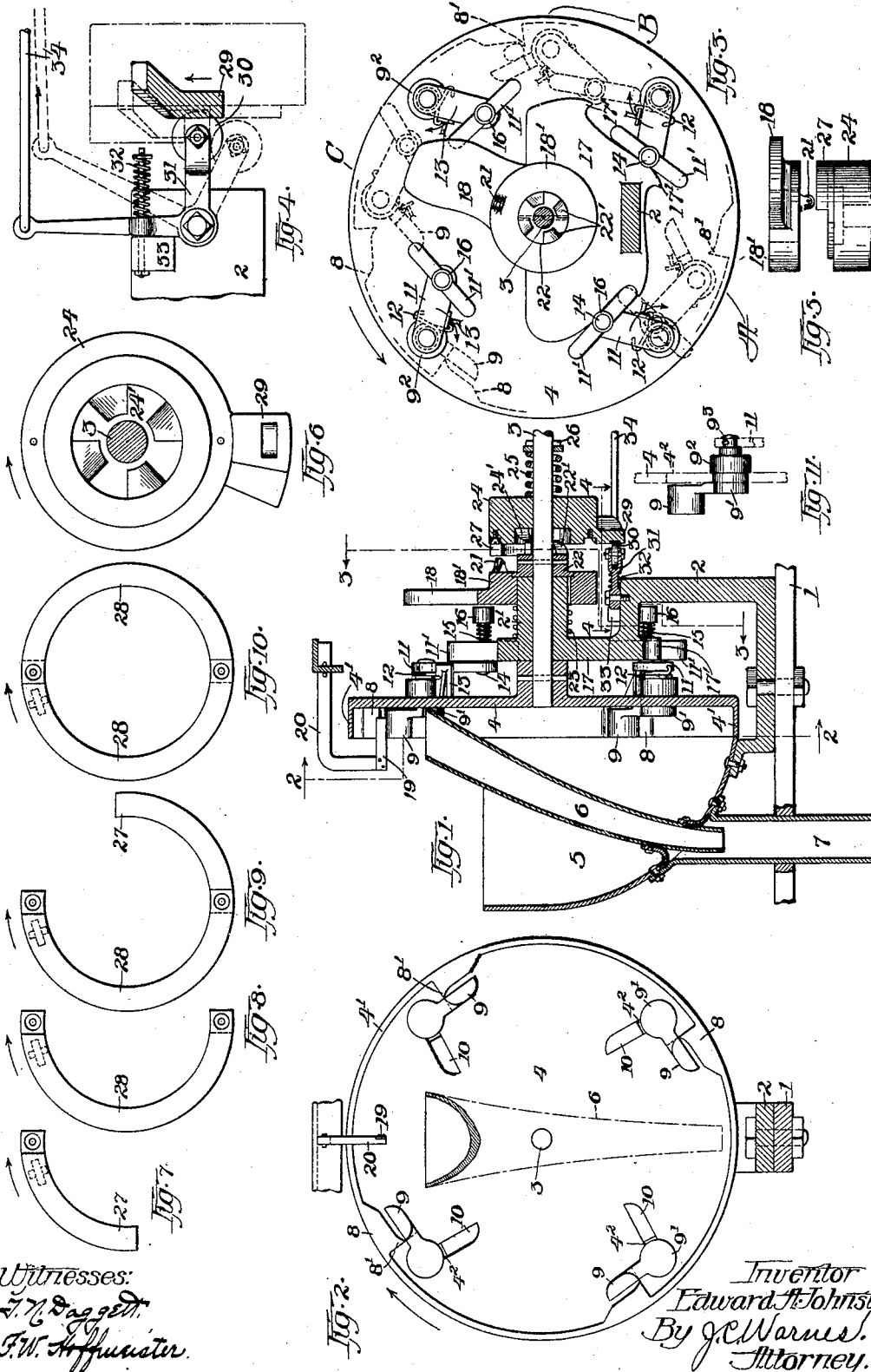


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E. A. JOHNSTON.
SEED DROPPING MECHANISM FOR CORN PLANTERS.
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UNITED STATES PATENT OFFICE.

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SEED-DROPPING MECHANISM FOR CORN-PLANTERS.

No. 831,352.

Specification of Letters Patent.

Patented Sept. 18, 1906.

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To all whom it may concern:

Be it known that I, EDWARD A. JOHNSTON, a citizen of the United States, residing at Sterling, in the county of Whiteside and State of Illinois, have invented a new and useful Improvement in Seed-Dropping Mechanism for Corn-Planters, of which the following is a complete specification.

It is well understood that the value of the seed-dropping devices in corn-planters depends upon the degree of accuracy with which they operate, and the lack of accuracy in such devices is the chief objection met.

The object of the invention is to produce a seed-dropping device of simple construction and one which will deposit the required number of grains of corn in each hill with unfailing precision.

The various features of the invention will be fully set forth in the following specification, pointed out in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a central transverse section through one of the seed-dropping devices, the one on the left-hand side of the planter being shown. Fig. 2 is an elevation, partly in section, of the front side of the vertically-disposed seed-disk and the seed-engaging devices mounted thereon, taken on the line 2 2 of Fig. 1. Fig. 3 is an elevation, partly in section, of the rear side of the same on the line 3 3 of Fig. 1, showing the means by which the seed-engaging devices are actuated. Fig. 4 represents a detail plan section on the line 4 4 of Fig. 1 and is designed to show the means for automatically actuating the clutch-shipping mechanism. Fig. 5 is a detail plan of one of the clutch members and the cam member operated thereby. Fig. 6 is an enlarged detail elevation of the engaging face of the clutch member shown in Figs. 1 and 5. Figs. 7 to 10 represent enlarged detail face views of the cam-segments which are employed to throw into an operative position the cam-plate which actuates the seed-engaging devices; and Fig. 11 is a detail of the movable jaw-spindle mounted on the cam-ring and seed-disk.

Referring to the several figures, 1 designates a member of the runner-frame, 2 a seed-box and operating-shaft support, and 3 the left-hand end of the operating-shaft jour-

naled in said support. A vertically-disposed disk 4 is fixed to the end of the operating-shaft 3, the disk being preferably provided with the outwardly-extending flange 4'. A seed-hopper 5 is mounted upon the support 2 adjacent to the seed-disk 4, the edge of the hopper lying closely adjacent to the flange 4' of the seed-disk and forming a continuous wall therewith. The seed-hopper is shaped like a half-cup, its side edge abutting the flange of the disk 4, to which it conforms in outline, and it extends a slight distance above the center of the disk, as shown. The seed-disk 4 is thus made to form one side of the hopper, and the hopper-bottom is of such shape that the seed will work down against the face of the lower side of said disk. A seed-conduit 6 leads from a position near the upper side of the disk and immediately adjacent thereto down through the seed-hopper 5, discharging into the seed-chute 7, which extends downwardly to and communicates with the runner-boot (not shown) in the usual manner. The seed-conduit 6 is shown centrally located with respect to the hopper; but this is a matter of convenience, as it might equally as well be deflected through one side of the hopper.

The operating-shaft 3 is rotated continuously through suitable connections (not shown) with the main supporting-shaft of the planter, and the seed-engaging means, which are mounted on the face of the seed-disk, are actuated mechanically and released through the check-lever.

The seed-engaging mechanism will now be described: On the side of the disk 4 within the hopper is provided one or more fixed jaws 8 near the periphery of said disk and preferably formed integral therewith. Corresponding movable jaws 9 coact with the fixed jaws, the spindle 9' of the movable jaws journaling in the seed-disk. The jaw 9 and spindle 9' for greater strength and simplicity are made integral, and to prevent longitudinal movement toward the hopper a shoulder 9² is formed upon the spindle 9', this shoulder bearing against the disk. Longitudinal movement in the opposite direction is prevented by the jaws 9. The jaw 9 and spindle 9' (shown in detail in Fig. 11) are placed in position from the rear side, the slots 4² in the disk 4 permitting the jaws 9 to

be passed through, after which the jaws are turned to working position and the jaw itself preventing endwise movement of the spindle. The slots 4² after the jaws are in place are closed up by means of the plugs 10. The fixed jaws 8 are provided at their inner ends with the shoulders 8', which coact with the movable jaws 9 and hold the cooperating jaws a slight distance apart at their outer ends, the function of this lug being to cause the grains of corn to stop between the jaws and not pass completely through. The end of each of the spindles 9' terminates in a reduced end 9³, to which is secured an arm 11, the arm being forced in the direction of the arrows in Fig. 3 by the coil-spring 12, thus holding the movable jaws 9 yieldingly against the shoulders 8' on the fixed jaws 8. The coil-springs 12 react between the arms 11 and lugs 13 on the disk 4. To the free ends of the arms 11 are pivotally mounted the blocks 11', the pins 14 forming the pivotal bearing therefor. Between the head of each pin and the block 11', mounted thereon, is interposed a coil-spring 15, which produces the required degree of frictional contact between said block and arm 11. A roller 16, the object of which will presently appear, is also mounted on said pins. The object of such arrangement is to hold the jaws 9 normally and yieldingly in contact with the jaws 8 and to provide the blocks 11' on the jaws 11 for operating the jaws, the said blocks 11' slightly resisting any movement on their axis, so that when disengaged from the fixed toothed actuating-rack 17 the ends will not accidentally swing into engagement with the teeth 17' on said rack. Instead of having the block 11' with the three-toothed rack 17 an eccentric toothed segment with corresponding teeth on the rack might be employed. As the disk carrying the seed-engaging device rotates about the fixed toothed rack 17 the blocks 11' will engage the teeth 17' thereon, thus swinging the arm 11 and jaw 9 to the dotted-line position of the seed-engaging device marked A in Fig. 3, at which time the jaws are open ready to engage a grain of corn. As rotation continues, if no seed has been engaged, the block 11' will be swung by the spring 12 against the rack again ready to be actuated by the second tooth; but if a grain of corn has been engaged the jaw 9 will be held partly open and the block 11' will be in a disengaged position with respect to the rack-teeth 17', as indicated by the dotted-line position of the seed-engaging device marked B in Fig. 3.

To disengage or release the seed from the jaws, a cam-plate 18 is employed, which projects upwardly into the path of travel of the rollers 16, which are mounted on the pins 14 on the arms 11. This cam-plate 18 is normally out of the path of travel; but when held in the path of travel it will be engaged

by the said rollers 16 and the arm 11 will be swung to the dotted-line position of the seed-engaging device marked C in Fig. 3, in which position the movable jaw 9 will be separated from the fixed jaw 8 and allow the seed to fall into the seed-conduit 6. To insure the seed being dislodged from between the jaws a flexible or elastic finger 19, secured to a suitable fixed support 20 on the frame of the machine, projects inward toward the disk in such a manner as to sweep between the jaws when the jaws are opened or to brush over the face of the jaws and grain of corn therein if the jaws are closed.

It is evident that so long as the cam-plate 18 lies in the path of travel of the rollers 16 the seed-engaging devices will be opened and the seed released therefrom. The number of grains deposited with each revolution of the disk 4 will depend upon the length of time the cam-plate or equivalent member is held in operative position with respect to the seed-engaging devices. Any means for moving this member to an operative position for a predetermined length of time will meet the requirements. The means illustrated are constructed as follows: The cam-plate 18 is provided with a hub 18', which is rotatively fixed but longitudinally movable upon the bearing 2' of the fixed support 2. A roller 21 is journaled in suitable lugs on the engaging face of the cam-plate hub 18', this roller engaging the cam-surface on one of the clutch members. The fixed clutch member 22 is pinned to the operating-shaft 3 adjacent to the bearing 2' of the support 2, and a coil-spring 23 operates to hold the cam-plate hub against the clutch member 22. The loose clutch member 24 is provided with a toothed annular recess 24', adapted to engage with the teeth 22' on the clutch member 22. A spring 25, acting between a pin 26 on the shaft 3, tends to press the two clutch members into engagement and also to move the cam-plate 18 along its bearing 2' into the path of travel of the rollers 16. In order to do this, the spring 25 is made stronger than the spring 23. The engaging face of the clutch member 24 is provided with removable cam-segments 27 and 28 of different lengths, adapted to contact the roller 21 on the hub 18' of the cam-plate, the length of segment used depending on the number of seeds it is required to drop at each revolution of the disk 4. For example, the quarter-segment 27 is used when it is desired to drop but a single grain each revolution, a half-segment 28 is used when two grains per revolution are desired, a quarter and half when three are desired, and two half-segments 28 when four grains are required. These same segments are secured to the clutch-surface by means of screws, as shown.

The clutch member 24 is thrown into and out of action as follows: A radially-projecting cam-surface 29 is formed on the clutch

member 24, and a roller 30 on a bell-crank lever is arranged to engage this cam-surface. The bell-crank is suitably mounted on a fixed part of the frame and is held yieldingly in one direction by means of the spring 32, which holds said lever against a fixed stop 33. The bell-crank lever 31 connects with the check-lever (not shown) through the rod 34, and when this rod is caused to move in the direction of the arrow in Fig. 4 it will move the said lever 31 to the dotted-line position of Fig. 4, thus permitting the clutch member 24 to move into engagement with the fixed clutch member 22 and forcing the cam-plate 18 into operative position. Before the operating-shaft 3 and parts thereon will have made one revolution, however, the bell-crank lever will again be in normal position and the roller 30 will throw the clutch member out of engagement, thus permitting the cam-plate 18 to be moved by the spring 23 out of its operative position.

The operation of the device, briefly stated, is as follows: Corn is placed in the hopper 5, and the operating-shaft 3 and disk 4 thereon are made to rotate automatically. As the pairs of jaws 8 and 9 pass through the corn they are made to open and close by the block 11' engaging the teeth 17' on the fixed tooth-segment 17 until a grain of corn is engaged. Usually a grain will be engaged the first time the jaws open; but if not the operation is repeated twice or three times, thus insuring engagement of a grain of corn. The construction will open the jaws not more than three times; but it is evident the extent of the segment could be increased to operate them more often. As soon as the jaws engage a grain of corn they will remain closed until released by the rollers 16 on the arms 11 contacting the cam 18. If two of the half-circle cam-segments 28, as shown in Fig. 10, are secured to the face of the clutch members 24, then all the jaws will be actuated successively and four grains deposited for each revolution of the seed-disk. Either three, two, or one kernel of corn can be deposited by presenting the cam-segments as shown, respectively, in Figs. 9, 8, and 7. In changing the number of grains dropped it is only necessary to remove and change the cam-segments accordingly.

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

1. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a vertically-disposed disk, independently-movable seed-engaging means carried by said disk, mechanism which will repeatedly actuate said means and cause it to engage the seed, and separate mechanism for causing said means to release the seed.

2. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a ver-

tically-disposed disk, independently-movable seed-engaging means carried by said disk, mechanism which will repeatedly actuate said means and cause it to engage the seed, said mechanism being rendered inoperative by the engagement of seed, and separate mechanism for causing said means to release the seed.

3. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a vertically-disposed disk, a plurality of independently-movable seed-engaging means carried by said disk, mechanism for actuating said means and for causing it to engage the seed, and separate mechanism for causing either one or several of said seed-engaging means to release the seed.

4. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a vertically-disposed disk, a plurality of independently-movable seed-engaging means carried by said disk, mechanism which will repeatedly actuate said means and cause it to engage the seed, said mechanism being rendered inoperative by the engagement of a seed, and separate mechanism for actuating one or all of the seed-engaging means at each revolution of said disk when the said means are near their highest position on the disk.

5. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a seed-conduit, a horizontally-extending shaft, a disk mounted on said shaft and in said hopper, a plurality of seed-engaging devices mounted on said disk and near the periphery thereof, means fixed with respect to said shaft for actuating the seed-engaging devices, and means movable longitudinally of the shaft for releasing the seed-engaging means.

6. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a seed-conduit, a vertically-disposed disk in said hopper, a plurality of seed-engaging means arranged on the face of said disk, mechanism for actuating said means and for causing them to engage the seed, separate mechanism for causing said means to release the seed, and means for positively dislodging the grain when the seed-engaging means have been released.

7. A seed-dropping mechanism for corn-planters comprising a seed-hopper, a seed-conduit, a vertically-disposed disk in said hopper, a plurality of seed-engaging means arranged on the face on said disk, mechanism for actuating said means and for causing them to engage the seed, separate mechanism for causing said means to release the seed, and a yielding finger for dislodging the grain when the seed-engaging means have been released.

8. A seed-dropping mechanism for corn-

planters comprising a seed-hopper, a seed-conduit, a vertically-disposed disk, a plurality of seed-engaging devices consisting of a series of jaws fixed on said disk and corresponding coöperating movable jaws pivotally mounted on said disk, a fixed tooth-segment, an operative connection between the seed-

engaging devices and the toothed segment, and a cam for opening and releasing the said devices.

EDWARD A. JOHNSTON.

Witnesses:

E. R. THOMPSON,
C. A. BUYERS.