(No Model.) 3 Sheets—Sheet 1.

J. M. NORMAND.

PLANTER.

No. 455,290. Patented June 30, 1891.

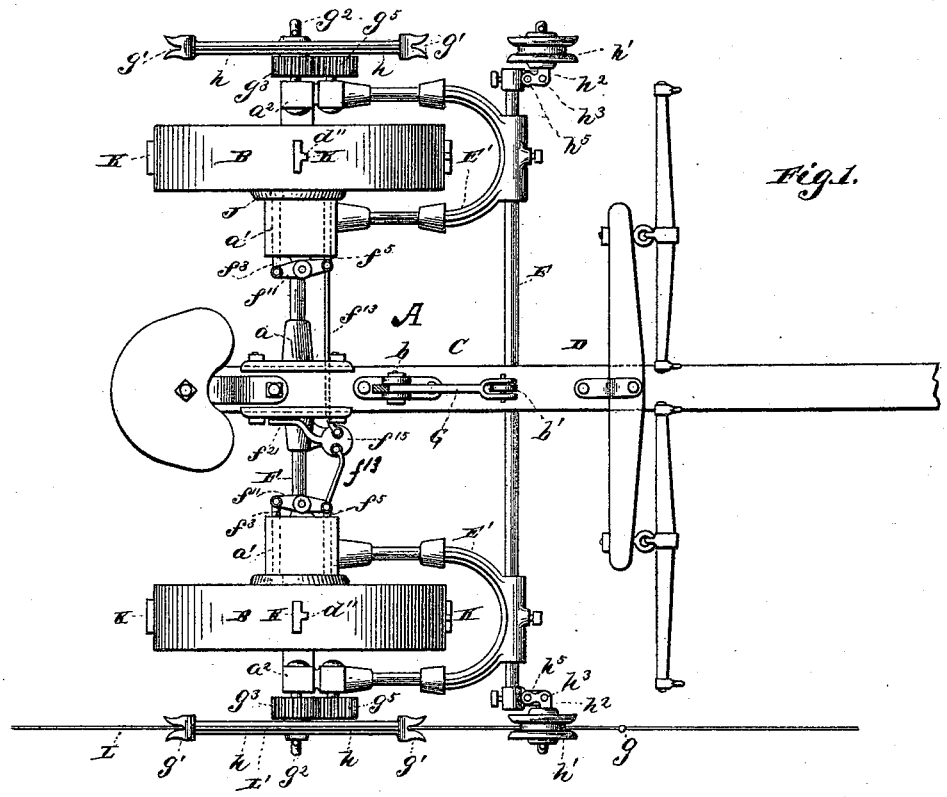
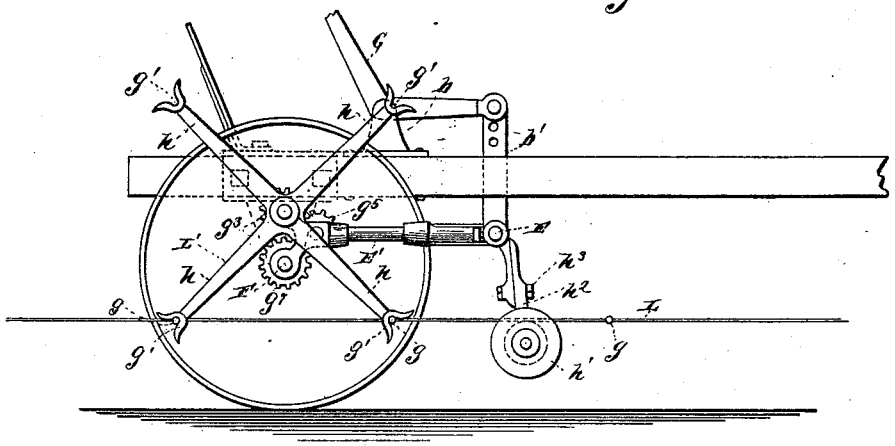


Fig. 1.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

J. M. NORMAND.

PLANTER.

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Fig. 3.

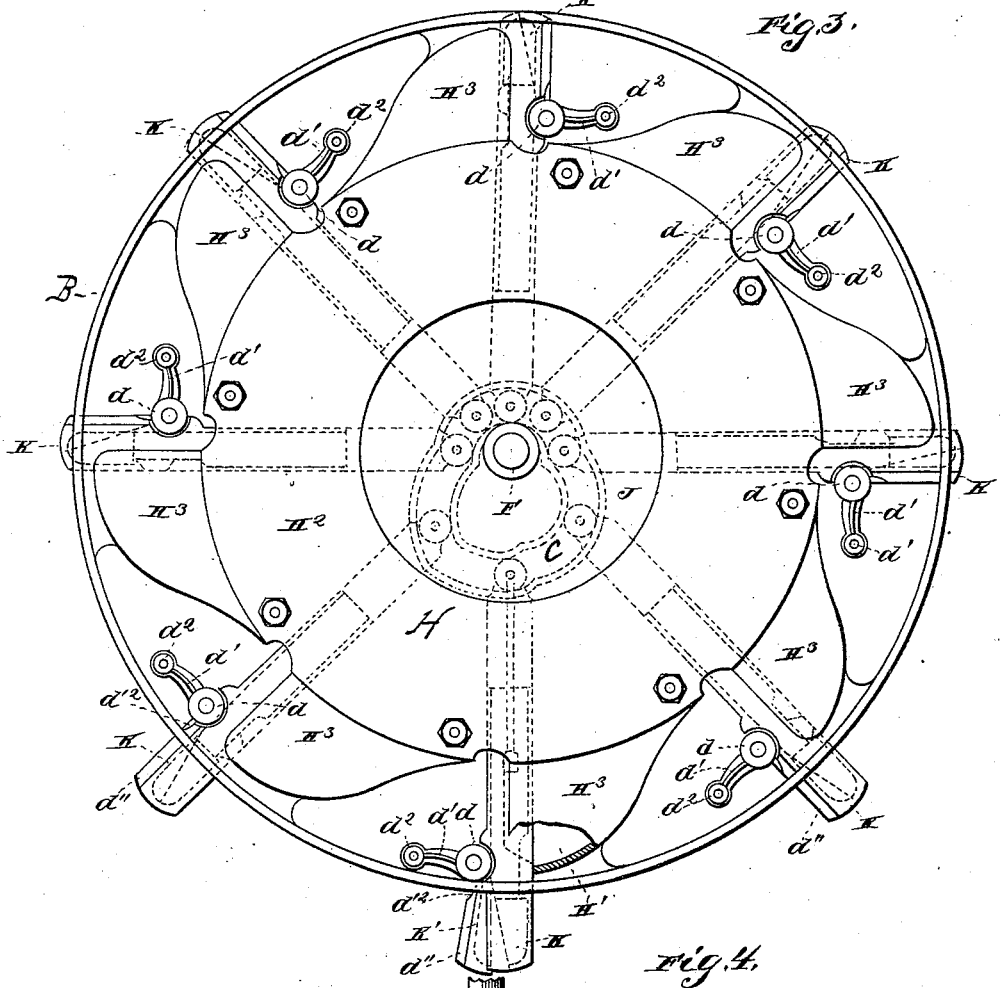
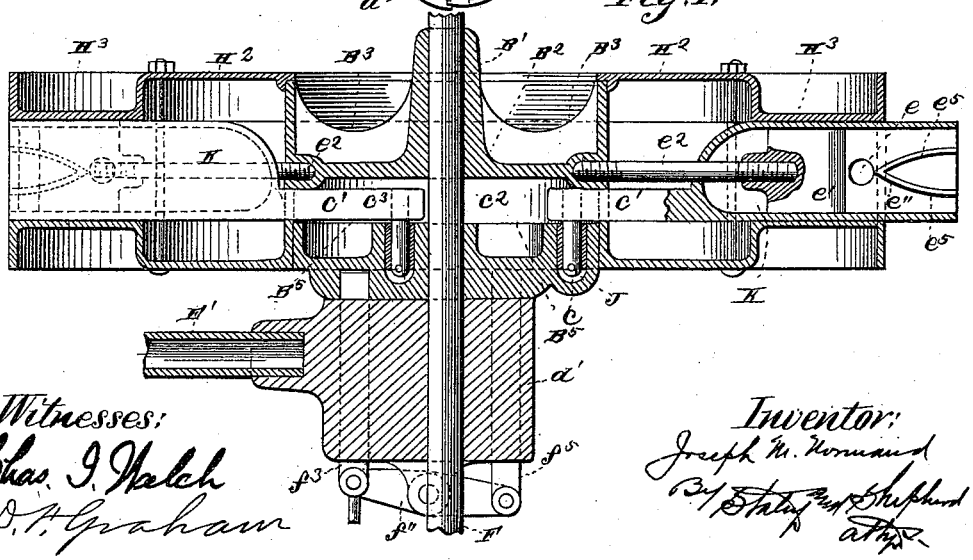


Fig. 4.



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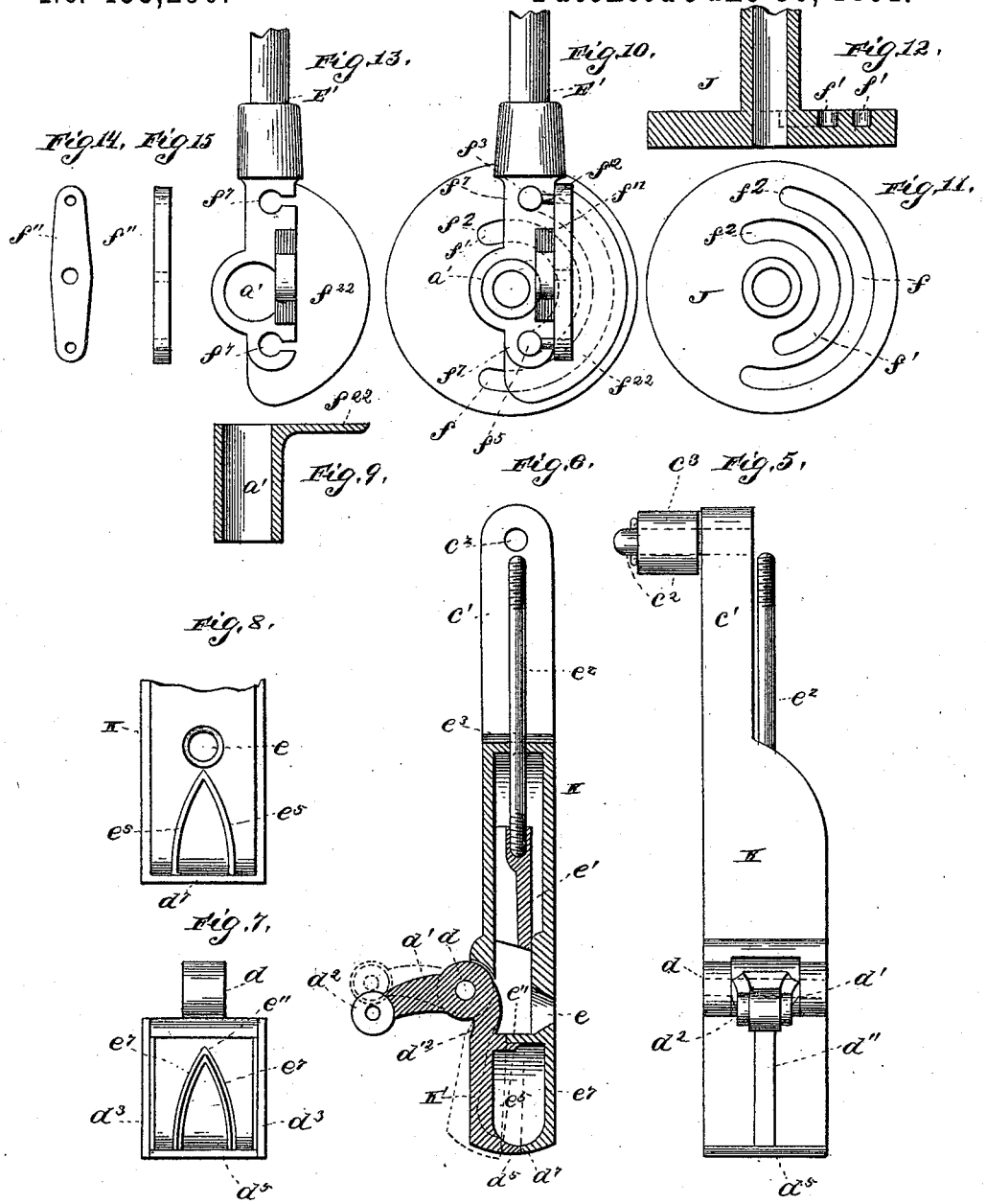
(No Model.) 3 Sheets—Sheet 3.

J. M. NORMAND.

PLANTER.

No. 455,290. Patented June 30, 1891.



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UNITED STATES PATENT OFFICE.

JOSEPH M. NORMAND, OF SPRINGFIELD, OHIO.

PLANTER.

SPECIFICATION forming part of Letters Patent No. 455,290, dated June 30, 1891.

Application filed December 24, 1890. Serial No. 375,672. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. NORMAND, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Planters, of which the following is a specification.

My invention relates to improvements in planters; and it especially relates to that class of planters in which the grain-receptacle is located within the supporting-wheels, and the planting and spacing accomplished by the revolution of said wheels, the accuracy of the planting being determined or the error of the spacing corrected by means of an independent controlling or checking device.

My invention consists in the various constructions and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a side view of one of the planting-wheels. Fig. 4 is a sectional view of the same. Figs. 5, 6, 7, and 8 are detail views of the dropping-plungers. Figs. 9 to 15, inclusive, are detail views of the cam operating or shifting mechanism.

Like parts are indicated by similar letters of reference in the several views.

In the accompanying drawings, A A represents the main frame; B B, the planting-wheels; C, the tongue, and D the doubletrees or hitch through which the power is applied.

The main frame consists, essentially, of a transverse bar E, which may be formed tubular or solid, round or square, as preferred, and U-shaped auxiliary frames which are connected to said rod or bar and pass around the front and at each side of the respective planting-wheels B B. The planting-wheels are each connected rigidly to a main axle F, which passes through a suitable central bearing a on the tongue C and auxiliary bearings a' a^2 on the extremities of the U-shaped frames E'.

Means are provided for tilting the machine or raising and lowering the tongue by an operating-lever G, pivoted in a suitable bearing b on the tongue C, and connected by a suitable link b' to the transverse bar E, any suitable well-known device being provided, if desired, for holding the lever G in any desired position of adjustment.

The planting-wheels B are each provided between the outer rim thereof and its hub with a hollow annular grain-receptacle H, which extends entirely around said wheel and forms a part thereof, the annular receptacle being provided at intervals about its periphery with depressions or pockets H', which extend outwardly therefrom to within a short distance of the outer periphery or rim of the wheel. One side of this annular receptacle H is formed in the nature of a removable cover H^2, having at intervals thereon projecting wings or flanges H^3, corresponding to the pockets H' and adapted to form one side of said pocket, the pockets being preferably drawn in or contracted so as to be of less width than the main receptacle, which is preferably constructed the full width of the outer periphery or rim of the wheel. The inner hub B' is connected to the walls of the grain-receptacle, and thence to the outer rim through the medium of a web B^2, and suitable strengthening-ribs B^3, forming a central core or spider, preferably formed wholly on one side of the center of the planting-wheel, leaving a corresponding opening or recess B^5 on the opposite side of the wheel. Supported on the main axle, and located within this central recess B^5, is a normally stationary cam J, the outer periphery of which is preferably formed to fit snugly within and close said recess, the said cam being provided with an inner camway or groove c, (shown in dotted lines in Fig. 3,) adapted to operate the movable plungers or planters in the manner hereinafter specified.

Each of the planting-wheels is provided in its outer rim or periphery with a series of openings, through which are projected movable hollow dropping-plungers K. These plungers are each extended through the annular grain-receptacle H, and provided with an extended portion c', projected through the inner wall of said receptacle into the central annular recess B^5, and provided with a stud c^2, carrying a suitable roller c^3, which rests and travels in the camway c in the normally stationary cam J. The conformation of the

camway *c* is such that as the planting-wheels are revolved the hollow plungers K are adapted to reciprocate through the outer rim or periphery of the said wheels, in the manner hereinafter more fully specified.

The plungers K are located, respectively, in front of the respective pockets H′, forming a part of the annular grain-receptacle H, the said plungers being preferably made of a width equal to the width of said pockets, and thus close the entire front of the same, the projecting portions H^3 of the cover H^2 being adapted to project over the edge of and partly cover the said plungers, the remainder of that portion of the plunger between the annular receptacle and the outer rim being exposed. The outer end of each of the hollow plungers K is provided with a movable side K′, pivoted to the main portion of the plunger at *d*, and provided with an outwardly-extending arm *d′*, in which is journaled an anti-friction roller d^2. The pivoted or movable side K′ is provided with laterally-projecting flanges d^3, adapted to overlap or telescope with the sides of the main part K of the plunger, and also with a curved projecting lip or flange d^5 at the outer end, adapted when in a closed position to meet a corresponding curved lip or flange d^7 on the main portion of the plunger, and thus close the end of the same. The hinged or movable part K^2 of each plunger is also preferably provided with a longitudinal rib d^{11}, the opening in the periphery or rim of the planting-wheel being correspondingly formed to receive said rib and fit snugly around the same, as well as around the movable and main portions of the hollow plunger. Immediately under the projecting arm *d′* a small curved recess or depression d^{12} is formed in the rib d^{11}, and also in the side of the hinged part K′ of each plunger. As the plunger is moved out through the periphery of the wheel by the action of the cam, as before stated, the roller d^2 of the projecting arm *d′* comes in contact with the inner periphery of the outer rim, and causes the hinged part K′ to turn about its pivoted center, and thus open the outer end of the hollow plunger, the overlapping sides or flanges d^3 permitting the necessary movement of said hinged portion to form an opening at the end of the plunger E without opening the sides thereof. The opening of the plunger occurs when the recess d^{12} is passing through the rim or periphery. As the plunger is drawn in by the action of the cam the curved sides of this recess or depression acts as a cam-track to impart a quick closing movement to the hinged portion K^2 of the plunger.

As before stated, one side of each hollow plunger forms the front of and closes one of the pockets H′ of the grain-receptacle. This side of the plunger is provided with a perforation *e*, which extends through the walls of said plunger, and is normally open to the grain-receptacle through the pocket which communicates therewith.

Located within the hollow plunger and adapted to normally cover the opening or perforation *e* is a stationary plate *e′*, supported from the central hub or spider B^2 of the wheel by a connecting-rod e^2, which rod passes through a suitable opening e^3 in the inner end of the hollow plunger, and is preferably provided at its respective ends with right and left screw-threads, by which it is connected in suitable openings in the inner hub and in the plate, respectively, this being a simple form of connection adapted to support said stationary plates, and at the same time furnish means for adjusting the same to or from the center of the wheel to cause them to register properly with the openings or perforations *e* in the side of the plunger. As the planting-wheel revolves, the cam J causes the plungers to be withdrawn through the rim of the wheel during that portion of the revolution at which the said plungers are at the top of the wheel or above the center of revolution, the plungers being gradually forced out as they pass below the center of revolution. During all this time the perforation or opening *e* is in communication with its pocket of the grain-receptacle and becomes filled with the grain therein. This outward movement of the plunger continues until the outer periphery of the roller d^2 has almost reached the inner periphery of the rim of the wheel, at which point the lower edge of the perforation or opening *e* is opposite the outer wall of the pocket H′ and the outer end of the stationary plate *e′*. In this position the plunger remains stationary until by the further revolution of the wheel it has assumed a substantially vertical position, when by the conformation of the cam-track a quick outward movement of the plunger is produced, which forces the plunger to the proper depth in the ground and causes the perforation e^2 to pass the plate *e′* on one side and the outer wall of the pocket H′ on the other, thus dropping the corn into the lower end of said hollow plunger, which, at the same time, is opened by the movement of the movable part K′, as before described, permitting the corn to escape through the outer end of said plunger. As the wheel continues its revolution the parts are returned to their normal positions, the first inward movement of the plunger causing the outward end thereof to be closed in the manner specified, after which, as the movement continues, the perforation is closed on one side by the plate *e′* and opened on the other into the grain-receptacle ready for a repetition of the operation.

By the use of the grain-receptacle having the pockets therein, as described, it will be seen that the grain to be planted is brought close to the periphery of the outer wheel before it is released or dropped from the grain-receptacle, so that it has but a short distance to fall when finally dropped by the action of the plunger, the conformation of the outer end of the plunger with the movable side

with the overlapping projecting flanges preventing any dirt or foreign substances from entering said plunger.

To prevent the corn from being bunched when dropped through the outer end of the hollow plunger, I provide on each side thereof dividing flanges or wings e^5 e^7. These dividing or scattering flanges in the respective sides of the plunger—*i. e.*, the stationary and moving sides—are adapted to overlap and telescope, and are preferably so shaped as to present a short sharp edge or apex e^{11} just below the perforation *e*, so that the grain is divided at this point and conveyed on each side of said dividing wings or flanges, and bunching of the grain when dropping through the outer end is prevented.

In the operation of this machine, as before stated, the plungers are all caused to reciprocate in and out through the outer rim or periphery of the planting-wheels, so that in the operation of planting they are projected outwardly and into the ground at the bottom portion of the revolution of the wheel and withdrawn at the top portion.

To provide for conveying or moving the machine from place to place without additional supports other than the planting-wheels, I furnish means for changing the position of the cam J, so that the operation of the plungers will be reversed—*i. e.*, projecting during the upper part of each revolution of the planting-wheel and withdrawn at the lower part—so that while the action of the plungers is continued no dropping of the grain is produced, and a smooth even periphery is secured at the bottom of the wheel adapted to travel on any ordinary road or other hard surface. This I accomplish as follows: The back of the cam is provided with two concentrical grooves *f* and *f'*, which are extended concentrically around the center of said cam slightly more than a semi-circumference, and each provided at one end with a stop-face f^2, adapted to contact with sliding stop-pins f^3 f^5, when moved into said grooves in the manner hereinafter more fully specified. These stop-pins f^3 f^5 are journaled and supported in suitable bearings f^7, located on each side and preferably slightly above the main bearing *a'* of the axle F. Pivoted to the top of the bearing *a'* is an oscillating bar f^{11}, connected at each end by suitable projections f^{12} to the respective stop-pins f^3 f^5, so that as the bar f^{11} is oscillated one of the pins is forced into and the other withdrawn from the respective grooves *f f'*. In the normal position of the cam when planting the pin f^3 is in the groove *f* and in contact with the stop-face f^2 thereof. By reversing the position of the pins—*i. e.*, withdrawing the pin f^3 and inserting the pin f^5—the cam is permitted to move one-half of a revolution about its center, being carried by the revolution of the wheel and the plungers therein, at which point it will come in contact with the stop-face f^2 of its groove *f'*, and hold the cam in this position. By again reversing the position of the pins the cam is permitted to make another half-revolution, thus completing the revolution back to its normal position, each movement changing the position of the cam, so that in one case the plungers will be operated during the lower half of the revolution of the planting-wheels, and in the other case during the upper half of the revolution thereof.

To provide for shifting the position of the cams for each of the planting-wheels simultaneously, I connect the rocking levers f^{11} by suitable connecting-rods f^{13} to a central revolving plate f^{15}, having a projecting lever or handle f^{22}, the said connecting-rods being pivoted to said plate in such a manner that as said plate is revolved upon its pivoted center the levers f^{11} are simultaneously operated to produce the proper movements of the stop-pins, as before described.

To provide for checking the dropping mechanism operated by the revolution of the wheels and to prevent an increase or decrease in the distance traveled during a given number of revolutions of said wheels, I employ a stationary check-wire L, stretched across the field in a well-known manner and having engaging projections *g*, which engage in V-shaped teeth *g'* of a check-wheel L', journaled on a suitable supporting-stud g^2 on the main frame and carrying a pinion g^3, which meshes with an intermediate pinion g^5, engaging with a gear or pinion g^7 on the main axle F, the gearing being such that the peripheral speed of the check-wheel L' and the planting-wheel B is the same, any error in the distance traveled by the planting-wheels being thus corrected.

I have shown in each planting-wheel eight movable plungers, adapted to plant a hill at an interval equal to one-eighth of the circumference of the wheel. It is obvious that any desired number may be used, the construction shown in the drawings being preferable for sowing corn or planting grain without reference in one row to the hills of another row. In planting corn, however, it is generally desirable that the hills in one row correspond or check with the hills of the other rows in order that the hills will be in line in either direction in a well-known manner and for obvious reasons. To accomplish this I preferably use but two plungers, arranged diametrically-opposite to each other in the planting-wheel and separated by a distance on the circumference of the wheel equal to the distance between the hills to be planted, usually about forty-two inches.

To provide for checking the planting-wheels and especially to provide for starting said wheels at the end of each row, so that the hills in said row will check with the next preceding row, I preferably construct the check-wheel L' in the nature of a star-wheel, with four projecting arms *h*, arranged on their outer extremities with notched V-shaped teeth *g'*. The distance between the respective arms,

there being four, represents one half the distance between the hills to be planted and the projections g on the check-wire, are formed a corresponding distance apart—in the present case twenty-one inches. The check-wire is held in position to contact with the outer extremities of the arms h below the center of their revolution by a guide-wheel h', having a grooved periphery through which the wire is adapted to pass. It will be seen that by this construction in starting a new row it is only necessary to turn the planting-wheel until the check-wire L engages with the outer extremity of a given arm of said wheel, the check-wire being first properly located in the usual manner to insure the proper checking of the planter throughout said row.

I have shown two checking devices arranged in proximity to each wheel. It will be seen, however, that each one of said devices controls both planting-wheels through the axle F, the checking device on one side of the machine being used in going in one direction across the field, and that on the opposite side of the machine being used for convenience in going in the opposite direction. It is obvious, however, that one device may be used in all cases, if desired. The guide-wheel h' is preferably supported on a hanger h^2, pivoted at h^3 to a suitable support on the transverse bar E in the main frame, a removable pin or catch h^5 being adapted to be withdrawn to permit the hanger to turn on its pivoted center to release the check-wire L.

Means may be employed for connecting the removable pin h^5 to a convenient point within the reach of the driver by a foot-lever, or otherwise, so that at or near the end of the row, by withdrawing said pin or catch, the check-wire may be discharged from the check device until the row is finished and the machine brought into position for a new row, the distribution of the weight of the guide-wheel on the hanger being such that it will be dropped by gravity when the hanger is released, so as to assume a position at one side of the line of the check-wire, and thus discharge the same.

To guard against dirt or other foreign substances entering the stop-grooves f and f' of the cam J, I preferably provide on the bearing-support, which carries the sliding stop-pins f^3 f^5, a projecting flange f^{22}, cast or otherwise formed integral with said bearing-support and adapted to project up and cover the concentric grooves f and f'.

It is obvious that a machine such as described herein admits of various modifications in the arrangement of parts and the mechanical constructions. I do not, therefore, limit myself to the arrangements and constructions shown herein; but

I claim as my invention—

1. In a planter, a planting-wheel having a grain-receptacle with pockets formed in the peripheral walls of said receptacle, said pockets being extended beyond the peripheral walls of the body of said receptacle, in combination with the dropping mechanism arranged adjacent to said pockets, substantially as specified.

2. The combination, with a revolving wheel and a stationary cam, a grain-receptacle in said wheel, and a hollow plunger adapted to be reciprocated by said cam so as to communicate with said receptacle through a perforation in the wall of said plunger, of a stationary plate in said plunger adapted to normally cover said perforation, substantially as specified.

3. The combination, in a planter such as described, with a grain-receptacle, of a hollow movable plunger having a perforation therein adapted to communicate with said grain-receptacle, and a stationary plate located within said plunger and adapted to normally cover said opening, substantially as specified.

4. The combination, with a planting-wheel having a grain-receptacle, of a hollow plunger having a perforation therein adapted to communicate with said receptacle, and a stationary plate in said hollow plunger to normally close said opening, and means for reciprocating said plunger past said plate to cause the opening to communicate with the interior of said plunger, substantially as specified.

5. The combination, in a planting-wheel having a grain-receptacle, of a hollow plunger normally closed at its outer extremity and provided with a perforation adapted to communicate with said grain-receptacle, a stationary plate within said hollow plunger, adapted to normally cover said opening, and means for opening the outer extremity of said plunger as the same is reciprocated to cause said opening to communicate with the interior thereof, substantially as specified.

6. The combination, in a planting-wheel having a grain-receptacle with extended recesses or pockets, as described, of a reciprocating hollow plunger arranged adjacent to one of said pockets, a perforation in the walls of said plunger, adapted to communicate with said pocket, and a stationary plate within said plunger, adapted to normally cover said perforation, said plunger being provided at its outer extremity with a hinged or movable side adapted to be operated by the movement of said plunger when the perforation has been uncovered by said plate, substantially as specified.

7. The combination, with a planting-wheel having a grain-receptacle and a series of movable plungers with perforations adapted to communicate with said grain-receptacle, of a stationary cam for operating said plungers, a stationary plate suspended within each of said hollow plungers by a detachable connection from said wheel, so as to register with and normally cover said perforations, and a hinged or movable side at the outer extrem-

ity of said plunger, adapted to be moved to form an opening in the same when said plunger is reciprocated, substantially as specified.

8. The combination, in a planting-wheel having a grain-receptacle and extended pockets, of a movable plunger and a stationary plate suspended within said plunger, a perforation in the wall of said plunger adapted to communicate with said pockets, and a hinged side on said plunger adapted to contact with the periphery of said planting-wheel when the plunger is moved outwardly, substantially as specified.

9. In a planting-wheel having a grain-receptacle, a hollow plunger adapted to project through the periphery of said wheel to form a conduit for the grain admitted from said receptacle, and a hinged movable side on said plunger, having projecting flanges to overlap with the sides of said plunger and adapted to be moved to form an opening in the extremity of said plunger, substantially as specified.

10. The combination, in a planting-wheel having a grain-receptacle, of a hollow plunger or conduit extending through the periphery of said wheel, means for communicating the interior of said plunger with said grain-receptacle, and a hinged or pivoted side on said conduit adapted to be opened to form a communication through the end of said conduit, the hinged and stationary parts of said conduit being provided with overlapping edges adapted to close the sides of said conduit when the movable part is operated to form an opening in the extremity thereof, substantially as specified.

11. The combination, in a planting-wheel having a grain-receptacle, of a hollow plunger or conduit and means for establishing a communication with said conduit and the grain-receptacle, and an outer extending portion having a hinged or movable side adapted to be operated to form an opening in the outer extremity of said conduit, the movable and stationary parts of said extended end being provided with scattering and dividing projections to divide the grain in its passage through said conduit, substantially as specified.

12. The combination, with a grain-receptacle and a hollow conduit or plunger adapted to communicate with said grain-receptacle, of a stationary plate within said hollow plunger adapted to cut off the communication between said grain-receptacle and said hollow plunger, a movable side on the outer extremity of said plunger having overlapping flanges to telescope with the sides of the stationary part of said plunger, and scattering or dividing flanges arranged in the respective parts of said plunger and adapted to overlap or telescope, substantially as specified.

13. The combination, in a planting-wheel having a grain-receptacle, of the plungers K, having perforations *e*, stationary plates *e'*, hinged sides K', and projecting arms *d'*, substantially as specified.

14. The combination, in a planting-wheel having a grain-receptacle, of a movable hollow plunger K, having a perforation *e*, stationary plate *e'*, adjustable connection e^2, hinged portion K', projecting arms *d'*, and overlapping flanges d^3, substantially as specified.

15. The combination, in a planting-wheel having a grain-receptacle, of a hollow movable plunger having a perforation in the wall thereof, a stationary plate to cover said perforation, a hinged movable part having a projecting arm and overlapping side flanges, and overlapping scattering projections or dividing-flanges, substantially as specified.

16. The combination, with a planting-wheel having a grain-receptacle and one or more dropping devices adapted to form a communication from said grain-receptacle to the outer periphery of said wheel, of a stationary cam for operating said dropping devices, and a detachable holder adapted to release said cam and cause it to revolve a portion of a revolution to advance or retard the operation of the dropping mechanism in the revolution of the wheel, substantially as specified.

17. The combination, with a planting-wheel having a grain-receptacle and a dropping mechanism, as described, of a normally-stationary cam adapted to operate said dropping mechanism at different points in the revolution of said wheel, and a holding device adapted to permit said cam to revolve a portion of a revolution to advance or retard the operation of said dropping device, substantially as specified.

18. The combination, with a planting-wheel having a grain-receptacle and one or more hollow conduits leading from said receptacle to the periphery of said wheel, of a normally-stationary cam adapted by the revolution of said wheel to establish a communication between the grain-receptacle and said conduits, and a holding device having movable projections adapted to release said cam at one point and engage it at another to change the point of operation of said dropping mechanism in the revolution of the wheel, substantially as specified.

19. The combination, with a planting-wheel having a grain-receptacle and the hollow movable plungers forming a communication from said grain-receptacle to the periphery of the wheel, of a normally-stationary cam adapted to operate said plungers and a holding device having holding projections adapted to release said cam at one point and engage it at another to change the point of operation of said plungers in the revolution of the wheel, substantially as specified.

20. The combination, in a planting-wheel having a grain-receptacle, of a series of movable plungers operated by a normally-stationary cam to project through the periphery of said wheel and establish a communication through the same with the grain-receptacle, and a holding device having engaging pro-

jections adapted to release said cam at one point and engage it at another, substantially as and for the purpose specified.

21. The combination, in a planting-wheel, with the movable plungers and a grain-receptacle, of a normally-stationary cam, movable sliding projections adapted to engage said cam at different points, a pivoted bar connecting said sliding projections, and means for operating said bar to cause a simultaneous movement of said engaging projections, substantially as specified.

22. The combination, with a planting-wheel having a grain-receptacle and a dropping device, as described, of a normally-stationary cam J, having stop-faces f^2 and engaging projections $f^3 f^5$, and means for simultaneously moving said engaging projections to release the cam at one point and engage it at another, substantially as specified.

23. The combination, with a planting-wheel having a grain-receptacle and a conduit forming a communication from said grain-receptacle at intervals in the outer periphery of the wheel, of a check-wheel connected to said planting-wheel, so as to move at the same peripheral speed therewith, and a stationary checking device having engaging projections at intervals thereon, said checking-wheel being formed with projecting arms to permit the checking device to extend from one of said arms to the other on the chord of an arc, substantially as specified.

24. The combination, with a planting-wheel having a planting device at intervals on the periphery thereof, of a check-wheel connected to said planting-wheel and consisting of projecting arms arranged at a distance apart equal to one-half the distance of the planting projections, and a stationary engaging-wire to engage said check-wheel, substantially as specified.

25. The combination, with a planting-wheel having a planting device, substantially as described, at intervals on the periphery of said wheel, of a check-wheel connected to said planting-wheel, so as to revolve at the same peripheral speed therewith, said check-wheel being formed in the nature of a star-wheel, with projecting arms having notched extremities separated from each other by a distance equal to the distance between the planting projections or a multiple thereof, and engaging projections on said check-wire adapted to engage with the arms of said wheel, substantially as specified.

In testimony whereof I have hereunto set my hand this 20th day of December, A. D. 1890.

JOSEPH M. NORMAND.

Witnesses:
PAUL A. STALEY,
L. F. YOUNG.