Oct. 23, 1923. 1,471,692

A. W. GUILD

ROTARY HARROW

Filed Aug. 31, 1922 2 Sheets-Sheet 1

Fig. 1.

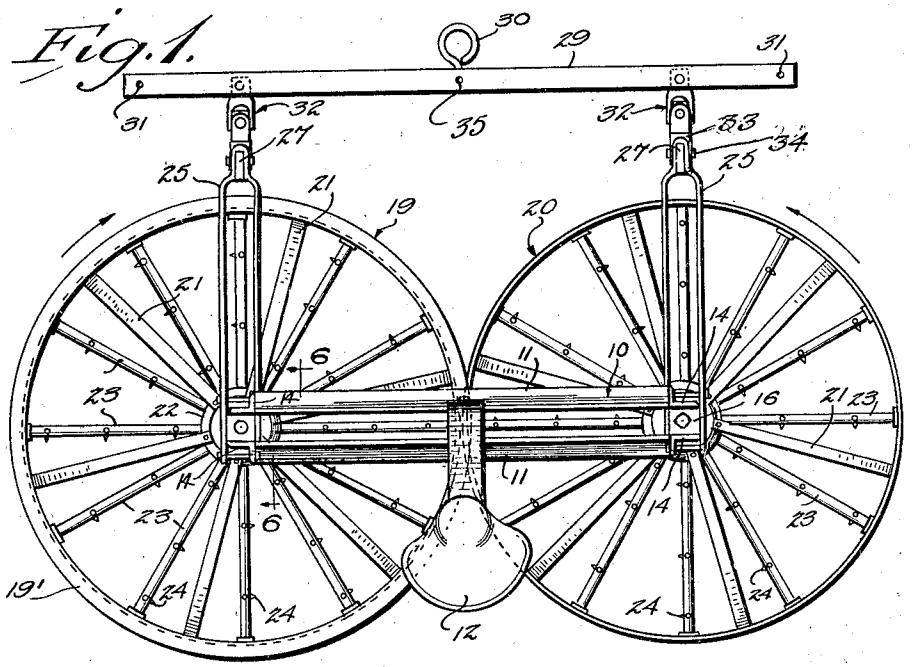
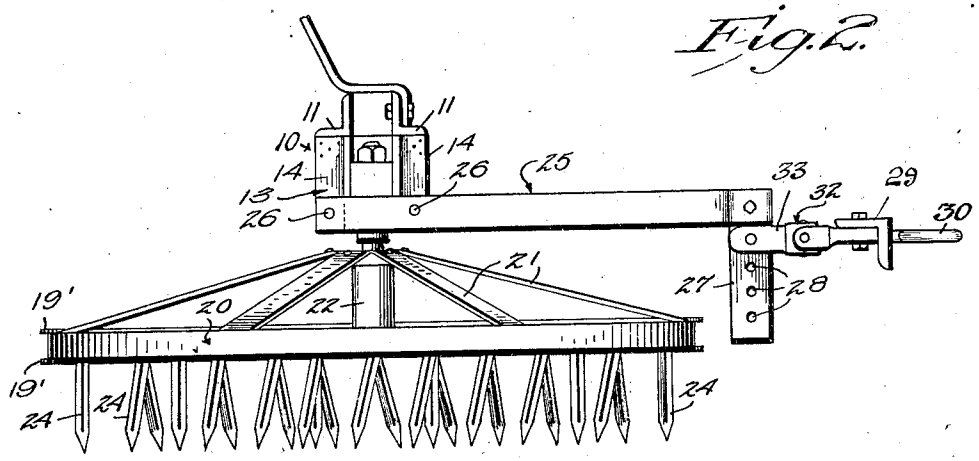


Fig. 2.



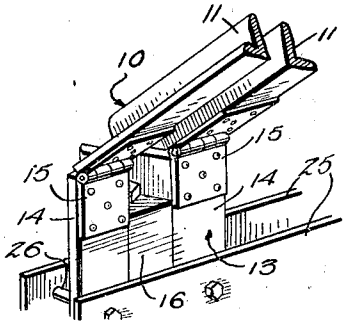


Fig. 3.

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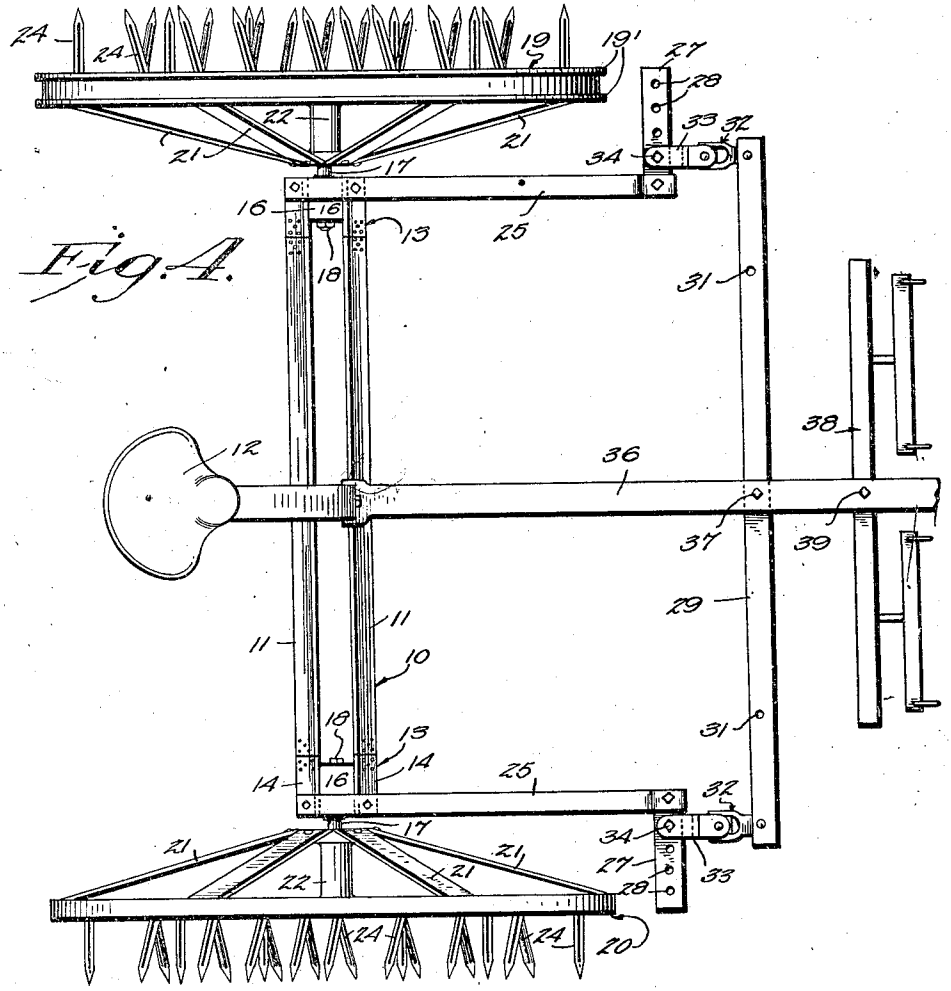


Fig. 4.

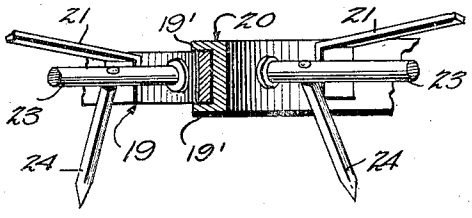


Fig. 5.

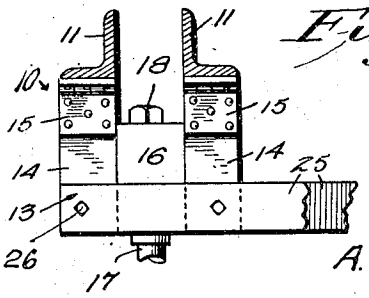


Fig. 6.

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Patented Oct. 23, 1923. 1,471,692

UNITED STATES PATENT OFFICE.

ANDREW W. GUILD, OF HOUSTON, TEXAS.

ROTARY HARROW.

Application filed August 31, 1922. Serial No. 585,502.

To all whom it may concern:

Be it known that I, ANDREW W. GUILD, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Rotary Harrows, of which the following is a specification.

This invention relates to rotary harrows and more particularly to such a device wherein the rotating elements that carry the harrow teeth are in the form of wheels adapted to be swung to a vertical position to operate as traction wheels whereby the harrow may be easily taken to and from the field upon which it is to be worked.

An important object of the invention is to provide a device of the above mentioned character wherein the rotating elements, when in operative position, are arranged with their edges in contact with each other, means being provided to prevent vertical displacement of the contacting edges of the wheels.

A further object of the invention is to provide universally connected draft means whereby the wheels may shift their position to accommodate themselves to the contour of the ground over which they are passing.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the drawings, I have shown one embodiment of the invention. In this showing,

Figure 1 is a plan view of the device in use as a harrow,

Figure 2 is a side elevation,

Figure 3 is a fragmentary perspective of the hinged connection between the main and auxiliary frames,

Figure 4 is a plan view of the device in use as a land vehicle,

Figure 5 is a detail sectional view through the contacting edges of the wheels, and,

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

Referring to the drawings, the numeral 10 designates, as a whole, a main frame consisting of spaced angle irons 11 arranged as shown in Figure 6. A seat 12 is preferably connected to the forward angle iron 11 of the main frame 10.

An auxiliary frame 13 is mounted at each end of the main frame 10 and these auxiliary frames are formed of spaced angle irons 14 corresponding in arrangement to the angle irons 11 and arranged in alinement therewith. Hinges 15 are connected between the angle irons 11 and 14 to permit the latter to assume a horizontal position or to swing downwardly through an angle of 90° to assume a vertical position. An axle block 16 is mounted between each pair of angle irons 14 intermediate the ends thereof. The blocks 16 are provided with openings in which are mounted the inner ends of stub axles 17 secured thereto as at 18.

Wheels 19 and 20 are mounted on the stub axles 17 as shown. The wheel 19 is provided with spaced peripheral flanges 19′ to form an angular groove adapted to receive the rim of the wheel 20 when the wheels are in the position shown in Figure 1. The wheels 19 and 20 are provided with radially arranged spokes 21 secured to hubs 22 which rotatably receive the stub axles 17. Radial tooth bars 23 are connected between the hubs and the rims of the wheels and these bars are provided with angularly arranged harrow teeth 24. The angular arrangement of the teeth 24 is such that the teeth upon one side of each wheel will offer more resistance to the ground than the teeth upon the other side of the wheels so that the wheels will turn as the harrow passes over the ground, as shown by the arrows in Figure 1.

The numeral 25 designates a pair of draft beams which are substantially U-shaped as shown, the rear or free ends of the beams straddling the outer ends of the angle irons 14 being secured thereto as at 26. The outer or closed ends of the beams 25 are arranged in proximity to each other as shown in Figure 1, and adjusting bars 27 are mounted between the sides of the beam, being secured thereto in any suitable manner. When the harrow wheels are in the position shown in Figures 1 and 2, the bars 27 depend vertically from the beams 27 as shown in Figure 2. The bars 25 are provided with a series of openings 28 for a purpose to be described.

A draft bar 29 is arranged transversely of the harrow adjacent the forward ends of the beams 25 and is provided with a suitable draft link 30. The bar 29 is provided adjacent its ends with openings 31, the inner openings 31 being adapted for connection with universal joints 32, when the wheels are

in the position shown in Figure 1. The inner member of each universal joint is swivelly connected with a substantially U-shaped member 33 which is adapted for connection through one of the openings 28 of the bars 27 by means of bolts 34.

The drift bar 29 is provided substantially centrally thereof with an opening 35 to which is connected a tongue 36, by means of a bolt 37. A double-tree 38 may be secured to the tongue 36 as at 39 to which draft animals may be hitched for pulling the harrow.

The operation of the device is as follows: When it is desired to employ the device as a land vehicle, as when taking it to and from the field to be worked, the angle irons 14 are swung to the horizontal position as shown in Figure 4, the edges of the vertical portions of the angle irons 11 and 14 contacting with each other to prevent the wheels from swinging upwardly. The members 33 are then connected to the inner openings 28 and the universal joints connected to the outer openings 31 of the draft bar 29, see Figure 4.

When it is desired to employ the device as a harrow the tongue 36 and double-tree 38 are removed from the frame 10 and draft bar 29, the device being drawn through the medium of the draft link 30. The universal joints 32 are disconnected from the outer openings 31 and the frames 13 swung downwardly to a vertical position whereby the wheels 19 and 20 assume a horizontal position with the teeth 24 in contact with the ground. When the frames 13 are swung downwardly the draft beams 25 move inwardly to the position shown in Figure 1 and the universal joints 32 are then connected to the bar 29 through the inner openings 31. When the wheels are swung to the position just described, the rim of the wheel 20 is arranged within a groove formed between the flanges 19′ of the wheel 19. The wheels being freely hinged to the frame 10, they are permitted to rock slightly to accommodate themselves to the varying contour of the ground upon which the device is employed, the flanges 19′ serving to maintain the contacting edges of the wheels in alinement. The depth of penetration of the teeth 24 may be varied by connecting the U-shaped members 33 in selected openings 28. When the members 33 are connected in one of the lower openings 28 there is a tendency for the wheels 19 and 20 to lift slightly whereby a relatively shallow cut will be made, a deeper penetration of the ground being accomplished by connecting the members 33 through upper openings 28.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:

1. A device of the character described, comprising a main frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each auxiliary frame and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the rim of one wheel being provided with an annular groove to receive the rim of the other wheel, and draft means connected with said frame.

2. A device of the character described, comprising a main cross frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each auxiliary frame and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the rim of one wheel being provided with an annular groove to receive the rim of the other wheel, and a draft bar universally connected with said frame.

3. A device of the character described, comprising a main cross frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each auxiliary frame and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the rim of one wheel being provided with an annular groove to receive the rim of the other wheel, draft beams rigidly connected with said auxiliary frames, and a draft bar universally connected with said beams.

4. A device of the character described, comprising a main cross frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each auxiliary frame and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the

rim of one wheel being provided with a groove to receive the rim of the other wheel, draft beams rigidly connected with said auxiliary frames, and a draft bar mounted adjacent the forward ends of said beams and universally connected at opposite ends therewith.

5. A device of the character described, comprising a main cross frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each auxiliary frame and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the rim of one wheel being provided with an annular groove to receive the rim of the other wheel, a draft bar universally connected with said frame, and means for adjusting the height of said bar.

6. A device of the character described, comprising a main cross frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each of said auxiliary frames and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the rim of one wheel being provided with an annular groove to receive the rim of the other wheel, draft beams rigidly connected with said auxiliary frames, a draft bar universally connected with said beams, and means for varying the height of said universal connection.

7. A device of the character described, comprising a main cross frame, an auxiliary frame hinged at its inner end to each end of said main frame, a stub axle carried by each auxiliary frame and extending outwardly thereof, a traction wheel including a rim mounted on each of said axles, said wheels being provided with outwardly extending harrow teeth, said auxiliary frame being adapted to swing downwardly to dispose said wheels horizontally with the harrow teeth thereof projecting downwardly, the rim of one wheel being provided with an annular groove to receive the rim of the other wheel, a forwardly extending draft beam rigidly connected with each of said auxiliary frames, the forward ends of said beams being provided with horizontal outstanding projections, said projections being adapted to assume a vertical position when said wheels assume a horizontal position, a draft bar mounted adjacent the forward ends of said beams, and means for connecting said bar to selected positions on said projection when it is in a vertical position.

8. A device of the character described, comprising a main cross frame formed of a pair of spaced angle irons, a pair of similarly formed auxiliary frames pivoted to the outer ends of said main frame in alinement therewith, an axle block rigidly mounted between the angle irons of each of said auxiliary frames, said blocks being provided with outstanding stub axles, traction wheels mounted on said axles and provided with outstanding harrow teeth, said wheels being adapted to swing downwardly to a horizontal position with said harrow teeth projecting downwardly, and draft means connected with said frame.

9. A device of the character described, comprising a main cross frame formed of a pair of spaced angle irons, a pair of similarly formed auxiliary frames pivoted to the outer ends of said main frame in alinement therewith, an axle block rigidly mounted between the angle irons of each of said auxiliary frames, said blocks being provided with outstanding stub axles, traction wheels mounted on said axles and provided with outstanding harrow teeth, said wheels being adapted to swing downwardly to a horizontal position with the harrow teeth projecting downwardly, a substantially U-shaped forwardly extending traction beam rigidly connected at its free end to each of said auxiliary frames, and a draft bar universally connected adjacent each end of the forward ends of said draft beams.

10. A device of the character described, comprising a main cross frame formed of a pair of spaced angle irons, a pair of similarly formed auxiliary frames pivoted to the outer ends of said main frame in alinement therewith, an axle block rigidly mounted between the angle irons of each of said auxiliary frames, said blocks being provided with outstanding stub axles, traction wheels including rims mounted on said axles and provided with outstanding harrow teeth, said wheels being adapted to swing downwardly to a horizontal position with said harrow teeth projecting downwardly, the rim of one of said wheels being provided with an annular groove adapted to receive the rim of the other wheel when said wheels are in horizontal position, and draft means connected with said frame.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW W. GUILD.

Witnesses:
T. G. Ford,
P. Thetford.