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DISK HARROW.

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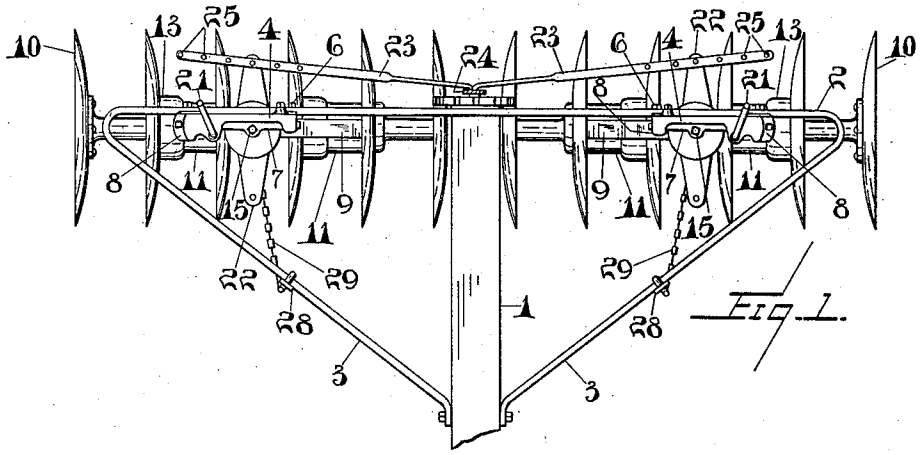


Fig. 1.

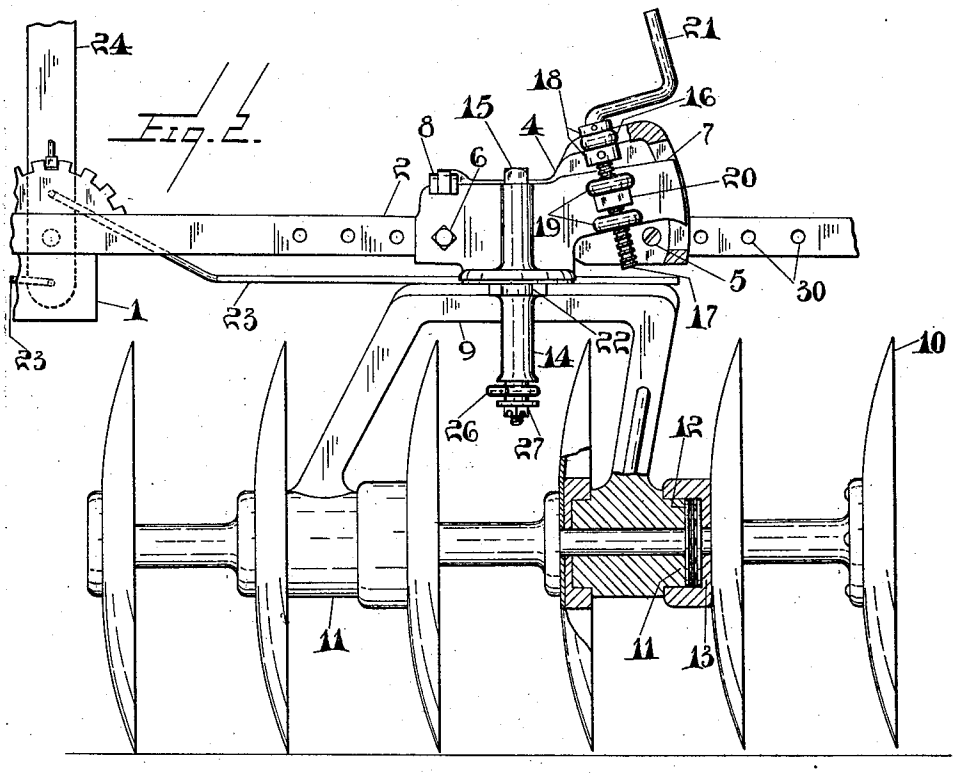


Fig. 2.

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DISK HARROW.

1,162,332. Specification of Letters Patent. Patented Nov. 30, 1915.

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To all whom it may concern:

Be it known that we, ALBERT ERNEST BUCHANAN and HENRY GAFFNEY, of the city of Toronto, in the county of York, Province of Ontario, Canada, subjects of the King of Great Britain, have invented certain new and useful Improvements in Disk Harrows, of which the following is a specification.

The invention relates to harrows of the type in which two gangs of rotary concavo-convex disks are connected with a transverse arch or frame connected with a suitable tongue. In such harrows it is frequently desirable that the gangs be arranged so that they may be set so as to throw the soil either inward or outward, and it is also necessary to be able to vary the angle of the gangs to the line of draft. Difficulty is commonly experienced in holding down the inner or outer ends of the gangs to their work, and for this purpose spring pressure is often employed.

Our object is to devise a harrow which may be quickly and easily reversed and the angles of the gangs adjusted when in either position, and in which the angles of the gangs to the horizontal may be varied to shift more or less of the weight of the frame and driver on to the inner or outer ends of the gangs as may be necessary to hold them down.

We attain our object by supporting each gang on a fork pivotally connected by means of a vertical king pin with a plate pivoted to swing up or down on the transverse frame, means being provided to adjust the plate and means for holding the fork in positions necessary to give the gang any desired angle to the line of draft.

The whole is constructed in detail substantially as hereinafter more specifically described and as illustrated in the accompanying drawings in which—

Figure 1 is a plan view of part of a disk harrow constructed in accordance with our invention; and Fig. 2 a front elevation of part of the same on a larger scale and partly in section.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

Referring particularly to Fig. 1, the frame of the harrow comprises the tongue 1, and the transverse bar 2 which is secured to the rear end of the tongue and is preferably formed integral with the forwardly extending braces 3 secured to the tongue. To this bar at each side is secured a casting 4, by means of a bolt 5 with countersunk head, and a bolt 6 which also forms a pivot for the plate 7 which lines against the forward side of the casting. This casting 4 is provided with the restraining members 8, which overlap the forward side of the plate and serve to hold the plate and casting in contact. These plates 7 form part of the connecting means between the disk gangs and the harrow frame, the other part of each side being formed by the member 9 preferably formed as a fork.

Each disk gang 10 is substantially of ordinary construction, and the ends of the fork are journaled between pairs of disks in any suitable manner by means of the bearings 11. Preferably a thrust bearing 12 is formed between the outer end of the bearing 11 and the hub 13 of the adjacent disk. Each fork 9 is provided with a vertical elongated bearing 14 so positioned that the gang substantially balances on this pivot.

A king pin 15 passes through the plate 7 and the bearing 14 and forms a journal on which the fork 9 may swing to allow of the disk gang assuming different angular positions to the line of draft of the harrow. The plate 7, being pivoted on the bolt 6, may be moved in a vertical plane to give the disk any desired inclination to the horizontal. A slight inclination is indicated in Fig. 2. As set out in the preamble to this specification, the purpose of providing for such adjustment is that the tendency of the inner gangs to lift may be overcome by concentrating more of the weight of the frame and driver thereon.

The adjustment of the plate and the casting 4 may be accomplished by various means. We show particularly in Fig. 2 a suitable arrangement for this purpose. A lug 16 is formed on the casting, and through this lug loosely passes the threaded spindle 17. The spindle is held from longitudinal movement in this lug by means of collars 18 secured to the spindle at opposite sides of the lug. Lugs 19 are formed on the plate 7. Between these lugs a nut 20 is set with its flat side in contact with the plate. The spindle passes loosely through the lugs 19 and is screwed through the nut 20.

It follows from this construction that

when the spindle 17 is rotated, the plate 7 will be swung on the pivot bolt 6 so that the plate, and consequently the disk gang supported therefrom may be adjusted to any angle to the horizontal within the range of adjustment provided. The spindle 17 has the crank handle 21 formed thereon whereby it may be rotated.

As the fork 9 may rotate freely on the king pin 15, the angle of each disk to the line of draft may be varied as may be desired, and the gang may, when desired, be turned through an angle of 180 degrees to reverse its position, such reversibility being desirable in order that the disks may be set to throw either inwardly or outwardly as may be necessary. For this purpose of varying the angles of the disk gang to the line of draft within certain limits and for the purpose of holding the gangs and adjusting them either in normal position or reverse position, we provide the following mechanism. Two arms 22 are formed on the fork 9, one extending forwardly and the other rearwardly. To the rearward arm is pivotally connected one end of a connecting rod 23, the other end of which is connected with the adjusting lever 24 suitably pivoted to the rear end of the tongue provided with the usual means of adjustment. The connecting rod from the arm 22 at one side will be connected above the pivot of the lever, the connecting rod of the gang at the other side being connected below the pivot, so that the arms may be moved simultaneously inwardly or outwardly to properly vary the angles of the gangs.

A plurality of holes 25 are formed in the connecting rods 23 so that the gangs may be adjusted independently of the lever 24 by connecting the arms 22 to the connecting rods at different parts of their length. A plurality of holes 30 are also provided in the transverse bar 2 so that the castings 4 may be connected to the bar in different positions to adjust the gangs to and from the tongue. The holes 25 in the connecting rods 23 permit of the rods with the arms 22 being correspondingly adjusted. When the gangs are reversed, the arms which normally were in front become the rearward arms, and to these the connecting rods are connected.

To take care of the twisting strain on the king pin, we provide a connection between the lower end of each bearing 14 and the forward part of the harrow frame. For this purpose we provide the swivel eye 26 on the lower end of the bearing, which is held in place by the washer and nut 27 screwed on the lower end of the king pin. A suitable clamp 28 connects the forward end of each chain 29 with the diagonal braces 3. These clamps may be adjusted on the braces to tighten the chains 29.

From the above description it will be seen that we have devised a construction which will satisfactorily attain the objects of our invention as set out in the preamble to this specification.

What we claim as our invention is:

1. In a disk harrow, the combination of the harrow frame; a disk gang; a disk gang supporting frame to which the gang is suitably connected; a plate to which said supporting frame is connected; a pivotal connection between said plate and the harrow frame; a screw spindle supported on the harrow frame to rotate without moving longitudinally; a nut through which the spindle is screwed; lugs on the plate between which the nut is fitted in contact with the plate, said lugs having holes formed therein for the free passage of the spindle.

2. In a disk harrow, the combination of the harrow frame; a disk gang; a disk gang supporting frame to which the gang is suitably connected; a plate to which said supporting frame is connected; a casting secured to the harrow frame on which said plate is pivoted; restraining members on said casting holding said plate in contact with the casting while permitting it to swing on its pivot; a screw spindle supported on the casting to rotate without moving longitudinally; a nut through which the spindle is screwed; lugs on the plate between which the nut is fitted in contact with the plate, said lugs having holes formed therein for the free passage of the spindle.

3. In a disk harrow, the combination of the harrow frame; a disk gang supporting frame to which the gang is suitably connected, said frame having an elongated vertical bearing formed thereon; means for connecting said frame to the harrow frame pivotally connected with the latter to swing vertically; a vertical king bolt passing through said connecting means and the said elongated bearing; an eye at the bottom of the bearing; a forwardly led flexible connection between said eye and a part of the harrow frame; an arm extending from the supporting frame; an adjusting lever supported on the harrow frame; and a connecting rod connecting said lever and arm.

4. In a disk harrow, the combination of the harrow frame; a disk gang supporting frame to which the gang is suitably connected, said frame having an elongated vertical bearing formed thereon; means for connecting said frame to the harrow frame pivotally connected with the latter to swing vertically; a vertical king bolt passing through said connecting means and the said elongated bearing; an eye at the bottom of the bearing journaled thereon; a forwardly led flexible connection between said eye and a part of the harrow frame; an arm extending from the supporting frame; an ad-

justing lever supported on the harrow frame; and a connecting rod connecting said lever and arm.

5. In a disk harrow, the combination of the harrow frame; a disk gang supporting frame to which the gang is suitably connected, said frame having an elongated vertical bearing formed thereon; means for connecting said frame to the harrow frame pivotally connected with the latter to swing vertically; a vertical king bolt passing through said connecting means and the said elongated bearing; an eye at the bottom of the bearing journaled thereon; a forwardly led flexible connection between said eye and a part of the harrow frame; an arm extending from the supporting frame; an adjusting lever supported on the harrow frame; a connecting rod connecting said lever and arm and a second arm extending from the supporting frame opposite the aforesaid arm.

Signed at Toronto, Canada, this 10th day of March, 1915, in the presence of the two undersigned witnesses.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."