

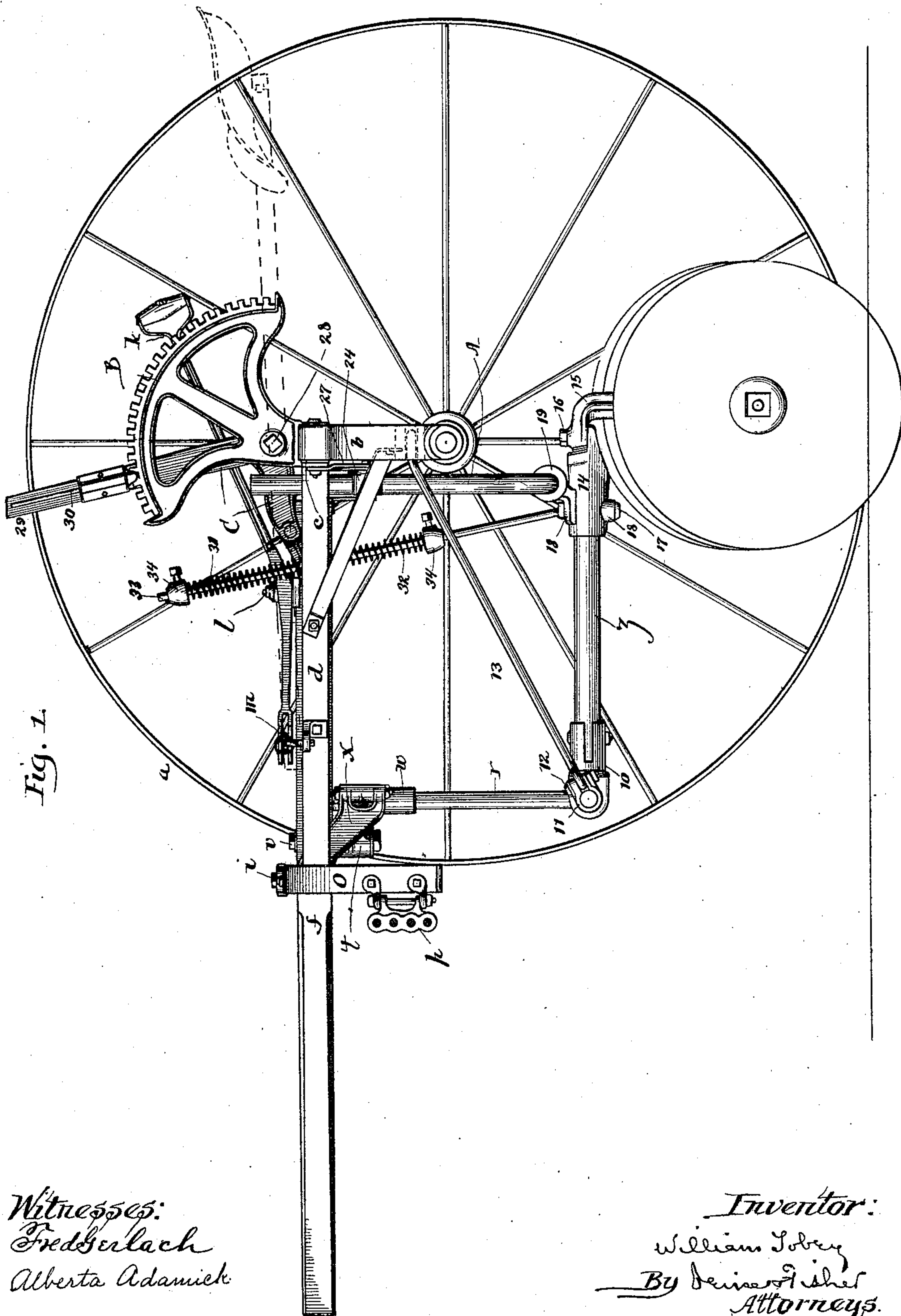
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7 Sheets—Sheet 1.

W. SOBEY.
DISK CULTIVATOR.

No. 574,957.

Patented Jan. 12, 1897.



Witnesses:
 Fred Gerlach
 Alberta Adamick

Inventor:
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By *Devin Fisher*
Attorneys.

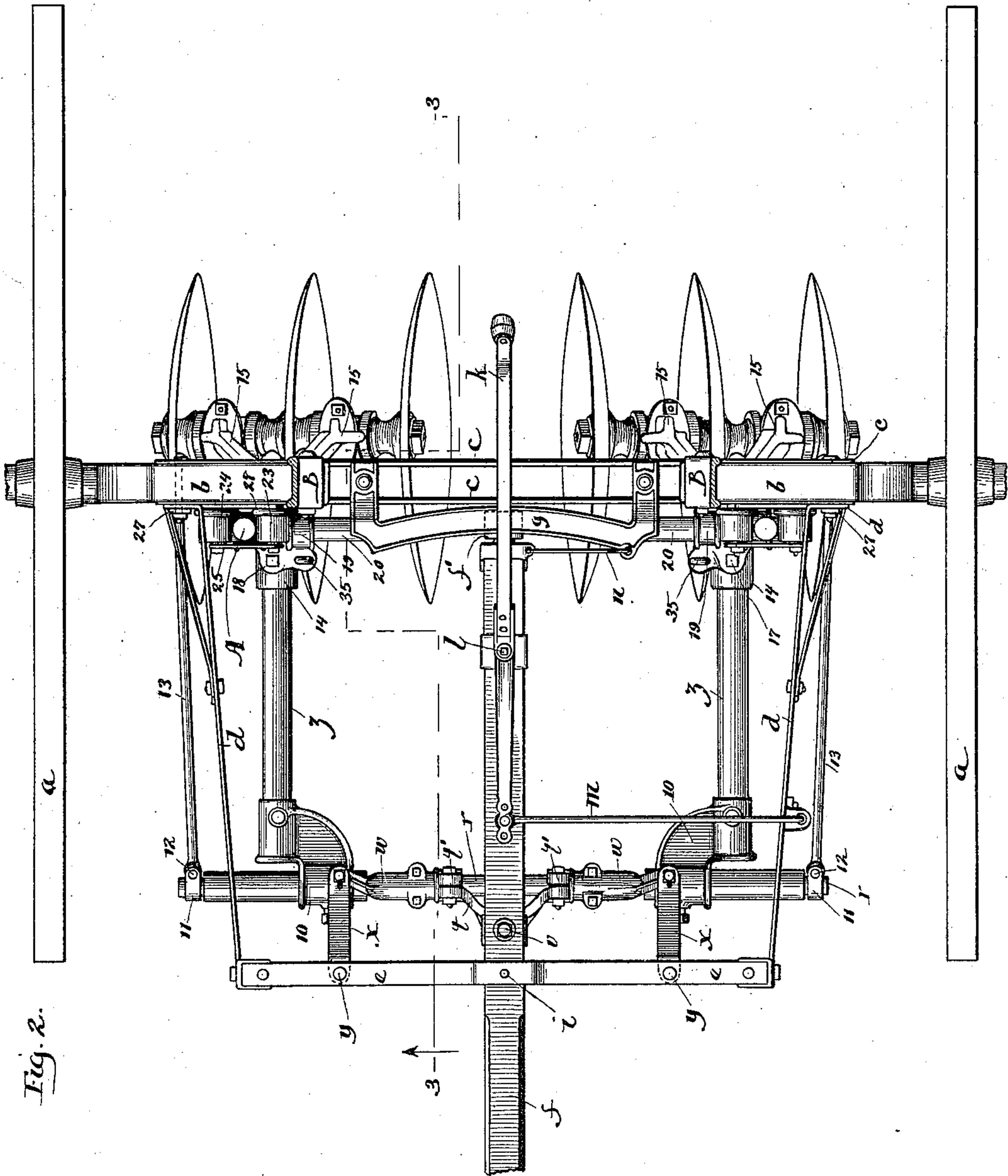
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7 Sheets—Sheet 2.

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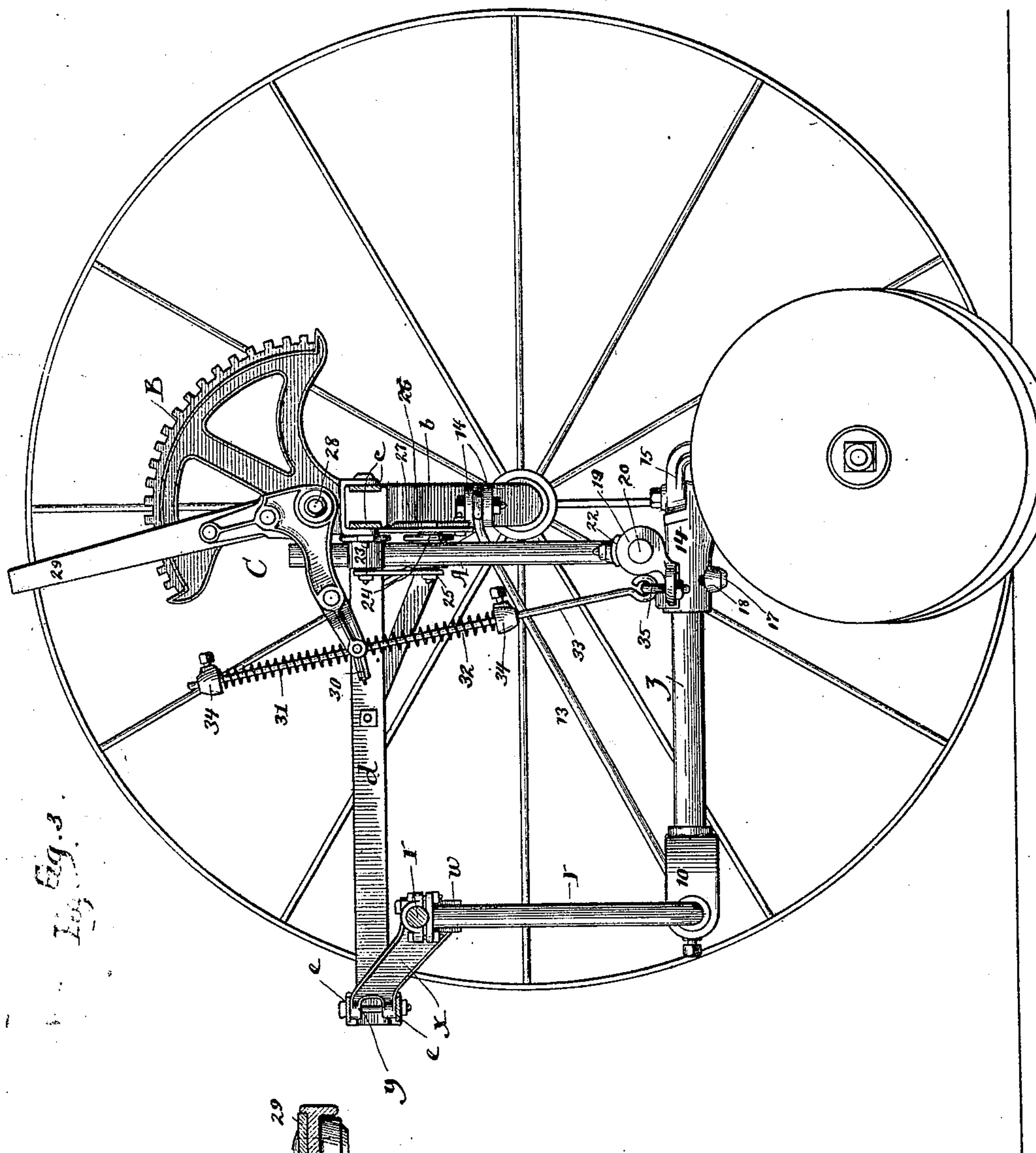
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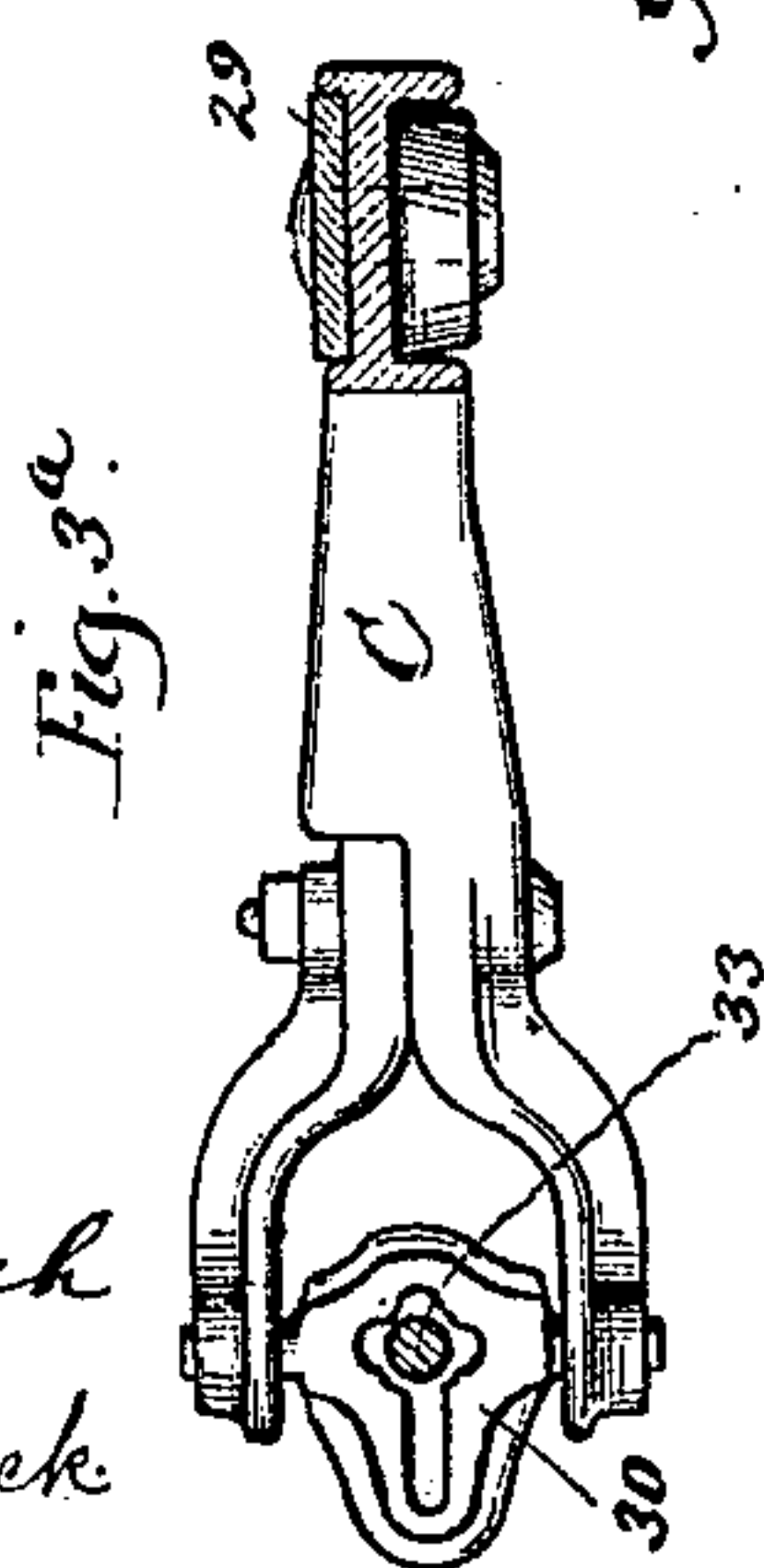


Fig. 3^a.

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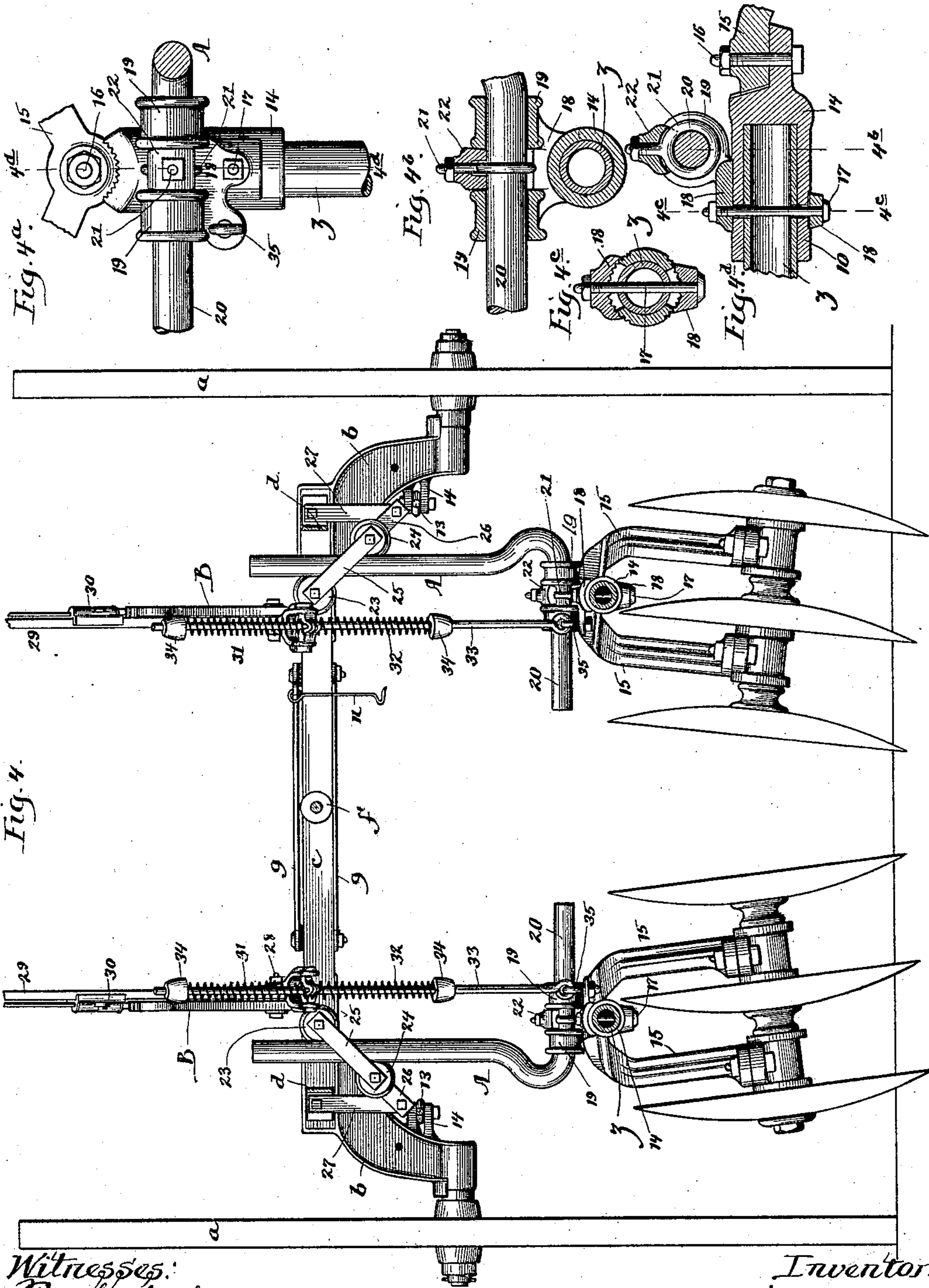
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W. SOBEY.
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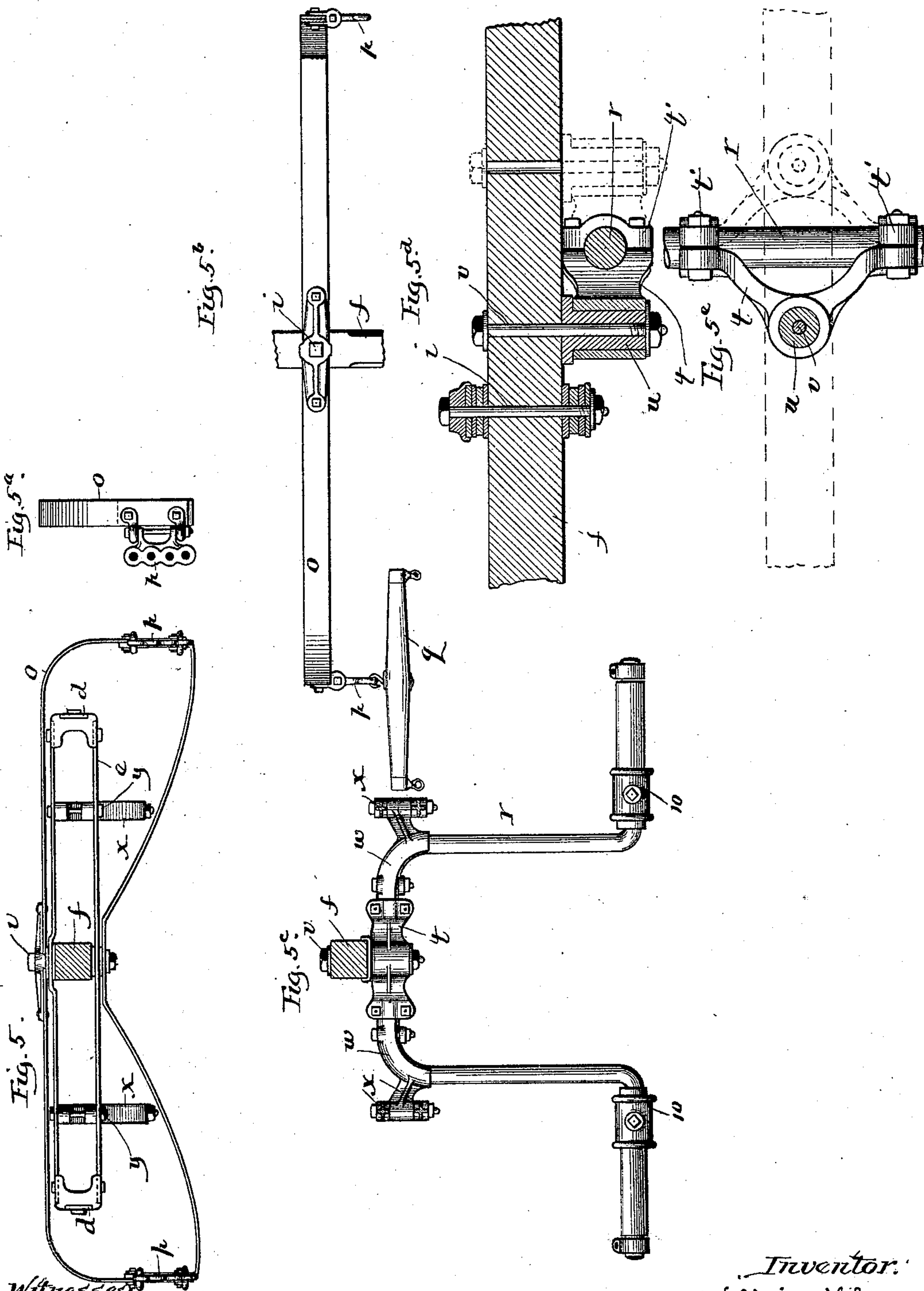
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7 Sheets—Sheet 5.

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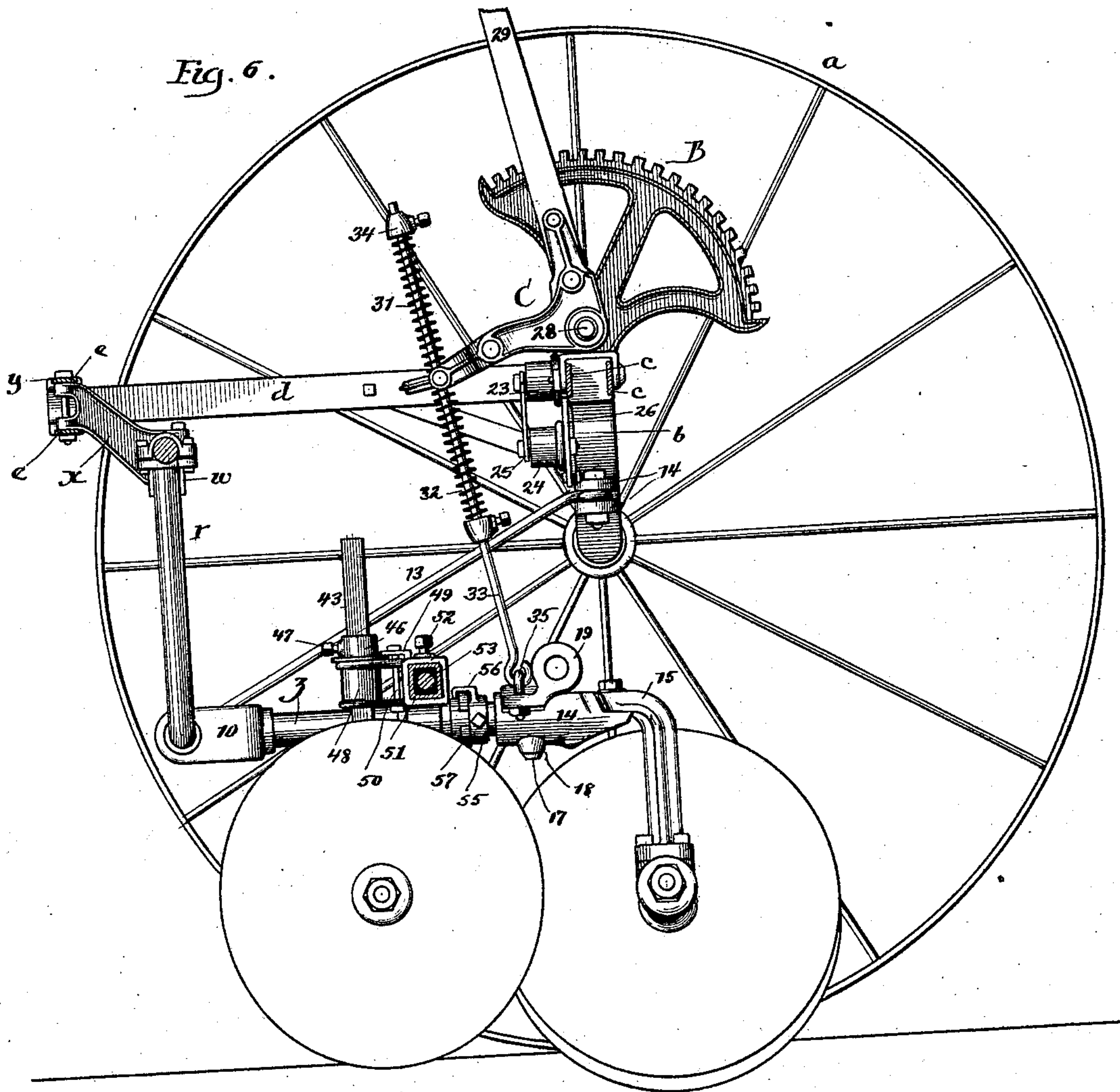
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Fig. 6.



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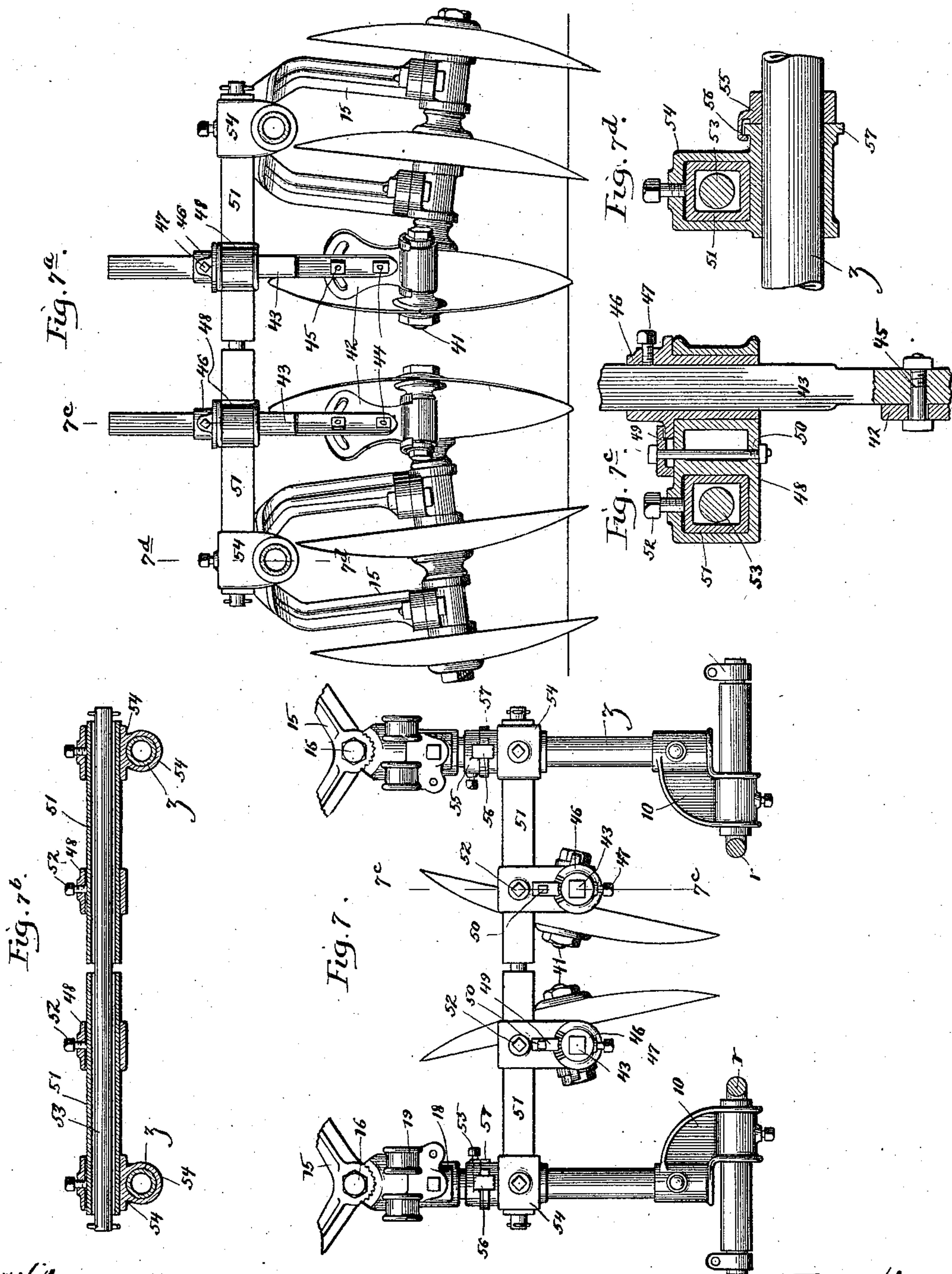
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Patented Jan. 12, 1897



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UNITED STATES PATENT OFFICE.

WILLIAM SOBEY, OF RACINE, WISCONSIN, ASSIGNOR TO THE J. I. CASE
PLOW WORKS, OF SAME PLACE.

DISK CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 574,957, dated January 12, 1897.

Application filed November 9, 1894. Serial No. 528,307. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SOBEY, of the city and county of Racine, State of Wisconsin, have invented certain new and useful Improvements in Disk Cultivators, of which the following is hereby declared to be a full, clear, and exact description.

The invention designs to improve the structure of cultivators, and in its details is more especially directed to such machines as employ double sets of rotary disks, each series carried by its own gang bar or beam. The two beams travel at opposite sides of the plant-row, and in customary usage heretofore a cross-piece or jockey-keeper extended between the beams to hold them evenly apart and yet compel their unison action in "dodging" irregularities or obstacles along the row. Near their front ends the beams were carried pivotally upon the tongue or upon a cross-reach from the tongue, while at the back, where the jockey united them, the weight of each beam (with its disks) was adjustably supported by a suspension-rod from a hand-lever on the main frame. If the gang at one side ran into a dead furrow or depression, then by reason of the suspension of the parts and the cross-jockey connection between the beams the other gang was lifted clear from the ground, and the tillage became defective. The reverse occurred if the gang overrode a minor obstacle, since the opposite gang would then tend to run deeper into the soil than might be prudent for the safe cultivation of the plants.

The invention proposes to dispense with the cross-jockey, in avoidance of the objections named, and yet plans to effect a unison play of the gangs in dodging, as the machine advances along the row. Other features of advantage are involved, and the exact nature of the improvements will appear from the description and be thereafter pointed out more particularly by claims at the conclusion thereof.

In the drawings which accompany like parts have like designation throughout.

Sheet I, Figure 1, is a view of the machine in side elevation with the wheel next to the observer removed. Sheet II, Fig. 2, is a top plan view with levers and adjuncts taken off; Sheet III, Fig. 3, a fore-and-aft section at

line 3 3 of Fig. 2; Fig. 3^a, a plan view of an arm of the gang-lever with its swivel-seat for the springs; Sheet IV, Fig. 4, a cross-sectional elevation in front of the wheel-axle, the pole and side braces being removed; Fig. 4^a, a detail plan at the junction of the gang-beam and yoke with the jockey; Figs. 4^b and 4^c, views in sectional elevation at lines 4^b and 4^c of Fig. 4^d; Fig. 4^d, a view in sectional elevation on line 4^d of Fig. 4^a; Sheet V, Fig. 5, a front elevation of the crosstree and the front reach at their mount with the tongue; Figs. 5^a and 5^b, end and top views of the drag-elever; Fig. 5^c, a detail front view of the gang arch-bar or cross-arm; Fig. 5^d, a section view along the tongue at the junction therewith of the drag-elever and reach and the arch-bar, respectively; Fig. 5^e, a detail plan of the union-coupling between the tongue and arch-bar; Sheet VI, Fig. 6, a sectional elevation corresponding to Fig. 3, but with a "leader-disk" set on the gang-beam; Sheet VII, Fig. 7, a plan view showing the mount for the leader-disks upon the gang-beams; Fig. 7^a, a front sectional elevation of said leader-disk attachment; Fig. 7^b, a detail longitudinal section of the counter-beams for said attachment as mounted on the gang-bars; Fig. 7^c, a detail cross-section at line 7^c of Fig. 7; Fig. 7^d, a detail section view at junction of counter-beam with the gang-bar.

Between the carrying-wheels *a* extends the arch-axle or backbone of the machine. The axle consists of the end risers *b*, having terminals for the wheel-spindles, and of the transverse parallel bars or plates *c*, securely seated and bolted at their opposite ends to the front and back face of the risers *b*. Extending forward from the main axle, to which they are stoutly fastened, are the braces *d*, secured at the front to the ends of the fore-reach *e*. At the mid-length of the reach, Figs. 2 and 5, is pivoted the team-pole *f*. Ordinarily the pole *f* stands alined with the center of the machine and at its rear terminal is furnished with a friction-roll *f'*, which travels in the guideway *g*, Figs. 2 and 4, clamped above and below to the axle-bars *c* and projecting in front thereof. The side braces *d* act in conjunction with the fore-reach *e* to support the pole at the pivot *i*. The pole is still fur-

ther held and strain upon its pivot relieved by the bearing of the friction-roll f' at the pole terminal within the guideway g . A hand-lever k , Figs. 1 and 2, pivots upon the pole at l within easy reach of the driver, and at its forward end connects by link m with one of the side braces d .

When the machine is in use, the front end of the pole is sustained by the hitch from the breast-straps or hame-chains on the horses. If the operator throws his steering-lever k to the right, there will be a slight initial play of the pole at the outset, the pole f moving alone about its pivot i . This movement is arrested almost immediately at the front terminal of the pole because one of the hame-chains there located draws taut to resist the traverse and holds the pole set. This initial throw suffices, however, to change the angular relation of the front of the steering-lever l and link m enough to compel the two to act togglewise (as the operator persists) in effecting a thrust upon the main frame of the machine where the link m joins the side brace d . Owing to the toggle relation the link m transfers its thrust onto the main frame in such fashion as to compel the frame (including the wheels a and the fore-reach e) to turn slightly around the pole-bolt i , the off wheel at its contact with the ground then serving as the pivot about which the frame system turns. That is, the main frame and its carrying-wheels shift in unison to a minor degree, swinging at the ground from pole-pivot i as a center. The movement is necessarily limited, being determined by the extent of throw which the operator at his seat can impart to the steering-lever k . At the extreme thrust the machine will have turned about pole-pivot i so far that the guideway g will support, near its outer right-hand end, the friction-roll f' of the tongue. Should the steering-lever k be thrown to the left instead of to the right of the median line the machine will describe a slight turn to the left about the near wheel a as a pivot-marker. It thus appears that the operator can divert the course of the machine at will, so that the main frame and wheels shall travel disaligned more or less (either to the right or left) from a straight track. Except for occasional obstructions or the offset relation of minor parts of the plant-row, the diversion of the machine from a straight course will be unnecessary. Adjusting-holes at the junction of the steering-lever k and link m enable the lever to be applied with nice advantage in keeping with the burden or resistance it is to overcome. A hook n holds the rear of the pole f to the frame without lateral sway when the machine is traveling to and from the field.

The same pivot i which unites the team-pole with the fore-reach e also serves to pivotally secure the drag-elever o , Figs. 5 and 5^b. The lever is made in bow-like form and at opposite sides carries the clevises p , into which

are hooked the singletrees q , Fig. 5^b, for the horses.

Swivel-mounted on the tongue f a short distance back of the bolt i is the cross-arm r , which carries the disk gangs. The mount for the arch-bar r consists of the two-part boxes $t t'$, clamped so as to set loosely on the bar and having an eye to inclose the thimble u , sustained by bolt v from the pole. This provision enables the arch-bar and its adjuncts to swivel laterally upon the pole, when desired, while the bar can also ease or turn slightly back and forth in its box $t t'$. Castings w , fastened at the upper turns of the arch-bar, Fig. 5^c, next to box $t t'$, confine it from end play and are furnished with an offset ear through which is bolted the forked rear end of the link x , Figs. 1, 2, and 3. The link extends thence to the fore-reach and is fastened at y between the plates thereof, Figs. 3 and 5. The lower branch terminals of the arch-bar r carry the gang-beams z , which are connected thereto, through the medium of the joint-castings 10, fastened, as appears, Figs. 2, 3, and 5^c, by set-screws to the gang-beams and adjustably to the pipe boxes or sleeves on the arch-bar, respectively.

Beyond the pipe-boxes for the castings 10 the arch-bar terminals have clips 11 set thereon, Figs. 1 and 2. The bolt 12 for the clips passes through the eye of the brace 13, which is pivoted in turn at its rear end between the ears 14, Fig. 4, on the risers b at the backbone or main axle of the machine. By this arrangement of the parts when the wheel-frame turns to the right or left under control of the driver in act of dodging the wheeling movement of the main axle is imparted by the braces 13 to the terminals of the gang arch-bar. Thereupon the arch-bar proceeds to swivel in unison at its thimble-joint $u v$ on the team-pole. The front links x , which unite the arch-bar with the fore-reach e , participate to effect the swing of the arch-bar and its gangs. Said links also resist any tendency of the arch-bar to rise during the progress of the machine. The relation of the links x between the reach e and arch-bar and of the pivot-braces 13 between said bar and the risers b permit the swinging action to occur without strain or binding and especially so since the swivel-pin v for the arch-bar and the pivot-bolt i for the reach are located on the team-pole nearly together. Indeed, except for greater sweep desired when gang-shovels, instead of disks, are used, the pivots $i v$ can be identical. It thus appears that the gang-beams are compelled to participate in the diversion of the wheel-frame from a median line, since each beam is held rigidly by its couplings 10 against any transverse or pivotal yield (except up and down) on the arch-bar.

At its rear end the gang-beam z receives a sleeve-coupling 14, Figs. 4^a and 4^d, which is flattened at its back to seat the yoke-frame 15 for the cultivator-disks, the axle of the disks

being carried at the dependent terminals of the yoke, Fig. 4. The sleeve 14 and yoke 16 are serrated at their contact-faces, Fig. 4^a, and may thus be adjusted radially and held
 5 by the bolt 16 between them. By such expedient the two gangs of disks can be set to run in direction parallel with the plant-row or to or from the same in keeping with the nature of the cultivation desired.

10 In front of the yoke 15 the sleeve-coupling 14 is united to the gang-beam by the bolt 17, which carries the opposite clamps 18, Fig. 4^c, serrated, as appears at the contact-face, with the sleeve 14. Said sleeve has cross-slits
 15 therein at the through-bolt 17, by which expedient the sleeve, together with the yoke-frame and disks, can be adjusted axially around the gang-beam z to tip the set of disks up or down from a level and thus vary the
 20 depth of cut or penetration between the several disks of the same gang. The upper clamp 18 is expanded at the back to afford eye-sockets 19, through which passes the horizontal arm 20 of the jockey A. A ring-bolt 21
 25 surrounds the jockey-arm between the eyes 19, and, together with the spacer 22, clamps the jockey-arm. By this provision the gang-beams can be adjusted laterally at proper distance apart upon the arms of the individual
 30 jockeys 20 and be there firmly held through the medium of the clamp 21 22.

The upright arm of each jockey A extends between the guide-rolls 23 24, Figs. 2 and 4, held securely in place on the main arch by
 35 the side straps 25 26 and hanger 27. Said parts constitute a rigid bracket dependent from the main arch to afford axle-bearings for the rolls 23 24. All lateral thrust upon the jockey as exerted by the gang is stoutly re-
 40 sisted, although the jockey is yet free to rise or fall at its bearing with the rolls. The rise and fall of the jockey ensues if a gang-disk encounters an obstacle or rides into a depression. In either event the shift of the
 45 gang-beam pivotally on its pipe-coupling at the arch-bar r is readily accomplished, since the arm 20 of the jockey swivels freely at its connection 21 22 with the beam, while the upright member of the jockey rides easily up
 50 or down between the roll-bearings 23 24 on the main axle of the machine.

Rack-plates b are fastened by clip-joint or like expedient to the transverse bars c of the backbone and afford pivot-bearing 28, Fig. 3,
 55 for the elbow-lever C, having a handle 29, fastened thereto and extending upward within easy reach of the driver. The handle is furnished with the familiar thumb-latch and bolt 30, Fig. 1, to engage with the teeth of
 60 the arc-rack. The other member of the elbow-lever C is forked, as shown, Fig. 3^a, at its outer end and receives pivotally between its prongs the seat 30 for the carrying-spring 31 and for the resist-spring 32, Fig. 3, mounted
 65 on opposite sides of the seat upon the rod 33. The rod has set-blocks 34 to vary the tension

of the springs and extends through the eye of the seat 30, Fig. 3^a, and is pivoted at its lower end to a ring-bolt 35, attached to an ear on clamp 18. The driver can adjust the hand-
 70 lever 29 at will to lower or raise the gangs, and in doing so the jockey rides readily up or down, any tendency to bind being eased at the joint 21 22 between the jockey and gang-beam and at the pipe-coupling of the beam and arch-
 75 bar. The springs 31 32 nicely control the action of the gangs in the soil, while the swivel-plate 30 affords a snug seat for the confronting ends of the springs. These always remain seated despite the radial throw of the adjust-
 80 ing-lever C.

If desired, gang-beams with ordinary shov-
 els can replace the disk gangs and the ma-
 chine be used in like fashion. When shovel-
 gangs are employed, it is simply necessary to
 85 loosen the box-mount t t' and bolt v where the gang arch-bar swivels upon the pole f and turn the mount over to the rear, Fig 5^d, dotted lines. On setting the bolt v in the hole of
 90 the pole there located the arch-bar is afforded a new pivot somewhat more remote from the pivot i for the fore-reach than before. Slots in the links x between said reach and arch-bar allow for easy play on readjust-
 95 ment. In the modified relation the swing of the shovel-gangs in dodging becomes a little greater than with the disks, because the distance between pivots i v on the pole has increased. The gang-beams carrying the
 100 shovels would be slipped onto the terminals of the arch-bar and be secured to the pipe-couplings in lieu of the beams appropriate to the disk gangs. The jockeys would be taken
 off, and in place of the suspension-rod 33 and its springs 31 32 a simple chain would ex-
 105 tend from the beam below and be set at any desired link in the notched eye of the pivot-plate 30, carried between the forks of elbow-lever C, Fig. 3^a.

Figs. 6 and 7^d show an attachment which is
 110 applied to the machine when in course of cultivation it is desired to provide leader-disks ahead of the main gang to modify the character of the tillage. For this purpose the in-
 115 ner disk in each set or gang is removed from the axle of yoke 15 and is mounted upon a stud-axle 41, Fig. 7^a, carried by a sleeve-plate 42, to which a standard 43 is pivoted, as at 44. The slot in the plate 42 engages
 120 with the bolt and nut 45 on the standard and allows the plate and disk to be adjusted at a greater or less incline. The upper part of the standard 43 has an angular contour and is snugly fitted within the corresponding
 125 thimble 46, being retained at proper height by the set-screw 47 or like expedient. The thimble 46 rests within an eye-bearing formed in the box 48, Fig. 7^c, and together with the standard and its attached disk is axially ad-
 130 justable, a serrated plate 49, set upon box 48, Figs. 7 and 7^c, engaging with serrations on the thimble 46, Fig. 7, to hold the thimble in its

adjusted position through the medium of the bolt 50. The box 48 has a square bearing to receive the counter-beam 51, and with its adjuncts is movable laterally on said beam and is secured by set-screw 52 in position to insure the proper separation of the leader-disks from each other and from the plant-row between them.

From side to side through the hollow counter-beams 51 freely extends the rod 52, having an easy play therein. Near their outer ends the counter-beams 51 afford seats for the boxes 54, through the lower part of which pass the gang-bars *z*. A collar 55, adjustably secured to each gang-bar, Fig. 7, carries a lock-lug 56 to engage with the notched rim 57 at the back of box 54, by which expedient said box, together with the counter-beams and adjuncts, is firmly held against slipping on the gang-bar *z*. The leverage exerted on the counter-beams by reason of the set and travel of the leader-disks is resisted through the cross-rod 53. It holds the disks to their work as against the upward thrust exerted by heavy clods or obstructions in the path of the disks, the counter-beams easing at the collar-joint 55 56 with the gang-bar, Figs. 7 and 7^a, to relieve the bar and its "trailer-disks" from the thrust. At the same time either gang-beam with its disk sets can follow the inequalities or be raised or lowered by the driver without materially affecting the companion gang, since cross-rod 53 affords some freedom of play and is besides located with the counter-beams much nearer the center of motion at the pipe-couplings than are the trailer-disks. The two gang-bars with their attached disks are free to rise or fall, while practically independent, and yet move in unison in dodging obstacles or along an irregular plant-row under easy control of the driver from his seat.

Obviously the details of structure can be varied according to the skill of the mechanic without departure from the essentials of the invention.

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

1. The combination with the wheel-frame comprising the axle and a fore-reach sustained therefrom, of the centrally-swiveled arch-bar, the vertically-rigid connecting-links pivotally uniting said arch-bar at opposite sides with the fore-reach, the companion gang-beams pivotally carried upon the arch-bar extremities and the adjusting-levers in suspension union with said gang-beams, substantially as described.

2. The combination with the carrying-wheels and with the main frame comprising the axle and a fore-reach sustained therefrom, of the team-pole pivoting laterally at said reach, the steering-lever fulcrumed on the team-pole, the cross connector or link uniting the lever with the main frame, the cross-arm or arch-bar swiveled to the pole, the opposite gang-beams carried thereby and the connect-

ing links or braces extended from the cross-arm pivotally fore and aft to the main frame, substantially as described.

3. The combination with the wheel-frame comprising the axle and a fore-reach sustained therefrom, of the team-pole pivoting laterally at said reach, the cross-arm or arch-bar swiveled to the pole and the independent gang-beams extended therefrom, and each supported separately by its own jockey in the wheel-frame, substantially as described.

4. The combination with the wheel-frame and with the team-pole pivoting laterally thereon, of the cross-arm swiveled separately to said pole, the gang-beams extended from said arm and the independent jockeys for each beam supported on the wheel-frame, substantially as described.

5. The combination with the wheel-frame comprising the axle and a fore-reach sustained therefrom, of the team-pole pivoting laterally at said reach, the cross-arm swiveled to said pole, the gang-beams extended separately from said cross-arm and the braces pivotally uniting the cross-arm and main frame, substantially as described.

6. The combination with the wheel-frame and with the team-pole pivoting laterally thereon, of the cross-arm swiveled to said pole, the braces uniting the cross-arm pivotally with the frame, the gang-beam extended from said arm and the independent jockeys for each beam supported at the wheel-frame, substantially as described.

7. The combination with the wheel-frame, of the swivel-mounted cross-arm or arch-bar sustained forward of the main axle, the independent gang-beams pivotally carried by said arch-bar at opposite sides of the plant-row, and a separate jockey for each gang-beam, pivotally united to such beam and to the main frame respectively, substantially as described.

8. The combination with the wheel-frame and with the cross-arm or arch-bar, of the independent jockeys supported on the wheel-frame and the gang-beams extended between and mounted pivotally at said cross-arm and the jockeys, substantially as described.

9. The combination with the main frame and with the gang-beam pivoted therefrom, of the adjusting-lever on the frame the connecting-link extended between said lever and beam and the resist and suspension springs separately mounted upon said link with their confronting ends carried at the lever-arm, substantially as described.

10. The combination with the gang-beam and with its adjusting-lever, of the connecting-link between them, the resist and suspension springs upon said link and the seat for confronting ends thereof, pivotally carried by said lever, substantially as described.

11. The combination with the wheel-frame comprising the axle and a fore-reach sustained therefrom, of the team-pole pivoting laterally at said reach, the cross-arm or arch-bar and

the intermediate box or coupling in swivel union with said pole and cross-arm respectively, substantially as described.

12. The combination with the wheel-frame 5 having a fore-reach, of the team-pole pivoted laterally thereon, the cross-arm or arch-bar, the intermediate union-coupling or box-swivel mounted on said pole and cross-arm respectively, and the connecting-link extended between the fore-reach and cross-arm, substantially as described. 10

13. The combination with the wheel-frame, of the swivel-mounted cross-arm or arch-bar sustained forward of the main axle, the independent gang-beams pivotally carried by 15 said arch-bar at opposite sides of the plant-row, the separate jockey for each gang-beam, pivotally united to such beam and to the main frame respectively, and the individual adjusting-levers on the frame linked to the 20 separate gang-beams, substantially as described.

14. The combination with the wheel-frame and with the pivoted gang-beam, of the individual jockey guided on said frame and the 25 union-coupling extended between said gang-beam and jockey and swiveling upon the jockey-arm, substantially as described.

15. The combination with the wheel-frame 30 and with the pivoted gang-beam of the individual jockey guided on said frame and the

union-coupling extended from the gang-beam and swiveling upon and adjustable laterally along the jockey-arm, substantially as described. 35

16. The combination with the wheel-frame and with the pivoted gang-beam, of the jockey guided on said frame and the union-coupling axially adjustable upon said beam, swivel-mounted about the jockey-arm and laterally 40 adjustable thereon, substantially as described.

17. The combination with the gang-bars of the separate counter-beams for the leader-disks and the cross connector or rod extending 45 between said beams, substantially as described.

18. The combination with the wheel-frame and with the pivoted gang-bars, of the separate counter-beams for the leader-disks, the 50 cross-connector and the union boxes between each bar and beam swivel-mounted upon the bar, substantially as described.

19. The combination with the gang-bar and with the counter-beam, of the box-coupling 55 adjustable laterally thereon and the leader-disk standard adjustable radially in said box, substantially as described.

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