March 28, 1939. G. FERRARO 2,152,347

DISK RIDGER

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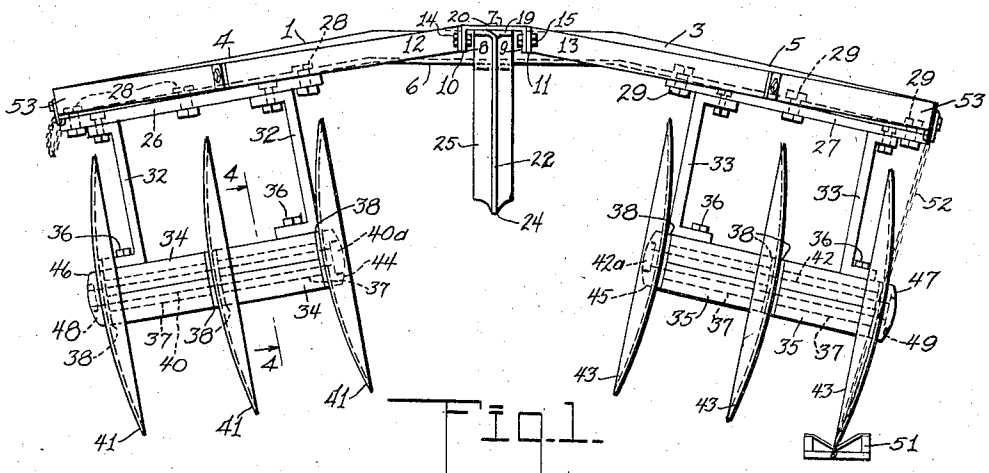


FIG. 1

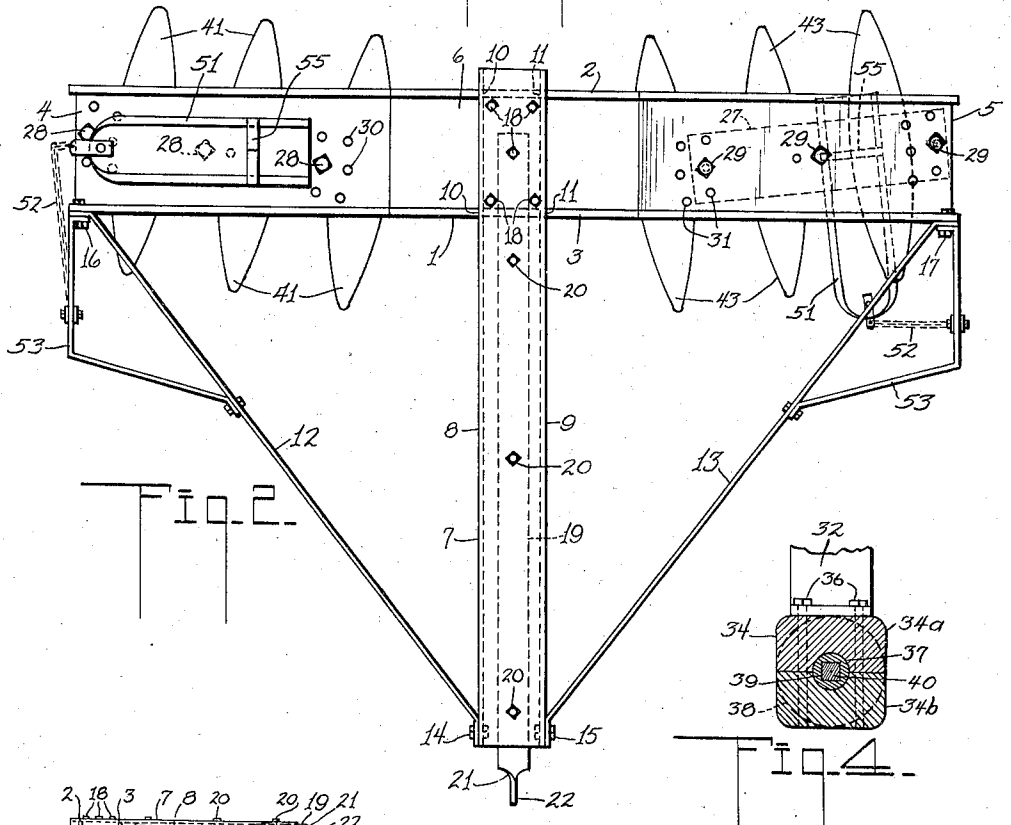


FIG. 2

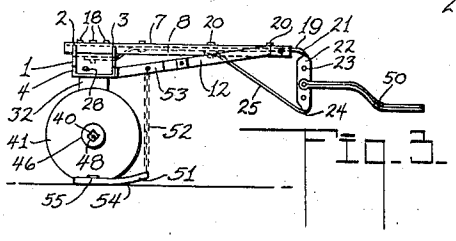


FIG. 3

FIG. 4

INVENTOR.
GILIO FERRARO
BY Munn, Anderson & Liddy
ATTORNEYS.

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DISK RIDGER

Gilio Ferraro, Hollister, Calif.

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7 Claims. (Cl. 55—30)

My invention relates to improvements in a disk ridger for irrigation purposes, and it consists of the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide a disk ridger in which the ends of the frame are inclined downwardly at the desired angle so as to support disk carrying shafts at the same angles. A plurality of discs are mounted on each shaft and the ground contacting portions of the discs in each group will be at different levels. This will cause the outermost disks to first dig into the dirt and move it toward the center of the device. The next disc of each group or set will then engage with the dirt and will move it nearer the center of the device. Finally the innermost disks will engage with the dirt and form it into a ridge, approximately one and one-half feet high. Space is provided between the center portion of the frame and the ground for a ridge up to two and one-half feet in height. The device can make use of large disks 24 inches in diameter and when these are used, a ridge will be built up to a height of two and one-half feet in two operations or movements of the device, over the same ground.

I provide novel means for swinging the axes of the shafts in inclined planes that are parallel with the inclined ends of the frame. These shafts may be swung so that their axes will lie in a vertical plane that extends at right-angles to the line of movement of the device or they may be swung so as to extend at different angles. The changing of these angles will cause the disks to move a greater or less amount of dirt toward the center of the device. The tongue for drawing the device over the ground carries a vertical member at its free end that is provided with openings, and a draw bar may be attached to the member by passing a bolt through any one of the desired openings. By this means the angle of the tongue may be changed from a horizontal position to a downwardly inclined position and this will move the disks so that they will penetrate a less distance into the ground and therefore move a smaller quantity of earth. In this simple way the height of the ridge may be controlled.

When the device is being transported, I provide shoes that may be placed beneath the outermost disks, and these shoes will ride upon the ground and support the device so that the disks will not cut into the ground. The device is extremely simple in construction and is durable and efficient for the purpose intended.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawing forming a part of this application, in which

Figure 1 is a front elevation of the device;

Figure 2 is a top plan view;

Figure 3 is a side elevation on a reduced scale; and

Figure 4 is an enlarged section along the line 4—4 of Figure 1.

In carrying out my invention I provide a frame composed of a channel iron indicated generally at 1. This channel iron has its side flanges 2 and 3 turned upwardly and has its end portions 4 and 5, inclined downwardly at a slight angle from a horizontal central portion 6. A tongue indicated generally at 7 is also made from channel iron and it has its side edges 8 and 9 turned downwardly and receivable in slots 10 and 11, see Figure 1, in the sides 2 and 3 of the channel iron 1. The tongue 7 is braced to the channel iron 1 by means of bracing members 12 and 13 which are connected to the free end of the tongue by bolts 14 and 15 and are connected to the ends of the channel iron 1 by bolts 16 and 17. The tongue 7 is secured to the channel 1 by bolts 18.

Within the tongue 7, I dispose a bar 19 and this bar is secured to the under surface of the tongue by means of bolts 20. The portion of the bar 19 that projects beyond the free end of the tongue 7 is bent downwardly at 21 and is also twisted through an arc of 90°, see Figure 3. The portion 22 of the bar 19 extending downwardly from the bend 21 is provided with a plurality of openings 23. The bar 19 is again twisted through an arc of 90° at 24 and is inclined upwardly at an angle at 25, see Figure 3, and has its free end secured in place by one of the bolts 20. The other end of the bar 19 is bent so as to underlie the channel 1 and is attached to the channel by means of one of the bolts 18, see Figure 3.

The inclined ends 4 and 5 of the channel iron 1 extend at the proper angle with respect to the ground. Plates 26 and 27 are disposed beneath the inclined portions of the channel and are adjustably secured in place by means of bolts 28 and 29. Figure 2 shows the channel 1 provided with two sets of openings 30 and 31 for receiving the bolts of the plates 26 and 27. The sets of openings are so arranged that the plates may be shifted laterally toward or away from the center of the device and may also be swung into angular positions. The plates 26

and 27 carry supports 32 and 33 respectively, and these supports in turn are secured to housings 34 and 35. Figure 4 shows one of the housings 34, and it will be seen that the housing has an upper half-section 34a, and a lower half-section 34b. Screws 36 are passed through the flanged ends of the supports 32 and 33, and these screws extend down into the housings 34 and 35 for securing the two sections of each housing together and also for securing each housing to its support.

Within the housings, I mount spools 37 that have flanged ends 38 shaped for rotatably engaging with the ends of the housings and for engaging with disks. The spools 37 are provided with square bores 39 and these receive square shafts. In Figure 1, I show a square shaft 40 carried by the spools and in turn supporting a gang of disks 41. I further show, in Figure 1, another square shaft 42 mounted in spools and supporting a second gang of disks 43. The shafts 40 and 42 have square heads 40a and 42a, receivable in square recesses in a washer. I provide a washer 44 for the shaft 40 and a washer 45 for the shaft 42. The other ends of the shafts pass through bumper washers 46 and 47 respectively, and the whole assembly is held by nuts 48 and 49 mounted on the free ends of the bolts. The construction is such that the gang of disks on each shaft must rotate as a unit because the disks are provided with square openings that receive the square shafts. The disks in rotating, carry the spools therewith, and the spools in turn rotate in the housings.

In Figure 3, I show a draw bar 50 secured to the vertical portion 22 of the bar 19 by means of a bolt or a pin. The free end of the draw bar 50 is connected to a tractor, not shown. The type of draw bar shown at 50 is used where a low seat tractor is employed for pulling the device. The low seat tractor is normally used in orchards. Where a tractor is used that carries a high seat rather than a low one, a straight type of draw bar may be used.

When it is desired to move the device over the ground without causing the disks to dig into the ground, I provide shoes 51 of the shape shown in Figures 1, 2 and 3. These shoes are connected by chains 52 to braces 53, and the braces in turn are connected to the members 12 and 13.

When the shoes are not in use they are placed up on the top of the channel iron 1, as illustrated by the left-hand shoe of Figure 2. When the shoes are used they are placed beneath the outermost disks of each gang, as illustrated by the right-hand shoe in Figures 1 and 2. The chains 52 keep the shoes beneath the disks as the device is moved over the ground. It will be noted from Figure 3 that the under surface of the shoe is curved as at 54 so that it will ride over the surface of the ground. In Figures 1 and 2 I show a V-shaped strip 55 extending between the sides of the channel-shaped shoe and this strip supports the disk.

From the foregoing description of the various parts of the device, the operation thereof may readily understood.

When using the device, the shoes are placed on the channel iron 1 as already stated. The plates 26 and 27 are adjusted to the desired angular position by means of the bolts 28 and 29 and the draw bar 50 is connected to the member 22, at the desired point. The device is now attached to a tractor and is moved over the ground. Due to the inclination of the shafts, the outermost disks of each gang will first engage with the ground and, as already stated, will move the earth toward the center of the device. The middle disks in each gang or set will then engage with the earth and will move it nearer the center. The innermost disks will be the last to engage with the earth and are disposed at a sufficient height above the outermost disks to form this earth into a ridge that is approximately one and one-half feet high. This height of ridge is made with one operation of the machine and the second operation will build the ridge to a two foot level. Such a ridge is formed when using disks 22 inches in diameter.

If it is desired to make a higher ridge, disks 24 inches in diameter may be used, and with two operations of the device will form a ridge two and one-half feet in height. It will be seen that a changing of the angular positions of the plates 26 and 27 will change the angle of the disks 41 and 43 and therefore the amount of earth moved toward the center of the device can be controlled. The depth of the cut made by the disks can be controlled by attaching the draw bar 51 at the desired point in the vertical portion 22. The disks will dig the deepest when the tongue 7 is disposed in a horizontal position as shown in Figure 3. When, however, the tongue is inclined downwardly at a slight angle the outermost disks will be swung rearwardly and upwardly a slight distance, with respect to the innermost disks, with the result that the vertical distance between the lower edges of the innermost disks and the lower edges of the outermost disks will be reduced. This will cause the device to make a more shallow cut in the earth.

In the standard disk ridger, rollers are provided on top of the frame for supporting the device when it is moved from place to place. This necessitates the inverting of the device in order to bring the rollers into operation. In my device, I place the shoes 51 beneath the outermost disks of each gang and these shoes are held in place by the chains 52 and will therefore support the disks. The device may be transported from place to place in this manner, the shoes sliding on the ground. It should be noted that the inclined ends of the frame not only give the desired angle to the shafts for holding the disks at the proper levels, but this also permits the ends of the frame to more readily clear low hanging branches of trees.

While I have shown only the preferred form of my invention, it should be understood that various changes or modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A disk ridger comprising a frame with downwardly inclined ends, two sets of disks, a separate support for each set, each support being placed beneath one of the downwardly inclined ends for disposing the outermost disk in each set at a lower level than the innermost disk of the same set, and means for adjustably securing the supports to the frame for positioning the sets of disks nearer or further away from the center of the frame, the downwardly inclined ends acting as positioning means for holding the disk sets at the same inclined angles, regardless of the distance that separates them from the frame center.

2. A disk ridger comprising a frame with downwardly inclined ends, two sets of disks, a separate support for each set, each support being placed beneath one of the downwardly inclined ends for

disposing the outermost disk in each set at a lower level than the innermost disk of the same set, and means for adjustably securing the supports to the frame for positioning the sets of disks nearer or further away from the center of the frame, the downwardly inclined ends acting as bearing plates for holding the disk sets at the same inclined angle, regardless of their distance away from the center, said means also being designed to secure the supports to the downwardly inclined ends of the frame for holding the disk sets in the desired angular position with respect to the direction of travel

3. The combination with a disk ridger having a frame, disks carried by the frame and being disposed at different levels, the outermost disks on the frame being disposed at the lowest level, shoes slidable beneath the outermost disks for supporting the disks above the ground, and flexible means connecting the shoes with the frame.

4. The combination with a disk ridger having a frame, disks carried by the frame and being disposed at different levels, the outermost disks on the frame being disposed at the lowest level, shoes slidable beneath the outermost disks for supporting the disks above the ground, and flexible means connecting the shoes with the frame, said means permitting the shoes to be carried by the frame during the operation of the device.

5. A disk ridger comprising a frame with downwardly inclined ends, two sets of disks, a support for each set and including a plate designed to contact with the under surface of the inclined frame end, each frame end having a set of prearranged openings, and bolts passed through the desired openings and connecting the plates with the frame ends, said openings permitting the plates to be adjusted toward or away from the center of the frame and also permitting an angular adjustment to be made.

6. A disk ridger comprising a channel-shaped frame with its flanged sides extending upwardly and its ends extending downwardly at a slight angle, a channel-shaped tongue secured to the mid-portion of the frame, a bar secured to the tongue and having a portion bent at right angles and positioned in front of the tongue channel, a draw bar connectible at various levels to the bar portion, and two sets of disks, each set being secured to the inclined portions of the frame.

7. A disk ridger comprising a channel-shaped frame with its flanged sides extending upwardly and its ends extending downwardly at a slight angle, a channel-shaped tongue secured to the mid-portion of the frame, a bar secured to the tongue and having a portion bent at right angles and positioned in front of the tongue channel, a draw bar connectible at various levels to the bar portion, and two sets of disks, each set being secured to the inclined portions of the frame, a shoe for each set of disks, flexible means securing the shoes to the frame, said shoes being carried by the frame during the operation of the device and being insertable beneath certain of the disks when it is desired to transport the device over the ground without digging.

GILIO FERRARO.