

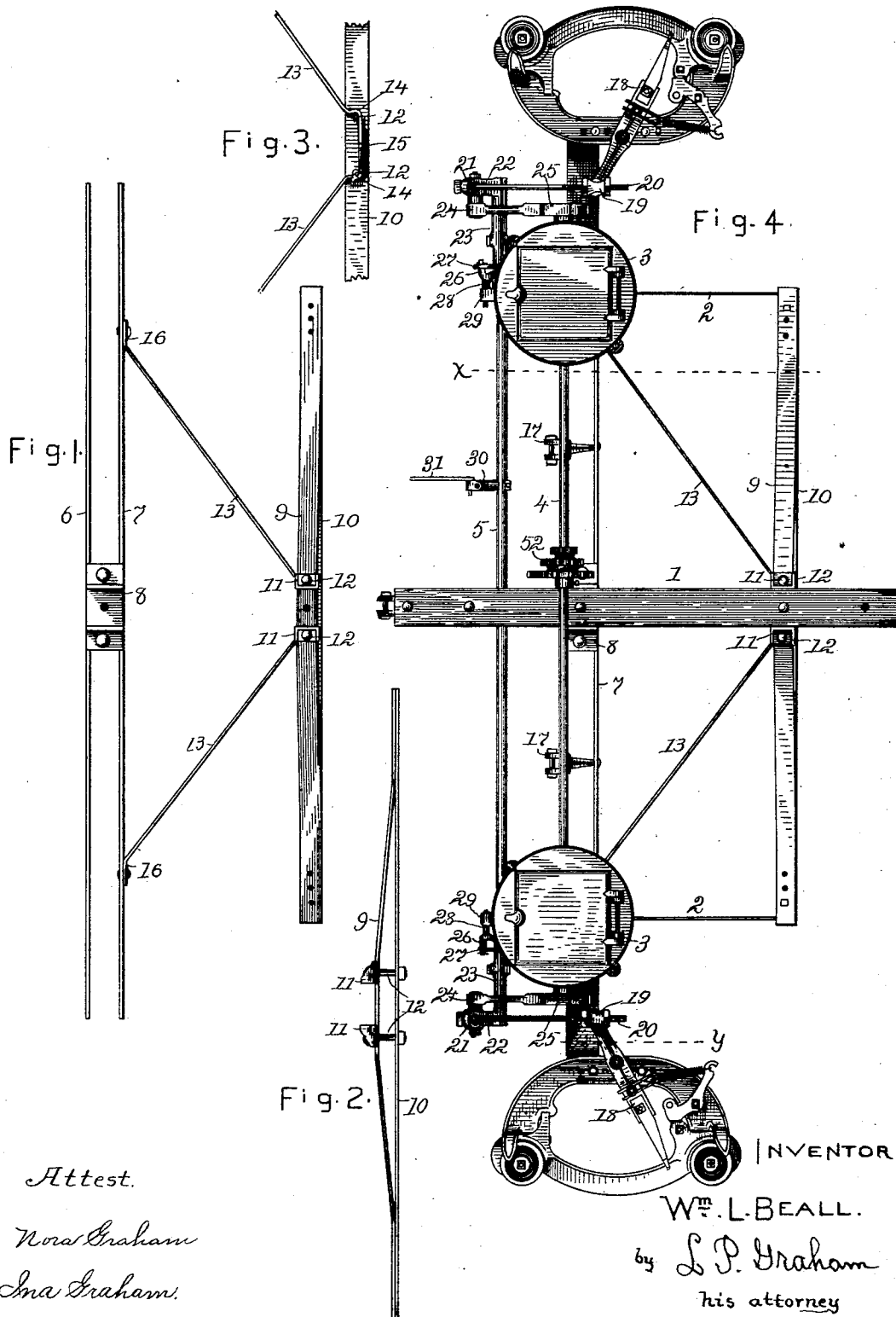
(No Model.)

2 Sheets—Sheet 1.

W. L. BEALL.
CORN PLANTER.

No. 587,694.

Patented Aug. 10, 1897.



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Fig. 5.

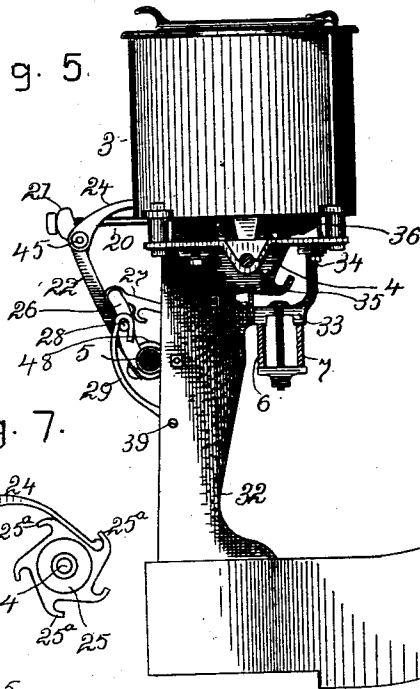


Fig. 7.

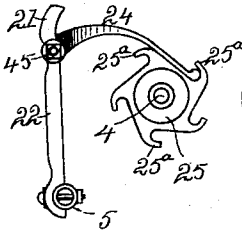


Fig. 6.

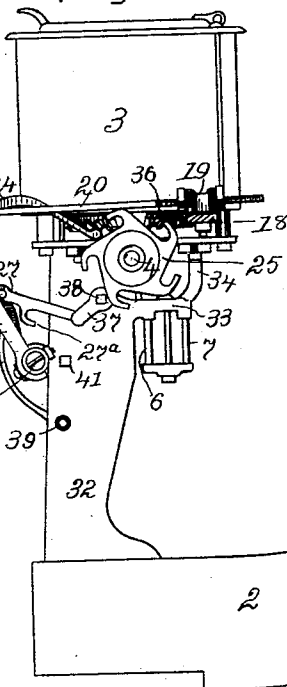
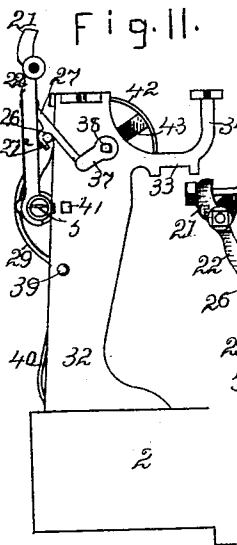


Fig. 11.



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Nora Graham
Ana Graham.

Fig. 10.

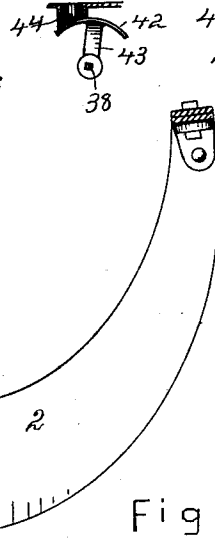


Fig. 8.

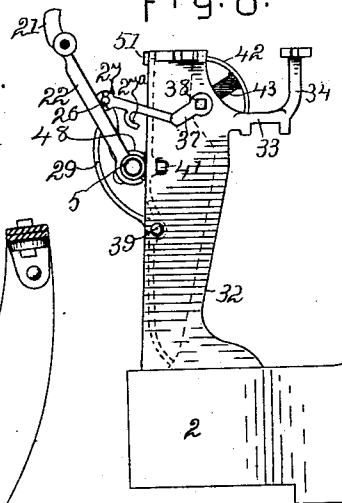


Fig. 12.

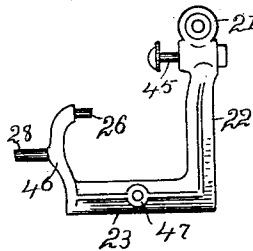


Fig. 13.

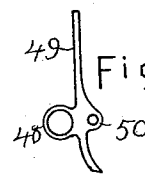
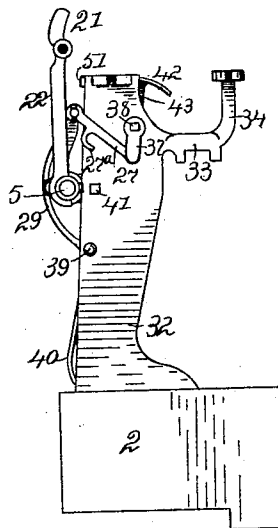


Fig. 9.



INVENTOR
Wm. L. BEALL
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his attorney

UNITED STATES PATENT OFFICE.

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MANUFACTURING COMPANY, OF SAME PLACE.

CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 587,694, dated August 10, 1897.

Application filed April 5, 1897. Serial No. 630,746. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. BEALL, of Albion, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Corn-Planters, of which the following is a specification.

This invention concerns the front or runner frame of a two-frame planter. It relates in part to the frame construction and in part to the dropping mechanism. It is exemplified in the structure hereinafter described, and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is a plan of the skeleton of the runner-frame. Fig. 2 is an elevation of the front bar of the frame. Fig. 3 is a diagram illustrative of the manner in which the diagonal braces are joined to the front bar. Fig. 4 is a plan of the front frame and the working mechanism thereof. Fig. 5 is a side elevation of the left-hand seedbox, runner, &c., on line *x* in Fig. 4. Fig. 6 is a side elevation of the right-hand seedbox, runner, &c., on line *y* in Fig. 4. Fig. 7 is a diagram illustrating in side elevation the manner in which the ratchets on the shaft that drives the seed-wheels are locked by the pawls at the termination of their throw. Fig. 8 is a diagram illustrative of the intermediate valves and the actuating mechanism therefor. Fig. 9 is a similar view showing the intermediate valve closed and the lower or final drop valve open. Fig. 10 is a detail showing how the intermediate valve obstructs the passage of the corn when it is closed. Fig. 11 is a diagram showing how the lower valve and the intermediate valve are held open when the planter is used for drilling the seed. Fig. 12 is a detail of one of the brackets or castings that imparts the motion of the rock-shaft to the dropping mechanism when the planter is used to drop the seed in check-rows. Fig. 13 is a detail showing one of the plates that close the upper portions of the rear sides of the shanks and provide bearings for the drop-actuating rock-shaft.

In constructing an embodiment of my invention I make a two-part front bar of truss formation, joining the parts at their ends and separating them throughout their intermediate portions somewhat as shown in Fig.

2. As a matter of preference the lower member 10 is straight and the upper one 9 is deflected to make the separation, but this is not essential, so far as the principle involved is concerned. A brace-bar 13 is made of substantially the form shown in Figs. 1 and 3. Its central portion is extended for a short distance between the members of the truss-bar at the center thereof and parallel therewith, as shown at 15 in Fig. 3. It is bent abruptly at the ends of the parallel portion, as shown at 14, and it extends from such abrupt bends obliquely outward and backward to the cross-bar that carries the seedboxes and planting mechanism, with which bar it connects, as shown at 16. Bolts 12 extend through the truss-bar inside the abrupt bends 14 of the brace bar, and they hold stay-brackets 11 on the upper surface of the truss member 9. The cross-bar that sustains the seedboxes, the check-row heads, &c., is preferably made of two parallel bars 6 and 7, which carry at their longitudinal centers a tongue-seat 8. The tongue 1 is fastened to the truss-bar between brackets 11, and it is fastened to the seat-block 8 between edges thereon. This constitutes the frame, and the novelty thereof resides in the peculiar correlation of the truss-bar and the braces therefor. The truss formation of the bar provides stiffness with little weight, the brace-bar is continuous and simple, and its conjunction with the truss is strong, durable, and easily made. The abrupt bends 14 partly encircle the bolts, and they hold the braces against lateral and forward stress, the parallel portion 15 resists backward strain on the braces, and the brace-bar limits the approach of the members of the truss toward each other while receiving pressure from the bolts. In other words, the parallel portion of the brace-bar serves as the central member or strut of the truss, the bolts of the truss draw the members of the truss against the brace-bar in a manner to stiffen the conjunction, and the bolts by passing through the abrupt bends of the brace effectively stay the conjoined parts against strain in all directions.

Runners 2 connect with the ends of the truss-bar and with the shanks 32 in the usual manner. The shanks have forward exten-

sions 33, that rest on and are secured to the cross-bar, composed of parts 6 and 7, and further extensions 34 rise to the front portions of the bases of the seedboxes 3. The seedboxes are supported from the upper ends of the shanks and from the extensions 34 in a manner not necessary to describe in detail, but which is shown in a general way in the drawings. The seed-disks of the boxes are toothed directly or indirectly, as suggested at 36. A shaft 4 extends across the frame under the seedboxes, and it has gear-wheels 35, which mesh with the teeth of the seed-disks. On the ends of shaft 4 are fixed ratchet-wheels 25, which are peculiar in that their teeth 25^a are undercut or hooked backward in their rear faces. A rock-shaft 5 is journaled in bearings 48, which are connected with the shanks by means to be hereinafter described, and arms 22 are fastened to the rock-shaft. Forked levers 18 are mounted pivotally on the check-row heads, and they connect pivotally with perforated blocks 19. Rods 20 are threaded each at one end, and each has a head on its other end. Their threaded ends extend through blocks 19, in which they are held by nuts bearing against opposite ends of the blocks, and their headed ends engage the heads of arms 22 through holes therein. Pawls 24 are pivotally connected with the swinging ends of arms 22, and their operative ends are adapted to fit into the recesses formed by the hooked teeth of the ratchet-wheels 25.

When a forked lever 18 encounters a knot on a check-row line as the planter is drawn across the field, the pawls 24 each engage a tooth 25^a of the ratchet-wheels, giving the shaft 4 a partial rotation and advancing the seed-disks one cell. A stop is made in the position and under the conditions illustrated in Fig. 7, where both the pawl and the ratchet-wheel are locked against further forward movement by the front end of the pawl bearing upward against the under surface of the tooth and the under surface of the pawl bearing against the plane surface, a part of which forms the front or advance portion of the next succeeding tooth of the ratchet-wheel—that is to say, the condition of the pawl and the ratchet-wheel at the end of the operative throw of each is such that neither can advance farther unless the pawl can be raised to permit such advance, and the pawl is held from rising by the arm at one end and the hooked tooth at the other end. In riding back to its primary position the pawl is not raised materially, or at least not suddenly, and there is no perceptible tendency to drag the ratchet-wheel backward or to throw the pawl backward out of working position. Moreover, the pawl may have the free lateral motion that results from the loose fitting that makes building easy and still do effective work. Still another advantage of the construction of the pawl and ratchet, and one that will be more apparent after further de-

scription of the planter, is that the hooked teeth permit a long initial inoperative movement of the pawl, and this motion is utilized in closing or nearly closing the intermediate valves before the seed-disks begin to move, thus assuring complete closure of such valves before the disks discharge their contents or the contents of the cells that pass over the discharge-openings.

The final-drop valves of the planter are shown at 40. They are pivoted to the shanks at 39, and above the pivots they extend outward and upward and terminate in hooks, as shown at 29. (See Fig. 5.) Arms 46 (designated only in Fig. 12) are fastened to the rock-shaft 5, and they have laterally-extending studs 28, which engage the hooks of the upper ends 29 of the final-drop valves 40. The arms 46 extend above the rock-shaft, as do also the hooked ends of the lower valves. The construction is such that the valves are closed when the shaft is in its normal position, and when the shaft is rocked by action of a check-row knot or other impulse they are swung open, as shown in Fig. 9. They are pivoted pretty low down in the shanks, and their lower portions only act as back walls or closures for the shank. Above the pivots of the valves are plates 49. (Shown in Fig. 13 and indicated in dotted lines in Fig. 8.) The lower ends of these plates rest against the pivots of the valves. Their upper ends fit behind lugs 51 on the upper ends of the shanks, and they are held in position by bolts 41, which extend through holes 50 of the plates and through the side walls of the shanks. The plates inclose the upper rear portions of the shanks, and in addition thereto they are provided with rearward-extending perforated or bored bearings 48 for the rock-shaft 5.

To insure accurate dropping, intermediate valves between the seed-disks and the final-drop valves are desirable, and these are in this instance constructed as follows: A shaft 38 is extended one through each shank at the upper end thereof and pretty well to the front, an arm 43 is fastened onto the shaft between the walls of the shank, and it has an arc-formed plate 42 on its outer end, the upper portion of which forms the valve, while the lower portion is adapted to rest on extension 33 of the shank and thereby form a stop. An arm 37 is fastened onto an end of shaft 38 alongside the shank, and a link 27 connects the arm 37 with a stud 26 on arm 46. The arm 37 extends downward from its shaft, and as the rock-shaft is moved forward in act of planting the upward-extending valve-arm 43 is swung upward and backward, with the result that the seed-passage is closed, (see Fig. 10, where the seed-passage is designated 44,) and such closure is effected at a time when the lower valve is open and the seed-disk is discharging grain from one of its cells. As the rock-shaft swings back to its primary position the final-drop valve closes, the inter-

mediate valve opens, and the grain on the intermediate valve falls to the lower valve preparatory to deposit in the furrow made by the runner. When the rock-shaft is in its primary or normal position, the final-drop valves are held tightly closed and the lower ends of the intermediate valves rest on the extensions 33 of the shanks.

The foregoing description of the operation of the planter has reference to dropping in check-rows by wire, by foot, or by hand. When it is desired to drill the seed, the intermediate valves and the lower valves are all held open in order that the seed may have free passage from the seed-disks to the ground. To provide for this, the links 27 have hooks 27^a formed at some little distance from their rear ends, and the valves are held open by disconnecting the ends of the links from studs 26 and catching the hooks over such studs, as shown in Fig. 11.

The arms of the rock-shaft are preferably made in two integral sets, as shown in Fig. 12. A saddle-bar 23 is adapted to fit around one side of the rock-shaft. It has a hole 47, through which a securing-bolt may pass. Arm 22 extends from one of its ends and terminates in perforated head 21, and arm 46 extends from the other end and has the laterally-extending studs 26 and 28 on opposite sides. A bolt 45 projects laterally inward from the head 21 of arm 22, and it provides a bearing for a pawl 24. This constitutes one of the sets of arms, and its advantage is that it is easily made, easily connected with the shaft, and as the bearings are all cast integral there can be but little if any chance of disadjustment. The other set of arms is the same as that described except that the relations are reversed, one set being right hand and the other left hand.

When the planter is used for drilling, the sprocket-wheel 52 provides means whereby motion may be imparted from the wheel-shaft to shaft 4 through the intervention of a chain.

In addition to the structure shown and described herein a complete planter will have a suitable wheel-frame, and brackets 17 in Fig. 4 provide means for connecting the wheel-frame with a runner-frame.

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

1. A front frame for planters, in which the front bar is truss-formed and a brace-bar forms the strut member of the truss.

2. A front frame for planters, in which the front bar is truss-formed, a brace-bar forms the strut member of the truss and bolts bind the members of the truss-bar onto the brace-bar.

3. A front frame for planters, in which the front bar comprises two members joined together at their ends and separated intermediately, a brace-bar extended for a short distance between the members of the front bar at the center thereof and parallel therewith,

such brace-bar having abrupt bends at the terminations of such parallel portions, and bolts extending through the members of the front bar in the abrupt bends of the brace-bar.

4. A front frame for planters, comprising a box-supporting cross-bar, a trussed front bar, a brace-bar forming the strut member of the trussed bar and connecting at its ends with the box-supporting cross-bar, and a tongue connected with both the cross-bars, substantially as set forth.

5. In a planter, a drop-actuating ratchet-wheel having undercut or hooked teeth, and a pawl adapted to engage the recesses of the teeth with its operative end and to bear intermediately against a salient portion of the wheel at the termination of an operative throw.

6. In a planter, a drop-actuating ratchet-wheel having undercut, or hooked, teeth and plane surfaces between teeth, and a pawl adapted to engage the recesses of the teeth with its operative end and to bear intermediately against a salient portion of the wheel at the termination of an operative throw, whereby the pawl locks the wheel at the end of its throw and rides back to its normal position without disarrangement of parts.

7. In a planter, the combination of a drop-actuating ratchet-wheel having undercut, or hooked, teeth, a rock-arm, a pawl on the rock-arm adapted to engage the recesses of the teeth of the ratchet-wheel with its operative end and to bear intermediately against a salient portion of the wheel at the termination of an operative throw, and a lever for actuating the rock-shaft.

8. In a planter, the combination of a shank, a rock-arm pivoted in the rear of the shank and having a laterally-extending stud, and a final-drop valve pivoted in the shank between its ends and having its upper end hooked around the stud of the arm.

9. In a planter, the combination of shanks, a rock-shaft journaled in the rear of the shanks, arms connected with the shaft and extended upward therefrom, laterally-extending studs on the arms, and final-drop valves pivoted in the shanks, extended past the shaft and hooked around the studs of the arms.

10. In a planter, the combination of shanks, final-drop valves pivoted in the shanks, between the ends thereof, and having their upper ends extended outward and hooked, plates fastened in the shanks above the pivots of the final-drop valves, a rock-shaft journaled in bearings extending rearward from the plates, arms extending upward from the shaft, and lateral studs on the arms engaging the hooks of the valves.

11. In a planter, the combination of shanks, seedboxes on the shanks having seed-dropping mechanism therein, rocking intermediate valves journaled in front of the grain-passages of the shanks and having backward-

closing swing, and means for actuating such intermediate valves, substantially as set forth.

12. In a planter, the combination of shanks, seedboxes on the shanks having dropping mechanism therein, rocking intermediate valves journaled in front of the grain-passages of the shanks and having backward-closing swing, downward-extending arms connected with the intermediate valves outside the shanks, rock-arms journaled in the rear of the shanks, and links connecting the rock-arms with the arms of the intermediate valves.

13. In a planter, the combination of a backwardly-closing intermediate valve, a backwardly-opening final-drop valve, and adjustable connections between the valves whereby each may act to hold the other open, substantially as and for the purpose set forth.

14. In a planter, the combination of shanks, seedboxes on the shanks having dropping mechanism, rocking intermediate valves journaled in front of the grain-passages of the shanks and having backward-closing swing, arms journaled in the rear of the shanks, final-drop valves connected with the rock-arms, and links between the intermediate valves and the rock-arms having different points of connection, whereby the valves may be operatively or inoperatively connected, substantially as set forth.

15. In a planter, the combination of rock-arms, rocking intermediate valves, final-drop valves connected with the rock-arms and links connecting the intermediate valves with

the rock-arms and having end eyes and intermediate hooks, substantially as set forth.

16. In a planter, the combination of shanks, seedboxes on the shanks having dropping mechanism, rocking intermediate valves journaled in the shanks and having rearward-closing throw, final-drop valves pivoted in the shanks and having their upper ends extended outward and hooked, a rock-shaft journaled in the rear of the shanks, arms on the shaft having lateral studs engaging the hooks of the final-drop valves and also having other lateral studs, and links connecting the intermediate valves with such other studs, substantially as set forth.

17. In a planter, and in combination with first-drop mechanism, intermediate-drop mechanism and final-drop mechanism; a rock-shaft, and an integral bracket, or casting, adapted to be fastened to the rock-shaft and having an actuating-arm for each of the drop mechanisms, substantially as set forth.

18. In a planter, and in combination with first-drop mechanism, intermediate-drop mechanism and final-drop mechanism; a rock-shaft, and an integral bracket, or casting, saddled to embrace a side of the rock-shaft and having an actuating-arm for each of the drop mechanisms, substantially as set forth.

In testimony whereof I sign my name in the presence of two subscribing witnesses.

WILLIAM L. BEALL.

Attest:

I. N. MILLER,
FRED T. LAWLER.