No. 829,930. PATENTED AUG. 28, 1906.

R. L. NELLIS.

RIDING ATTACHMENT FOR HARROWS.

APPLICATION FILED SEPT. 5, 1905.

2 SHEETS—SHEET 1.

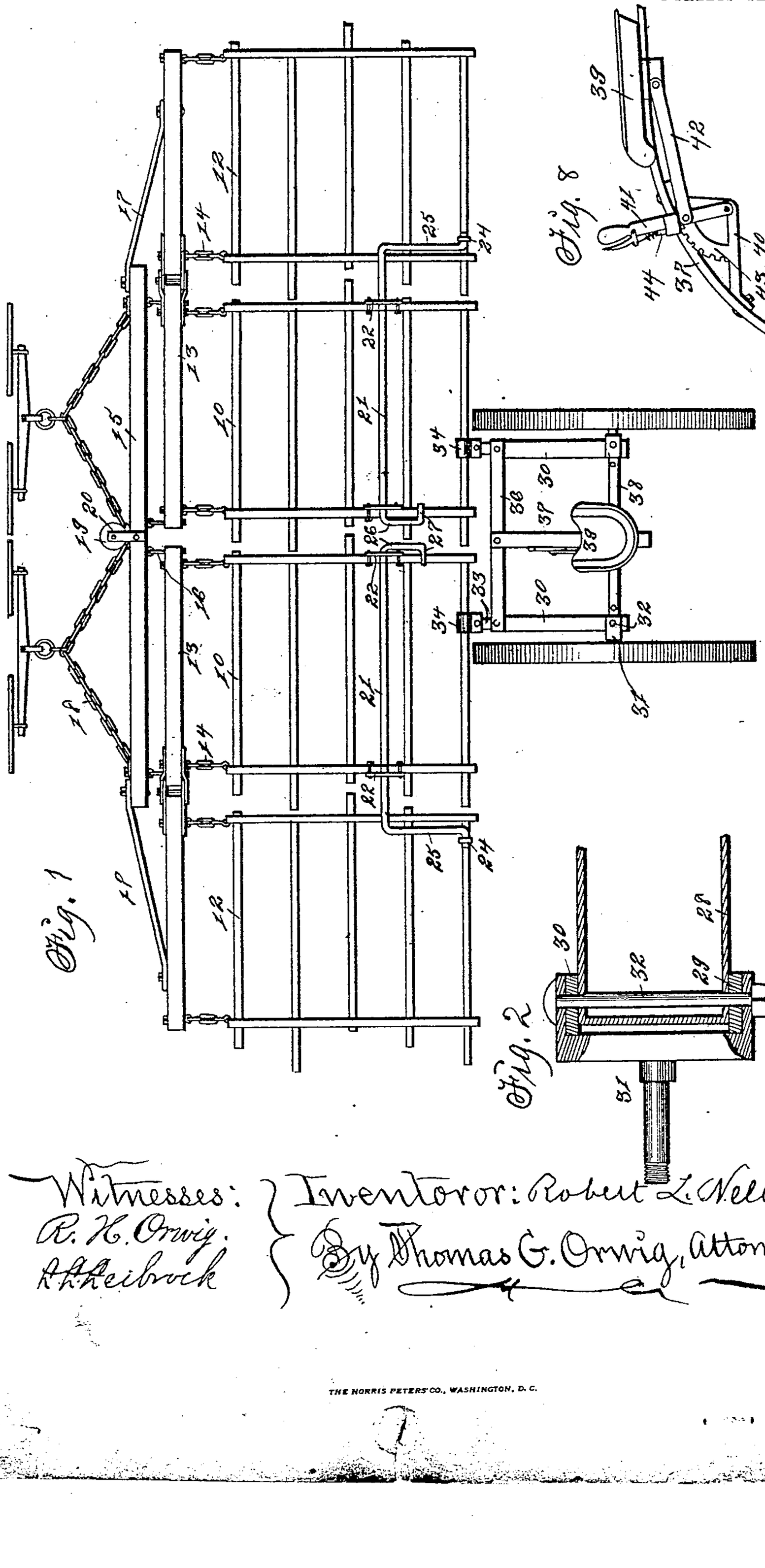

Fig. 1

Fig. 3

Fig. 2

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Fig. 4

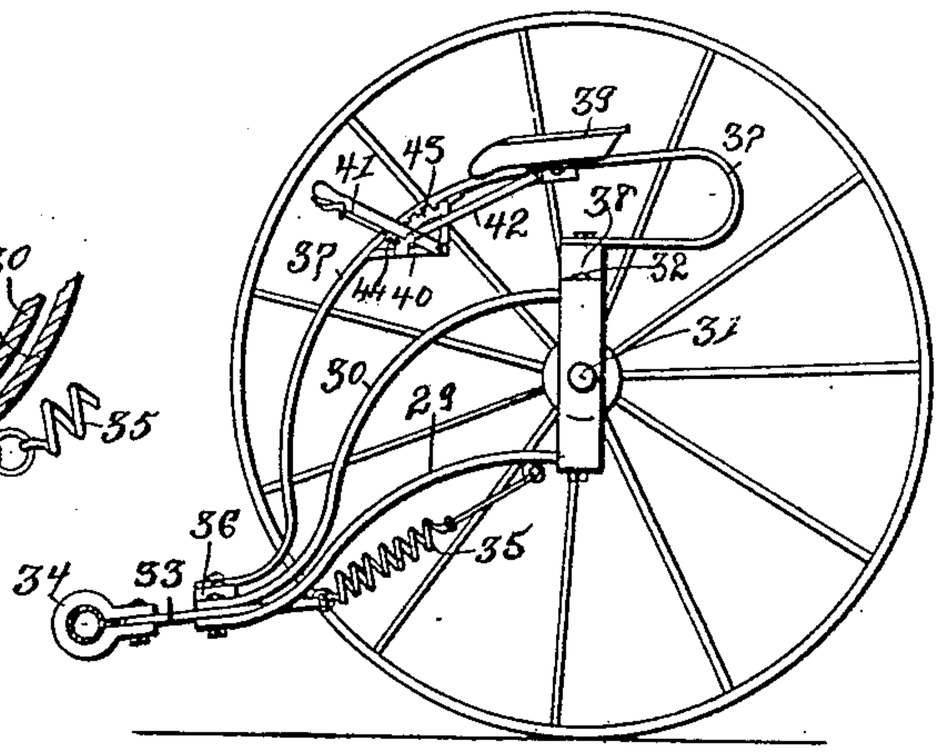


Fig. 3

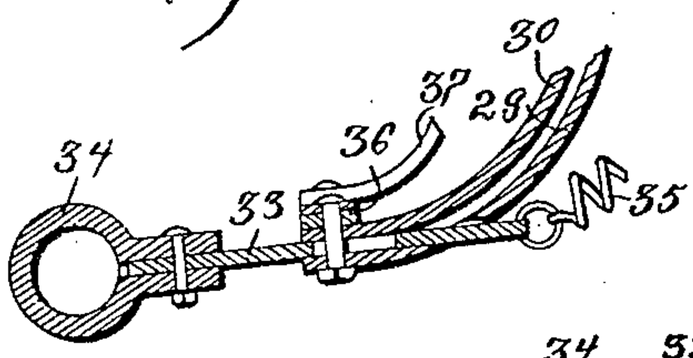


Fig. 6

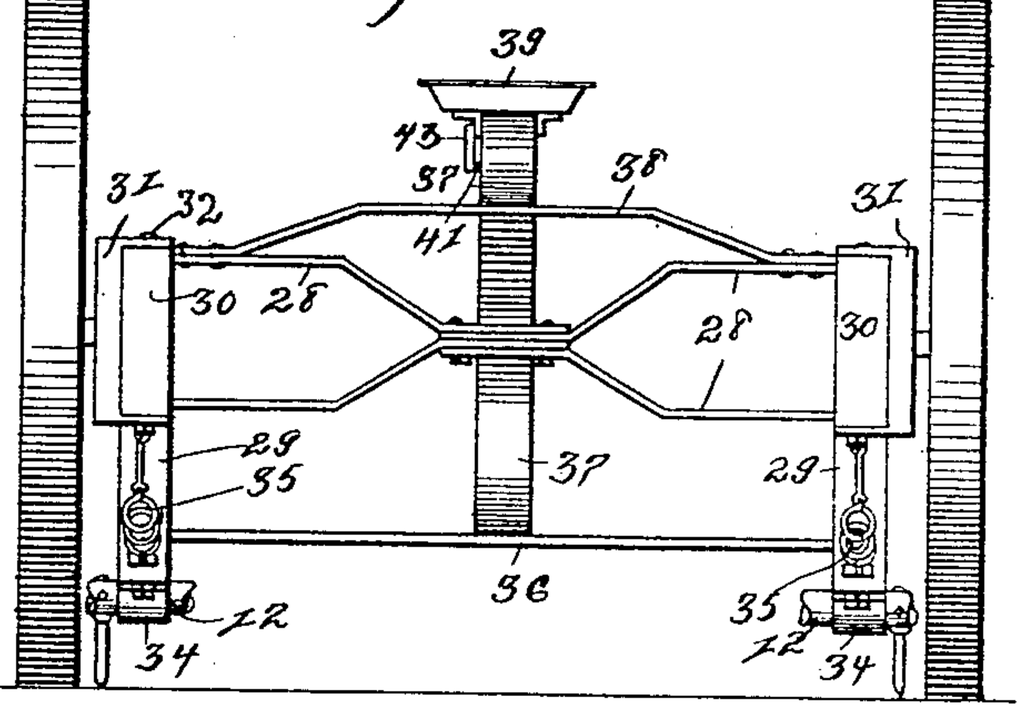


Fig. 5

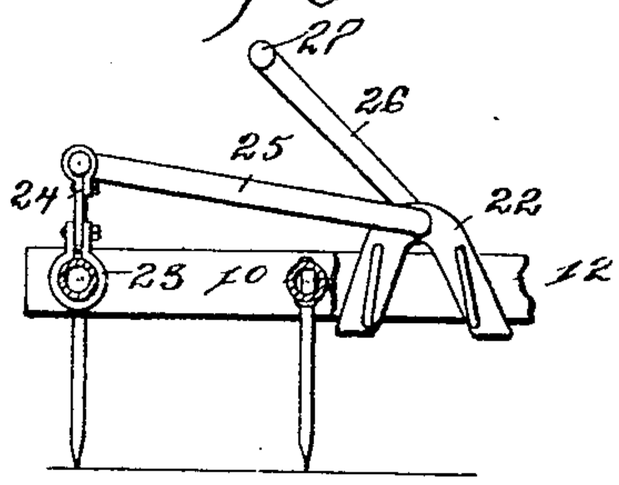
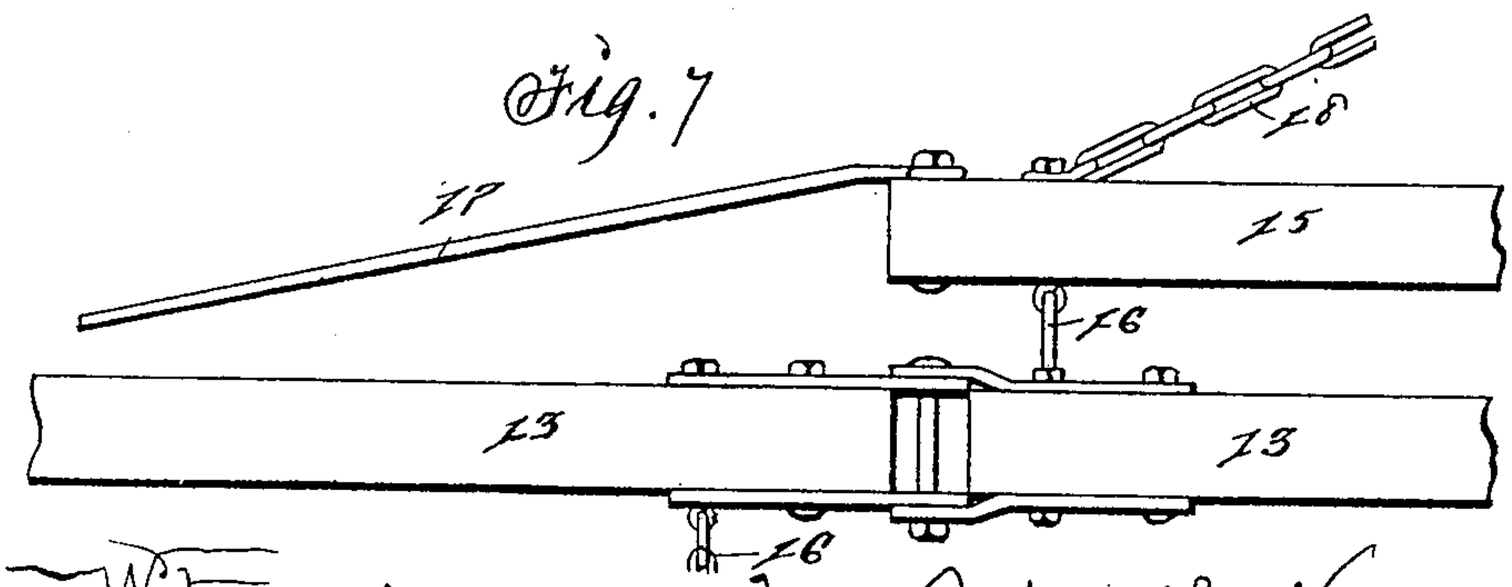


Fig. 7



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UNITED STATES PATENT OFFICE.

ROBERT L. NELLIS, OF EARLHAM, IOWA.

RIDING AT ACHMENT FOR HARROWS.

No. 829,930. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed September 5, 1905. Serial No. 277,123.

To all whom it may concern:

Be it known that I, ROBERT L. NELLIS, a citizen of the United States, residing at Earlham, in the county of Madison and State of Iowa, have invented a new and useful Riding Attachment for Harrows, of which the following is a specification.

My object is, first, to connect four harrow-sections direct to a drag-bar and evener in such a manner that the outer sections will be vertically adjustable relative to the inner sections; second, to connect a sulky direct to the rear ends of the two inner sections in such a manner that by shifting the position of the driver on the sulky-seat the inner sections can be lifted as required to release rubbish gathered by the teeth; third, to provide means for adjusting the driver's seat; fourth, to connect treadles and crank-shaft with the outer sections, so the driver can by foot-pressure, lift the outer sections as required to clean them; fifth, to provide a sulky-carriage adapted to be connected with the two inner sections in such a manner that it will be automatically adjusted relative to the line of advance by the movements of the inner harrow-section.

My invention consists in the construction, arrangement, and combination of elements and subcombinations as hereinafter set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 is a top view that shows all the parts combined and their positions relative to each other as required for practical use. Fig. 2 is an enlarged view that shows the manner of hinging the stub-axles to the sulky, frame and also to the ends of the main axle. Fig. 3 shows means used for flexibly connecting the front end of the sulky-frame direct with rear ends of the inner harrow-sections. Fig. 4 shows the manner of constructing the sulky-frame and means for supporting and adjusting a driver's seat thereon. Fig. 5 shows the manner of connecting a crank-shaft with a harrow-section for lifting and cleaning the harrow-teeth by means of foot-pressure. Fig. 6 is a rear end view of the sulky and shows the form of the axle and its connection with the toothed rear harrow-bars of the two inner harrow-sections. Fig. 7 is an enlarged view that shows the hinged connection between the front ends of an inner and an outer harrow-section and one end of the drag-bar and evener.

The numeral 10 designates the central or inner harrow-sections, and 12 the outer sections. Each section 10 and 12 is flexibly connected at its front corners with a straight rigid bar 13 by means of chains 14, as shown in Fig. 1, in such a manner that each section will have independent motion relative to the ground over which it is advanced. The bars 13, connected with the inner sections 10, are also flexibly connected with a drag-bar 15 by eyebolts 16 or in any suitable way, and the ends of bars 13 of the inner sections 10 and the outer sections 12 are hinged together as required to allow the outer sections 12 to be vertically adjustable relative to the inner sections 10. Braces 17, fixed to the outer end portions of the outer bars 13, are pivotally connected with the ends of the drag-bar 15 in such a manner that the braces will allow vertical adjustment of the outer harrow-sections, as required to carry the outer sections inoperative and to allow the complete harrow to pass between gate-posts in moving in and out of a field.

An evener-chain 18 is fixed at its ends to the ends of the drag-bar 15 and its central portion extended over a pulley 19 in a bearer 20, fixed to the center of the drag-bar, as shown in Fig. 1, in such a manner that the chain will adjust itself to the force applied thereto by horses hitched thereto by means of doubletrees and swingletrees connected therewith.

The rear ends of the inner harrow-sections 10 and outer sections 12 are adjustably connected, by means of crank-shafts 21, in bearers 22 fixed to the parallel bars of the inner sections 10, as shown in Fig. 1, and to the rear and round toothed bars of the outer sections 12, as shown in Fig. 5, by means of clips 23 on said round bars and links 24 on the ends of the cranks 25, that extend rearward from the shafts 21 and are pivotally connected with the clips 23.

Cranks 26 on the inner ends of the shafts 21 terminate in treadles 27 within reach of the driver's feet in such a manner that while the harrow is in motion he can by foot-pressure on the treadles operate the crank-shafts 21 as required to elevate the outer harrow-sections 12, so as to allow rubbish gathered by the harrow-teeth to drop therefrom to clean the outer sections 12.

The sulky-axle is composed of two bars bent into shape to produce frames 28 and their inner ends placed in overlying position and riveted together, as shown in Fig. 6. To

the ends of the frames are jointly pivoted bars 29 and 30 and stub-axles 31, as shown in Figs. 2, 4, and 6, by bolts 32 in such a manner that the bars 29 and 30 will extend forward and downward, and the stub-axles outward.

The front ends of the bars 29 and 30 and straight bars 33, having elongated slots, are connected by bolts that extend through said slots in such a manner that the bars 33 can slide back and forth a distance limited by said slots, and their front ends are pivotally connected with the rear toothed bars of the inner harrow-sections 10 by means of clips 34, as shown in Fig. 4, and the rear ends of the bars are connected with the bars 29 by means of coil-springs 35, that allow sliding motions to the bars 33 and flexible connection between the inner harrow-sections and the sulky.

A bar 36 is fixed to the front end portions of the bars 30, and a spring-seat bearing-bar 37 is fixed to its center at its front end and to the center of a bar 38, fixed on top of the frames 28 of the axle. A seat 39 is slidably connected with spring-bar 37 and a frame 40 fixed to the said spring-bar and a lever 41 fulcrumed thereto and connected with the seat by a link 42 in such a manner that a person on the sulky can operate the lever as required for moving the seat backward or forward. A toothed sector 43 on the under side of the spring-bar 37 and a spring-actuated pawl 44, connected with the lever, detachably lock the lever as required to retain the seat stationary. By thus adjustably connecting the seat with the spring-bar 37 the operator can move the seat backward and forward as required to balance his weight, so that he can, by leaning backward, lift the inner harrow-sections to allow rubbish accumulated on the harrow-teeth to drop therefrom.

Having thus set forth the purposes of my invention and the construction and function of each element and the arrangement and combination of all the parts, the practical operation and utility thereof will be readily understood by farmers and others familiar with the art to which it pertains.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a riding-harrow, a rigid drag-bar, two eveners flexibly connected with the front of the drag-bar, four straight bars hinged together at their ends and to the drag-bar at its rear, a harrow-section flexibly connected with each of said straight bars, to operate as set forth.

2. In a riding-harrow, a drag-bar, two eveners flexibly connected with the front of the drag-bar, two straight bars hinged to the rear of the drag-bar, harrow-sections flexibly connected with said hinged bars, harrow-sections flexibly connected with straight bars and the straight bars hinged to the ends of the hinged bars, braces pivotally connected with the ends of the drag-bar and fixed to the straight bars hinged to the outer ends of the inner hinged bars and the rear ends of the four harrow-sections flexibly connected, to operate as set forth.

3. In a riding-harrow, a drag-bar, two eveners flexibly connected with the front of the drag-bar, two straight bars hinged to the rear of the drag-bar, harrow-sections flexibly connected with said hinged bars, harrow-sections flexibly connected with straight bars and the straight bars hinged to the ends of the hinged bars, braces pivotally connected with the ends of the drag-bar and fixed to the straight bars hinged to the outer ends of the inner hinged bars and the rear ends of the four harrow-sections flexibly connected by crank-shafts in bearings fixed to the inner harrow-sections and hinged to the rear ends of the outer harrow-sections, to operate as set forth.

4. In a riding-harrow, a drag-bar, two straight bars hinged to the rear of the drag-bar, two harrow-sections flexibly connected with said hinged bars, harrow-sections flexibly connected with straight bars and the straight bars hinged to the ends of the drag-bar, braces fixed to the outer straight bars and pivotally connected with the ends of the drag-bar, crank-shafts in bearings fixed to the inner harrow-sections hinged to the rear ends of the outer harrow-sections and a seat in rear of the inner harrow-sections from which a person can tread on the cranks at the inner ends of the crank-shafts, arranged and combined to operate in the manner set forth.

5. In a riding-harrow, two harrow-sections in parallel position, a crank-shaft in bearings fixed to one of the harrow-sections, a crank at one end of the shaft terminating in a treadle and a crank at its other end hinged to the other harrow-section, for the purposes stated.

6. In a riding-harrow, two harrow-sections in parallel position, a crank-shaft in bearings fixed to one of the harrow-sections, a crank at one end of the shaft terminating in a treadle and a crank at its other end hinged to the other harrow-section by means of a clip and a link, arranged and combined to operate in the manner set forth for the purposes stated.

7. In a riding-harrow, four harrow-sections hinged together and flexibly connected with a rigid drag-bar at their front ends, crank-shafts in bearings fixed to the rear of the inner harrow-sections and hinged to the rear end of the outer harrow-sections, a sulky flexibly connected to the rear ends of the two inner harrow-sections, and a seat on the sulky, for the purposes stated.

8. In a riding-harrow, two harrow-sections flexibly connected with a drag-bar at their front ends and a sulky flexibly connected

with their rear ends, a seat-bearer fixed to the sulky and a seat slidably mounted on the seat-bearer, for the purposes stated.

9. In a riding-harrow, two harrow-sections flexibly connected with a drag-bar at their front ends and a sulky flexibly connected with their rear ends, a seat-bearer fixed to the sulky and a seat slidably mounted on the seat-bearer and means for adjusting and fastening the seat to the bearer, arranged and combined to operate as set forth for the purposes stated.

10. In a riding-harrow, a sulky flexibly connected with a harrow, a seat-support fixed to a cross-bar at the front end of the sulky-frame and connected with the sulky-axle at its rear end, a seat slidably mounted on the bearer, a bearer fixed to the seat-support in front of the seat, a lever pivoted to the bearer and connected with the seat by a link and means to lock the lever, arranged and combined to operate as set forth for the purposes stated.

11. A riding-harrow comprising a rigid drag-bar, two eveners flexibly connected with the drag-bar at its front, two straight bars flexibly connected with the drag-bar at its rear, a harrow-section flexibly connected with each of said straight bars, straight bars hinged to the ends of the aforesaid straight bars and harrow-sections flexibly connected therewith, crank-shafts mounted on the inner harrow-sections and the cranks on their inner ends provided with treadles and the cranks at their outer ends flexibly connected with the outer harrow-sections, a sulky flexibly connected with the rear ends of the two inner harrow-sections and a seat on the sulky to support a person to allow his feet to operate the crank-shafts, arranged and combined to operate in the manner set forth.

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