No. 869,605. PATENTED OCT. 29, 1907.

I. A. WEAVER.

CULTIVATOR.

APPLICATION FILED NOV. 5, 1906.

4 SHEETS—SHEET 1.

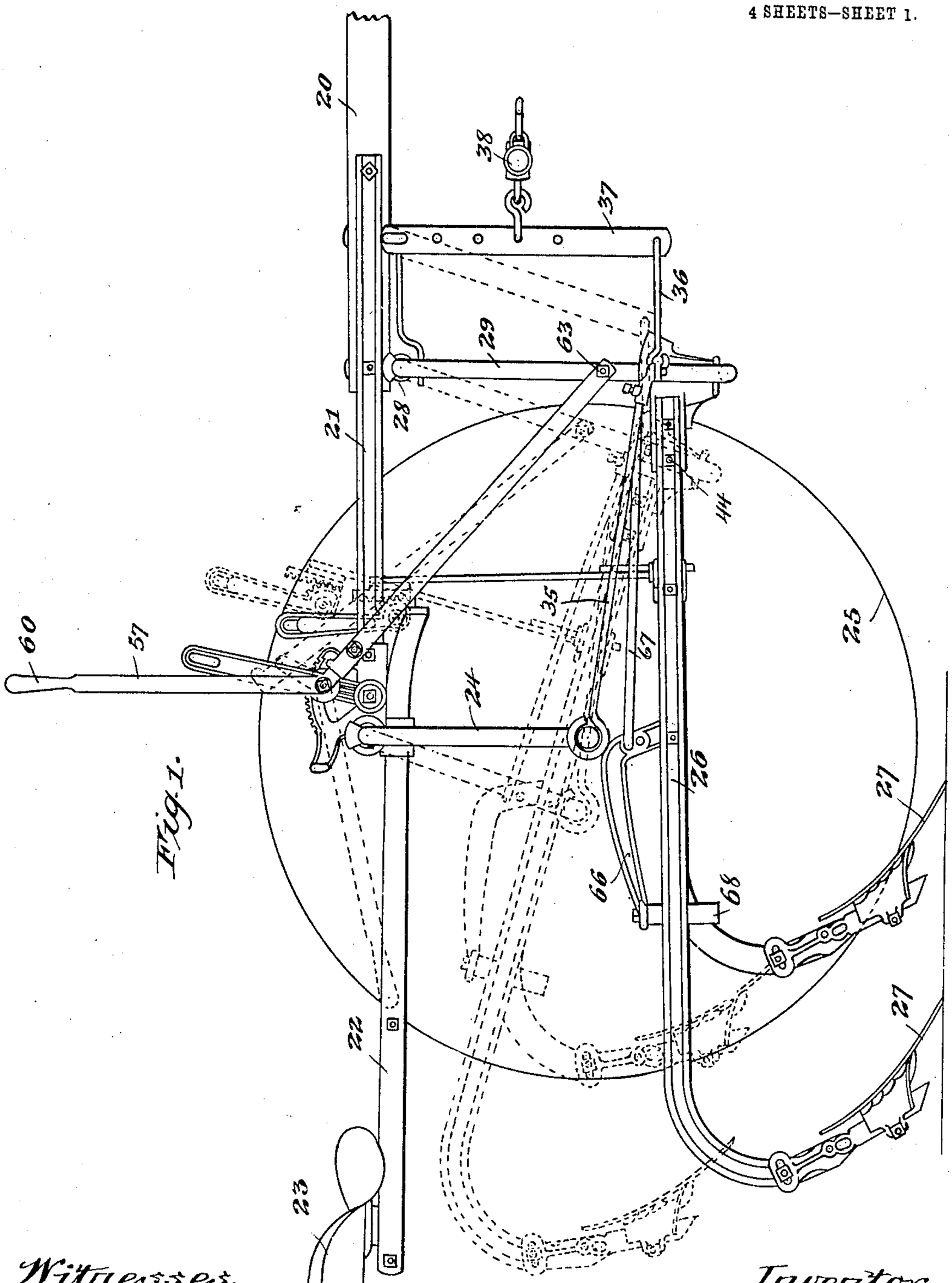

Fig. 1.

Witnesses,
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Walter M. Fuller

Inventor,
Ira A. Weaver
By Offield Towle & Linthicum
Attys.

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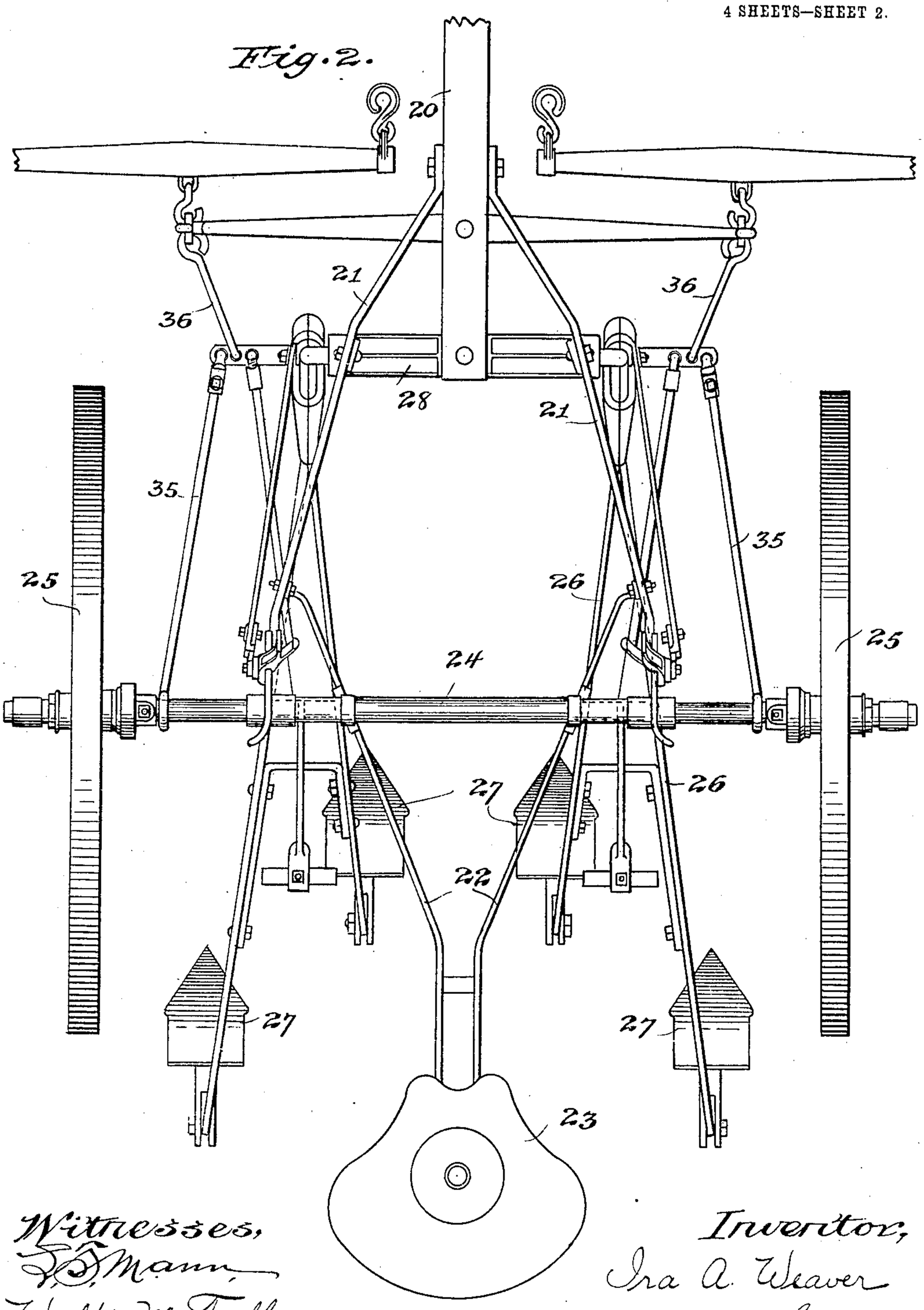
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

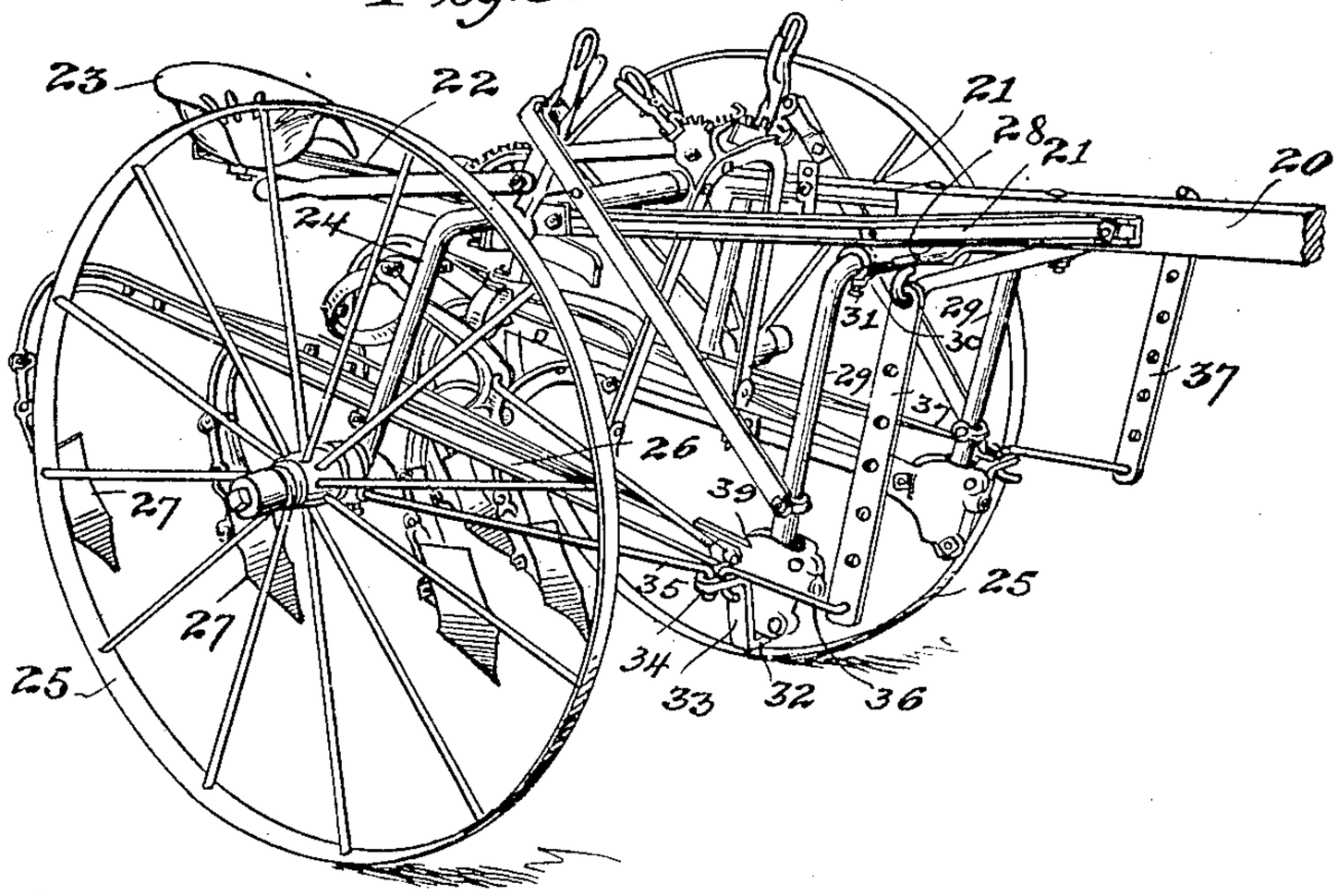


Fig. 8.

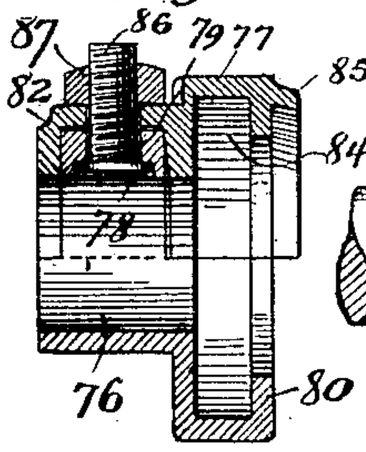


Fig. 7.

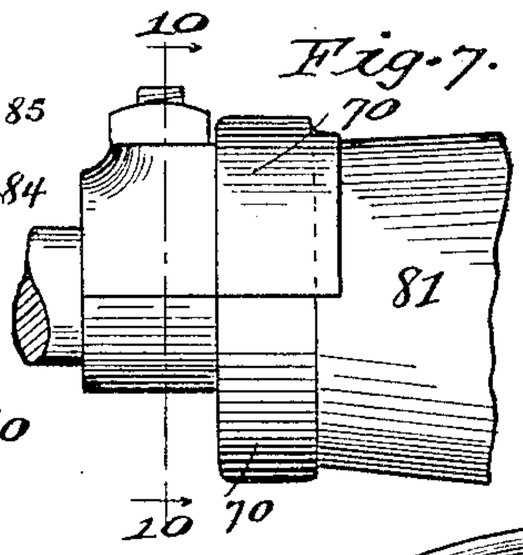


Fig. 9.

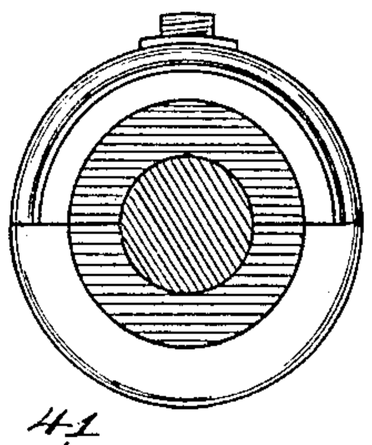


Fig. 10.

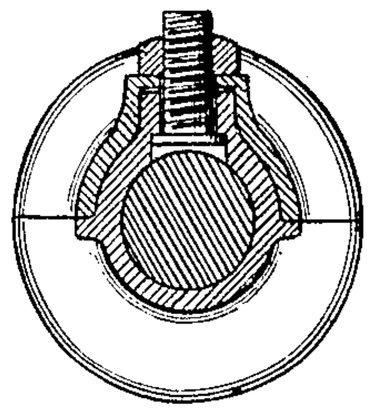


Fig. 11.

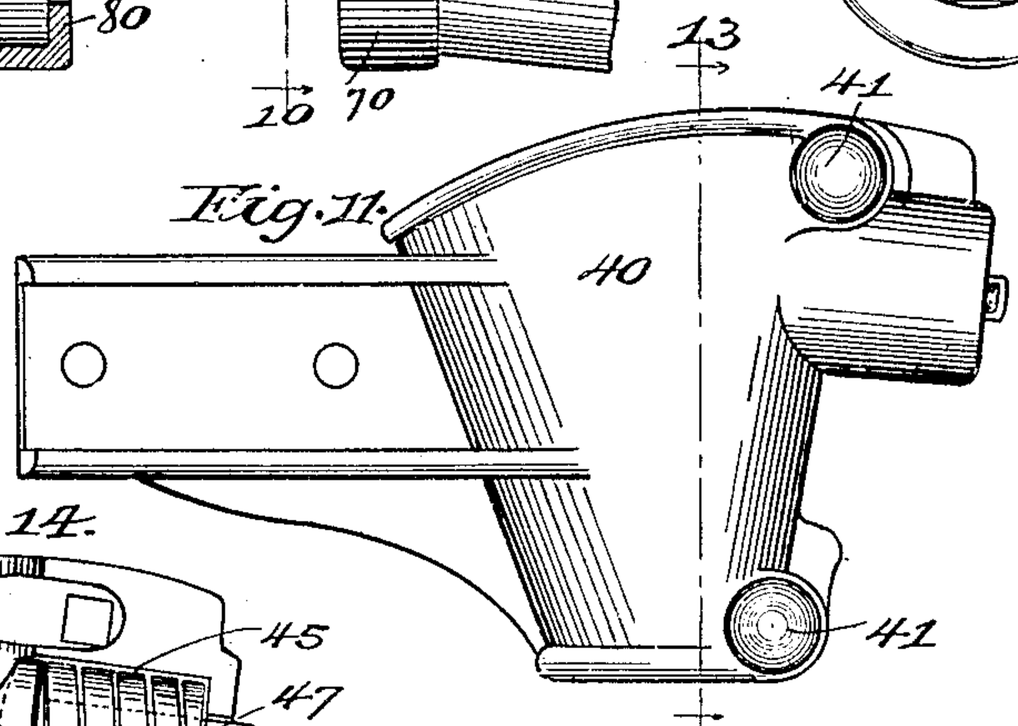


Fig. 13.

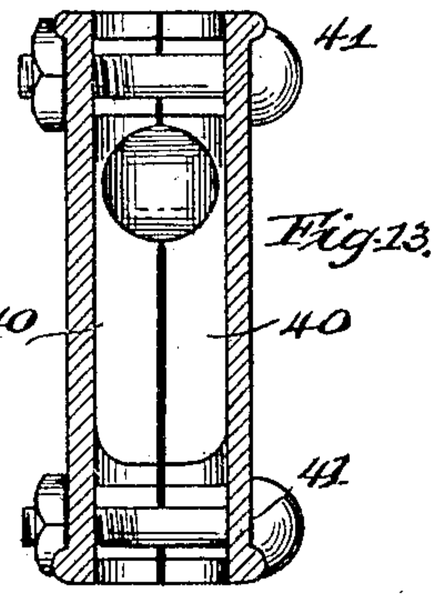


Fig. 14.

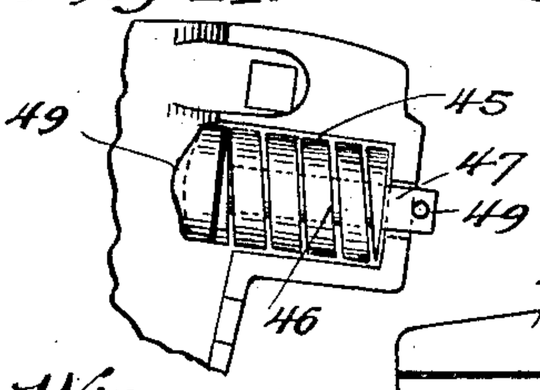
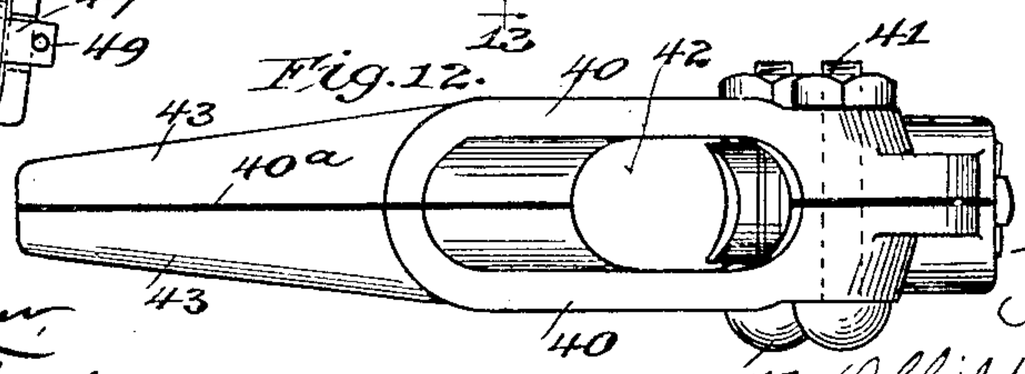


Fig. 12.



Witnesses,
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4 SHEETS—SHEET 4.

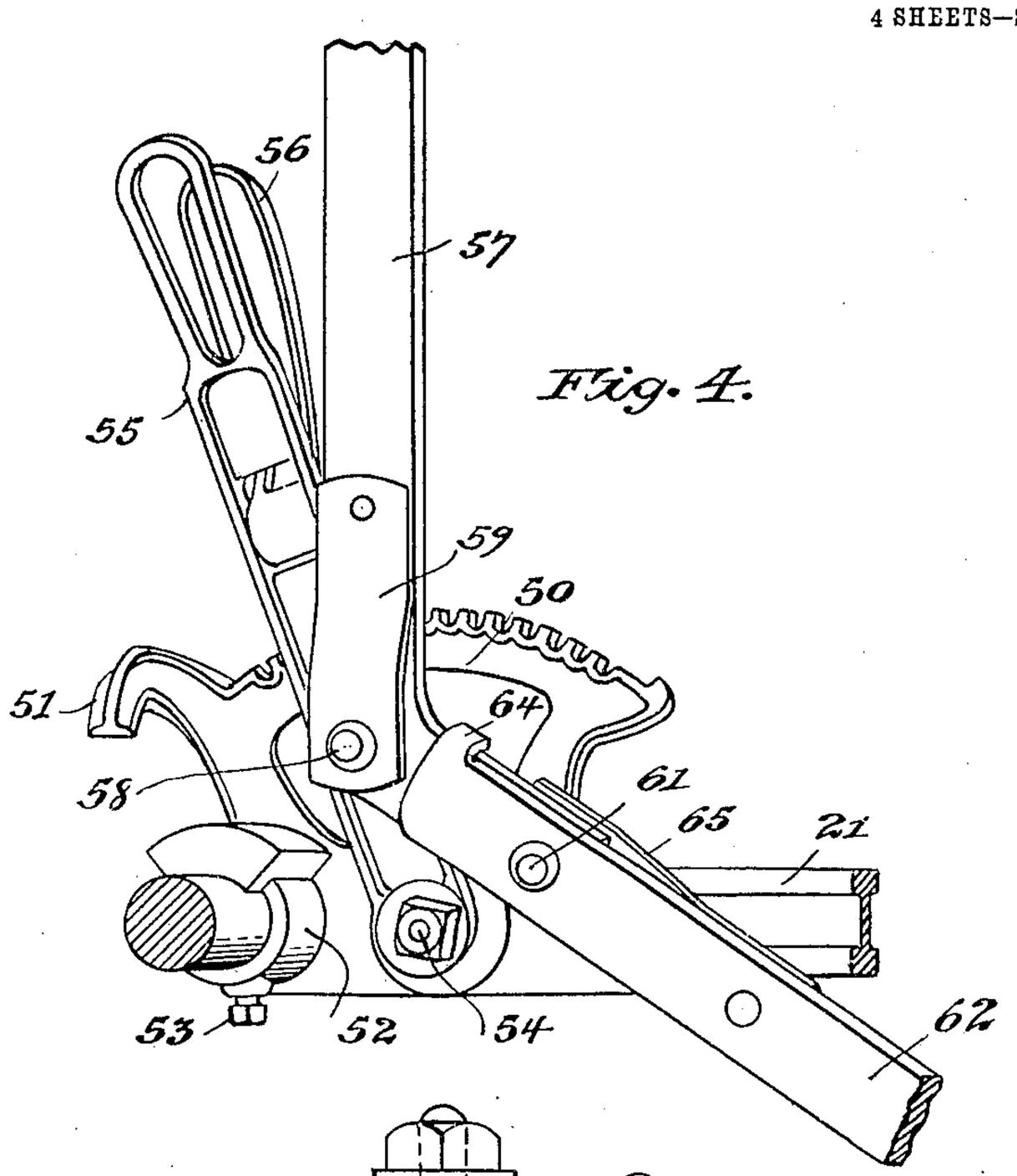

Fig. 4.

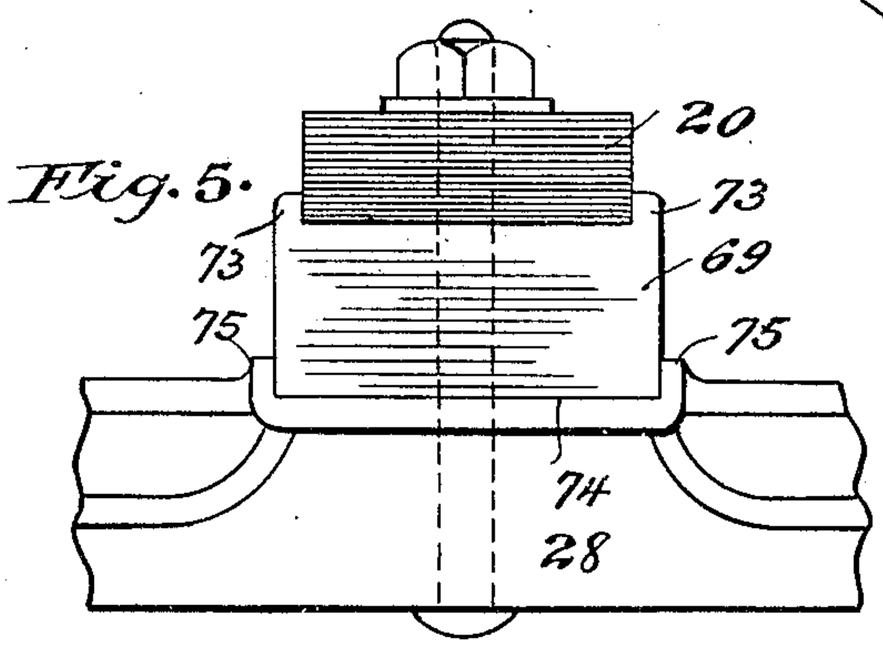

Fig. 5.

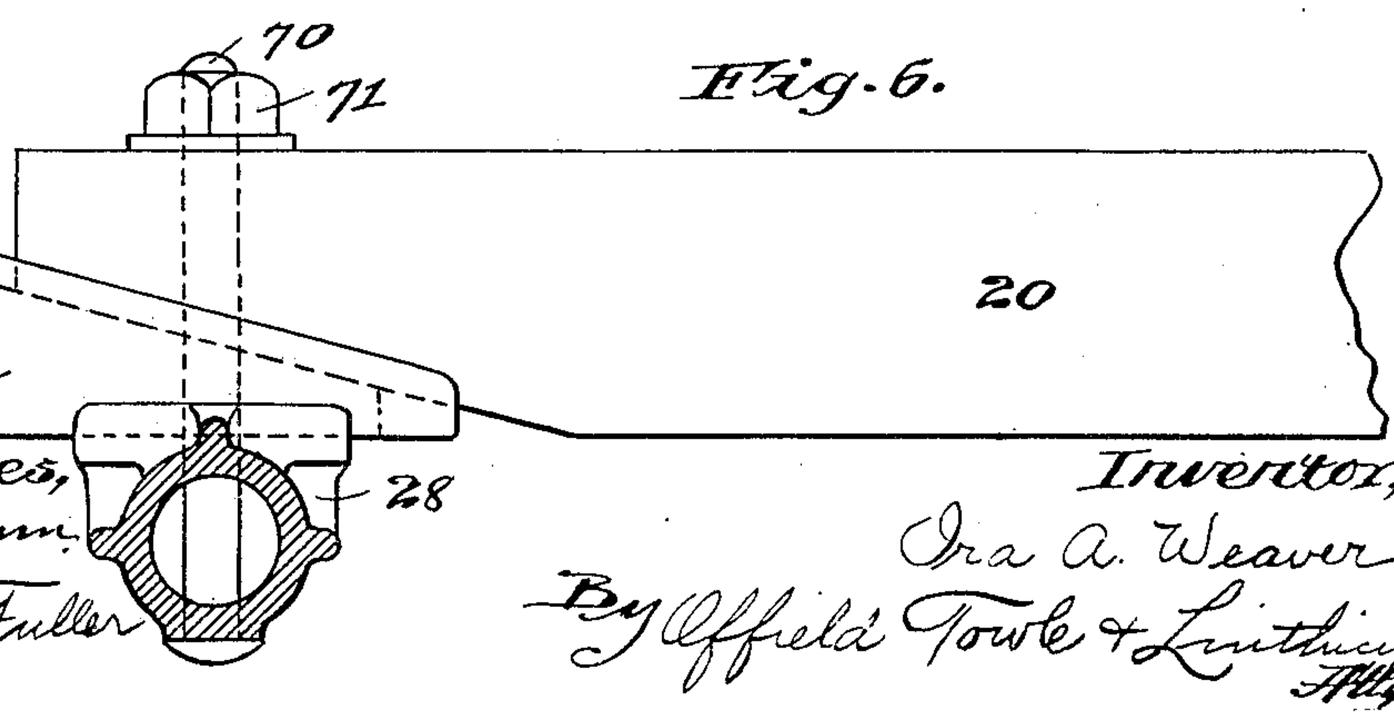

Fig. 6.

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Att'ys

UNITED STATES PATENT OFFICE.

IRA A. WEAVER, OF SPRINGFIELD, ILLINOIS, ASSIGNOR TO RACINE-SATTLEY COMPANY, OF SPRINGFIELD, ILLINOIS, A CORPORATION OF ILLINOIS.

CULTIVATOR.

No. 869,605. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed November 5, 1906. Serial No. 342,068.

To all whom it may concern:

Be it known that I, IRA A. WEAVER, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Cultivators, of which the following is a specification.

My invention concerns improvements in the various parts of a cultivator whereby the machine is better fitted to perform its functions. Instead of making the beam coupling arch integral throughout, as is usual, I construct it of two parts adjustable within its bearing or socket on the frame permitting the width of the arch to be varied to correspond to the breadth of the plants with which the machine is used. This divided construction also allows the two halves of the arch and the gangs or beams to be raised or lowered independently. By this improvement I secure a riding cultivator giving plenty of room at the coupling arch to accommodate bushy plants such as cotton and tobacco. A novel type of beam coupling is used, the same being in two parts with an interposed separator or thin washer which may be removed or replaced with a thinner one whereby the wear may be taken up. Within each coupling I employ a cushion spring which will allow the shovels to be forced down to a greater depth while passing over a depression in the soil thereby securing a uniform depth of cultivation. The beam coupling arch passes down through each coupling and below it extends outwardly, then upwardly, and again outwardly, this latter outwardly projecting portion being at the top of or above the adjacent beam. To this end of the arch is connected a draft link, and the construction is such that the draft on the beam is at the bottom of the coupling thereby obtaining a better penetration than has been customary. The foot-dodge lever is preferably pivoted between the beams and is connected by an adjustable rod or link to the beam coupling arch at a point at one side of the beam and above the line of draft thereon whereby the beams may be swung to one side without effecting a greater or deeper penetration of the shovels. A lift lever is used for each half of the beam coupler arch, the lever being connected thereto by a toggle joint mechanism, and to compensate for the adjustment of the parts of the arch I make some of the joints of the lifting mechanism expansible or flexible. These forms of joints also permit each lifting lever to be moved laterally to engage under a stationary hook to maintain the shovels in raised position. The lifting levers are pivoted to adjustment levers which construction gives a fine or minute regulation of the position of the beams and shovels and permits their raising or lowering without disturbing the permanent adjustment for depth when the shovels have once been set for the proper penetration. My improved construction also enables the resistance of the carrying wheels in the soil to assist in raising the beams and shovels.

Another valuable feature of my invention is the automatic balancing of the cultivator, the carrying wheels shifting rearwardly sufficiently when the shovels are raised to constantly maintain the proper balance of the machine. In addition, in order to raise or lower the coupling end of the beams, that is to adjust the same to enable the shovels to run at an even depth, I use an adjustable wedge.

In the accompanying drawings, which form a part of this specification, I have shown the most desirable embodiment of my invention, and in the various views like reference characters refer to the same parts throughout.

Figure 1 is a side elevation of a cultivator embodying my invention with the tongue or pole broken away, the nearer wheel omitted, the remote wheel illustrated conventionally, and the positions of the parts assumed when the shovels are raised indicated in dotted lines; Fig. 2 is a plan view of the structure shown in Fig. 1, both wheels being shown and the draft mechanism being partly broken away; Fig. 3 is a perspective view of the cultivator shown in Figs. 1 and 2 with the shovels and beams in raised position, the pole or tongue broken away, and a portion of the spokes of the remote wheel omitted for the sake of clearness; Fig. 4 is a perspective detail view of the manually operated lifting mechanism showing the flexible mounting of the lift lever; Figs. 5 and 6 are detail views of the wedge adjustment for the beam coupling socket or bearing; Fig. 7 is a side elevation of my improved sand band and the adjacent parts; Fig. 8 is a central longitudinal section of the sand band; Fig 9 is an end elevation of the sand band, the axle being shown in section; Fig. 10 is a section on line 10—10 of Fig. 7 as viewed in the direction indicated by the arrows; Fig. 11 is a side elevation of my improved beam coupling; Fig. 12 is a plan of the coupling; Fig. 13 is a section on the line 13—13 of Fig. 11; and Fig. 14 is a fragmentary view of a portion of one half of the coupling, and illustrates the construction and position of the cushioning device.

The cultivator includes the usual tongue or pole 20, hounds 21, seat bars 22, seat 23, arched axle 24, carrying wheels 25, shovel beams 26 and shovels 27. Transversely mounted on hounds 21 is a beam coupling arch bearing or socket 28 adapted to receive the top inturned ends of two members 29 which together form a beam coupling arch. In other words, instead of using an integral and unitary beam coupling arch I employ one which is divided at its center, and the two parts thereof are adjustable lengthwise in the bearing 28 whereby the width of the arch may be varied to correspond to the character of plant with which the cultiva-

tor is used. To maintain these members 29 in adjusted position I equip each with a collar 30 held in position by a set screw 31, the collar fitting in a recess in the bearing 28 and being prevented from longitudinal movement. The lower ends of members 29 forming the arch pass down through vertical apertures in the beam couplings 39 and their lower ends are flattened, bent outwardly at 32, then upwardly at 33, and again outwardly at 34, which brings the portions 34 at one side of the beam and above the line of draft thereon. The two outwardly extended portions 34 of the beam coupling arch are connected by rods 35 with the axle 24 and extending forwardly from each of these portions 34 is a draft link 36 connected to the lower end of a clevis hitch bar 37 on which clevis 38 is adjustably mounted.

Each beam coupling 39 which connects the forward ends of the beams to the legs 29 of the coupling arch comprises two halves or sections 40 (Figs. 11, 12, 13 and 14) bolted together at 41 and provided on their inner surfaces with recesses which together form a vertical aperture 42 wider at its top than at its bottom and adapted to receive the beam coupling arch. A thin washer or separator 40^a is placed between the two parts of the coupling and by removing it or by replacing it with a thinner one the wear may be readily taken up. To the rearwardly projecting arms or bars 43 of the coupling the shovel beams 26, comprising the gangs, are bolted at 44 near the top of the coupling, and housed within a recess or pocket 45 within the coupling is a coil spring 46 (Fig. 14) encircling a rod or plunger 47 having at its inner end within recess 42 a head 48 adapted to co-act with or push against the coupling arch, and having at its outer end a transverse cotter 49 limiting the inward movement of the plunger. Preferably the face of head 48 is curved to conform substantially to the cylindrical surface of the coupling arch, and the function of this spring-pressed head is to allow the shovels to be forced down to a greater depth while passing over a depression in the ground.

Since the two parts of the beam coupling arch may be raised independently I equip the cultivator with a lifting lever for each side of the arch, each lifting mechanism including a segmental rack 50 supported on the axle and one of the hounds. At its rear end each rack has a lateral and downwardly turned hook 51 (Fig. 4) beneath which the lifting lever is adapted to engage when the gangs and shovels are in raised position. To prevent each rack from shifting longitudinally on the axle the latter is equipped with a collar 52 having a set screw 53 to fix the collar on the shaft at the desired position, the collar engaging a recess in the rack mounting or support whereby longitudinal movement of the rack on the axle is prevented. Pivoted at 54 on the rack or rack support is an adjustment lever 55 provided with a manually actuated pawl or dog 56 to coöperate with the rack whereby to maintain lever 55 in its adjusted relation. The lifting bell-crank lever 57 is pivoted on lever 55 on a pin 58 considerably longer than the thickness of levers 55 and 57 permitting lever 57 to slide lengthwise the pivot pin away from lever 55. In order, under normal conditions, to maintain lever 57 close to lever 55 I fasten on the outer side of lever 57 a flat offset spring or clip 59 through an aperture in which pivot pin or bolt 58 passes. This spring by thus being interposed between the outer head of the pivot and the outer surface of lever 57 pushes the lifting lever inwardly as far as it is permitted to go. The longer end of bell-crank lever 57 has an operating handle 60 and the short end of the lever on the opposite side of its pivot is pivoted at 61 to a link 62 which at its lower end is pivoted or hinged to the corresponding side of the beam coupling arch at 63. Lever 57 and link 62 comprise a toggle, and to prevent the same from being overset and to keep it in straightened condition the top end of link 62 has a portion bent over at 64 to engage the top edge of lever 57 and form a stop. The pivotal connection at 61 is like that at 58, the pivot pin or bolt being somewhat longer than the thickness of the two bars one of which, in the present instance bar 62, has an offset spring 65 in the same relation and performing a similar function to that of spring 59. These expansible or flexible joints permit the two bars or levers which are pivoted together to separate a small amount to compensate for the adjustment in width of the beam coupling arch. If the joints of this lifting mechanism were tight and incapable of expansion it would be impossible to adjust the beam coupling arch in width and still have the lifting mechanism operative. When it is desired to raise either gang and shovels the driver or operator by means of handle 60 pulls down lever 57 which raises the opposite end of the lever thereby breaking the toggle connection and effecting a rearward swing of the beam coupling arch and an elevation of the gang and attached shovels. When the latter have been raised to their full height lever 57 may be sprung beneath hook 51 so as to keep the shovels in their elevated position, this springing of lever 57 being permitted through the flexibility or expansion of its pivotal connection. By mounting the lifting lever upon the adjustment lever 55 a fine regulation of the depth of penetration of the shovels may be secured and the gangs may be raised or lowered without changing their substantially permanent depth adjustment.

It will be seen that by making the vertical aperture 42 through the coupling 39 wider at the top than at the bottom and extending one side of the beam coupling arch downwardly through this aperture and then to one side and applying the draft to this latter portion, the draft on the beams or gang takes place at the lower end of the coupling whereby an effective and better penetration than has heretofore been obtained is secured. By making the line of draft on the beams low and connecting the foot-dodge lever 66, which is pivoted to the gang between its two beams 26, by a link 67 to the outer end 34 of the coupling arch, this arch connection being at one side of and above the line of draft on the beams, the shovels may be easily shifted to one side without effecting a deeper penetration. This foot dodge lever 66 is substantially a right-angle in shape and being connected above its pivot to the link 67 a downward pressure on the stirrup 68 at the end of the foot dodge lever 66 tends to lift the shovels and at the same time thrust them to one side. In this manner any tendency, as in the usual constructions, toward greater penetration is obviated. Although I have shown the foot dodge lever as pivoted to the beams it might be bolted rigidly to the beams as in the common construction of riding cultivators.

In order to adjustably raise and lower the coupling

end of the beams whereby the shovels may all run at an even depth, for all adjustments of levers 55, I have provided a wedge block 69 (Figs. 5 and 6), interposed between the surface of socket or bearing 28 and the end of tongue or pole 20. A bolt 70 equipped with a nut 71 passes through the parts 28, 69 and 20, the wedge 69 having a slot 72 so that the wedge may be adjusted inwardly or outwardly to vary the distance between the tongue 20 and the socket or bearing 28. In this manner the front ends of the beams may be adjusted vertically so that the shovels will have an even and equal penetration. Preferably, wedge block 69 has on the edges of its top surface or face flanges 73 engaging opposite sides of the tongue 20 while the bracket 28 is equipped with a seat 74 having flanges 75 between which the wedge neatly fits.

My improved sand band is illustrated in detail in Figs. 7 to 10, inclusive, and it comprises two parts 76 and 77. Part 76 at one end has a circular ring 78 wider at its lower half than at its upper half, the latter having a squared aperture 79 extending radially therethrough. The other end of member 76 is enlarged and semi-circular and is equipped with an inwardly turned flange 80 adapted to fit about the hub of wheel 81. That portion of member 77 corresponding to and adapted to fit over the ring portion of part 76 is semi-circular at 82 and has on its inner surface a curved recess to receive the upper half of ring 78. The inwardly extended flanges 83 and 84, between which the top portion of ring 78 fits, are curved on their inner edges at a slightly less radius than the longitudinal circular aperture through ring 78. The other end of member 78 is like that of member 76 except that it has an additional semi-circular outwardly projected flange 85 which acts as an additional means for protecting the hub of the wheel from sand. When the two parts are placed on the axle, as shown in Figs. 7 and 10, and the bolt 86 is tightened by its nut 87, the two parts of the sand band are held together by the bolt and nut and at the same time are clamped upon the axle, the lower half of ring 78 engaging the under surface of the axle while the two flanges 83 and 84 bear against the upper surface of the axle. By using the nut and bolt as described the two parts of the band may be firmly fastened on the axle at the point desired and the sand band can be taken off or shifted in its position without separating its pair of members.

An important feature of my invention is the employment of the resistance of the wheels in the soil combined with the draft on the machine to assist in raising the beams and shovels, the carrying wheels being moved rearwardly at the same time the shovels are elevated so that the proper balance of the machine is maintained at all times and under all conditions. When the operator pulls down lever 57 the resistance of the wheels in the soil aids in swinging the beam coupling arch rearwardly, as shown in dotted lines in Fig. 1, thereby assisting in the raising of the shovels. When this coupling arch turns or swings backwardly the axle is also shifted by means of the connecting rods 35 so that the balance of the machine is maintained.

Summarizing, my invention may be said to include among others the following features, the division of the beam coupling arch into two adjustable parts permitting the width of the arch to be varied at will; the application of the draft on the beams at a comparatively low point; an improved lifting mechanism which can shift to compensate for the widening or contraction of the beam coupling arch, this lifting mechanism including a toggle whose operation is assisted by the draft and the resistance of the wheels in the earth; the provision of a foot dodge device which shifts the shovels laterally without effecting a deeper penetration; means for vertically adjusting the front ends of the shovel beams; and an improved form of sand box the two parts of which are held together by a bolt which has the additional function of clamping them upon the axle.

Although I have set forth in detail the various parts of my improved cultivator, it is to be understood that my invention is not limited to the details of construction shown and described since many minor changes may be made therein without departure from the substance of my invention.

I claim:

1. In a cultivator, the combination of a frame, a bearing on said frame, a two-part beam coupling arch having its two adjacent ends rotatably mounted in said bearing, and means for holding said ends in said bearing in various adjusted positions, whereby the width of the arch may be varied at will and maintained at any desired width, substantially as described.

2. In a cultivator, the combination of a frame, a bearing on said frame having grooves, a two-part beam coupling arch having its two adjacent ends rotatably mounted in said bearing, a collar on each of said ends fitting in one of the grooves of said bearing, a set-screw to adjustably fasten each collar on its part of the arch, whereby the width of the arch may be varied at will and maintained at any desired width, substantially as described.

3. In a cultivator, the combination of a frame, one or more bearings on said frame, a two-part beam coupling arch rotatably mounted in said bearing or bearings, and means permitting the adjustment of the two parts of said arch in said bearing or bearings to vary its width as a whole, substantially as described.

4. In a riding cultivator, the combination of a cultivator frame, a bearing on said frame, a beam coupling arch rotatably mounted in said bearing and adapted to swing rearwardly, and means to swing said arch rearwardly substantially as described.

5. A cultivator having a beam coupling comprising two parts bolted together and an interposed washer or separator, substantially as described.

6. In a cultivator, the combination of a beam, a vertically-apertured coupling, a beam coupling arch, one leg of which projects through the aperture of said coupling, and means to apply the draft to said arch substantially as described.

7. In a cultivator, the combination of a beam, a vertically-apertured coupling, a beam coupling arch one leg of which projects through the aperture of said coupling, and means to apply the draft to said arch at one side of said coupling, substantially as described.

8. In a cultivator, the combination of a beam, a vertically-apertured coupling, a beam coupling arch one leg of which projects down through the aperture of said coupling and is bent laterally below said coupling, and means to apply the draft to said laterally bent portion of said arch, substantially as described.

9. In a cultivator, the combination of a beam, a vertically-apertured coupling, a beam coupling arch one leg of which projects down through the aperture of said coupling and is bent outwardly below said coupling and then upwardly and again outwardly, and means to apply the draft to the latter outwardly projecting portion of said beam coupling arch, substantially as described.

10. In a cultivator, the combination of an axle, carrying wheels, a beam, a vertically-apertured coupling, a beam coupling arch one leg of which projects down through the aperture of said coupling and is bent outwardly below said

coupling and then upwardly and again outwardly, means to apply the draft to the latter outwardly projecting portion of said beam coupling arch, and means connecting said latter outwardly projecting portion to the axle, substantially as described.

11. In a cultivator the combination of a frame, an axle, carrying wheels, a swinging beam coupling arch, means directly connected to said axle to swing the same, means connecting said arch and axle whereby when the arch is swung back to lift the shovels the axle is also shifted rearwardly, substantially as described.

12. In a riding cultivator, the combination of a frame, an axle, a swinging beam coupling arch, a lifting lever on said frame, a link pivoted to said arch and to said lever, and means connecting said arch and axle, substantially as described.

13. In a riding cultivator, the combination of a frame, a swinging beam coupling arch mounted on said frame, a bell-crank lifting lever pivotally mounted on said frame, a link pivoted to said lifting lever and to said arch, said lifting lever and link forming a toggle which is straightened out when the shovels are down and collapsed when the shovels are raised, substantially as described.

14. In a riding cultivator, the combination of a frame, a swinging beam coupling arch mounted on said frame, an adjustment lever mounted on said frame, a lifting lever pivoted to said adjustment lever, and a link pivoted to said lifting lever and arch, substantially as described.

15. In a riding cultivator, the combination of a frame, a swinging beam coupling arch mounted on said frame, a segmental rack, an adjusting lever pivotally mounted on said frame, a locking dog or pawl associated with said lever and coöperating with said rack to maintain said lever in adjusted position, a lifting lever pivoted to said adjusting lever, and a link connecting said lifting lever to said arch, substantially as described.

16. In a riding cultivator, the combination of a frame, a swinging beam coupling arch mounted on said frame, a segmental rack, an adjustment lever pivotally mounted on said frame, a locking dog or pawl associated with said adjustment lever and coöperating with said rack to maintain said lever in adjusted position, a bell-crank lifting lever pivoted to said adjustment lever, and a link pivoted to said lifting lever and to said arch, said lifting lever and link forming a toggle which is straightened out when the shovels are down and collapsed when the shovels are raised, substantially as described.

17. In a cultivator, the combination of a support and a lifting lever pivotally secured to the support by an expansible connection, substantially as described.

18. In a cultivator, the combination of a support and a lifting lever pivoted to said support by means of a pivot pin the construction permitting said lever to shift lengthwise of said pivot pin, substantially as described.

19. In a cultivator, the combination of an apertured support, an apertured lifting lever, a pivot pin longer than the thickness of said support and lever passing through said aperture, and a spring to normally maintain the parts in such position that the support and lever will be at one end of said pivot pin but permitting said lever to shift position longitudinally of said pin, substantially as described.

20. In a cultivator, the combination of an adjustable coupling arch, a lifting lever, a connecting bar fastened to said arch and pivoted to said lifting lever, the pivotal connection between said lever and bar permitting said bar to shift longitudinally of its pivot pin when said arch is adjusted, substantially as described.

21. In a foot-dodge riding cultivator, the combination of a shovel beam, a foot lever connected to said beam, and a rod connecting said foot lever to a point of support at one side of and above the line of draft on said beam, substantially as described.

22. In a foot-dodge riding cultivator, the combination of a supporting frame, a beam coupling arch, a shovel beam, a coupling connecting said beam to said arch, the latter extending down through said coupling and being bent below said coupling to extend outwardly, upwardly, and again outwardly, a foot lever pivoted to said beam, and a rod connected to said foot lever and to said latter outwardly extended portion of said arch, substantially as described.

23. In a cultivator, the combination of a main frame, a beam coupling arch, a bearing for said arch, a pole or tongue secured to said frame, and an adjustable wedge between said bearing and said tongue, substantially as described.

24. In a cultivator, the combination of a main frame, a beam coupling arch, a bearing for said arch, a pole or tongue pivoted to said frame, and an adjustable wedge interposed between the rear end of said pole or tongue and said bearing, substantially as described.

As evidence that I claim the foregoing as my invention I have signed the same this 31st day of October, 1906, in the presence of two witnesses.

IRA A. WEAVER.

Witnesses:
J. F. McLennan,
M. A. McCutchen.