(No Model.)

2 Sheets—Sheet 1.

G. A. THODE.

CHECK ROW CORN PLANTER.

No. 405,444. Patented June 18, 1889.

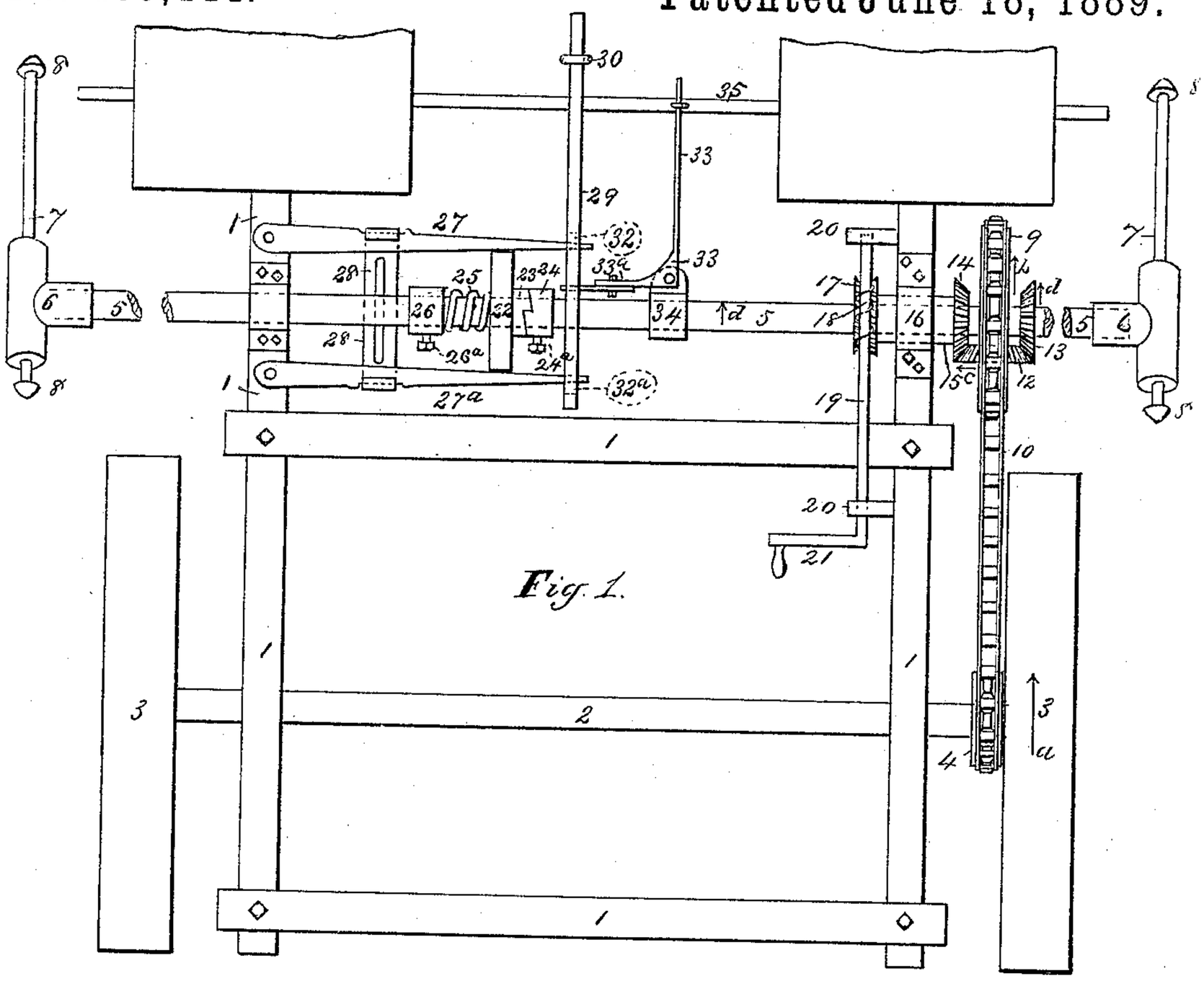


Fig. 1.

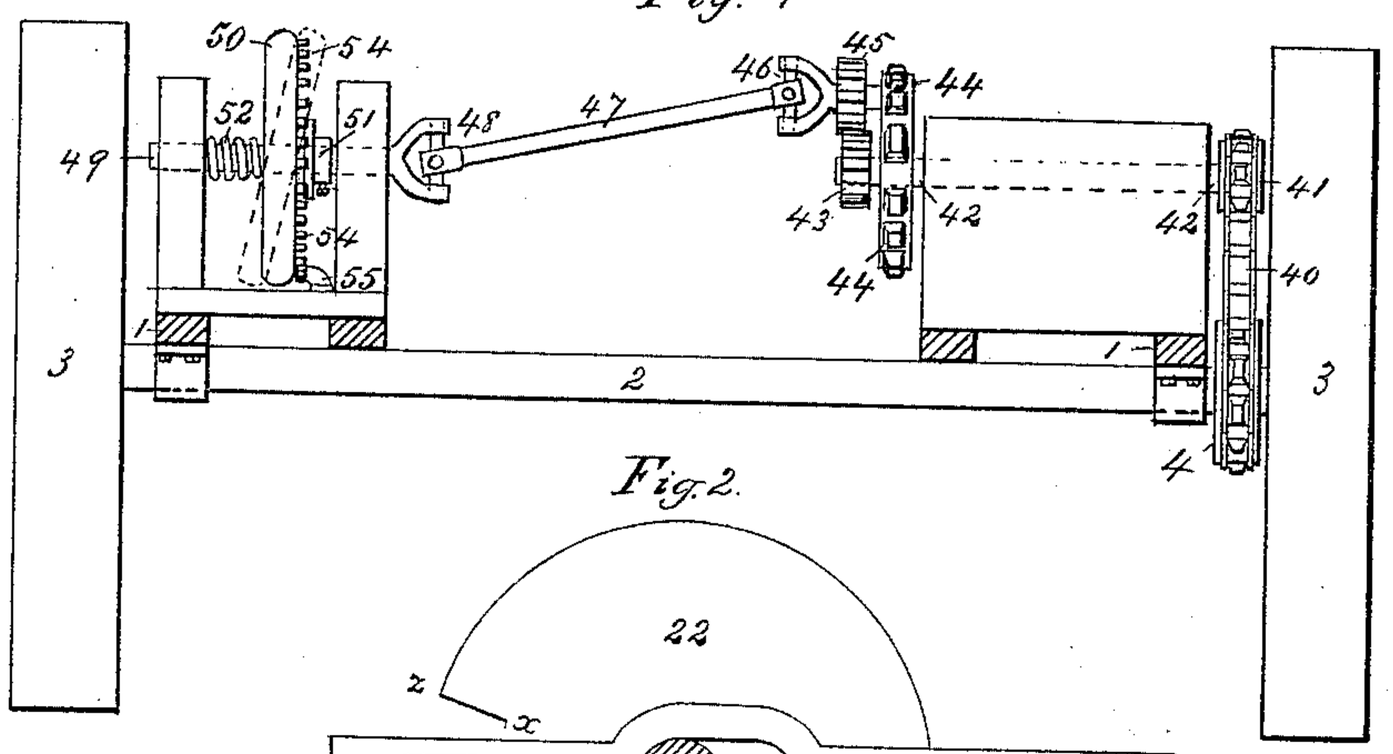
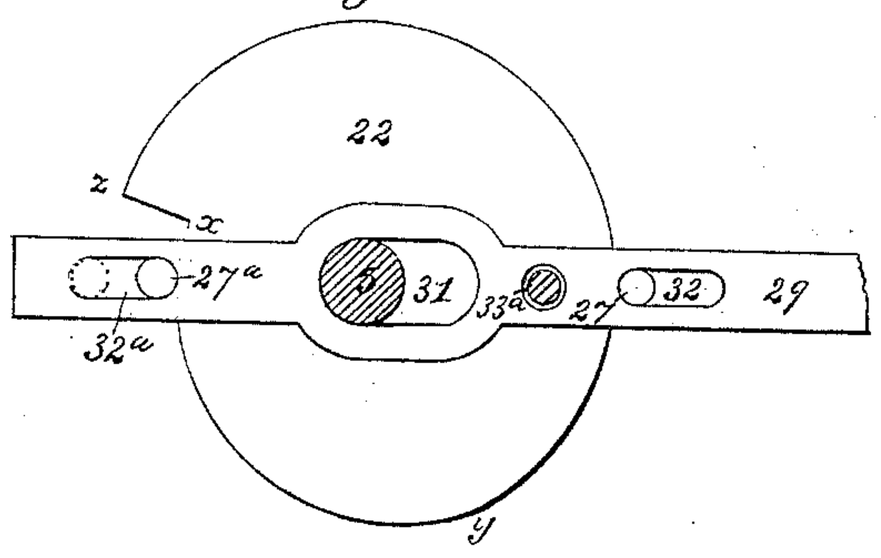


Fig. 4

Fig. 2.



Witnesses:
Emma Arthur
W. E. Knight.

Inventor:
Gustav A. Thode,
By Knight Bros
Attys.

(No Model.)

2 Sheets—Sheet 2.

G. A. THODE.

CHECK ROW CORN PLANTER.

No. 405,444. Patented June 18, 1889.

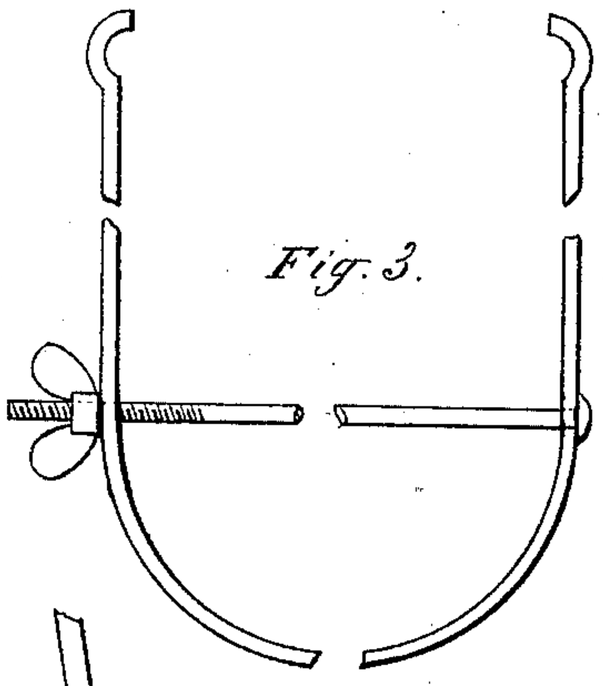


Fig. 3.

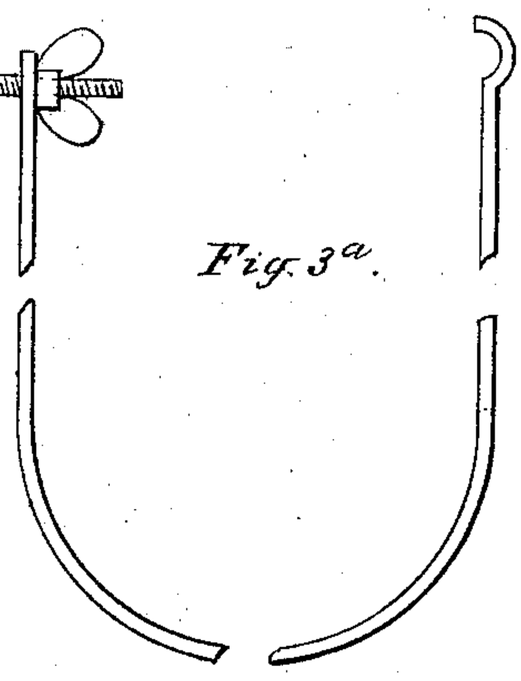


Fig. 3a.

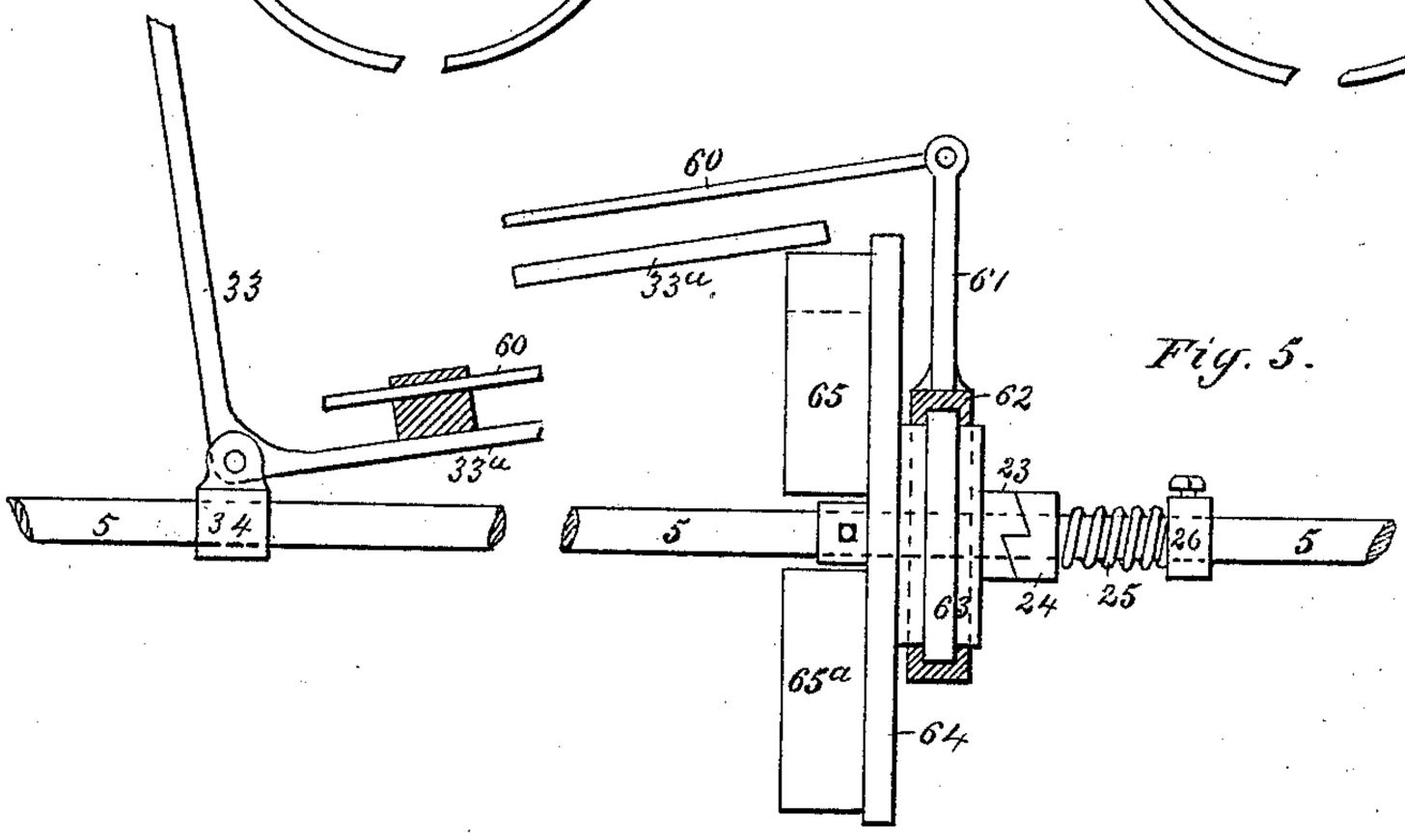


Fig. 5.

Fig. 6.

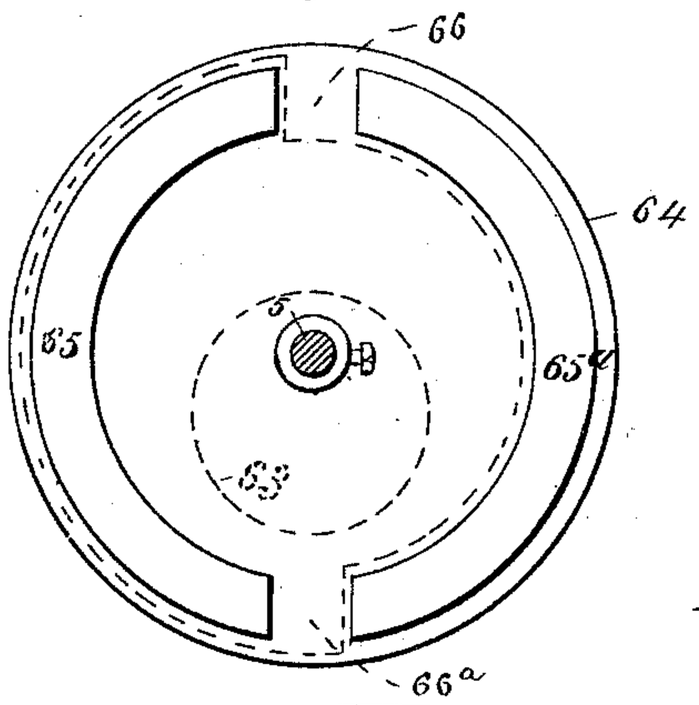


Fig. 8.

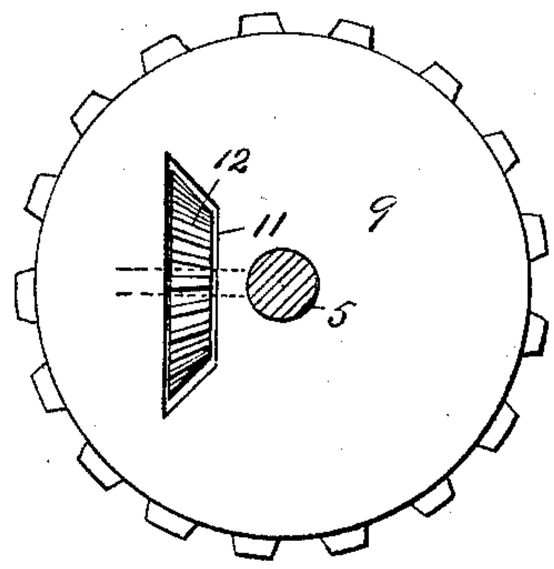
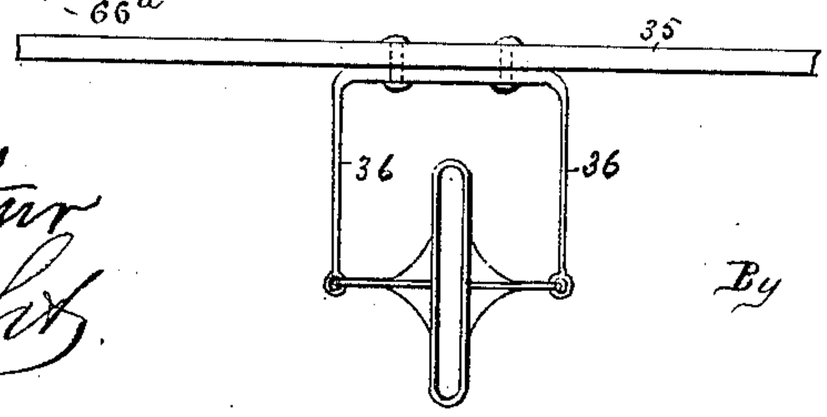


Fig. 7.



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W. E. Knight.

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By
Knight Bros
Attorneys.

UNITED STATES PATENT OFFICE.

GUSTAV A. THODE, OF HOLSTEIN, IOWA.

CHECK-ROW CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 405,444, dated June 18, 1889.

Application filed January 16, 1889. Serial No. 296,470. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV A. THODE, a citizen of the United States, residing at Holstein, in the county of Ida and State of Iowa, have invented certain new and useful Improvements in Check-Row Corn-Planters, of which the following is a full, clear, and exact description.

The present invention consists in certain features of novelty which are particularly pointed out in the claims following this description.

In the accompanying drawings, which form a part of this specification, Figure 1 is a plan view of a corn-planter embodying the invention in its preferred form. Fig. 2 shows in elevation certain parts of the mechanism for operating the drop-slide. Figs. 3 and 3ª show in detail, and under two modifications, a spring forming part of the mechanism for operating the drop-slide. Fig. 4 shows a modified form of the mechanism for setting the dropping mechanism. Fig. 5 is a plan view of a modified form of the mechanism for operating the drop-slide. Fig. 6 is an elevation showing some of the parts thereof in detail. Figs. 7 and 8 are views showing in detail certain parts, hereinafter more particularly referred to.

1 represents the main frame of the machine, 2 the axle, 3 the ground-wheels, and 4 a sprocket-wheel which is fixed to one of said ground-wheels or to the axle, if the latter is fast with the former.

5 is a shaft journaled to the main frame parallel with the axle 2, and projecting at its ends beyond the ground-wheels. Upon each of its ends is screwed or otherwise secured a "T" 6, the head of which is perforated longitudinally—*i. e.*, transversely to the shaft 5—for the reception of the stem 7 of a sliding or tumbling marker. The said stem 7 is slightly less in diameter than its socket in the T-head, so that said stem is free to slip back and forth endwise through said socket as the shaft 5 rotates. The stem 7 has upon each end a bead 8, which beads serve the double purpose of preventing said stem from falling out of its socket and of "marking," said stem being of such length that its opposite ends will strike the ground alternately at each half-revolution of the shaft, and at the instant the seed is dropped.

9 is a sprocket-wheel mounted loosely upon the shaft 5, and 10 a sprocket-chain passing around said wheel and around the sprocket-wheel 4. The sprocket-wheel 9 has through it an elongated opening or slot 11, within which is situated a miter-wheel 12, whose axis is at right angles to the length of the slot 11 and radial with respect to shaft 5.

13 is a second miter-wheel, which is secured by a set-screw (not shown) to the shaft 5 and meshes with the wheel 12.

14 is a third miter-wheel which is formed upon or secured to the end of a short sleeve 15, which surrounds the shaft 5, (forming its bearing at this point,) and passes through a suitable box 16, by which it is secured to the frame. Upon the other extremity of the sleeve 15 is a worm-wheel 17, which is engaged by a worm or "endless screw" 18 upon shaft 19, journaled in suitable brackets 20 and terminating within reach of the operator in a handle 21. The forward movement of the planter causes the ground-wheels 3 and sprocket-wheel 4 to turn in the direction of the arrow *a*. This movement is transmitted through chain 10 to sprocket-wheel 9, causing the latter to turn in the same direction as indicated by the arrow *b*. During the ordinary operation of the machine the worm 18 holds wheel 14—which is the "sun-wheel"—from turning upon its own axis, and the wheel 9 carries around with it the "planet-wheel" 12, which travels in the plane of the periphery of the sun-wheel 14. As a consequence, wheels 12 and 14 being in mesh, the planet-wheel 12, in addition to being carried round the axis of the sun-wheel 14, will be turned upon its own axis in the direction of the arrow *c*. Wheels 12 and 13 being in mesh, the latter will be turned in the direction of the arrow *d* with an accelerated speed—equal to one revolution for each revolution of the wheel 9 and one revolution for each revolution of the wheel 12, the diameters of 12 and 13 being equal.

Whether the machine be at rest or in motion, the shaft 5 may be adjusted forward or

backward, for setting the dropping mechanism, by turning the crank 21 in one direction or the other, as may be necessary.

Mounted loosely upon shaft 5 is a wheel 22, whose periphery is eccentric from *x* to *y* and concentric from *y* to *z*, the termini *x x* being united by a surface about perpendicular to the periphery of the wheel.

Formed upon or secured to one side of the wheel 22 is one member 23 of a clutch, the other member 24 of which is fixed to the shaft 5 by a set-screw 24ª. The two members of the clutch are held constantly in engagement by the pressure of a spring 25, which surrounds shaft 5 and bears at its respective ends against the wheel 22, and a collar 26, secured to shaft 5 by a set-screw 26ª. The teeth of the clutch are inclined in such directions that during the forward movement of the machine their abrupt faces will abut against each other, enabling the member 24 to carry with it member 23 and wheel 22; but when the machine moves backward, and the shaft 5 is turned in the direction contrary to that indicated by the arrow *d*, the inclined faces of the teeth will slip over each other, (spring 25 yielding to permit it,) permitting the wheel 22 to remain at rest.

27 27ª represent a pair of levers each pivoted at one end to a suitable part of the frame 1, so as to lie in the plane of the shaft 5 and upon opposite sides thereof. They extend past the wheel 22, and are held in contact therewith at diametrically opposite points by a spring 28. This spring is preferably of U shape, and is provided with a thumb-screw or other device, as shown in Figs. 3 and 3ª, for adjusting its tension. This form of spring is preferred, as it does away with the need for a separate spring for each lever. Separate springs may, however, be employed, if desired, without departing from the spirit of my invention.

29 is a slide-rod which is loosely secured to a suitable part of the frame by a staple at 30, and is provided with an opening elongated in the direction of its length or slot 31 for the passage of the shaft 5, whereby said rod is supported and held against lateral movement, while at the same time it is free to move for a limited distance endwise. This slide-rod 29 is also provided with a pair of slots 32 and 32ª, which also are elongated in the direction of its length, and through which pass the ends of the levers 27 and 27ª, respectively. Assuming the parts to be in the positions shown in Fig. 2, as the wheel 22 rotates in the direction of the arrow *d*, its eccentric portions *x y* will bear outward upon the end of lever 27ª, so that when the point *y* shall have arrived at said lever the eccentric portion will have moved it to the position shown by the dotted circle—*i. e.*, on the outer extremity of the slot 32ª. After point *y* passes the lever 27ª, the point *z* arrives at lever 27, whereupon said lever is forced by the spring 28 from *z* to *x* toward the axis of the wheel. As said lever bore against the inner end of slot 32 when it arrived at *z*, the force of the spring is exerted directly upon it, moving the slide-rod 29 backward and bringing the inner end of slot 32ª to bear against lever 27ª. As the wheel 22 continues to rotate, the eccentric *x y* will return the lever 27 to the outer end of slot 32, after which the point *z* will arrive at the lever 27ª, whereupon said lever will be forced by the spring 28 toward the axis of the wheel—from *z* to *x*—moving the parts to the positions shown in the drawings. By these means the slide-rod 29 is moved once in each direction by each revolution of the cam-wheel 22. The distance between the inner ends of slots 32 and 32ª should be just equal to the shortest diameter of the cam-wheel; but the distance between the outer ends of said slots is not material.

33 is a bell-crank lever, which is fulcrumed at its angle to a collar 34, mounted loosely upon the shaft 5. One of its arms 33ª is parallel with the shaft 5, is adjustable in length, and engages at its extremity the slide-rod 29, so that the forward and backward movements of the said rod cause the other arm 33 of said bell-crank lever to move to the right and left, respectively. This arm 33 of the bell-crank lever engages a rod 35, which is situated parallel with the shaft 5, and is connected, through the medium of spring-arms 36, with the drop-slide. As the internal mechanism of the seed-box, the boots, and other features accessory thereto form no part of my present invention, they are not shown in the drawings.

Before proceeding to describe the modifications which are shown in the drawings I will set forth more fully the purpose of the preferred form of the principal feature of the invention.

While the sun-wheel 14 is prevented from turning upon its axis the shaft 5 and ground-wheel 3 will be constant in their relations to each other, as regards both position and speed; but when said sun-wheel 14 is moved, or permitted to move, then both of these relations change. By turning the handle 21 in one direction or the other the shaft 5 will be turned forward or backward, as the case may be, if the machine be at rest; or if the machine be in motion what is the equivalent thereof will result—*i. e.*, the speed of the shaft will be increased or decreased. Thus the machine may be set. In Fig. 4 is shown a modified form of this setting mechanism.

40 is a drive-chain, which embraces the sprocket-wheel 4, and also a second sprocket-wheel 41, fixed to one end of a short shaft 42, which is journaled in suitable brackets and has fixed to its other end a pinion 43. Mounted loosely upon the shaft 42 is a sprocket-wheel 44, over which passes the sprocket-chain for driving the main shaft 5. (Not shown.)

45 is a small pinion, which gears with pinion 43, and is fixed to a short shaft, one end of which fits in a perforation in wheel 44, so as to be capable of turning freely. The other

end of said shaft is connected by a universal joint 46 with one end of a shaft 47, whose other end is connected by a universal joint 48 with one end of a shaft 49, journaled in suitable standards or brackets secured to the frame.

50 represents a wheel provided with a square or other non-circular eye, through which the shaft 49 passes, that portion of the shaft destined to form the seat for said wheel being non-circular also, so that neither can turn upon its axis independently of the other. The eye of the wheel is somewhat larger than the cross-section of the shaft, so that said wheel may be canted or moved out of plumb, as indicated by dotted lines.

51 is a shouldered collar, which is secured to the shaft 49 by a set-screw, and 52 a coiled spring surrounding shaft 49 and bearing at its respective ends against the standard, in which shaft 49 is journaled, and the wheel 50 for holding the latter against said collar 51 and in a plane perpendicular to said shaft. One side of the periphery of the wheel 50 is provided with teeth 54, which are engaged, when the wheel is in normal position, by a stationary tooth 55 secured to some fixed part of the frame.

The operation of this mechanism may be readily understood from the description already given of the operation of the equivalent mechanism in Fig. 1. The same results which are produced by turning the crank 21, Fig. 1, may be produced by turning the wheel 50, in order to do which it is necessary to cant it, as shown by dotted lines, for disengaging its teeth from the tooth 55. In this form of the invention 43 is the sun-wheel and 45 the planet-wheel. In one form it is the sun-wheel and in the other it is the planet-wheel that is held normally from turning about its axis.

Many other means for setting the marking and wrapping mechanisms are within the scope of my invention.

The mechanism shown in Figs. 5 and 6 for operating the drop-slide is, in all its essential features, the equivalent of the mechanism for the same purpose shown in Figs. 1 to 3. Those parts which are precisely alike in the two forms are indicated by similar numbers in all the figures. To the arm 33^a of the bell-crank lever, near its fulcrum, is secured one end of a stout plate-spring 60, which normally is parallel with said arm and extends some distance beyond its extremity. The extremity of this spring is connected to one extremity of an arm or pitman 61, whose other extremity is secured to a yoke 62, surrounding an eccentric 63 fixed to shaft 5.

64 is a wheel, which also is fixed to shaft 5, and has upon one of its sides a two-part flange 65 65^a, whose inner and outer surfaces are concentric with said shaft. The free end of arm 33^a rests upon the outer surface of one or the inner surface of the other of the two parts of this flange, said parts being separated by notches or passages 66 and 66^a, situated at diametrically opposite points. These notches or recesses are also in line with the major radius of the eccentric 63.

The operation of this mechanism is as follows: As the arm 61 projects horizontally from the yoke 62, it will be moved rearward as the eccentric moves rearward from a position with its major radius horizontal, and in front of shaft 5 to a position with its major radius horizontal and in rear of shaft 5. It will be moved forward as said eccentric in a similar manner passes forward, completing its revolution. In Figs. 5 and 6 of the drawings the parts are shown in the positions which they occupy when the eccentric has half completed its rearward stroke, its major axis being vertical and the passages 66 and 66^a in line therewith. Until it has quite completed its rearward stroke it will continue to pull upon the rod 61 and consequently to strain the spring 60, whose force is in turn transmitted to the arm 33^a, causing it to bear with considerable force against the outside of part 65 of the flange. (The outside of this part 65 should be concentric with the axis of the wheel; but it is immaterial what the shape of its interior is.) At the instant the eccentric completes its rearward stroke the notch or passage 66 arrives at the arm 33^a. Said arm being no longer supported against the pressure of the spring 60 the latter will cause the bell-crank lever to rock upon its fulcrum, moving the drop-slide rod 35 to the right, the arm 33^a passing through the passage or notch 66. As the eccentric moves from this point forward, the spring 60 is again strained, but this time in the opposite direction, causing the end of arm 33^a to bear outward against the inner surface of the part 65^a of the flange. (The inner surface of this part of the flange should be concentric with the wheel 64; but it is immaterial what the shape of its outer surface is.) At the instant the eccentric completes its forward stroke the passage 66^a arrives at the arm 33^a, thus permitting the spring 60 to move the bell-crank lever in the opposite direction, arm 33^a passing outward through passage 66^a.

In describing this form of the device the eccentric 63, the wheel 64, and the flange 65 65^a have been spoken of as being separate; but I desire to have it understood that they may all be formed together if preferred. Whether they be formed of one or one dozen parts they are in all respects the equivalent of the wheel 22 of the preferred form of the invention, the eccentric 63 being the equivalent of the eccentric portion $x\,y$, the flange 65 65^a the equivalent of the concentric portion $y\,z$, and the notches or passages 66 and 66^a the equivalents of the notch $z\,x$.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent—

1. In a corn-planter, the combination, with the ground-wheel and the dropping mechanism adjustable independently thereof, of

gearing connecting them, comprising a sun-wheel and a planet-wheel, and a handle connected with one of these latter wheels, substantially as set forth.

2. In a corn-planter, the combination, with the ground-wheel, the dropping mechanism adjustable independently thereof, and gearing connecting them, comprising a sun-wheel and a planet-wheel, of means for normally holding one of these latter wheels from turning about its axis, and a handle connected with said wheel, substantially as set forth.

3. In a corn-planter, the combination, with the ground-wheel and the dropping mechanism, of gearing connecting them, comprising a sun-wheel and a planet-wheel, a worm-wheel on the shaft of one of them, and a crank-shaft having a worm engaging said worm-wheel, substantially as set forth.

4. In a corn-planter, the combination, with the ground-wheel and the dropping mechanism, of gearing connecting them, comprising a sun-wheel and a planet-wheel, and a handle having intermediate mechanism connecting it with the sun-wheel, substantially as set forth.

5. In a corn-planter, the combination, with the ground-wheel, the dropping mechanism, and gearing connecting them, comprising a sun-wheel and a planet-wheel, of means for normally holding the sun-wheel from turning about its axis, and a handle having connection with said wheel, substantially as and for the purpose set forth.

6. In a corn-planter, the combination, with the dropping mechanism and the ground-wheel, of the gearing connecting them, comprising the shaft 5, the wheel 9, loosely mounted thereon, the miter-wheel 13, secured to said shaft, the miter-wheel 12, carried by the wheel 9 and gearing with wheel 13, and the miter-wheel 14, concentric with wheel 9 and gearing with wheel 12, substantially as set forth.

7. In a corn-planter, the combination, with the ground-wheel and the dropping mechanism, of the gearing connecting them, comprising the shaft 5, the wheel 9, loosely mounted thereon, the miter-wheel 13, secured to said shaft, the miter-wheel 12, carried by wheel 9 and gearing with wheel 13, the miter-wheel 14, concentric with wheel 9 and gearing with wheel 12, and the hand mechanism for controlling wheel 14, substantially as set forth.

8. In a corn-planter, the combination, with the dropping mechanism and the ground-wheel, of the gearing connecting them, comprising the shaft 5, the wheel 9, mounted loosely thereon, the miter-wheel 13, secured to said shaft, the miter-wheel 12, carried by wheel 9 and gearing with wheel 13, the miter-wheel 14, gearing with wheel 12, the short sleeve 15, surrounding shaft 5, and to which wheel 14 is secured, the worm-wheel 17, secured to sleeve 15, and the band-shaft having worm 18, engaging worm-wheel 17, substantially as set forth.

9. In a corn-planter, the combination, with the dropping mechanism and the shaft 5, of the wheel 22, secured to the shaft and having the eccentric surface $x\ y$ and concentric surface $y\ z$, the spring-actuated levers 27 and 27^a, bearing upon opposite sides of said wheel, the slide-rod 29, with which said levers engage alternately, and connections between said rod and the dropping mechanism, substantially as set forth.

10. In a corn-planter, the combination, with the dropping mechanism and the shaft 5, of the cam-wheel 22, the spring-actuated levers 27 and 27^a, bearing upon opposite sides of said wheel, the slide-rod 29, having slots 32 and 32^a, with which said levers engage, respectively, and connections between said rod and the dropping mechanism, substantially as set forth.

11. In a corn-planter, the combination, with the dropping mechanism and the shaft 5, of the cam-wheel 22, the spring-actuated levers 27 and 27^a, bearing upon opposite sides of said wheel, the slide-rod 29, with which said levers have loose connection, and the bell-crank lever 33, engaged at one end by said rod and at the other having connection with the dropping mechanism, substantially as set forth.

GUSTAV A. THODE.

Witnesses:
C. J. WOHLENBERG,
H. SCHNECKLOTT.

Corrections in Letters Patent No. 405,444.

It is hereby certified that in Letters Patent No. 405,444, granted June 18, 1889, upon the application of Gustav A. Thode, of Holstein, Iowa, for an improvement in "Check-Row Corn-Planters," errors appear in the printed specification requiring correction, as follows: In line 47, page 1, the word "bead" should read *head* and the word "beads" should read *heads*; in line 6, page 2, the reference letters "x x" should read *z x*, and in line 64, page 4, the word "band-shaft" should read *hand-shaft;* and that the Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 9th day of July, A. D. 1889.

[SEAL.]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

C. E. MITCHELL,
Commissioner of Patents.