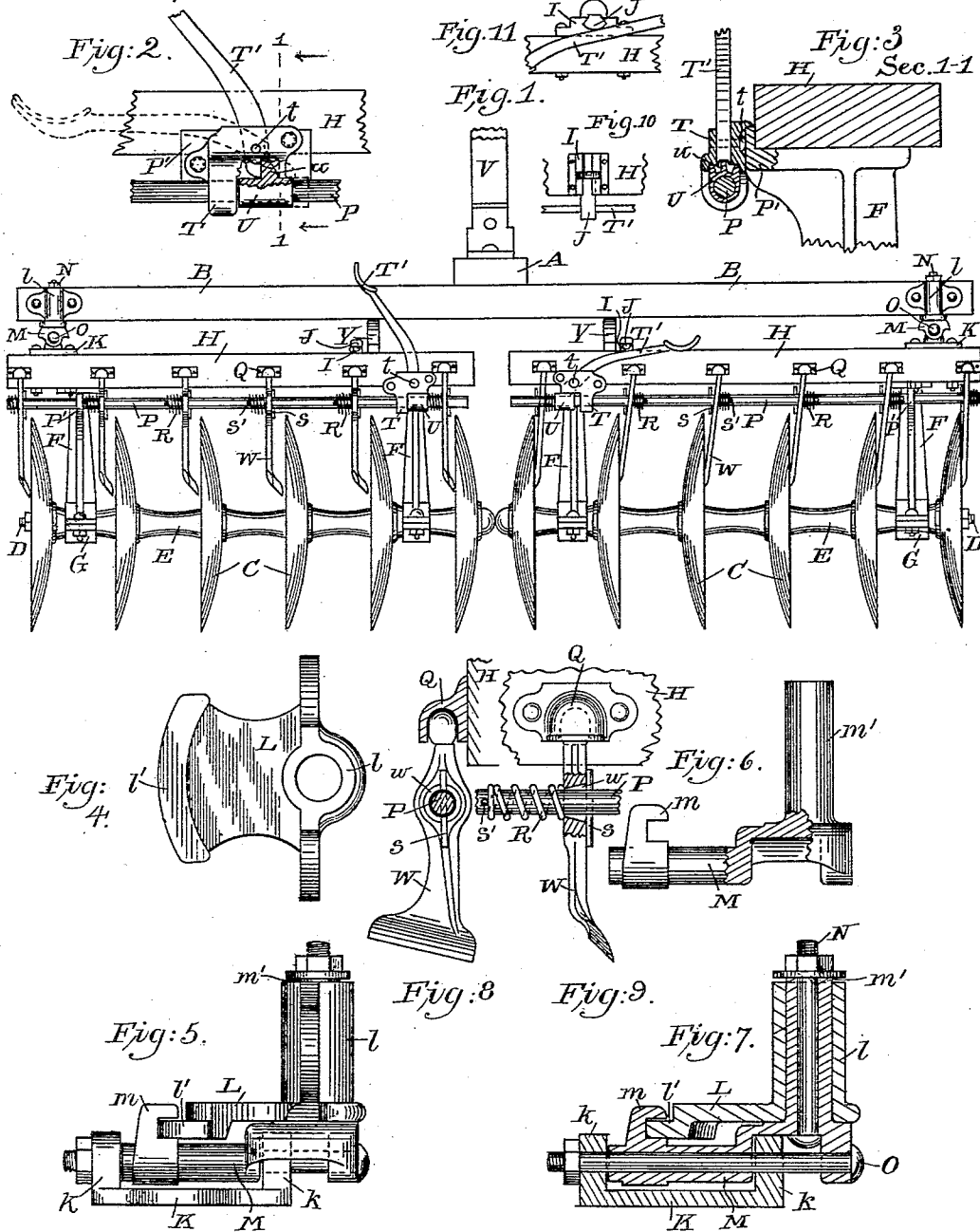


(No Model.)

H. WIARD & H. M. BURDICK.
DISK HARROW.

No. 476,435.

Patented June 7, 1892.



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DISK HARROW.

SPECIFICATION forming part of Letters Patent No. 476,435, dated June 7, 1892.

Application filed October 22, 1891. Serial No. 409,631. (No model.)

To all whom it may concern:

Be it known that we, HARRY WIARD and HIRAM M. BURDICK, citizens of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Disk Harrows; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has for its objects, first, to provide a hinge-joint for securing a disk gang to the main frame, adapted to permit a vertical and horizontal movement of said gang, and also to enable the forward cutting-edges of the inner disks of the gangs to be brought close together when the gangs are arranged obliquely to the line of draft; second, to construct scrapers for the disks adapted to be operated together in a gang, to conform to the inequalities of their respective disks, and to be automatically withdrawn from the face of the disks when desired. These objects are accomplished by the means illustrated in the accompanying drawings, in which—

Figure 1 is a rear view of a disk harrow embodying our invention. Fig. 2 is a sectional rear view of a bracket supporting one end of a scraper-bar, a foot-lever, and a portion of a gang-beam. Fig. 3 is a sectional side view of the parts shown in Fig. 2. Fig. 4 is a plan view of a sector-plate forming part of hinge-joint. Fig. 5 is a side view of a hinge-joint which secures the disk gangs to the main frame. Fig. 6 is a sectional side view of central piece of hinge-joint. Fig. 7 is a vertical transverse section of the parts shown in Fig. 5. Fig. 8 is a face view of scraper with section of scraper-rod and socket-plate on gang-bar. Fig. 9 is a sectional edge view of scraper with scraper-rod, spring, and socket-plate secured to gang-bar. Fig. 10 is a plan view of sliding bolt for locking foot-lever and scrapers in position. Fig. 11 is a front view of the parts shown in Fig. 10.

As illustrated in the drawings, the main frame of the harrow consists of a pole A, having a cross-bar B extending laterally there-

from. A seat-standard V may, if desired, be secured to the pole A.

The disk gangs each consist of a series of cutting-disks C, mounted on an axle-rod D and separated from each other by spools E. Standards F, provided with bearing-boxes G at their lower ends and secured at their upper ends to a gang-bar H, also form part of the disk gangs. The disk gangs are connected to the main frame by a hinge-joint consisting of a base-plate K, a sector-plate L, and a central piece M. The base-plate K is secured to the gang-beam H and is provided with vertical ears or lugs *k*, between which the horizontal shank of the central piece M is secured by the bolt O, passing through said ears and shank. A vertical shank *m'* is formed on the rear end of the central piece M to engage the sleeve *l* of the sector-plate L. This sector-plate is secured to the cross-bar B and provided with a curved forward edge *l'*, which engages the recessed lug *m*, formed on the central piece M. The sector-plate is secured in position by means of a bolt N, provided with a washer and passed through the vertical shank *m'* of the central piece M. The sector-plate L is preferably secured to the back of the cross-bar B, so that the sleeve *l* and the shank *m'* of the central piece may be arranged in rear of the disk gangs, although we do not desire to be limited to such a construction. When said parts are arranged in rear of the cross-bar and disk gangs, as shown herein, the forward cutting-edges of the inner disks of the gangs are brought close together, when the gangs are set in working position obliquely to the line of draft, and thereby cultivate all the ground between said disks, whereas when those parts are arranged farther forward the forward cutting-edges of the inner disks of the gangs separate when the gangs are arranged obliquely to the line of draft and leave a considerable portion of the ground uncultivated.

Scrapers W are mounted on the rod P by means of apertures *w*, formed in the scraper-shanks. These apertures expand outwardly toward the concave faces of the disks, so that said shanks may have a free rocking move-

ment on said bar. The upper ends of the scrapers are pivoted on the gang-bars H by a universal joint formed by the socket-plates Q, engaging the rounded upper end of the scrapers. Any other joint having similar capabilities may be used, however, without departing from our invention.

Spiral springs R are secured to the bar P, so as to bear against the back of the scraper-shanks, and the bar is also provided with lugs of any suitable construction such as the pins s, which bear against the front of the scraper-shanks. In the construction shown herein the pins s are extended vertically through the bar and project above and below the same. When the scrapers are in their normal position, the scraping-blades are removed from the faces of the disks and the pins bear against the front of the scraper-shank above and below the bar P, as shown in the left disk gang herein; but when the scraping-blades are brought in contact with the faces of the disks the scraper-shanks are inclined toward the faces of the disks and only the lower ends of the pins s bear against the scraper-shanks, as indicated in the right disk gang shown in the drawings.

A collar U is secured to the inner ends of the bars P and provided with a lug u, (shown in Fig. 2,) which engages the lower end of the lever T', which is pivoted to the bracket T at t. The bar P is free to move lengthwise in its bearings, the outer bearing of which is formed in a backward extension P' of the standard F and the inner bearing in the bracket T, which is bolted to the upper end of the inner standard F.

A locking device may, if desired, be secured to the gang-beam to hold the scrapers in contact with the disks. The device shown herein consists of a bolt J, which moves transversely of the gang-beam in a channel-iron I, and is adapted to extend out over the lever T' when depressed, as shown in Fig. 10. Stops Y are secured to the cross-bar B to prevent the inner ends of the gangs from rising above a horizontal position. The scrapers are brought in contact with the respective disks by pressing down the foot-lever T' until it assumes the position shown in the right disk gang in the drawings. The lower end of the lever engaging the lug u of the collar U thereby draws the bar P inward bodily and inclines the scraper-shanks, as shown in said gang. The springs R are at the same time compressed somewhat; but they may be further compressed by any raised irregularity on the face of the disks or expand to compensate for any irregularity in the opposite direction. The pivotal attachment of the upper end of the scrapers, together with their loose-jointed connection with the scraper-bar P, permits the shanks to move in an axial line and the scraping-blade to move in a horizontal plane, so as

to correspond with any irregularity appearing either near the center or outer portion of the disk, and at the same time keep its entire scraping-edge against the face of the disk. The operator after pressing down the lever T' with the forward portion of his foot, and while his foot is still on the lever, may throw the bolt outward with his heel until it overlaps the lever, and thereby prevent it from rising, which will hold the scrapers continuously in contact with the disks. When the pressure is released from the foot-lever T', the spiral springs R expand to regain their normal position, and in so doing they draw the scraper-bar P and scraper-shanks backward. In this operation they are aided by the lower ends of the pins s, which are continuously pressed against the front of the scraper-shanks below the bar P until the shank bears equally against said pin above and below the bar and the scrapers have regained their normal position away from the disks.

We do not desire to be limited to the specific construction or arrangement of the spring, the scraper-shank, and pin shown herein; but we desire to include any equivalent construction and arrangement of parts wherein the same spring that operates to equalize the pressure of the scrapers against the disks and overcome the inequalities of their faces also operates to bring the scrapers back from the disks when the pressure is released.

The disk gangs are adapted to move vertically, so as to enter a depression in the ground by means of the base-plate K, rocking on the horizontal pivot O, and the vertical shank m' of the central piece serves as a pivot-pin to permit the base-plate and central piece to move horizontally, and thereby produce a similar movement of the disk gang. The recessed lug m of the central piece engaging the forward edge of the sector-plate strengthens the joint forward and prevents any strain on the vertical pivot.

What we claim is—

1. In a disk harrow, the combination of a main frame, disk gangs, and a hinge-joint having a base-plate, a sector-plate, and a central piece pivoted to the base-plate by a horizontal pin and to the sector-plate by an engaging vertical shank and sleeve and provided with a recessed lug engaging the forward edge of the sector-plate, substantially as shown and described.
2. In a disk harrow, the combination, with a gang of revolving disks, of a series of scrapers pivoted at their upper end to the gang-beam and mounted freely on a reciprocating bar provided with lugs bearing against the front of the scraper-shank, and spiral springs bearing against the back of said shank and adapted when compressed to adjust the scrapers to any irregularity in the faces of the disks

and when relaxed to withdraw the scrapers from the disks, substantially as shown and described.

3. In a disk harrow, the combination, with
5 a gang of revolving disks, of a series of scrapers pivoted at their upper end to the gang-beam and mounted freely on a reciprocating rod provided with vertically-disposed pins bearing against the front of the scraper-shank
10 below said bar, and spiral springs bearing

against the back of said scraper-shanks, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

HARRY WIARD.
HIRAM M. BURDICK.

Witnesses:

J. F. DRAIME,
E. BRAINARD.