

No. 620,285.

Patented Feb. 28, 1899.

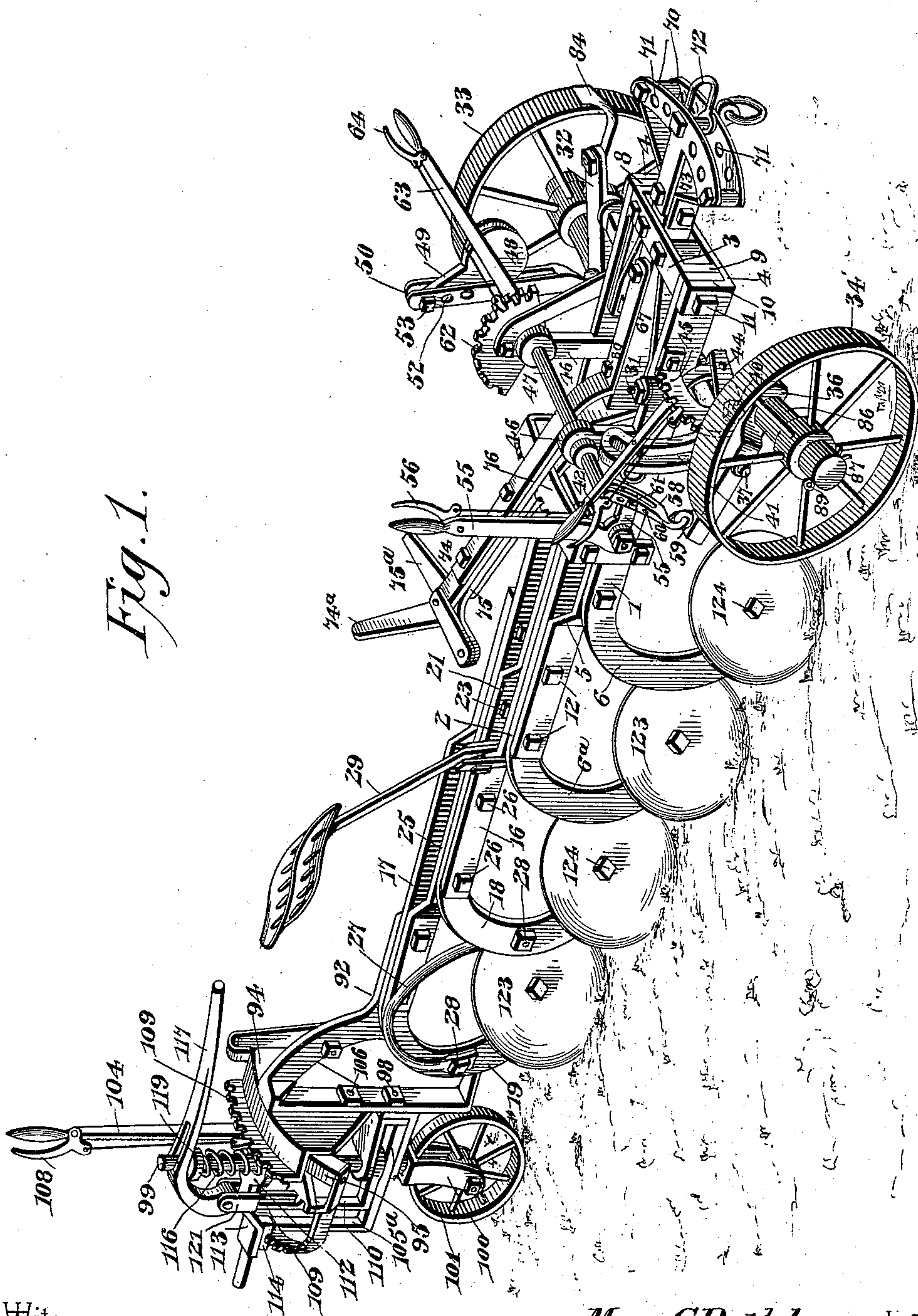
M. C. DETHLEFS.
REVOLVING PLOW.

(Application filed Sept. 6, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses

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4 Sheets—Sheet 2.

Fig. 8.

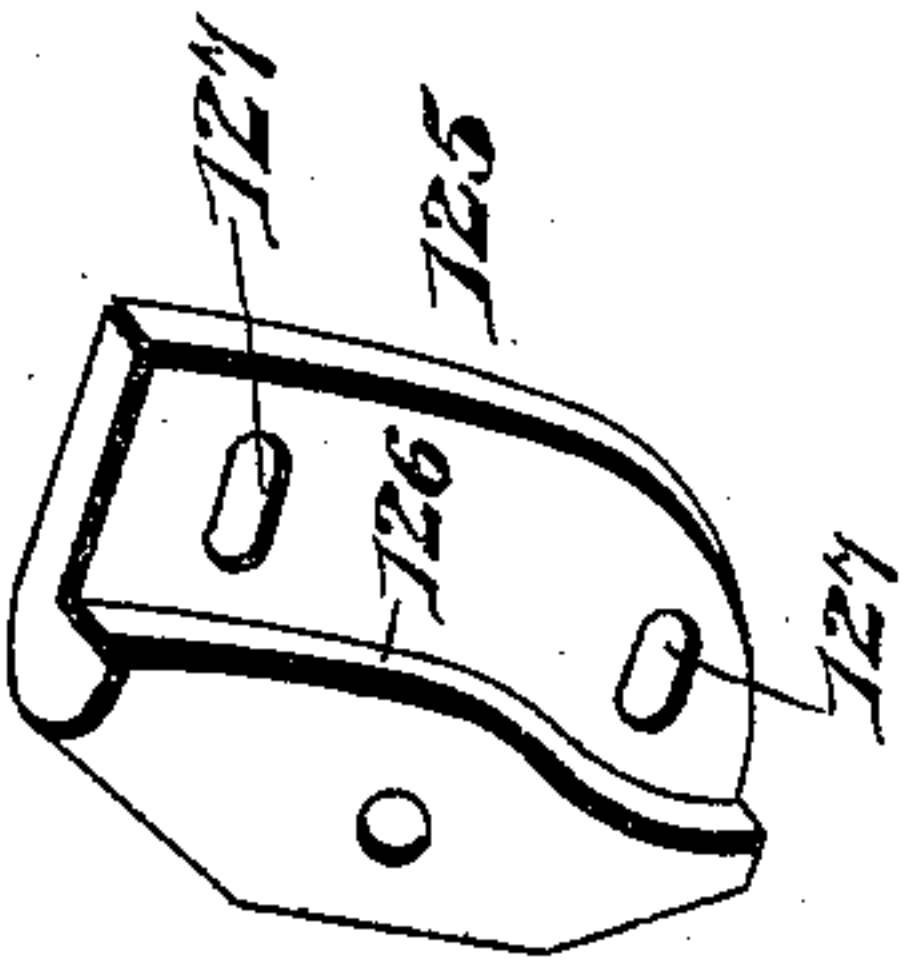


Fig. 2.

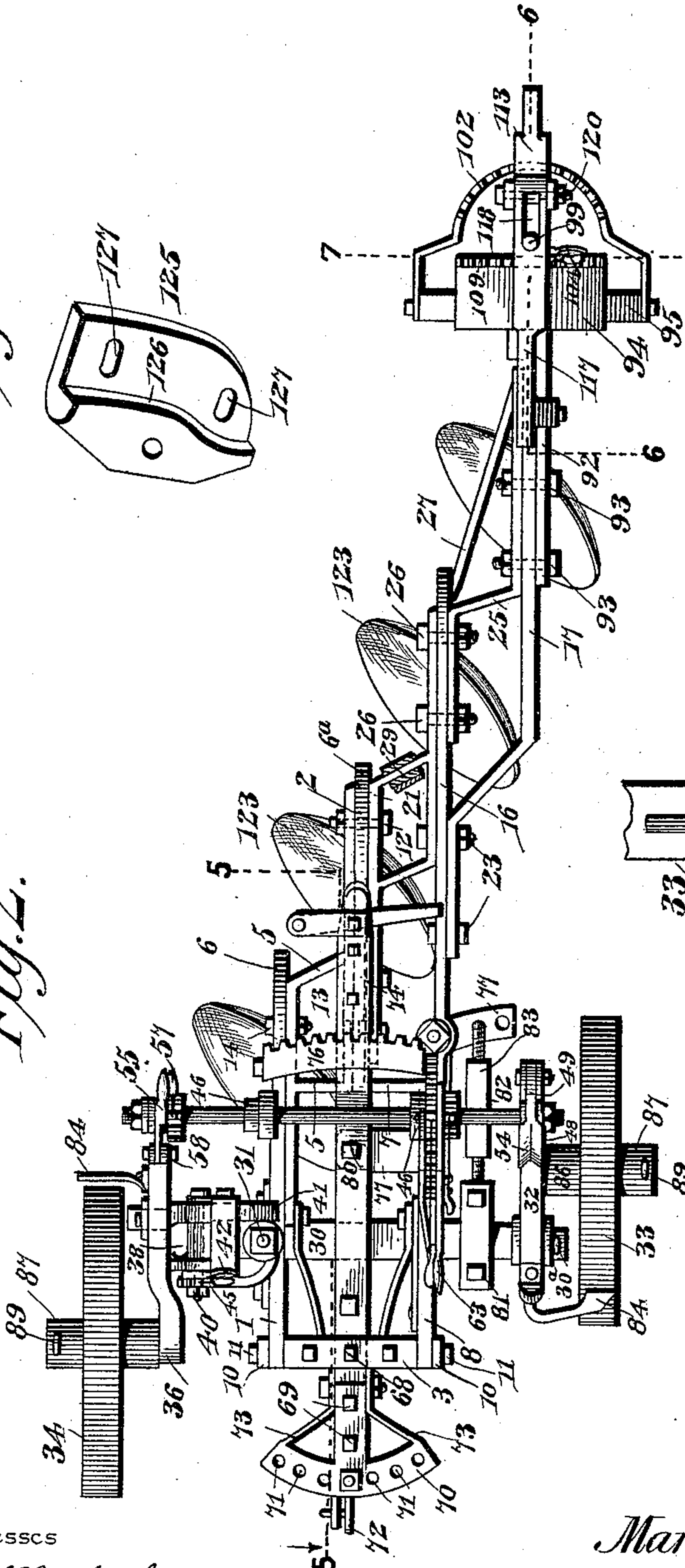


Fig. 10.

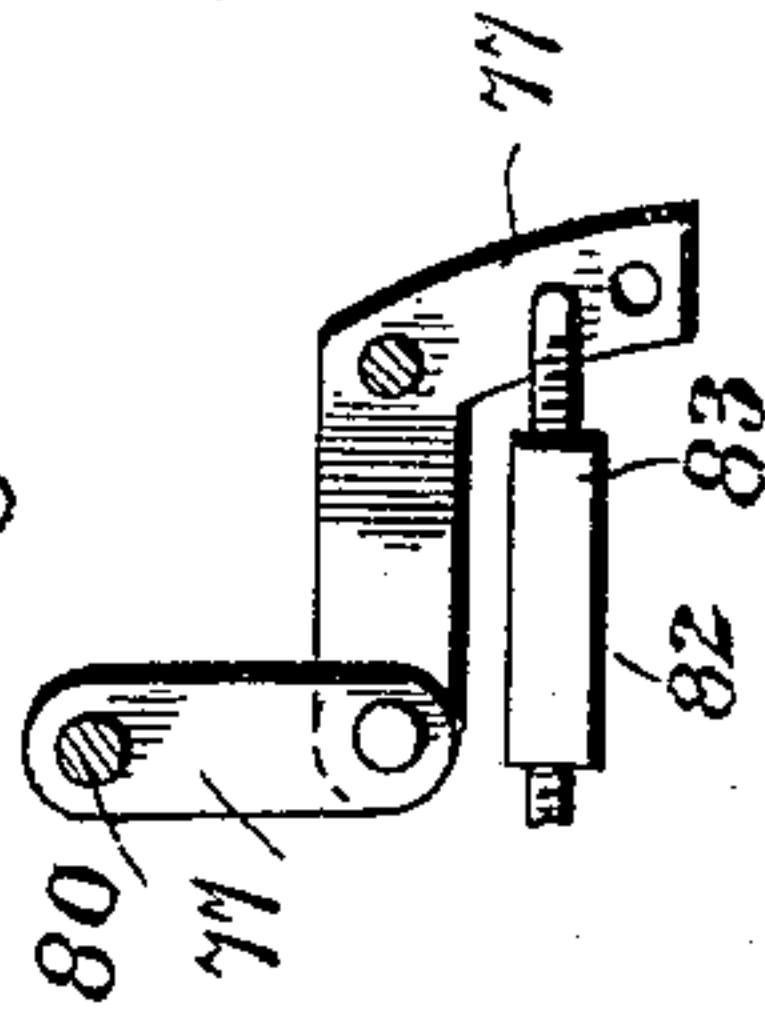
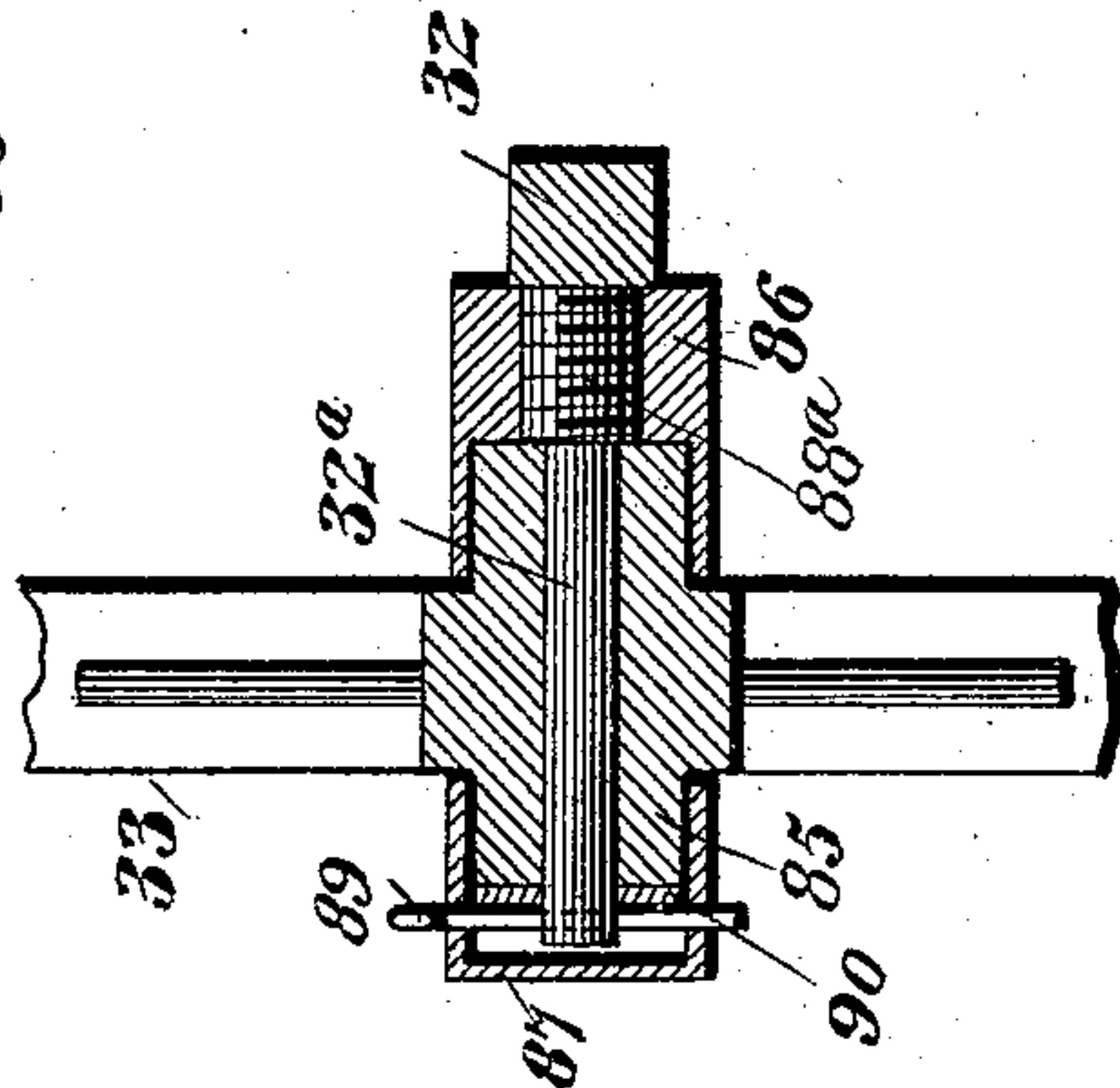


Fig. 9.



Witnesses

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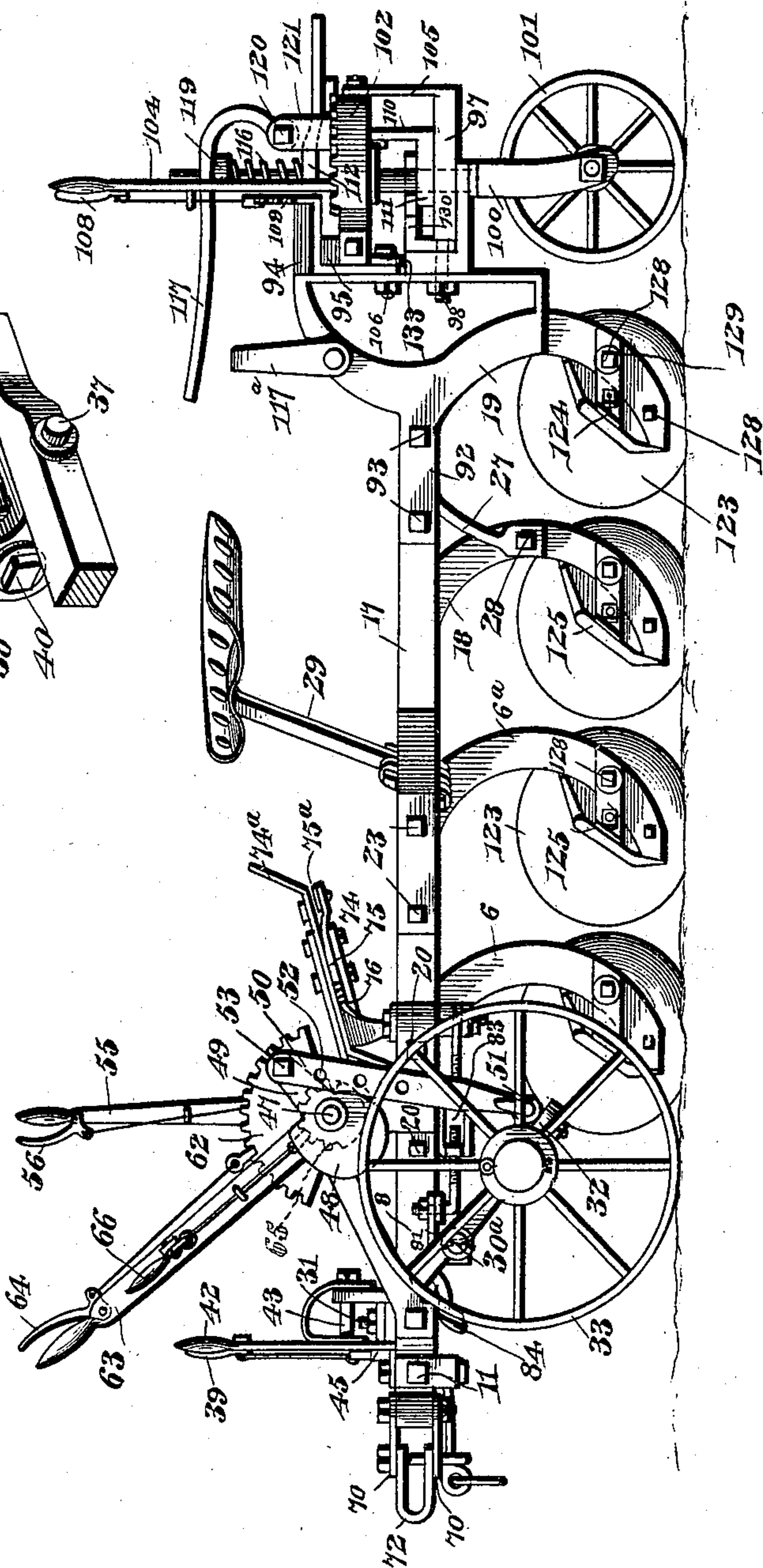
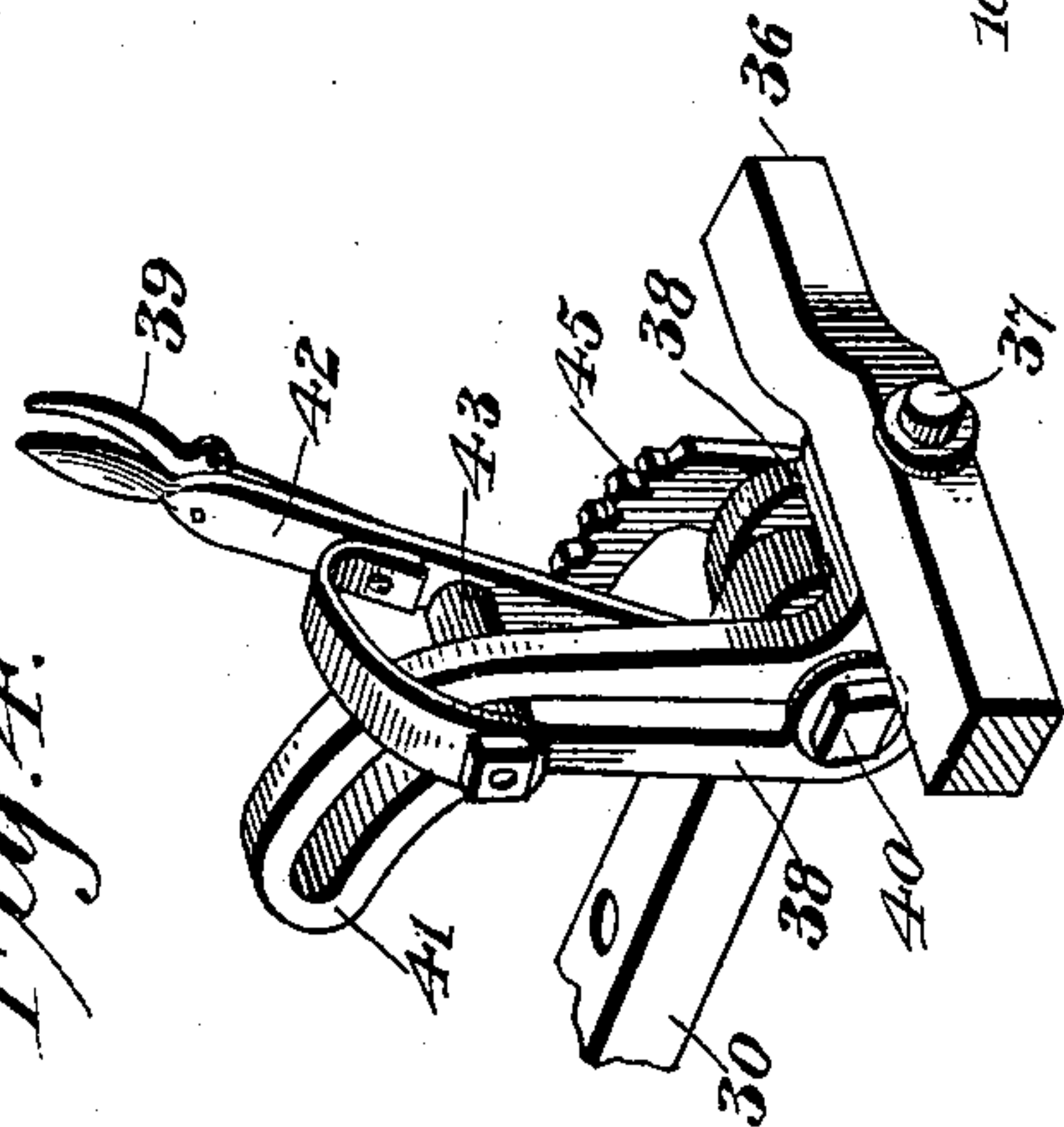
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(No Model.)

4 Sheets—Sheet 3.



Witnesses

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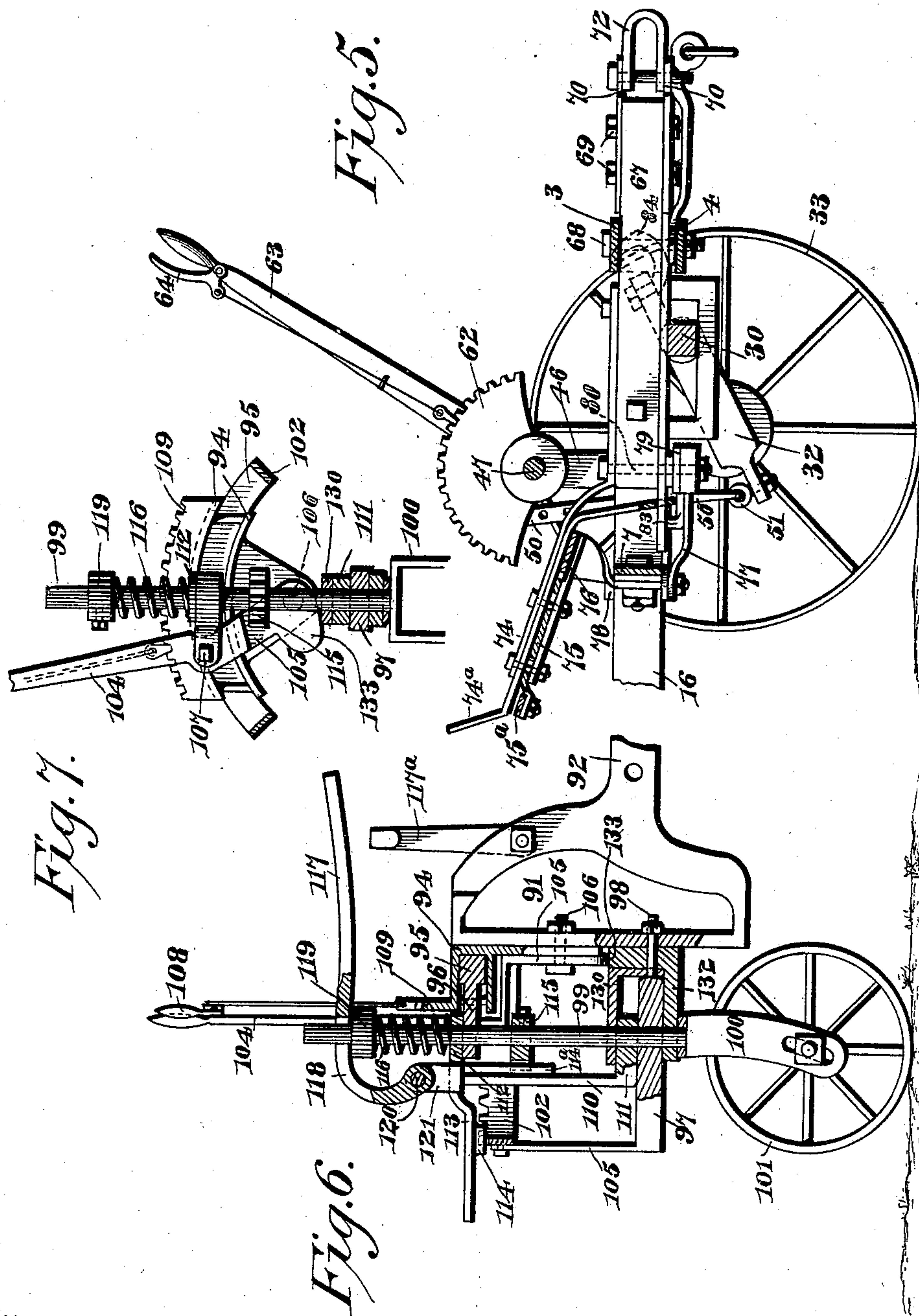
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(Application filed Sept. 6, 1898.)

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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

MARX CLAUSZEN DETHLEFS, OF WILLOWS, CALIFORNIA.

REVOLVING PLOW.

SPECIFICATION forming part of Letters Patent No. 620,285, dated February 28, 1899.

Application filed September 6, 1898. Serial No. 690,331. (No model.)

To all whom it may concern:

Be it known that I, MARX CLAUSZEN DETHLEFS, a citizen of the United States, residing at Willows, in the county of Glenn and State of California, have invented new and useful Improvements in Revolving Plows, of which the following is a specification.

My invention is a revolving and sidehill plow or cultivator designed more particularly as an improvement on the machine disclosed by United States Letters Patent No. 606,001, granted to me June 21, 1898, in which I have disclosed adjustable ground-wheels at the sides of a main frame, an adjustable draft-beam at the front end of the machine, and an adjustable trailer-wheel in rear of the gang of plows or disks.

One object of the present invention is to provide means by which the furrow-wheel may be canted or tilted at an angle to the line of draft and at the same time permit the furrow-wheel to be adjusted simultaneously with or independently of the landside-wheel and also to provide means for firmly retaining the furrow-wheel in its normal or canted position.

Another object of the invention is to provide means by which the adjustable draft-beam may be locked securely in its adjusted position by devices within convenient reach of the operator.

A further object of the invention is to provide means for adjusting the trailer-wheel in a vertical direction to better adapt the plow or cultivator to sidehill-work and also enable the trailer-wheel to be adjusted to oblique positions in vertical or horizontal planes, such adjusting devices acting independently of each other.

A further object of the invention is to provide a structure in which the number of plows or cultivators in the gang may be varied according to the nature of the work and enable the trailer-wheel to be used in connection with the frame under all conditions of adjustment thereof.

A further object of the invention is to provide a supporting-shoe for the disk, which shoe may be adjusted to sustain the disk at different angles obliquely to the line of draft, so as to vary the presentation of the disk to the soil.

With these ends in view the invention consists in the novel combination of instrumentalities and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated the same in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of a sidehill gang plow or cultivator constructed in accordance with my present invention. Fig. 2 is a top plan view thereof. Fig. 3 is an elevation looking at the land side of the machine. Fig. 4 is a detail perspective view of the tiltable hanger for the furrow-wheel. Fig. 5 is a longitudinal sectional elevation on the plane indicated by the dotted line 5 5 of Fig. 2 through the adjustable draft appliance. Fig. 6 is a detail sectional elevation through the trailer-wheel and its supporting devices on the plane indicated by the dotted line 6 6 of Fig. 2. Fig. 7 is a sectional elevation of the trailer and its supporting devices, the plane of section being at right angles to Fig. 6 and on the plane indicated by the dotted line 7 7 of Fig. 2. Fig. 8 is a detail perspective view of the shoe for one of the cultivator-disks. Fig. 9 is a detail section through an axle-spindle, one of the ground-wheels, and the sand-excluding devices for said ground-wheel. Fig. 10 is a fragmentary detail of the bell-cranks and link connections between the pivoted draft-beam and the pivoted axle.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

1 and 2 designate the main beams of the machine, which beams are united together at the extreme front end of the frame by a double brace 3 4, and in rear of this double brace is a split or looped brace 5, which is united to said beams 1 and 2 at or near the places where the curved stocks depend from the beams. The beam 1 is bent downwardly in a curved line to form the stock 6, and in like manner the beam 2 is formed with a curved stock 6^a. This beam 2, which is arranged to one side of the beam 1, is bent laterally, as at 7, and then forwardly, as at 8, and this forwardly-extending portion 8 of the beam 2 is parallel to the straight portion of the beam

1, so as to form, in connection with the double brace 3 4 and the looped brace 5, the main frame of the machine. One member, 3, of the double brace is bent at its ends to form the short arms 9, while the other member, 4, of said double brace is likewise bent to form the short arms 10.

The members 3 4 of the double brace are arranged at right angles to the parallel lengths of the beams 1 and 2, and the short arms 9 of the brace member 3 are fitted between the faces of said beams 1 2, while the arms 10 of the brace member 4 overlap the outer sides of said beams. These arms of the braces and the forward ends of the beams are united firmly together by the transverse bolts 11, thus providing a substantial and simple construction of the main frame adapted to carry operating devices at the front end of the implement. The looped brace 5 has its rear end bolted at 12 to the beam 2, in rear of the laterally-bent portion 7 thereof, and the looped portion 13 of this brace 5 is bolted at 14 to the beam 1, in advance of the curved stock 6 thereof.

The beams 1 and 2 are designed to carry a pair of cultivator-disks, which lie out of line with each other lengthwise of the machine, and to increase the capacity of the machine I employ one or more supplemental beams, which are detachably fastened to the frame formed by the main beams 1 and 2 and the braces therefor. One of the supplemental beams is indicated at 16 and the other supplemental beam at 17, and this supplemental beam 17 may, if desired, be removed from the beam 16, and in like manner the beam 16 may be detached from the main carrying-frame, according to the capacity desired in the machine. The rear end of the beam 16 is bent downwardly to form the stock 18, and in like manner the beam 17 has the stock 19. The beam 16 is adjacent to the main beam 2, and its stock is in rear of the beam-stock 6^a, while the beam 17 has its stock 19 at one side and in rear of the stock 18 of the beam 16, whereby the gang of cultivator-disks are arranged one in rear and to one side of the other, as is usual in the art. The beam 16 has its front end extended forward against the straight front length 8 of the main beam 2, to which it is firmly united by the bolts, as at 20, and between the beams 2 16 is a double brace 21, which has its forward end arranged to bear against one side of the beam 2 for secure union therewith by the bolts 12, while the rear end of said double brace 21 bears against the supplemental beam 16, adjacent to the stock 18 thereof, so as to be united solidly thereto by the bolts 23. The supplemental beam 17 overlaps the beam 16 at a line opposite to the brace 21, and it is bolted, as at 23, firmly to said beam 16. The supplemental beam 17 is stayed by a single brace 25, which is bolted at 26 to the beam 16, and to further secure the beam 17 in place another brace 27 is bolted, as at 28, to the stocks 18 19 of said

beams 16 17. From this description it will be seen that the beam 17 and its braces may be detached from the beam 16 to reduce the number of disks in the gang to three, and in like manner the beam 16 and its brace may be detached from the carrying-frame and the beam 2 to further reduce the number of disks to two. On the other hand, either or both of the beams may be united to the implement-frame to increase the number of cultivator-disks, and the proper application of the supplemental beam or beams with their complementary braces properly positions the cultivator-disks in relation to the disks on the main beams 1 and 2.

The described construction of the frame, consisting of the plurality of beams and their braces, provides for the proper support of the seat-standard 29, which in the complete machine is bolted firmly to the double-looped brace 21 between the main beam 2 and the supplemental beam 16.

30 designates the front axle of the machine, which is arranged transversely beneath the substantial main frame formed by the front ends of the beams 1 2 and the braces therefor, and this axle is hingedly or pivotally connected to the main frame, at one side thereof, by a vertical king-bolt 31, which passes through the axle near one end and is suitably supported on the main length of the main beam 1. The end of the transverse axle which protrudes from the side of the main frame opposite to the king-bolt 31 carries a wheel-arm 32, which is pivotally mounted on a trunnion 30^a at said protruding end of the axle 30, and this wheel-arm 32 is provided near its rear end with an axle-spindle 32^a, which supports the landside-wheel 33.

On the opposite side of the frame to the landside-wheel 33 is disposed a furrow-wheel 34, which is loosely mounted on an axle-spindle 35, carried by a wheel-arm 36. This wheel-arm is not connected or attached directly to the transverse axle 30, as is the case with the wheel-arm 32; but the wheel-arm 36 for the furrow-wheel is mounted on a stud or journal 37 of an adjustable hanger 38, which has a jointed connection with the pivoted end of the axle 30 to be adjustable in a plane at right angles to the adjustment afforded by the king-bolt 31 of the axle 30, whereby the furrow-wheel may be tilted or canted to an oblique position with reference to the horizontal plane of the axle 30. The hanger 38 is connected pivotally to a protruding end of the axle by a horizontal bolt 40, which lies in a plane at right angles to that of the king-bolt 31, on which the axle is pivoted. The employment of this pivotal bolt 40 at right angles to the king-bolt provides for the adjustment of the hanger 38 in a vertical plane at right angles to the horizontal adjustment of the axle on the king-bolt, and said pivoted hanger 38 is formed with a cam-slotted arm 41, which extends in an upward direction inwardly toward the beam 1 of the main frame.

The hanger and its cam-slotted arm and the stud or journal 37 are formed or cast in a single piece.

To provide for the adjustment of the hanger and the furrow-wheel, I provide a lever 42, which is fulcrumed on a horizontal bolt 44, supported in the axle 30, and an arm of a toothed segment 45. This segment 45 is arranged alongside the protruding end of the axle 30, to which it is firmly fastened by the bolts 40 44, and the toothed curved edge of this segment is presented to a thumb-latch 39, which is mounted on the lever 42. The lever is fulcrumed on a bolt parallel to the pivotal bolt 40 of the adjustable hanger 38 for the purpose of moving the lever toward and from the main frame, and this lever 42 is operatively connected with the cam-slotted arm 41 of the hanger by means of a shiftable bolt 43, which is firmly attached to the lever and passes through the slotted arm 41. The adjustment of the lever in a direction downwardly from the frame causes its bolt 43 to ride in the cam-slotted arm 41 and move the hanger in a corresponding direction to move the wheel-spindle 35 and the furrow-wheel to a canted position relatively to the horizontal plane of the carrying-frame, and the engagement of the thumb-latch with the segment 45 firmly locks the hanger to the adjusted position and maintains the furrow-wheel in place. A reverse adjustment of the lever 42 throws the cam-slotted arm 41 and the hanger inwardly toward the main frame, and this adjustment of the hanger raises the wheel-spindle to a substantially horizontal position.

The main frame supports a pair of short standards 46, suitably secured to the beams 40 1 2, and in bearings on the upper ends of these standards is journaled a cross-shaft 47. A disk 48 is fixed to one end of this cross-shaft 47 and provided with a radial arm 49, adapted to fit the bifurcated upper end of a vertically-disposed connecting-link 50, having its lower end loosely or pivotally attached to an eyebolt 51, secured to the rear end of the wheel-arm 32 of the spindle, on which is mounted the landside-wheel 33. The upper end of the link 50 has a series of apertures 52, one of which receives a bolt 53, serving to adjustably connect the link with the arm 49 of the disk 48. The disk 48 may be placed on the cross-shaft near the lever 55, and it may be connected by a cable or chain with the arm 36, which carries the furrow-wheel, while the lever 55 may be placed near the other end of the shaft to take the place of the disk 48, it being also necessary to change the notched disk 57, thus placing both levers on the near side of the plow. The wheel-arm 36 is adapted to pull down, which enables it to be operated by a chain or cable from the disk 48.

55 designates a bell-crank lever which is loosely fitted on the end of the cross-shaft 47 opposite to the disk 48 and over the wheel-

arm 36, which carries the furrow-wheel 34. This lever 55 carries a thumb-latch 56, arranged to engage with a notched disk 57, 70 firmly secured to the shaft 47 and serving normally to make the lever fast with the shaft, so as to partake of the adjustment thereof, and to the short arm of said lever 55 is connected a link 58, which depends from the 75 shaft 47 and the lever 55 thereon, to have its lower end loosely or pivotally connected by an eyebolt 59 to the wheel-arm 36, which, it will be recalled, is pivoted on the journal or stud 37 of the adjustable hanger 38 and carries the furrow-wheel 34. The upper end of the link 58 has a series of apertures 60, adapted to receive a pivotal bolt 61, that connects the said link adjustably to the short arm of the bell-crank lever 55. The lever 55 and 85 the link 58 operatively connect the wheel-arm 36 of the furrow-wheel with the cross-shaft 47, and this shaft 47 is connected by the link 50 with the wheel-arm 32, that carries the landside-wheel 33, whereby the rocking of the shaft 47 serves to simultaneously adjust the furrow and landside wheels to regulate the height of the machine above the ground and the penetration of the disks into the soil. At the same time the furrow-wheel 95 is capable of two adjustments independently of the adjustment afforded thereto by the cross-shaft 47—that is to say, the furrow-wheel may be raised or lowered independently of the landside-wheel by disconnecting 100 the thumb-latch of the bell-crank lever 55 from the disk on the shaft 47 and raising or lowering the wheel-arm on its pivotal connection 37 with the hanger 38, or the lever 42 may be moved to change the position of the 105 pivoted hanger 38 and vary the angle of the furrow-wheel relatively to the plane of the main frame. The link connection 58 between the wheel-arm, which is pivoted on the hanger, is connected loosely with the short arm of the 110 bell-crank lever to allow of the adjustment of the hanger 38 and the proper canting of the furrow-wheel, as desired, and this independent adjustment of the hanger with reference to the fixed bolt of the lever 42 is permitted by the cam-slotted arm of the hanger and the bolt 43 of the lever 42, which bolt is adapted to travel in the arm 41.

62 designates a notched segment which is fast or integral with one of the standards 46 120 and lies adjacent to a main operating-lever 63, fitted loosely on the cross-shaft 47, and this lever carries a thumb-latch 64, adapted to engage with the segment 62 and hold the lever and the cross-shaft to their adjusted 125 positions. A notched disk 65 is secured to the cross-shaft 47, adjacent to the lever 63, and with this disk engages a thumb-latch 66, also mounted on the lever 63 and serving to make the lever fast with the shaft. By releasing the thumb-latch 64 from the fixed 130 segment 62 the lever may be moved in a forward or backward direction to actuate the cross-shaft 47 through the medium of the

notched disk 65 and the thumb-latch 66; but when the thumb-latches 64 66 of this main lever 63 are adjusted free from engagement with the notched segment 62 and the notched disk 65 the main lever may be turned loosely on the cross-shaft to any desired position convenient to the operator.

67 designates a short draft-beam which is arranged in a horizontal position and in a generally longitudinal direction with reference to the machine-frame at the front end thereof. This draft-beam is pivoted at a point intermediate of its length to the main frame by a king-bolt 68, supported in the double brace 34, and the members of this brace are stayed against the strain of the draft-beam and its king-bolt by the stay-bolts 69, which are fastened to the members of the double brace on opposite sides of the draft-beam and between the latter and the beams 1 2. At the front end of the draft-beam are the parallel segmental plates 70, having coincident apertures 71 to receive the bolt or bolts of one or more clevises 72, and the ends of these segmental plates are strengthened by the diagonal braces 73, suitably bolted to said plates and the draft-beam. The clevis or clevises may be adjusted in the segmental plates according to the draft desired on the machine and the number of animals which may be hitched thereto; but in lieu of these clevises I may employ a tongue which is adapted to be suitably connected to the apertured plates.

To the rear end of the draft-beam is secured a lever-arm 74, which is formed by a pair of metallic straps or plates, which are spread to fit against the upper and lower sides of the beam proper, and this lever inclines in an upward and rearward direction from the draft-beam, so as to form a handle-arm 74^a in convenient reach of the operator occupying the seat. The lever-arm 74 provides a convenient means by which the draft-beam may be turned horizontally on its king-bolt 68 to change the angle or position of the draft-beam in relation to the longitudinal axis of the machine, and said draft-beam is held in its adjusted position by means of a latch 75, which is slidably supported between the members of the lever-arm 74. The latch 75 is connected with a suitable operating-piece 75^a, pivoted on the lever-arm 74 of the draft-beam, and said latch is adapted to engage with any one of a series of notches in the locking-bar 76, which is arranged transversely across the machine-frame adjacent to the heel of the draft-beam, said locking-bar 76 having its ends bent downwardly and firmly bolted to the main beams 1 2.

The draft-beam is operatively connected with the transverse pivoted axle 30 by suitable devices arranged on the under side of the main frame, and one of these connecting devices is a bell-crank lever 77, which is fulcrumed on a vertical post 78, attached to the beams 2 16 substantially at the joint between said beams. To one end of this bell-crank

lever 77 is pivoted a link 79, having its other end pivoted at 80 to the heel of the draft-beam. A clip 81 is fixed to the transverse axle 30, adjacent to the carrying-arm 32, of the landside-wheel, and this clip on the transverse axle is operatively connected with the bell-crank lever 77 by an extensible link 82, said link having its respective members pivoted or loosely connected to the trip 81 and the bell-crank lever 77, while the members of the link are united adjustably together by a swivel 83, having threaded engagement with the link members.

The wheel-arms 32 36 for the landside and furrow wheels carry the scrapers 84, arranged to clear the peripheries of the wheels from undue accumulations of earth. Each wheel 32 or 34 is mounted on its spindle loosely and has combined therewith devices which exclude sand and earth from entering the hubs of the wheels, thus reducing the friction and wear on the spindles and wheel-hubs to a minimum. In Fig. 9 of the drawings I have indicated the wheel-hub 85, and the sand-excluding sleeves are designated by the numerals 86 87. One sleeve 86 has a fixed engagement with the wheel-spindle by securing said sleeve on the threaded part of the spindle, as at 88^a, while the other sleeve 87 is held in place by a pin 89, that passes transversely through the sleeve and an opening in the wheel-spindle, a washer 90 being interposed between the sleeve and one end of the hub. The ends of the sleeves embrace the wheel-hub closely to prevent the admission of sand and earth to said hub, and the sleeves may be readily detached when it is desired to apply lubricant to the axle-spindle.

91 designates the trailer-frame at the extreme rear end of the machine. This frame is in the form of a yoke having a forwardly-extending arm 92, which is firmly bolted at 93 to one of the beams which carries a cultivator-disk, and in the event that either or both of the supplemental beams 16 or 17 are detached this trailer-frame may be advanced and properly connected by its arm 92 and the bolts 93 to another of the beams of the machine. The yoke-shaped frame 91 has a fixed segmental guide 94, in which is loosely supported a segmental adjusting-bar 95, and extending rearwardly from the middle portion of this adjusting-bar is a horizontal lug 96, serving as one of the bearings for the spindle of the trailer-wheel. A bracket 97 is connected by a horizontal bolt 98 pivotally to the yoke-shaped frame at a point below the segmental guide and adjusting-bar, and in this bracket 97 and the lug 96 of the adjusting-bar is loosely fitted a vertical spindle 99, which is adapted to turn axially or slide vertically in said lug and bracket. The lower end of the spindle has a fork 100 to receive the axle or shaft of the trailer-wheel 101, and this trailer-wheel is designed to partake of the adjustments of the spindle 99 in order to raise or lower the trailer-wheel, with the spindle, to

adjust the trailer-wheel to an oblique position in a horizontal plane or to give the trailer-wheel an oblique position in a vertical plane.

A horizontal notched segment 102 is fastened rigidly to the ends of the segmental adjusting-bar 95 to move therewith, and between the middle portion of this notched segment and the bracket 97 is a brace 105^a, that assists in holding the segment 102 firmly in position with relation to the segmental adjusting-bar. The adjusting-bar 95 may be moved transversely to different positions across the machine by a lever 104, having a flattened foot 105, which is pivoted at 106 to the trailer-frame and is connected to this adjusting-bar 95 by a bolt 107, thus insuring the movement of the adjusting-bar with the lever 104. Said lever 104 carries a thumb-latch 108, which is adapted to engage with a notched segmental flange 109, which is integral or rigid with the transverse segmental guide 94, and the engagement of this latch 108 with the flange 109 holds the lever, the adjusting-bar, and the trailer-wheel in the proper oblique position with relation to the longitudinal axis of the machine.

As the spindle of the trailer-wheel is supported in the lug of the adjusting-bar and in the pivoted bracket 97, a lateral shifting movement of the lever 104 changes the position of the trailer-wheel to the axis of the machine, so that the trailer-wheel may be adjusted in a vertical plane obliquely to the machine, and to vary the angular relation in a horizontal plane of the trailer-wheel 2 of the machine I employ a yoke 110, which is operatively connected with the spindle 99 to turn the latter in a horizontal plane. This yoke 110 has a foot 111 and a head 112, which are loosely fitted on the spindle 99, and said yoke is also provided with a rearwardly-extended arm 113, that lies over the notched segment 102 and is provided with a depending lip 114 to engage with said notched segment 102. The yoke is furthermore provided on its vertical length with a rib 114^a, that is slidably engaged with a notched disk 115, firmly secured on the spindle 99 between the foot 111 and the lug 96 of the adjusting-bar, and when the arm 113 is raised to lift the lip 114 from the segment 102 the rib 114^a remains in engagement with the notched disk 115, so that the adjustment of the arm 113 in a horizontal plane turns the spindle 99 in a corresponding direction. This adjustment of the yoke and spindle imparts a horizontal adjustment to the trailer-wheel to vary its position with respect to the line of the machine. The head 112 of the yoke extends above the lug 96 of the adjusting-bar, and said yoke is normally depressed by a coiled spring 116, that is fitted loosely on the upper part of the spindle 99 and acts upon the head 112 to normally depress the yoke, so as to make the lip 114 on the arm 113 engage with the notched segment 102 and hold the yoke and the spindle firmly in their adjusted positions. The spindle 99

of the trailer-wheel is also capable of adjustment in a vertical plane to raise or lower the trailer-wheel and make the machine better adapted for work on the hillside, and to this end I employ a lever 117, formed with a slot 118 to receive the upper extremity of the spindle 99. This lever acts upon a collar 119, firmly secured near the upper end of the trailer-spindle, and the lever is fulcrumed by a bolt 120 to lugs 121, provided on the head of the yoke 110. It is evident that the lever 117 may be depressed to act against the collar 119 and force the spindle and the trailer-wheel downwardly to change the elevation of the trailer-wheel with reference to the plane of the cultivator-disks, and such depression of the spindle does not disengage the latter from the yoke, because the notched disk 115 on the spindle remains in engagement with the rib 114^a of the yoke under all conditions of adjustment.

The series of cultivator-disks used in the machine are indicated at 123. Each disk is mounted on a bolt 124, which is attached to a foot-piece 125, adjustably fastened to a stock on one of the beams. Each foot-piece is cast with a flange 126, which when the foot is properly applied to the stock is arranged to overlap the front edge of the stock, and said foot-piece is also provided with slots 127. Bolts 128 pass through these slots in the foot-piece and the stock on the cultivator-beam, and washers 129 are interposed between the ends of the bolts on the foot-piece 125. By providing the slots 127 in each foot-piece the latter may be adjusted more or less in a forward direction on the beam-stock to vary the angle of presentation of the disk to the ground-line, and the foot is clamped or held rigidly in place by the bolts 128.

Changes may be made in the form of some of the parts while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

It is evident that the disks or rolling colters may be removed and plows of any suitable type substituted therefor on the stocks of the frame.

One of the carrying-wheel arms is longer than the other, as shown by the arm 36 being longer than the arm 32, so that one wheel may be adjusted to run in advance of the other wheel, which enables the machine to be turned more easily and reduces the liability of breaking the axle.

The disks or plows may be held in their raised positions when traveling over a road, and thus thrown out of service by depressing the lever 117 to engage its free end with the guard 117^a. The locking-piece 130 is pivoted to the trailer-frame on the bolt 98, and it is of angular form to fit over the foot 111 of the yoke in order to hold the latter from vertical displacement owing to frictional engagement between the yoke and the spindle. When the

spindle is depressed by the lever 117 bearing on the collar 119 to move the trailer-wheel to its lowest position and raise the plow-frame, the locking-piece 130 serves to hold the yoke against lifting, and the lever holds the spindle from sliding under the weight of the machine.

The trailer-frame has an angular bracket 132 attached thereto by the bolt 98, and the upper edge of this angular bracket constitutes a bearing for the eccentric portion 133 of the lever 104. This lever is designed to bear on the edge of the bracket when the lever is moved to the near side of the machine, and thus when the wheel is canted or tilted on the hillside it will be moved downhill and made to hold the shares lower down in order that the trailer-wheel may secure a good hold on the ground, and thus keep the plow uphill. When the lever 117 is depressed to its lowest position, it will be disengaged from the notched disk 115, thus leaving the trailer-wheel free to turn corners and preventing said wheel from dragging.

Having thus described the invention, what I claim is—

1. In a hillside-cultivator, the combination with a frame, of a transverse jointed axle pivoted on said frame, the furrow-wheel and landside-wheel mounted on the respective members of said jointed axle and with the furrow-wheel adjustable to a canted position in relation to the plane of the frame, and a draft-beam pivoted in the frame and operatively connected with one member of said axle, substantially as described.

2. In a hillside-cultivator, the combination of a shiftable transverse axle, a hanger pivotally supported on one end of the axle and adjustable in a plane at right angles to the shiftable adjustment of said axle, a furrow-wheel mounted in devices carried by said hanger, and a landside-wheel mounted on devices carried by the axle, substantially as described.

3. In a hillside-cultivator, the combination with a shiftable transverse axle, of a hanger having a jointed connection therewith and carrying a furrow-wheel, and means for adjusting and locking the hanger to sustain the furrow-wheel in a canted or tilted relation to the axle, substantially as described.

4. In a hillside-cultivator, the combination with a transverse axle carrying a landside-wheel, of a hanger having a jointed connection with said axle and carrying a furrow-wheel, a lever fulcrumed on the axle and having a cam-slotted connection with the hanger, and locking devices in operative relation to said lever, substantially as described.

5. In a hillside-cultivator, the combination with a transverse pivoted axle carrying a landside-wheel, of a hanger provided with a cam-slotted arm and connected with said axle by a pivot which lies at right angles to the pivot of the axle, a furrow-wheel carried by said hanger, and an adjusting-lever having a slid-

ing connection with the cam-slotted arm of the hanger and provided with means for locking itself and the hanger in fixed relation to said axle, substantially as described.

6. In a hillside-cultivator, the combination with a transverse pivoted axle, wheel-carrying arms supporting the furrow and landside wheels, and adjusting devices for raising and lowering said carrying-arms, of a hanger jointed to the axle and having the furrow-wheel arm mounted thereon for adjustment with the same in a plane across the adjustment of the axle and independent of the raising and lowering adjustment afforded by the devices on the frame, and a draft-beam pivoted to the implement-frame and connected to one end of the axle, substantially as described.

7. In a hillside-cultivator, the combination with a frame, a cross-shaft thereon and wheel-carrying arms, of independent connections between said carrying-arms and the cross-shaft arranged to impart simultaneous adjustment to both wheels or to adjust the furrow-wheel independently of the landside-wheel, a pivoted axle on which the landside-wheel arm is directly mounted, and a hanger having the furrow-wheel arm connected thereto and said hanger jointed to the axle for adjustment at right angles to the plane of the axle, substantially as described.

8. In a hillside-cultivator, the combination with a carrying-frame and a cross-shaft supported thereon, of a transverse axle, a hanger jointed to said axle, a furrow-wheel having its arm pivoted on the hanger, an adjusting-lever mounted loosely on the cross-shaft for independent adjustment thereon and having means for making said lever fast with the shaft and for connecting the lever with the arm of the furrow-wheel, a landside-wheel mounted on an arm connected with the transverse axle and linked with said cross-shaft, and a main adjusting-lever connected with the cross-shaft to rock the same and impart simultaneous adjustment to the arms of both wheels, substantially as described.

9. In a hillside-cultivator, the combination with a main frame, a cross-shaft thereon, and a transverse axle pivoted to said frame, of a landside-wheel having its arm mounted on one end of the axle, a draft-beam pivoted in the frame and operatively connected with the axle at the end on which the landside-wheel arm is mounted, a furrow-wheel arm having a jointed connection with said axle, and adjusting-levers on the cross-shaft for simultaneously adjusting both wheel-arms or for independently adjusting the arm that carries the furrow-wheel, substantially as described.

10. In a hillside-cultivator, the combination with a frame and a transverse axle pivoted thereto, of a draft-beam fulcrumed to the frame for swinging adjustment in a horizontal plane, a lever-arm secured rigidly to the draft-beam and extending rearwardly therefrom, a transverse notched locking-bar fixed

to the frame, a latch slidably mounted on the lever-arm of the draft-beam and arranged to engage with the holding-bar, the wheeled arms operatively connected with the transverse axle, and means for adjusting said wheeled arms, substantially as described.

11. In a sidehill-plow, the combination with a trailer-frame, and a vertical spindle carrying a trailer-wheel, of means for adjusting the spindle and trailer-wheel in a vertical plane obliquely to the line of draft, consisting of a bracket pivoted to the trailer-frame and having journals for the vertical spindle, an adjusting-bar connected to the spindle and fitted slidably on the trailer-frame for movement transversely to the line of draft, and a lever fulcrumed on the trailer-frame and connected to the shifting bar to adjust the latter, substantially as described.

12. In a hillside-cultivator, the combination with a trailer-frame, of an adjustable bar slidably fitted to said frame for movement transversely across the line of draft, and having a rearwardly-extended lug, a pivoted bracket in line with said lug, a vertically-slidable spindle mounted in the bracket and the lug in said bar and provided with a notched disk, a yoke fitted to the lug of the bar and having interlocking sliding engagement with the disk of the spindle, and a lever fulcrumed on the yoke and engaging with the spindle for the purpose of depressing the latter and the trailer-wheel journaled therein, substantially as described.

13. In a hillside-cultivator, the combination with a trailer-frame, of a vertically-adjustable spindle, devices for supporting said spindle on the trailer-frame to permit an axial movement and a vertical sliding movement to said spindle, means for adjusting the spindle in a horizontal plane on its vertical axis, means for positively raising or lowering the spindle in its supporting devices, and means for adjusting the spindle in a vertical plane to give to the trailer-wheel a position oblique to the axis of the trailer-frame, substantially as described.

14. In a hillside-cultivator, the combination of a trailer-frame, a shiftable bar carrying a segment, a pivoted bracket, a yoke-formed spindle loosely supported in the shiftable bar and pivoted bracket, a yoke having means for engagement with the bar and a rib which interlocks slidably with the notched disk of the

spindle, a spring acting against the spindle and the yoke, a lever fulcrumed on the yoke and operatively fitted to the spindle to depress the latter, and another lever fulcrumed on the trailer-frame and connected with the shiftable bar, for the purpose described, substantially as set forth.

15. In a sidehill-plow, the combination with a trailer-frame, of a bracket, a vertical spindle fitted to the bracket and carrying a trailer-wheel, a yoke having slidable interlocking engagement with the spindle and provided with a lever for shifting said yoke and the spindle in a horizontal plane to adjust the trailer-wheel obliquely to the line of draft, and a lever connected to the yoke and operatively fitted to the wheel-spindle to adjust the latter vertically without disconnecting the spindle from the yoke, substantially as described.

16. In a plow, the wheel-spindle having the collar, 86, extended over one end of a wheel-hub, the band, 87, fitted to the spindle and held thereon by a transverse pin, and a wheel having its hub fitted to the spindle and embraced by said band or collar, substantially as described.

17. In a plow, the combination of a pivoted axle, the long and short arms attached to the respective ends of said axle and having the wheel-spindles, the wheels, and means for turning the axle on its pivotal connection with a frame, substantially as described.

18. In a plow, the combination with a trailer-frame and a standard, of a trailer-wheel spindle fitted to said frame and a foot of said standard, a lever to depress the spindle, and a pivoted locking-block to engage with the foot of the standard, substantially as described.

19. The combination with a pivoted, shiftable bar, a trailer-frame, a bracket attached to said trailer-frame, a spindle passing through said bracket, and a lever, 104, for shifting the bar and spindle and having an eccentric portion arranged to ride against the bracket, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MARX CLAUSZEN DETHLEFS.

Witnesses:

E. H. RHODES,
P. D. MAUPIN.