

No. 667,416.

Patented Feb. 5, 1901.

J. A. WILLARD.  
RIDING HARROW.

(Application filed Aug. 15, 1900.)

(No Model.)

3 Sheets—Sheet 1.

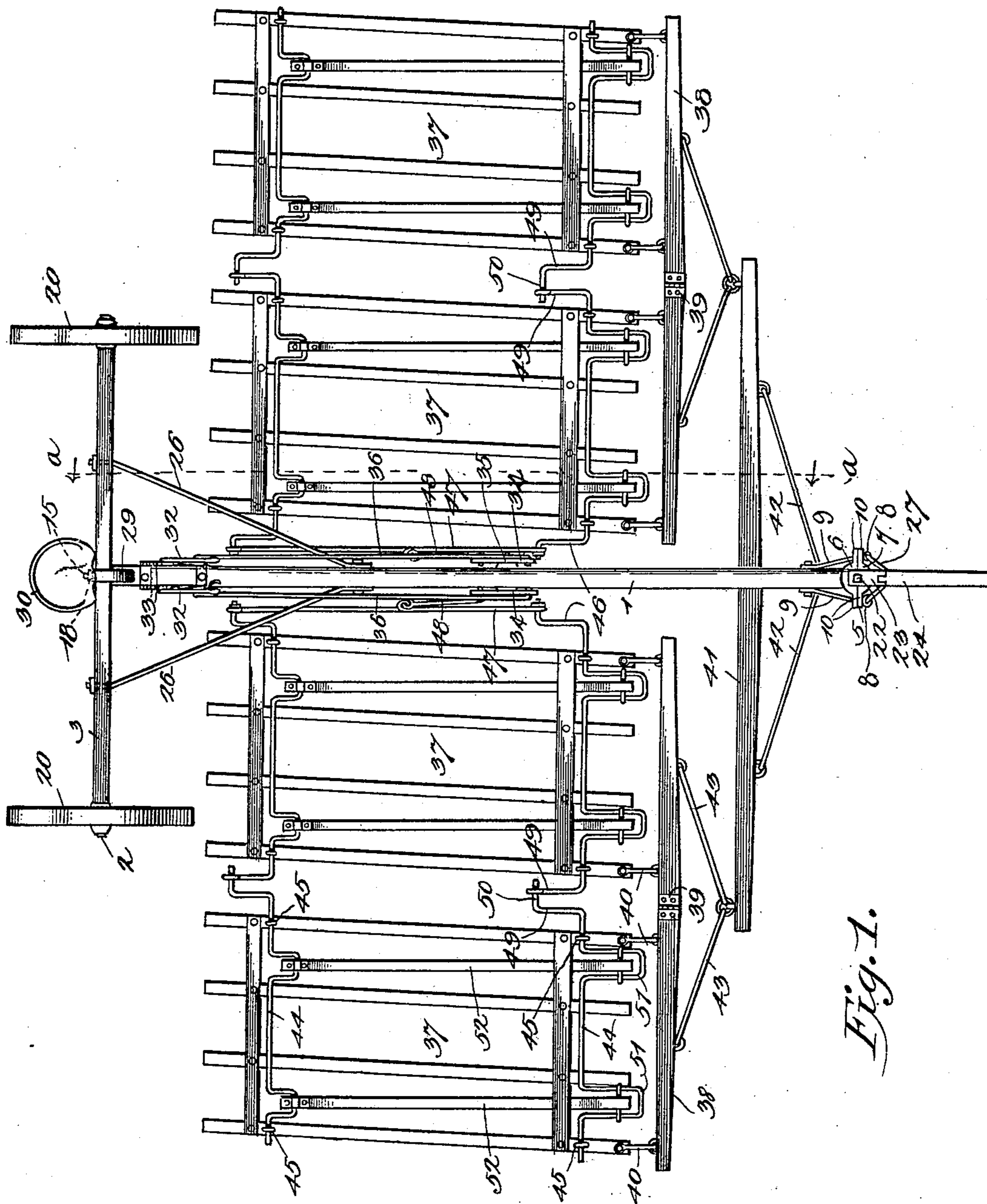


Fig. 1.

Witnesses

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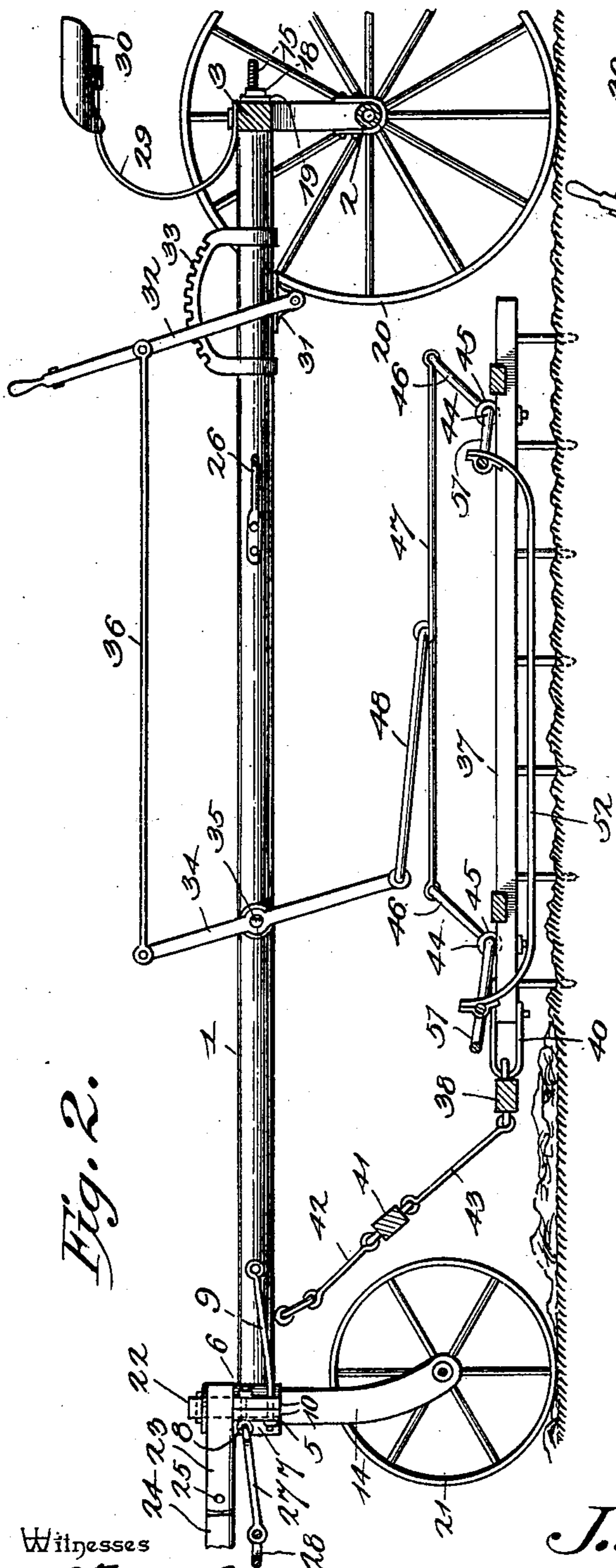


Fig. 2.

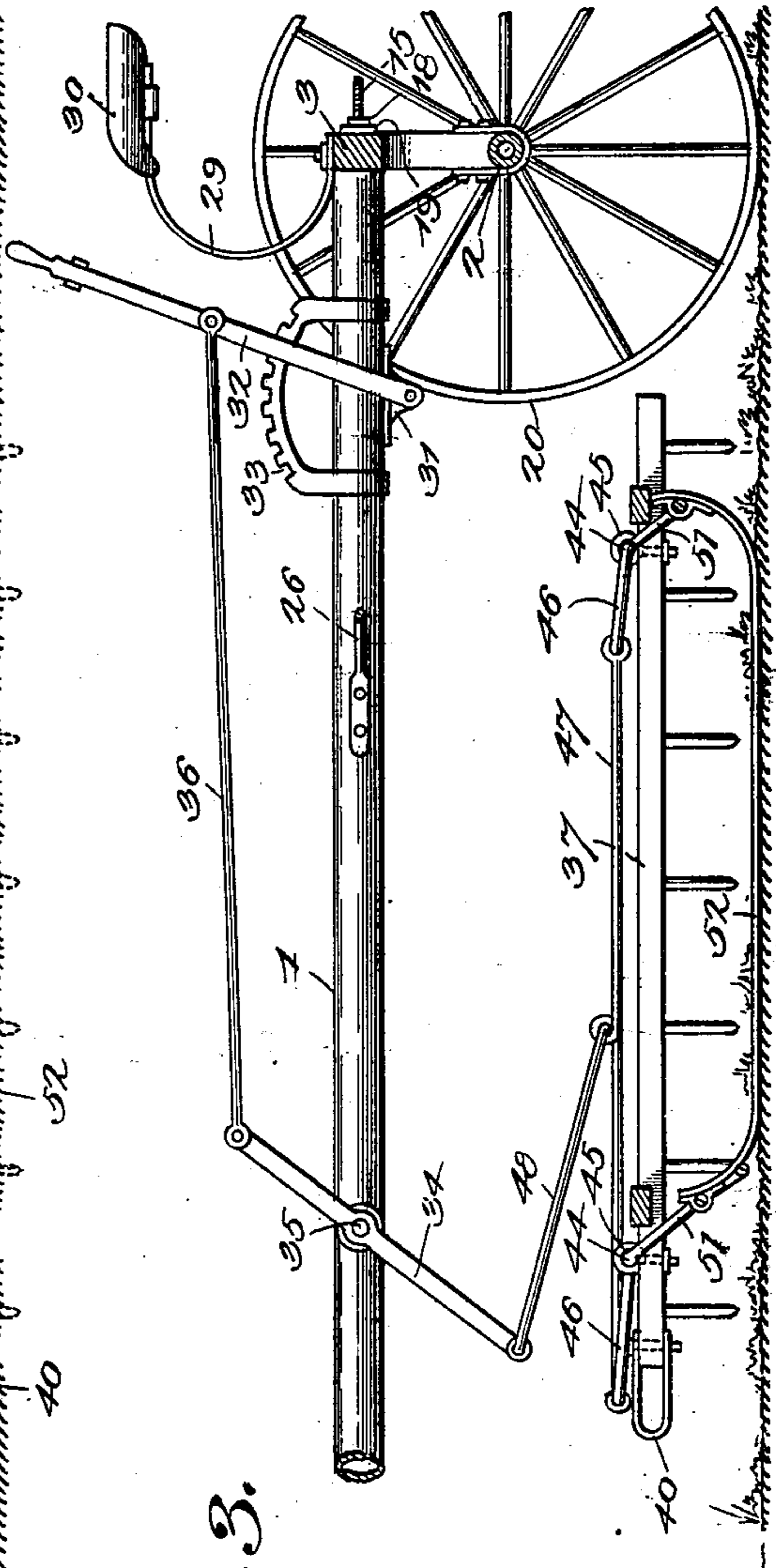


Fig. 3.

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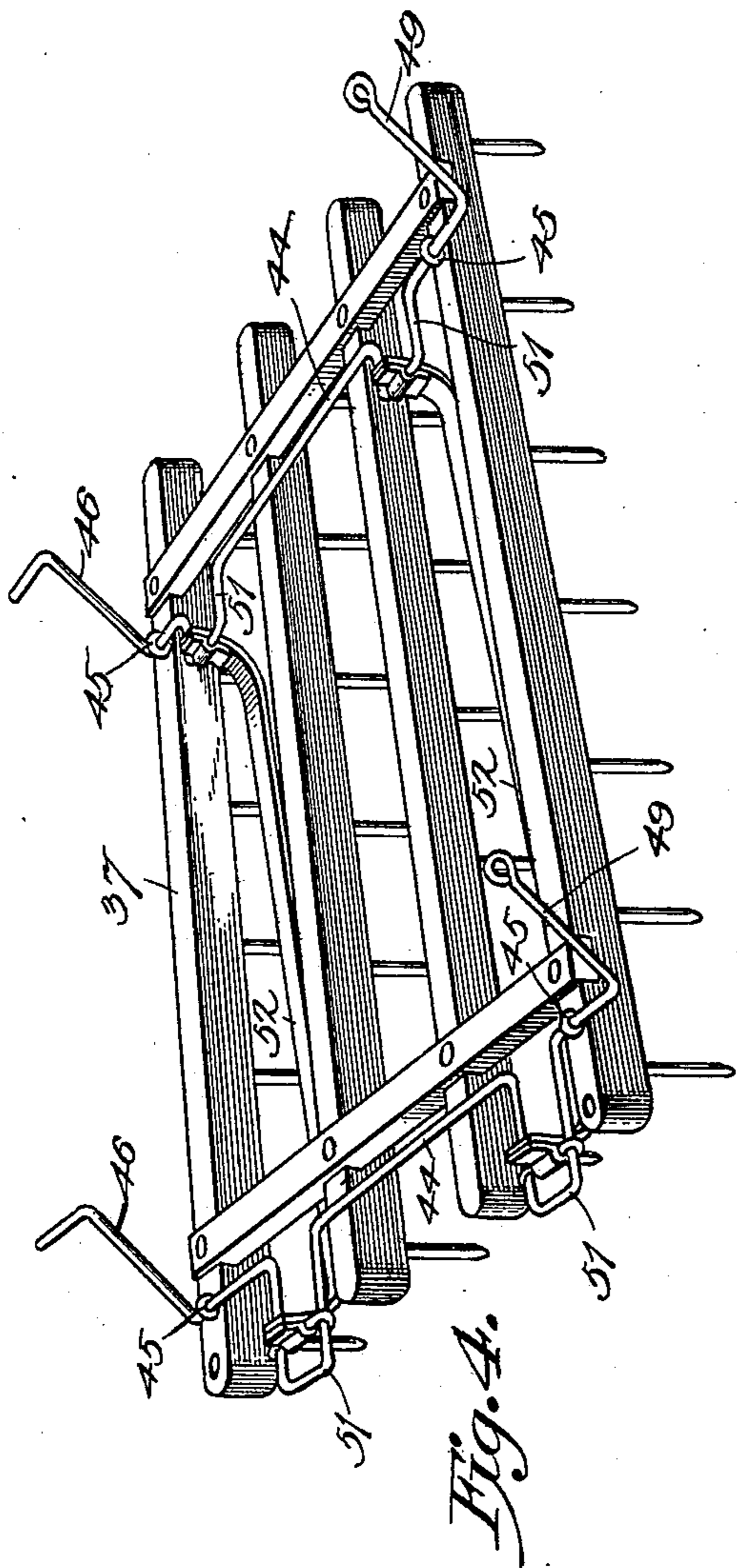


Fig. 6.

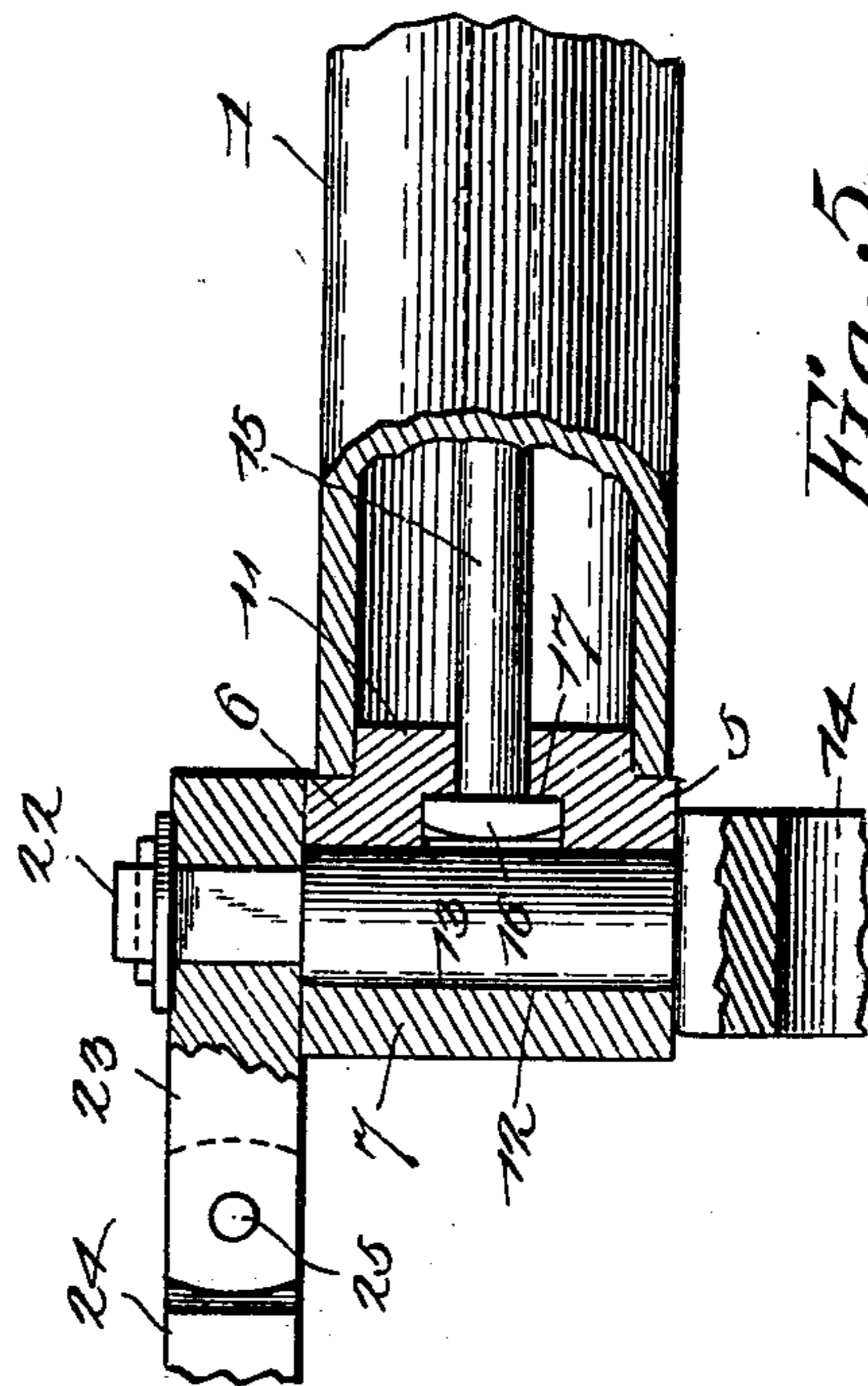
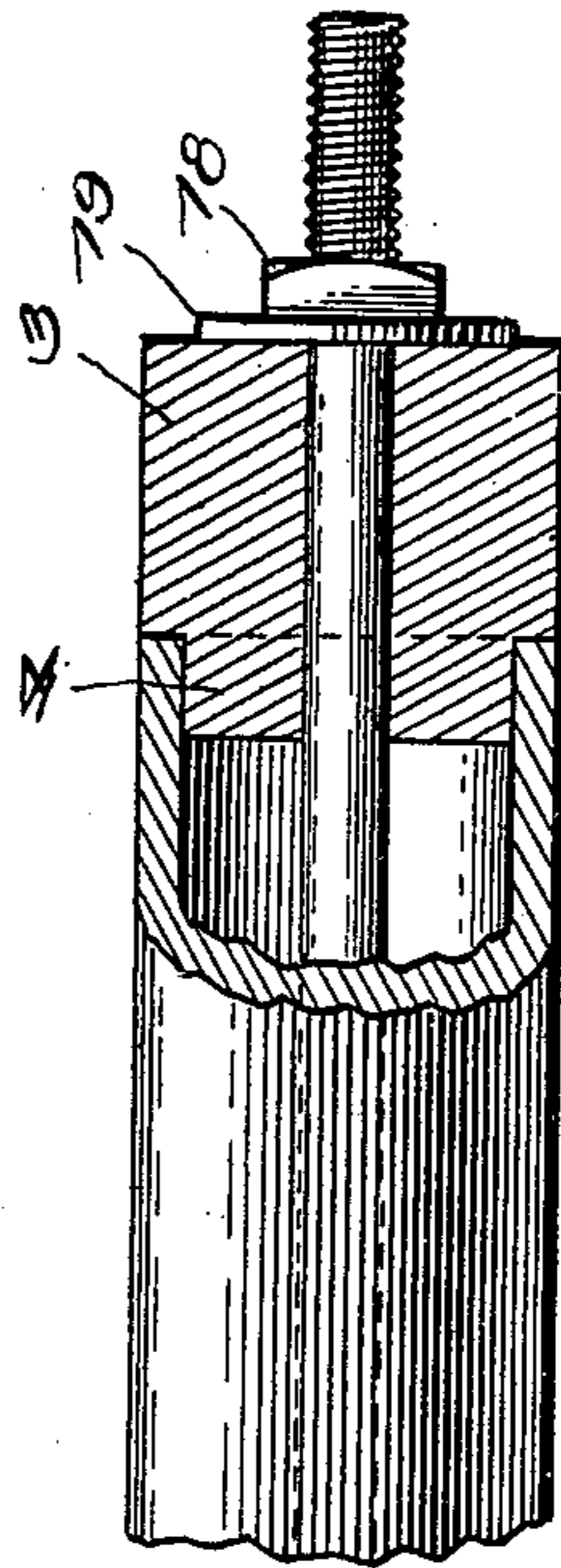


Fig. 5.

Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN A. WILLARD, OF BATCHELDER, OKLAHOMA TERRITORY.

## RIDING-HARROW.

SPECIFICATION forming part of Letters Patent No. 667,416, dated February 5, 1901.

Application filed August 15, 1900. Serial No. 26,961. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. WILLARD, a citizen of the United States, residing at Batchelder, in the county of Kay and Territory of Oklahoma, have invented a new and useful Riding and Drag Harrow, of which the following is a specification.

My invention is an improved riding and drag harrow; and it consists in the peculiar construction and combination of devices hereinafter set forth, and particularly pointed out in the claims.

One object of my invention is to effect improvements in the construction of the riding-frame.

A further object of my invention is to effect improvements in the means for connecting the harrow-sections together, whereby the harrow-sections are adapted to be folded one upon another when not in use and whereby the harrow-sections may be raised from the ground, supported on runners, and the teeth of the harrow-sections cleared of trash.

In the accompanying drawings, Figure 1 is a top plan view of a riding and drag harrow constructed in accordance with my invention. Fig. 2 is a side elevation of the same, partly in section, on the line *a a* of Fig. 1. Fig. 3 is a detail sectional view showing one of the harrow-sections raised, supported on its runners, in the position to clear the teeth of the harrow. Fig. 4 is a detail perspective view of one of the harrow-sections. Fig. 5 is a detail sectional view of the front end of the reach 1, the head, a portion of the turning yoke, and a portion of the tongue attached thereto. Fig. 6 is a similar view showing the connection between the rear end of the reach 1 and the axle arch-bar.

I will first describe my improved riding-frame, which drags the harrow-sections and from which the same are operated.

The reach 1 is a tube of suitable length and diameter. The axle 2 is provided with an arch-bar 3, which rises therefrom, and said arch-bar is provided at its center on its front side with a circular boss 4, which fits in the rear end of the tubular reach 1. The head 5 is formed of two sections 6 7, which are separable and are secured together by bolts 8 9 in openings in laterally-extending ears or lugs 10, with which said sections 6 7

are provided. The section 6 is provided on its rear side with a circular boss 11, which fits in the front end of the tubular reach 1. A vertical opening 12 of suitable diameter is made in the meeting sides of the sections 6 7 of the head, and in the said opening turns the vertical spindle 13, formed at the upper end of the bifurcated yoke 14. A tie-rod 15 passes longitudinally through the tubular reach, the section 6 of the head 5, and the arch-bar 3 of axle 2. The said tie-rod has an angular head 16 at its front end, which is embedded in a suitable recess 17, with which the section 6 of head 5 is provided, and the rear end of the said tie-rod is screw-threaded and provided with a clamping-nut 18 and washer 19, the latter bearing on the rear side of the arch-bar 3. The function of the tie-rod, as will be readily understood, is to securely connect the head 5, the tubular reach, and the arch-bar 3 together.

A pair of supporting-wheels 20 of suitable size and which are preferably provided with broad treads are mounted on the spindles of the axle 2. A wheel 21 is mounted between the depending arms of the fork 14. The upper end of the spindle 13 of the fork is squared, as at 22, and on the same is secured the rear section 23 of the tongue 24. The front section of the tongue is pivotally attached to the rear section 23, as at 25, and is hence adapted to be swung in a vertical plane and to turn the yoke in a horizontal plane, together with the wheel 21, for the purpose of guiding the harrow, as will be understood.

Brace-rods 26, which may be either constructed as here shown or otherwise suitably constructed, connect the rear portion of the tubular reach 1 to the arch-bar 3 of the axle 2. The bolts 9 are elongated to also form brace-rods, which extend rearward a suitable distance and have their rear ends secured to opposite sides of the tubular reach, as shown, thereby strengthening the connection between the head and the reach. Links 27 are flexibly connected to the front side of the head, and their front ends are connected to a ring 28, to which the usual doubletree may be secured in the usual manner. A spring-bar 29 is bolted on the center of the arch-bar 3 and supports the seat 30 for the driver. To a hanger 31, which depends from the tubular

reach, near the lower end thereof, are pivotally attached the lower ends of hand-levers 32. Each hand-lever is provided with a locking-dog of the usual construction, which is adapted to lock the said hand-lever at any desired adjustment to a segment-rack 33, which is secured to the tubular reach, as shown. Link-levers 34 are fulcrumed, as at 35, to the tubular reach at a suitable distance in advance of the hand-lever 32, and the upper end of each link-lever is connected to one of the hand-levers by a rod 36.

The harrow-sections 37 are of the usual construction, or may be of any suitable construction, and any suitable number thereof may be employed in connection with the riding-frame. In the form of my invention here shown I employ four harrow-sections in connection with the riding-frame, two sections being disposed on each side of the vertical frame of the tubular reach. Folding draft-bars 38, which are provided with centrally-disposed hinges 39, are connected to the harrow-sections in pairs by links, as at 40. A draft-bar 41 is connected by links 42 of suitable construction, to the front portion of the tubular reach, and the ends of the said draft-bar 41 are connected by links 43 to the respective sections of the folding draft-bars 38. It will be understood from the foregoing that one section of each pair of harrow-sections may be folded on the other by turning the same over, the hinged draft-bars 38 being also folded with said harrow-sections.

Each harrow-section 37 is provided near its front and rear ends with a pair of rock-shafts 44, the latter being secured in suitable bearings 45. The rock-shafts on the inner harrow-sections are provided with crank-arms 46, connected together by rods 47. Said rods 47 are connected to the lower ends of the link-levers 34 by rods 48. The contiguous ends of the rock-shafts of the respective pairs of harrow-sections are provided with crank-arms 49, which are flexibly connected together, as at 50, or in any other suitable manner. The said crank-arms cause the respective rock-shafts 44 to operate in unison, and the said flexible connections 50 between the said crank-arms permit the harrow-sections to be folded one over another, as hereinbefore stated. The said rock-shafts are further provided with cranks 51, which are disposed in the same direction, and the said cranks of the respective rock-shafts of each harrow-section are connected together by suitable supporting-runners 52, which are disposed under the harrow-sections and in parallel lines.

It will be understood from the foregoing and by reference to the drawings that when the hand-levers 32 are in the position shown in Fig. 2 the runners 52 will be raised and the harrow-sections will rest upon their teeth, which will be operated in the soil. When the

hand-levers are moved rearward, power will be communicated therefrom, through the means hereinbefore described, to the said runners 52, the latter will be depressed to the ground, causing the harrow-sections to be raised therefrom, so that the harrow-sections will be supported on the said runners, and the teeth of the harrow-sections will be cleared. This position of the respective parts is illustrated in Fig. 3. Hence the runners and their operative mechanism may be employed either to support the harrow-sections above the ground when the harrow is not in operation and is being drawn across the field, or the said runners may be employed for momentarily raising the harrow-sections in order to clear the teeth thereof and immediately thereafter lowering the harrow-sections to operative position.

Having thus described my invention, I claim—

1. In a harrow, the combination of a frame having longitudinally-disposed bars provided with harrow-teeth, transversely-disposed shafts on said frame having cranks, longitudinally-disposed runners connecting the cranks of the respective shafts, said runners being intermediate of said longitudinally-disposed bars of the frame and means to turn said shafts and thereby raise and lower said runners and hence lower and raise the frame, said runners, when lowered, supporting the frame and clearing the teeth thereof, substantially as described.

2. The combination of a plurality of harrow-sections transversely disposed, rock-shafts thereon, having crank-arms at their adjacent ends, between said sections, said crank-arms being flexibly connected together to admit of the folding of one harrow-section on another, the said rock-shafts being further provided with cranks, runners connecting the cranks of said respective rock-shafts of said harrow-sections, said runners being disposed longitudinally of the harrow-sections, and means for operating said rock-shafts in unison, substantially as described.

3. The combination, with a riding-frame, of the hand-levers thereon, the link-levers on said riding-frame, connected to and actuated by said hand-levers, the harrow-sections having the rock-shafts provided with cranks, the runners connecting the said cranks of the respective rock-shafts, the latter being further provided with crank-arms, rods connecting said crank-arms, and the links connecting said rods to the link-lever, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN A. WILLARD.

Witnesses:

F. M. CROOKS,  
JOHN S. TOWLE.