(No Model.) 2 Sheets—Sheet 1.

A. H. HULL.

CORN PLANTING MACHINE.

No. 422,416. Patented Mar. 4, 1890.

Fig. 1.

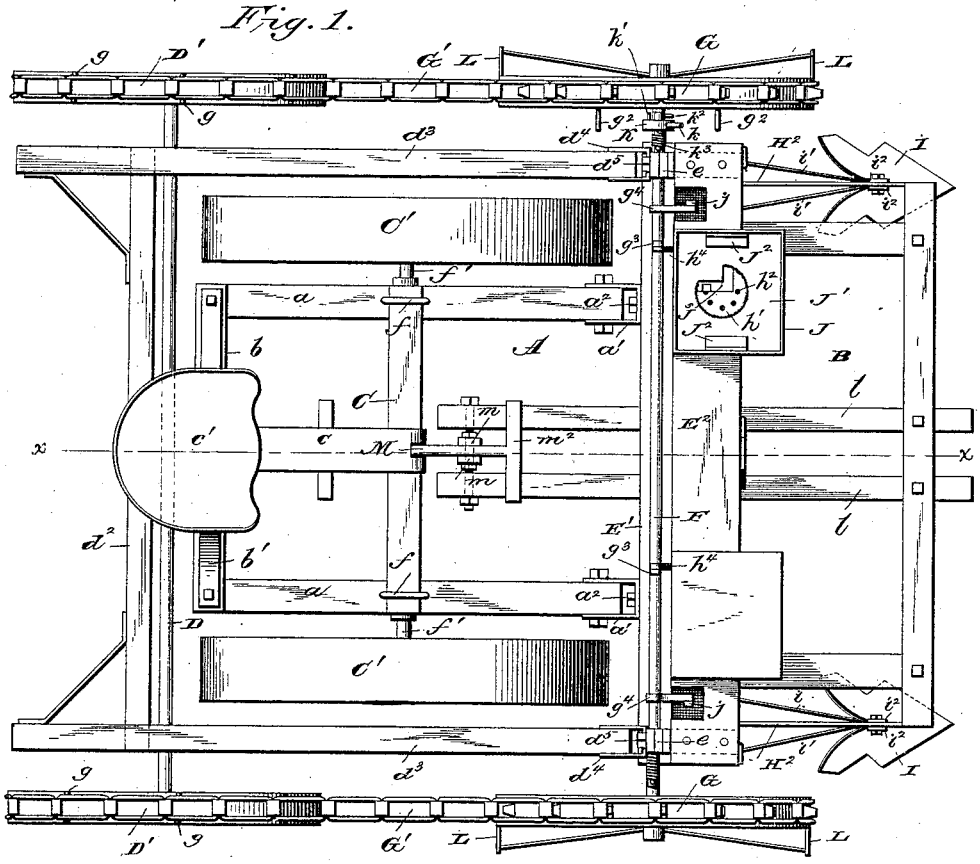
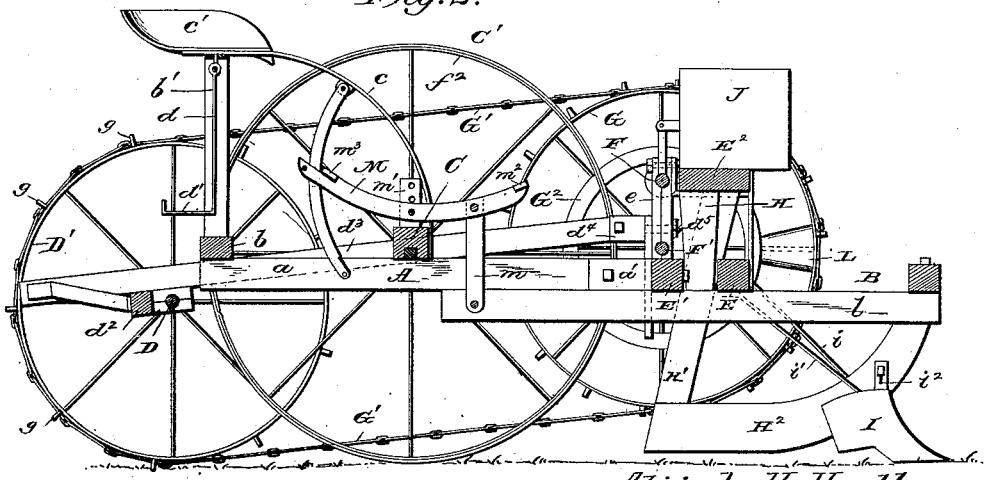


Fig. 2.



Witnesses
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H. L. Beall.

Abijah H. Hull.
Inventor

By his Attorneys

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

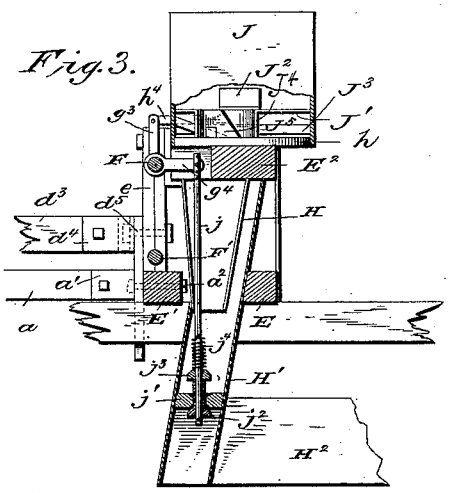


Fig. 4.

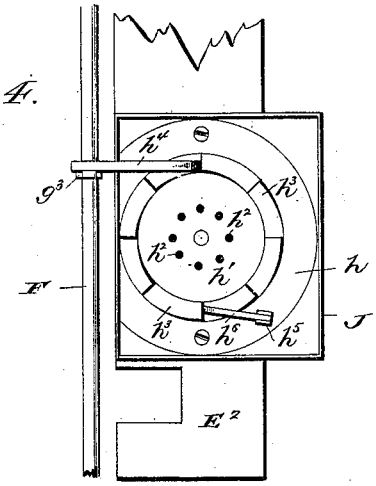


Fig. 5.

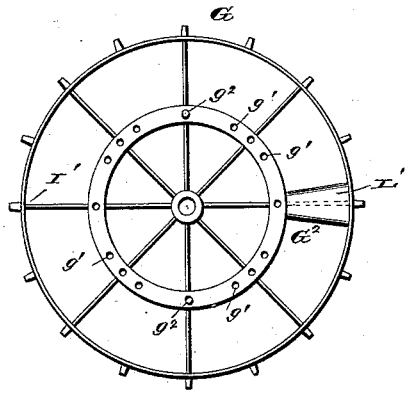
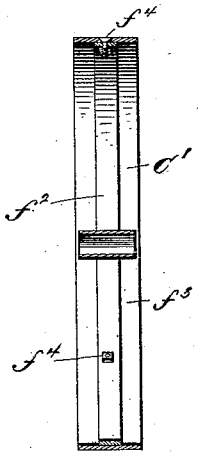


Fig. 6.



Witnesses
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By his Attorneys

UNITED STATES PATENT OFFICE.

ABIJAH H. HULL, OF SUPERIOR, NEBRASKA.

CORN-PLANTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 422,416, dated March 4, 1890.

Application filed March 23, 1889. Serial No. 304,572. (No model.)

To all whom it may concern:

Be it known that I, ABIJAH H. HULL, a citizen of the United States of America, residing at Superior, in the county of Nuckolls and State of Nebraska, have invented certain new and useful Improvements in Corn-Planters; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to corn-planters; and it consists in the improved construction hereinafter described and set forth, whereby a simple and effective planter is provided that possesses a number of improved features over previous machines.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a planter embodying my improvements. Fig. 2 is a vertical sectional view taken on the line *x x*, Fig. 1. Fig. 3 is a detail sectional view through one of the dropper-tubes, showing the arrangement of valves and clearer devices therein. Fig. 4 is a detail sectional plan view of one of the seed-hoppers and its valve-operating device. Fig. 5 is a detail side view of one of the hill-marker wheels, and Fig. 6 is a sectional view of one of the carrying-wheels.

The supporting-frame of the machine consists of two sections A B, hinged together, as will be explained. The rear section A comprises the two inner parallel longitudinal bars *a a*, which are connected together at their rear by means of a transverse horizontal bar *b*, on which is secured the curved spring *c b'*, centrally to which is connected the upper rear end of the spring member *c* to form a frame for sustaining the seat *c'*. A strap *d* depends pivotally from the rear of the seat-frame and has its lower end bent to form a hook *d'*, which is adapted to engage the rear bar d^2 of a second and outer portion of the rear section A, and consisting of said rear bar d^2 and extended side bars d^3, the forward ends of the latter being pivoted on transverse pivots in clips d^4, the said clips being connected to swivel-bolts d^5, secured to the vertical end bearing-boxes *e e*, secured near the ends of the transverse bars E E' of the front section B. The longitudinal bars *a a* of the inner portion of the rear section are also mounted upon horizontal pivots located in clips *a' a'*, swiveled upon bolts a^2, secured to said bar E'. Metal straps *f* are bolted to the bars *a a*, so as to secure the axle C in position, the spindles *f'* of the latter having the carrying-wheels C' C' mounted thereon, and each consisting of a wheel proper having a narrow peripheral portion f^2, to which is secured a broader and independent band f^3 by means of bolts f^4. A transverse shaft D is secured in bearings attached to the outer rear portion of the upper section, and on the ends of said shaft are mounted wheels D' D', each of which is provided with a periphery upon which are secured at certain regular points transverse wire prongs *g*.

Upper and lower transverse shafts F F' are supported in the bearing-boxes *e e*. The lower shaft F' has its ends projecting beyond the side of the section A, to have rigidly mounted thereon a pair of large sprocket-wheels G G, which are adapted to revolve in unison with the wheels D' D' through the medium of two chain connecting-belts G' G'. To the inner side of one of the wheels G is secured an annular section G^2, which is provided with a series of perforations *g'*, into one or all of which horizontal pins g^2 are adapted to be inserted. The upper shaft F carries four arms g^3 g^4, the inner pair of arms g^3 being vertical and arranged at right angles to the outer pair of arms g^4, which are disposed substantially horizontally.

An annular casting *h* is bolted to the upper face of the bar E^2, near each side thereof, and within said casting is located a centrally-journaled valve-plate *h'*, provided with an annular series of perforations h^2, each of which is adapted to successively register with a single opening in said casting *h*. The upper free end of the plate *h'* is provided with a marginal series of ratchet-teeth h^3, which are designed to be engaged by a gravitating pawl h^4, secured to and extending horizontally from the upper end of the adjacent arm g^3. A lug h^5, formed on the casting *h*, has pivoted thereto a dog h^6, which rides on and engages the ratchet-teeth of the casting and prevents any

backward rotation of the latter during the retraction of the pawl h^4.

The opening in the base of the casting h communicates with the upper end of an inclined feed-tube H, the lower portion H′ of which depends vertically to connect with and form the heel of a longitudinally-disposed runner H^2, the forward part of which curves upward and is bolted to the under side of the front bar of the front section. Brace-rods i i' are bolted at their upper ends to one of the transverse bars of the front section, and have their lower ends connected to a plow or shovel I, which is arranged in advance of the breast of the runner. Said shovel is further adjusted with respect to the runner by means of short vertical straps i^2, which are bolted to the runner.

The outer arms g^4 of shaft F are each provided with a projection which engages one of a series of perforations in a vertical rod j, extending down into the vertical portion of the seed-tube, as shown. The lower end of each tube adjacent to the heel of the runner is provided with a valve-seat j', through which the rod plays, the lower end of the latter being provided with an enlargement j^2, the upper face of which is conical to fit the under side of said seat, while a second enlargement j^3 is loosely mounted on said rod, but is connected thereto by means of a spiral spring j^4. The advantage of this special valve arrangement consists in the fact that normally the spring j^4 holds the enlargement j^3 against its valve-seat, so that a definite quantity of grain is fed thereto and retained therein until the point of location of the hill is reached. As the vertical rod is elevated through the medium of arm g^4, its shaft F, and a tappet device to be described hereinafter, the valve-seat will be closed from the under side, so that the seed can pass beneath said upper enlargement. The descent of the rod closes the valve from its upper side, effects the descent of the lower enlargement, and also causes it to act to keep the heel of the runner clear.

The hopper or seed-box J is removably secured on the upper face of the bar E^2, and is provided with a removable bottom J′, which is prevented from rising by means of ears J^2 located therein, an extended piece j^3 being secured at one side below the plane of the removable bottom to guide the movements of the pawl. The bottom J′ has a central opening provided with a depending flange J^4, at one side of which is formed a projection J^5, which serves to shield the discharge-opening and also prevent each individual valve-opening from delivering more than its definite amount to the said discharge-opening.

The tappet device previously alluded to consists of a circular disk K, mounted on the end of the upper shaft F, and is provided with a radially-extending pin k, adapted to be struck by the pin or pins g^2, carried by the annular casting bolted to the adjacent sprocket-wheel. A second pin k' projects laterally from the side of said disk, and is adapted to contact with a pin k^2 on the shaft F when said disk is turned in a forward direction.

A torsional spring k^3 is secured at one end to the shaft F, while its other end is secured to the disk, so that the latter can have a limited reverse movement on said shaft, but be automatically restored to position when released.

For planting in hills, two pins g^2 are arranged in the annular casting G^2, attached to the side of the sprocket-wheel G, the said pins being diametrically opposite to actuate the devices twice to one revolution of said wheel, and both of said sprocket-wheels are provided at points on the outer side with lateral projections L L, which serve to mark the ground beside the hills and thereby indicate the planted position of the same. On each sprocket-wheel and adjacent to one of the projections L thereof is located a weight L′, which when said wheel is in an elevated and inoperative position causes it to center, so as to be in proper position upon the resumption of the marking operation.

Two parallel center bars $l\,l$ of the front section B are rearwardly extended for the pivotal attachment between them of short links m, the upper end of which has pivotally connected therewith a horizontal curved lever M, intermediately pivoted in a bearing m' on the main axle. This bearing m' may be provided with a vertical series of perforations in order to vary the adjusted height of the lever. The front extremity of the said curved lever M has rigidly attached thereto a transverse foot-plate m^2, while a portion of said lever extends through the slot of a curved seat-sustaining spring c and is pierced transversely by a short pin to prevent its disengagement from a vertically-curved bar c', pivotally connected at its upper end to the spring. Immediately in front of said bar the said curved lever is also provided with a transverse plate m^3, which in conjunction with the end pin prevents either a forward or rearward movement of said lever with respect to said bar. It will be noticed that the lower portion of the seat-sustaining spring is vertically slotted for the passage of the curved lever.

In operation the seed in the hoppers enters the pockets in the rotating valve-plate, and as the machine moves the pins on the side of the sprocket-wheel intermittently contact with the pin on the disk of the upper shaft F and cause the pawl-connections of the same to rotate the valve-plates of the respective hoppers to the extent of one pocket. Simultaneous with the operation of the valve-plates the outer pair of arms on the shaft F cause the descent of the rods in the seed-tubes and effect the discharge of the seed and the clearance of the heel of the runner as previously explained.

Should it be desired to convert the machine into a seed-drill, it will only be necessary to insert pins in all the perforations in the annular casting G^2 on the inner side of the sprocket-wheel, so that the actuation of the valve and of the plunger devices in the seed-tube may be more rapid.

It will be understood that by changing the engagement of the projections of the outer arm on the upper shaft F with the perforations of the vertical rods in the seed-tubes the extent of the descent of the latter may be increased or diminished.

When it is desired that the rear wheels D′ D′ should move in direct contact with the ground, the depending strap hung from the rear side of the seat-frame is disengaged from the rear bar of the frame carrying said rear wheels, so that they can be lowered to the desired extent.

While I have shown the rear shaft D, with sprocket-wheels D′ D′ and chain belts for actuating the wheels G G, I do not herein specifically claim the same, as it will be apparent that any suitable driving devices may be used instead.

I claim—

1. The combination, in a corn-planter, of the front and rear sections A B, pivotally connected relative to each other, the rear section having the carrying-wheels, seat-supporting frame, and driving-wheels, and the seed-hoppers and valved devices located on the front section, and upper and lower transverse shafts bearing in said front section, the former operating the valve devices and provided at one end with a spring projection, and the lower shaft carrying suspended wheels geared to the rear driving-wheels and having a pin to intermittently contact with the projection of the upper shaft, substantially as set forth.

2. The combination, in a corn-planter, of the front and rear sections A B, pivotally connected relative to each other, the rear section having the carrying-wheels, seat-supporting frame, and driving-wheels, seed-hopper, rigid annular casting of the seed-wheel provided with marginal ratchet-teeth, a torsional spring-shaft having a pawl to engage said ratchet-plate, a spring-yielding pawl at one end, and a lower transverse shaft having a pin to intermittently contact with said spring-pawl and provided with suspended wheels geared to the rear driving-wheels, substantially as set forth.

3. The combination, in a corn-planting machine, of the seed-hopper and valve and seed-tube depending therefrom, the valve-seat located in said seed-tube, a rod extending through said seat and having upper and lower valve, a torsional spring, a transverse shaft and arms connected to said rod, and two sprocket-wheels for intermittently vibrating said shaft, substantially as set forth.

4. The combination, in a corn-planter, of seed-valves and operating mechanism, a seed-tube provided with an internal valve-seat, a rod playing therethrough and having a terminal valve, and an upper spring-seated valve mounted to slide on said rod, and means for reciprocating the latter, substantially as set forth.

5. The combination, in a corn-planter, with the seed-valve, transverse shaft, and gravity-pawl, of a sprocket-wheel having an annular section thereto attached and provided with projections, and a disk mounted on the end of said shaft and connected thereto by a torsional spring, and adapted to be operated by the projections on the annular section of the sprocket-wheel, and having a lateral pin to engage a pin on said transverse shaft, substantially as set forth.

6. The combination, in a corn-planter, of the rear driving-wheels, an upper torsional spring-shaft provided with a valve-operating pawl, together with an end pawl, a lower shaft having suspended wheels geared to the rear driving-wheels, one of said suspended wheels being provided with a pin to intermittently contact with the end pawl, a circular valve-plate, and seed-hopper, the latter being provided with an extended portion to guide the valve-operating pawl, substantially as set forth.

7. The combination, in a corn-planter, of the front and rear sections A B, pivotally connected together, a rear extended portion of said front section connected to a curved lever by a link, said curved lever being pivotally mounted in bearings on the main shaft of the machine and having the foot-plate at its front extremity, and a slotted arm embracing the rear end of said curved lever to control its movements, together with a slotted seat-standard through which the foot-lever plays, substantially as set forth.

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

ABIJAH H. HULL.

Witnesses:
J. S. JOHNSTON,
J. H. GILLESPIE.