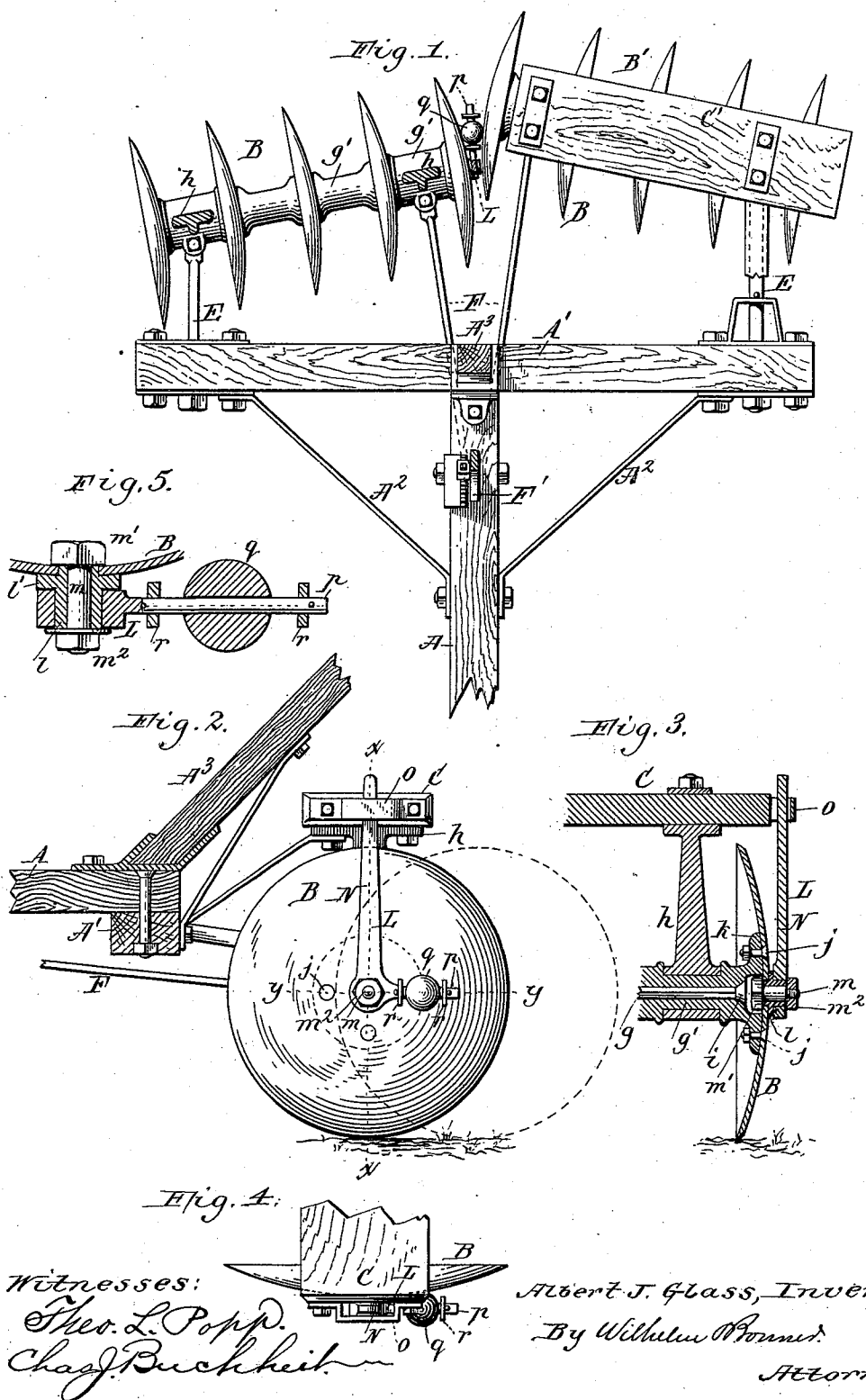


(No Model.)

A. J. GLASS.
DISK HARROW.

No. 429,437.

Patented June 3, 1890.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT J. GLASS, OF BATAVIA, NEW YORK.

DISK HARROW.

SPECIFICATION forming part of Letters Patent No. 429,437, dated June 3, 1890.

Application filed January 27, 1890. Serial No. 338,199. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. GLASS, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented new and useful Improvements in Disk Harrows, of which the following is a specification.

This invention relates to that class of disk harrows in which one of the two opposing disk-gangs is arranged slightly in advance of the other.

The object of my invention is to provide a simple anti-friction device between the two innermost disks of the two adjacent gangs to receive the inward thrust or pressure of the gangs, whereby friction between the parts is reduced to a minimum.

In the accompanying drawings, Figure 1 is a top plan view, partly in section, of a disk harrow provided with my improvements. Fig. 2 is a fragmentary longitudinal sectional elevation on an enlarged scale. Fig. 3 is a fragmentary transverse section in line *xx*, Fig. 2. Fig. 4 is a fragmentary top plan view of the inner end of the disk-gang carrying the anti-friction roller. Fig. 5 is a horizontal section, on an enlarged scale, in line *yy*, Fig. 2.

Like letters of reference refer to like parts in the several figures.

The main frame of the machine consists of a draft-pole A, a cross-bar A', and diagonal braces A².

A³ represents a backwardly-inclined seat-support secured to the main frame.

B B' represent the harrow-disks arranged in two transverse gangs underneath the usual gang-planks C C', respectively, in rear of the cross-bar A'.

E represents the swiveling connecting-rods, by which the outer portions of the gangs are attached to the cross-bar A' of the main frame and on which the angle of the gangs can be adjusted.

F represents the draft-rods, whereby the inner portions of the disk-gangs *c c'* are attached to the hand-lever F' of the adjusting mechanism on the main frame. The draft-rod E and connecting-rod F of the disk-gang C are made somewhat longer than the corresponding parts of the disk-gang C', so that the axis of the disk-gang C is arranged slightly in

front of the axis of the disk-gang C', whereby the innermost disks are brought very closely together, so as to leave little or no uncultivated space between these disks when the harrow is being operated. The disks of each gang are mounted upon a transverse shaft or axle *g*, which is journaled in a well-known manner by means of cylindrical sleeves or spools *g'* in bearings or hangers *h*, secured to opposite ends of the gang-planks. The shafts *g* are provided at their inner ends with beveled heads *i*, seated in the innermost sleeves *g'*, and at their outer ends with screw-nuts in the usual manner, which bear against the outermost disks, and whereby the disks, except the innermost disk of each gang, are clamped between the sleeves. The two innermost disks of the opposing gangs are secured by means of the bolts *j* to flanges *k*, formed on the adjacent ends of the innermost sleeves *g'*. The bolts *j* are countersunk, so as to leave the outer convex face of the disks B B' flush and free from projections.

L represents an elbow-lever arranged between the two innermost disks of the opposing gangs, and pivoted at its lower end on a shouldered sleeve or bushing *l*, secured centrally to the innermost disk B of the front gang by a pivot-bolt *m*.

N represents the upright or long arm of the lever L, projecting through and guided in a loop or strap O, secured to the inner end of the gang-plank, and in which the lever is free to move forwardly and backwardly.

p represents the short horizontal or rearwardly-projecting arm of the elbow-lever L, carrying an anti-friction roller or spheroidal knuckle *q*. The head *m'* of the pivot-bolt *m* bears against the concave side of the disk B, and the shoulder *l'* of the bushing is pressed tightly against the convex side of the disk by a screw-nut *m²*, applied to the outer end of the bolt, and which also serves to hold the elbow-lever on the bushing. The bushing *l* relieves the pivot-bolt *m* from wear and can be readily renewed when worn.

The roller *q* is arranged in rear of the axis of the front gang and in front of the axis of the rear gang, so that the ascending rear portion of the innermost disk of the front gang will bear against one side of the roller and

the descending portion of the opposing disk of the rear gang against the opposite side of the roller, whereby the latter is caused to rotate between these disks. This roller receives the inward pressure or strains of the opposing gangs and reduces the friction between the parts to a minimum. The roller also serves to relieve the mechanism connecting the gangs with the main frame from inward pressure and strains of the gangs.

By arranging the anti-friction roller in front of the axis of one gang and in rear of the axis of the other the innermost disks can be set very closely together, so as to leave practically no uncultivated ground or space between the gangs and yet hold the same apart. The roller *q* is mounted loosely on the round short arm *p* of the elbow-lever between two shoulders or collars *r r*, which are set a sufficient distance apart to allow of a limited lengthwise movement of the roller on its arm. The guide or strap which extends over the long arm of the elbow-lever holds the roller approximately in its normal position, but permits the lever to oscillate and the roller to rise and fall, but limits the movement of the lever and roller, so that the latter cannot be thrown out of its position between the disks. This lengthwise and vertical movement of the roller permits the latter to adjust itself to slight differences in the distance between the centers of the two innermost disks and to follow the undulating movement of the disks caused by the irregularities of the ground and to find a mean speed of movement between the two opposing disks, whereby the roller is enabled to rotate freely at all times and not liable to slip and act as a brake between the gangs. The pivot-opening in the lever is sufficiently large to permit a slight transverse movement of the roller and its supporting-arm to prevent binding of the parts.

I claim as my invention—

1. The combination, with the draft-frame and the transverse disk-gangs attached thereto, of a roller arranged between the innermost disks of the opposing gangs, and a support upon which the roller turns, arranged lengthwise of the machine between said disks, substantially as set forth.

2. The combination, with the draft-frame and the disk-gangs attached thereto, of a roller arranged between the innermost disks of the opposing gangs, and a support upon which the roller is capable of longitudinal movement, substantially as set forth.

3. The combination, with the draft-frame and the disk-gangs attached thereto, of a roller arranged between the innermost disks of the opposing gangs, and a vertically-movable support on which said roller is mounted, substantially as set forth.

4. The combination, with the draft-frame and the disk-gangs attached thereto, of a roller arranged between the innermost disks of the opposing gangs, and a vertically-movable support on which said roller is mounted, and on which said roller is capable of longitudinal movement, substantially as set forth.

5. The combination, with the draft-frame and the disk-gangs attached thereto and arranged one in advance of the other, of a roller arranged between the innermost disks of the opposing gangs in rear of the axis of the front gang and in front of the axis of the rear gang, substantially as set forth.

6. The combination, with the draft-frame and the disk-gangs attached thereto, of a lever pivoted at the inner end of one of the gangs and provided with a roller arranged between the innermost disks of the opposing gangs, substantially as set forth.

7. The combination, with the draft-frame and the disk-gangs attached thereto, of a lever pivoted at the inner end of one of the gangs, a roller mounted on said lever and arranged between the innermost disks of the gangs, and stops whereby the movement of said lever is limited, substantially as set forth.

8. The combination, with the draft-frame and the disk-gangs attached thereto, of an elbow-lever pivoted to the inner end of one of said gangs, a roller arranged between the gangs and mounted on the lower arm of the elbow-lever, and a guide attached to one of the gang-planks and engaging with the upper arm of the elbow-lever, substantially as set forth.

9. The combination, with the draft-frame and the disk-gangs attached thereto, of a bushing attached centrally to the innermost disk of one of said gangs, a lever pivoted on said bushing, and a roller journaled on said lever and arranged between the innermost disks of the gangs, substantially as set forth.

Witness my hand this 18th day of January, 1890.

ALBERT J. GLASS.

Witnesses:

R. C. TILLINGHAST,
GEORGE O. VOLZ.