No. 705,052. Patented July 22, 1902.

D. ELEY.

CORN PLANTER.

(Application filed Dec. 19, 1901.)

(No Model.) 4 Sheets—Sheet 1.

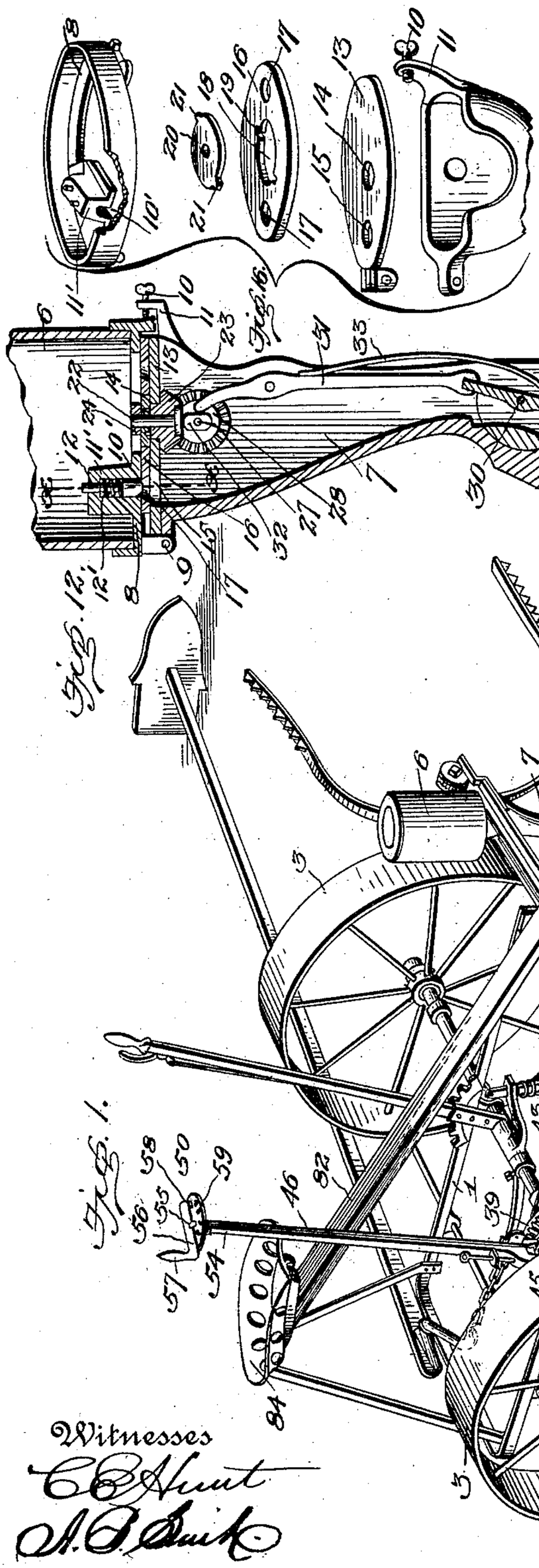


Fig. 1.

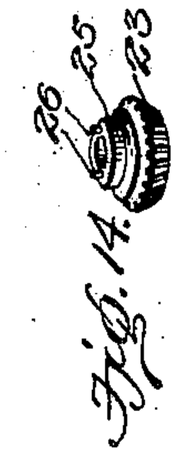


Fig. 14.

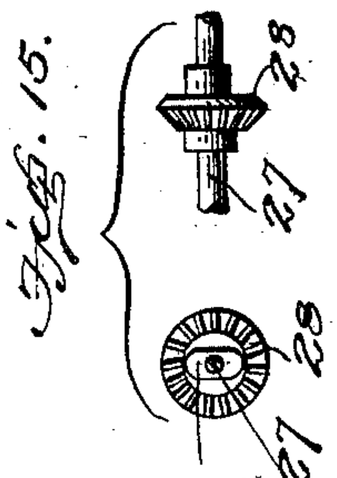


Fig. 15.

Fig. 12.

Witnesses
C. C. Hunt
A. D. Quick

Inventor
David Eley
by Chas. P. Miller
Attorney

No. 705,052. Patented July 22, 1902.

D. ELEY.

CORN PLANTER.

(Application filed Dec. 19, 1901.)

(No Model.) 4 Sheets—Sheet 2.

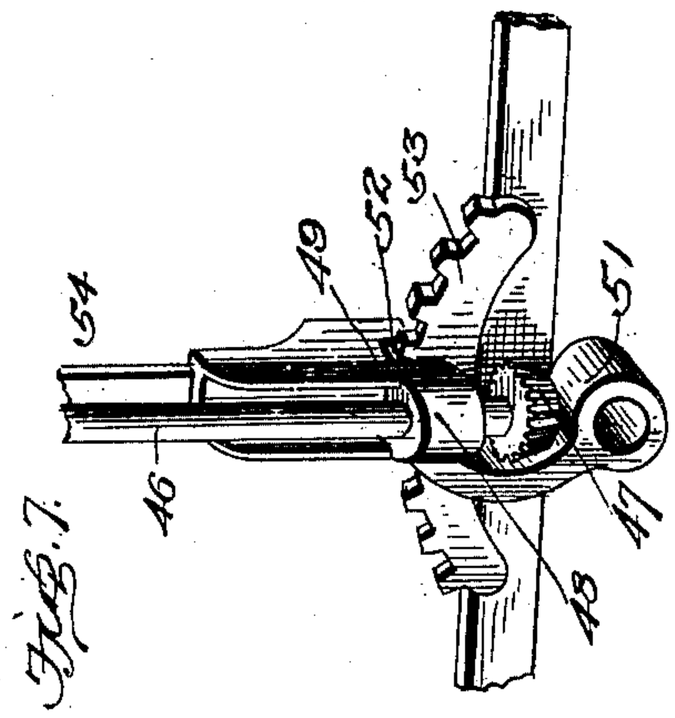


Fig. 7.

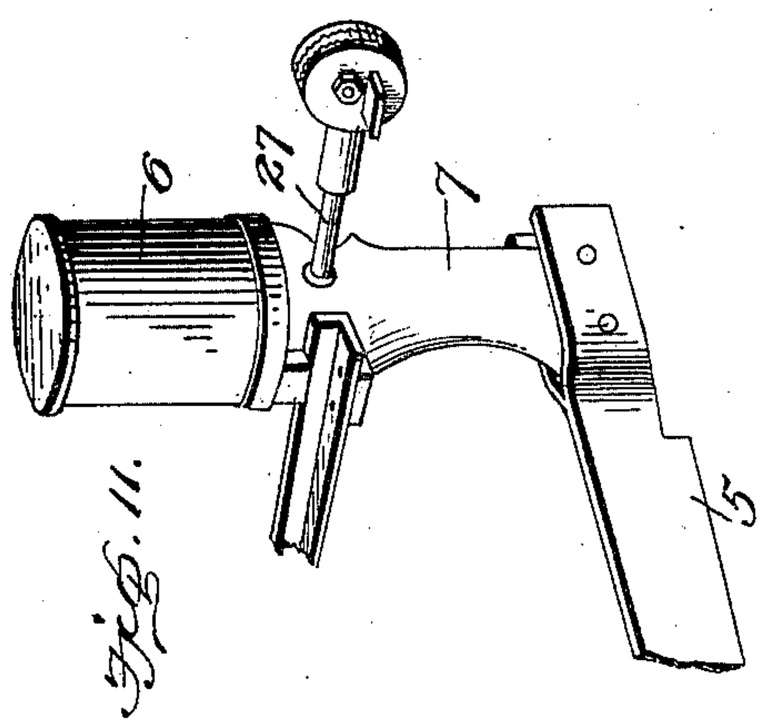


Fig. 11.

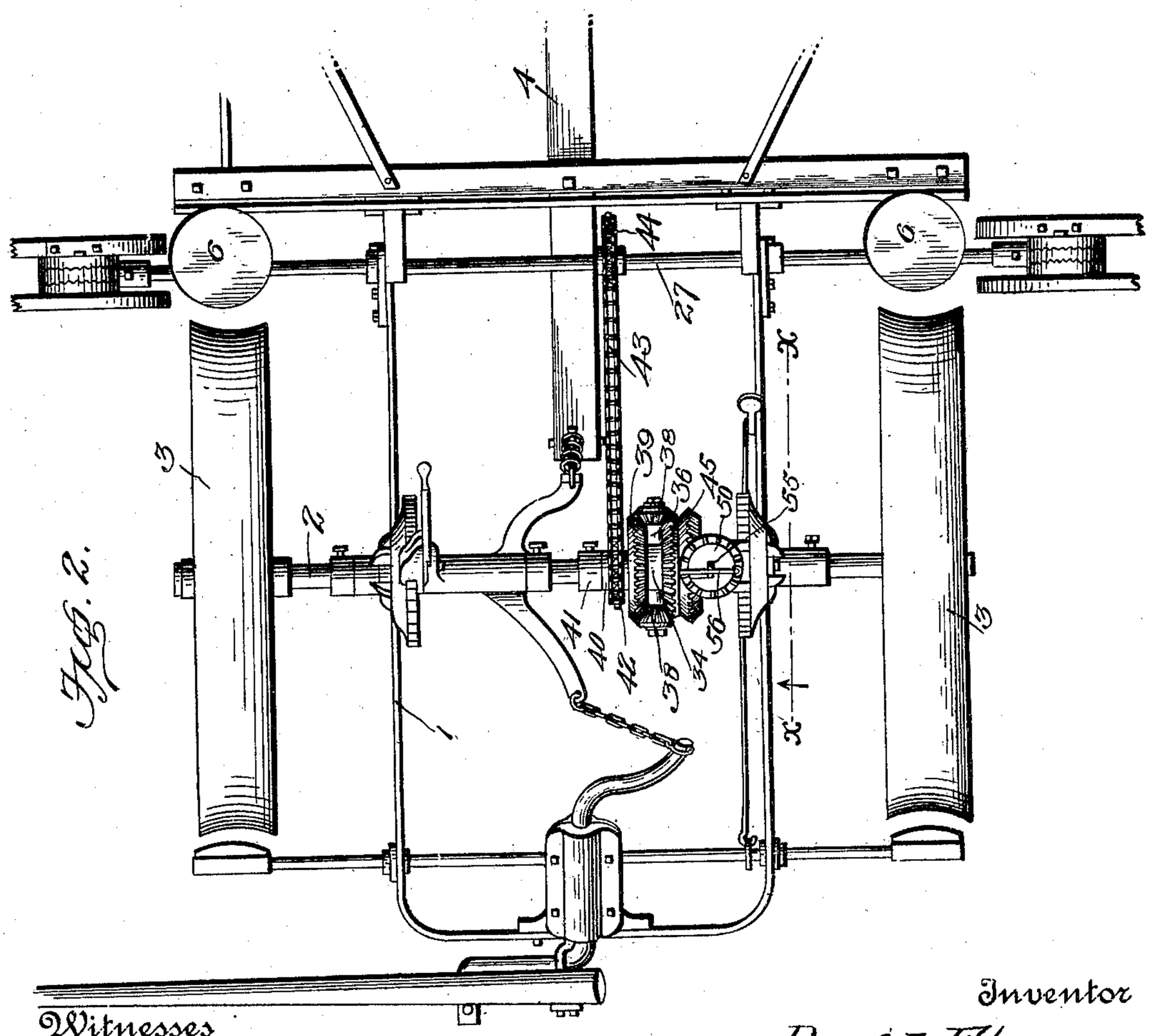


Fig. 2.

Witnesses
C. C. Hunt.
A. B. Smith

Inventor
David Eley
by Chas. P. Miller
Attorney

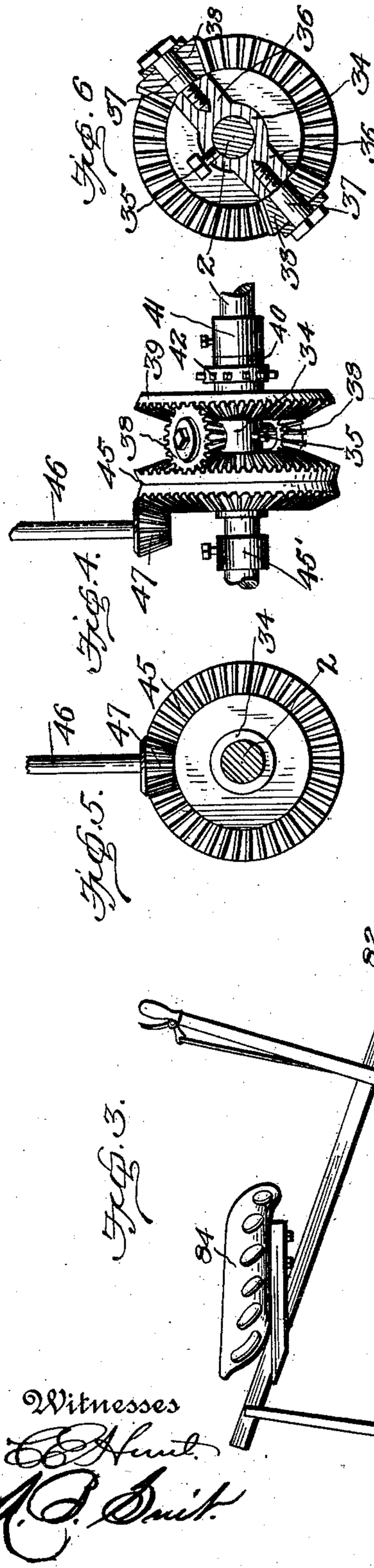
No. 705,052. Patented July 22, 1902.

D. ELEY.

CORN PLANTER.

(Application filed Dec. 19, 1901.)

(No Model.) 4 Sheets—Sheet 3.



Witnesses
E. E. Hunt.
A. C. Smith.

Inventor
David Eley
by Chas. P. Miller
Attorney

No. 705,052. Patented July 22, 1902.

D. ELEY.

CORN PLANTER.

(Application filed Dec. 19, 1901.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 7a

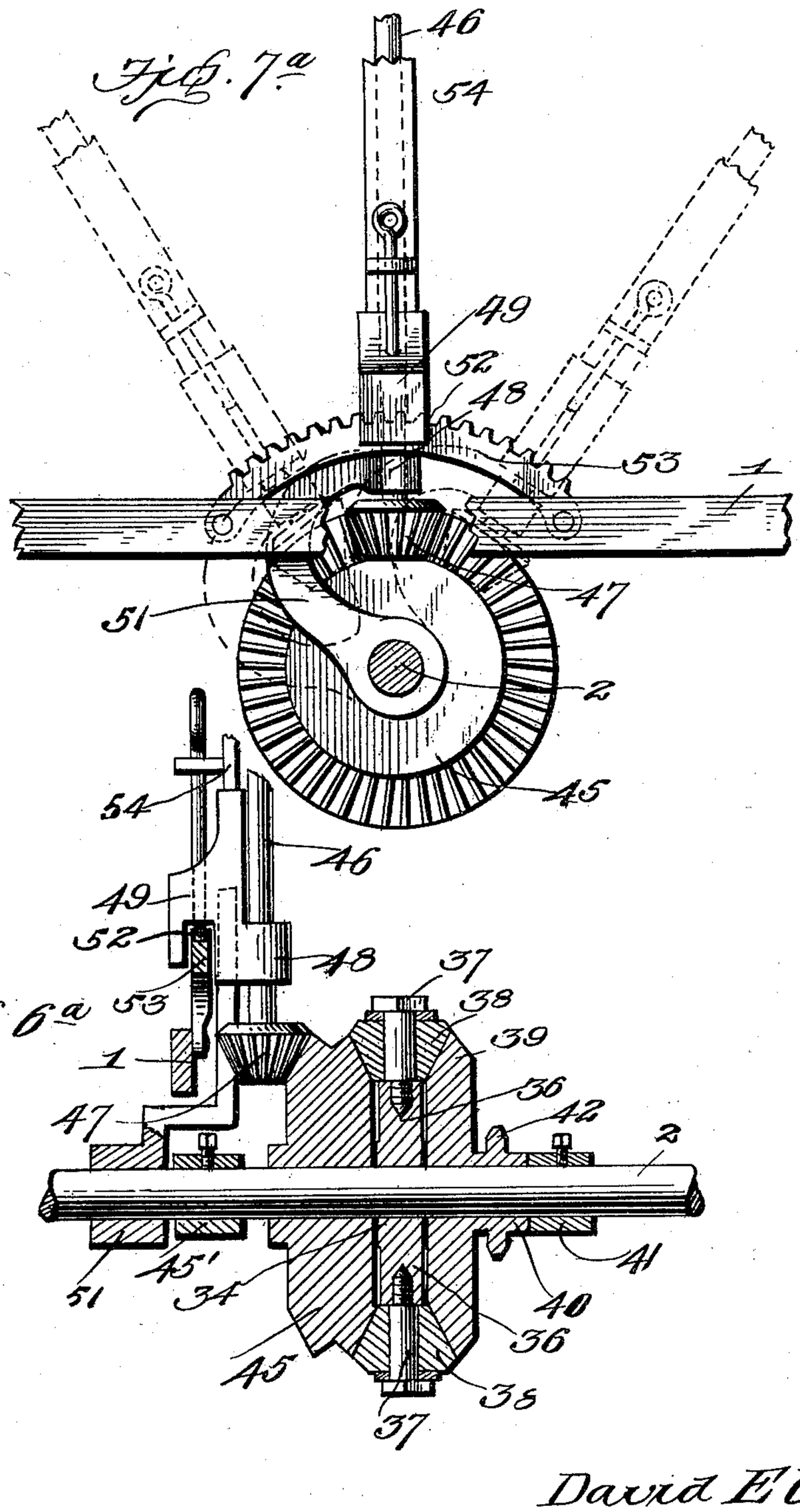


Fig. 6a

Witnesses
C. E. Hunt.
H. B. Smith

Inventor
David Eley
By Benj. F. Cowl
associate Attorney.

UNITED STATES PATENT OFFICE.

DAVID ELEY, OF LAKEFORK, OHIO.

CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 705,052, dated July 22, 1902.

Original application filed April 18, 1901, Serial No. 56,391. Divided and this application filed December 19, 1901. Serial No. 86,546. (No model.)

To all whom it may concern:

Be it known that I, DAVID ELEY, a citizen of the United States, residing at Lakefork, in the county of Ashland and State of Ohio, have invented new and useful Improvements in Corn-Planters, of which the following is a specification.

This invention relates to corn-planters; and its object is to generally simplify and improve the construction and increase the practical efficiency of planters of this class; and to this end it consists in certain improved features of construction and combination of parts, as will be hereinafter fully described, and particularly defined in the appended claims.

The present application is a division of my prior application filed April 18, 1901, Serial No. 56,391, and relates particularly to the compensating gearing for operating the seed-dropping mechanism at different rates of speed.

In the accompanying drawings, Figure 1 is a perspective view of a corn-planter embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical longitudinal section. Fig. 4 is a front elevation of the controlling compensating gearing for throwing the dropper mechanism into and out of action. Fig. 5 is an outer side view of the double bevel-gear thereof and the lower end of the controlling rod or shaft. Fig. 6 is a central cross-section through the gearing shown in Fig. 4. Fig. 6^a is a longitudinal section through the gearing. Fig. 7 is a perspective view showing the lower end of the controlling-rod and associated parts. Fig. 7^a is a section on line $x\,x$ of Fig. 2, illustrating the adjustment of rod 46. Fig. 8 is a perspective view showing the upper end of the controlling-rod and associated parts, the parts being separated and arranged in their proper relative positions. Fig. 9 is a cross-section through the detent-plate shown in Fig. 8. Fig. 10 is a detail perspective view of the upper end of the controlling-rod and spring connected thereto. Fig. 11 is a perspective view of the hopper and feed-chute. Fig. 12 is a central vertical longitudinal section of the same. Fig. 13 is a section on the line $x\,x$ of Fig. 12, showing the feed-plungers. Fig. 14 is a detail perspective view of the bevel-pinion which drives the rotary feed-plate of the hopper. Fig. 15 is an end and a side view of the bevel-gear which drives said bevel-pinion and the tappet lug or block coöperating therewith, and Fig. 16 is a perspective view showing the various parts of the feed mechanism disassociated and arranged in their proper relative positions.

Referring now more particularly to the drawings, the numeral 1 represents the rear or wheel frame; 2, the drive-shaft or axle; 3, the carrying and covering wheels; 4, the tongue or pole; 5, the furrow-opening shoes or runners which open the soil to receive the seed; 6, the seed-hoppers, and 7 the discharge-tubes or seed-chutes, connected at their upper ends to the hoppers and at their lower ends to said shoes. The bottom 8 of each hopper is flanged or channeled to receive the lower edge of the hopper-body and is hinged at one side, as shown at 9, to the upper front portion of the seed-chute 7 and is held secured at its rear side to said chute by means of a set-screw 10, mounted in a bracket 11, projecting from the upper rear side of the chute. By this construction the hopper is adapted to be tilted forward to permit of ready access being had to the seed-dropping mechanism to apply and remove interchangeable feed-disks to drop more or less seed, as desired. The bottom 8 has a feed-opening 10′, through which the seed is discharged from the hopper, and has mounted thereon a housing 11′, in which are arranged two vertically-movable spring-actuated plungers 12, the purpose of which will be hereinafter explained.

Mounted upon the top of the seed-chute 7 is a supporting-plate 13, having a central opening 14 and a feed-hole 15, located beneath the housing 11′. Between this plate and the bottom 8 of the hopper is arranged a rotary feed-disk 16, in which are formed two or more feed-holes 17 and a central hole 18, provided at diametrically opposite points with notches 19. The feed-holes 17 form, with the solid portion of the supporting-plate 13, pockets for the reception of a predetermined amount of seed passing from the hopper 6 and feeding downward through the opening 10′ in the bottom 8 of said hopper, and as said disk rotates the holes 17 are brought into alinement

with the feed-hole 15 in the supporting-plate 13, through which the seed drop down into the feed-chute 7. As the feed-holes 17 come into alinement with the hole 15 one plunger 12 strokes the hole, leaving it level full of seed, and when the hole comes below the other plunger the latter forces the seed through the hole 15 and into the chute 7. The springs 12′ serve to project the plungers and at the same time to allow them to recede under pressure from the holes 17 and ride upon the surface of the disk 16.

Into the opening 18 of the disk 16 fits a coupling plate or disk 20, which is provided with lugs 21 to seat within the notches 19 and positively connect said plates or disks together to rotate in unison. Projecting upwardly through the center of the coupling plate or disk 20 is a pin or bolt 22, having its head seated in a socket in the under side of the bevel-pinion 23 and the extremity of its stem threaded to receive a nut 24, whereby it is held in position. The pinion 23 is formed with a hub 25, which extends loosely through the opening 14 in the supporting-plate 13, and is provided with pins or projections 26, which enter sockets in the under side of the coupling-plate 20 and connect said plate to turn with the pinion. By this construction it will be seen that as the pinion rotates motion will be communicated therefrom to the coupling plate or disk 20 and that said coupling plate or disk will in turn communicate motion to the rotary feed-disk 16, and it will also be seen that the parts are so constructed and connected as to permit of the ready association and disassociation thereof for cleaning, repairs, or the substitution of new parts and to apply and remove feed-disks having larger or smaller holes 17 to drop more or less seed.

The dropping mechanism of the two hoppers 6 receives motion from a transverse shaft 27, journaled in the front portion of the frame 1, which shaft is provided within the upper portion of each seed-chute or discharge-tube 7 with a fixed bevel gear-wheel 28, which meshes with the pinion 23, and thereby communicates motion to the rotary feed-disk 16. The seed falling from the hopper into the seed-chute 7 drop into a discharge-opening formed in an oscillating valve 29, mounted upon a pivot pin or bolt 30 in the base of the chute and jointed to the lower end of a vibrating lever 31, which is adapted to be operated by a tappet block or lug 32, fixed upon the shaft 27. At each half-revolution of the shaft a predetermined amount of seed when planting is discharged into the said tube and falls into the pocket or opening of the oscillating discharge-valve 29, and simultaneously therewith the knocker-block 32 operates to move the vibrating lever 31, which oscillates the valve to bring the pocket or opening therein into position to allow the seed to discharge into the furrow formed by the shoe or runner 5 and also to close the feed-chute 7 at the top of oscillating valve 29. A plate-spring or ribbon-spring 33 bears against the valve and lower arm of the vibrating lever and serves to restore the same to their normal positions after being operated by the said knocker-block.

The seed-dropping mechanism above described is controlled through the instrumentality of the following compensating mechanism: On the drive-shaft 2 is mounted a sleeve 34, which is fixed thereto by means of a set-screw 35 and is provided with radial arms 36, carrying stub-shafts 37, on which are revolubly mounted cone-shaped bevel-pinions 38. On one side of these pinions is mounted a bevel gear-wheel 39, which turns loosely on the shaft 2 and is formed with a laterally-projecting sleeve 40, which is adapted to bear against a collar 41, rigidly secured to said shaft, and has formed thereon a sprocket-wheel 42, which is connected by means of a sprocket-chain 43 with a sprocket wheel or pinion 44 on the forward transverse shaft 27, whereby said latter shaft is driven. On the opposite side of the pinions 38 is arranged a double-bevel gear-wheel 45, which is loosely mounted on the axle 2 and is adapted to bear against a collar 45′, rigidly secured to said axle. In the normal arrangement of the parts when the seed-dropping mechanism is not running the pinions 38 contact only with the toothed face of the gear-wheel 39, and as the gearing of the dropper mechanism opposes a resistance to the rotation of said wheel 39 the pinions 38 do not turn the same, but simply rotate on their axes (the short shafts 37) in contact with said gear. During this operation of the parts the inner toothed face of the double gear-wheel 45 is out of mesh with the pinions 38. When it is desired to throw the seed-dropping mechanism into operation the double-bevel gear is moved inwardly on the shaft or axle 2 away from the collar 45′ toward the pinions 38, so as to bring its inner toothed face into mesh therewith, whereby upon said double-bevel gear being held stationary the pinions will be caused to transmit motion to the loose gear 39, by means of which motion is communicated to the sprocket-wheel 42 and from said sprocket-wheel through the medium of the chain 43 and sprocket wheel or pinion 44 to the transverse shaft 27, whereby motion is imparted to the rotary feed-disks of the said dropping mechanism in the manner heretofore described. The double gear-wheel 45 is adapted to be revolved and moved toward the pinions 38 and held in engagement therewith by means of a controlling-rod 46, which carries at its lower end a fixed pinion 47, which is adapted to mesh with the outer toothed face of the gear-wheel 45. The rod 46 is vertically movable to bring the pinion 47 into and out of gear with the gear-wheel 45 and is mounted to slide at its lower end in an eye 48 on a bracket 49 and at its upper end through an opening formed in a notched or toothed plate 50. The bracket 49 is formed at its

lower end with a hanger 51, which pivotally connects it with the shaft 2 to swing in the arc of a circle in a direction longitudinally of the frame and has a pawl 52, which is adapted to coöperate with a rack 53, secured to the frame 1 to hold it securely in adjusted position. The bracket 49 is also formed with a socket in which is stepped or fitted the lower end of a standard 54, which is secured at its upper end to the notched or toothed plate 50 and serves as a support for said plate and for the upper end of the controlling-rod 46. The rod 46 is bent at right angles at its upper end to form a bearing 55 for a pivoted hand-lever 56, which is formed at one end with a crank-handle 57 and at its other end with a fixed pawl or dog 58, having a cam-shaped end or extremity 58′, as clearly shown in Fig. 8. This dog is adapted to engage in the notches between teeth 59, formed upon the upper surface of the plate 50 to hold the rod or shaft against rotary movement and is normally held seated by means of a pressure-spring 60, mounted upon the said angular end 55 of said rod. When it is desired to withdraw the pinion 47 from engagement with the double gear-wheel 45, the handle 57 of the lever 56 is grasped and forced upwardly, thereby bringing the rounded or cam-shaped extremity 58′ of the pawl into engagement with the plate 50 and causing it to act as a fulcrum, whereby the controlling-rod 46 is elevated and the pinion 47 withdrawn from engagement with said double gear-wheel. The purpose of mounting the bracket 49 to swing upon the axle or shaft 2 is to permit of the controlling-rod being swung backward and forward, according to the position of the driver's seat 84 upon the seat-bar 82, to adjust the lever 56 to the front or rear, so as to be within easy reach of the operator from his position on said seat. The pawl 52 is withdrawn from engagement with the rack 53 to permit of this swinging movement of the controlling-rod and associated parts and is then engaged with the rack to hold said rod and parts in adjusted position.

By means of the rod 46, pinion 47, and hand-lever 56 the compensating gearing may be thrown into and out of action and regulated to drive the shaft 27 at varying speeds, to stop the dropping mechanism, and to operate the same to drop the seed fast or slow, as circumstances may require. The compensating gearing is thrown into and out of action by moving the pinion 47 into and out of engagement with the outer toothed face of the double-bevel gear 45, as hereinbefore described. When the pinion 47 is brought into engagement with the gear 45 and the latter is forced inward, thereby to bring its inner toothed face in engagement with the pinions 38, the parts are disposed as in Fig. 4 for operation to drive the dropper mechanism at its normal speed. The parts of the gearing are so proportioned and arranged that when said parts are arranged as shown in Fig. 4 and the bevel-gear 45 is held stationary by the pinion 47 the motion of the axle 2 will be communicated to the gear-wheel 39 and multiplied through the action of the pinions 38 to rotate said gear-wheel 39 at a higher rate of speed than said axle, the gear-wheel 39 revolving twice upon each revolution of the axle 2. When it is desired to have the dropper mechanism operated at less speed, the crank-handle 57 of the lever 56 is forced down to release the pawl 58 from engagement with the teeth on the plate 50, and said crank-handle is then turned to rotate the rod in the proper direction to cause the pinion 47 to turn the double-bevel gear-wheel 45 forwardly or in the direction of revolution of the axle 2. The pinions 38 will then lock the two gear-wheels 39 and 45 together, and as the gear-wheel 45 is permitted to rotate by the rotation of the rod 46 and pinion 47 it will be seen that both gears will be caused to turn with the axle 2, and to therefore make one revolution upon each revolution of said axle, thereby driving the dropper mechanism at a lower rate of speed. When, on the other hand, it is desired to drive the dropper mechanism at a much higher rate of speed than that afforded by holding the gear 45 fixed or turning said gear forwardly, this may be accomplished by turning the rod 46 and pinion 47 by the hand-lever 57 to revolve the gear 45 rearwardly, whereupon the pinions 38 will be revolved in a reverse direction to the direction of rotation of the sleeve 34, producing a change in leverage, which causes a correspondingly greater speed of revolution of the pinions 38, whereby higher speed is imparted to the gear-wheel 39. It will thus be seen that by simply holding the gear-wheel 45 fixed or by turning it in one direction or the other the speed of the gear-wheel 39 may be varied to operate the dropper mechanism slow, fast, or at normal speed, as desired or circumstances may require.

Various changes in the form, proportion, and details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a corn-planter, the combination of driving means, dropper mechanism, compensating gearing between the driving means and dropper mechanism to throw the latter into and out of action and to operate the same at different rates of speed, and means for controlling said compensating gearing, substantially as described.

2. In a corn-planter, the combination of a drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, compensating gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, and means for adjusting said compensating gearing, substantially as described.

3. In a corn-planter, the combination of a

drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, compensating gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, markers mounted upon the driven shaft, and means for adjusting said compensating gearing, substantially as described.

4. In a corn-planter, the combination of a drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, variable-speed gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, said gearing including a pair of gear members loose on the drive-shaft, an intermediate gear fixed to turn with the drive-shaft and independently revoluble, said intermediate gear being normally in engagement with one of said pair of gear members, and means for moving the other gear member into engagement with said intermediate gear and for rotating said gear member to vary the speed of the gearing, substantially as set forth.

5. In a corn-planter, the combination of a drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, variable-speed gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, said gearing including a pair of gear members loose on the drive-shaft, an intermediate gear fixed to turn with the drive-shaft and independently revoluble, said intermediate gear being normally in engagement with one of said pair of gear members, a shifting and driving device by which the other gear member may be shifted into engagement with said intermediate gear, and by which said gear member may also be rotated, and manually-operable means for actuating said shifting and driving device for performing the described functions, substantially as set forth.

6. In a corn-planter, the combination of a drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, variable-speed gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, said gearing including a power-transmitting gear loose on the drive-shaft, a double shiftable speed-changing gear also loose on the drive-shaft, an intermediate gear normally in engagement with the power-transmitting gear, said intermediate gear being mounted to turn with the drive-shaft but indendently revoluble in a plane at right angles to said shaft, a pinion for engaging one of the toothed faces of the double gear, and means for operating said pinion for shifting said double gear to bring its other toothed face into engagement with intermediate gear, and for rotating said double gear, substantially as set forth.

7. In a corn-planter, the combination of a drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, variable-speed gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, said gearing including a power-transmitting gear loose on the drive-shaft, a double shiftable speed-changing gear also loose on the drive-shaft, an intermediate gear normally in engagement with the power-transmitting gear, said intermediate gear being mounted to turn with the drive-shaft but independently revoluble in a plane at right angles to said shaft, a pinion engaging one of the toothed faces of the double gear, a rod carrying the pinion, means for moving the rod vertically to move the pinion into and out of engagement with the double gear, thereby bringing said double gear into and out of engagement with the intermediate gear, and means for turning said rod for rotating the pinion and double gear, substantially as set forth.

8. In a corn-planter, the combination of a drive-shaft, a driven shaft, dropper mechanism operated by the driven shaft, variable-speed gearing between the shafts and adjustable to stop the operation of the driven shaft and to drive said shaft at different rates of speed, said gearing including a power-transmitting gear loose on the drive-shaft, a double shiftable speed-changing gear also loose on the drive-shaft, an intermediate gear normally in engagement with the power-transmitting gear, said intermediate gear being mounted to turn with the drive-shaft but independently revoluble in a plane at right angles to said shaft, a pinion 4 engaging one of the toothed faces of the double gear, a rod carrying the pinion, means for moving the rod vertically to move the pinion into and out of engagement with the double gear, thereby bringing said double gear into and out of engagement with the intermediate gear, means for turning said rod for rotating the pinion and double gear, and means for positively locking the rod in adjusted position, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DAVID ELEY.

Witnesses:
B. F. PAULLIN,
W. R. PAULLIN.