

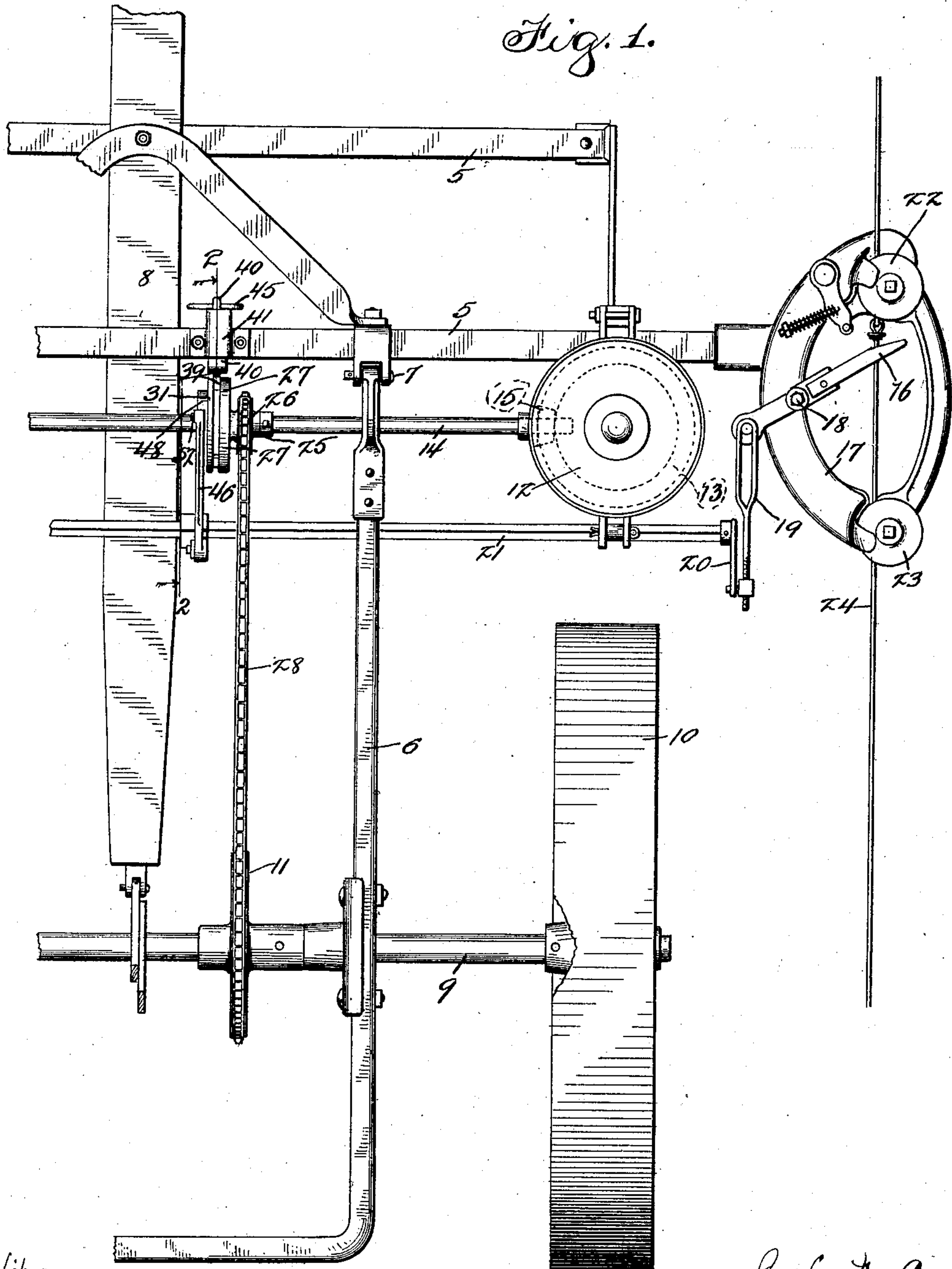
No. 751,548.

PATENTED FEB. 9, 1904.

W. L. PAUL.
CORN PLANTER.
APPLICATION FILED APR. 9, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
J. B. Weir
C. A. D. Perry

Inventor:
William L. Paul,
by Bond, Adams, & Jackson,
his Atty's.

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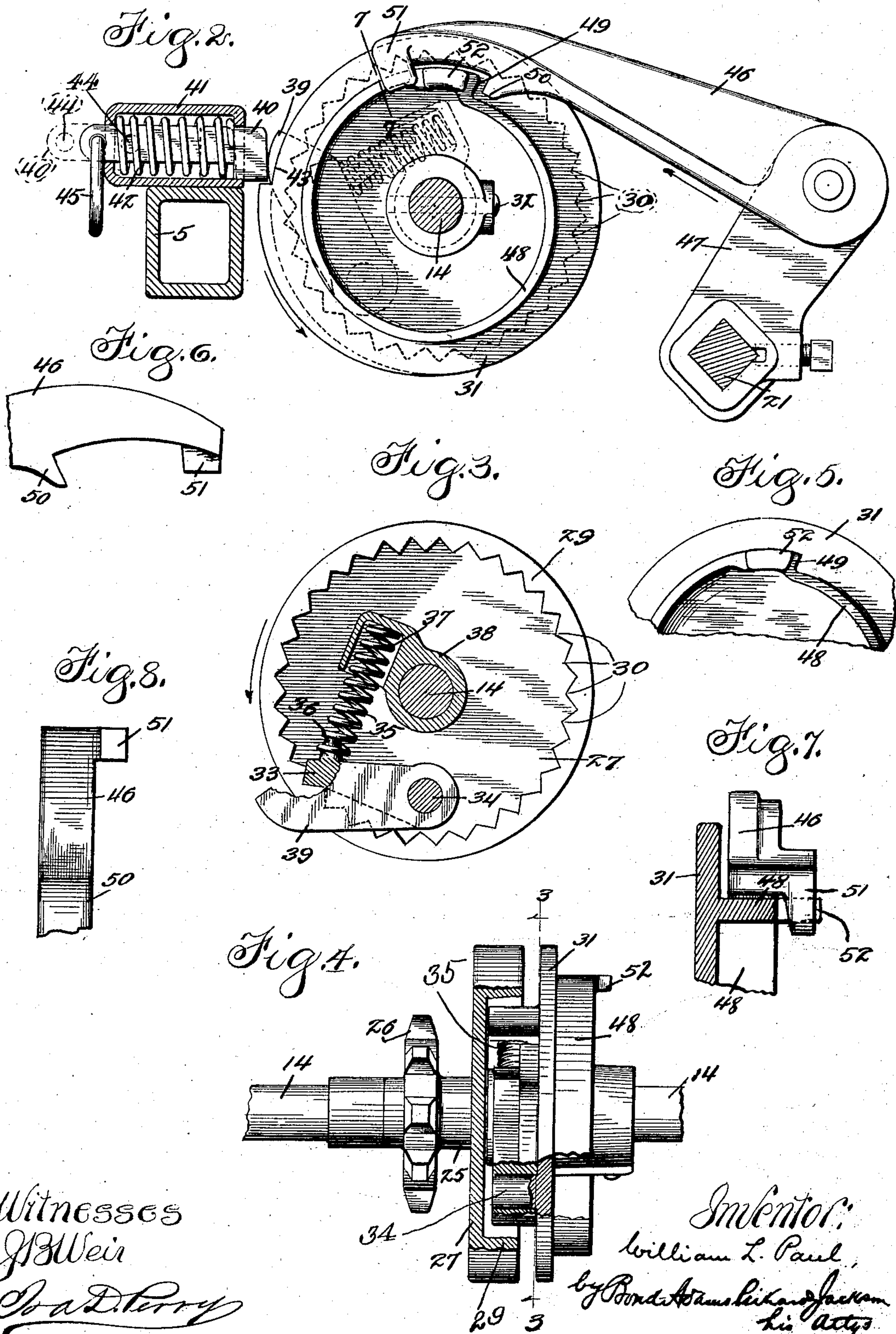
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UNITED STATES PATENT OFFICE.

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CORPORATION OF ILLINOIS.

CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 751,548, dated February 9, 1904.

Application filed April 9, 1903. Serial No. 151,842. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LOUIS PAUL, a citizen of the United States, residing at Bradley, in the county of Kankakee and State of Illinois, have invented certain new and useful Improvements in Corn-Planters, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to check-row corn-planters, and has particularly to do with the mechanism by which the seed-plate or equivalent device is connected to or disconnected from the driving mechanism by which it is actuated, my principal object being to provide improved mechanism for insuring a measured actuation of the seed-plate, with a consequent dropping of a predetermined number of seeds upon each actuation of the rock-shaft by the check-row wire.

A further object is to provide for converting the machine from a check-row to a drill planter at pleasure.

Prior to my invention various forms of mechanism had been devised for the purpose of insuring regularity of operation of the seed-plate, the typical construction consisting of the usual seedboxes having the seed-dropping mechanism therein, a rotary shaft for rotating the seed-plates, a sleeve loosely mounted on said shaft and driven constantly from the carrying-wheels, clutch mechanism for connecting said sleeve with said shaft to provide for rotating said shaft by the rotation of the carrying-wheels, mechanism operated by the usual rock-shaft connected to the check-row-wire forks for actuating the clutch mechanism, and suitable means for throwing the clutch out of operation and disconnecting the seed-plate shaft from the driving mechanism when said shaft is rotated to a predetermined extent. So far as I am aware in all prior constructions when the seed-plate shaft has been connected with the driving mechanism it has been rotated uniformly until disconnected therefrom and has depended altogether for its rotation upon the clutch mechanism. It is, however, desirable to start the rotation of the

seed-plate shaft less abruptly than is the case where the carrying-wheel-driven clutch mechanism is employed for the purpose, and it is also desirable after the seed-plate shaft has commenced to rotate to increase the speed thereof abruptly. The advantage of starting the seed-plate shaft gradually is that there is less strain on the machinery and less liability of damaging the machine. The advantage of suddenly accelerating the speed of the seed-plate shaft and seed-plate is that such action agitates the seed in the seedbox, and particularly that lying in or over the pockets in the seed-plate, thereby insuring the proper depositing of the seed in the seed-pockets. It frequently happens that seed is deposited in such manner upon the seed-plate as not to enter the pockets properly, and consequently is not properly deposited. By thus agitating or jolting the seed-plate, however, in most instances the grains adjust themselves to the pockets and are consequently deposited with greater accuracy. By my invention I provide means by which this operation may be secured, such means consisting of a pawl operated by the usual rock-shaft, which initiates the rotary movement of the seed-plate shaft, and clutch mechanism by which the rotating seed-plate shaft is connected suddenly with driving mechanism operated from the carrying-wheels.

My invention further resides in improved means for disconnecting the seed-plate shaft from the driving mechanism in such manner as to prevent engagement of the parts, with consequent rattling, while not operatively connected, also in providing means by which the automatic disconnecting devices may be thrown out of operation to permit the clutch mechanism to remain constantly operative, thereby converting the machine into a drill-planter.

In the drawings I have illustrated one embodiment of the various features of my invention above mentioned; but it will be understood that I do not restrict myself to the specific construction illustrated except in so

far as the same is particularly claimed, as my invention includes also, generically, the subject-matter of the broader claims.

In the accompanying drawings, Figure 1 is a plan view of a part of a planter embodying my invention. Fig. 2 is a sectional view taken on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 4. Fig. 4 is a view, partly in section, illustrating the clutch mechanism. Fig. 5 is a detail, being a partial view of one face of one of the clutch members. Fig. 6 is a detail, being a partial side view of the end of the operating-pawl. Fig. 7 is a partial sectional view on line 7 7 of Fig. 2, and Fig. 8 is an under side view of the outer end of the operating-pawl.

Referring to the drawings, 5 indicates the front or furrow-opener frame, and 6 the rear or wheel frame. Said two frames may be of any approved construction and are hinged together at 7 in the usual manner.

8 indicates the tongue, 9 the axle or carrying-wheel shaft, and 10 one of the carrying-wheels, all of which are of the usual construction.

11 indicates the usual sprocket-wheel, mounted upon and keyed to the axle 9.

12 indicates one of the seedboxes, in which is carried the usual beveled gear 13, by which the seed-plate is rotated.

14 indicates the usual seed-plate shaft, carrying a beveled pinion 15 under the seedbox 12, which meshes with the gear 13, so that by rotation of the shaft 14 the seed-plate is rotated.

16 indicates one of the check-row forks, which is carried on a bracket 17, supported by the front frame 5, being mounted on a vertical pivot 18 in the usual way. The fork 16 is connected by link 19 and crank 20 with the usual rock-shaft 21, so that when the fork 16 is actuated by the check-row wire the rock-shaft 21 is rocked. Suitable spring mechanism (not shown) is provided for holding the fork 16 normally in the position shown in Fig. 1.

22 23 indicate the common guides for the check-row wire 24.

25 indicates a sleeve loosely mounted on the shaft 14, which sleeve carries a sprocket-wheel 26 and a clutch member 27. The sprocket-wheel 26 is connected by a chain 28 with the sprocket-wheel 11, carried by the shaft 9, so that said sleeve, with the clutch member 27, is rotated continuously as the machine progresses.

The clutch member 27 is in the form of a disk, having an annular flange 29, on the inner face of which are teeth 30, as shown in Fig. 3. Also mounted upon the shaft 14, adjacent to the clutch member 27, is a second clutch member 31, which is in the form of a disk and is fixedly secured to the shaft 14, preferably by a pin or key 32. On its inner face—i. e.,

that next to the clutch member 27—the clutch member 31 carries a dog 33, mounted on a pivot 34 a short distance within the periphery of the clutch member 27, the arrangement being such that when the dog 33 is in its outermost position, as shown in Fig. 3, it engages the teeth 30 of the clutch member 27, and thereby causes the clutch member 31 to rotate with the clutch member 27, the direction of rotation being indicated by the arrow in Fig. 3. A spring 35 is provided for exerting outward pressure on the dog 33 to hold it normally in engagement with the teeth 30. One end of said spring fits upon a pin 36, carried by the dog 33, and the other end thereof is fitted in a pocket 37 in a sleeve 38, mounted upon the shaft 14, as shown in Fig. 3. The sleeve 38 may be formed separately from the clutch member 31, in which case it is keyed upon the shaft 14; but said sleeve and pocket are preferably formed integral with the clutch member 31.

39 indicates an arm which is rigidly connected with the dog 33 and normally projects outward beyond the periphery of the clutch members 27 and 31, as best shown in Figs. 2 and 3. Said arm 39 is adapted to be engaged and pressed inwardly by a spring-dog 40, mounted on the front frame 5 in a suitable pocket 41, so as to move perpendicularly to the peripheries of the clutch members 27 and 31. Said dog is provided with a spring 42, which presses it constantly toward the periphery of the clutch member 31, and consequently said dog is at all times in a position to intercept the arm 39 as said arm is carried around by the rotation of the clutch members. The spring 42 is stronger than the spring 35, so that when the dog 40 engages the arm 39 it presses it back, compressing the spring 35 and carrying the dog 33 out of engagement with the teeth 30. In order to move the dog 33 suddenly out of engagement with the teeth 30, the clutch member 31 is made in the shape of a cam having an abrupt depression 43 in its periphery opposite the end of the arm 39, so that when by the rotation of the clutch members the arm 39 is carried around toward the dog 40 said dog gradually rides up on the elevated portion of the periphery of said clutch member 31 until the abrupt depression 43 is reached, when the dog 40 being suddenly released forcibly strikes the end of the arm 39, moving said arm, with the dog 33, inward toward the shaft 14, thereby releasing said dog 33 from the teeth 30, as illustrated in dotted lines in Fig. 2. If desired, the dog 40 may be locked out of operative position by inserting a pin through a hole 44 near the outer end thereof after first drawing back said dog by means of a ring 45, provided for that purpose, until the hole 44 lies outside of the pocket 41. The dog 33 will then be pressed outward under the action of the spring 35 into engage-

ment with the teeth 30 and will remain in such position. Consequently the shaft 14 will be rotated continuously from the carrying-wheels.

46 indicates a pawl, mounted on an arm 47, carried by the rock-shaft 21, as best shown in Fig. 2. The outer end of the pawl 46 is adapted to rest upon the periphery of a flange 48, carried on the outer face of the clutch member 31, as best shown in Figs. 2 and 4. Said flange, as best shown in Figs. 2 and 5, is provided with an offset portion 49, adapted to be engaged by a downwardly-projecting lug 50, carried by the pawl 46 near its outer end, as best shown in Fig. 2. Said pawl is also provided with a laterally and downwardly projecting lug 51 at its outer end, which lug is adapted to engage a laterally-projecting lug 52, carried by the flange 48 near the offset portion 49, as best shown in Figs. 2 and 5. The position of the lug 51 is best shown in Figs. 7 and 8.

The lug 50, through its engagement with the offset portion 49 of the flange 48, is adapted to prevent reverse rotation of the clutch member 31, while the lug 51, through its engagement with the lug 52, serves to prevent excessive forward rotation of said clutch member. As best shown in Fig. 2, the pawl 46 and dog 40 are arranged so that the lugs 50 51 of said pawl and the dog 40 are normally about ninety degrees apart, the upper end of the pawl 46 being arranged to rest upon the upper surface of the flange 48, while the dog 40 is arranged in a horizontal position at the side of the clutch members opposite that at which the rock-shaft 21 is placed. The object of this arrangement will appear in the following description of the operation of the machine.

When the machine is traveling, the clutch member 27 is constantly rotated through the sprocket-chain 28, moving in the direction indicated by the arrow in Fig. 3. Normally, however, the clutch member 31 is not rotated, since the dog 33 is held out of engagement with the teeth 30 of the clutch member 27 by the engagement of the dog 40 with the arm 39, as shown in Fig. 2. At this time also the pawl 46 rests upon the flange 48, its lug 50 lying opposite the offset portion 49 of said flange, while its lug 51 lies opposite the lug 52 of said flange, thereby locking the clutch member 31 against rotation. This locking is advantageous, because if for any reason the clutch member 27 should not rotate freely upon the shaft 14—as, for example, if the bearings should become dry—it might tend to rotate the shaft 14 if said shaft were not locked against rotation. This, however, is prevented by the lock described. When the check-row fork 16 is actuated by one of the knots on the check-row wire, the rock-shaft 21 is rocked, throwing the pawl 46 in the direction

indicated by the arrow in Fig. 2. The pawl therefore acts through lug 50, which engages the offset portion 49, to rotate the clutch member 31 in the direction indicated by the arrow in Figs. 2 and 3. It will be understood that at this time the clutch member 27 is being rotated from the carrying-wheels, and the gearing by which this is effected is arranged to drive the clutch member 27 at a higher rate of speed than that at which the clutch member 31 is driven by the pawl 46. When the clutch member 31 has been rotated far enough to carry the arm 39 away from the dog 40, the release of said arm permits the dog 33 to move outward into engagement with the teeth 30 of the clutch member 27, so that the clutch member 31 is thereby locked to the clutch member 27 and thereafter rotates in unison therewith, being driven thereby until the arm 39 again reaches the dog 40 and is by it pressed back, carrying the dog 33 out of engagement with the teeth 30, thereby disconnecting the two clutch members. The action of the dog 40 upon the arm 39 is made abrupt by reason of the fact that as the clutch member 31 rotates the dog 40 rides up on the projection portion of the periphery thereof until when the arm reaches the abrupt depression opposite the projecting end of the arm 39 it is thrown outward suddenly against said arm by the action of the spring 42, and consequently moves the dog 33 quickly and abruptly out of engagement with the teeth 30. The advantage of this construction, as has been pointed out, is that the dog 33 is moved clear of the teeth 30, thereby preventing rattling and wear of the dog and teeth. When this takes place, the pawl 46 through the lug 51 at the free end thereof acts to lock the clutch member 31 against further rotation, since said lug lies in advance of the lug 52, as shown in Fig. 2. The lug 50 at this time also lies back of the offset portion 49, so that further rotation in either direction of the clutch member 31 is prevented until the pawl 46 is again actuated by the check-row wire.

From the foregoing description it will be seen that the clutch member 31 is started by the action of the check-row wire on the fork and that its speed is suddenly accelerated by the abrupt connection of the two clutch members, thus securing the desired jarring or agitation of the seed-plate, hereinbefore referred to, also that when the clutch mechanism is not in operation the seed-plate shaft is positively locked against actuation in either direction, so that improper rotation thereof is prevented.

When it is desired to operate the planter as a drill, by locking the dog 40 out of operative position in the manner described the dog 33 remains in engagement with the teeth of the clutch member 27, and consequently the seed-plate shaft and seed-plate are constantly

rotated as the machine travels. The pawl 46 is of course thrown back out of operative position under such circumstances.

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

1. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, and other mechanism for continuing the operation thereof, substantially as described.

2. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, and mechanism for varying the speed of said seed-delivering mechanism, substantially as described.

3. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, and mechanism for accelerating the speed of said seed-delivering mechanism, substantially as described.

4. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for operating said seed-delivering mechanism, and mechanism for jolting the seed-delivering mechanism, substantially as and for the purpose specified.

5. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, and mechanism for suddenly varying the speed of said seed-delivering mechanism, substantially as described.

6. In a seeding-machine, the combination of a seedbox, a seed-plate, mechanism for partly rotating said seed-plate, and other mechanism for continuing the rotation thereof, substantially as described.

7. In a seeding-machine, the combination of a seedbox, a seed-plate, mechanism for partly rotating said seed-plate, and mechanism for varying the speed of said seed-plate, substantially as described.

8. In a seeding-machine, the combination of a seedbox, a seed-plate, mechanism for partly rotating said seed-plate, and mechanism for suddenly varying the speed of said seed-plate, substantially as described.

9. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, and clutch mechanism for continuing the operation thereof, substantially as described.

10. In a seeding-machine, the combination of seed-delivering mechanism, check-row-wire-operated mechanism for partly operating said seed-delivering mechanism, and means for continuing the operation of said seed-delivering mechanism, substantially as described.

11. In a seeding-machine, the combination of seed-delivering mechanism, check-row-wire-operated mechanism for partly operating

said seed-delivering mechanism, and clutch mechanism for continuing the operation thereof, substantially as described.

12. In a seeding-machine, the combination of seed-delivering mechanism, check-row-wire-operated mechanism for partly operating said seed-delivering mechanism, and means operated by the movement of the machine for continuing the operation of the seed-delivering mechanism, substantially as described.

13. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, other mechanism for continuing the operation thereof, and means for stopping said seed-delivering mechanism at regular intervals, substantially as described.

14. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for varying the speed of said seed-delivering mechanism, and means for stopping said seed-delivering mechanism at stated intervals, substantially as described.

15. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for partly operating said seed-delivering mechanism, other mechanism for continuing the operation thereof, means for stopping said seed-delivering mechanism at regular intervals, and means for temporarily locking the said seed-delivering mechanism against operation when stopped, substantially as described.

16. In a seeding-machine, the combination of seed-delivering mechanism, check-row-wire-operated mechanism for partly operating said seed-delivering mechanism, means for continuing the operation thereof, and means for stopping said seed-delivering mechanism at stated intervals, substantially as described.

17. In a seeding-machine, the combination of seed-delivering mechanism, check-row-wire-operated mechanism for partly operating said seed-delivering mechanism, means for continuing the operation thereof, means for stopping said seed-delivering mechanism at stated intervals, and means for locking said seed-delivering mechanism against further operation until the next actuation of the check-row-wire-operated mechanism, substantially as described.

18. In a seeding-machine, the combination of seed-delivering mechanism, mechanism for continuously operating said seed-delivering mechanism, and means adapted to be moved into or out of operative position for disconnecting said seed-delivering mechanism from said operating mechanism, substantially as described.

19. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving said latter clutch

member, and means operated by the partial rotation of said first-mentioned clutch member for connecting said clutch members together so that they rotate in unison, substantially as described.

20. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving said latter clutch member, means operated by the partial rotation of said first-mentioned clutch member for connecting said clutch members together so that they rotate in unison, and means for automatically disconnecting said clutch members when they have rotated to a predetermined extent, substantially as described.

21. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, check-row-wire-operated mechanism for partly rotating said shaft, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving said latter clutch member, and means operated by the partial rotation of said first-mentioned clutch member for connecting said clutch members together so that they rotate in unison, substantially as described.

22. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, check-row-wire-operated mechanism for partly rotating said shaft, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving said latter clutch member, and a spring-actuated dog for automatically disconnecting said clutch members when they have rotated to a predetermined extent, substantially as described.

23. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving the latter clutch member, a rock-shaft, check-row-wire-operated mechanism for rocking said shaft, a pawl carried by said shaft and adapted to engage said first-mentioned clutch member for partly rotating the same, and means operated by the partial rotation of said first-mentioned clutch member for connecting said clutch members together, substantially as described.

24. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving the latter clutch member, inwardly-projecting teeth carried by one of said clutch members, a dog carried by the other clutch member adapted to engage said teeth, and a stationary spring-dog for moving said first-mentioned dog out of engagement with said teeth, substantially as described.

25. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving the latter clutch member, inwardly-projecting teeth carried by one of said clutch members, a dog carried by the other clutch member adapted to engage said teeth, an arm connected with said dog and projecting beyond the periphery of said clutch member, and a spring-dog adapted to engage said arm for moving said first-mentioned dog out of engagement with said teeth, substantially as described.

26. In a seeding-machine, the combination of a seedbox, a seed-plate, a shaft for rotating said seed-plate, a clutch member fixedly mounted on said shaft, a separate clutch member, means operated by the forward movement of the machine for driving the latter clutch member, inwardly-projecting teeth carried by one of said clutch members, a dog carried by the other clutch member adapted to engage said teeth, an arm connected with said dog and projecting beyond the periphery of said clutch member, a spring-dog adapted to engage said arm for moving said first-mentioned dog out of engagement with said teeth, and means for retracting said spring-dog prior to its engagement with said arm and for suddenly releasing said dog to permit it to engage said arm abruptly, substantially as described.

27. In a seeding-machine, the combination of seed-delivering mechanism, check-row-wire-operated mechanism for actuating said seed-delivering mechanism, and means for locking said seed-delivering mechanism against actuation when stopped, substantially as described.

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Witnesses:

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