

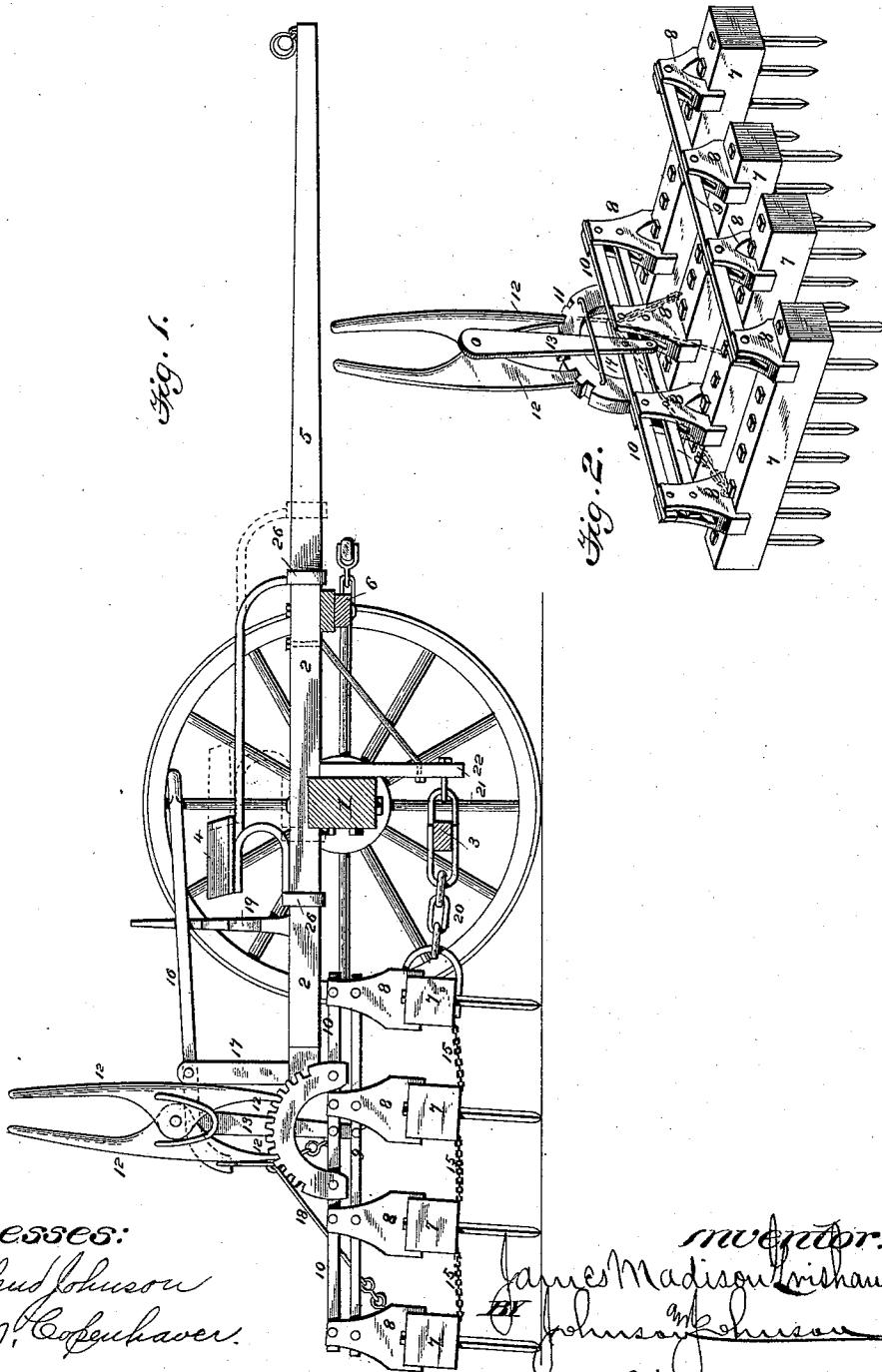
(No Model.)

2 Sheets—Sheet 1.

J. M. GRISHAM.
HARROW.

No. 469,060.

Patented Feb. 16, 1892.



witnesses:

A. Roland Johnson
J. M. Copenhaver.

inventor:

James Madison Grisham
Johnson & Johnson
his attorneys.

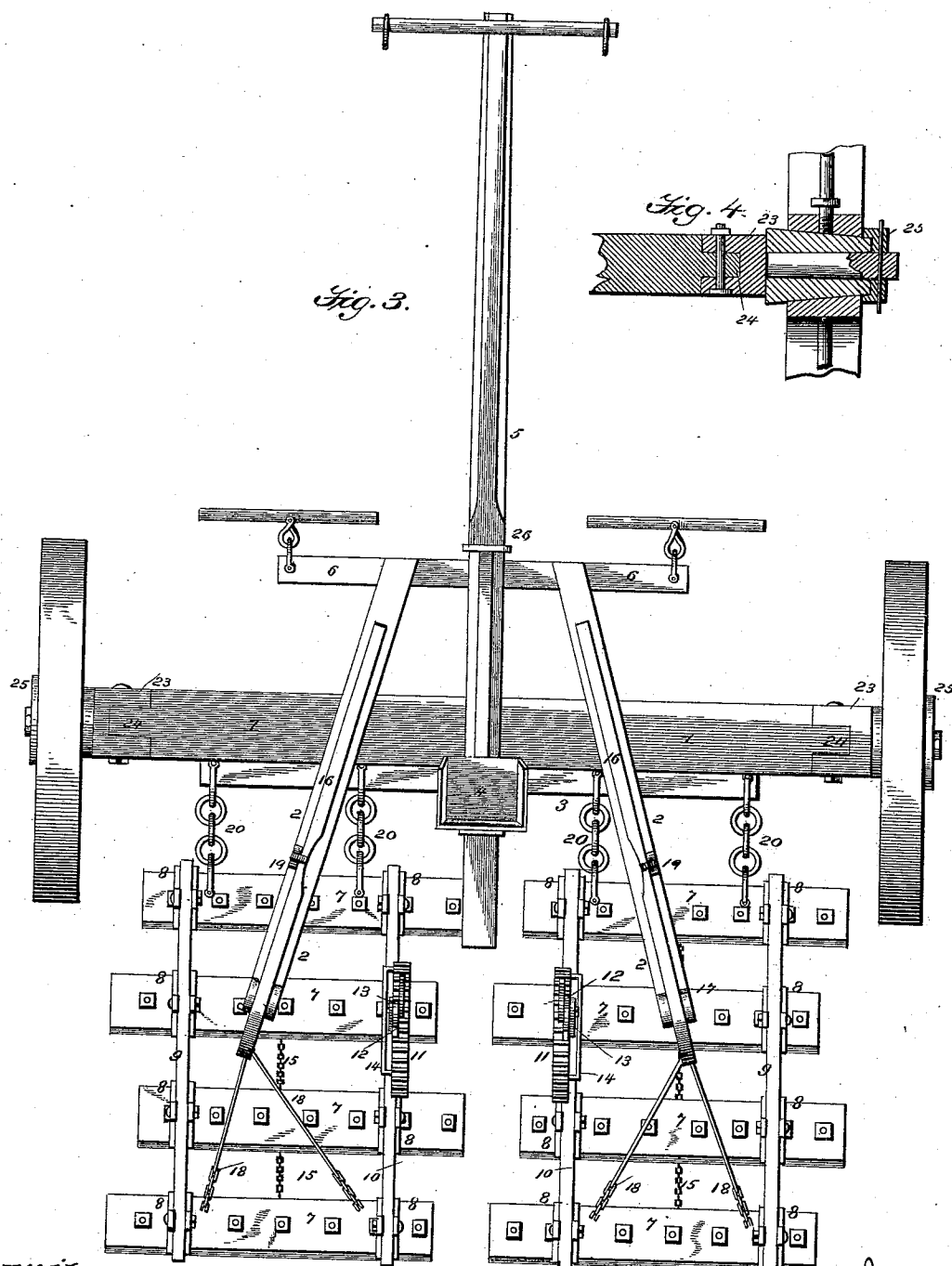
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Witnesses:

A. Roland Johnson
J. M. Spencer.

Inventor:

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UNITED STATES PATENT OFFICE.

JAMES MADISON GRISHAM, OF WHITNEY, TEXAS.

HARROW.

SPECIFICATION forming part of Letters Patent No. 469,060, dated February 16, 1892.

Application filed August 27, 1891. Serial No. 403,853. (No model.)

To all whom it may concern:

Be it known that I, JAMES MADISON GRISHAM, a citizen of the United States, residing at Whitney, in the county of Hill and State of Texas, have invented a new and useful Improvement in Harrows, of which the following is a specification.

I have improved the wheeled harrow in certain particulars of construction and of combination, whereby the labor of working and handling the harrow is made comparatively light, easy, and satisfactory under all conditions and kinds of ground.

In the accompanying drawings I have shown my improved harrow in vertical longitudinal section in Fig. 1. Fig. 2 shows one of the harrow-sections in perspective. Fig. 3 is a top view of the harrow, and Fig. 4 is a sectional detail of the axle-bearing parts.

The wheeled part of the harrow consists of an axle, the wheels, the axle-hounds, and the tongue. A harrow-section is adjustably suspended in the rear of the axle 1 from the inner end of each hound 2, and these harrow-sections are independently connected to the axle by an intermediate coupling-bar 3. These harrow-sections are constructed without frames in a way which I shall presently describe. A seat 4 is mounted on the tongue 5 for the driver, so that he can slide it so as to bring his weight forward of the axle to hold the harrow up in going to and returning from the field. The draft-bar or doubletree 6 is hung in front of the axle, to the under sides of the axle-hounds, so that the draft of the team is on the axle and not on the harrow coupling-bar.

The harrow-sections are constructed as follows: A number of bars 7 are each provided with harrow-teeth, and from each end of each bar rises a firmly-secured iron bracket 8, having its upper end slotted crosswise of the bar. An iron bar 9 lies within the slot of each bracket and is pivoted to each to connect the bars and hold them in parallel relation. At one side only of each harrow-section and within the slotted brackets a bar 10 is pivoted above, parallel to, and separated from the bar 9, and this top bar has an upward standing semicircular rack 11, into which engage spring-connected pawls 12, which are pivoted to the upper end of a lever 13, which at its

lower end is pivotally connected to the parallel bars 9 10, so that the movement of this lever in either direction will cause all the harrow-bar teeth to be turned toward the front or toward the rear or in vertical positions to suit the soil, to clear the harrow of trash, and to make the draft of the harrow light or heavy to suit the team. In any position they are held by the spring-pawls 12 and rack 11, which serve to lock the lever and the parallel bars together. A loop 14 on the side of the rack holds the lever and its pawls in proper relation to the rack. To relieve the pivots of the parallel bars 9 and 10 and lever 13 from the twisting strain caused by the draft on the harrow, I connect the harrow-bars by chains 15, preferably at the under sides of the bars, so that the force of the draft will be more directly on the bars and the chains and will therefore resist and modify the force of the draft on the pivots, on the brackets, and on the parallel bars. These chains may connect the toothed bars at their ends or at the middle of their length only.

A lever 16 is pivoted to a stud 17 on the rear end of each of the axle-hounds, and to the rear end of each lever is suspended a harrow-section by chains and rods 18, which serve to hold the harrow-sections in proper relation to each other and to allow them to be raised and held up by the levers 16, which for this purpose are adapted to engage a vertical rack 19 on the axle-hounds. Each harrow-section is connected to the coupling-bar 3 by yokes and links 20, and the coupling-bar 3 is connected by a yoke and link 21 to a strong hanger-bar 22, which is secured to and depends from the axle, so that the harrow-sections are drawn directly from the axle, and will thereby be kept more evenly together, and is particularly advantageous in turning the harrow. This arrangement also allows the doubletree 6 to be placed above the plane of the harrow coupling-bar 3 to allow the pull to be directly on the shoulders of the team.

The axle is made of wood about three by four inches and of a length sufficient to bring the wheels outside of the harrows. The journals of the axles are formed of iron couplings 23, each made with a grooved end, into which tongues 24 of the axle fit and are bolted thereto, and this construction gives lightness and

durability to the axle. A cap 25 on the outer end of the journal serves to exclude sand and dirt.

The seat 4 can be made of comparatively stout iron rods formed with loops 26, which are fitted on the tongue, so that the driver can slide the seat to bring his weight at the rear side of the axle in working; but in going to and returning from the field the seat is moved in advance of the axle, so that the weight of the driver will hold the tongue down and the harrow-sections up when raised by the levers.

It will be observed that the lever-pawl device of each harrow-section stands vertically within convenient reach of the driver, so that he may set the harrow-teeth as he may desire, and he can also raise one or both of the harrow-sections to pass over obstructions.

The arrangement of the parallel pivoted bars 9 10 with the harrow-teeth bars 7 and the mounting of the adjusting and locking device directly upon the parallel pivoted bars gives the advantage of compactness and dispenses with separate frames for each harrow-section. The spring-connected pawls form the handles for the adjusting-lever, while the parallel movement of the pivoted bars 9 10 as a means for adjusting and locking the set of the harrow-teeth is made durable by the chain connections 15 for the harrow-teeth bars, which, while giving freedom for the adjustment of the latter to vary the angle of the teeth, serve to relieve the locking-lever device of undue strain. This construction gives freedom for the independent movement of the harrow-toothed bars within certain limits, so that each section forms a flexible harrow.

Various constructions have been proposed for casting the harrow-teeth backward or forward to clear them of rubbish and suit different soils by different adjustments of the teeth, and it is only the special provisions and novel combinations for obtaining such object which constitute my improvements, as illustrated in the drawings and set out in the concluding claims.

Referring to the sliding seat and its relation to the axle and the harrows, it will be understood that when the driver has raised and suspended the harrows out of use in going to and from the field the machine would be constantly liable to tilt backward and cause the harrow-sections to drag on the ground. To prevent this, I provide for sliding the seat forward on the tongue, so as to bring the weight of the driver a little in front of the axle, as shown by dotted lines in Fig. 1, and thereby allow the driver to tilt the machine forward and thus raise and hold the already suspended harrows higher above the ground. In this action the tongue is supported on the breast-chains of the team, and thus hold the machine from tilting backward and dipping the harrows down, as would be the case in going over hilly and rough roads. This ad-

vantage can only be obtained when the harrows are raised and suspended by the levers and the seat moved forward, and the relation of these parts is such that the driver can raise and hold the harrows in suspended positions and then pull the seat forward of the axle to support the tongue on the breast-chains, and thereby raise and hold the harrows higher above the ground than they could be by the suspending-levers. As the harrow-bars of each section have no frame connections, but are only pivotally connected by the top bars and the chains, I connect each harrow-section to its suspending-lever by three branch chains 18, one of the branches being shorter than the others, so as to support the pivotally-connected harrow-bars in level relation to each other when suspended.

Referring to the device for holding and adjusting the harrow-bars, the two spring-connected pawls 12 give the advantage of a double and strong engagement with the teeth of the rack 11, and they form the handles by which the short lever 13 is moved, so that the pawls or catches can be disengaged by merely grasping their handles and pressing them together, and the lever is then shifted by them.

I claim—

1. The combination, in a harrow, of the separate harrow-sections, the wheeled-axle part having the tongue and the hounds, the vertical racks on the hounds, the hand-levers pivoted on the hounds connected to said harrow-sections, and a seat adapted to slide on the tongue between the harrow-sections, whereby when the harrow-sections are raised and suspended above the ground by said levers the machine may be tilted forward and supported by the breast-chains to further raise and hold up the suspended harrow-sections, as stated.

2. In a harrow, the combination of the pivotally-connected toothed harrow-bars, adjusting and locking connections therefor, the tri-branched chains connected to each other and to the upper sides of the several toothed pivoted bars, the chains connecting the latter at their lower ends, and the suspending-lever connected to said tri-branched chains, as shown and described.

3. The harrow-section herein described, consisting of the toothed bars, the pivotally-connecting top bars 9 9, the suspending tri-branched chains, and the bottom chains connecting said toothed bars, in combination with a device for adjusting and locking said toothed bars, consisting of the pivotally-connecting bar 10, having the rack 11, the vertical pivoted bar 13, the pawls pivoted to the upper end of the latter, the spring connecting said pawls, and the loop 14 for holding the pawls on the rack, as shown and described.

JAMES MADISON GRISHAM.

Witnesses:

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