No. 697,402. Patented Apr. 8, 1902.

W. S. GRAHAM.

CORN PLANTER.

(Application filed Sept. 26, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

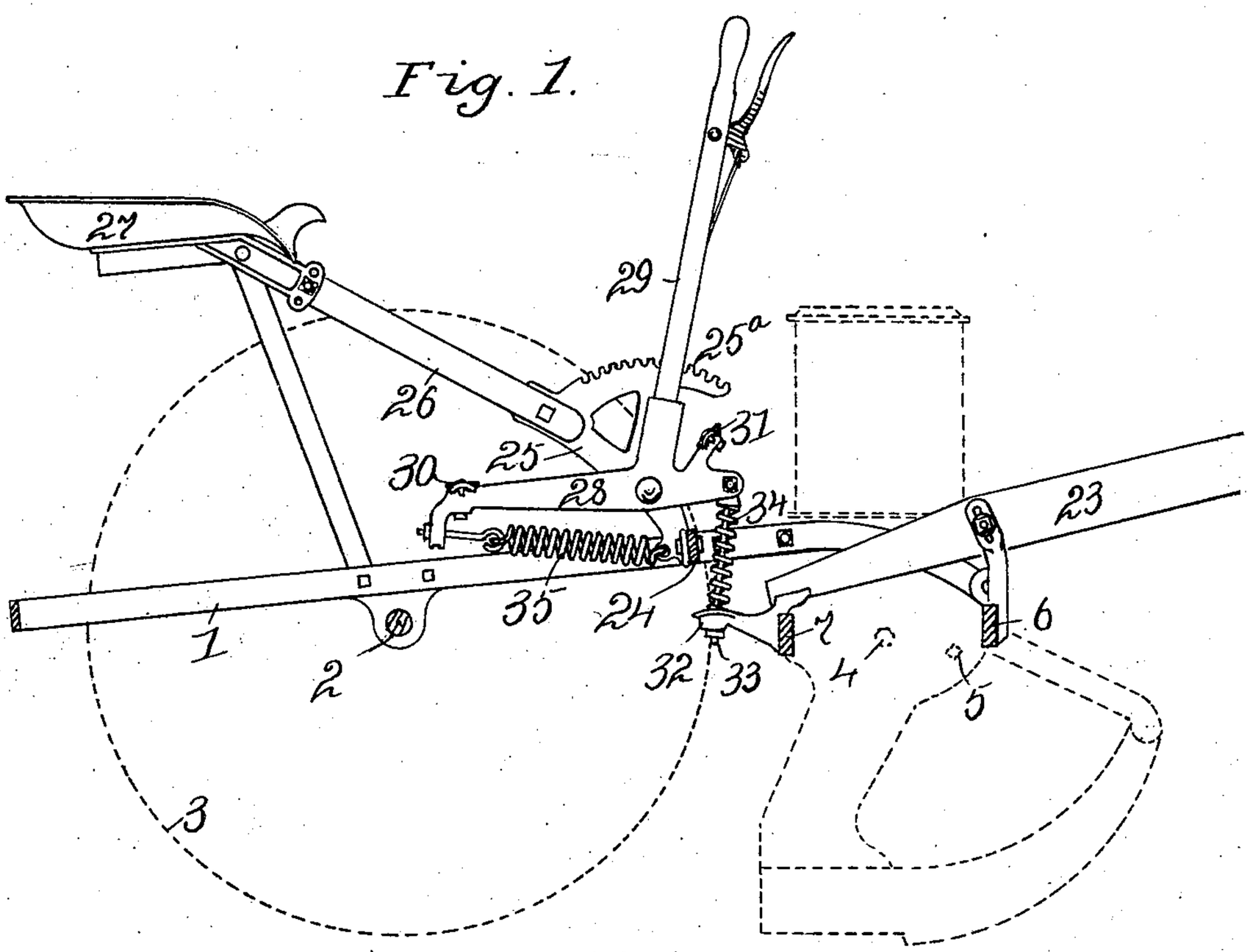
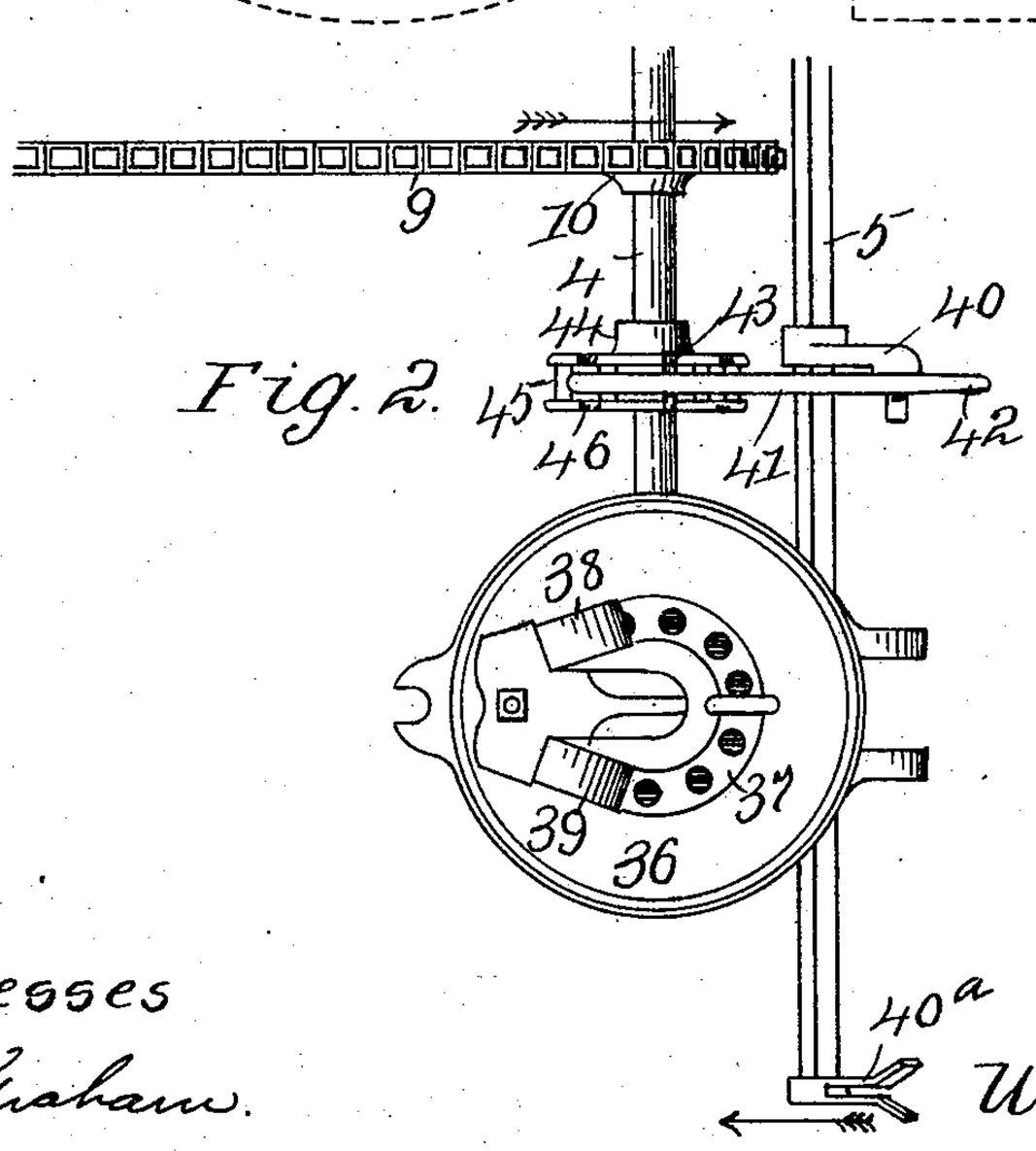


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

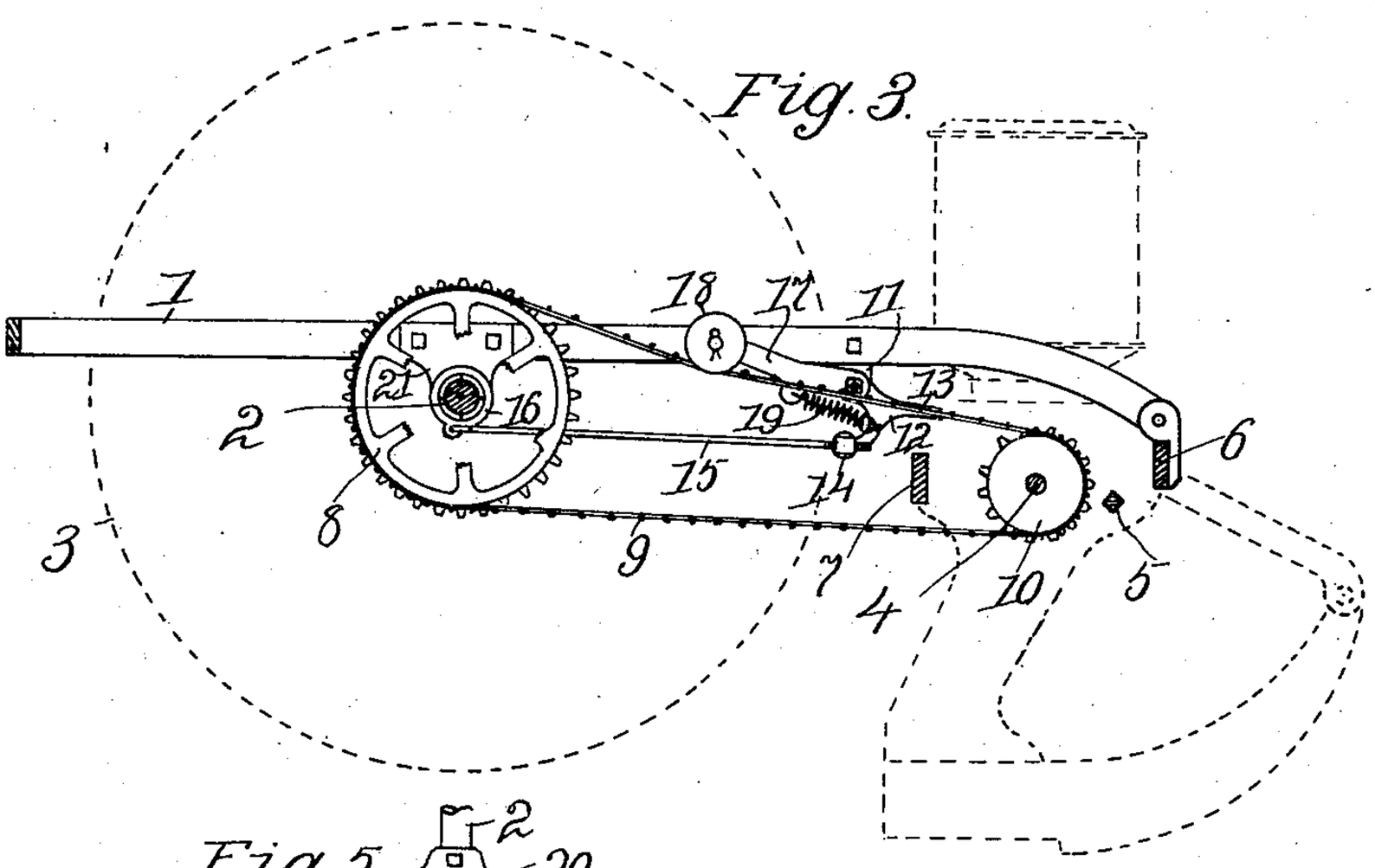


Fig. 5.

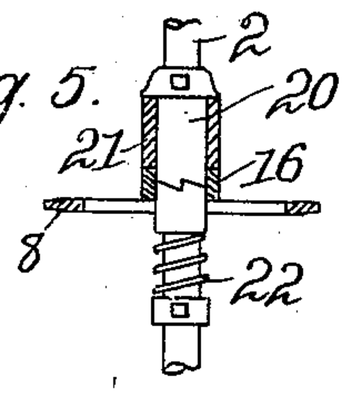


Fig. 4.

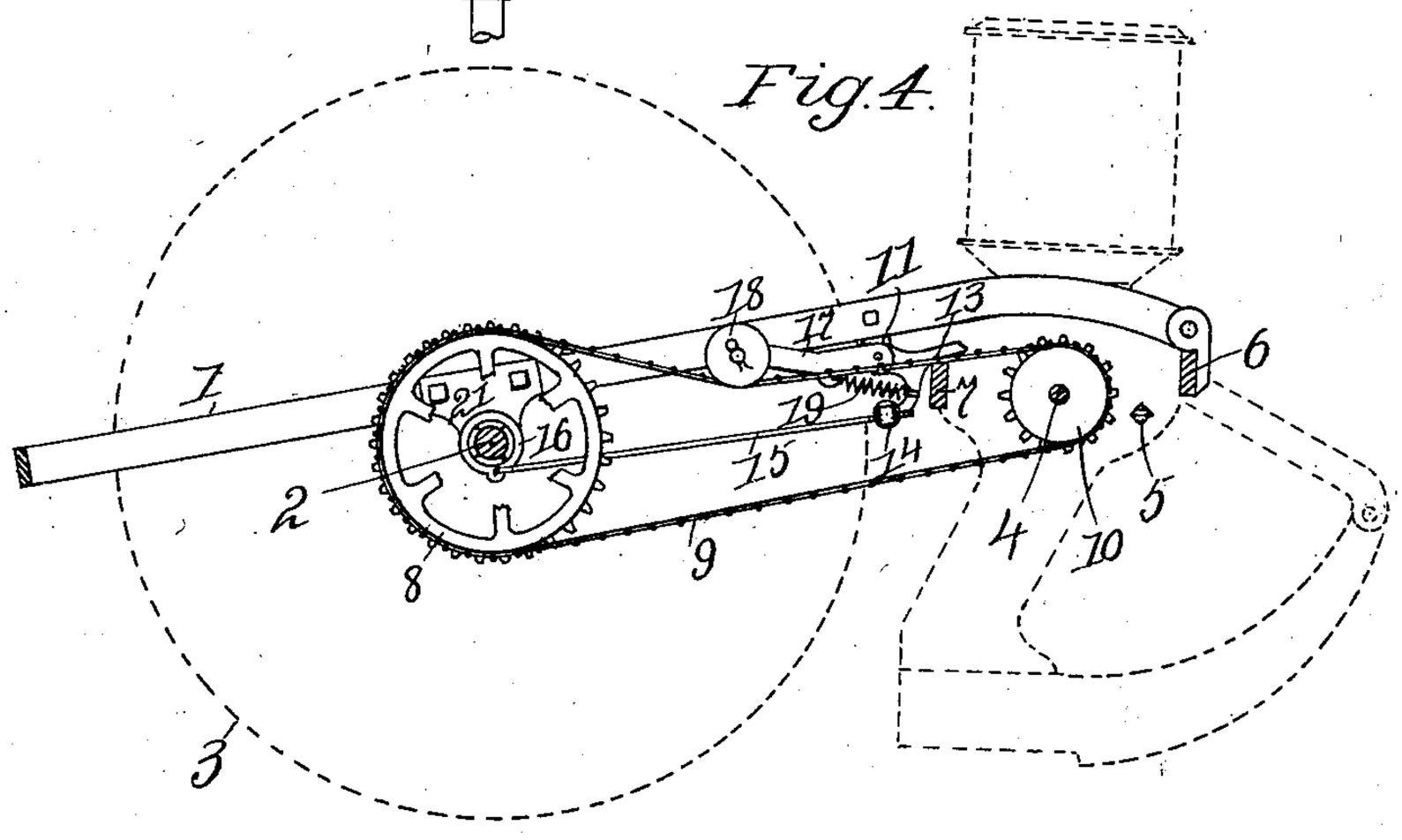
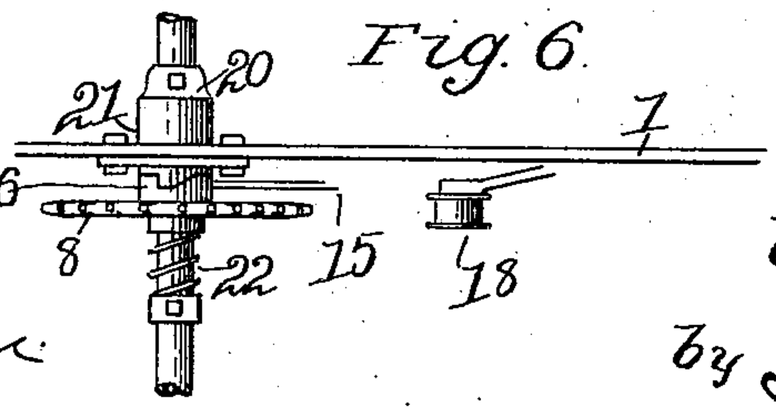


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 7.

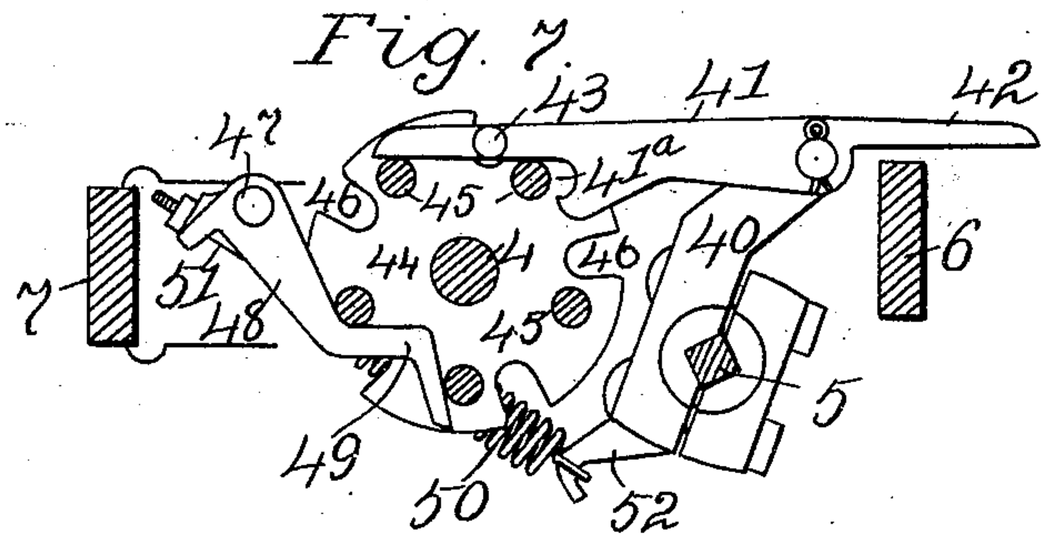


Fig. 8.

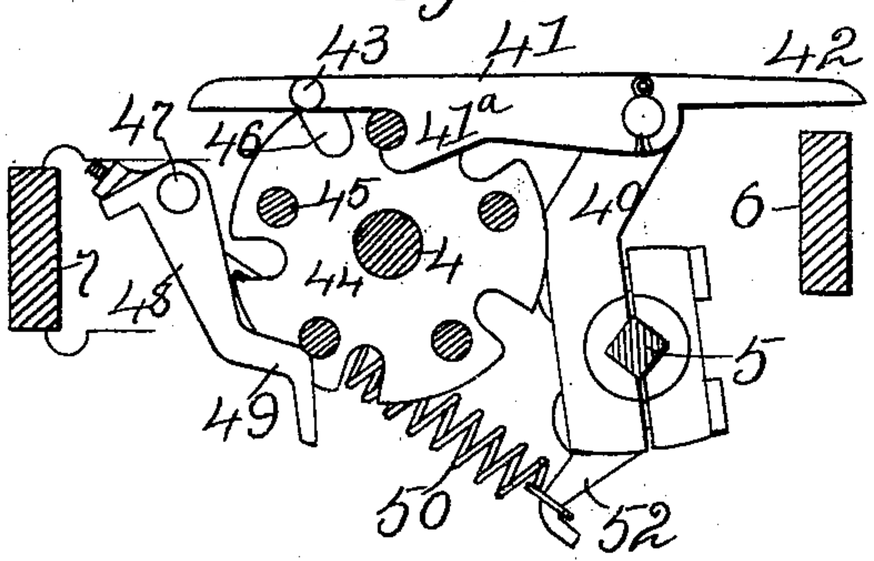


Fig. 9.

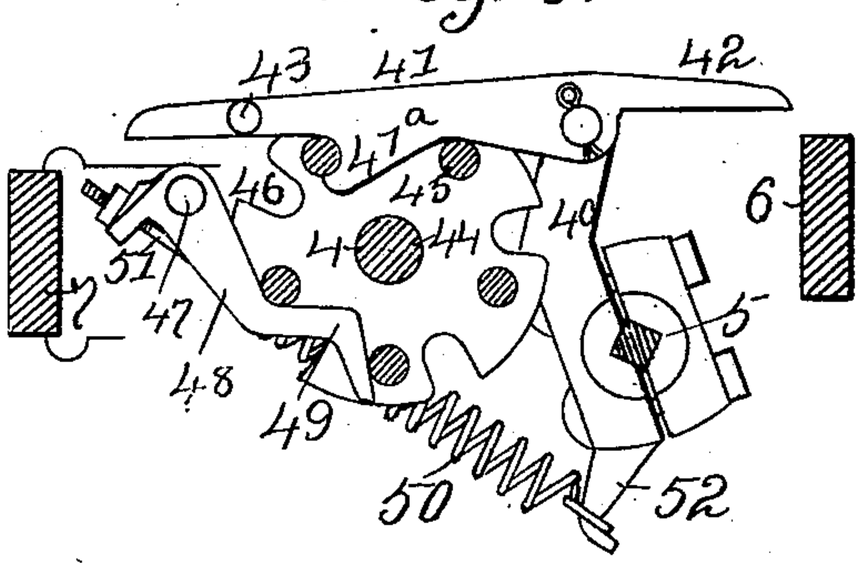


Fig. 11.

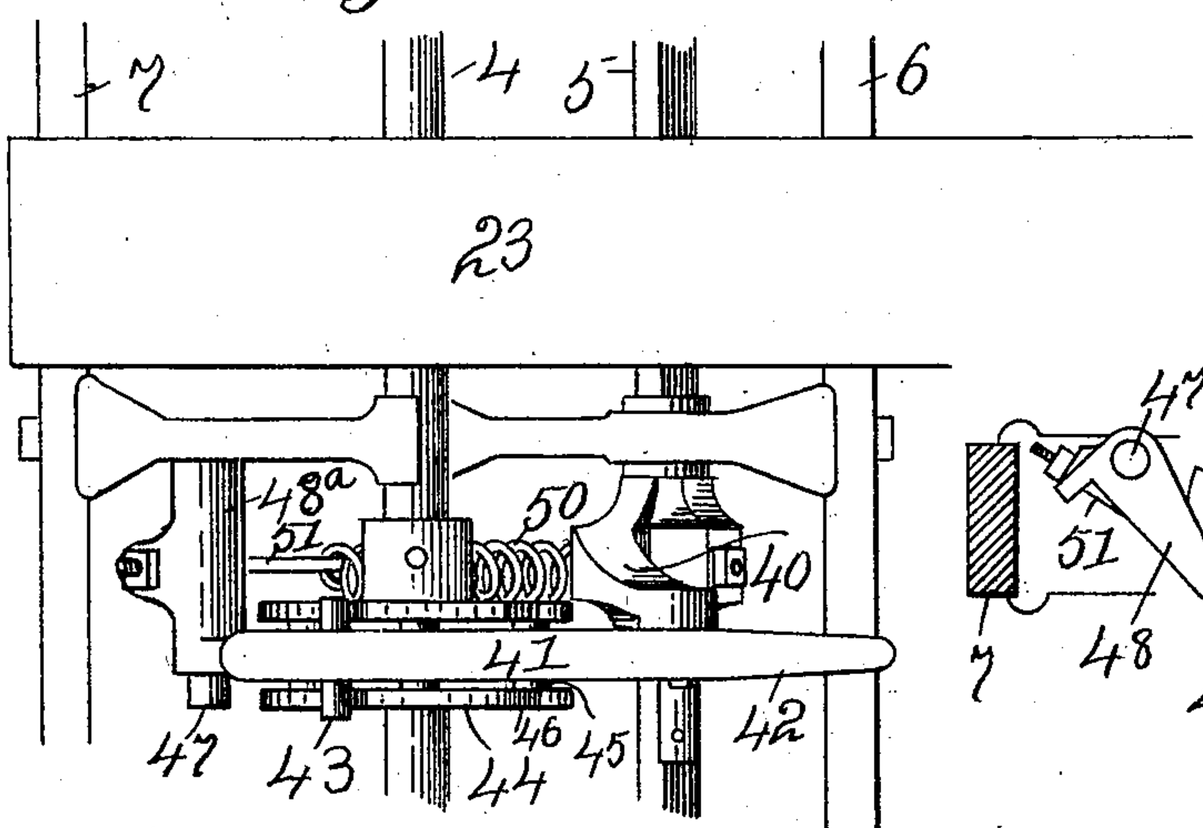
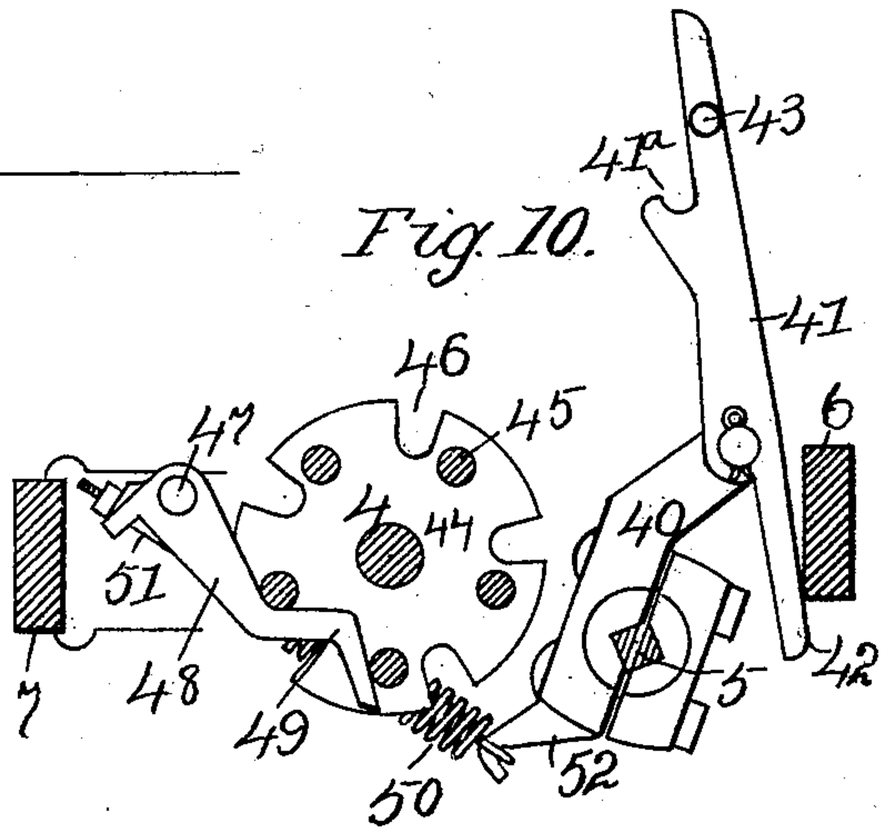


Fig. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM S. GRAHAM, OF CANTON, ILLINOIS, ASSIGNOR TO PARLIN & ORENDORFF COMPANY, OF CANTON, ILLINOIS, A CORPORATION OF ILLINOIS.

CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 697,402, dated April 8, 1902.

Application filed September 26, 1901. Serial No. 76,662. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. GRAHAM, of Canton, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Check-Row Corn-Planters, of which the following is a specification.

This invention relates to means for dropping the seed so as to accommodate the backward rock of the check-row fork and the forward rotation of the drill-chain, and to improved check-row mechanism.

The invention is exemplified in the structures hereinafter described, and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is a vertical section from front to back through a planter-frame, illustrating the means used to raise and lower the front frame of the planter. Fig. 2 is a detail plan showing the means employed to drop the corn when the dropping-shaft is rocked backward by the check-row lever or rotated forward by the drill-chain. Fig. 3 is a detail of the clutch-shifting and chain-tightening mechanism of the drill, showing the conditions that exist when runners are in planting position. Fig. 4 is the same as Fig. 3, except that in Fig. 4 the runners are shown raised and the clutch shifted. Fig. 5 is a section through the clutch mechanism of the drill. Fig. 6 is a plan of the clutch. Fig. 7 is a detail of the check-row movement, the pawls and arm thereof being shown in side elevation and the lantern-wheel in section. In this figure the parts are at rest preparatory to the beginning of an operation. Fig. 8 is a detail of the check-row mechanism, showing an operative movement of the check-row pawl partly completed. Fig. 9 shows an operative movement of the check-row pawl entirely completed and the lantern-wheel locked against further motion. Fig. 10 shows how the check-row pawl is held out of contact with the lantern-wheel when the planter is used as a drill. Fig. 11 is a plan of the check-row movement.

A side bar of the rear or wheel frame of the planter is shown at 1.

At 2 is shown the axle-shaft of the rear frame of the planter, and a planter-wheel is represented in broken lines at 3.

The cross-bars of the front or runner frame of the planter are shown at 6 and 7. The shaft that drives the seed-plates of the hoppers is shown at 4, and the check-row shaft is shown at 5.

The improved means for raising and lowering the front frame consists of elements as follows: A bracket 25 is attached to a cross-bar 24 of the frame, at the center thereof, and it has a notched sector 25ª. A rock-arm 28 is pivotally connected with bracket 25 concentric with the notched sector. One of its ends extends in front of the pivot and is provided with a foot-rest 31, while its other end extends rearward and is provided with a foot-rest 30. An extension-spring 35 connects with the rearward extension of the rock-arm and with the bracket 25 below the pivot of the rock-arm. A rod 33 is pivotally connected with the forward end of the rock-arm, and it extends downward through a bracket 32, which extends rearward from the end of the tongue 23. The rod has a limited amount of play in the bracket 32, being restrained by a nut or pin on its lower end and by a compression-spring 34, encircling the rod between the bracket and the rock-arm. A lock-lever 29 extends upward from the rock-arm 28 and connects rigidly therewith. A brace 26 for seat 27 extends obliquely upward and backward from the rear end of bracket 25. The front frame is lifted through rod 33 and depressed through spring 34. The spring 35 helps to lift the front frame, and its tension may be regulated. The lever 29 may be used to rock the arm 28 either by itself or in conjunction with leg-pressure applied to the foot-rests, and it may also be used to lock the front frame in either a lowered or raised position. When the lock-bolt of lever 29 is locked out of engagement with the notches of the sector, the runner-frame may be controlled by leg-pressure applied through the foot-rests, downward pressure being transmitted through foot-rest 31 and upward lift being applied through foot-rest 30. The spring 35 aids this operation by sustaining part of the weight of the front frame.

In Fig. 2 the bottom of a seedbox is shown at 36. The seed-plate thereof is shown at 37. At 38 is shown a cut-off for the seed-plate, and at 39 is shown a second cut-off presented in a direction opposed to the direction in

which cut-off 38 is presented. The shaft 4 is geared to the seed-plate in the customary manner, and it is provided with a sprocket-wheel 10 and a ratchet-wheel 44. A chain 9 connects wheel 10 with a sprocket-wheel on the axle-shaft of the rear frame of the planter when the planter is used as a drill, and a pawl 41 on a check-row shaft 5 imparts motion to the shaft 4 through ratchet-wheel 44 when the planter is used to plant in check-rows. The chain 9 drives the shaft forward with a continuous rotary motion and turns the seed-plate in a direction to bring cut-off 39 into action. The check-row fork 40^a is thrown backward by the knots on a check-row wire, and the pawl 41 imparts intermittent rotary motion to the shaft 4 through the ratchet-wheel. The effect of the check-row mechanism on shaft 4 is to rotate the shaft backward, reverse the motion of the seed-plate, and bring cut-off 38 into operation. In this instance the ratchet-wheel is constructed in a peculiar manner; but it is obvious that the essential requirement is that the intermittent rock of the check-row shaft shall be transmitted through a pawl and ratchet to the shaft 4 and be converted therein into intermittent rotary motion. This feature of the invention permits the chain and the check-row shaft to each transmit its natural motion to the seed-plate without complicated intervening mechanism and without any shifting or adjustment of parts when one means for driving the planting mechanism is substituted for the other. When the chain is used, the pawl is thrown out of contact with the ratchet-wheel. (See Fig. 10.) When the check-row shaft is used, the chain is disconnected, and that is all there is about the conversion of the planter from a drill to a check-rower, and the reverse.

When the planter is used to drill corn, the drilling mechanism is thrown out of operation whenever the runners are raised, so that the seed will not be wasted in turning the planter around or in traveling from one place to another. When the front frame is raised, the distance between the axle-shaft of the rear frame and the drill-shaft of the front frame is lessened somewhat and the chain used to transmit motion to the drill-shaft becomes so slack that it is liable to run off its sprocket-wheels unless steps are taken to prevent this result. The means employed by me to throw the drilling mechanism out of operation when the front frame is raised and to take up the slack of the chain resulting from such raising of the front frame is illustrated in Figs. 3, 4, 5, and 6 of the drawings and is as follows: A sleeve, as 20, is attached to the axle-shaft 2 of the rear frame in position to extend through the bracket 21 of the rear frame and form a bearing therein, and the inner end of the sleeve has ratchet-notches, as shown in Fig. 5. The sprocket-wheel 8 is mounted loosely on the axle-shaft. It has ratchet-teeth on its hub adapted to engage the ratchet-notches of sleeve 20, and it is normally held in engagement with the sleeve by means of a spring, as 22. (Shown in Figs. 5 and 6.) The bearing-sleeve of bracket 21 has inclined teeth on its inner end, and it is somewhat shorter than the sleeve 20, for which it forms a bearing. The hub of the sprocket-wheel is equal in diameter to the sleeve 20, and a collar 16 is mounted on the extended end of the sleeve 20 and upon the hub of the sprocket-wheel. The collar has inclined recesses in which the inclined teeth of bracket 21 rest when the wheel is in clutch with sleeve 20, and the wheel is moved lengthwise of the shaft 2 against the tension of the spring 22, so as to force the wheel out of clutch with the sleeve whenever the collar is turned so as to bring the ends of its teeth into contact with the ends of the teeth of the bracket 21. A bracket 11 is attached to a side bar 1 of the rear frame of the planter near the rear bar 7 of the front frame. An arm 12 is pivotally attached to the bracket 11. An end 13 of the arm 12 extends above the cross-bar 7. A downward extension 14 of the arm provides a pivotal bearing for rod 15, and the rod connects pivotally with a lug on the clutch-breaking collar 16. An arm 17 is pivotally connected with the bracket 11, is extended backward therefrom, and is provided with an idler 18, which rests on the chain 9. A spring 19 connects with arm 12 and with arm 17 below the pivots of each, and its tension exerts a downward pull on both arms. The rear frame of the planter connects pivotally with the front cross-bar 6 of the front frame, and when the front frame is raised, as shown in Fig. 4, the cross-bar 7 approaches the rear frame, raises the extension 13 of arm 12, and by pulling backward on extension 14 rocks the collar 16 and forces the half-clutch 16 of wheel 8 out of engagement with the collar 20. At the same time the spring 19 is made to pull downward on arm 17 with increased force and the idler 18 takes up the slack of the chain caused by raising the front frame. When the front frame is lowered, the chain is tightened, the idler-arm is raised somewhat with reference to its pivot, and the spring 19 exerts sufficient tension on arm 12 to force the collar 16 into its original position. The spring 19 forms an elastic link between the idler-arm and the clutch-shifting arm, and the action of the arms is of a nature to minimize the importance of the elasticity of the spring. When the arm 12 is raised, it pulls downward on arm 17, and when arm 17 is raised by the tightening of the chain it tends to pull arm 12 downward and shift the clutch-breaking collar. The spring-link is useful, however, in that it makes nice adjustment needless, applies force yieldingly, and augments the action of the idler-arm on the clutch-breaking arm.

The mechanism used to transmit motion from the check-row shaft to the seed-dropping shaft is exemplified in Figs. 7, 8, 9, 10, and 11 of the drawings, and it comprises the fol-

lowing details: The ratchet-wheel 44 of shaft 4 is a lantern-wheel, in which the rods 45, that connect the end disks, act as the ratchet-teeth and in which the end disks are notched in their perimeters, as shown at 46. An arm 40 is fastened onto the check-row shaft 5 and a pawl 41 is pivotally connected with the swinging end of the arm. The pawl has an undercut extension 41ª, that engages the rods 45 of the lantern-wheel. It has laterally-extended pins 43, that engage the notches of the disks of the wheel, and it extends forward beyond its pivot, as shown at 42. A pin 47 extends back of the ratchet-wheel and a brake-arm or stop-pawl 48 has a sleeve 48ª, that journals on pin 47. The brake-arm has a V-shaped extension 49, that rests between two pins of the ratchet-wheel when the wheel is at rest and by bearing against such pins tends to impede motion of the wheel in either direction. A spring 50 connects with an extension 52 of rock-arm 40 and also connects through a link-rod 51 with the upper end of the brake-arm off the center thereof. The spring tends to retract the check-row shaft after an operative motion thereof, and it also applies slight pressure to the brake-arm. The notches 46 are between the pins 45 when the circumference of the wheel is considered, and when the mechanism is at rest the pins 43 of the pawl lie in notches of the disks, while the rod-engaging tooth 41ª is entirely out of contact of the rod that it is to engage. As the check-row shaft is rocked backward by a check-row knot or otherwise the wheel is put in motion by the pins 43 and carried to about the position shown in Fig. 8, after which the tooth 41ª engages a rod and completes the partial rotation of the wheel. When the stroke of the pawl is completed, the tooth 41 is extended below a rod to keep the pawl from rising and another rod strikes the under surface of the pawl, as shown in Fig. 9, and arrests the rotation of the shaft. Subsequently the spring 50 carries the check-row shaft back to its original position preparatory to a repetition of the operation, and during such backward motion of the pawl the brake-arm holds the wheel against turning with the pawl. After the pawl is at rest the brake-arm holds the wheel against accidental turning.

The impact of a check-row knot against the forked lever is sudden and somewhat severe and the tendency is to give the intermittently-rotating shaft an impulse that will cause it to travel away from the pawl and escape the locking action thereof. If, for instance, the force of the check-row knot were transmitted to a rod of the wheel through tooth 41ª of the pawl, the wheel might be driven away from the pawl by the sudden impulse and the pawl might not catch up in time for the tooth to extend under one rod when the rod next following struck the under surface of the pawl. In that case the shaft would be carried too far and inaccurate dropping would result. When, however, the first impact of the knot is imparted to the wheel through the pins 43 acting in slots 46, the wheel must travel with the pawl for about one-half the stroke or until the pins ride out of the slots, as shown in Fig. 8, and by that time the wheel and the pawl are moving in unison, the effect of the stroke-like initial action has subsided, and the pawl completes the movement by continued pressure against one of the rods.

The check-row shaft extends parallel with cross-bar 6 of the front frame not far therefrom, and when the planter is in use as a drill the pawl is turned upward, as shown in Fig. 10, with the extension 42 bearing against the cross-bar and holding the pawl out of contact with the ratchet-wheel.

I claim—

1. In a corn-planter, the combination with a seedbox and a seed-wheel therefor, of a pair of cut-offs presented in opposite directions; whereby the seed-wheel may be driven in one direction to plant in check-rows and in the contrary direction to drill the seed.

2. In a planter, the combination of a shaft to drive the dropping mechanism, a ratchet-wheel for the shaft comprising a notched disk having laterally-extended pins, and a drive-pawl for the ratchet-wheel having a sidewise-extended pin to engage the notches of the disk and a tooth to engage the pins of the wheel.

3. In a planter, the combination of a shaft to drive the dropping mechanism, a lantern-wheel on the shaft the end disks whereof are notched in their peripheries, a rock-shaft, an arm on the rock-shaft and a pawl on the arm having laterally-extended pins to engage the notches of the disks and also having an undercut tooth to engage the rods of the lantern-wheel.

4. In a planter, the combination of a shaft to drive the dropping mechanism, a lantern-wheel on the shaft, a rock-arm, a pawl on the rock-arm to drive the lantern-wheel, a brake-arm bearing against the rods of the lantern-wheel and a spring connecting an extension of the brake-arm with an extension of the rock-arm and tending to retract the pawl while holding the brake-arm to its work.

5. In a planter, the combination with a ratchet-wheel on a drive-shaft and with a fixed part of the planter-frame, of a rock-arm and a pawl on the rock-arm having an extension beyond its pivot to engage the frame when the pawl is not in use and hold the pawl out of contact with the ratchet-wheel.

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

WM. S. GRAHAM.

Witnesses:

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WILLIAM L. TAYLOR.