No. 811,977. PATENTED FEB. 6, 1906.

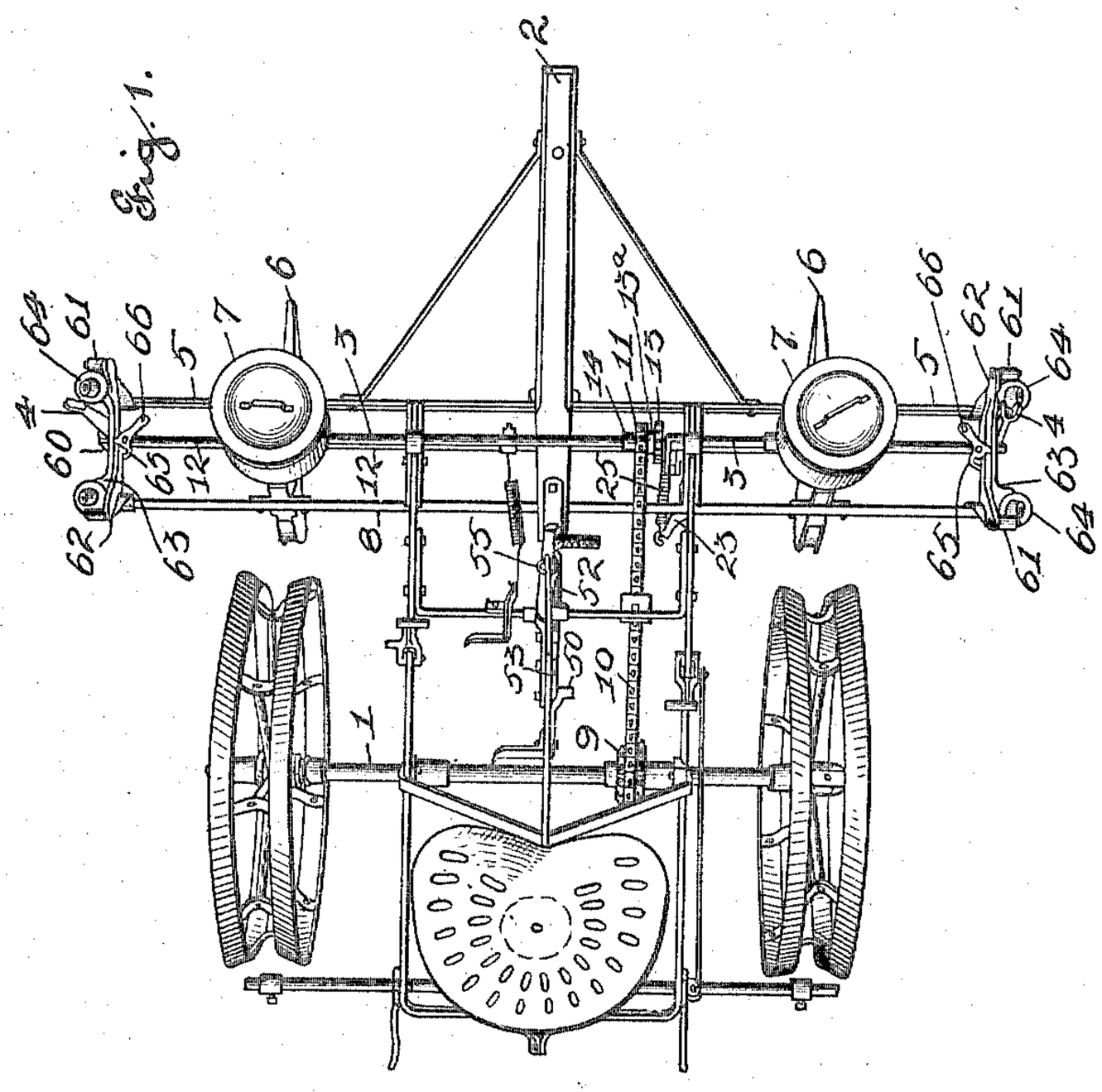
I. A. WEAVER.

CORN PLANTER.

APPLICATION FILED DEC. 12, 1902.

10 SHEETS—SHEET 1.

Fig. 1.



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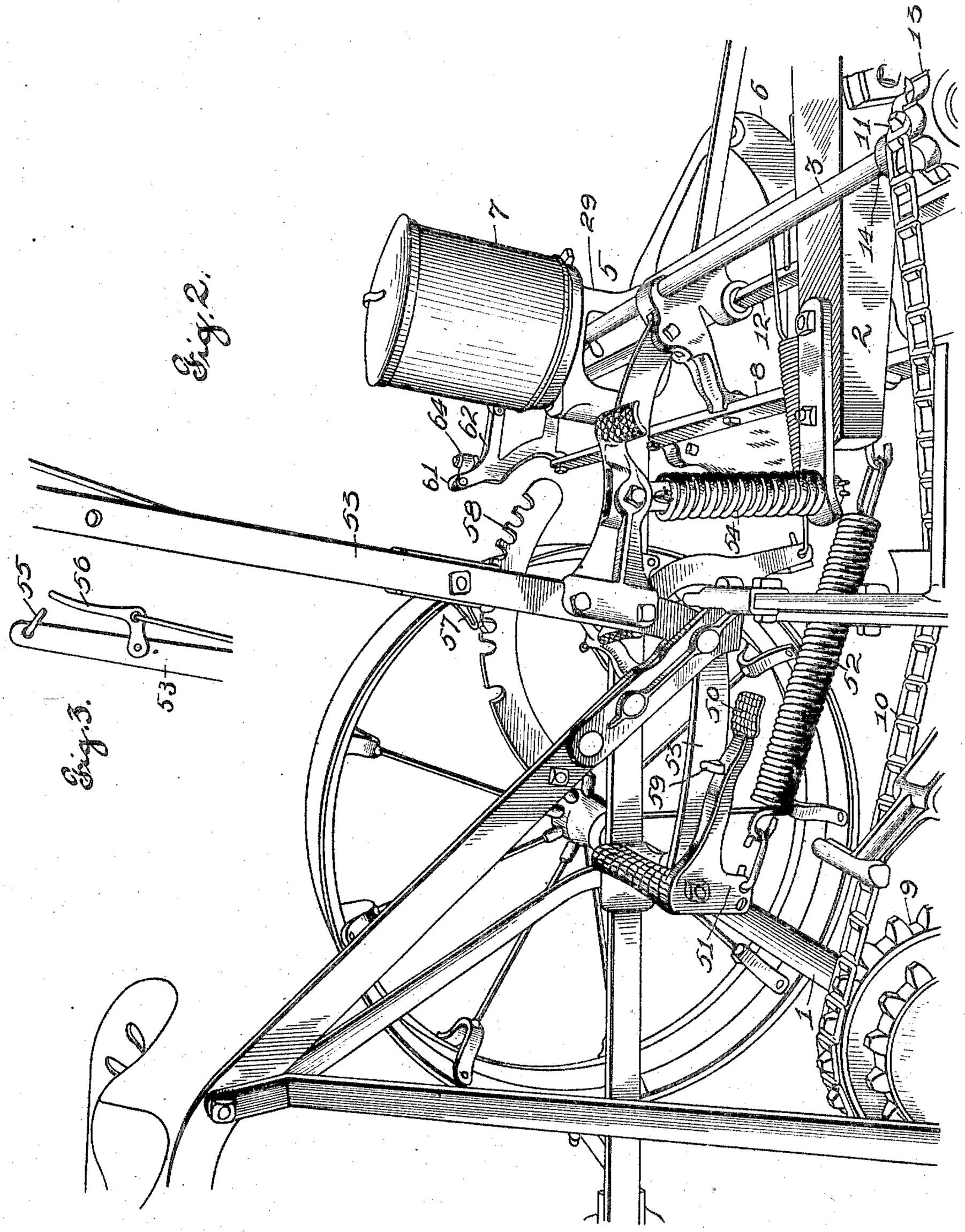
10 SHEETS—SHEET 2.



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10 SHEETS—SHEET 3.

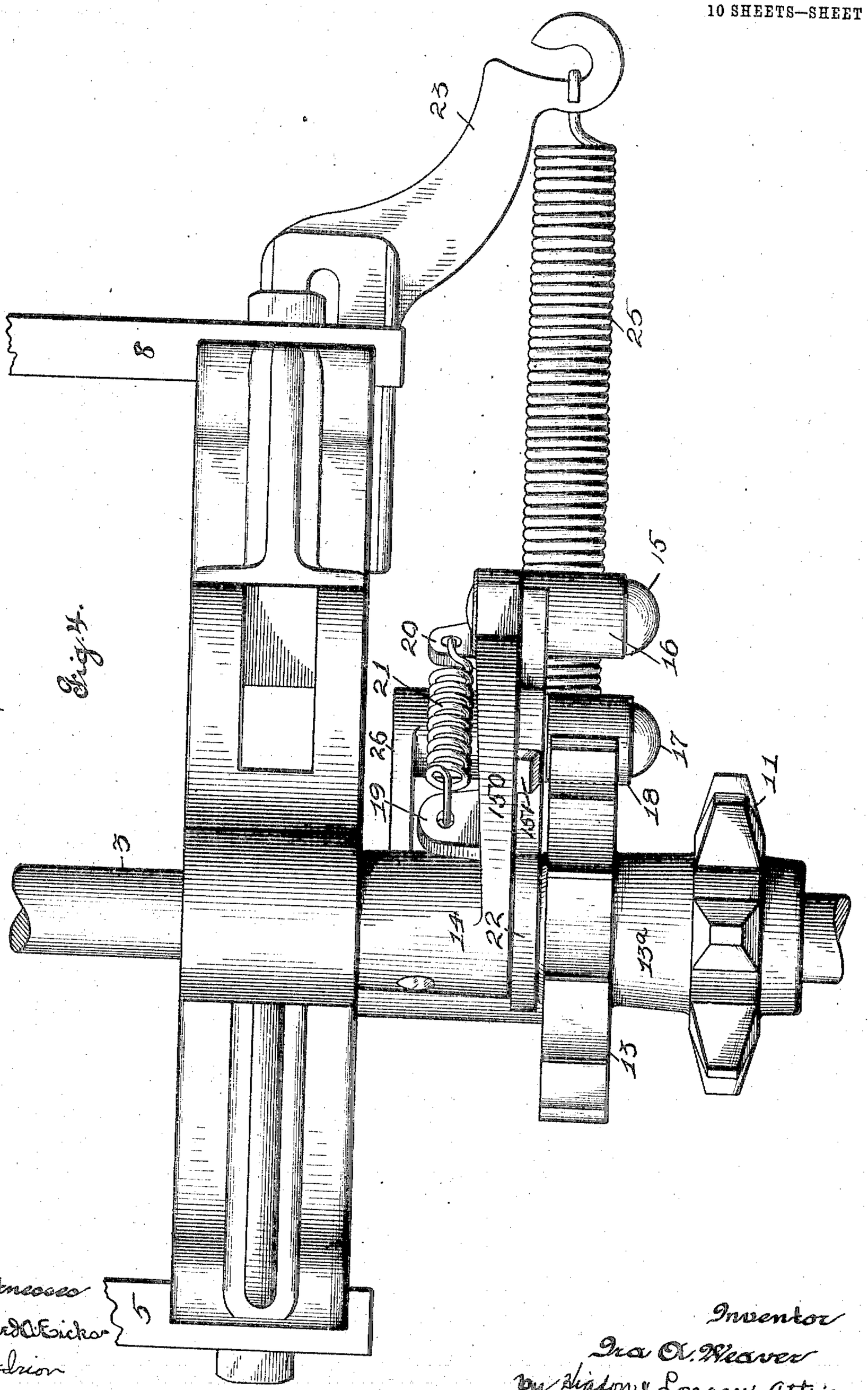

Fig. 4.

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No. 811,977. PATENTED FEB. 6, 1906.

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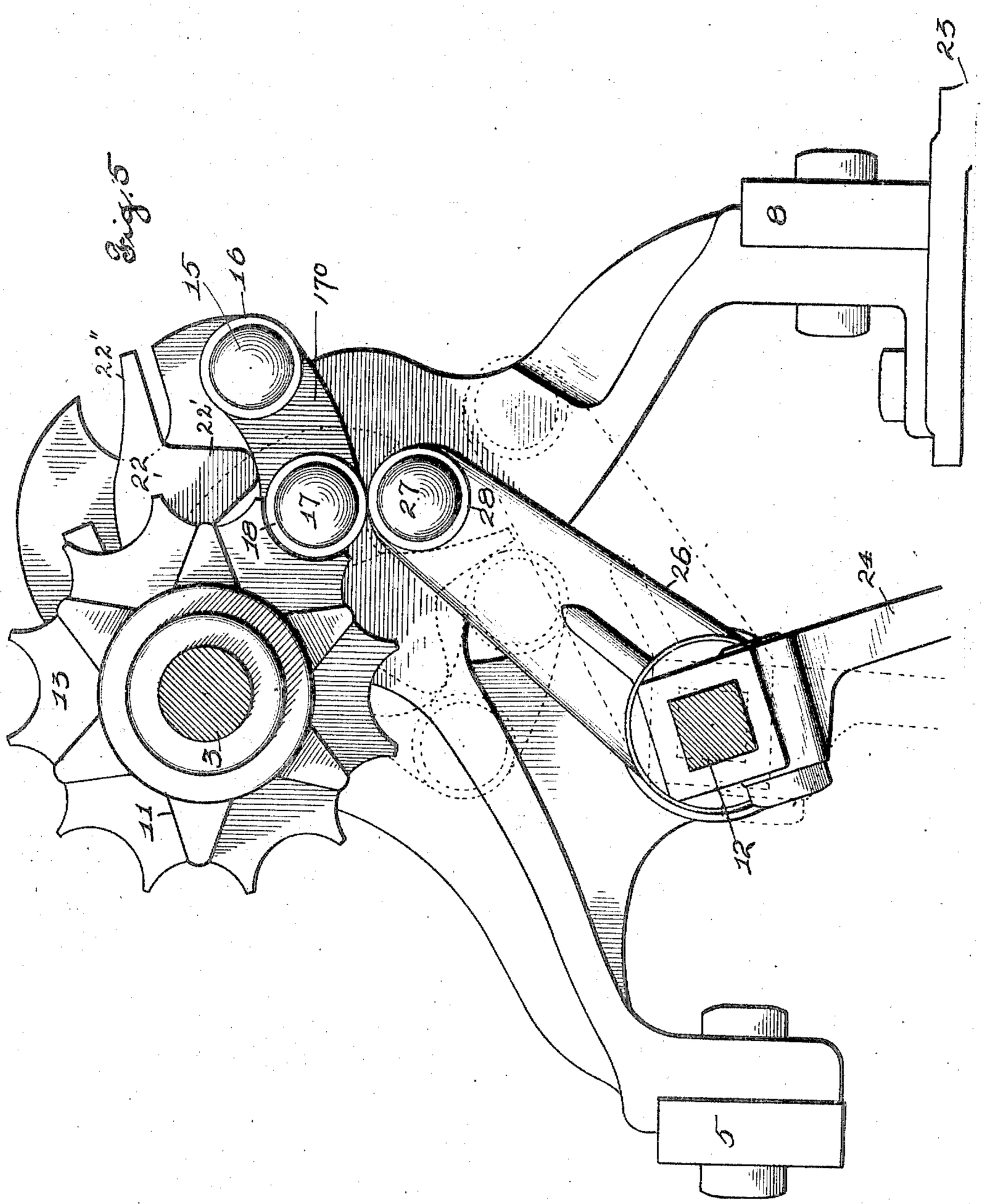
10 SHEETS—SHEET 4.

Fig. 5



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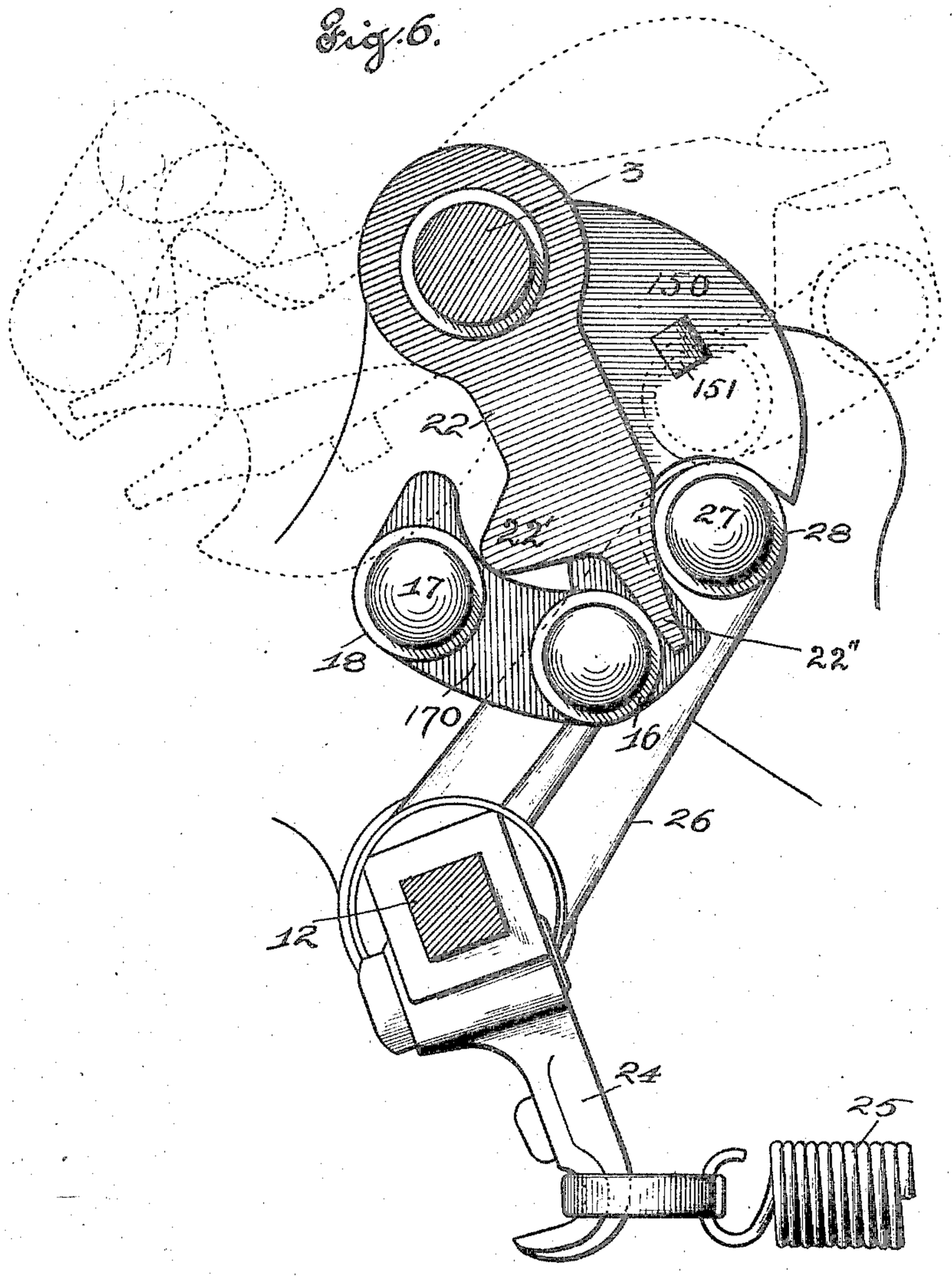
10 SHEETS—SHEET 5.

Fig. 6.



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10 SHEETS—SHEET 6.

Fig. 7.

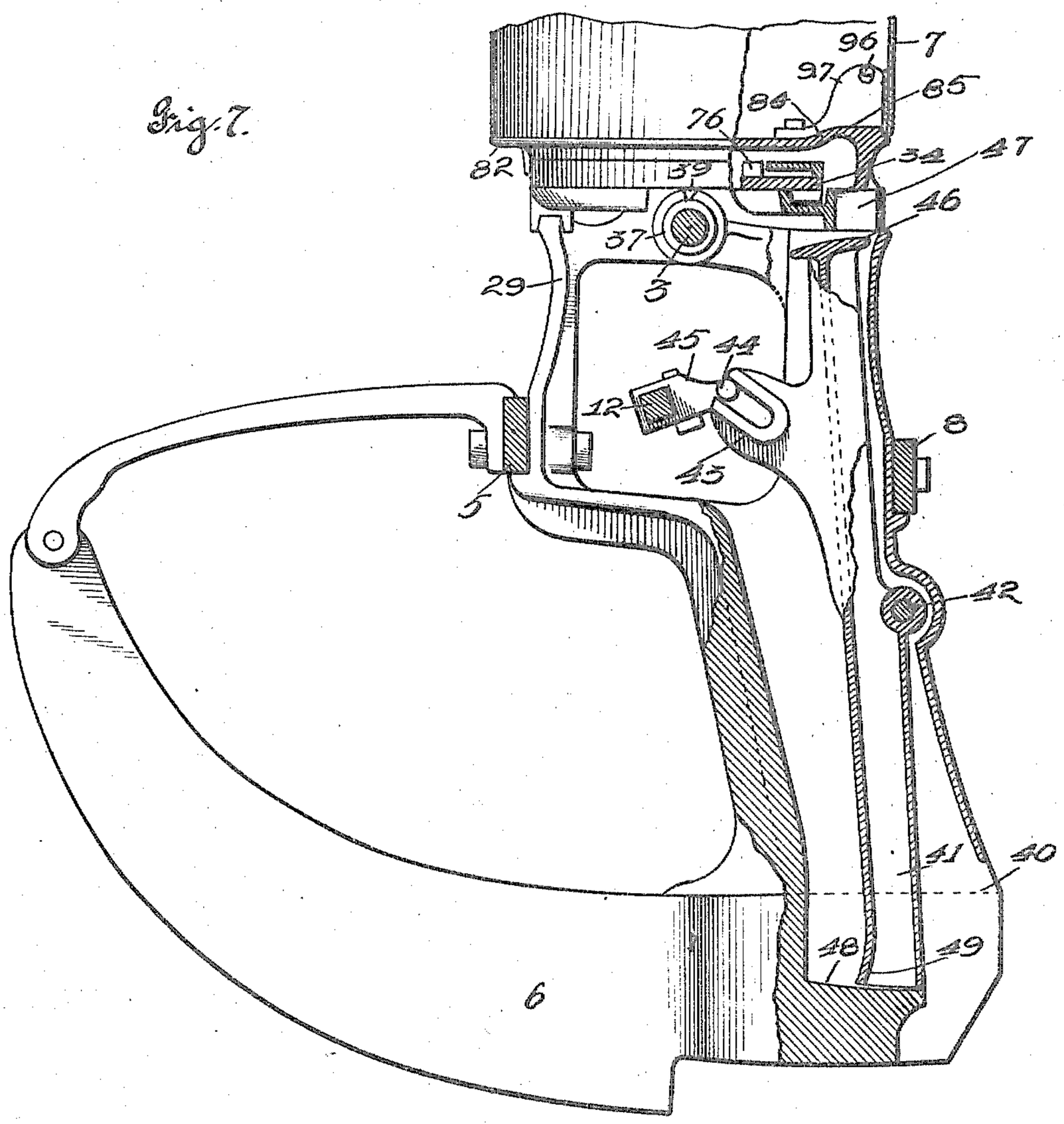
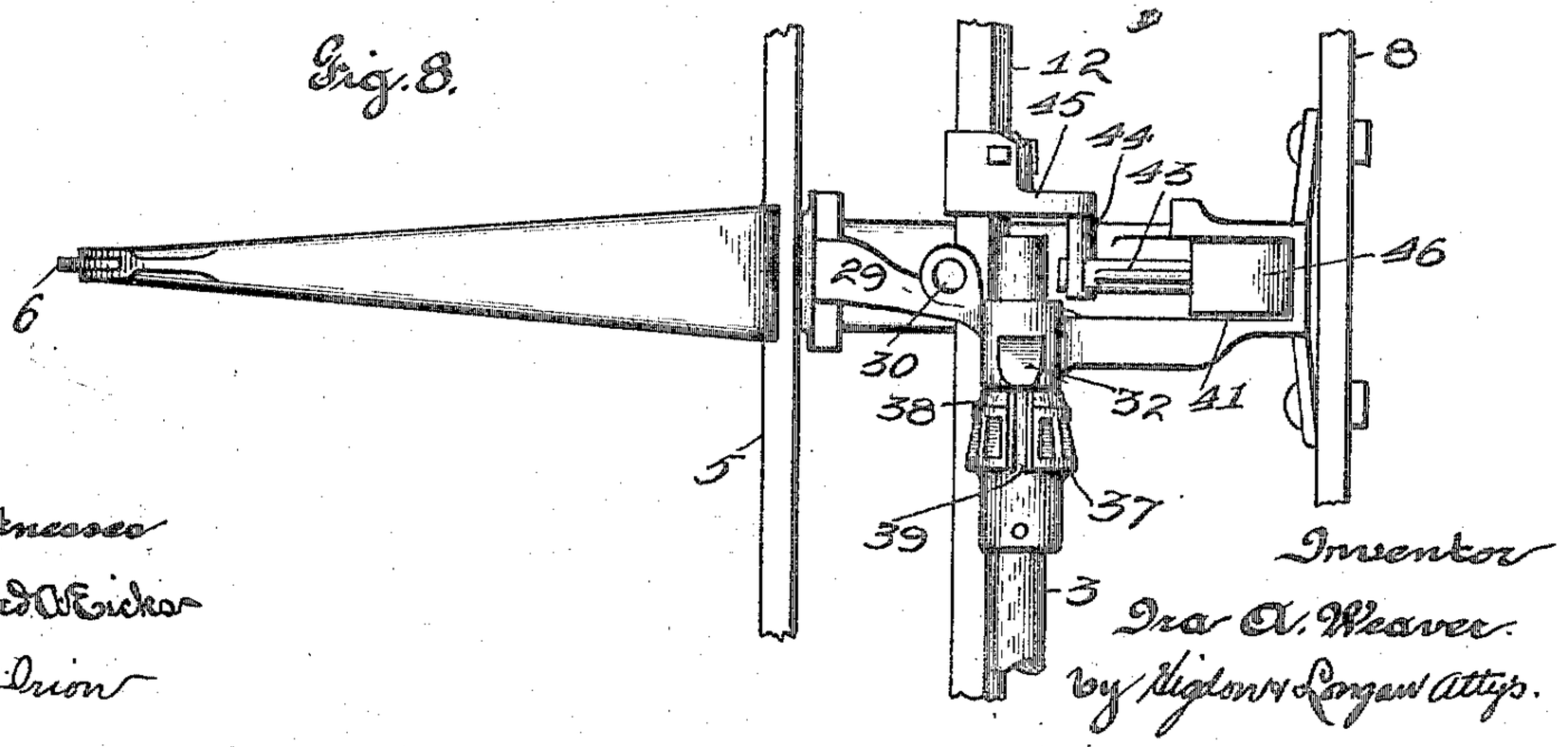


Fig. 8.



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CORN PLANTER.

APPLICATION FILED DEC. 12, 1902.

10 SHEETS—SHEET 7.

Fig. 9.

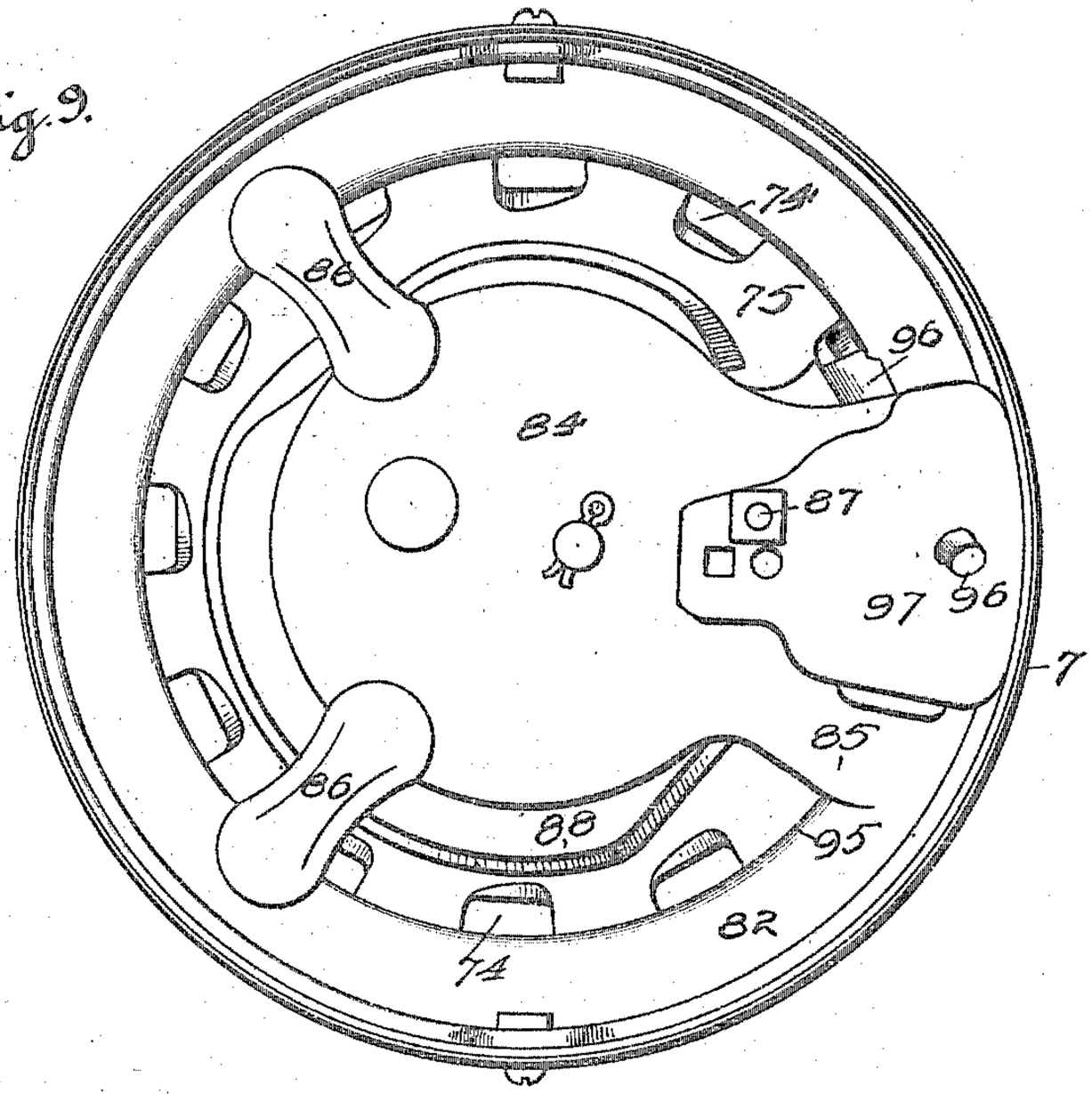
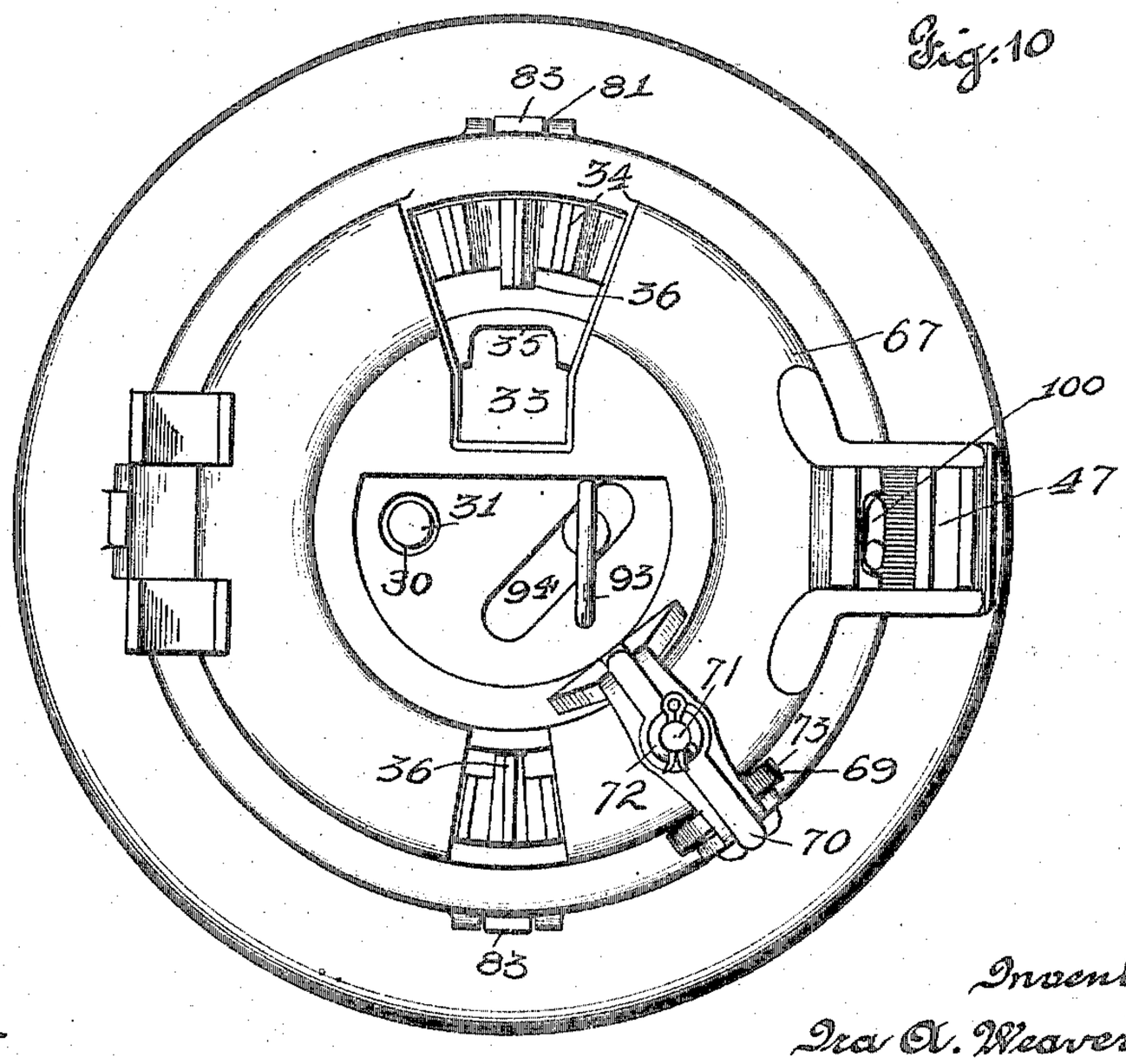


Fig. 10



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APPLICATION FILED DEC. 12, 1902.

10 SHEETS—SHEET 8.

Fig. 11.

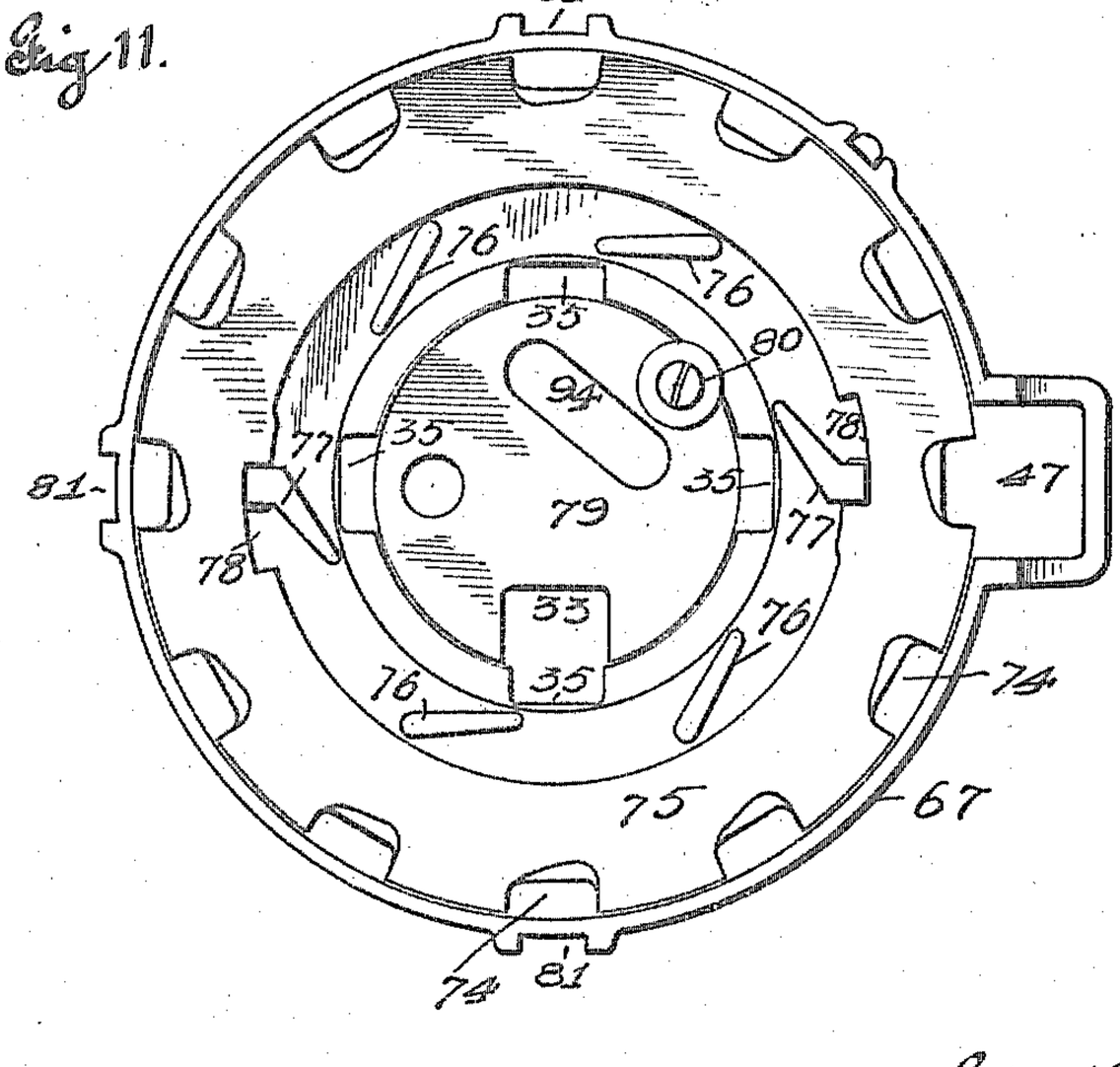
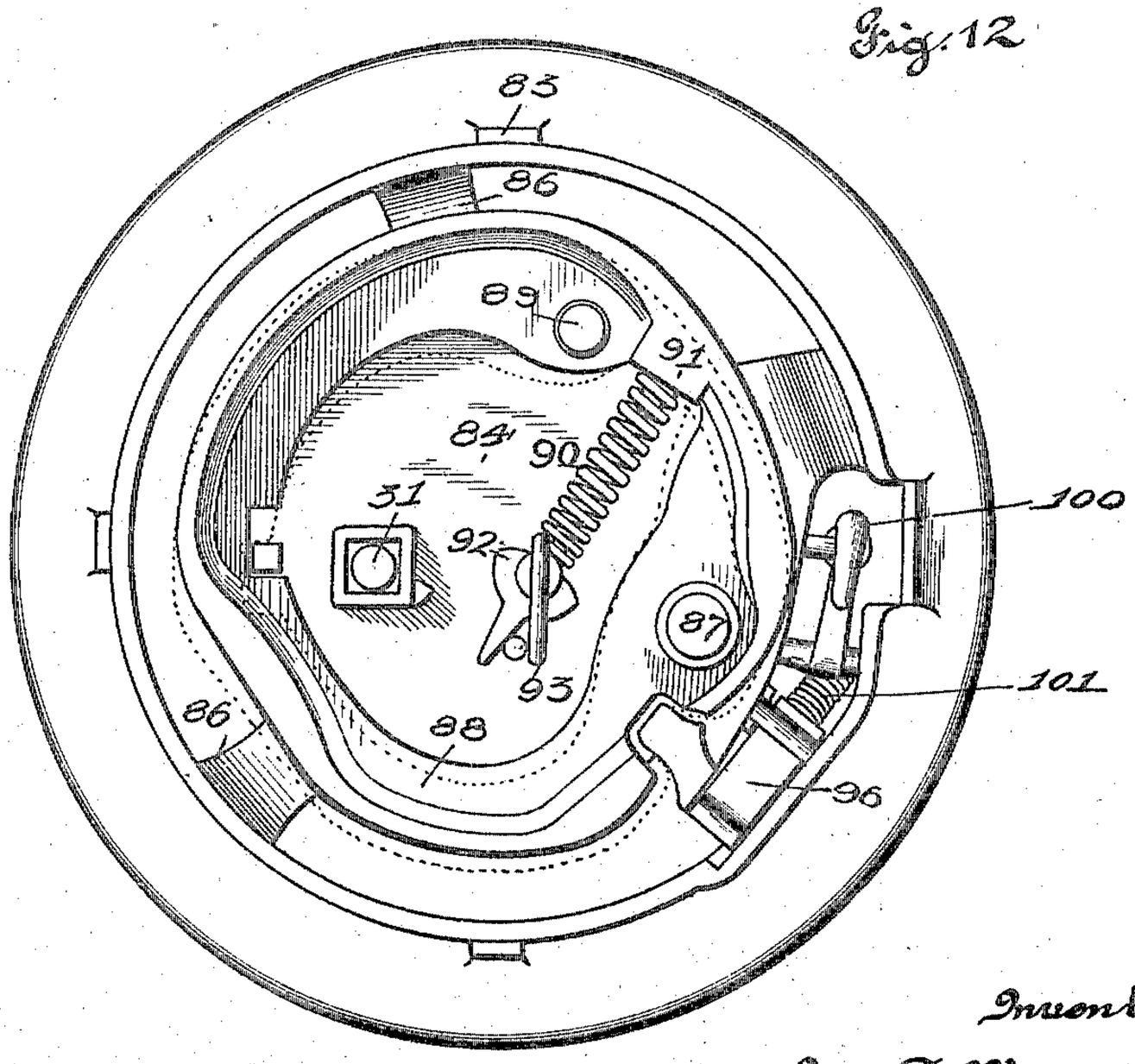


Fig. 12



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CORN PLANTER.

APPLICATION FILED DEC. 12, 1902.

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Fig. 13

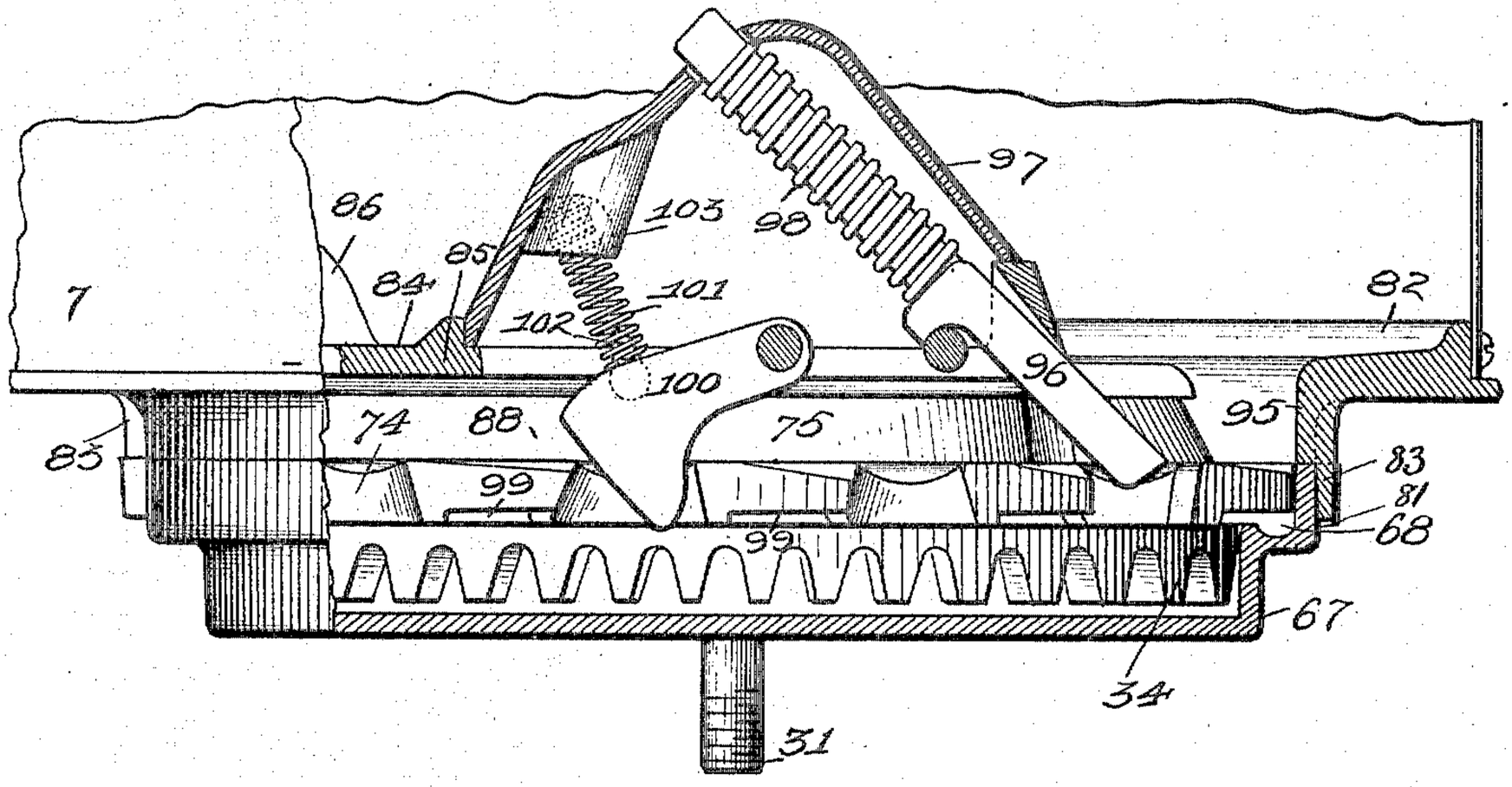


Fig. 14

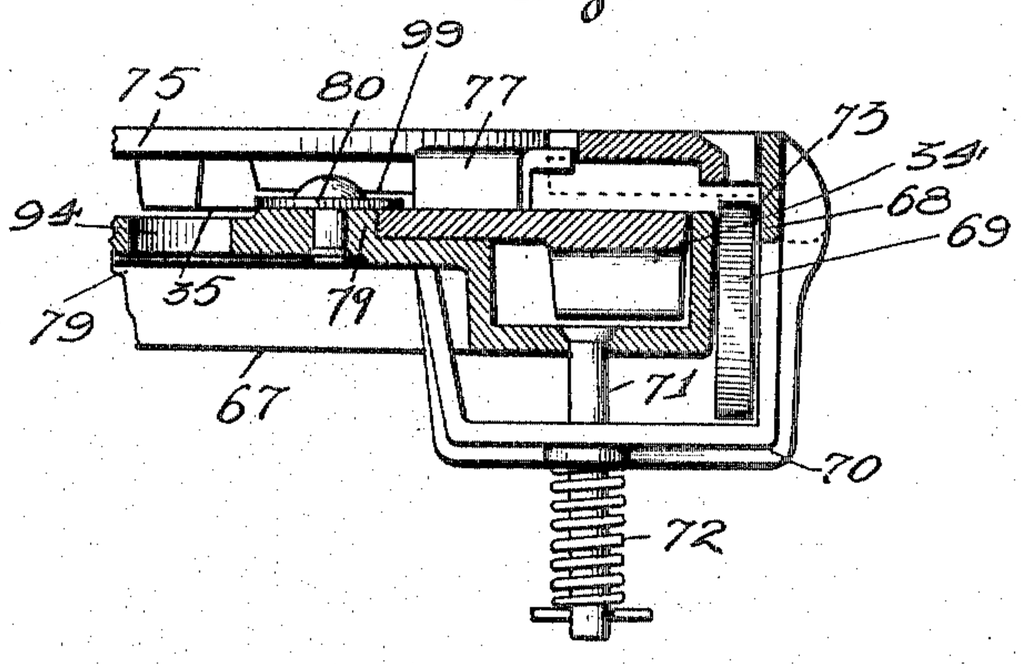
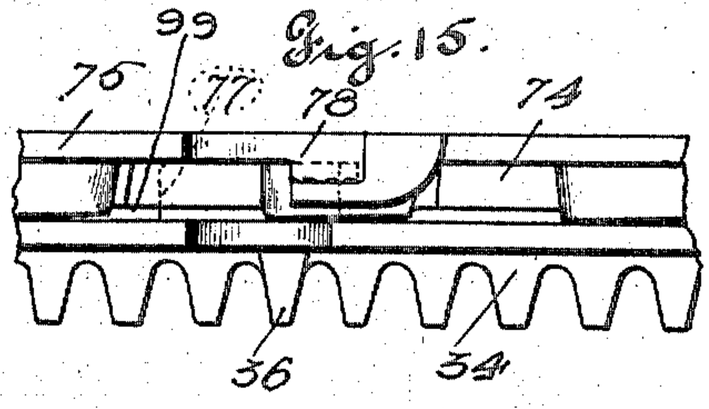


Fig. 15.



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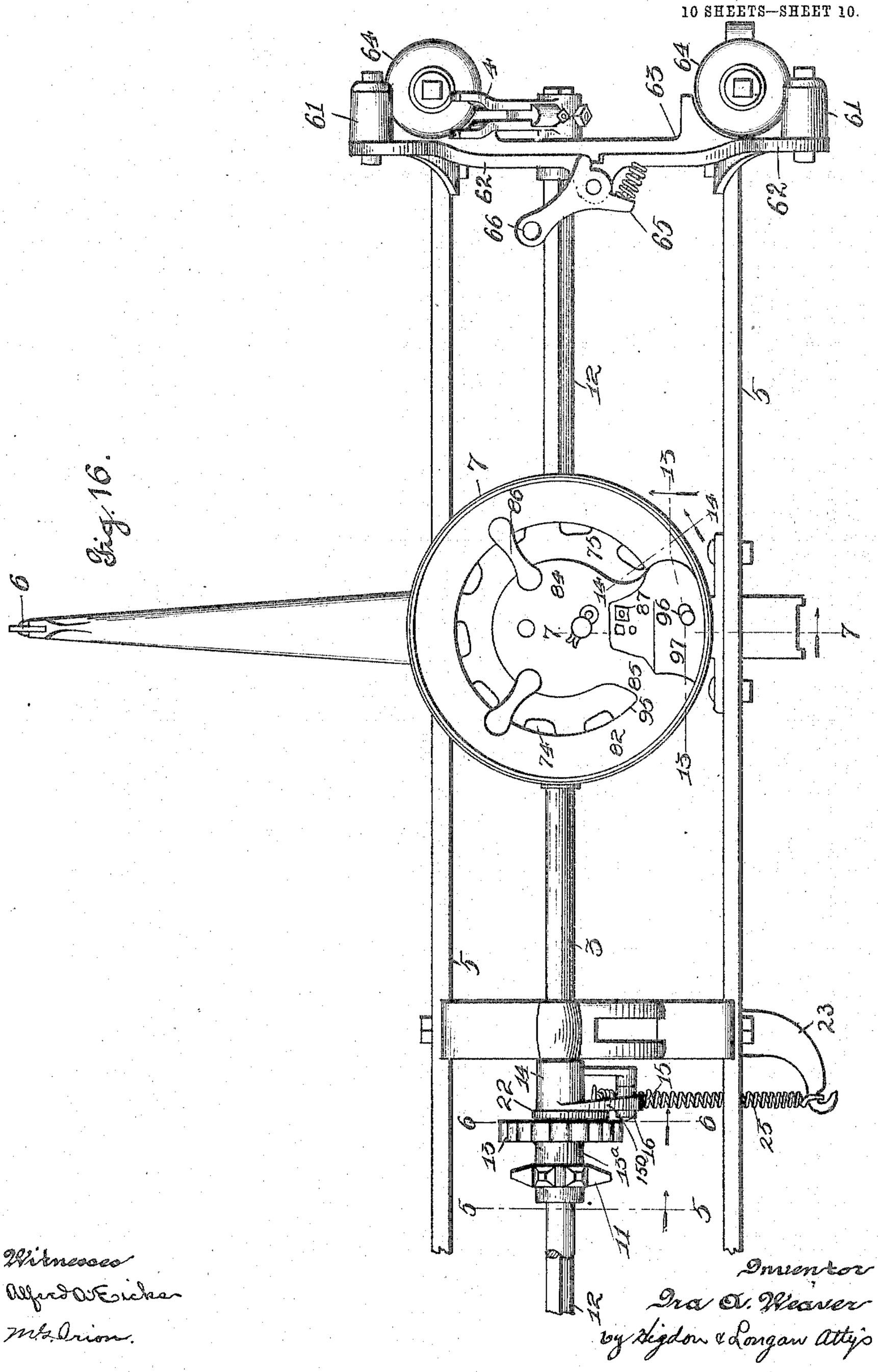
APPLICATION FILED DEC. 12, 1902.

10 SHEETS—SHEET 10.

Fig. 16.



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UNITED STATES PATENT OFFICE.

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CORN-PLANTER.

No. 811,977. Specification of Letters Patent. Patented Feb. 6, 1906

Application filed December 12, 1902. Serial No. 135,013.

To all whom it may concern:

Be it known that I, IRA A. WEAVER, of the city of Springfield, Sangamon county, State of Illinois, have invented certain new and useful Improvements in Corn-Planters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in corn-planters; and it consists in the peculiar arrangement and construction of parts hereinafter particularly described and claimed and which will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a top view of a machine embodying my invention. Fig. 2 is a perspective of a portion of the same machine. Fig. 3 is a side view of the top of the lever 53. Fig. 4 is a top view of the clutch connection between the drill-shaft and the check-row shaft. Fig. 5 is a side view of the sprocket connection between the drill-shaft and check-row shaft, being shown in section along the line 5 5 in Fig. 16. Fig. 6 is a side view of the stroke connection between the drill-shaft and check-row shaft, the drill-shaft and check-row shaft being shown in section along the line 6 6 in Fig. 16. Fig. 7 is a side view of the runner-shoe and its connections, showing portions broken away along the line 7 7 in Fig. 16. Fig. 8 is a top view of the runner-shoe and its connections with the hopper and contained parts removed. Fig. 9 is a top view of the base of the seedbox. Fig. 10 is a bottom view of the base of the seedbox. Fig. 11 is a top view of the base of the seedbox with the seed-plate 75 in place with its connections. Fig. 12 is a bottom view of the agitator 88 and the base of the seedbox and their connections. Fig. 13 is a side view of the base of the seedbox, showing a portion thereof in section along the line 13 13 in Fig. 16. Fig. 14 is a detail in section of construction of the base of the seedbox along the line 14 14 in Fig. 16. Fig. 15 is a side view of a portion of the seed-plate in position above the gear-plate; and Fig. 16 is a top view of one of the seedboxes and its attachments, showing the parts assembled in operating position, the cover of the seedbox being removed and is provided with section-lines, to be referred to in the description of several of the foregoing figures.

1 indicates the axle, upon which the corn-planter frame is mounted, and 2 the tongue, to which the animals are attached. A check-row shaft 12 is provided with the check-forks 4, which are adapted to engage tappets upon a check-row wire. The front or runner frame 5 carries the runners or furrow-openers 6, the seedboxes 7, and transverse frame-bars 8. The front or runner frame 5 is flexibly connected to the rear or wheel frame, in which the axle 1 is mounted. The drill-shaft 3 is actuated by chain-and-sprocket connection with the axle 1, and in the drawings the sprocket on the axle 1 is indicated as 9, the chain as 10, and the sprocket on the drill-shaft 3 as 11.

The check-forks 4 are rigidly mounted upon the check-row shaft 12, which is connected with the drill-shaft 3 by a clutch mechanism, which may be described as follows: Integral with the sprocket 11 is the clutch-sprocket 13, both sprockets being mounted upon and joined together by the collar 13^a, which is loosely mounted upon the shaft 3. The shaft 3 is provided with a collar 14, secured fast thereto and from which extends an arm 150, that is provided at its end with a transversely-arranged lug 15, upon which is mounted the revoluble collar 16. Upon this lug 15 there is mounted an arm 170, that is provided with a transversely-disposed lug 17, upon which in turn is mounted the revoluble collar 18. 19 represents a lug extending inward—that is, away from the clutch-wheel 13—from the arm 150 and in alinement with a lug 20, carried by the arm 170, the lugs 19 and 20 being connected by means of the coil-spring 21, the force of such spring tending to rock the arm 170 and bring the collar 18 into engagement with the clutch-wheel 13, as shown in Fig. 5. 22 is a throw-off or clutch-disengaging arm, mounted loosely upon the shaft 3 and preferably arranged between the collar 14 and the clutch-wheel 13. Its outer end is formed with two fingers, one, 22′, arranged in the path of movement of the arm 170, and the other, 22″, in position to be engaged by the collar 28, to be presently referred to. The check-row shaft 12 is provided with a hook-shaped depending

arm or lug 24, between which and a lug 23, carried by the transverse frame-bar 8, is a coil-spring 25, such spring tending to hold the shaft and the arms projecting therefrom in the position indicated in Figs. 1, 4, and 6. The check-row shaft is also provided with an arm 26, carrying at its outer end a transverse lug 27, upon which is mounted a revoluble collar 28. Upon that face of the arm 150 that is next to the arm 22 is formed a lug 151, with which the arm 22 is adapted to engage, the lug serving to limit the movement of the arm 22.

When the machine is in operation for check-row planting, the sprockets 11 and 13 are continuously driven by the chain 10, normally running loose upon the drill-shaft 3. Whenever one of the tappets upon the check-row wire engages with the fork 4 and rocks this shaft against the force of the spring 25, the parts assume the position indicated in dotted lines, Fig. 5—that is, the arm 26 and the collar 28, carried thereby, are moved backward out of engagement with the finger 22″ of the arm 22. This arm 22 is thus freed, having before been held in the position indicated in Fig. 6 by reason of the engagement of the collar 28 therewith. The arm 22 in turn held the arm 170 by reason of the engagement of its finger 22′ therewith, so that the collar 18 on the transverse pin 17 thereof was out of the path of the sprockets of the clutch-wheel 13. When a tappet coming into engagement with a fork of the check-row shaft moves the latter into the dotted-line position of Fig. 5, as already suggested, the spring 21 comes into operation and rocks the arm 170 about its pivotal support 15 until the collar 18 comes into engagement with one of the depressions or recesses between the teeth of the wheel 13, as indicated in full lines, Fig. 5. When the parts are in this position, the shaft 3 and the wheels 11 and 13 are connected and turn together until a complete revolution of the shaft 3 is made. As the parts come to the position indicated in Fig. 6, the finger 22″ of the arm 22 comes into engagement with and is arrested by the roller 28 of the lateral projection of the arm 26, which latter has been restored to its normal position by the spring 25 on the escape of the tappet from the fork 4, and its movement being thus stopped it in turn arrests the movement of the arm 170, which comes into engagement with the finger 22′ and rocks said arm about its support from a position in engagement with the clutch-wheel 13 to the position indicated in Fig. 6, this movement disengaging the clutch mechanism and freeing the shaft 3 from connection with the driving-sprocket 11.

In mounting the seedbox in my improved corn-planter I have provided certain novel means, which I have illustrated fully in my drawings and which answer to the following description: The runners or furrow-openers 6 are provided with the conducting-tubes 29. In a machine of the kind under consideration it is necessary that the gears operating the seed mechanism must so match together that the seed-plates on each side of the machine will be exactly timed together in order that each cell in the seed wheel or plate will pass the discharge-opening at exactly the same time. As a first step toward the attainment of this result I have provided the conducting-tube 29 with the vertical bolt-opening 30 (see Fig. 8) and the bottom of the seedbox 7 with the bolt 31, (see Fig. 10,) which is adapted to be seated through the opening 30 and held in position by a thumb-nut. (Not shown.) On the top of the conducting-tube 29 I have provided the hook 32, (see Fig. 8,) and in the bottom of the seedbox 7 I have provided the opening 33, which is adapted to fit over and receive the hook 32. In order, however, to secure the exact alinement of the gearing to which I have referred, I have provided my gear-plate 34 with four internal notches 35, and on the lower face of the gear-plate 34 I have formed four long teeth 36, which divide the depending teeth upon the gear-plate 34 into four equal parts. The pinion 37, which engages with the teeth on the gear-plate 34, is provided with a flange or shrouding 38 upon its inner end, and this shrouding is provided with a transverse groove 39 between two of the teeth on the pinion 37, so that one of the long teeth 36 will engage with this groove 39 at each revolution. This groove 39 in the shrouding 38 is always uppermost when the clutch mechanism is disengaged. The hook 32 passes up through the opening 33 in the bottom of the seedbox 7 and through one of the notches 35 in the gear-plate 34 and over the top of the gear-plate 34. If the groove 39 in the pinion 37 does not correspond with one of the long teeth 36, the seedbox 7 cannot be mounted on the conducting-tube 29—that is to say, if the pinion 37 is not in the right position the long teeth 36 will hit the shrouding 38 and will not allow the gears of the pinion 37 and gear-plate 34 to intermesh. By this means I have rendered it impossible for the most careless operator to place the seedbox 7 in position unless the gearing is in proper alinement.

Each revolution of the shaft 3 will cause the gear-plate 34 to make one-fourth of a complete revolution, and the number of kernels of corn that it will deposit in the hill is consequently dependent on the number of seed-cells 74 in each quarter of the seed-plate 75, which is connected with the gear-plate 34, so as to turn therewith in a manner presently to be described. As shown in the drawings, there are twelve cells in this seed-plate, and the machine is therefore adapted to deposit three kernels in a hill. It is manifest that when so desired the plate 75 may be con-

structed with two cells in one quadrant and three in the next, which will equip the machine to deposit two and three kernels alternately.

In the conducting-tube 29 is the vertical valve-opening 40, which I have provided with the valve 41, held in position by the transverse pivot 42, and provided with the slotted lug 43, adapted to engage with the transverse pin 44 on the lug 45, mounted on the check-row shaft 12, so that the operation of the valve 41 is controlled by the engagement of the fork 4 with the tappets on a check-row wire. The upper end of the valve 41 is provided with the seat 46. The kernels discharged from the seedbox 7 pass through the chute 47 and accumulate upon the seat 46. The kernels in the lower part of the opening 40 will be discharged in the furrow by the backward motion of the lower part of the valve 41, when the kernels that have accumulated on the seat 46 will be caught in the lower part of the valve as it swings forward and over the shelf 48 in the lower part of the runner. The valve 41 is of novel construction at its lower end, as shown in Fig. 7, in that its front edge 49 flares downward, which construction causes the seed-kernels to be delivered without the tendency to string them out in the furrow.

The foot-lever 50 is provided with a depending arm 51, which is connected with the rear end of the tongue 2 by means of the coil-spring 52. The foot-lever 50 is rigidly connected to the lower end of the locking hand-lever 53, so that in pulling the locking hand-lever 53 backward the arm 51 will move downwardly, while the tongue 2 and its attachments (see Fig. 2) will move upwardly. This motion is assisted by the spring 52, which enables the runners 6 to be easily raised out of the ground. This mode of attachment is of my invention. The reverse operation of forcing the runners into the ground is facilitated by the compression-spring 54, which is connected with the locking hand-lever 53 and the tongue 2, as shown in Fig. 2; but the use of this compression-spring 54 is common in the art. In the operation of the corn-planter over rough and uneven ground it is desirable in order to facilitate its operation to unlock the hand-lever 53 in order to render the machine more flexible. This I have accomplished by providing the hand-lever 53 with the ring 55, which is adapted to fit over the hand-lever 56 and hold it closely to the lever 53, thus keeping the lever 53 unlocked by disengaging its plunger 57 from the ratchet 58 and allowing the runners to pass over uneven ground. In this use of the machine the lift of the spring 52 has a tendency to raise the runners 6 out of the ground and not allow them to run deep enough for the purpose of seeding. In this case the foot-lever 50 is disengaged by the foot from the lug 59 on the side of the hand-lever 53, by which it is normally held in the position shown in Fig. 2. Thereupon the arm 51 swings forward and releases the tension on the spring 52 to a sufficient extent to prevent the runners 6 from going too deep in loose ground, thus saving the frame of the machine from excessive racking stresses and aiding in its equal and uniform operation in various conditions of soil.

The lateral spools 61, by which the tappet-wire is held and directed, are mounted on the vertical framework 62, which carries the rack 63, upon which are vertically mounted the spools 64. The rack 63 is held in alinement with the frame 62 by means of the locking-lug 65, which is provided with the opening 66 for the purpose of receiving the wire or other similar attachment to enable the operator to control the releasing from a vertical position of the spools 64.

I have provided my seedboxes 7 with a dropping mechanism intended to facilitate the accurate delivery of the seed to the valve-seat 46. That form of my idea of means whereby I accomplish this end which is illustrated in the drawings may be described as follows: I have already indicated the peculiar construction of the gear-plate 34. This gear-plate 34 is seated within the casting 67, which forms the base of the seedbox 7 and which is provided with the chute 47 and has an annular depression 68, which surrounds the gear-plate 34 when in position. The casting or base-plate 67 is also provided with the ejector wheel or roll 69, which is held in position by the depending bracket 70, which is in turn held upwardly against the lower surface of the base-plate 67 by means of the pin 71 and spring 72. (See Fig. 14.) The wheel 69 fits in a groove 73, cut vertically through the annular depression 68, in such manner that its upper portion extends vertically into the bottom of the cells 74 in the seed-plate 75 as they advance toward the chute 47. The gear-plate 34 is provided on its upper face with a series of upwardly-projecting lugs 76 and two lugs 77, which terminate in outward projections, as shown in Fig. 11, adapted to engage with the recesses 78 in the seed-plate 75 and constituting the means for connecting the gear-plate and the seed-plate so that they revolve together. As is well known, the kernels of seed-corn vary more greatly in width and length than in thickness. It is therefore desirable to so construct the seed-cells as to receive the kernels edgewise, and I accordingly construct my seed-cells 74 of unusual depth in order to accommodate the greatest width of the kernels and insure their safe delivery and discharge from the seedbox 7. These seed-cells 74 are also provided with a flaring mouth upon their innermost sides, as shown in Fig. 11.

The gear-plate 34 is held in position on the

base-plate 67 by being fitted about the circular elevation 79, which is provided with the washer or button 80, which projects over the inner edge of the gear-plate 34. (See Figs. 11 and 14.)

It is desirable and necessary for the proper construction of the seedbox mechanism that it be provided with means whereby the kernels of seed-corn may be delivered sidewise into the seed-cells 74. This feeding I have accomplished in the following manner: I have provided the base-plate 67 upon its outer edge with slots 81, and I have provided the main body of the seedbox 7 with the base-ring 82, which in turn is provided with the depending legs 83, adapted to set into the slots 81. The base-ring 82 I have further provided with the central platform 84, preferably cast integral with the base-ring 82 and joined thereto by the neck 85 and arched arms 86. Through the neck 85 I have fixed the pivot 87 to secure the oscillating agitator 88, which is preferably irregular in form, as shown in Fig. 9 and Fig. 12, and is mounted eccentrically with reference to the seed-plate 75. The oscillation of the agitator 88 is accomplished by the vertical lugs 76 and 77 of the gear-plate 34 coming successively in contact with the depending lug 89, which extends downwardly from the lower face of the agitator 88, the agitator 88 being normally held toward one side of the seedbox 7 by means of the coil-spring 90, held in position by the lug 91 upon the lower face of the agitator 88 and the lug 92 depending from the lower face of the platform 84. The lug 92 is provided with a keyed projection 93, by means of which the platform 84 is locked to the base-plate 67 through the slot 94. The ring 82 is beveled inwardly, as shown in Fig. 13, to the top of the wall 95, so that the kernels are tilted to be fed edgewise to the seed-cells 74 by the bevel of the ring 82, the wall 95, and their agitation by the oscillation of the agitator 88.

It has heretofore been a common defect of the machines pertaining to this art that means were not provided to prevent the delivery of more than one kernel at a time in each seed-cell. In overcoming this defect I have provided the means illustrated and which may be described as follows: Upon one side of the ring 82 I have mounted a cut-off mechanism consisting of the plunger 96, mounted obliquely in the casing 97 and provided with a coil-spring 98. Just in front of the plunger 96 is located the wheel or roll 69, which I have before specified and which is a little less in thickness than the width of the seed-cells 74 and is so journaled in the bracket 70 by the spring 72 that the wheel or roll 69 will rise up a short distance into each of the seed-cells 74 as they approach the cut-off with a slightly-springing motion, so as to remove or throw out of the seed-cell 74 all but the lower of the kernels contained in it, and thus assist the cut-off in permitting only one kernel to pass through it in each cell.

It is manifest that the ejector mechanism which I have described, comprising the roller 69 and its spring-mounted supporting-frame, is, in effect, a spring-pressed plunger the operative end of which is adapted to be forced or projected successively a little way into the seed-cells as they come opposite to such plunger. I prefer that the operative end of the plunger should be in the form of a wheel or roller 69, as such construction tends to materially reduce the force necessary for operating the dropping mechanism.

In order that the roll or wheel 69 may be readily depressed in its socket, the seed-plate 75 is grooved out on the under side of its outer edge, as indicated by the numeral 99, so that as the cell 74 leaves the roll or wheel 69 the roll or wheel 69 is forced down and comes back up into the groove 99 and is in position to lift the kernel in the next cell. The object of this construction is to guard against the roll 69 snapping violently into the seed-cell 74 and throwing its contents completely out. The function of the oscillating agitator 88 is to prevent the seed-corn from bridging across the feedway between its edge and the wall 95, and it assists in forcing the corn edgewise into the seed-cells. I have accomplished the return motion of the agitator 88 by the use of the spring 90, so that if for any reason the agitator 88 should bind and work hard it will be simply pushed out of the road and will not interfere with the operation of the other mechanism of the seedbox. It may be constructed, however, to have a positive motion in both directions. I aid in effecting the discharge of the kernels into the chute 47 by means of the reciprocating lug 100, which is pivotally mounted in the casing 97 and depressed by the coil-spring 101, which is held in place upon the vertical lug 102 and has its upper end confined in the chamber 103.

Throughout this description I have confined myself to the embodiment of my ideas of means which are shown in the drawings and which illustrate merely the preferred form of the embodiment of my invention.

Having thus described my invention, what I claim as new, and desire to have secured to me by the grant of Letters Patent, is—

1. In a corn-planter, a seedbox, a seed-plate, grooved out on the under side of its outer edge, a cut-off, and a wheel adapted to rise successively into the seed-cells, substantially as described.

2. In a corn-planter, a seedbox, a seed-plate containing seed-cells having a flaring mouth upon their inner sides, the seed-plate being grooved out on the under side of its

outer edge, a cut-off, and a wheel adapted to rise successively into the seed-cells, substantially as described.

3. In a corn-planter, a seedbox, a seed-plate provided with seed-cells, a cut-off, and a plunger mounted beneath the seed-cells and in front of the cut-off, substantially as and for the purposes specified.

4. In a corn-planter, a seedbox, a seed-plate provided with seed-cells and beveled upon its lower face between the seed-cells, a cut-off, a plunger with a wheel mounted at its upper end beneath the seed-cells and adapted to rise upward and into the seed-cells and in front of the cut-off, substantially as and for the purposes specified.

5. In a corn-planter, a seedbox containing an oscillating agitator, a seed-plate provided with seed-cells, a cut-off, a vertically-mounted plunger beneath the seed-cells and in front of the cut-off, substantially as and for the purposes specified.

6. In a corn-planter, a seedbox containing an oscillating agitator, a seed-plate provided with seed-cells and beveled upon its lower face between the seed-cells, a cut-off, a vertically-mounted plunger beneath the seed-cells and in front of the cut-off, substantially as and for the purposes specified.

7. In a corn-planter, a seedbox containing an oscillating agitator, a seed-plate provided with seed-cells and beveled upon its lower face between the seed-cells, a cut-off consisting of an obliquely-mounted cut-off plunger and a vertically-mounted ejector-plunger having a small wheel mounted on its upper end beneath the seed-cells and in front of the cut-off, substantially as and for the purposes specified.

8. In a corn-planter, a seedbox containing a seed-plate, a cut-off consisting of an obliquely-mounted plunger, a vertical ejector-plunger beneath the seed-plate and adapted to rise upward and into the seed-cells, an oscillating agitator mounted eccentrically to the seed-plate, substantially as and for the purposes specified.

9. In a corn-planter, a removably-mounted seedbox containing a seed-plate, a cut-off consisting of an obliquely-mounted plunger, a vertical ejector-plunger with a wheel mounted at its upper end beneath the seed-plate and adapted to rise upward and into the seed-cells, an oscillating agitator mounted eccentrically to the seed-plate, substantially as and for the purposes specified.

10. In a corn-planter, a seedbox, a shaft controlling the mechanism of the seedbox, a wheel notched on the outer edge and mounted loosely on the latter shaft, an arm keyed to the shaft and carrying a pawl mounted outside of the periphery of the notched wheel, a lever mounted between the notched wheel and the arm and engaging the pawl that the motion imparted by the driving-axle may be imparted to the mechanism of the seedbox when the lug on the check-row shaft is disengaged from the clutch mechanism, substantially as and for the purposes specified.

11. In a corn-planter, a tongue, a hand-lever, a foot-lever pivoted to the hand-lever and having a spring connected with the tongue, and a lug upon the hand-lever adapted to hold the foot-lever in engagement, substantially as and for the purposes specified.

12. In a corn-planter, a tongue, a runner-frame, a hand-lever, a foot-lever pivoted to the hand-lever and having a spring connected with the runner-frame, and a lug upon the hand-lever adapted to hold the foot-lever in engagement, the tension of the spring being adapted to be released or applied by the movement of the foot-lever, substantially as and for the purposes specified.

13. In a corn-planter, a tongue, a locking hand-lever, a foot-lever pivoted to the locking hand-lever and having a spring connection with the tongue, a lug upon the locking hand-lever adapted to hold the foot-lever in engagement, the main bar of the locking hand-lever being provided with a loop to hold the locking hand-lever and its attached plunger disengaged from the ratchet, substantially as and for the purposes specified.

14. In a corn-planter, a seedbox comprising a base-ring, a gear-plate mounted within the ring and provided with upwardly-projecting lugs, a seed-plate mounted upon and actuated by the gear-plate, an inwardly-beveled ring surrounding the seed-plate and provided with a platform, an oscillating agitator pivotally mounted underneath the platform eccentrically to the seed-plate, a cut-off mounted upon and through the platform, and a vertical roll journaled in the bracket beneath the base-ring and provided with a spring, substantially as and for the purposes specified.

15. In a corn-planter, a check-row shaft, 12, provided with the arm 26, and lug, 27, and the depending lug, 24, and held in position by the spring, 25; the shaft, 3, provided with sprocket, 11, and clutch-sprocket, 13, a collar, 14, lugs, 15, 17, 19 & 20, spring, 21, and arm, 22, substantially as and for the purposes specified.

16. In a corn-planter, the combination of the conducting-tube 29, the hook 32 at the top of the conducting-tube, the seedbox 7 provided upon its bottom with the opening 33 adapted to fit over and receive the hook 32, the gear-plate 34 provided with depending teeth, and the pinion 37 adapted to engage with the teeth on the gear-plate 34, substantially as specified.

17. In a corn-planter, the combination of a driving-axle, a check-row shaft, a seedbox

provided with a base-plate, a gear-plate, a seed-plate, containing seed-cells having beveled mouths, an oscillating agitator, a cut-off, and a vertical plunger beneath the seed-plate and operating vertically into the seed-cells, a pinion intermeshing with the gear-plate mounted on a transverse shaft and actuated by a chain-and-sprocket connection with the driving-axle, the chain-and-sprocket mechanism being connected and disconnected by a clutch mounted on the transverse shaft and alternately caught and released by a lug mounted on the check-row shaft, substantially as and for the purposes specified.

18. The combination with a movable disk having seed-cells, of means disposed underneath said disk to engage and tilt the seeds, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

IRA A. WEAVER.

Witnesses:

C. F. CLAPP,

WM. I. BOGARDUS.