(No Model.) 3 Sheets—Sheet 1.

E. PRIDMORE.

DISK HARROW.

No. 503,774. Patented Aug. 22, 1893.

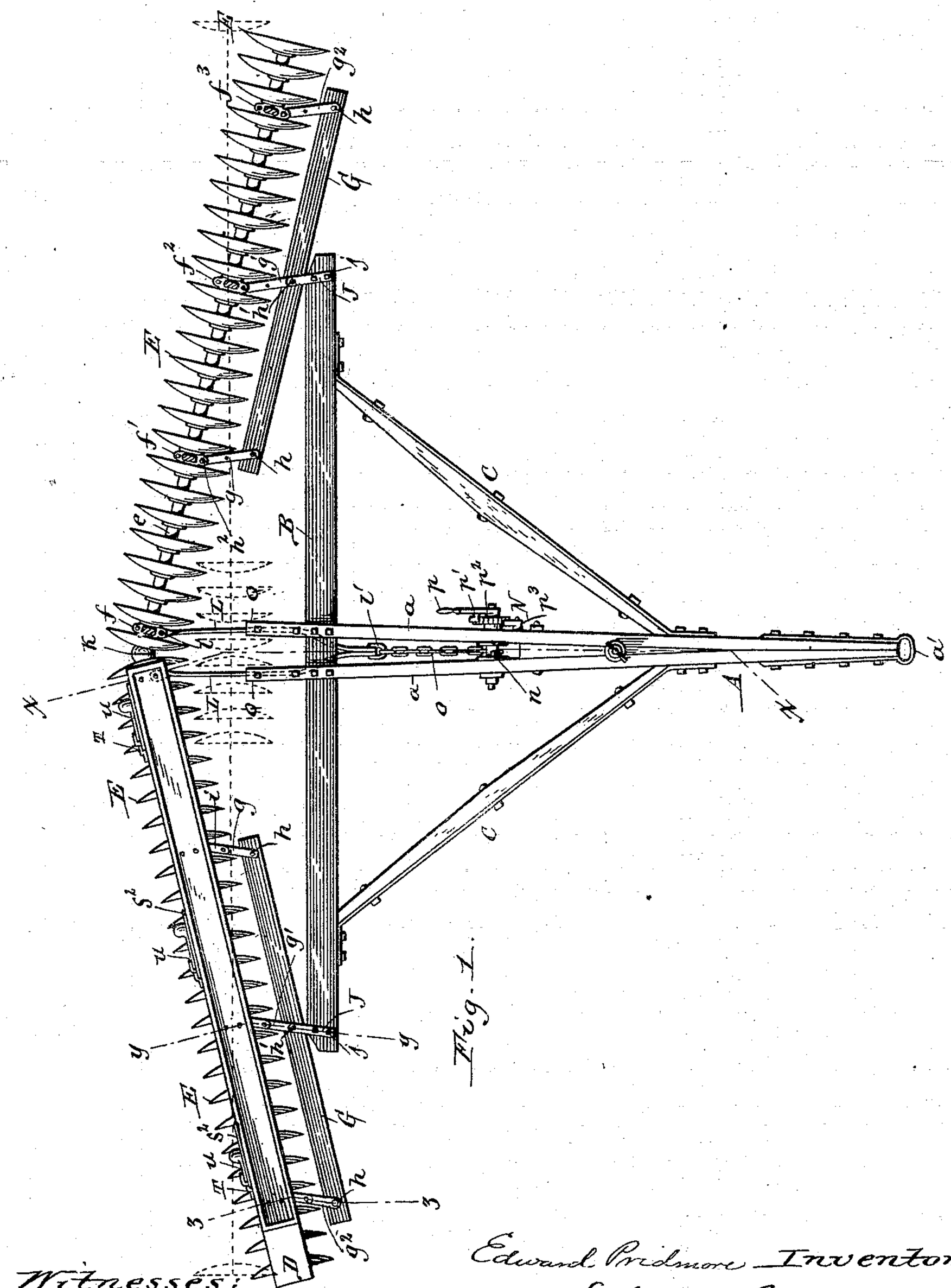

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

E. PRIDMORE.

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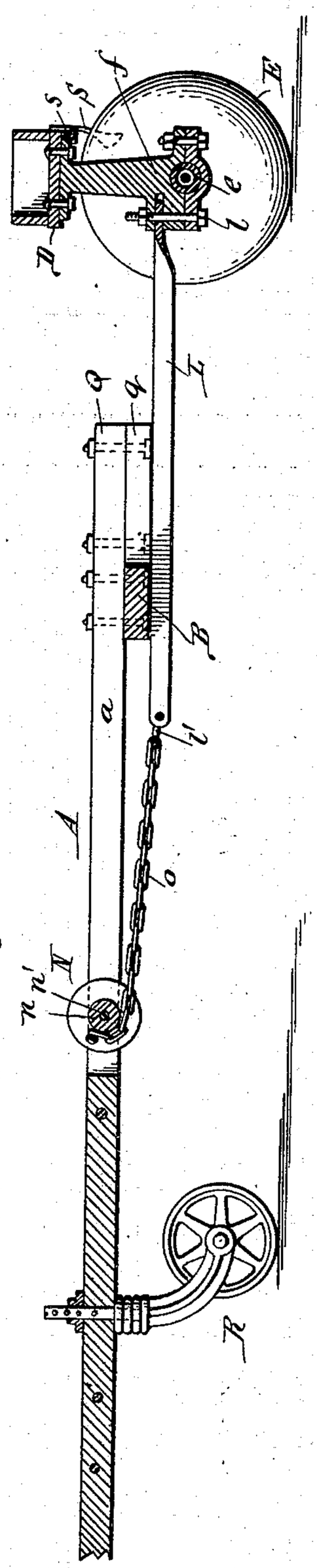

Fig. 2.

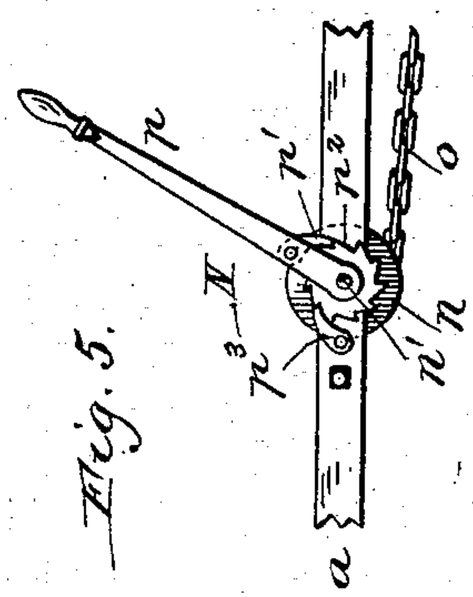

Fig. 5.

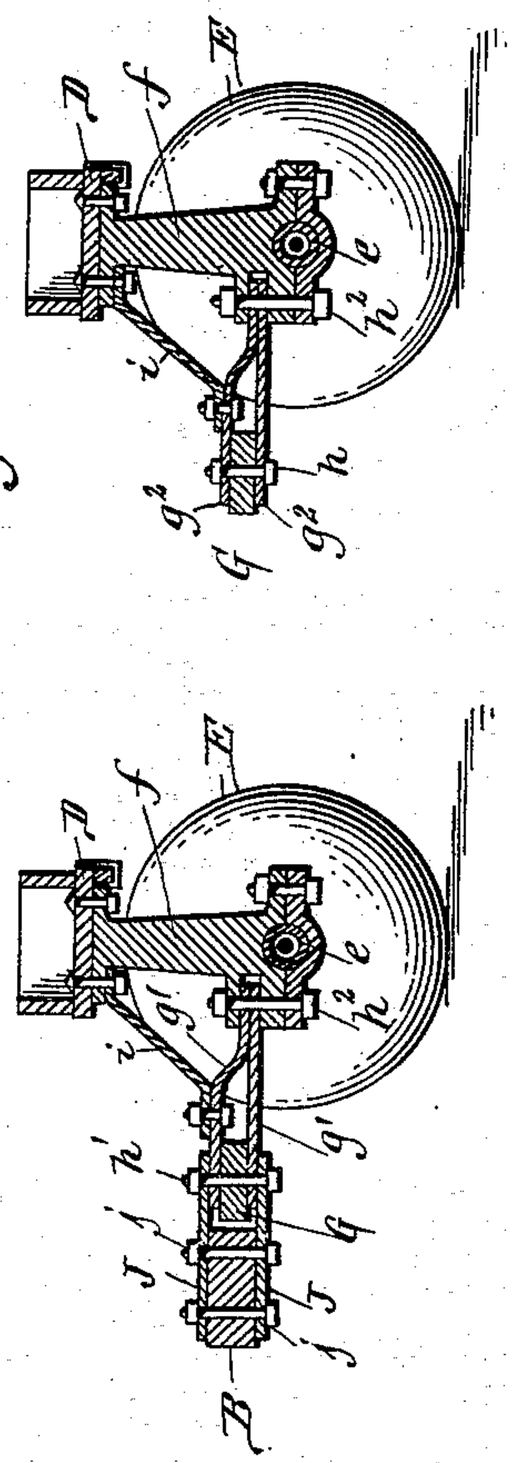

Fig. 4.

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

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DISK HARROW.

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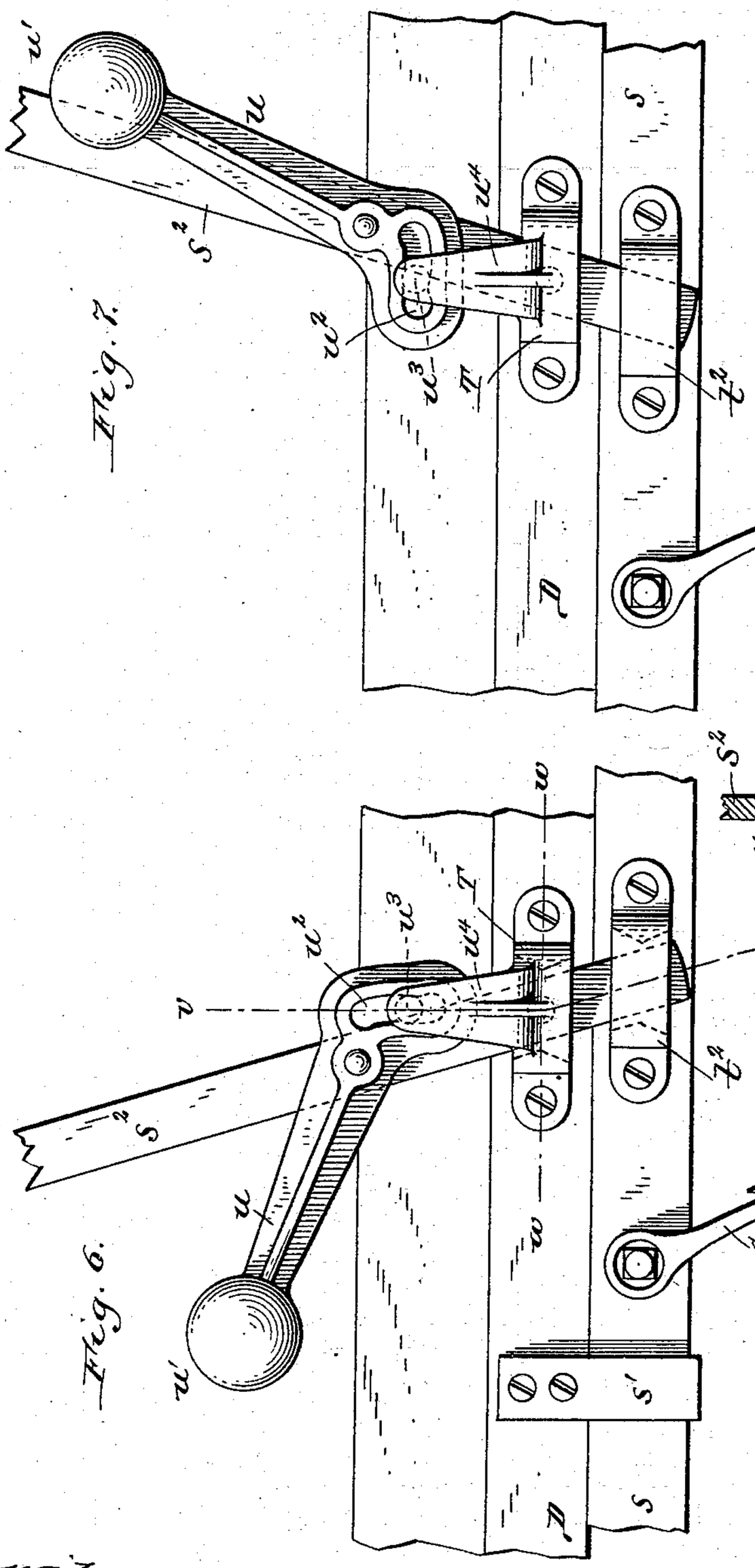

Fig. 7.

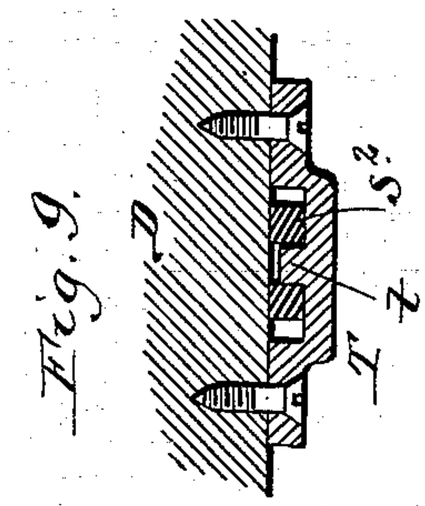

Fig. 9.

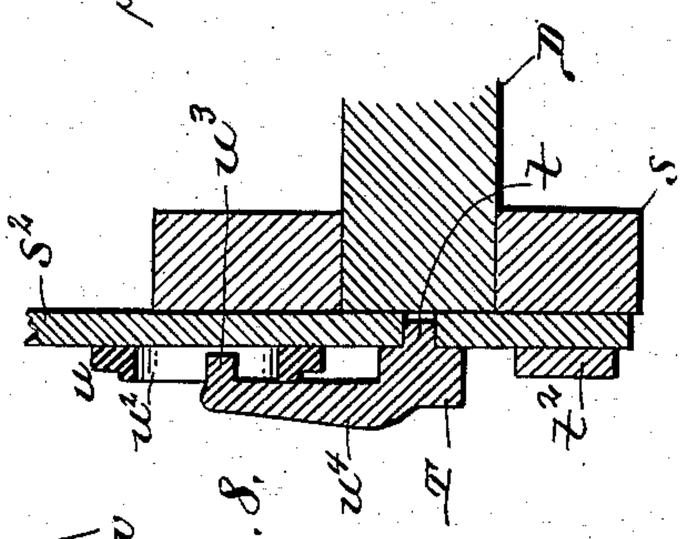

Fig. 8.

Fig. 6.

Witnesses:
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Fred. C. Geyer.

Edward Pridmore Inventor.
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UNITED STATES PATENT OFFICE.

EDWARD PRIDMORE, OF BATAVIA, NEW YORK, ASSIGNOR TO THE JOHNSTON HARVESTER COMPANY, OF SAME PLACE.

DISK HARROW.

SPECIFICATION forming part of Letters Patent No. 503,774, dated August 22, 1893.

Application filed April 11, 1892. Serial No. 428,610. (No model.)

To all whom it may concern:

Be it known that I, EDWARD PRIDMORE, 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 a disk harrow which contains a large number of disks and which is particularly designed for use in large fields and adapted to be drawn by steam power.

The objects of my invention are to improve the construction of the harrow, to permit of using a large number of disks, and to provide a simple and reliable device whereby the scrapers are held in or out of contact with the disk.

In the accompanying drawings consisting of three sheets:—Figure 1 is a top plan view of my improved harrow, partly in section. Figs. 2, 3 and 4 are vertical longitudinal sections, on an enlarged scale, in lines *x*—*x*, *y*—*y* and *z*—*z*, Fig. 1, respectively. Fig. 5 is a side elevation of the windlass for changing the position of the disk gangs. Fig. 6 is a fragmentary rear elevation, on an enlarged scale, of the scraper-shifting device, showing one of the scrapers in contact with one of the disks. Fig. 7 is a similar view, showing the scraper out of contact with the disk. Fig. 8 is a vertical section in line *v*—*v*, Fig. 6. Fig. 9 is a horizontal section in line *w*—*w*, Fig. 6.

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

A represents the draft pole which consists preferably of two rearwardly diverging members *a a* which are secured together at their front ends and provided with a ring or loop *a'* with which the motive power is connected.

B represents the main cross piece of the harrow frame which is secured at its middle to the under side of the pole near the rear ends of its members.

C represent the diagonal braces extending from the outer portions of the main cross piece to the front portion of the pole and forming with these parts the rigid draft frame of the harrow.

D D represents the gang-planks, and E E the harrow disks mounted upon shafts *e*, each of which is journaled in depending bearings *f f' f² f³* secured at regular intervals to the under side of each gang plank from the inner toward the outer end of each gang.

G represents equalizing bars which connect the outer portions of the disk gangs with the ends of the main cross piece and serve to equally distribute the strain upon the outer portions of each disk gang. Each equalizing bar is arranged transversely in front of the outer portion of the disk gang and connected to the lower portions of the outer bearings *f' f² f³* by three pairs of links *g g' g²*. The ends of the equalizing bar are connected to the bearings *f² f³* by the end links *g g²* while the middle of the bar is connected with the bearing *f²* by the middle links *g'*. The end links are secured with their front ends to the upper and lower sides of the equalizing bar by vertical pivot bolts *h* and the middle links are pivotally secured with their front ends to the upper and lower sides of the middle of the equalizing bar by a vertical bolt *h'*. The rear ends of each pair of links rest one upon the other and are pivotally attached to the lower portion of the depending bearing by a vertical pivot bolt *h²*.

i represents braces connecting the upper members of the links with the upper portions of the disk bearings.

J represents a pair of straps whereby the middle of each equalizing bar is connected with the end of the main cross piece B. Each pair of straps is secured with the front ends to the upper and lower sides of the cross piece B by bolts *j*, while the rear ends of these straps are secured to the upper and lower sides of the middle links and to the equalizing bar by the front pivot bolt *h'* of the middle links *g'*. Upon shifting the disk gangs the equalizing bars turn on the front pivot bolts *h'* of the middle links and the several links accommodate themselves to the position of the disk gangs and equalizing bars. If desired, the equalizing bars may be lengthened and additional links may be employed for connecting the equalizing bars with the disk gangs.

By employing the equalizing bars between the draft frame and the disk gangs, a large

number of disks can be employed in each gang and the strain upon the disks is more uniformly distributed.

As represented in the drawings the disks are arranged with their concave sides facing outwardly which produces an inward thrust of the disk gangs. This thrust is taken up by a knuckle joint *k* arranged between the inner ends of both disk gangs.

L represents draft bars whereby the inner ends of the disk gangs are adjustably connected with the main frame. These draft bars are arranged underneath the main frame and are pivotally connected at their rear ends by vertical bolts *l* with the lower portions of the bearings *f* at the inner ends of the disk gangs. The front ends of the draft bars are bent toward each other and are connected by a ring *l'*.

N represents a windlass whereby the angle of the disk gangs is shifted. The drum *n* of the windlass is arranged between both members of the pole and mounted upon a transverse shaft *n'* journaled in the members of the pole. The drum is connected with the ring *l'* of the draft bars by a chain *o*, and the latter is wound upon the drum by a hand lever *p* which is pivoted loosely upon the drum shaft *n'* and provided with a pawl *p'* which engages with a ratchet wheel p^2 secured to the drum shaft. The drum is held against return movement, when desired, by a detent pawl p^3 pivoted on the side of the pole and engaging with the ratchet wheel. Upon turning the drum in the proper direction the chain is wound upon the drum, thereby drawing the inner ends of the gangs forwardly and decreasing the angle of both gangs. When it is desired to place the disk gangs at a greater angle, the drum is released to permit the chain to unwind and upon drawing the harrow forwardly the inner ends of the disk gangs will trail until the slack of the chain is taken up, when the disk gangs will remain in that position.

When the disk gangs are arranged at an angle, their inner ends tend to rise when in use, thereby causing an upward strain on the rear ends of the draft bars and this strain increases as the angle of the disk gangs is increased. To relieve this strain upon the draft bars the members of the pole are provided with rearward extensions or horns Q which are arranged lengthwise over the draft bars, as represented in Fig. 1. The undersides of these horns are provided with filling blocks *q* whose lower surfaces are flush with the underside of the cross piece B, so that the draft bars bear with their upper sides against the lower sides of the main cross piece and the filling pieces, whereby the upward thrust on the draft bars is evenly applied to the main cross piece and the horns of the pole. The horns extend rearwardly to within a short distance of the inner bearings *f* of the disk gangs when the latter are in a straight position, as indicated by the dotted lines in Fig. 1, thereby sustaining the draft bars against upward pressure as near the disk gangs as possible.

R represents a caster wheel arranged underneath the front portion of the pole.

S represents the scrapers whereby the ground is removed from the disks and which are secured to a supporting bar *s* arranged lengthwise underneath each gang plank and moving in hangers *s'*.

s^2 represents a shifting lever whereby the scraper bar is moved in the direction of its length—for the purpose of throwing the scrapers in or out of contact with the disks.

T represents a loop which is secured to the rear side of the gang plank and provided with a forwardly projecting pin *t* upon which the shifting lever is pivoted near its lower end. The lower arm of the shifting lever enters a loop t^2 secured to the rear side of the scraper bar for the purpose of moving the latter.

u represents a weight lever which securely holds the shifting lever in either extreme position in which the scrapers are either in or out of contact with the disks. This weight lever is pivoted to the shifting lever above the pivot of the latter and is provided at the end of its long upper arm with a weight *u'*. The short lower arm of the weight-lever is provided with a slot u^2 which receives a stationary pin u^3. This pin projects inwardly from the upper end of a bracket u^4 projecting upwardly from the loop T. Upon moving the shifting lever from one extreme position to the other, the weight-lever is shifted in the same direction, since it is pivoted to the shifting lever, but the weighted end of the weight-lever travels more rapidly than the shifting lever, because the stationary pin u^3 retards the lower arm of the weight-lever and thereby causes an accelerated movement of the upper weighted end of the same. The weight-lever exerts a pressure on the shifting lever and scraper bar at either extreme position of the shifting lever and so holds the scrapers securely in or out of contact with the disks. It is desirable to apply a greater pressure to the scrapers when they are in contact with the disks than when they are out of contact therewith. For this purpose the slot u^2 in the lower arm of the weight-lever is arranged obliquely across a radial line drawn from the pivot of the weight lever. This construction of the slot causes the weight lever to overhang farther when the shifting lever is in the position for holding the scrapers in contact with the disks, as represented in Fig. 6, than when the scrapers are out of contact with the disks, as represented in Fig. 7, thereby increasing the leverage of the weighted part of the lever and exerting a greater pressure upon the scrapers.

I claim as my invention—

1. The combination with the harrow frame, of transverse equalizing bars arranged in rear of the harrow frame, disk gangs arranged in

rear of the equalizing bars, longitudinal straps extending from the harrow frame rearwardly to the middle portions of the equalizing bars and connected with the frame and bars by vertical pivots, and longitudinal links and vertical pivots connecting the end portions of the equalizing bars with the disk gangs, substantially as set forth.

2. The combination with the harrow frame, of transverse equalizing bars arranged in rear of the harrow frame, disk gangs arranged in rear of the equalizing bars, longitudinal straps extending from the harrow frame rearwardly to the middle portions of the equalizing bars and connected with the frame and bars by vertical pivots, longitudinal links and vertical pivots connecting the end portions of the equalizing bars with the disk gangs, and longitudinal draft bars connecting the inner ends of the disk gangs with the harrow frame, substantially as set forth.

3. The combination with the disk gangs and the draft bars connected with the inner portions thereof, of a harrow frame provided with a divided pole having its rear portions projecting rearwardly beyond the harrow frame over the draft bars, and provided on their under-sides with filling pieces, whereby the upward movement of the draft bar is restrained, substantially as set forth.

4. The combination with the disk gang, the gang plank, the scraper bar and the scraper, of a shifting lever connected with the scraper bar and pivoted to the gang plank, a stationary support mounted upon the gang plank, and a weighted lever pivoted to the shifting lever and connected with said stationary support, whereby the movement of the shifting lever reverses the position of the weighted lever, substantially as set forth.

5. The combination with the gang of disks, the gang plank, the scraper bar and scrapers, of a shifting lever pivoted upon the gang plank and connected at its lower end with the scraper bar, a weighted lever pivoted to the shifting lever and provided with a slot in its short arm, and a stationary pin mounted upon the gang plank and engaging in said slot, substantially as set forth.

6. The combination with the gang of disks, the gang plank, the scraper bar and scrapers, of a loop secured to the gang plank and provided with an inwardly projecting pin, a shifting lever pivoted upon said pin and connected at its lower end with the scraper bar, a weighted lever pivoted upon said shifting lever and provided with a slot in its short arm, and a bracket formed on said loop and provided with a stationary pin which engages in said slot, substantially as set forth.

Witness my hand this 7th day of April, 1892.

EDWARD PRIDMORE.

Witnesses:
GEORGE O. VOLZ,
E. K. CALKINS.