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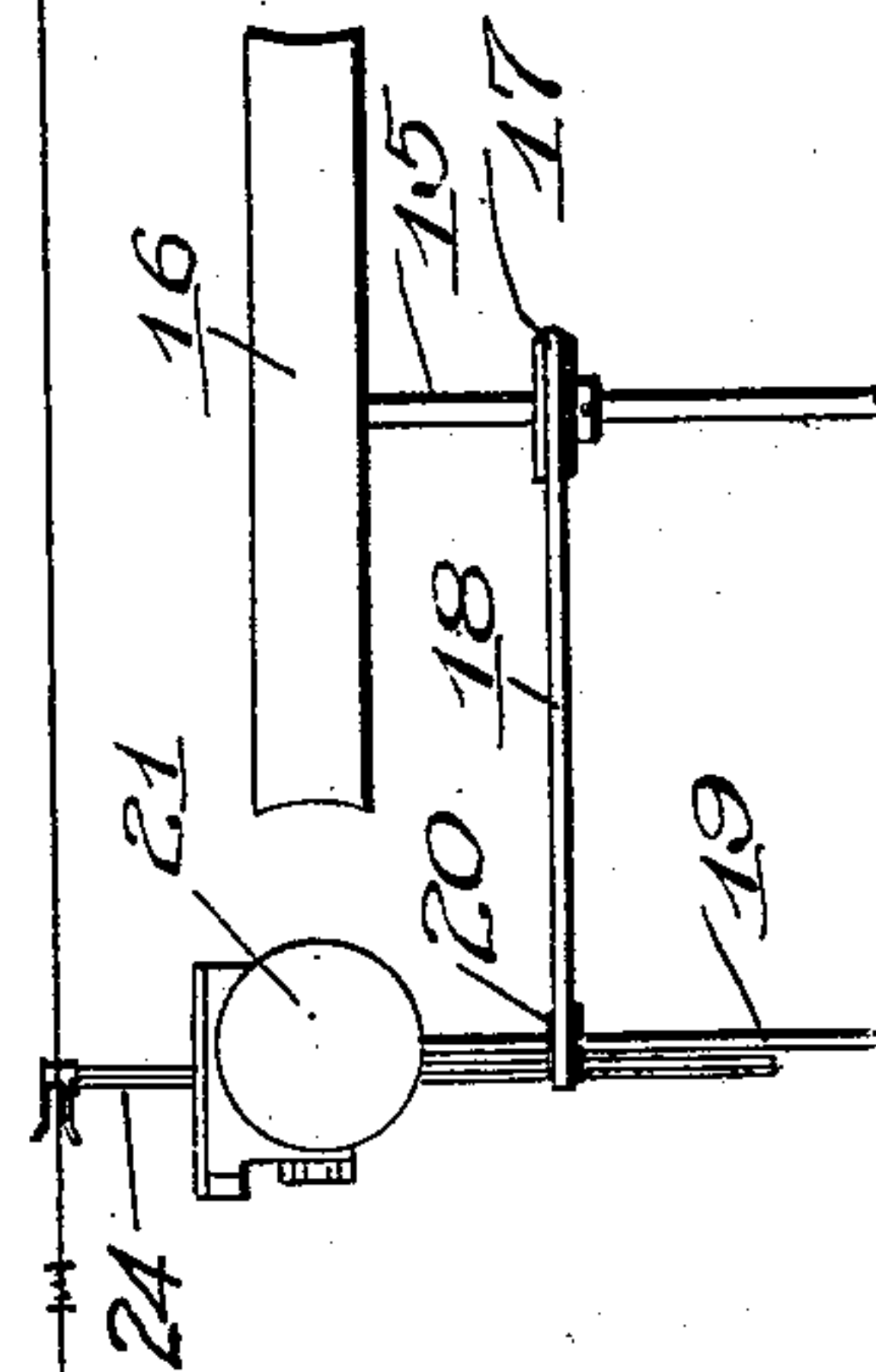
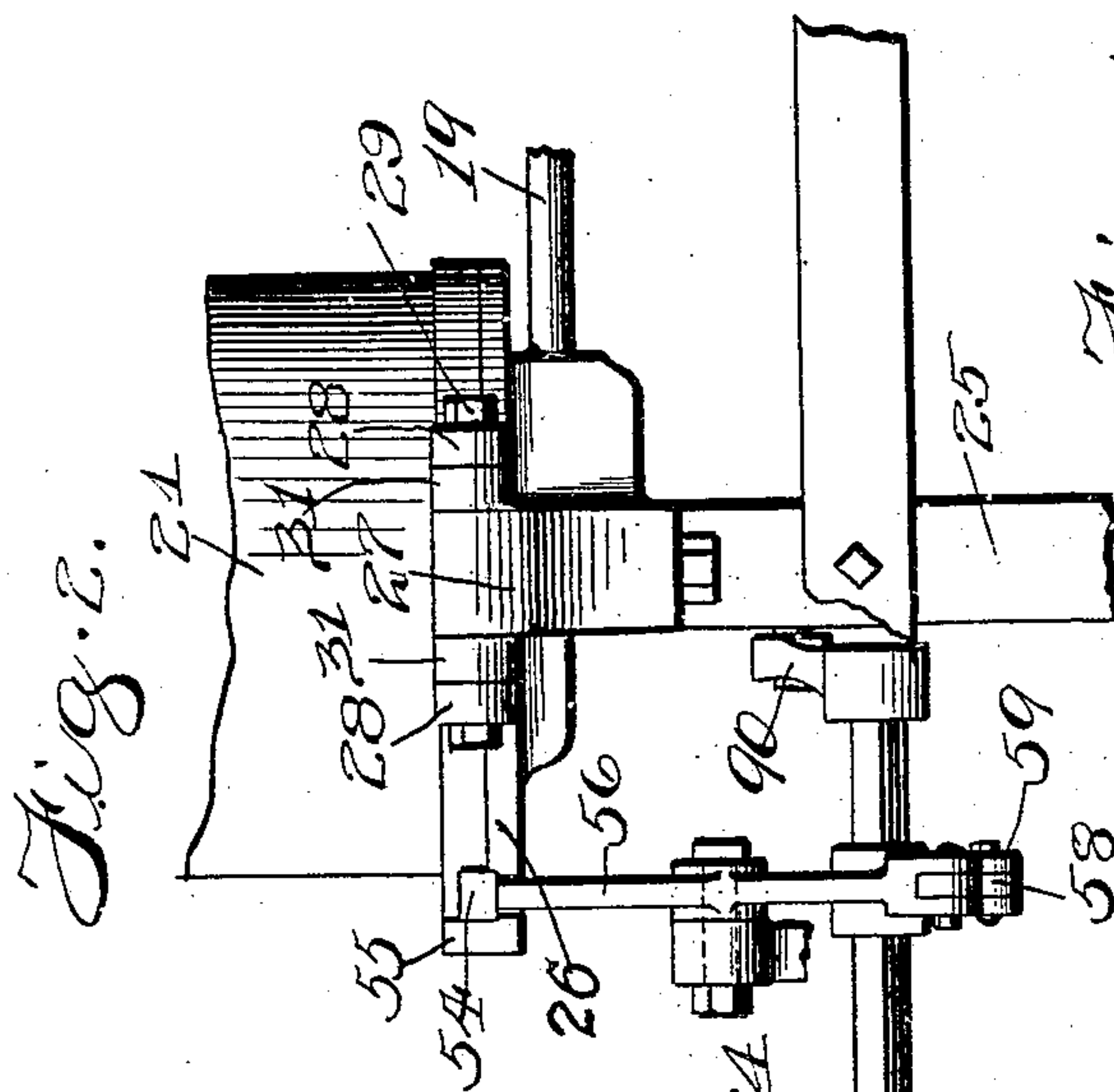
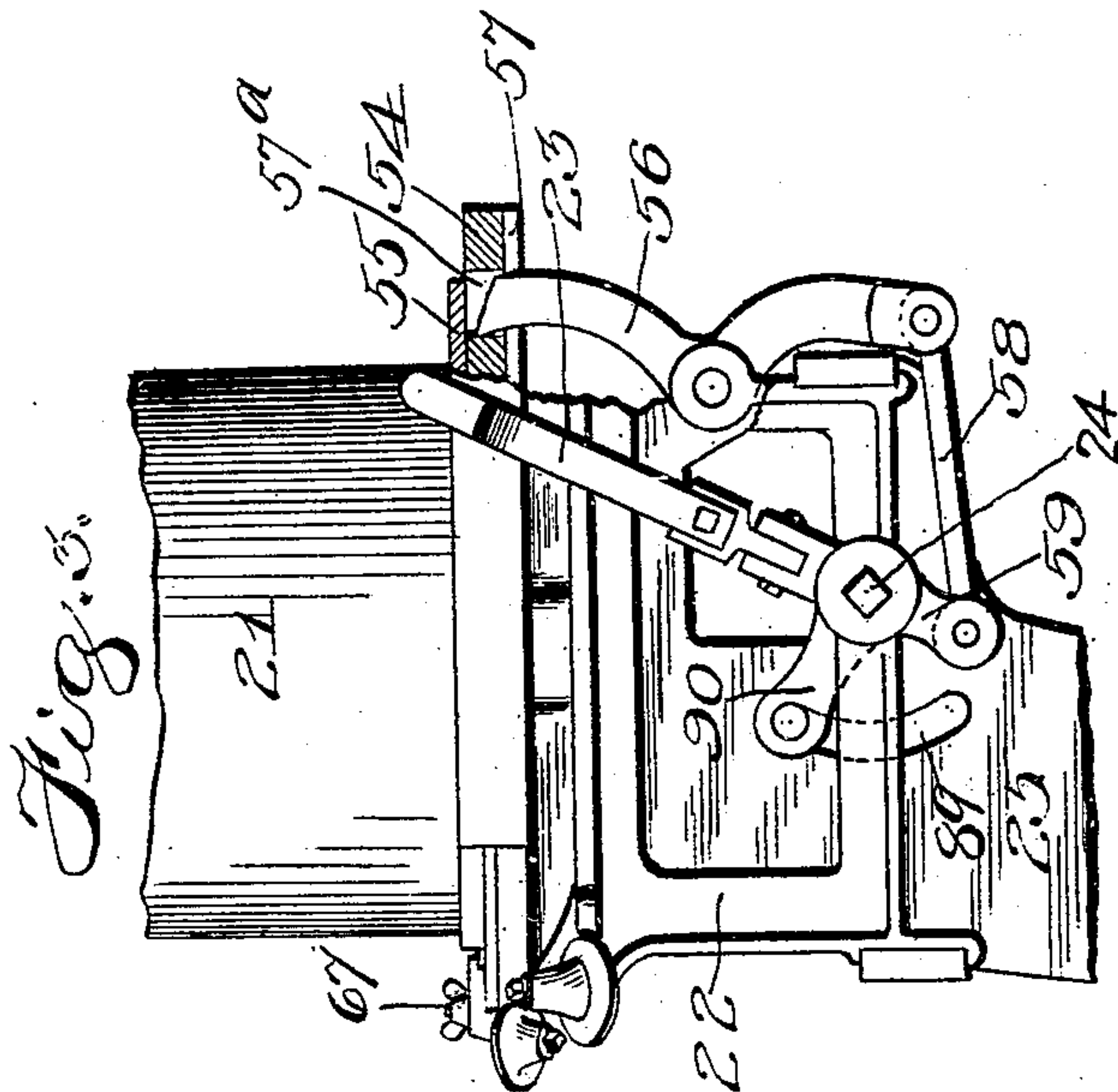
PATENTED DEC. 17, 1907.

W. M. BERING & R. L. FORD.

CORN PLANTER.

APPLICATION FILED MAY 28, 1906.

5 SHEETS--SHEET 1.



Witnesses
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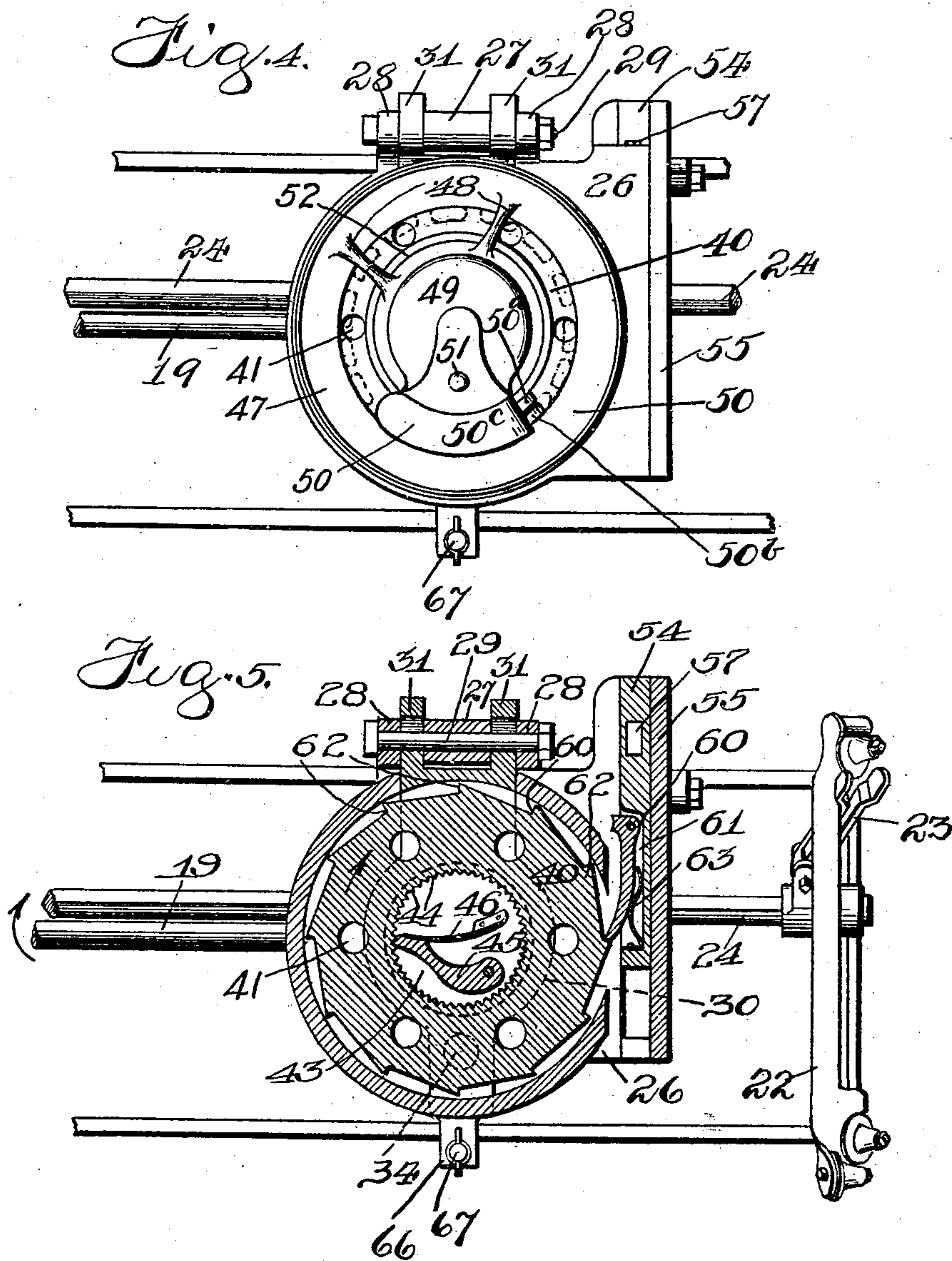
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5 SHEETS—SHEET 2.



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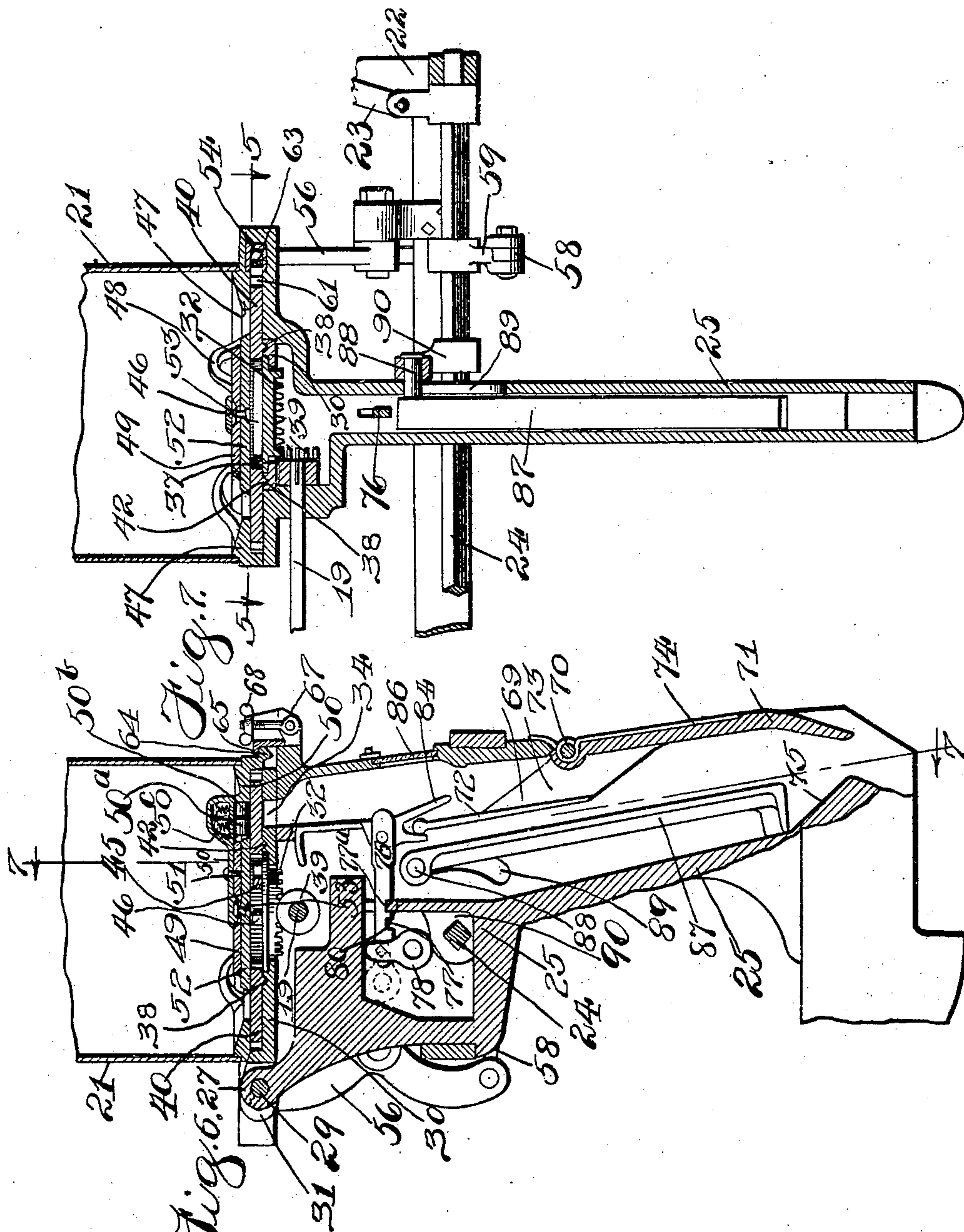
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

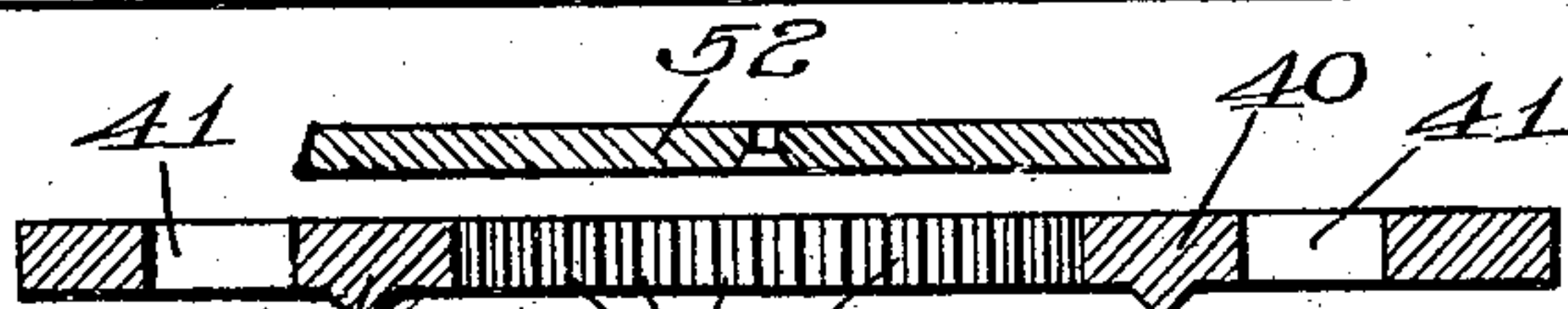
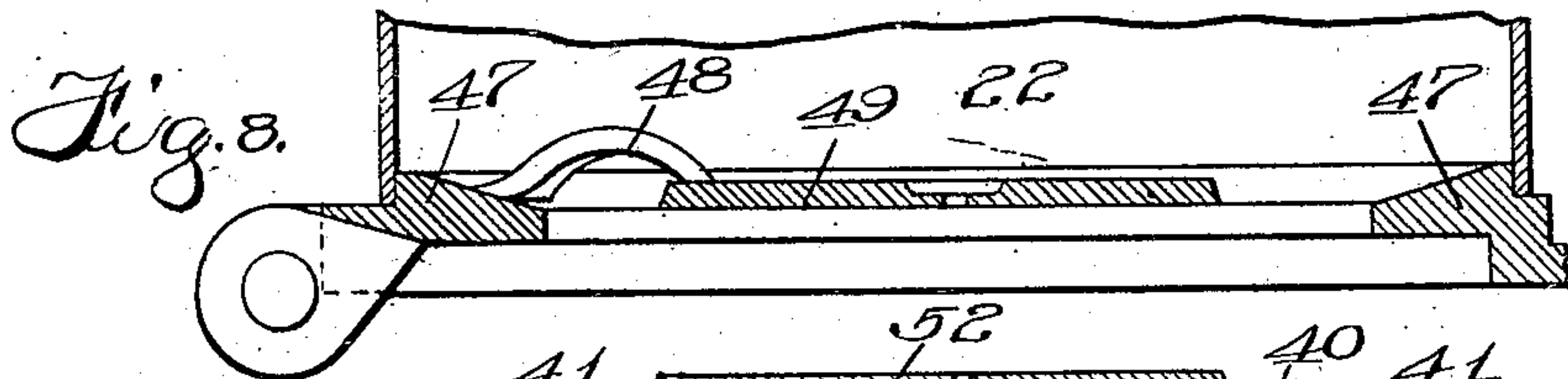


Fig. 10.

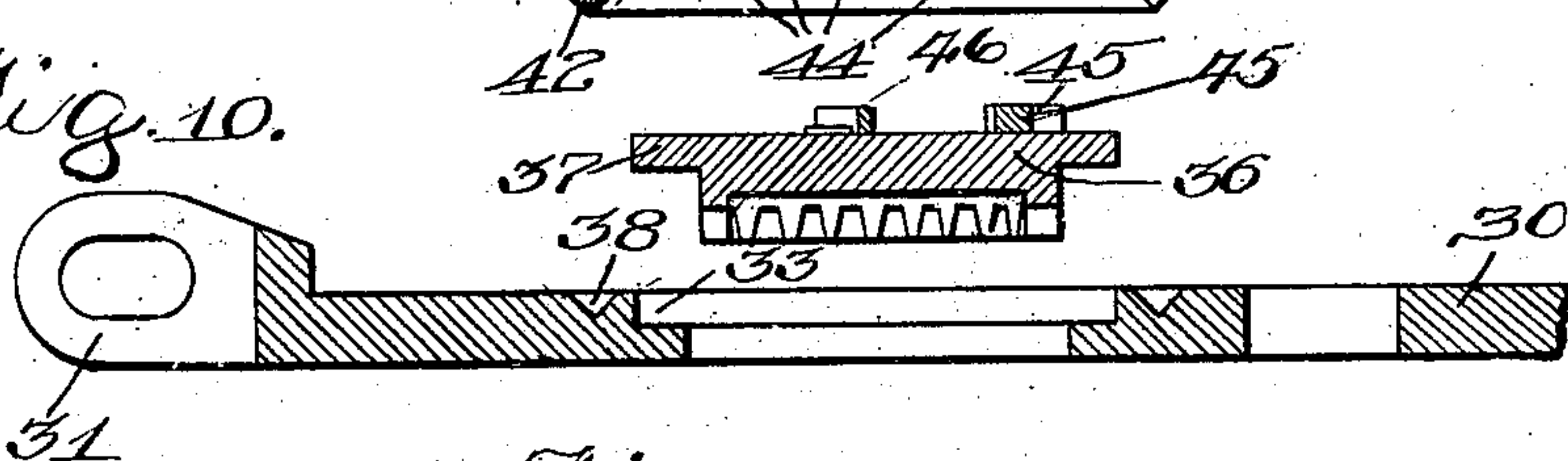


Fig. 11.

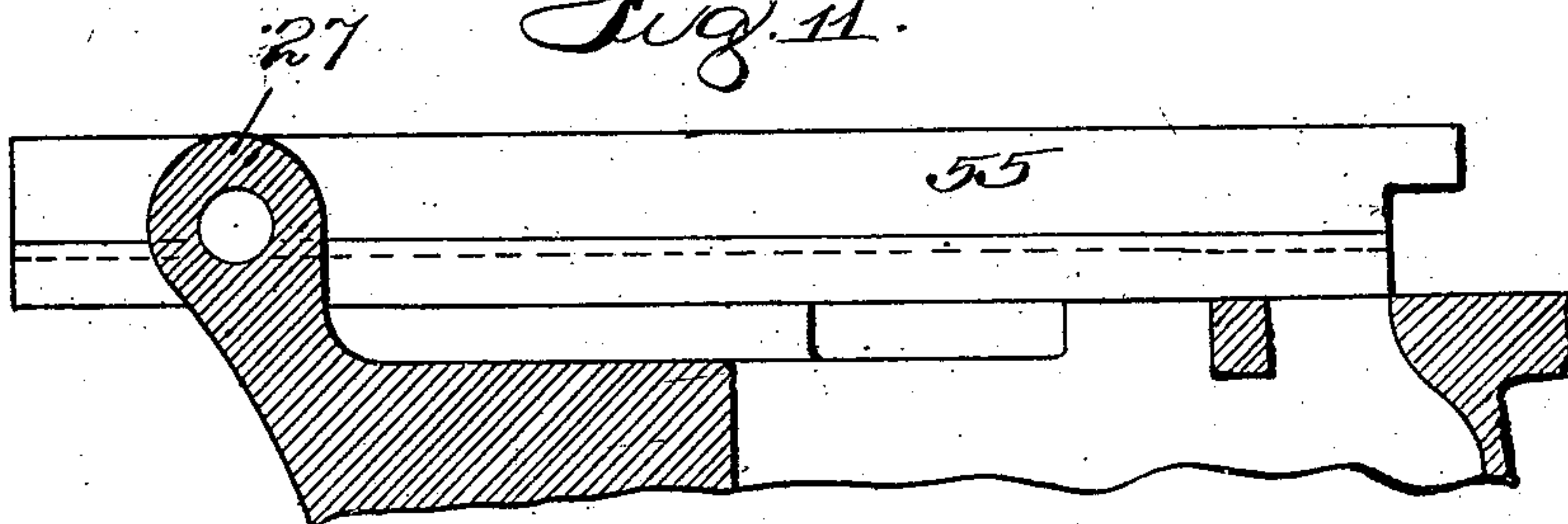
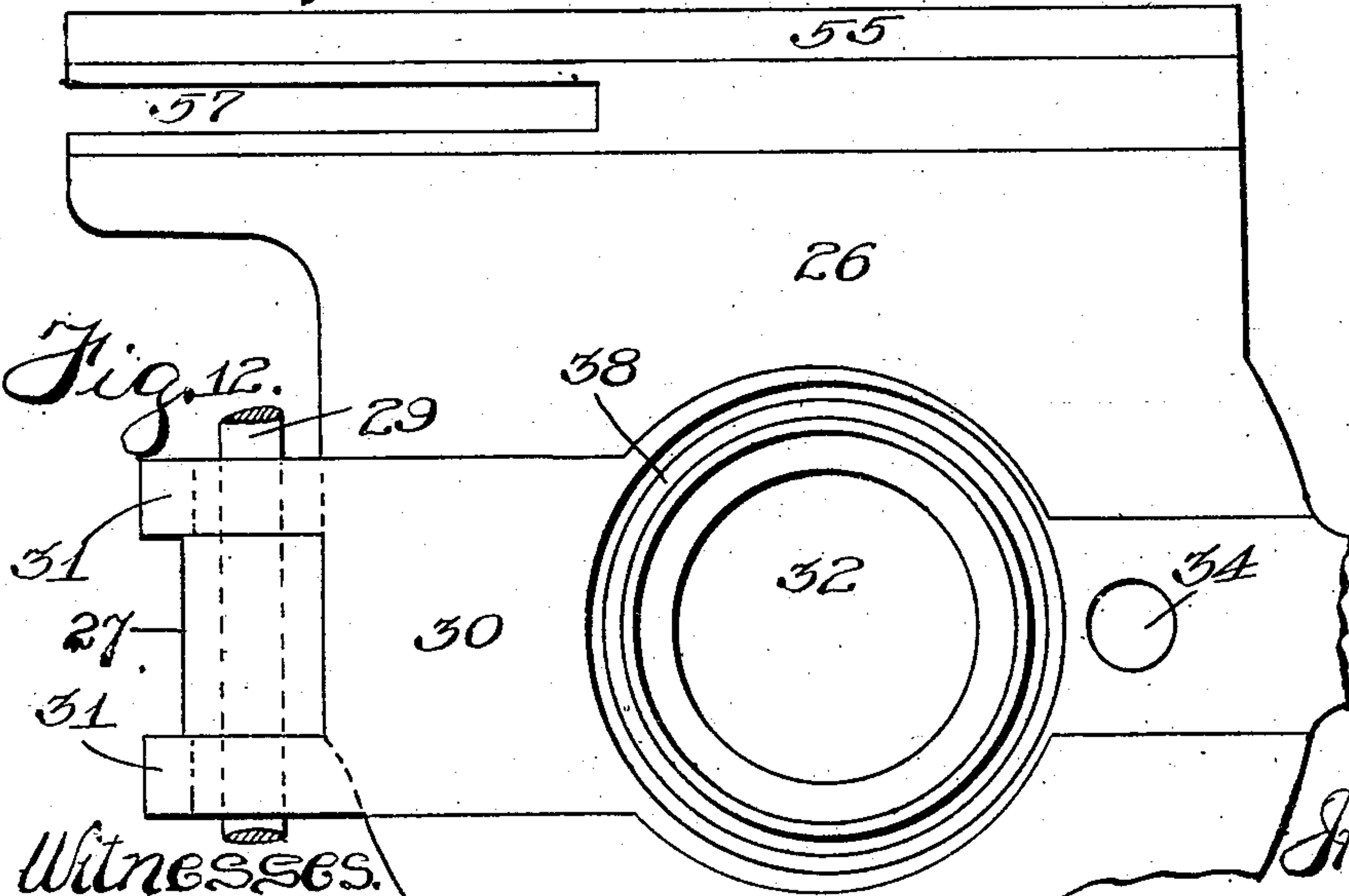


Fig. 12.



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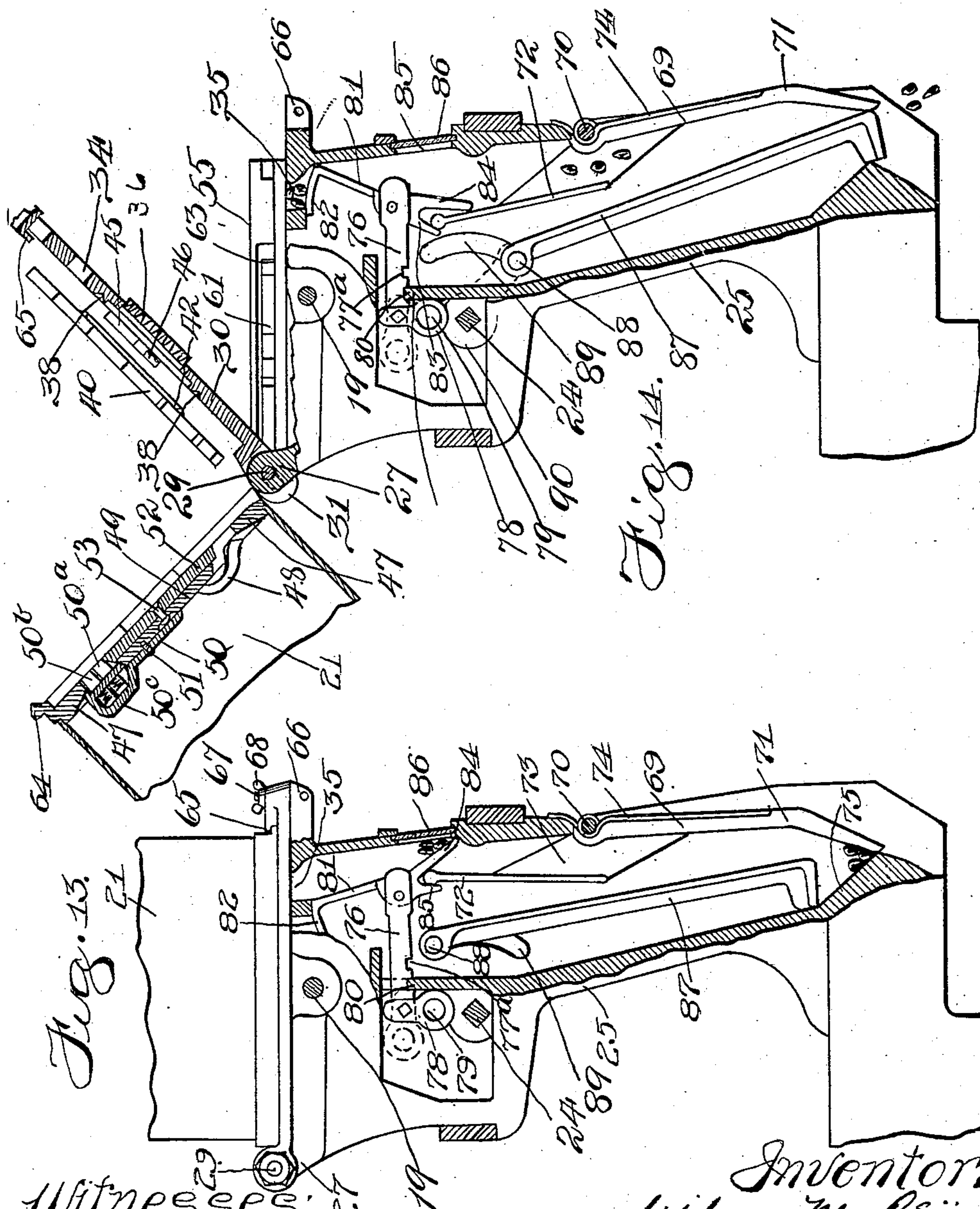
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CORN PLANTER.

APPLICATION FILED MAY 28, 1906.

5 SHEETS--SHEET 5.



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UNITED STATES PATENT OFFICE.

WILSON M. BERING AND RALPH L. FORD, OF DECATUR, ILLINOIS, ASSIGNORS TO CHAMBERS
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CORN-PLANTER.

No. 873,708.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed May 28, 1906, Serial No. 319,108.

To all whom it may concern:

Be it known that we, WILSON M. BERING and RALPH L. FORD, citizens of the United States, residing at Decatur, in the county of Macon, 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.

Our invention relates to corn-planters, and in one of its aspects relates particularly to improvements in the driving and operation of the seed-plate; and in another of its aspects to the valves located in the shank of the runner.

In its first aspect, which relates to improvements in the seed-plate and the seed-plate driving mechanism, our invention relates particularly to that class of corn-planters in which the seed-plate is driven continuously by gear from the axle of the cover wheels at a speed which is somewhat too slow to move the seed-plate that predetermined portion of its rotation that is necessary to deposit a given charge of corn through the opening into the runner and thence to the ground, and in which the movement of the seed-plate is therefore accelerated, just before the cross-row is reached, by the operation of the fork lever of the check-rower mechanism.

In this respect, it is the object of our invention to provide a new and improved mechanism for driving the seed-plate, and for accelerating it just before the cross-row is reached, and also a new and improved mechanism by which the planter may be used as a full hill drop.

In respect to the valves, it is the main object of our invention to provide new and improved valves, and means for operating them, by which a triple closure may be effected, the first to receive the corn from the seed-plate, the second to arrest it on its way down in such a position that the number of grains that are being deposited may be observed by the driver through a glass covered opening in the rear of the runner frame, and the third to arrest the charge of seed at the heel of the runner from which position it is forced out and into the ground by a plunger.

In this aspect, also, another object of our invention is to provide a new and improved arrangement of valves and mechanism connected therewith, by which the planter may

be readily converted from a check-rower to a drill.

Our invention has for a further object the improvement of corn-planters of the type described in sundry details hereinafter pointed out.

In the drawings:—Figure 1 is a diagrammatic view of a portion of the planter, showing a part of the front or runner frame, rear axle on the wheel frame, and one of the cover-wheels and seed-boxes. Fig. 2 is a front view of a portion of one of the seed-boxes, with the check-rower head and operating mechanism connected therewith. Fig. 3 is a side elevation of the same parts shown in Fig. 2. Fig. 4 is a top or plan view of one of the seed-boxes with the cover removed. Fig. 5 is a top or plan view, partially in cross-section on line 5—5 of Fig. 7. Fig. 6 is a vertical section through a seed-box and runner shank, showing also the valves in drilling position. Fig. 7 is a vertical cross-section on line 7—7 of Fig. 6. Fig. 8 is an enlarged detail, being a vertical section through the bottom of the seed-box. Fig. 9 is an enlarged detail, being a vertical central section through the seed-plate and detached cover-plate. Fig. 10 is an enlarged detail, being a vertical section through the hinged bottom or supporting plate, and seed-plate driving gear, with the driving gear removed from its position. Fig. 11 is an enlarged detail, being a vertical section through the top of the runner or furrow opener. Fig. 12 is an enlarged detail, being a top or plan view of a portion of the top of the runner with the hinged bottom-plate in position therein, and showing the flat surface on which the seed-plate rests when in position. Fig. 13 is a side elevation partly in vertical section of one of the runner shanks with a portion removed, showing the valves. Fig. 14 is a view of the same parts shown in Fig. 13, partially in vertical section, showing the tilting seed-box and mechanism by which the parts may be separated, and also showing the valves in another position.

As it will, of course, be understood that the parts shown in the drawings and described hereinafter are duplicated on opposite sides of the machine, it is believed to be unnecessary to show more than one side of the machine with its seed-box, valves, and operating mechanism.

Referring to the drawings, 15 indicates the

rear axle of the wheel frame of the machine, and 16 one of the cover-wheels journaled thereon.

17 indicates a sprocket-wheel keyed or otherwise secured to the axle 15.

18 indicates a sprocket-chain connecting with the seed-plate drive shaft 19 by means of a sprocket-wheel 20 more fully hereinafter described.

21 indicates a seed-box.

Referring more particularly to Figs. 2 and 3, 22 indicates the check-rower head, which is mounted in any usual manner upon the front frame of the planter, and is provided with the fork-lever 23, which is mounted upon the rock-shaft 24, which is journaled in the usual manner in the front frame of the planter. 25 indicates a runner shank of the corn-planter, which is cast hollow in the usual manner to contain the valves hereinafter described. 26 indicates the top of the runner, which, as is best shown in Figs. 4, 5 and 12, is a flat surface upon which the seed-box is supported and upon which rests the outer part of the under surface of the seed-plate hereinafter described. 27 indicates a forwardly-projecting lug at the upper front of the runner upon which the seed-box 21 is hinged by means of two projecting arms 28 and a pin 29 whereby the seed-box may be tilted forward in the manner hereinafter described. 30 indicates a plate whose shape is best shown in Figs. 5 and 12, which is pivoted by lugs 31 upon the pin 29, and which is sunk into a corresponding recess in the top of the plate 26, so that its upper surface will lie flush therewith. The plate 30 is provided with a circular opening 32 which is provided with a circular rabbet 33 in order to receive the seed-plate driving-gear hereinafter described. The plate 30 is also provided with an opening 34 which, when the plate 30 is in operative position, registers with a seed-opening 35, opening through the top of the top-plate 26 in the runner shank to permit the passage of the seed into the same. 36 indicates the seed-plate drive-gear which is adapted to fit into the opening 32 of the plate 30 and is provided with a circular flange 37 adapted to rest upon the rabbet 33 in the plate 30, so that its top may be flush with the top of the seed-plate. The plate 30 is also provided with a V-shaped circular groove 38 for the purpose of centering the seed-plate, as hereinafter described. The gear 36 is operated by an intermeshing gear 39 which is keyed or otherwise secured to the end of the seed-plate drive-shaft 19. 40 indicates a seed-plate which is provided with seed-cups 41. The seed-plate 40 is also provided on its under surface with a circular V-shaped shoulder or rib 42 which is adapted to rest in the circular V-shaped groove 38 in the plate 30 for the purpose of centering the seed-plate in proper position. We have

shown the seed-plate 40 as provided with six seed-cups, each one of a size adapted to hold a full hill charge of corn, which is usually three grains. It will be readily understood, however, that a seed-plate in other respects like this may be used but having seed-cups adapted to each contain a single grain of corn and therefore correspondingly increased in number, so that the plate may be used as a cumulative drop. The seed-plate 40 is provided with a concentric circular opening 43, best shown in Fig. 5, around the periphery of which are ratchet-teeth 44. 45 indicates a pawl which is pivoted upon the top of the gear 36, and which, by means of a spring 46, is held normally in engagement with the ratchet-teeth 44 when the parts are in operative position. The seed-box 21 is provided at its bottom with a concentric ring 47 which is screwed or otherwise secured to the bottom of the seed-box in any appropriate manner. 48 indicates brackets, preferably integral with the ring 47, which support a cap 49, preferably cast integral with said brackets and with said ring. The brackets 48 are curved upwards to permit of free passage of seed around under them. 50 indicates a cut-off which is preferably of the form hereinafter described, and which is secured to the cap 49 by means of a screw 51, or in any other appropriate manner. 52 indicates a cover-plate which is removably secured to the cap 49 by means of a bolt 53. The cover-plate 52 is of such size and diameter that it covers the opening 43 in the seed-plate 40, but its outer periphery does not extend quite to the seed-cups 41, leaving the seed-cups 41 thus open to receive the seed. 54 indicates a slide-bar which is slidingly mounted upon the upper surface of the top 26 of the runner, bearing on its outer end against a ledge or flange 55 on said runner top. 56 indicates a lever which is pivoted upon the runner 25. The upper end of the lever 56 working in a slot 57 in the top-plate 26 of the runner engages the forward end of the slide-bar 54 by means of a suitable opening 57^a therein. The lower arm of the lever 56 is connected by a link 58 with the lower arm 59 of the fork-lever 23. Referring particularly to Fig. 5, where these parts are best shown, 60 indicates a pawl which is pivoted in a suitable slot 61 in the slide-bar 54. 62 indicates ratchet-teeth on the periphery of the seed-plate 40, and by means of a spring 63 the operative end of the pawl 60 is normally held against the periphery of the seed-plate 40.

The operation of the parts hereinbefore described is as follows:—By the action of the cover-wheel 16, through the sprockets 17 and 20, and sprocket chain 18, the shaft 19 is rotated. By means of the gear 39 this rotation is communicated to the seed-plate drive-gear 36, which, by the action of the pawl and ratchet mechanism above described, causes

rotation of the seed-plate. The gearing between the axle of the cover-wheels and the seed-plate is such that this rotation of the seed-plate will be somewhat too slow to effect, between the cross-rows, the predetermined amount of its rotation necessary to carry the charge of corn under the cut-off and discharge it into the runner. For instance, in the mechanism illustrated in the drawings, in which the seed-plate contains six seed-cups each adapted to contain a full hill charge of corn, it will be necessary, in order to discharge this corn into the runner at proper intervals to effect check-rowing, that the seed-plate should be rotated one-sixth of a rotation between cross-rows. The drive of the seed-plate from the cover-wheels, therefore, is such that the seed-plate, between rows, will not be driven quite one-sixth of a complete rotation but will be given a partial rotation somewhat short of this predetermined required amount. Just as the cross-row is reached, however, the fork lever is operated by one of the tappets on the usual check-rower wire. This rocks the shaft 24 and by means of the lever 56 the slide bar 54 is thrown quickly backward, causing the pawl to engage one of the teeth upon the periphery of the seed-plate and accelerate its motion. This acceleration of the motion is permitted by the pawl 45 which is so mounted, as has been above described, as to engage the ratchet-teeth on the inner periphery of the opening 43 of the seed-plate 40 and drive the seed-plate around as the gear 36 is driven, but which will permit these ratchet-teeth on the seed-plate to slip over the pawl in the direction of its rotation when given the accelerated motion above described. By the mechanism above described, we secure an accurate operation of the plate for a full hill drop planter, and insure that the seed-plate will be given between rows an exact predetermined rotation, insuring the passage of the seed-cell over the discharge opening with each throw of the check-rower mechanism. As the check-rower mechanism is thrown back to its normal position in the usual manner, the slide-bar 54 and pawl 60 are again returned into operative position. It will be obvious, of course, that instead of six full hill cells a different number could be used, in which case the movement of the seed-plate would be governed accordingly. This, however, is the number that we prefer to use. It will also be obvious that instead of providing the seed-plate with full hill cells, it might be provided with single grain cells, in which case the number of cells would simply be increased two, three, or four times, according to the number of grains which it was desired to plant in each hill, and we do not confine our invention to the full hill drop plate, except as hereinafter specifically claimed.

Referring particularly to Figs. 6, 13 and

14, where these parts are best shown, 64 indicates a latch formed on the rear portion of the exterior of the ring 47, which is adapted to engage with a shoulder 65 at the rear end of the plate 30. As is best shown in Fig. 10, the lugs 31 at the forward end of the plate 30 are provided with slotted openings through which the pin 29 above described passes, by means of which the plate 30 is hinged to the top of the runner and is also permitted a slight movement longitudinally of itself. 66 indicates a projection at the top of the rear of the runner upon which is pivoted a bolt 67 provided with a wing-nut 68. When the parts are in the position shown in Figs. 6 and 13, for instance, the wing-nut engaging the rear end of the plate 30 locks the plate and the seed-box in position. By disengaging the wing-nut 68, the plate 30 carrying the gear 36, seed-plate 40 and seed-box 21, may be tilted forward as is shown in Fig. 14. By a rearward longitudinal movement of the plate 30, the latch 64 on the seed-box 21 may be freed from the bearing 65 on the plate 30, permitting the separation of the seed-box carrying its cap, cut-off and cover-plate, from the plate 30, whereby the seed-plate 40 and the gear 36 may be readily removed without the necessity of un-screwing sundry bolts and screws, as is usually the case.

Referring now particularly to Figs. 6, 7, 13 and 14, 69 indicates the bottom closure valve, which is pivoted by means of a pivot 70 in an opening at the back of the runner 25. This bottom closure valve 69 consists of two plates 71 and 72 connected at one side by a web 73. The plates 71 and 72 are of sufficient width to fill the space between the inner surfaces of the runner opening. By means of a spring 74, the bottom closure valve 69 is normally held in the position shown in Fig. 13, with the plate 71 bearing against a sloping shelf 75, at the lower end of the forward inner wall of the runner and adapted to hold therein a charge of seed, as is shown in Fig. 13. The plates 71 and 72, being connected at both sides by the thin web 73, afford a passage for the corn downward, as hereinafter described. 76 indicates a latch arm which extends from the exterior into the interior of the runner through a suitable opening for that purpose, and is provided with two notches 77 and 77^a, by means of which it is held in either one of the two positions hereinabove described. 78 indicates a pull which is pivotally connected with the forward end of the latch arm 76, and is located within a suitable opening in the runner shank. The pull 78 is provided with a ring 79 at one end, and its other end is of sufficient length to bear closely against the upper surface of the runner opening when in the position shown in solid lines in Figs. 6, 13 and 14, so as to prevent the upward movement of the arm 76, whereby, when the notches 77 and 77^a

engage with the lower edge 80 of the opening through which the latch-arm 76 passes, the latch-arm cannot be jarred out of engagement. By turning the pull into the position shown in dotted lines in Fig. 13, the latch-arm 76 may be lifted out of engagement and moved forward or backward, as the case may be. 81 indicates the upper closure valve, which is provided at its upper end with the plate 82 which is adapted, when the valve is rocked backward, as hereinafter described, into the position shown in Fig. 14, to close the opening 35 and receive the charge of seed dropped by the seed-plate. The lower end of the upper closure is provided with a fork consisting of arms 83 and 84, which straddle the upper end of the plate 72. The upper closure valve 81 is pivoted in the rear end of the latch-arm 76, and is of such width as to extend across between the interior side surfaces of the runner. The arm 84 is of such length that when the valve 81 is rocked forward into the position shown in Fig. 13, its lower end bears against the rear wall of the runner shank and forms an intermediate closure. Immediately above this point, the rear wall of the runner is provided with an opening 85 which is covered with a glass plate 86, which, being in the full view of the driver, affords him an opportunity to see just how many grains of corn are being delivered by the seed-valve, as they are arrested in their downward progress by the intermediate closure 84. 87 indicates a plunger whose upper end is pivotally connected with a pivot-pin 88 which passes through an arc-shaped slot 89 in the side of the runner and is secured to an arm 90 mounted upon the rock-shaft 24. The lower end of the plunger 87 rests against the inner surface of the forward wall of the runner shank, and is adapted to move down the shelf 75 when actuated by the check-rower mechanism, as hereinafter described and bearing against the lower plate 71 of the lower closure 69 to force it backward against the operation of the spring 74 and forcibly eject the accumulated corn from the shank and into the ground.

The operation of these parts is as follows:—The latch-arm 76 being pushed backward so that the forward notch engages the edge 80 in the position shown in Figs. 13 and 14, the fork lever is engaged by one of the tappets of the check-rower wire and thrown backward. This not only accelerates the motion of the seed-plate, as above described, but throws down the plunger 87 forcing back the lower plate 71 of the lower closure 69 and rocking the upper plate 72 of the lower closure 69 forward. The upper arm 72 engaging the forks 83 and 84 of the valve 81 throws them forward, throwing the upper closure 82 backward to close the opening 35 to receive the charge of corn delivered by the seed-plate as shown in Fig. 14. When the fork

lever is released from the tappet on the check-rower wire and springs back to its former position, the plunger 87 is retracted; the spring 74 thereupon quickly returns the lower closure into the position shown in Fig. 13, and, rocking the plate 72 backwards, rocks the fork arms 83 and 84 of the lever 81 backward and the upper closure 82 forward, permitting the charge of corn to fall upon the intermediate closure 84, as is shown in Fig. 13, where it is arrested until the next throw of the check-rower mechanism, permitting the charge of corn to be seen through the glass 86, as above described. At the next throw of the check-rower, the parts are again put into the position shown in Fig. 14, and the charge of corn drops from the intermediate closure 84. The rear side of the lower end of the plunger 87 coming in contact with the forward face of the lower end of the plate 71, will prevent the charge of corn from being dribbled into the ground as it falls. In the meanwhile, the second charge is of course delivered by the seed-plate to the upper closure 82. When the check-rower mechanism is again freed from the tappet, the parts are quickly returned into the position shown in Fig. 13, and the charge of corn rests between the shelf 75 and the lower end of the plate 71, forming a third closure. At the next operation of the check-rower mechanism, this charge of corn is forced out by the plunger, as is shown in Fig. 14. When it is desired to use the planter as a drill, the pull 78 is lifted into the position shown in Fig. 13, and the notch 77 of the latch-arm 76 being freed from engagement, the latch-arm is pulled forward and the notch 77^a brought into engagement. The valve 81 being so mounted that the forward play of the upper arm is limited to the position shown in Fig. 13, as the latch-arm 76 is pulled forward, the engagement of the forks 83 and 84 with the top of the plate 72 rocks the plate 72 forward and the plate 71 backward, so as to open the lower closure. The pull 78 being then thrown downward into the position shown in solid lines, the parts are locked in the position shown in Fig. 6, affording a free and continuously open passage from the seed-plate to the heel of the runner.

Referring to Figs. 4, 6 and 14, where it is best shown, the cut-off 50 consists of two spring-seated levers 50^a 50^b which are pivoted within a suitable housing 50^c, each of which operates in the usual manner, being held yieldingly against the surface of the seed-plate 40. The two spring-seated levers 50^a 50^b lie side by side, and each operates independently of the other. They are together of such width that they will cover, or extend a little more than across, the seed-cups of a hill drop plate, and each by itself will extend across the seed-cup opening of a single seed cell or edge drop plate, as is shown

by dotted lines indicating such an edge drop or single cell plate in Fig. 4. By this means when the planter is used as a hill drop, both of the spring-seated levers of the cut-off will operate; while, when the planter is used as a drill or as a cumulative drop,—in each of which cases a seed plate containing a single cell or edge-drop openings will be used,—only one of the levers will be put into active operation.

What we claim as new and desire to secure by Letters Patent is:—

1. In a corn-planter, the combination with cover-wheels, a seed-box, a seed-plate, and check-rower mechanism, of means for driving said seed-plate from said cover-wheels at a relatively slow speed, and mechanism operating directly upon said seed-plate and connected with said check-rower mechanism to impart to said seed-plate an accelerated movement with each throw of the check-rower mechanism.

2. In a corn-planter, the combination with cover-wheels, a seed-box, a seed-plate, check-rower mechanism, and gearing between said seed-plate and said cover-wheels adapted to drive said seed-plate at a relatively slow speed, of a slide-bar in proximity to said seed-plate, devices on said slide-bar adapted to engage said seed-plate, and connections between said slide-bar and said check-rower mechanism adapted to operate said slide-bar to engage said seed-plate and give it an accelerated rotation with each throw of the check-rower mechanism.

3. In a corn-planter, the combination with cover-wheels, a seed-box, and check-rower mechanism, of a seed-plate having ratchet-teeth, a driving gear, pawl mechanism on said driving-gear adapted to engage the ratchet-teeth on said seed-plate and rotate the same as said drive-gear is rotated, gearing between said drive-gear and said cover-wheels adapted to continuously rotate said seed-plate at a relatively slow speed, and mechanism operating on said seed-plate and connected with said check-rower mechanism adapted to give to said seed-plate an accelerated rotation with each throw of the check-rower mechanism.

4. In a corn-planter, the combination with cover-wheels, a seed-box, and check-rower mechanism, of a seed-plate having ratchet-teeth, a driving-gear, pawl mechanism on said driving-gear adapted to engage the ratchet-teeth on said seed-plate and rotate the same as said driving-gear is rotated, gearing between said driving-gear and said cover-wheels adapted to continuously rotate said seed-plate at a relatively slow speed, a slide-bar, connections between said slide-bar and said check-rower mechanism to throw said slide-bar as the check-rower mechanism is operated, and a pawl carried by said slide-bar and adapted to engage said seed-plate to

impart to the same an accelerated rotation with each throw of the check-rower mechanism.

5. In a corn-planter, the combination with a runner shank having a sloping shelf at its heel, and check-rower mechanism, of a plunger adapted to be moved along said shelf, a spring-seated lower closure valve pivoted to said runner shank and adapted to be opened by the downward movement of the plunger, connections between said plunger and said check-rower mechanism, an arm on said lower closure valve extending upwards in said runner shank, a bar mounted in said runner shank, and an upper closure valve pivoted on said bar and having a lower extension adapted to engage with the upper end of said arm and to form an intermediate closure as said lower closure valve is operated.

6. In a corn-planter, the combination with a runner shank having a sloping shelf at its heel, and check-rower mechanism, of a plunger adapted to be moved along said shelf, a spring-seated lower closure valve pivoted to said runner shank and adapted to be opened by the downward movement of the plunger, connections between said plunger and said check-rower mechanism, an arm on said lower closure valve extending upwards in the said runner shank, a longitudinally movable bar mounted in said runner shank and adapted to be locked therein in inner and outer positions, and a lever pivotally mounted on the inner end of said bar and having an upper closure valve on its upper end and having an intermediate closure plate on its lower end adapted to engage with the upper end of said arm and to operate said lever as said lower closure valve is operated by said plunger.

7. In a corn-planter, the combination with a runner shank having a sloping shelf at its heel, and check-rower mechanism, of a plunger adapted to be moved along said shelf, a spring-seated lower closure valve pivoted to said runner shank and adapted to be opened by the downward movement of the plunger, connections between said plunger and said check-rower mechanism, an arm on said lower closure valve extending upwards in said runner shank, a longitudinally movable bar mounted in said runner shank and adapted to be locked therein in inner and outer positions, a lever pivotally mounted on the inner end of said bar and having an upper closure valve on its upper end and having an intermediate closure plate on its lower end adapted to engage with the upper end of said arm, and means for locking said bar in its inner and outer position.

8. In a corn-planter, the combination with a runner having a seed-supporting shelf at its heel, and check-rower mechanism, of a plunger adapted to move along said shelf,

connections between said check-rower mechanism and said plunger, a spring-seated plate pivotally mounted on said runner shank and adapted to be held normally against said
5 shaft to form a lower closure, an inner plate extending above said lower closure plate and rigidly connected therewith, a bar carried by said runner shank and extending within the same, a lever pivotally mounted on the inner
10 end of said bar and having an upper closure plate at its upper end and on its lower end a fork connection adapted to engage the upper end of said inner plate, a plate adapted to be thrown backward against the rear wall of
15 said runner shank, said lever by means of its

connections with the lower closure plate being adapted to rock its upper closure backward to close the seed-opening when said lower closure is opened by said plunger and to rock its lower plate backward to form an
20 intermediate closure when said lower closure is closed, and a glass-covered opening in the rear wall of said runner shank above said intermediate closure.

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Witnesses:

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