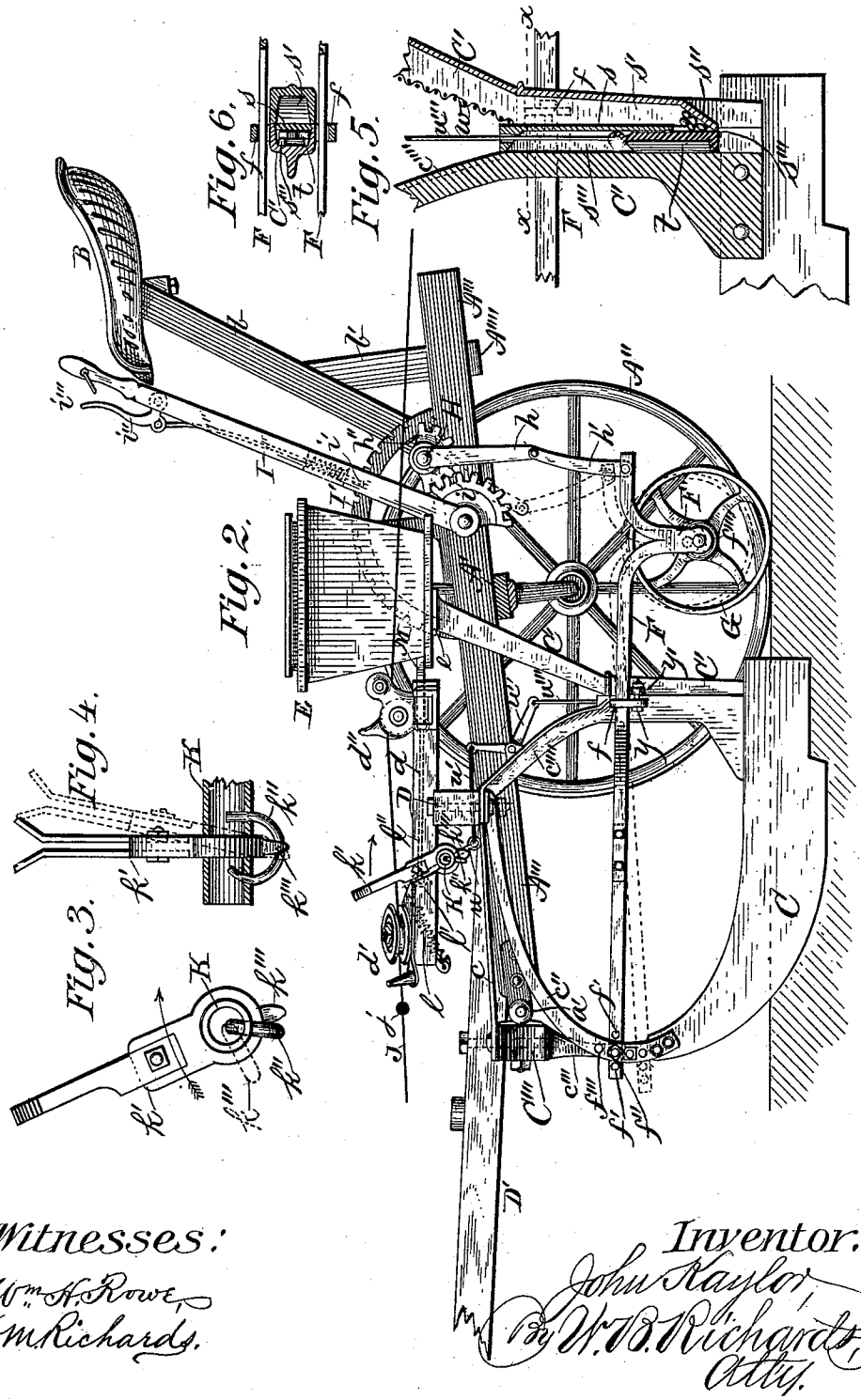
Inventor
John Kaylor,
By W. B. Richards,
Atty.

(No Model.) 4 Sheets—Sheet 2.

J. KAYLOR.

CHECK ROW CORN PLANTER.

No. 340,511. Patented Apr. 20, 1886.



Witnesses:
Wm. A. Rowe,
H. M. Richards.

Inventor:
John Kaylor,
By W. B. Richards,
Atty.

(No Model.)

4 Sheets—Sheet 3.

J. KAYLOR.

CHECK ROW CORN PLANTER.

No. 340,511. Patented Apr. 20, 1886.

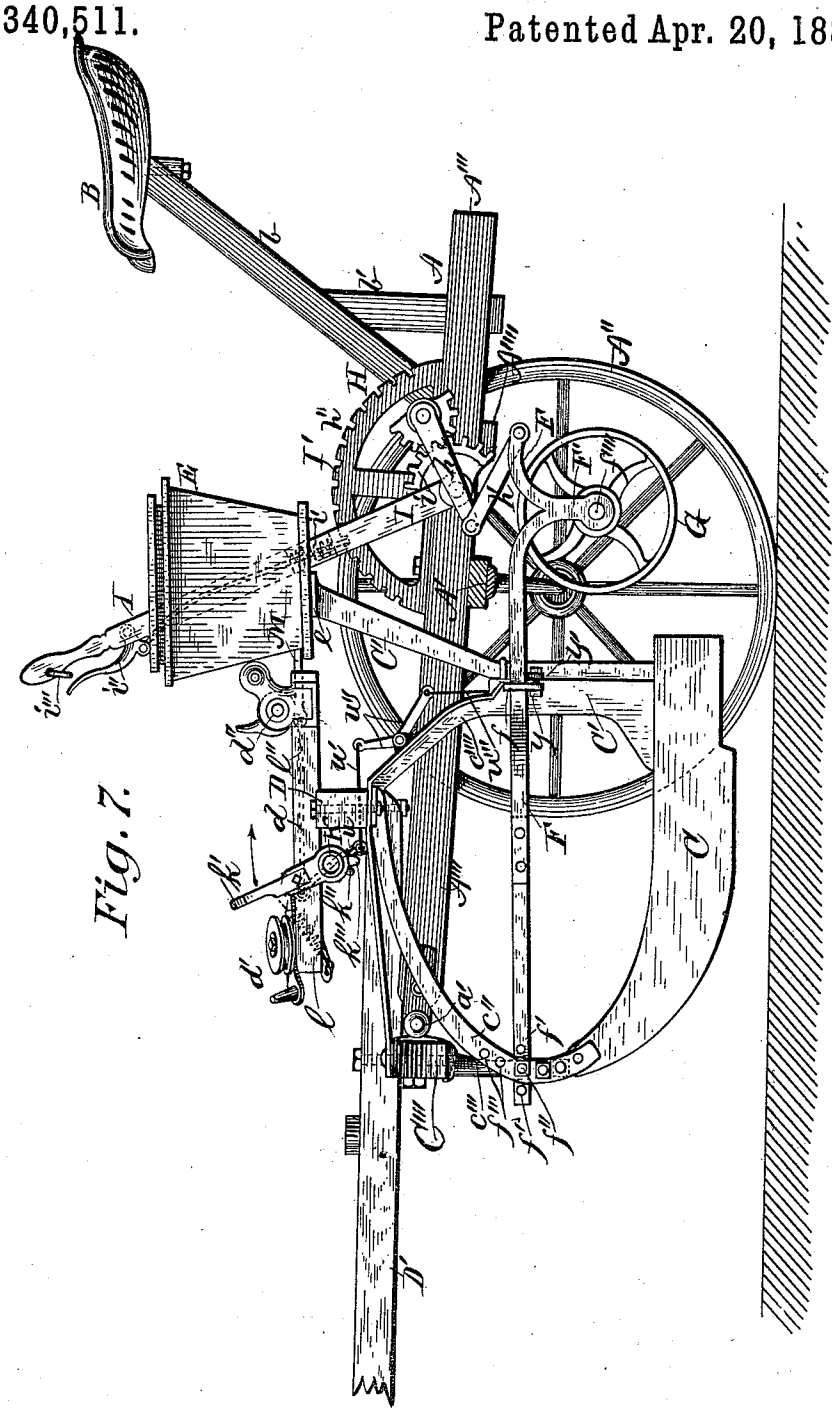


Fig. 7.

Witnesses:
Wm. H. Rowe,
H. M. Richards

Inventor:
John Kaylor,
By W. B. Richards,
Atty.

(No Model.) 4 Sheets—Sheet 4.

J. KAYLOR.

CHECK ROW CORN PLANTER.

No. 340,511. Patented Apr. 20, 1886.

Fig. 8.

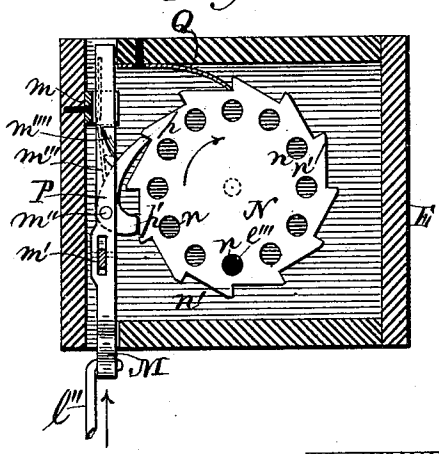


Fig. 9.

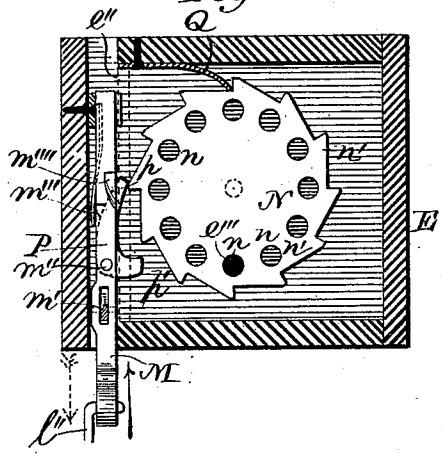


Fig. 10.

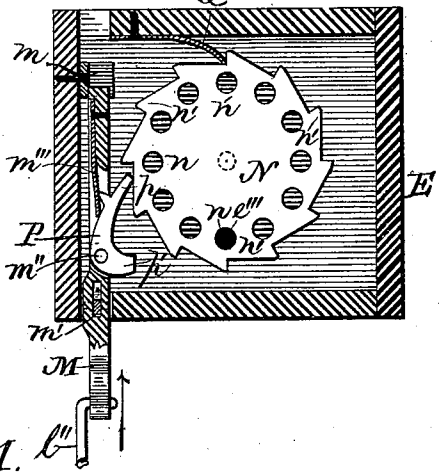
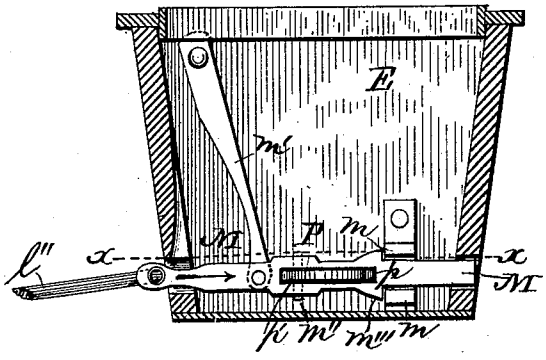


Fig. 11.



Witnesses:

Wm. H. Rowe

H. W. Richards.

Inventor:

John Kaylor,

by W. B. Richards,

Attv.

UNITED STATES PATENT OFFICE.

JOHN KAYLOR, OF DECATUR, ILLINOIS.

CHECK-ROW CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 340,511, dated April 20, 1886.

Application filed January 2, 1886. Serial No. 187,444. (No model.)

To all whom it may concern:

Be it known that I, JOHN KAYLOR, a citizen of the United States, residing at Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Check-Row Corn-Planters, of which the following is a specification.

The main features of my invention relate to check-row corn-planters of that type which are actuated by the check-rower devices on the moving planter coming in contact with indexes or tappets on a check-line which is stretched adjacent to the path of the moving planter across the ground to be planted.

Some of the features of my invention, however, relate to improvements which may be used in planters in which the seeding devices are operated either automatically or by hand.

These different features of invention are hereinafter fully described, and are summarized and pointed out in the claims hereto annexed.

In the accompanying drawings, which illustrate one method of embodying the different features of my invention in a single practical check-row corn-planter, Figure 1 is a top plan of the planter, shown with one seed-box removed and the tongue and seat-supporting bar partly broken away. Fig. 2 is a side elevation of the planter, shown in position for planting, but the rear wheel removed, the axle in section in line *x x* in Fig. 1, and the tongue partly broken away. Fig. 3 is an end elevation of the check-rower rock-shaft and a side elevation of one of the forked levers. Fig. 4 is an elevation of the forked lever and the check-row rock-shaft in section, seen at right angles from the view of the same parts shown at Fig. 3. Fig. 5 is an enlarged sectional elevation of the lower end of the planter seed-tube and its contained parts. Fig. 6 is a sectional plan of the seed-tube in line *x x* in Fig. 5. Fig. 7 is a side elevation of the planter, showing all its parts elevated and supported on the traction-wheels for local transportation, the tongue shown broken away, the near traction-wheel removed, and the axle in section, as at Fig. 2. Fig. 8 is a sectional plan of one of the seed-boxes in the plane of the line *x x* in Fig. 10, showing the seed-cup wheel in plan and the cap-plate ordinarily above it removed. Fig. 9 is same plan as Fig. 8, but shows the parts in different relative positions from those shown at Fig. 8. Fig. 10 is same plan as Fig. 8, but further shows the slide-bar with its upper portion removed, to show the spring-actuated integral pawl and detent. Fig. 11 is a sectional elevation of the seed-box, showing the slide-bar, its supports, and the integral pawl and detent in elevation.

In so far as the frames of this planter are concerned, it is one of that class in which a forward frame mounted on runners or furrow-openers and carrying the seed-boxes is hinged to a rear frame which is supported on the traction-wheels, and one of that particular kind in said class in which the forward end of the forward or runner frame is hinged to the extended forward end of the rear or wheel frame.

The rear frame, A, is formed in an ordinary manner of an arched axle, A′, supported on wheels A″, side bars, A‴, fixed to the axle A′, transverse bars, A⁗, and brace-bars *a*, and supports a seat, B, on bars *b b′*, which rest on and are secured to the bars A⁗.

The forward frame consists of the runners or furrow-openers C, seed-tubes C′, transverse bar C‴ at the forward end of the forward frame, braces *c*, a rear transverse bar, D, and a tongue or draft-pole, D′, which parts are constructed and combined with other parts in an ordinary manner, except as hereinafter otherwise specifically pointed out and described.

The extended rear-frame side heads, A‴, are connected by ordinary hinges, *a′*, with the bar C‴, so as to permit the forward frame to rise and lower at its rear end, or to swing in a vertical plane on the hinges *a′* and the attachment to the neck-yoke, and to permit of the rear frame being oscillated on the axle when the forward frame is raised, to permit and to aid in raising the forward frame. The tongue D′ is fixed to the bars D and C‴. The forward and upper end of each runner C is bolted between bars *c″*, which extend upward and rearward, and are bolted at their other ends to the bar D. The bar C‴ is extended laterally, and has pendants *c‴* at its ends, which are bolted, respectively, to the bars *c″*. This extension of the bar C‴ is such as to locate the runners C on the outer sides of the wheels

A″, as shown at Fig. 1. A branch, c'''', extends from the seed-tube and connects with the bar D. Thus the parts of the forward frame are connected with each other, as last described.

The bar D is extended laterally beyond the runners to form a support on which the check-rower devices are carried, as hereinafter described, while it forms, as already described, one of the main-frame bars of the runner-frame of the planter.

The lower half or portion of each seed-tube is vertical, and the upper part inclined rearward toward its upper end, where it has flanges *e*, by means of which it is bolted to the seed-box E.

Each seed-tube has a pair of levers or bars, F F, one bar on each side of the seed-tube, and each passed loosely through a slotted ear, *f*, on its respective side of said tube. The bars F converge forward of the seed-tube, and are there fixed to a single bar, which forms a continuation or extension of said bars F and passes through between the bars c'', where it has a series of holes, f', through one of which a bolt, f'', passes, and near same point the bars c'' have a series of holes, f'''. Pendants F′, near the rear ends of the bars F, carry an axial bolt, f'''', on which is journaled a wheel, G, which by these means is carried in rear of and in the path of the seed-tube.

H is a shaft which extends transversely across the rear frame of the planter in rear of the axle A′, and has suitable bearings on said frame. The shaft H has a crank-arm, *h*, on each of its ends, and the outer ends of these crank-arms are connected by rod-links h', one with the rear end of each pair of bars F. The shaft H carries a segment-gear, h'', which gears with another segment-gear, *i*, carried on a short shaft from which a hand-lever, I, extends upward to within convenient reach of the driver when in the seat B. The hand-lever I is provided with an ordinary spring-actuated pawl, i', operated by an ordinary thumb-piece, i''. By drawing the thumb-piece i'' toward the lever I the open link i''' may be thrown over said thumb-piece to hold the pawl i' out of engagement with the rack-bar I′, which is fixed to the rear frame for its engagement, for purposes hereinafter described.

The bar D has fixed to each of its ends a cross-head, *d*, on each of which is fixed the ordinary forward guide-pulleys, d', and rear guide-pulleys, d'', for the check-row line J, which carries the ordinary tappets or dropping-indexes *j*.

K is an ordinary rock-shaft journaled in suitable bearings, *k*, which are fixed to the heads *d*, and has a forked lever, k', on each of its ends. Each forked lever k' is loosely mounted on the tubular shaft K, and is held from sliding lengthwise on said shaft by a staple, k'', which is secured to the rock-shaft, as shown at Fig. 4. A lug, k''', projects from the lower end of the forked lever beyond the staple k'. As the forked lever is moved by a tappet in the direction shown by the arrow at Figs. 2, 3, and 7, the lug k''' will, by contact with a staple k'', give a partial rotation to the rock-shaft in the same direction, and as the rock-shaft is swung or rotated backward in an opposite direction to that last described by the spring *l* the staple will act on the lug to give the return movement to the forked lever.

When the rock-shaft is moved, as last described, by one forked lever, the other forked lever will remain still, as shown at Fig. 3, where the dotted-line position of the lug k''' indicates its movement away from the staple shown, as supposed to be given it by the forked lever not shown, while the forked lever shown at same figure remains still. This manner of mounting the forked lever and transmitting motion from it to the rock shaft also permits the lever to swing laterally, as shown by dotted lines at Fig. 4, the well-known advantages of which need not be herein stated.

A crank-arm, l', projects from the shaft K, forward of and in line with each seed-box, and a rod-link, l'', extends from each crank l' to, and connects it with a slide bar, M, which passes through the seed-box about in same horizontal plane and near to one side of the seed-cup wheel N, which is centrally journaled, so that it can rotate, and is provided with ordinary seed-cups, *n*, and ratchet-teeth n'—one to each seed-cup.

Figs. 8 to 10, inclusive, show the seed-cup wheel, but do not show the cut-off and cap-plate which covers the seed-wheel, and which may be of any ordinary or desired construction, and hence need not be herein shown or described.

The slide-bar M runs between guides *m* at one end, and is suspended by a swinging bar, m', at its other end, which reduces the friction. The swinging bar m' is pivoted at one end to the slide-bar M, and at its other end to the seed-box. (See Fig. 11.)

P is my combined pawl and detent, formed of a pawl end, *p*, and a detent end, p', about at right angles to its pawl end. This pawl and detent is located in a slot in the slide-bar M, (see Fig. 11,) and is pivoted therein by a bolt, m'', near the angle or bend between the detent and the pawl-arms. A spring-plate, m''', fixed to the slide-bar M, presses the pawl end *p* toward the seed-cup wheel.

Q is a spring-plate detent, attached at one end to the seed-box, and at its other end located so as to come in contact with the ratchet-teeth on the seed-cup wheel. The bar m' is located in a space formed by a partition, e'', and the side of the seed-box, which partition keeps the corn in the seed-box from contact with said bar, and the position of which is indicated by dotted lines at Fig. 9.

As a forked lever is moved rearward by a tappet, a rectilinear motion is given the slide-bars M in the direction shown by the arrows at Figs. 8 to 11, inclusive, and the pawl *p* is

thus made to act on one of the ratchet-teeth, and thereby give a partial rotation to the seed-cup wheel in the direction shown by the arrow at Fig. 8, and thus bring a seed-cup in each wheel in register with and in position to discharge its contents through the opening e''' in the bottom plate of the seed-box into the throat of the seed-tube.

When the throw of the slide-bar M and seed-cup wheel are completed, as last described, the detent p' will be brought in contact with the sloping side of one of the ratchet-teeth on the seed-cup wheel, and will thus arrest the motion of said wheel at the proper time and prevent its momentum carrying it too far for the proper registry of the discharging seed-cup with the opening e''', and the spring-detent Q will at the same time drop behind one of the ratchet-teeth and prevent any backward movement of the seed-cup wheel, as shown at Fig. 8.

When the spring l returns the rock-shaft, as hereinbefore described, and thus withdraws or moves the slide-bar M in an opposite direction from that last described, and as shown by the dot-line arrow at Fig. 9, the spring m''' will allow the pawl p to yield and rise over the ratchet-tooth in rear of the one it last acted on, as shown plainly at said Fig. 9.

When the throw of the slide-bar M in the direction last described is completed, the combined pawl and detent will be brought approximately into the position shown at Fig. 10, and ready to again act on the seed-wheel, as hereinbefore described, when the slide-bar again is moved in the direction of the arrow shown at said figure.

The movement of the slide-bar M in one direction is limited by the shoulders m'''' on said bar coming in contact with the guides m, and its movement in the opposite direction is limited by the movement of the rock-shaft K, which is limited by the forked levers coming in contact, respectively, with an adjacent projecting arm, d''', from a head, d.

The vertical lower end of the seed-tube is divided into two compartments by a partition-plate, s, to near the lower end of said tube, (see Fig. 5,) and the bottom or lower end of the duct s', formed by said partition and the rear side of the tube, is terminated by a shelf, s'', which inclines downward and forward, as plainly shown at same figure. The lower end of the plate s does not quite extend to the lower end of the inclined discharging-shelf s'', and thus leaves a discharge-opening, s''', which is opened and closed by a discharging-valve, t, as hereinafter described. The valve t slides vertically in a duct, s''', formed in the seed-tube forward of the plate s, and is operated by the rock-shaft K by means of a crank, u, which extends downwardly from the rock-shaft and is connected by a link-rod, u', with one end of a bell-crank lever, u'', the other end of which is connected by a link-rod, u''', with the valve t. The upper end of the rod u''' passes through a hole in the upper end of the plate s, which upper end is enlarged to close the upper end of the duct in which the valve t slides. The bell-crank lever u'' is pivoted at its bend to the branch c'''' of the seed-tube. By these means the valve t will be drawn upward and the discharge s''' immediately opened, when a forked lever is forced rearwardly by one of the tappets on the check-line, and the seed contained on the shelf s'' will escape and be thrown forward, by the forward and downward inclination of said shelf, with a velocity about equal to the velocity at which the planter may be moving, whereby they will be dropped more nearly as if dropped from a stationary tube, and will not be scattered, as when discharged vertically or rearwardly from the tube. The seed-cup wheel is not operated fully and so as to discharge a charge of seed until the forked lever has about completed its throw rearwardly; hence the forked lever is given its return-throw by the spring l in time to lower the valve t and close the opening s''' and catch the charge of seed which was discharged by the seed-wheel from the forward throw of the forked lever.

The seed-tube C′ is formed in two parts—a front and rear part—united about on a line with the valve t. The front part of the seed-tube is extended and forms the branch c'''', and the rear part is extended, and the front and inclined side of its upper end is formed of woven wire, w, through which the interior of the seed-duct may be seen in order to know if the seed-cup wheel is measuring and discharging regularly. The front and rear parts of the seed-tube are held together by a bolt, y, which passes through the lug f and another lug, y'. (See Figs. 2 and 7.)

The wheels G not only act as covering-wheels in the ordinary manner, but also gage the depth of penetration of the soil by the runners C, and hence gage and control the depth of planting, whereby the different charges of seed may be deposited at uniform depths. The forward end of the bars F may be adjusted at higher and lower points on the bars c'', and held after adjustment by the bolts f'', for the purpose of raising and lowering the wheels G relatively to the runners C, as shown by dotted lines at Fig. 2, and thereby regulating the depth of planting, as hereinbefore referred to. The different holes f' in the bar F will enable the adjustment referred to to be accomplished in an evident manner. When the bars F are adjusted as last described, and as shown by the dotted lines referred to, the lever I may then be adjusted to bring the wheels G to the surface of the ground in planting, and by engaging the pawl i with the segment rack-bar I′ the lever I will be locked, and will lock the front and rear frames of the planter to each other, and thereby hold the runners in the soil to the depth controlled by the wheels G. By engaging the link i''' with the thumb-lever i'' the pawl i' will be held out of engagement with the rack-bar I′, and the flexible connection-joints a' will then permit either the for-

ward or rear frames to rise and lower in operation without, to any practical extent, affecting the other frame.

By throwing the lever I forward the runners C will be raised entirely above the ground, as shown at Fig. 7, and in so doing the weight of a great portion of the forward frame will be supported by the bar H on the rear frame in rear of the axle A′, which, together with the weight of the driver in his seat B, will raise and hold the forward end of the rear frame in the elevated position shown at same figure, in which position the front and rear frames may again be locked rigidly together by the lever I, as hereinbefore described, and the rear frame will support the weight of the forward frame without any "neck-draft" or pressure on the horses' necks for local transportation, while the planter is being turned round at ends of rows, moved from field to field, or for any other necessary purpose.

The last-described function of my invention arises mainly from the fact of the tongue or draft-pole D′ being bolted to the forward frame instead of to the rear frame, as is common in this type of planters, in which the rear frame is hinged to the forward end of the forward frame.

The lever I may be connected directly to the shaft H and operate it without the gears *i h″*, as will be readily seen by any one skilled in this art.

I do not deem it necessary herein to point out different modifications which may be made of several of the main features of my invention, nor to describe different combinations that some of the features may be easily adapted to, nor do I intend by so doing to limit my claims to include in either of them elements or parts not recited therein; and,

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

1. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices and runners or furrow-openers, and having the tongue fixed to said forward frame, and a hinge-connection between said frames located approximately at the front ends of both the forward and rear frames, substantially as and for the purpose specified.

2. In a corn-planter, in combination, a rear frame mounted on wheels and carrying a driver's seat, a forward frame carrying the seeding devices and runners or furrow-openers, and having the tongue rigidly fixed to said forward frame, and a hinge-connection between said frames located approximately at the forward ends of both the forward and rear frames, substantially as and for the purpose specified.

3. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices and runners or furrow-openers, a tongue fixed to the forward frame, a hinge-connection between said frames located approximately at the front ends of both the forward and rear frames, and a crank-arm projecting from a shaft mounted on the rear frame and connected with a rear projection from the forward frame by a link or its equivalent, substantially as and for the purpose specified.

4. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices, and runners or furrow-openers, a tongue fixed to the forward frame, a hinge-connection between said frames located approximately at the front ends of both the forward and rear frames, a shaft extending across the rear frame and provided with cranks or arms which are hinged to extensions from the forward frame, and a hand-lever adapted to oscillate said transverse shaft and raise and lower the forward frame, substantially as and for the purpose specified.

5. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices, and runners or furrow-openers, a tongue fixed to the forward frame, a hinge-connection between said frames located approximately at the front ends of both the forward and rear frames, a shaft extending across the rear frame and provided with cranks or arms which are hinged to extensions from the forward frame, and a hand lock-lever adapted to oscillate said transverse shaft and raise and lower the forward frame, substantially as and for the purpose specified.

6. In a corn-planter, in combination, a rear frame mounted on wheels and carrying a driver's seat, a forward frame carrying the seeding devices and runners or furrow-openers, a tongue fixed to the forward frame, a hinge-connection between said frames located approximately at the front ends of both the forward and rear frames, a shaft extending across the rear frame and provided with cranks or arms which are hinged to extensions from the forward frame, and a hand lever adapted to oscillate said transverse shaft and raise and lower the forward frame, substantially as and for the purpose specified.

7. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices and runners or furrow-openers, a tongue fixed to said forward frame, a hinge-connection between said frames located approximately at the front ends of both the forward and rear frames, and a hand-lever mounted on the rear frame and hinged to the front frame, substantially as and for the purpose specified.

8. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices and runners, a tongue rigidly connected with said forward frame, a rock-shaft extending across the rear frame in rear of the axle and provided with arms which are connected by hinges with extensions from the forward frame, and a driv-

er's seat supported also in the rear of the axle, substantially as and for the purpose specified.

9. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seeding devices and supported on runners hinged at its front end to the front end of the rear frame and provided with rear extensions which carry covering-wheels, and a lever mounted on the rear frame and hinged to said extensions from the forward frame, substantially as and for the purpose specified.

10. In a corn-planter, in combination, a rear frame supported on wheels, a forward frame carrying the seeding devices and runners, and hinged at its forward end to the forward end of the rear frame, and provided with rear extensions carrying covering-wheels, a rock-shaft extending across the rear frame in rear of the axle, and provided with crank-arms which are hinged to the rear extensions from the forward frame, substantially as and for the purpose specified.

11. In a corn-planter, in combination, a rear frame supported on wheels, a forward frame carrying the seeding devices and runners, and hinged at its forward end to the forward end of the rear frame, and provided with rear extensions carrying covering-wheels, a rock-shaft extending across the rear frame in rear of the axle, and provided with crank-arms which are hinged to the rear extensions from the forward frame, and a lever geared with said rock-shaft, substantially as and for the purpose specified.

12. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame carrying the seed-boxes, and connected with the rear frame by hinge-connections which permit of vertical movement of both frames, and check-row devices consisting of heads supporting the rock-shaft K, and forked levers mounted on a bar, D, which constitutes a support for the check-row devices, and a frame-bar of said forward frame, substantially as and for the purpose specified.

13. In a corn-planter, in combination, a rear frame mounted on wheels, a front frame carrying the seed-boxes and runners, a bar, D, carrying the check-rower devices, and constituting at same time a frame-bar of the forward frame, and a tongue fixed to the forward part of the forward frame and to the bar D, substantially as and for the purpose specified.

14. In a corn-planter, in combination, a rear frame mounted on wheels, a forward frame hinged to said rear frame and carrying the seed-boxes and runners, a bar, D, adapted for use as a frame-bar of the forward frame, and extended at its ends and provided with heads *d*, which support the check-rower devices, substantially as and for the purpose specified.

15. In a corn-planter, in combination, a rear frame supported on wheels, a forward frame hinged to said rear frame and carrying the seeding devices and runners, and bars F, pivotally secured to the seed-tubes, adjustably connected with the front ends of the runners, and provided with the covering-wheels G near their rear ends and in rear of the seed-tubes, substantially as and for the purpose specified.

16. In a corn-planter, in combination, the rear frame mounted on wheels, the forward frame hinged to the rear frame and carrying the seed-boxes and runners, the bars F, pivotally secured to the seed tubes and adjustably connected with the front ends of the runners, the covering-wheels G, shaft H, cranks *h*, and links *h'*, substantially as and for the purpose specified.

17. In a corn-planter, in combination, the rear frame mounted on wheels, the forward frame hinged to the rear frame and carrying the seed-boxes and runners, the bars F, pivotally secured to the seed-tubes and adjustably connected with the front ends of the runners, the covering-wheels G, shaft H, cranks *h*, links *h'*, and a lever, I, geared with said shaft H, substantially as and for the purpose specified.

18. In a corn-planter, in combination, a seed-cup wheel having ratchet-teeth, a slide-bar, and an integral pawl and detent hinged to the slide-bar and adapted to act on the seed-cup wheel to give it successive partial rotations and to arrest its movement, substantially as and for the purpose specified.

19. In a corn-planter, in combination, a seed-cup wheel having ratchet-teeth, a slide-bar, and a spring-actuated integral pawl and detent hinged to the slide-bar and adapted to act on the seed-cup wheel to give it successional partial rotations, substantially as and for the purpose specified.

20. In a corn-planter, in combination, a seed-box, a seed-cup wheel, a slide-bar, M, guides *m*, and a swinging bar, *m'*, hinged at one end to the seed-box and at its other end to the slide-bar, substantially as and for the purpose specified.

21. In a corn-planter, and in combination, a rock-shaft which is operated by forked levers and a check-line, a crank-arm extending from said rock-shaft and adapted to actuate the seed-slides in the seed-box, and another crank-arm extending from same shaft and adapted to actuate the lower valve or discharge-valve in the seed-tube, substantially as and for the purpose specified.

22. In a corn-planter, in combination, a rock-shaft, K, forked levers *k'*, check-line J, spring *l*, crank *l'*, rod *l''*, slide-bar M, crank *u*, rod *u'*, bell-crank lever *u''*, rod *u'''*, and discharge-valve *t*, substantially as and for the purpose specified.

23. In a corn-planter, in combination with a rock-shaft, forked levers mounted on said rock-shaft, a spring, and a check-line, a crank-arm projecting from the rock-shaft and connected with the devices for operating the seed-slides in the seed-box, and another crank-arm projecting from same shaft and connected with

the devices for operating the discharge-valve in the seed-tube, substantially as and for the purpose specified.

24. In a check-row corn-planter, in combination with the shaft which receives motion from an index check-line, seed-slides in the seed-box adapted to receive motion from connection with said shaft, and a valve in the seed-tube, also adapted to receive motion from said shaft by a connection of its own therewith, and not through any connection with the seed-slide, substantially as and for the purpose specified.

25. In a corn-planter, a seed-tube formed in two parts with a partition, *s*, at their union, the front part having a duct for the valve *t* and the rear part having a duct for the seed; substantially as and for the purpose specified.

26. In a corn-planter check-rower, in combination with a check-row shaft, D, and forked levers loosely mounted on said shaft, a lug, *k'''*, projecting from each forked lever, and a staple, *k''*, secured to the rock-shaft and adapted to coact with the forked levers and rock-shaft, substantially as and for the purpose specified.

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

JOHN KAYLOR.

Witnesses:

JOHN B. PRESTLEY,

HENRY A. WOOD.