

(No Model.)

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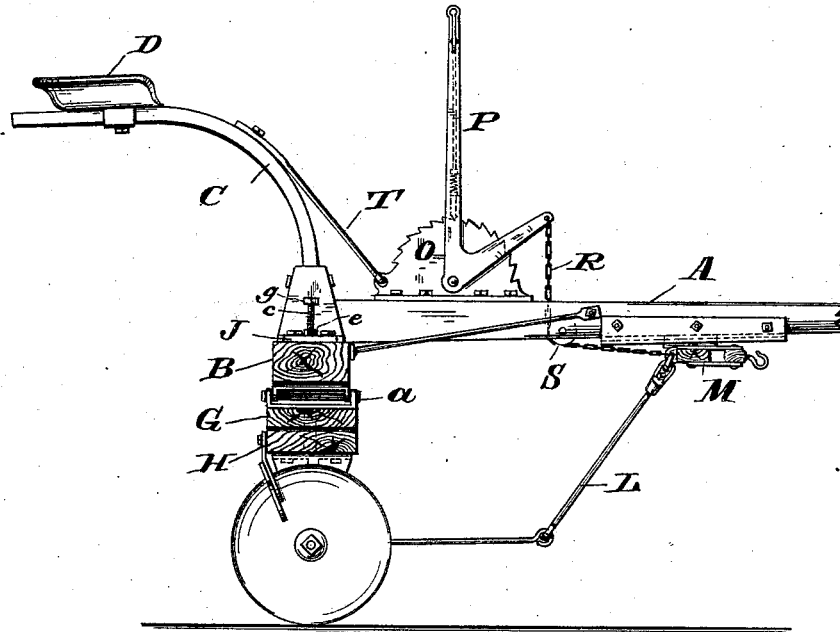
E. F. STODDARD.

HARROW.

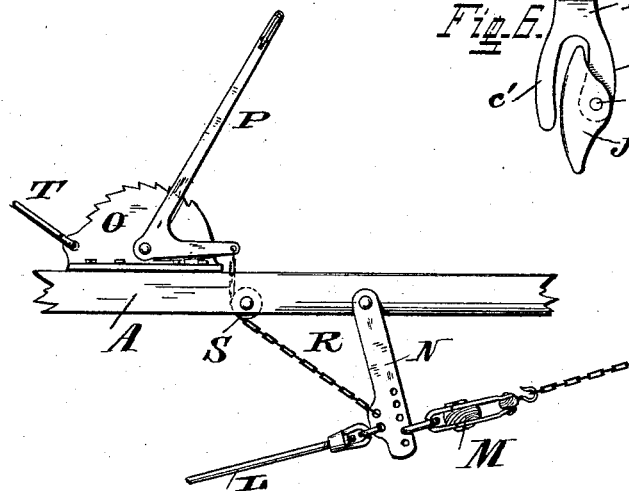
No. 347,745.

Patented Aug. 17, 1886.

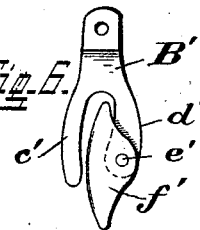
*Fig. 1.*



*Fig. 5.*



*Fig. 6.*



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2

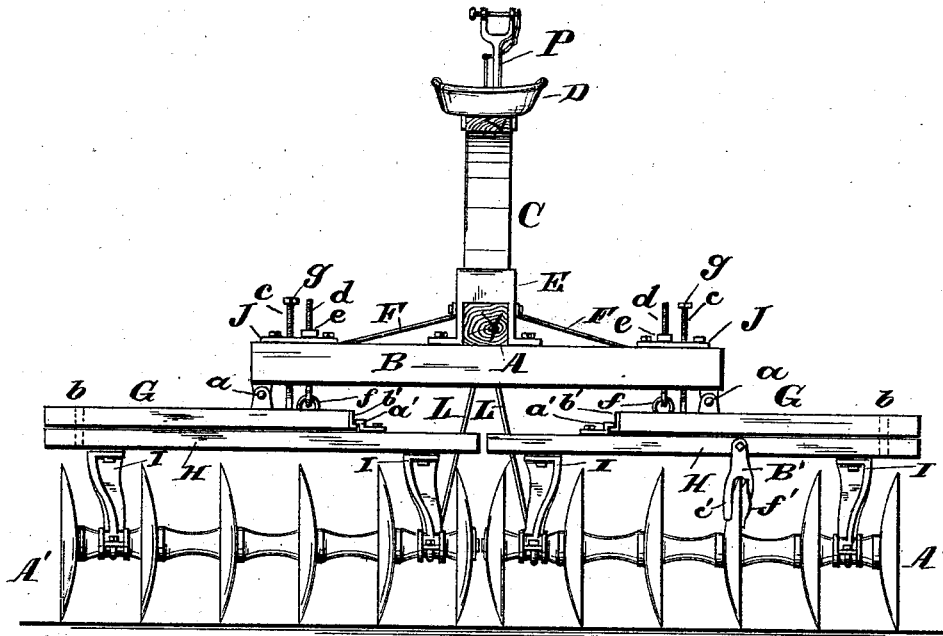


Fig. 7.

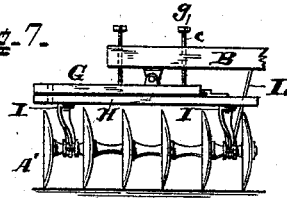
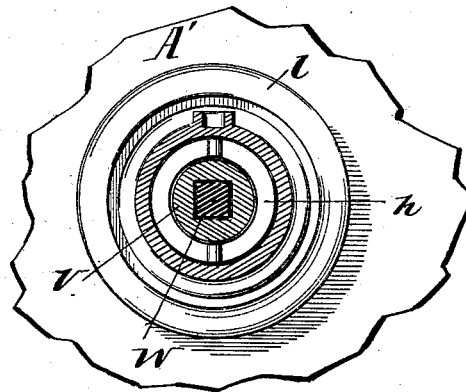
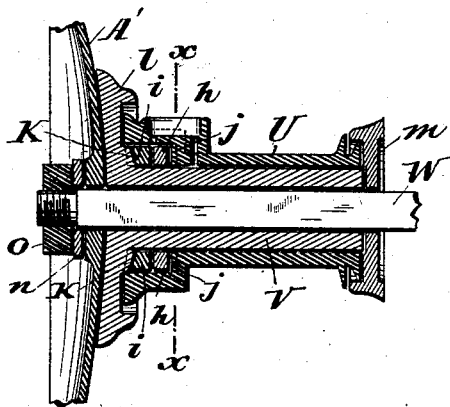


Fig. 3.

Fig. 4.



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# UNITED STATES PATENT OFFICE.

E. FOWLER STODDARD, OF DAYTON, OHIO, ASSIGNOR TO THE STODDARD MANUFACTURING COMPANY, OF SAME PLACE.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 347,745, dated August 17, 1886.

Application filed January 14, 1885. Serial No. 152,830. (No model.)

*To all whom it may concern:*

Be it known that I, E. FOWLER STODDARD, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Harrows, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of harrows or cultivators known as "rotary-disk" harrows, and it is an improvement on the harrow shown and described in my patent dated February 24, 1885, No. 312,772, wherein the movement and adjustment of the double-tree backward or forward determined the extent of backward or forward adjustment of the wheel-gangs.

The object of my present invention is to combine a positive leverage with a swinging or sliding double-tree, so that the said double-tree may be the more readily operated and locked in any of its adjusted positions, and at the same time to improve and simplify the construction and operation of the harrow and its parts.

The novelty of my invention will be herein described, and distinctly pointed out in the claims.

In the accompanying drawings on two sheets, Figure 1 is a side elevation of my improved harrow. Fig. 2 is a rear elevation of the same. Fig. 3 is an enlarged axial section of one of the end spools and devices for receiving the end-thrust of the gangs. Fig. 4 is a sectional view through the line *xx* of Fig. 3. Fig. 5 is a detail view of my improved swinging double-tree and connections. Fig. 6 is an enlarged detail view of my improved scraper. Fig. 7 is a diminished detailed view representing a modification of the construction.

The same letters of reference are used to indicate identical parts in all the figures.

A is the tongue or pole bolted to the main beam B, which is in this instance somewhat shorter than usual.

C is the seat-beam, carrying the driver's seat D and secured in a socket-piece, E.

F F are the usual brace-rods for the frame.

Suitably hinged to the outer extremities of the beam B, as at *a*, and so as to have vertical

play only, are beams G, which form practically hinged extensions of the main beam B, and pivoted to these beams G at their outer ends by vertical pivots *b*, of any suitable construction, are the gang-beams H, carrying the usual disk-gangs supported in hangers I. From this construction it will be seen that the disk-gangs have horizontal play upon the pivots *b* to permit them to be angled as desired, while at the same time they can tilt vertically by means of the hinges *a* to follow the inequalities of the ground. At the same time to relieve the pivots *b* of the strain that would otherwise come upon them, I secure to the inner ends of beams G a casting or equivalent device, *b'*, with a projecting flange which hooks under a flanged casting, *a'*, secured to the beams H, as seen in Fig. 2, from which construction, while the beams H can slide backward or forward, they cannot drop down or away from the beams G, as will be readily understood.

To further regulate the adjustment of the wheel-gangs and to render the harrow a flexible or rigid or partially rigid harrow at will, I provide upon the ends of the beam B plates or castings J, perforated so as to permit the passage through each and the beam B of two vertical rods or bolts *c d*, the former of which are threaded to engage with their correspondingly-threaded perforations, and the latter threaded at their upper ends to receive the adjusting nuts *e*. The bolts *d* have their lower ends bent to form a hook that engages with an eye, *f*, secured to the inner projecting ends of the beams G, as shown, while the upper ends of the bolts *c* are provided with heads or thumb-pieces *g*. It will be seen from this construction that when the bolts *c* are screwed up out of the way and the nuts *e* are at the tops of the bolts *d*, the gang-beams have their greatest limit of vertical play both ways. By screwing down the nuts *e* the downward vertical play can be adjusted or stopped entirely, while by screwing down the bolts *c* the upward vertical play can be adjusted or stopped entirely, so that the gang-beams can be locked from vertical play in either direction to render the harrow a rigid harrow, or they can be given as much play in either or both directions, as desired, or they may be permanently set at any tilting angle desired. In all cases,

however, whether the harrow be rigid or flexible to any degree, the gangs have free horizontal play to enable their degree of angling to be regulated; or, instead of the arrangement of bolts and eyebolts above described, for rendering the harrow rigid or flexible, or partially so, or to tilt the gangs, the modification shown in Fig. 7 may be employed where the beam B is extended somewhat beyond the hinges *a*, and two threaded bolts, *c*, with heads or thumb-pieces *g* are passed down through the beam B, one on each side of the hinge *a*, and bear against the beam G. By adjusting these bolts the harrow may be made rigid or flexible, or partially so, or the gangs can be tilted to any extent desired in either direction.

To accomplish the angling of the harrow, I connect the inner ends of the gangs by jointed or flexible draft-links L to a backwardly and forwardly movable adjustable double-tree, M, which may be arranged as in my patent before referred to, so as to slide, as seen in Fig. 1, or may be connected to a swinging arm, N, pivoted to the pole, as shown in Fig. 5, and which latter construction is the one preferred for this harrow. Secured upon the pole near the seat-beam is a toothed sector-plate, O, to which is pivoted any well-known form of lock hand-lever P, from which or an extension of which a chain or cord, R, passes down through a slot in the pole containing a sheave, S, around said sheave, and has its forward end secured to the double-tree or to the arm N.

As in my former patent referred to, the shifting of the gangs is caused, in the one instance, by the draft of the team directly upon the gangs, and, in the other instance, by the draft of the team exerted through the machine and aided by the resistance of the earth. By means of the lever P the forward and backward adjustment of the gangs can be regulated at will and while the machine is in motion, so that the shifting of the gangs either forward or backward is always accomplished by the forward motion of the team.

T is merely a brace-rod for the seat-beam.

Another feature of my invention, illustrated in Figs. 3 and 4, consists in the construction of the end spools and the devices connected therewith for receiving the end-thrust of the gangs and preventing wear at a minimum friction. U is the cylindrical box secured by a clip-bolt or otherwise to the lower end of the hanger I, which partially embraces it. The outer end of this box has an enlarged bore to receive two preferably-chilled washers, *h* and *i*, the former of which is secured by recessed dowels or teats *j* to the inner wall of the enlarged bore of the box to prevent its turning, while the latter, *i*, fits upon and is secured by recessed dowels or teats K on a rounded beveled self-adjusting surface formed upon the inner face of the flange *l* of the spool V. The spool V fits into and revolves within the box U, and is provided with a square or

polygonal bore to permit the passage of a correspondingly-shaped shaft W. The length of the spool is such that it slightly projects beyond the inner end of the box, so as to receive a sand-band disk *m*, which intervenes between the second cutting-disk and its spool. The outer cutting-disk, A', is clamped to the flange-disk *l* by means of a washer, *n*, and nut *o* screwed upon the end of the shaft W, as shown. Perforations *p* *r* are provided, opening from an oil-cavity, the former, *p*, between the disks *h* *i* and the latter, *r*, directly upon the spool to lubricate the box, as shown. From this construction it will be seen that all of the cutting-disks can be clamped together upon the shaft W between their spacing-spools, while the end-thrust is borne directly by the washers *h* *i*, which bear and turn upon each other. In case of wear or breakage of these washers it is only necessary to remove the outer cutting-disk, whereupon the spool V can be drawn out, the old washers removed and new ones substituted without loss of time or the dismantling of the machine or the expenditure of much labor. As the washer *i* has play upon its beveled bearing-surface so as to tilt thereon, the bearing-faces of the two washers will always adjust themselves so as to run true.

I am aware that leather washers have been before employed to receive the end-thrust of the gangs, which washers required to be forced into the lubricating-chamber without any provision for either of them being locked or for their turning on each other, as shown in Bayliss' patent, reissued April 2, 1878, No. 8,147, and do not therefore claim the same.

The remaining feature of my invention, illustrated in Figs. 1, 2, and 6, consists in the scrapers for the disks. My object is to provide independent automatically-acting scrapers for the disks, which will at all times remain in operating contact with the disks to prevent the adherence or accumulation of earth upon them. Upon the rear side of each of the gang-beams are pivoted a series of pendent arms, B', having forked lower extremities, *c'* *d'*, which straddle the disks. To the lower end of the arm *b'* is pivoted, as at *e*, the scraper-blade *f'* of the shape shown, which bears slightly at all times upon the concave side of the disk, and is held in such operating contact by the lower end of the arm *c'* bearing against the convex side of the disk, as will be readily understood. In this manner the scrapers will always accommodate themselves to the disks in their variations out of their normal positions, and will thus prevent wearing or clamping or binding.

I am aware that independent straddling scraper-blades in one unjointed piece are old, and therefore do not claim the same.

Having thus fully described my invention, I claim—

1. In a wheel or disk harrow having the disk-gangs pivoted to the main beam, said main beam formed in three parts hinged together so

as to have independent vertical play, and to the outer sections of which the gang-beams are pivoted so as to have horizontal play.

2. In a wheel or disk harrow, the combination, with the main frame and the disk-gangs hinged thereto, of adjusting mechanism whereby said harrow may be made rigid or flexible at will, or may be given any desired amount of vertical play either upward or downward, as desired.

3. In a wheel or disk harrow, the combination, with the main frame and the disk-gangs hinged thereto, of adjusting mechanism whereby said harrow may be made rigid or flexible at will, or may be given any desired amount of vertical play either upward or downward, and whereby the gangs may be locked in any tilted position desired, substantially as described.

4. In a wheel or disk harrow, the combination, with the main frame and hinged extensions thereto, to which the gang-beams are pivoted, of adjusting and locking mechanism, whereby the harrow may be made rigid or flexible at will, or may be given any desired amount of vertical play either upward or downward, and whereby the gangs may be locked in any tilted position desired, substantially as described.

5. In a wheel or disk harrow, the combination and arrangement of the main beam B, supplemental extensions G, hinged to the main beam and having the gang-beams pivoted to them, and the adjusting and locking bolts *cd*, substantially as described.

6. In a wheel or disk harrow, the combination, with a series of rotating harrow-disks, of a series of independent pivoted rocking arms carrying self-adjusting scrapers, and which said rocking arms straddle the disks so as to cause the scraper-blades to remain in constant operating contact.

7. The combination, with the main frame and

the simultaneously-adjustable disk-gangs, of the toothed sector O, locking hand-lever P, connecting chain or link R, and backwardly and forwardly movable double-tree N, substantially as and for the purpose described.

8. The combination, with the main beam and the supplemental beams G, of the beams H, pivoted to the beams G at *b*, and the supporting devices *a' b'*, substantially as described.

9. In a wheel-harrow, the combination, with the hanger-box and spool adapted to revolve therein, of two washers interposed between the spool and the box, the one of which is locked to and revolves with the spool, and the other of which is locked to the box for receiving the end-thrust and wear of the series of disks.

10. In a wheel disk or harrow, the combination, with the hanger-box and spool adapted to revolve therein, of two washers interposed between the spool and the box, the one of which is self-adjustable upon the spool and revolves therewith, and the other of which is locked to the box for receiving the end-thrust and wear of a series of disks.

11. In a wheel or disk harrow, the combination, with the hanger-box and spool adapted to revolve therewith, of two chilled washers interposed between the spool and the box, the one of which is self-adjustable upon the spool and revolves therewith, and the other of which is locked to the box for receiving the end-thrust and wear of a series of disks.

12. The combination, with the hangers I and boxes U, of the spools V and washers *h i*, the parts constructed and arranged, as described, for the purpose of receiving the end-thrust of the gangs.

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Witnesses:

H. A. CRANDALL,

WM. W. WAGNER.