March 27, 1928. 1,663,813

W. L. PAUL

RIDGER

Filed June 9, 1922 2 Sheets-Sheet 1

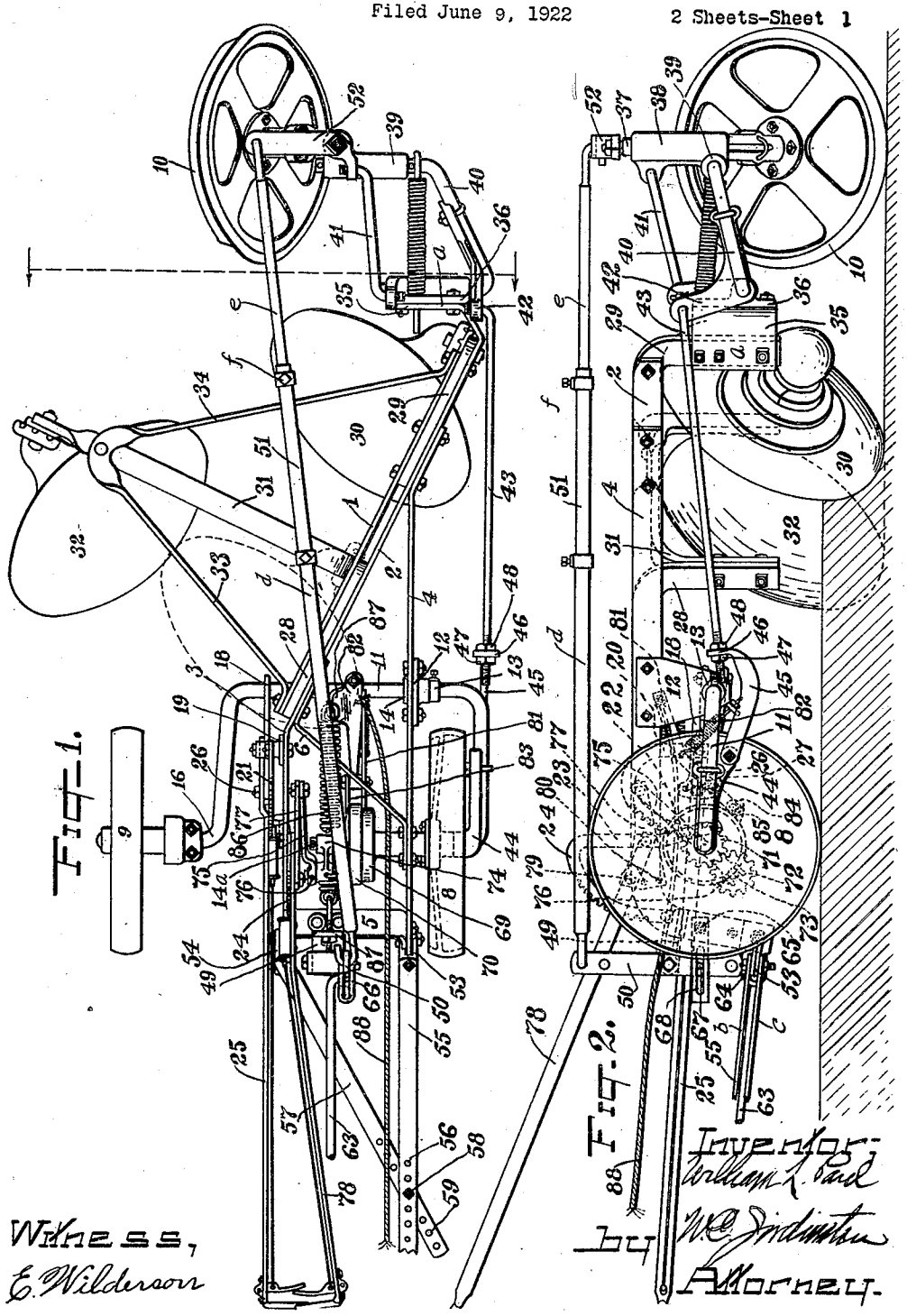


Fig. 1.

Fig. 2.

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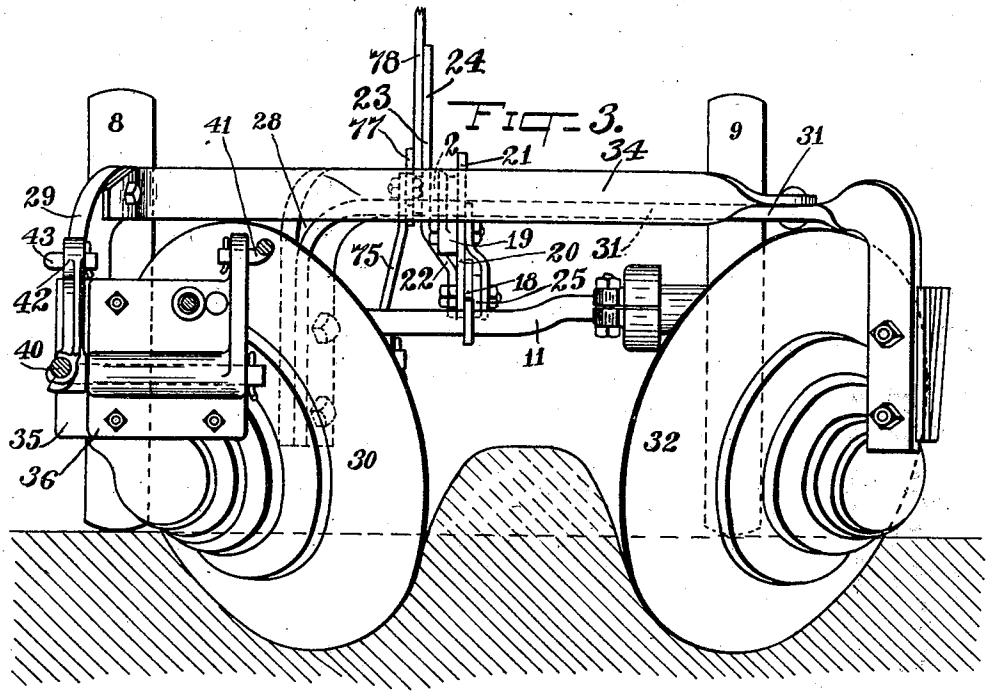


Fig. 3.

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UNITED STATES PATENT OFFICE.

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RIDGER.

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My invention relates to implements employed in turning the soil and more particularly to that class utilized for the purpose of forming ridges to enclose areas of land in orchards and vineyards to be flooded with water for the purpose of irrigation.

An object of my invention is to utilize a double disk plow and convert it into a ridger by removing one of the disks, reversing it to an inthrow position and supporting it on the plow frame in a simple and economical manner so that it will effectively cooperate with the remaining disk to construct a perfect ridge for the desired purpose.

Referring to the drawings in which similar numerals indicate identical parts—

Figure 1 is a plan view of my improved ridger. Figure 2 is a side elevation of Figure 1 showing the ridger in operative position, and Figure 3 is an enlarged rear elevation in part of Figure 2.

The main frame comprises a diagonal composite beam formed, preferably, of flat beams 1 and 2 spaced apart and parallel; the beam 2 is bent at 3 to extend forwardly parallel with the line of draft and with a landward frame beam 4 which, at its rear end, is rigidly connected to the diagonal beam. The forward ends of the beams 2 and 4 are bent downwardly and braced firmly apart by an inverted arch brace 5 bolted to both beams; a brace 6 is interposed between the beams 2 and 4 and is bolted rigidly thereto.

The wheel system on which the ridger is carried includes a landwheel 8, a front furrowwheel 9 and a rear furrowwheel 10. An axle 11 extends transversely of the frame and is journaled in a bearing in a depending bracket 12 secured on the beam 4, the bearing being sufficiently large to permit forward and rearward rocking movement of the axle and also a rocking movement transversely of the frame; I secure the axle 11 from longitudinal movement by collars 13 and 14 on the axle on opposite sides respectively of the bracket 12.

The landward portion of the axle 11 is bent downwardly and terminates in a spindle 14 extending toward the center of the frame and on which is supported the landwheel 8. The furrowward portion of the axle 11 is likewise bent downwardly and terminates in an outwardly extending spindle 16 on which is mounted a furrowwheel 9. Furrowwardly the axle is supported in a bearing on a forwardly extending arm 18 which is pivotally mounted intermediate its length, between the lower end of a bracket 19, bolted to the beam 2, and the lower end of a radius arm 20 of a notched sector 21 which is rigidly attached to the bracket 19 and to a downwardly projecting extension 22 of a radius arm 23 of a notched sector 24 secured on the beam 2. A forwardly extending lever 25 is mounted on the pivot of the arm 18 and is adjustably attached to the forward end by a bolt 26 projecting into any one of a series of holes 27 which are provided in the arm for adjustment of the lever 25 to different positions on the arm 18 to increase or lessen its angular relation therewith. It is readily apparent that by operation of the lever 25 the axle 11 can be rocked transversely in its bearing on the beam 4, relatively to the frame to preserve the level of the ridger. The lever 25 is provided with the usual type of latch to engage with the notches in the sector 21.

Rigidly bolted between the beams 2 and 4 are standards 28 and 29; a plowing disk 30 is mounted on the standard 29. A supplemental frame consisting of a furrowwardly extending arm 31 is mounted on the standard 28 and at its furrowward end is bent downwardly to form a support for a disk 32 which is mounted thereon forwardly of the disk 30 and positioned to operate in a direction contrary to the operation of the disk 30 so that the disks are both inthrow, resulting in the formation of a ridge between them as clearly shown in Figure 3. When the plow is operating to turn the furrows in the same direction the disk 32 is mounted on the standard 28, as shown in dotted lines in Figure 1, and is dismounted therefrom and secured on the downwardly extending part of the arm 31 so that the plow will operate as a ridger. To add rigidity to the structure part of the supplemental frame is a V-shaped brace secured to the arm 31, adjacent the disk 32, the arms 33 and 34 thereof extending to the diagonal beam of the main frame to which they are bolted. A bracket *a* composed of parts 35 and 36 is bolted to the standard 29.

The rear furrowwheel 10 is supported on an axle having a vertical spindle 37 journaled in a vertical bearing 38 and extending above the upper end thereof. A sleeve 39,

preferably integral with the bearing 38, extends horizontally landward and journaled therein is an arm of a horizontally disposed U-shaped member 40; the remaining arm of the member 40 is supported in bearings on the part 36 of the bracket *a*. A link 41 is connected to an eye in the upper end of the vertical bearing 38 and extends, in parallelism with the member 40, to connection with an eye in the part 36 of the bracket *a*.

An upstanding arm 42 is rigidly attached to the member 40 and has an eye in its upper end in which is hooked an end of a forwardly extending rod 43. Secured to the landward crank arm of the axle 11 is a casting 44 having a portion extending rearwardly to which is pivotally attached a link 45; the link 45 is bent upwardly at its rear end and through an eye 46 therein the rod 43 extends and is rigidly and adjustably secured in place by nuts 47 and 48 on opposite sides respectively of the link 45.

Mounted on the arch brace 5 is a forwardly extended bracket 49; a vertically disposed rocker arm 50 is supported, intermediate its length, on the bracket 49. The upper end of the rocker arm 50 is provided with an eye in which is hooked an end of a steering rod 51; the steering rod 51 extends rearwardly to hook engagement with a steering arm 52 rigidly attached to the upper end of the spindle 37. On the forward termination of the frame beam 4 is mounted, on a horizontal pivot, a coupling 53, and a similar coupling 54 is mounted in a similar manner on the beam 2. A draft bar 55 is attached to the coupling 53 on a vertical pivot, and is provided with a series of holes 56 intermediate its ends; a draft bar 57 is secured to the coupling 54 in a similar manner and extends diagonally to the draft bar 55 which is composed of parallel flat bars *b* and *c* spaced apart and between which the draft bar 57 is adjustably held by a bolt 58 passed through holes in the draft bar 55 and any one of a series of holes 59 in the draft bar 57.

A rod 63 extends rearwardly, substantially parallel with the draft bar 55, and its rear end is bent horizontally to an approximate right angle and is journaled in a casting 64 secured on a vertical pivot on the lower end of the rocker arm 50. Below the arch brace 5 and extending between the frame beams 2 and 4, and to which it is secured, is a shaft 65 on which is pivotally supported a forwardly extending arm 66. The arm 66 is formed of a single flat bar bent upon itself and embraces the rocker arm 50 below the pivotal support of the latter on the bracket 49. The rocker arm 50 is provided with a pin 67 projecting from both sides of the rocker arm and engaging with slots 68 in the arm 66 and longitudinal thereof.

The ridger is raised by traction power of the land-wheel 15 by well known mechanism which includes a clutch having one of its parts 69 rigidly attached to the hub of the landwheel 8; the second part 70 of the clutch is loosely mounted on the spindle 14ª and has, preferably integral therewith, a sun gear 71. A planet gear 72 meshes with the sun gear 71 and is rigid with a stub shaft 73 journaled in a bearing on a member 74, the latter rotatably supported on the spindle 14 adjacent the sun gear 71. A link 75 has a bifurcated end embracing the stub shaft 73 and is secured thereto by a pin 76 which passes through the stub shaft and the end of the link 75; the upper end of the link 75 is pivotally attached to the rear end of an arm 77 which is pivoted intermediate its length on the beam 2 and on the same pivot is supported a lever 78 secured to the forward end of the arm 77 by a bolt 79 extending through the lever 78 and any one of a series of holes 80 in the forward end of said arm; by supplying a plurality of holes 80 it is possible to adjust the lever 78 to varying degrees of angularity relative to the arm 77 and the frame. By actuation of the lever 78 the operating depth of the ridger is regulated.

A tripping lever 81 is pivotally supported, intermediate its length, on the end of an arm 82 rigidly mounted on the axle 11. On the opposite side of the arm 82, and secured to the arm by the bolt which forms the pivot of the tripping lever 81, is a strap 83 parallel with said lever, and between the lower ends of the strap 83 and lever 81 is mounted a roller 84 which is adapted to rest upon a dog 85 to hold the clutch out of engagement. A relief spring 86 is attached to a lug 87 on the arm 82 adjacent the axle 11, and extends to the arch brace 5 to which it is connected. From the upper end of the tripping lever 81 a rope 88 leads to the tractor within convenient reach of the operator, whereby the tripping lever 81 can be operated to bring into play the mechanism just described to rock the axle 11 and raise the ridger by the traction power of the landwheel 8.

It will be noted that in the construction of my ridger the parts have been so arranged as to present a low compact, efficient mechanism, and, as clearly shown in Figure 2, with all the parts, liable to cause injury to low hanging branches of an orchard, below the top level of the frame, and where any part is above the level of the frame it is fended by the steering rod 51.

The front and rear of the ridger are raised simultaneously, for when the clutch is tripped into operation and the axle 11 rocks and raises the ridger, the rod 43, through its connection with the axle 11, is forced rearwardly, and as it is attached to the arm 42 on the U-shaped member 40 the latter is

rocked raising the rear of the ridger, the member 40 operating as a lever having its fulcrum in the sleeve 39. By this construction the parts just stated are well below the frame level and out of the way, and the wheel 10 is substantially in the longitudinal central plane of the ridger, and its mounting within the transverse limit of the frame.

As previously stated the draft bars 55 and 57 are adjustably connected for the purpose of offsetting the ridger from the line of travel of the tractor, the series of holes in each bar providing for such adjustment, and its retention by the bolt 58. The draft bar 55 and the rod 63 are substantially parallel, consequently when the ridger is offset from the tractor, to operate close to the trees, the links 60 and 61 are parallel with the line of advance of the tractor and ridger, but if a turn or change in the direction of travel of the tractor is made the links 60 and 61 swing with the pull of the tractor rocking the arm 50, through connection of the rod 63 therewith and with the arm 62 on the link 60; rocking the arm 50 actuates the steering rod 51, connected to the steering arm 52 on the spindle 37, consequently the rear furrowwheel 10 steers to follow the turn of the tractor. The steering rod 51 is made in two parts *d* and *e*, one telescoping within the other, to provide for any needed adjustment in the length of the rod, and by means of a set screw *f* the two parts are held rigidly together.

In the mechanism herewith described, and illustrated in the drawings, I have shown a ridger formed from a gang disk plow, of a well known type, such as shown and described in my application of even date herewith, in which the disks are mounted on the frame in stepped relation one on each side of the longitudinal center of the plow, and normally operate to turn the soil in one direction. In my invention the change is readily made from a gang plow to a ridger, without decreasing the efficiency of operation and with an economy of manufacture.

What I claim is—

1. In a gang plow, including a wheel-supported diagonal plow beam and two plowing disks, the combination therewith of an arm rigidly supported on the beam and extending furrowwardly, braces secured to said arm adjacent the outer end thereof and to the beam, and means to secure one of said disks to the outer end of the arm furrowwardly of the other disk to operate toward the other disk and in an opposite direction to the operation thereof.

2. In a gang plow, having a wheel-supported frame including a diagonal plow beam and two plowing disks, the combination therewith of an arm rigidly supported on said beam and extending furrowwardly, a V-shaped brace having its apex secured to said arm adjacent the furrowward end thereof, the ends of said brace bolted to said beam forward and rearward of the arm respectively, one of said disks mounted on said beam and the other disk mounted on the furrowward end of said arm, said disks being positioned to turn the soil toward each other.

WILLIAM L. PAUL.