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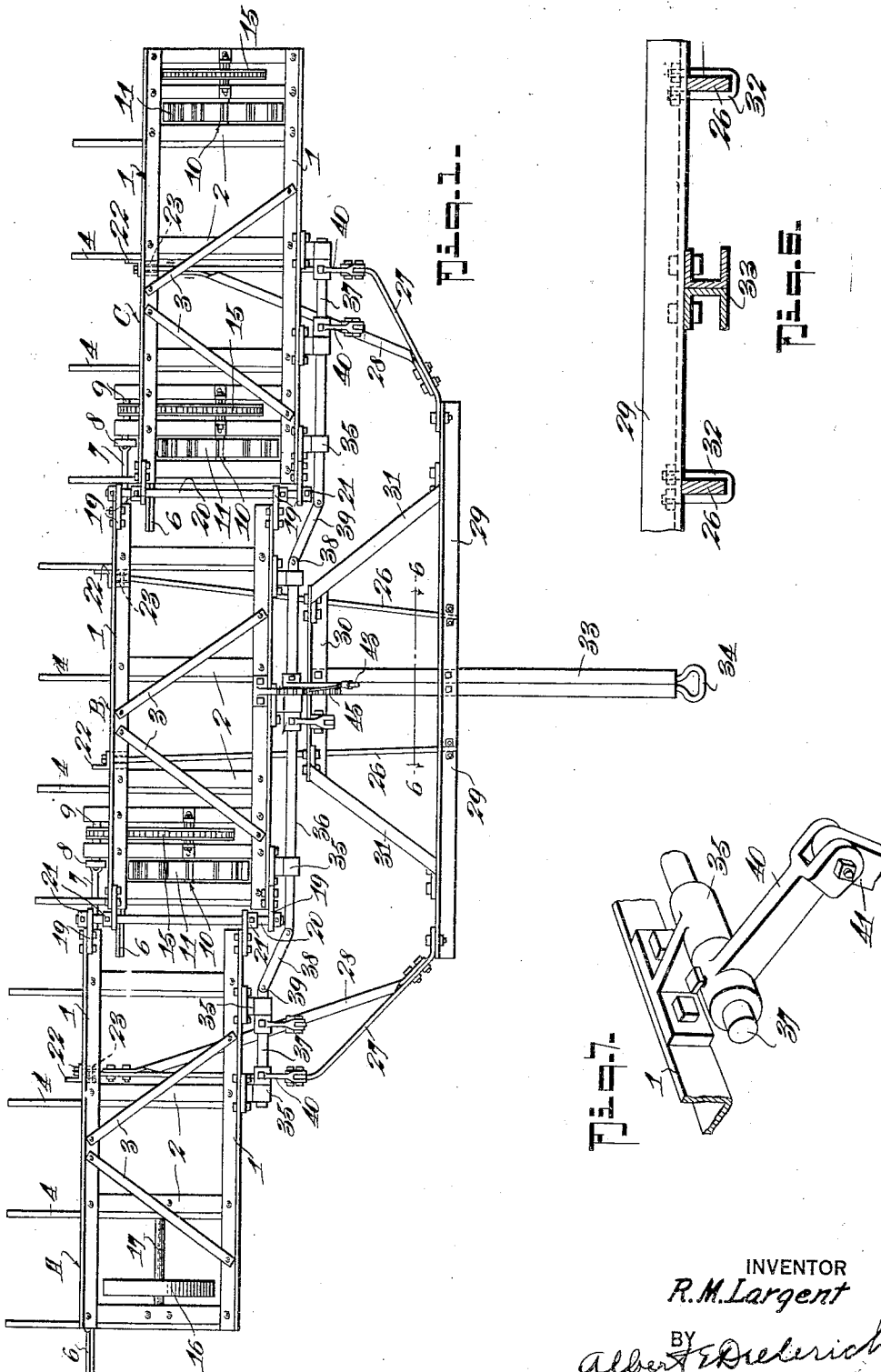
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GANG WEEDER WITH TRACTOR HITCH

Filed June 9, 1927

3 Sheets-Sheet 1



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3 Sheets--Sheet 2

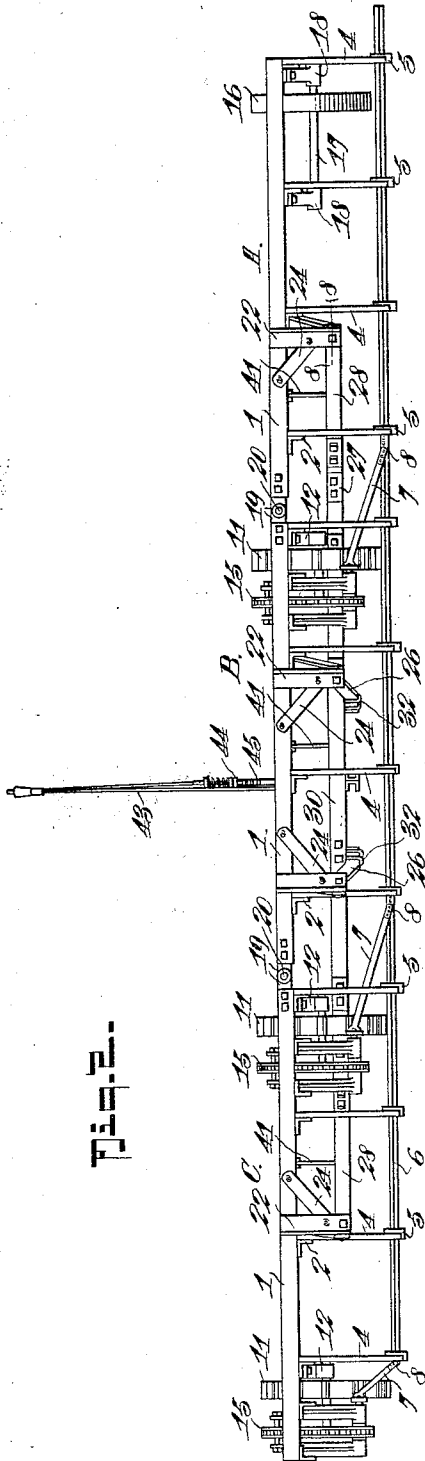
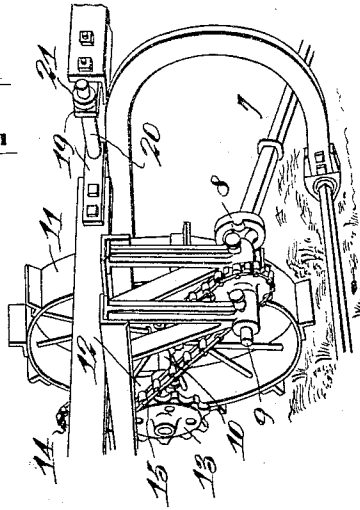
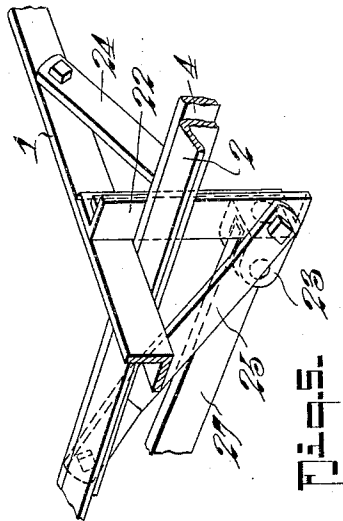


Fig. 4--



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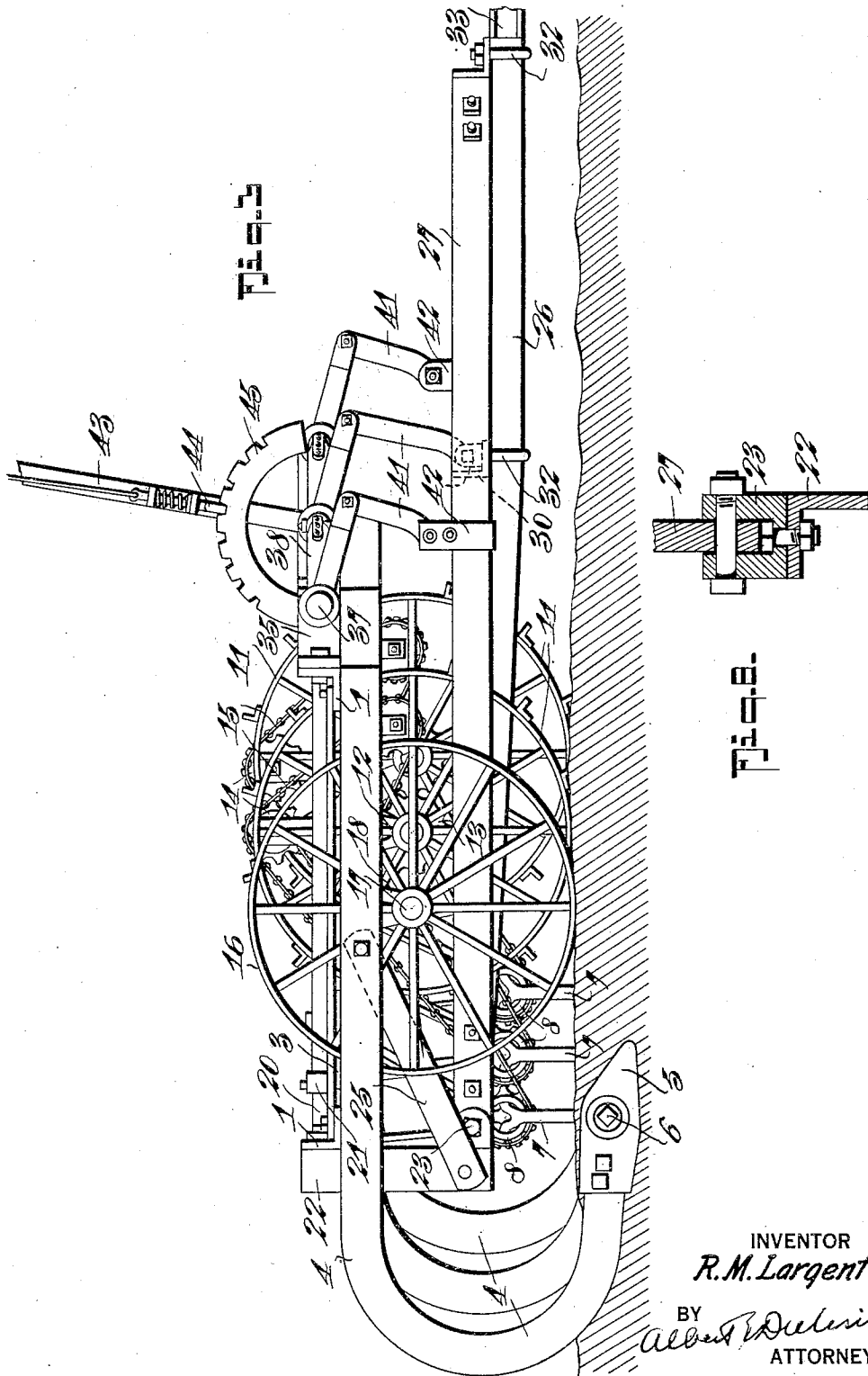
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GANG WEEDER WITH TRACTOR HITCH

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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

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GANG WEEDER WITH TRACTOR HITCH

Application filed June 9, 1927. Serial No. 197,706.

The present invention has for its objects the provision of a gang weeder for use especially with tractors and the invention not only lies in the manner of arranging the several units of the gang but in the manner in which these units are hinged to the tractor whereby to provide a well balanced machine that can be used close up to fences and will not leave strips of untreated soil between adjacent units. In other words it is an object of my invention to provide a weeder composed of a plurality of standardized units so combined as to permit the machine to work close up to fences and prevent leaving untreated strips between adjacent units of the machine and to so connect the several units by a draft appliance of such character that the units may be drawn by a tractor or other draft means, in a well balanced fashion.

Another object of the invention is to provide a single lever control or lifting device for tilting all weeder unit's frames with respect to the plane of the draft appliance, in unison for the purpose of increasing or diminishing the depth of penetration of the several rotary rods and to remove such rods from the ground when it is desired to transport the machine from field to field so that all units will at all times tend to maintain the same relative position with respect to the surface of the ground, thereby giving a unified action of the rods at a uniform distance beneath the surface of the ground when the machine is in operation.

With other objects in view which will be apparent to those skilled in the art invention also resides in those novel features of construction, combination and arrangement of parts, which will be hereinafter described, and then be specifically pointed out in the appended claims, reference being had to the accompanying drawing, in which:—

Figure 1 is a plan view of a machine composed of three units (the preferred embodiment of the invention).

Figure 2 is an end elevation of the same.

Figure 3 is a rear elevation of the same.

Figures 4 and 5 are detail perspective views of portions of the invention.

Figure 6 is a detail section on the line 6—6 of Figure 1.

Figure 7 is a detail perspective view of a portion of the invention.

Figure 8 is a detail section on the line 8—8 of Figure 2.

In the drawing in which like letters and numerals of reference indicate like parts in all the figures, the several units composing the machine are designated respectively by the letters A, B and C. As the construction of each unit is substantially the same the same reference numerals on the several units indicate corresponding parts.

Each unit comprises front and rear beams 1—1 preferably constructed of angle irons, longitudinal beams 2 also preferably constructed of angle irons and diagonal braces 3 as may be required to provide a substantially rigid rectangular frame, the frame consisting of the beams 1 and 2 and braces 3.

Standards 4 are carried by the frame (goose-neck standards being preferred), the standards having bearing shoes 5 of any approved kind for the rotary rods 6. 7 designates the tumbling or telescopic rod which is connected by universal joints 8 to the rotary rod 6 and to the driven shaft 9, the latter being driven by a suitable power transmission connection with the driving shaft 10 that carries the driving wheel 11. The power transmission connection may be of any approved type, preferably however it consists of the driving wheel's shaft 10 that is mounted in bearings 12 and carries a driving sprocket 13 over which and over idler sprockets 14 a driving chain 15 passes in such manner that the rotary rod 6 will be turned (preferably) in a direction opposite to the direction of rotation of the driving wheel.

The several driving wheels 11, and a wheel 16, that does not function as a driver, serve as supporting wheels. The supporting wheel 16 is mounted on a shaft 17 that is journaled in suitable bearings 18 at the right hand end (looking forward) of the machine as clearly indicated in Figure 1 of the drawing.

19 designates hinge brackets secured on the adjacent ends of the longitudinal bars 1 of the respective units and these hinge brack-

ets 19 are apertured to receive the hinge rods 20. Suitable spacing collars 21 are provided whereby the frames of the adjacent units are stepped or offset with relation to one another, slightly, in order that the rotary rods 6 of the respective units may not interfere with one another, and in order that the rotary rod of each unit may project beyond the end of the frame. It will be noted from Figure 1 that the rod 6 of unit C projects beneath the frame of unit B a distance sufficient to overlap the tumbling rod of unit B, or in other words, to project far enough to effect an operation in the ground which will prevent leaving a layer or line of untreated soil between that treated by the rod 6 of unit C and the rod 6 of unit B. Likewise the rod 6 of unit B laps unit A while the rod 6 of unit A projects correspondingly beyond the end of that unit so that the machine may be worked close up to a fence F indicated in dotted lines in Figure 1.

22 designates tractor hitch draft brackets secured to the rear beams 1 of the several units, the brackets 22 being suitably braced transversely and longitudinally by braces 24 and 25 respectively.

23 are members secured to the brackets 22 (the members 23 of units A and C being preferably swiveled to the brackets). These members 23 are of bifurcated type and serve as a means to which the hitch drafts bars 26—26 of the central and end sections respectively are connected by suitable hinge bolts.

The draft bars 26 which are connected with the central unit B preferably converge slightly as they project forwardly beneath the front beam 1 and extend to the front cross beam 29 and the draft frame to which they are secured by suitable fastening devices 32, in a rigid manner. The draft bars 27 which are connected with the brackets 22 of the end units A and C respectively also connect with the front beam 29 of the draft frame at its ends and as these draft bars 27 are extended straight forward beneath the frame of the respective end units and then bent to converge toward the bar 29. Suitable braces 28 are provided for the draft bars 27.

30 designates the rear beam of the draft frame which is also rigidly secured to the draft bars 26 and the beam 30 is connected with the beam 29 at the ends by diagonal braces 31.

The bars 26 are connected to the beam 30 by suitable connecting devices 32 such as U bent clamps or the like.

33 is the draft tongue which is rigidly secured centrally to the beams 30 and 29 and extends forwardly of the beam 29 and is provided with a hitch eye 34 by means of which it may be coupled to a tractor.

35 designates bearing brackets on the front beam 1 of the several units, in which bear-

ing brackets the lifting device shafts 36 (of the several units) and 37 (of the end units) are mounted, the shafts of the several units being connected end to end by means of coupling shaft sections 38 and universal joints 39 so that all shafts 36 and 37 may turn in unison. 40 designates lifting arms secured to the respective shafts 36 and 37 and connected by links 41 to connections 42 on the several draft bars 26 and 27. A lever 43 is secured to one of the shafts, preferably the central shaft 36, and is provided with a latch 44 to cooperate with a holding segment 45 secured to the frame of the section adjacent which the lever 43 is positioned. By positioning the lever at the central section the operator of the tractor has the lever within easy reach for manipulating purposes.

By manipulating the lever 43 the frames of the several units may be tilted in unison with respect to the plane of the draft devices thereby causing shallower or deeper penetration of the shoes 5 into the ground according to the position of the lever, or complete elevation of the shoes 5 out of the ground when the lever is in an extreme position.

The draft bars 27 may be rigidly or pivotally secured to the beam 29 but where it is desired to permit considerable degree of movement between the several sections it is preferable to make the connection between the parts 27 and 29 pivotal so that twisting strains on the bars 27 and their brace 29 may be reduced to the minimum.

From the foregoing description, taken in connection with the accompanying drawing, it will be noted that by arranging the units as indicated a well balanced machine is provided and by stepping the units and permitting the rods of the several units to project beyond the ends of the several units, the rod on the right hand unit A can work up close to the fence F while the rods of the other two units overlap the adjacent units sufficiently to take care of that strip of the ground located between the driven end of the rotary rod and the extreme end of the frame adjacent thereto, thus in effect giving the operative advantage of a rotary rod whose length is equal to the overall spread of the machine. Again it will be seen that I have provided a very effective yet simple but strong draft appliance so connected with the several units as to balance the pull or resistance encountered in drawing the machine along and preventing lateral or zig-zag motion of the machine. Furthermore the provision of the single lever lifting device by means of which all of the frames may be tilted in unison, the operation of adjusting the several frames to give the proper penetration of the rod is accomplished with one operation instead of with a series of operations as would be the case

were separate lifting devices on the respective units employed.

Other advantages of the invention will be clear to those skilled in the art.

Furthermore the invention may have its gangs of any number of units from two up, the limit being only that which it is impracticable for a tractor to pull and impracticable to handle in the field. I therefore do not wish to be understood as limiting my invention to a device composed of three units.

In referring in the specification to the "frame" of the weeder unit I do not wish to be understood as limiting myself to any particular type of frame (i. e. one made up of several longitudinal bars connected by transverse bars as shown) but the frame may be made up of a single beam or body or a single element instead of a series of parts rigidly secured into a unitary structure.

While the invention has been especially devised for tractor drawn machines, nevertheless I do not desire it understood as limiting the drafting means to a tractor as horses may be used for pulling the machine over the ground if desired.

While the present invention was devised particularly with respect to rotary rod weeder, it is quite obvious that it may be used in connection with other kinds of agricultural machines as, for instance, stationary rod weeders, blade weeders and other wheeled cultivators employing ground working elements which are adapted to penetrate the surface of the ground and such adaptations can be made without departing from the spirit of the present invention.

From the foregoing description, taken in connection with the accompanying drawing, it is thought the complete construction, operation and advantages of my invention will be clear to those skilled in the art to which it relates.

What I claim is:

1. In combination with a plurality of rotary rod weeder units each including a body having rod supports and a rotatable rod journaled in bearings on said supports, said units also including supporting and driving wheels; means flexibly connecting said units together endwise on longitudinal axes whereby said units may rise and fall to accommodate them to the surface of the ground traversed, the rotary rod of one unit projecting to overlap an adjacent unit whereby to treat the ground by the rods in a continuous way from the outer end of one end unit to the outer end of the opposite end unit for the purposes specified, and a draft appliance connected to the several units.

2. In combination with a plurality of rotary rod weeder units each including a body having rod supports and a rotatable rod journaled in bearings on said supports, said

units also including supporting and driving wheels; means flexibly connecting said units together endwise on longitudinal axes whereby said units may rise and fall to accommodate them to the surface of the ground traversed, the rotary rod of one unit projecting to overlap an adjacent unit whereby to treat the ground by the rods in a continuous way from the outer end of one end unit to the outer end of the opposite end unit for the purposes specified, and a draft appliance connected to the several units, and a lifting device connecting the bodies of said units with said draft appliance.

3. In combination with a central rotary rod weeder unit and side units hingedly connected end to end on longitudinal axes, each unit including a frame, rod standards and a rotary rod; said units including supporting and driving wheels and driving connections between said driving wheels and rotary rods, each unit also including a rock shaft mounted in bearings on the respective frames, flexible connections between the adjacent ends of said rock shafts, a lever for rocking said rock shafts, a draft frame connected with the units and an arm and link connection between said draft frame and said rock shafts.

4. In combination with a central rotary rod weeder unit and side units hingedly connected end to end on longitudinal axes, each unit including a frame, rod standards and a rotary rod; said units being stepped one in advance of another with the rod of one unit overlapping the adjacent unit, said units including supporting and driving wheels and driving connections between said driving wheels and rotary rods, each unit also including a rock shaft mounted in bearings on the respective frames, flexible connections between the adjacent ends of said rock shafts, a lever for rocking said rock shafts, a draft frame connected with the units and an arm and link connection between said draft frame and said rock shafts.

5. In combination with a central weeder unit and side weeder units hingedly connected end to end on longitudinal axes, each unit including a frame, rod standards and a rotary rod, said units including supporting and driving wheels and driving connections between said driving wheels and said units' rods, each unit also including a rock shaft mounted in bearings on the frame, flexible connections between the end of adjacent rock shafts, a lever for rocking said rock shafts, a draft frame including a central rigid section hinged to the frame of the central unit and lateral sections hinged to the frames of adjacent side units, articulated connections between said rock shafts and the draft frame, and means to hold said lever in various positions of adjustment.

6. In combination with a central weeder unit and side weeder units hingedly connect-

ed end to end on longitudinal axes, each unit including a frame, rod standards and a rotary rod, said units including supporting and driving wheels and driving connections between said driving wheels and said units' rods, each unit also including a rock shaft mounted in bearings on the frame, flexible connections between the end of adjacent rock shafts, a lever for rocking said rock shafts, a draft frame including a central rigid section hinged to the frame of the central unit and lateral sections hinged to the frames of adjacent side units, articulated connections between said rock shafts and the draft frame, and means to hold said lever in various positions of adjustment, pendent supports secured to the rear bar of each frame to which pendent supports said draft frame is hingedly connected whereby as said lever is moved the frames of the several weeder units will be inclined as one with respect to said draft frame.

7. In combination with a plurality of rotary rod units including supporting and driving wheels, each unit including a frame, rod supports and a rotary rod; means flexibly connecting said units together endwise to accommodate themselves to the contour of the ground travelled over, the rods of adjacent units overlapping, a draft frame lying beneath the units' frames and hingedly connected to said frames in proximity to places directly over the rotary rods, and a lever operating means associated with the several units for adjustably connecting the draft frame to the several units' frames whereby the planes of the units' frames may be inclined to different angles with respect to the plane of the draft frame.

8. In combination with a plurality of rotary rod units including supporting and driving wheels, each unit including a frame, rod supports and a rotary rod; means flexibly connecting said units together endwise to accommodate themselves to the contour of the ground travelled over, the rods of adjacent units overlapping, said driving wheels including a wheel on one unit with driving connection to the rotary rod of an adjacent unit, a draft frame lying beneath the units' frames and hingedly connected to said frames in proximity to places directly over the rotary rods, and a lever operating means associated with the several units for adjustably connecting the draft frame to the several units' frames whereby the planes of the units' frames may be inclined to different angles with respect to the plane of the draft frame.

9. In a rotary rod weeder, the combination with a unit including a frame, rod carrying standards, a rotary rod and means to rotate the rod and sustain the frame above the ground; a tractor hitch including draft bars hingedly secured to the units' frame at a place in proximity to the rotary rod and ex-

tending forwardly beneath the remainder of the frame and in advance thereof, front and rear cross beams in advance of said frame, and means for rigidly securing said draft bars to said front cross beams, a central draft beam secured to the front and rear cross beams and extending forwardly of the same, and means at the front end of said central draft beam by which it may be secured to a draft appliance.

10. In a rotary rod weeder, the combination with a unit including a frame, rod carrying standards, a rotary rod and means to rotate the rod and sustain the frame above the ground; a tractor hitch including draft bars hingedly secured to the units' frame at a place in proximity to the rotary rod and extending forwardly beneath the remainder of the frame and in advance thereof, front and rear cross beams in advance of said frame, and means for rigidly securing said draft bars to said front cross beams, a central draft beam secured to the front and rear cross beams and extending forwardly of the same, and means at the front end of said central draft beam by which it may be secured to a draft appliance, a rocking shaft journaled in bearings on said weeder frame, arm and link connections between said rock shaft and said tractor hitch, a lever secured to said rock shaft, a holding segment mounted on said weeder frame, said lever having a holding latch associated with said segment, all being arranged whereby upon manipulation of said lever the plane of said weeder frame may be inclined to different angles with respect to the plane of the tractor hitch.

11. In combination with a central rotary rod weeder unit and side units hingedly connected end to end on longitudinal axes, each unit including a frame, rod standards and a rotary rod; said units including supporting and driving wheels and driving connections between said driving wheels and rotary rods, each unit also including a rock shaft mounted in bearings on the respective frames, connections between the adjacent ends of said rock shafts, a lever for rocking said rock shafts, a draft frame connected with the units and an arm and link connection between said draft frame and said rock shafts.

12. In combination with a plurality of agricultural machine units each of which includes a frame mounted on wheels, and ground working elements carried by the frame; means hingedly securing said frames together endwise whereby said units may rise and fall to accommodate the units to the surface of the ground being passed over, a draft frame flexibly connected to the several units and means for tilting all units with respect to the plane of the draft frame.

13. In combination with a plurality of agricultural machine units each of which in-

cludes a frame mounted on wheels, and ground working elements carried by the frame; means hingedly securing said frames together endwise whereby said units may rise and fall to accommodate the units to the surface of the ground being passed over, a draft frame flexibly connected to the several units; and means including a single operating lever for tilting all units with respect to the plane of the draft frame.

14. In agricultural machines, a central unit and side units hingedly connected end to end on longitudinal axes, each unit including a frame, standards and ground working elements carried by the standards; wheels to support said units above the ground combined with a rock shaft for each unit mounted in bearings on the respective frames, connections between adjacent ends of said rock shafts, a lever for rocking said rock shafts, a draft frame connected with said units and an arm and link connection between said draft frame and said rock shafts.

15. A weeder comprising a plurality of rotary rod units, each including a supporting body, a rotary rod and a ground wheel for operating the rotary rod, the rotary rod of one end unit projecting beyond its supporting body whereby to work close up to fences; means hingedly connecting said units together endwise on longitudinal axes whereby said units may rise and fall to accommodate themselves to the surface of the ground traversed; and a draft appliance connected to the said several units.

16. A weeder comprising a plurality of rotary rod units, each including a supporting body, a rotary rod and a ground wheel for operating the rotary rod, the rotary rod of one end unit projecting beyond its supporting body whereby to work close up to fences; and the rotary rods of adjacent units overlapping whereby to treat the ground by the rods in a continuous way from the outer end of one end unit to the outer end of the opposite end unit, means hingedly connecting said units together endwise on longitudinal axes whereby said units may rise and fall to accommodate themselves to the surface of the ground traversed; and a draft appliance connected to the said several units.

17. A weeder comprising a plurality of frames flexibly connected together endwise on longitudinal axes; a rotary rod carried by each frame, one end of each respective rod projecting beyond an end of its frame, means separately effecting rotation of the respective rotary rods; and a draft appliance connected with said frames.

18. A weeder comprising a plurality of units, each including a supporting body, and a rotary rod carried thereby, the rotary rods of the respective units projecting beyond one end of their respective supporting bodies; means for flexibly connecting said support-

ing bodies endwise together; means to drive said rotary rods; a draft appliance connected to said units, the rods of the several units from one end unit toward the other end unit overlapping whereby to treat the ground in a continuous way from the outer end of one end unit to the outer end of the opposite end unit.

19. In combination with a plurality of rotary rod weeder units each of which includes a frame and means for supporting the frame above the ground; means hingedly securing said frames together endwise whereby said units may rise and fall to accommodate the units to the surface of the ground being passed over, a rigid draft frame flexibly connected to the several units and means for tilting all units with respect to the plane of the draft frame.

20. In combination with a plurality of rotary rod weeder units, each of which includes a frame and means for supporting said frame above the ground; means hingedly securing said frames together endwise whereby said units may rise and fall to accommodate the units to the surface of the ground being passed over, a rigid draft frame flexibly connected to the several units and means including a single operating lever for tilting all units with respect to the plane of the draft frame.

21. A plurality of rotary rod weeder units including frames connected endwise and means for supporting said frames above the ground, a tractor hitch comprising a draft frame with draft bars hingedly connected with the respective units' frames, and a lever and link device connecting the several units' frames with the draft frame whereby the units' frames may be inclined to different degrees with respect to the plane of the hitch.

22. In combination with a plurality of rotary rod weeder units each of which includes a frame and means supporting the frame above the ground; means hingedly securing said frames together endwise whereby said units may rise and fall to accommodate the units to the surface of the ground being passed over, a draft frame connected to the several units and means for tilting all units with respect to the plane of the draft frame.

23. In combination with a plurality of rotary rod weeder units each of which includes a frame and means for supporting the frame above the ground; means hingedly securing said frames together endwise whereby said units may rise and fall to accommodate the units to the surface of the ground being passed over, a draft frame connected to the several units, and means including a single operating lever for tilting all units with respect to the plane of the draft frame.

24. A plurality of machine units each in-

cluding frames connected endwise, means for supporting the frame above the ground and ground working elements supported upon the frame; a tractor hitch comprising
 5 a draft frame with draft bars hingedly connected with the respective units' frames at points to the rear of the supporting means, and a lever and link device connecting the several units' frames with the draft frames
 10 whereby the units' frames may be inclined to different degrees with respect to the plane of the hitch.

25. In combination with a plurality of rotary rod weeder units, each of which includes a frame, means for supporting the frame above the ground, a rotary rod and means for rotating the rod; a draft appliance for said units which comprises a tongue, a cross beam rigidly secured to the tongue and
 20 bars connecting said tongue with said frames to apply the draft force at a place to the rear of and below the axes of the frame supporting means, said bars underlying said frames, guides at the front of said frames
 25 for said rods, all being arranged substantially as shown and described.

26. In a rotary rod weeder, the combination of a wheel supported frame, a rotary rod mounted in fixed position thereon, a draft
 30 frame pivotally connected to the wheel supported frame and extending forwardly therefrom, and means for adjusting the relative angular positions of the frames thereby elevating and lowering the rotary rod said draft
 35 frame being positioned to underlie said implement frame and the pivotal axis thereof.

27. A rotary rod weeder comprising, in combination, a rotary weeding rod in fixed position, a wheel supported frame carrying
 40 the rod, a forwardly extending draft frame pivoted to the wheel supported frame and adapted to have its forward end supported by a tractor at a fixed elevation, and manually operable means engaging the frames for
 45 adjusting the angular relations of the frames to vary the ground penetration of the rotary rod said draft frame being positioned to underlie said implement frame and the pivotal axis thereof.

50 28. A rotary rod weeder having a main frame, a draft frame pivotally connected at its rear end to the main frame and overlapping said frame, a tractor hitch at the forward end of the draft frame, and a pressure
 55 regulator adjustably connecting the main frame and the draft frame intermediate the ends of the latter said draft frame being positioned to underlie said main frame.

29. In a rotary rod weeder, a wheel supported frame, a rotary weeding rod carried
 60 by said frame, a draft frame pivotally connected to the wheel supported frame at a substantial distance from the front of the latter and extending forwardly therefrom,
 65 means at the forward end of the draft frame

for attachment to the drawbar of a tractor, and manually operable means intermediate the ends of the draft frame for controlling the position of said rotary rod, said manually operable means being capable of so lifting the
 70 forward end of the wheel supported frame that its entire weight will be carried by the rotary rod said draft frame being positioned to underlie said wheel supported frame.

30. A rotary rod weeder comprising, in combination, a wheel supported frame, a rotary weeding rod carried by said frame, a draft frame extending forwardly of the wheel supported frame and pivotally connected thereto at a position substantially removed from the front of said wheel supported frame, means at the forward end of the draft frame for attachment to the drawbar of a tractor, and a manually operable pressure
 80 regulator connecting the forward end of the wheel supported frame and the draft frame, said pressure regulator being capable of increasing the distance between the forward end of the wheel supported frame and the draft frame for raising the rotary rod from
 90 the ground said draft frame being positioned to underlie said wheel supported frame.

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