

No. 694,451.

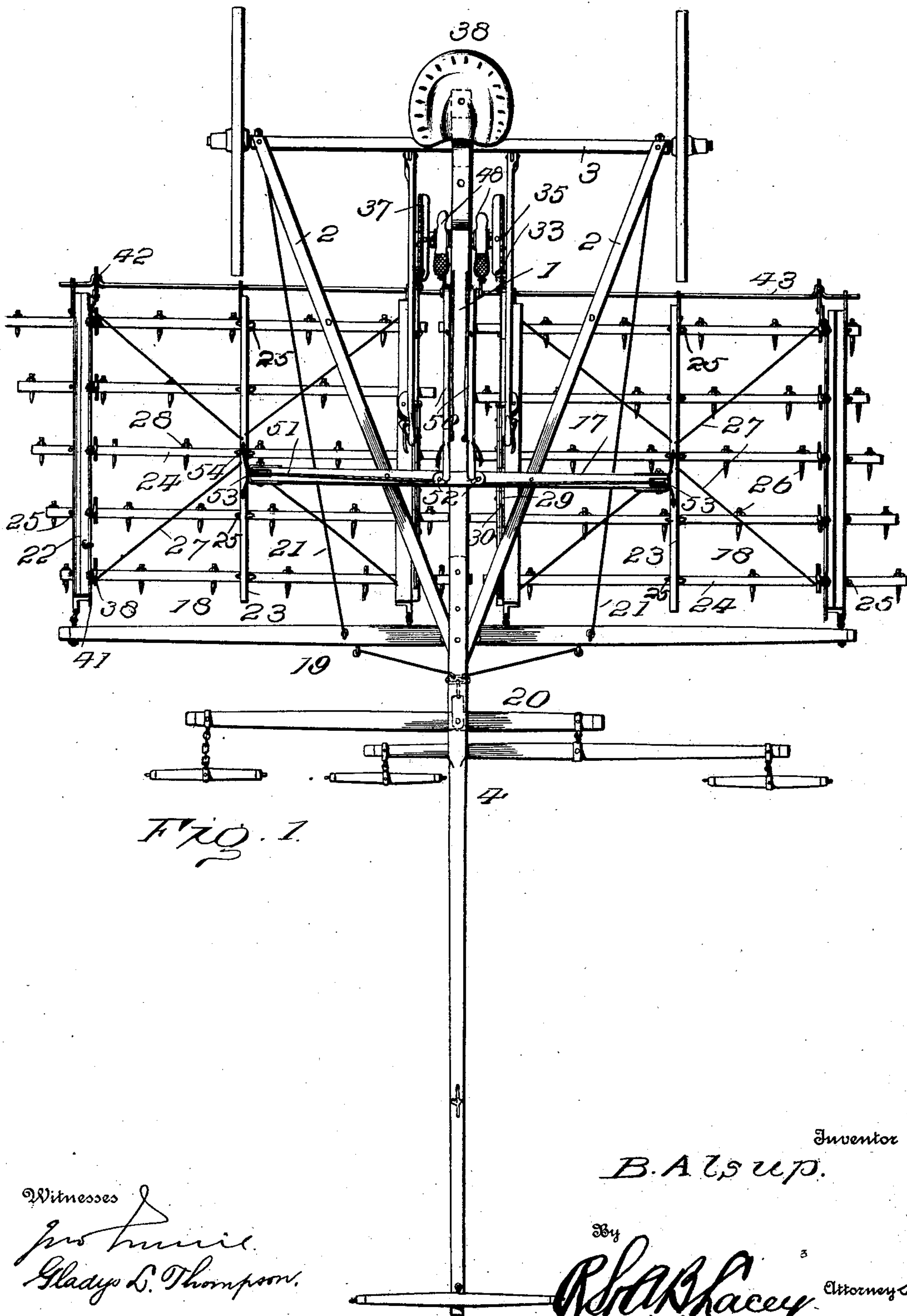
Patented Mar. 4, 1902.

B. ALSUP.
RIDING HARROW.

(Application filed May 18, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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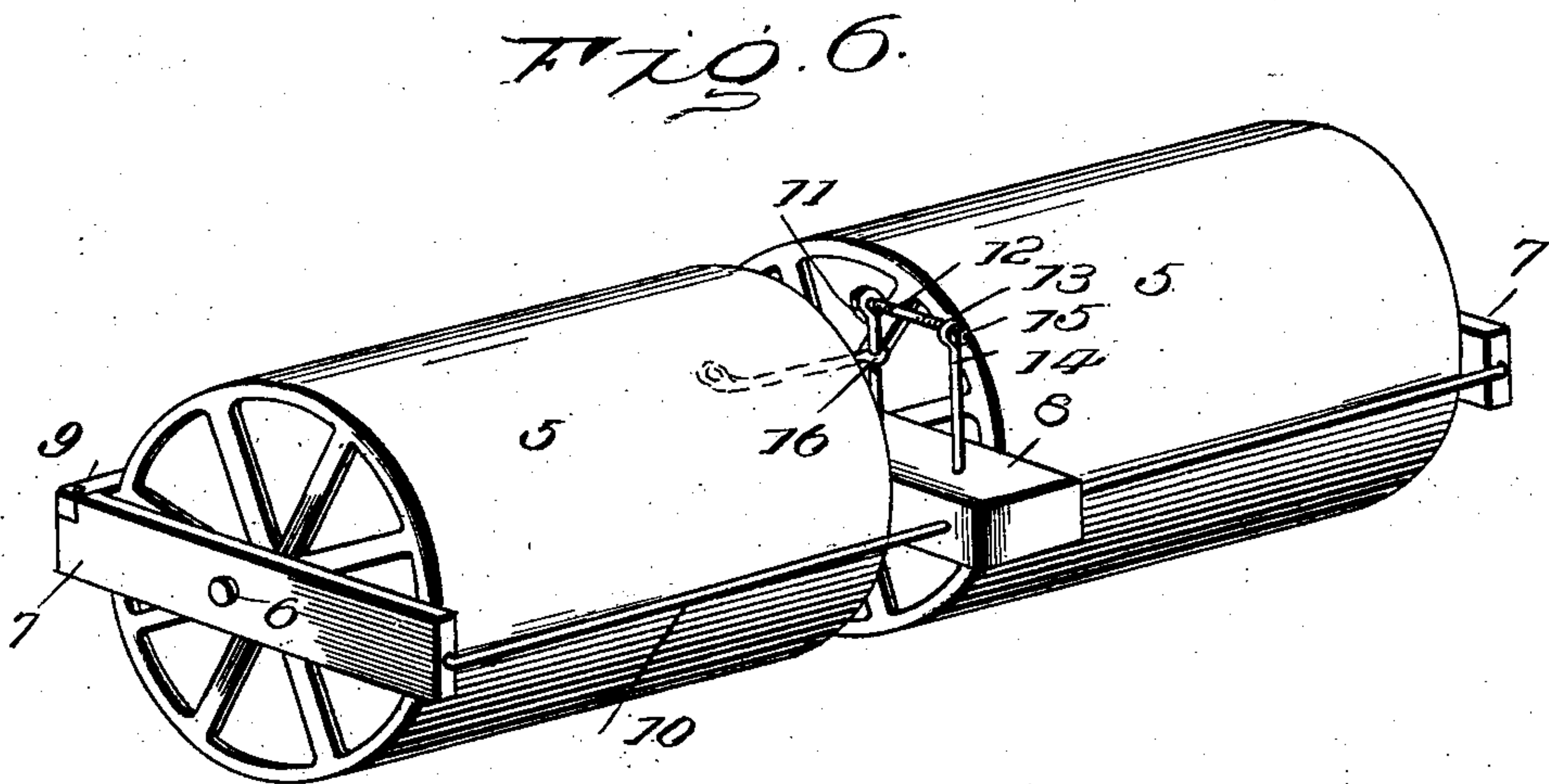
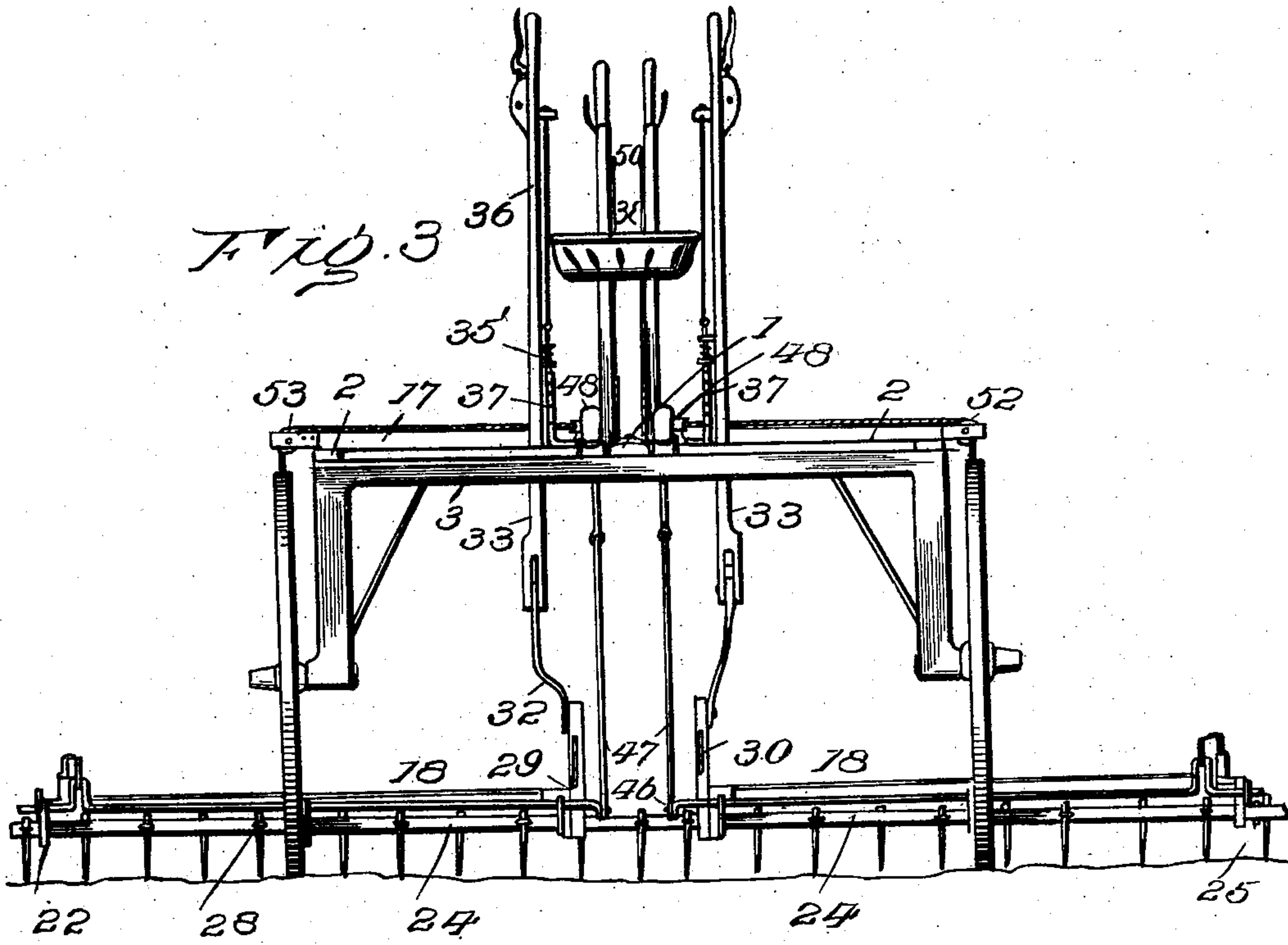
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

BEN ALSUP, OF BLUFFCREEK, IOWA.

RIDING-HARROW.

SPECIFICATION forming part of Letters Patent No. 694,451, dated March 4, 1902.

Application filed May 18, 1901. Serial No. 60,876. (No model.)

To all whom it may concern:

Be it known that I, BEN ALSUP, a citizen of the United States, residing at Bluffcreek, in the county of Monroe and State of Iowa, have
5 invented certain new and useful Improvements in Riding-Harrows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same.

This invention relates to riding-harrows, the object in view being to provide, in connection with a suitable riding-frame, harrow-sections which are supported and carried there-
15 by and capable of being adjusted up and down to suit conditions and also capable of being elevated entirely clear of the ground in driving to and from the place of operation.

The invention also has for its object to pro-
20 vide in connection with each of the harrow-sections a plurality of rocking harrow-bars carrying the harrow-teeth, all of said bars being coupled together, so that they may be rocked simultaneously for presenting the har-
25 row-teeth at any desired angle or pitch, the means for rocking the harrow-bars being under the immediate control of the rider in his seat on the machine.

A further object of the invention is to pro-
30 vide, in connection with the rocking harrow-bars, locking means for holding the harrow-bars rigidly in their adjusted positions and other means for tripping the locking mechanism and permitting the harrow-bars to rock
35 and the teeth to incline rearwardly whenever occasion requires. The harrow-teeth setting and tripping mechanisms are, like the harrow-elevating mechanism, arranged in such position as to be under the immediate control of
40 the rider seated upon the riding-frame.

A further object of the invention is to provide a support for the riding-frame consisting of rollers which travel in rear of the harrow-sections and which are so mounted as to tilt
45 on axes extending longitudinally of the machine-frame, thereby enabling the rollers to automatically adjust themselves to inequalities in the soil.

With the above and other objects in view,
50 which will more fully appear as the description proceeds, the invention consists in a rid-

ing-harrow embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is
55 a plan view of a riding-harrow constructed in accordance with the present invention. Fig. 2 is a central vertical longitudinal section with a portion of the frame broken away to show
60 the trip-lever. Fig. 3 is a rear elevation of the machine. Fig. 4 is a perspective view of one of the harrow-sections looking toward the inner side thereof. Fig. 5 is a vertical longi-
65 tudinal section through one of the harrow-sections, showing the means for locking the harrow-bars. Fig. 6 is a detail perspective
70 view of the central portion of one of the roller-frames, illustrating the manner of mounting the same upon the riding-frame of the ma-
chine.

Similar numerals of reference denote like parts in all figures of the drawings.

In carrying out the present invention I provide a suitable riding-frame, which is preferably of triangular shape, and comprises
75 a main central bar 1, to which are connected the forward ends of a pair of rearwardly-diverging side bars 2, all of said bars 1 and 2 being rigidly connected at their rear ends to
80 an arched axle 3, the pendent end portions of which have attached thereto a pair of roller-frames, which, together with the rollers carried thereby, serve as a support for the riding-frame. The draft pole or tongue 4 is
85 connected rigidly with the front portion of the riding-frame and provided with suitable means for attaching draft-animals thereto.

Each of the roller-frames carries a pair of rollers 5, having their axes arranged in line
90 with each other and mounted upon a common shaft 6, which is received in openings in the end bars 7 of the roller-frame and also in an intermediate central bar 8, the said bars being connected at one side by a longitudinal
95 frame-bar 9 and at their opposite sides by a connecting rod or bar 10. Extending upward from the central bar 8 is a standard 11, the upper portion of which is bent and extended horizontally to form a journal 12, which
100 passes through a bearing in the lower end of one of the pendent extremities of the arched

axle 3, the said journal extending in a direction parallel with the path of movement of the machine, whereby the roller-frame is adapted to rock transversely for the purpose of allowing the rollers to adjust themselves to any unevenness in the ground. The extremity of the journal 12 is received in the eye 13 of a post 14, extending upward from the bar 8, and is threaded to receive a nut 15. By this means the roller-frames may be detached from the riding-frame of the machine and substituted by ordinary carrying-wheels when it is not necessary to use the rollers. The standard 11 is strengthened by means of an inclined brace 16, which extends from the upper portion of the standard 11 downward and connects at its opposite end with the bar 8, thus preventing the bending of the standard when the rollers come in contact with stumps, rocks, and other unyielding obstacles.

It will be understood that two roller-frames are employed, each of which is connected centrally to one of the pendent ends of the arched axle, and each roller-frame is adapted to tilt and adjust itself independently of the other. As will hereinafter appear, two harrow-sections are employed, and the roller-frames, with the rollers mounted therein, are arranged to travel in rear of the harrow-sections and smooth and level the soil after it has been treated by the harrow-teeth. The riding-frame is also equipped with a rigidly-attached cross-bar 17 of sufficient length to locate the opposite ends thereof, respectively, over the centers of the harrow-sections, so as to form, in connection with other devices to be described, a means for supporting the harrow-sections and enabling the same to be raised and lowered.

Two harrow-sections 18 are employed, and they are arranged at opposite sides of the center of the machine, as illustrated in Fig. 1, and are coupled together at their front ends by means of a draft-bar 19, to which any desired form of draft-rigging 20 may be attached, so that the draft will be applied directly to the harrows, the draft being further applied directly to the end portions of the arched axle by means of connecting rods or chains 21, which are attached at their forward ends to the draft-bar and at their rear ends to the axle. Each of the harrow-sections comprises a pair of longitudinal side bars 22, arranged parallel to each other and also parallel with an intermediate centrally-arranged bar 23. Journalled in the bars 22 and 23 is a series of harrow-bars 24. Any number of these harrow-bars may be employed, and they are arranged parallel with each other, as shown, and endwise movement of such bars is prevented by means of pins 25, connected with the bars 24 and arranged on opposite sides of the longitudinal bars 22 and 23, as shown. The inner and outer ends of the harrow-bars are arranged out of line with each other, so as to give a staggered arrangement to the harrow-

teeth (represented at 26) for the purpose of more thoroughly breaking up the soil. While the harrow-bars are adapted to oscillate or rock in their bearings in the frame of the harrow-section, they are prevented from moving endwise. The bars 22 and 23 are braced relatively to each other by means of the diagonal rods 27, and the harrow-teeth are individually secured to their respective bars by clips 28, which admit of the removal of the teeth for purposes of sharpening or renewal.

In order to simultaneously rock the several harrow-bars, each bar is provided with a crank-arm 29, extending upward therefrom and pivotally connected to a coupling-bar 30. This coupling-bar 30 is arranged parallel with the frame of the harrow-section and is pivotally connected to the extremity of each of the arms 29. One of the arms 29 is made longer than the rest or is extended beyond its pivotal connection with the coupling-bar 30, as shown at 31, where it has pivotally connected therewith a link 32, which at its opposite end is connected pivotally to the lower end of a thumb-latch lever 33, which is fulcrumed at 34 on one end of a cross-head 35, connected rigidly to the riding-frame. The thumb latch lever carries a dog 35', operatively connected with a thumb-lever 36, arranged at the upper end of the lever 33, and said dog or latch is adapted to engage with the notches of a toothed segment 37, mounted on the cross-head 35 or other convenient part of the riding-frame. The lever 33 is arranged within reach of the rider in his seat 38 on the machine-frame, and when vibrated said lever operates through the connections described to simultaneously rock all of the harrow-bars, and thereby change the pitch or inclination of the harrow-teeth. In this way the harrow-teeth may be given a forward or rearward inclination with respect to a vertical plane or adjusted so as to stand vertically, according to the condition of the soil and other requirements.

In order to lock the several harrow-bars, each of the harrow-bars is provided with a ratchet-wheel 39, fast thereon, the several ratchet-wheels being adapted to be engaged and held by means of a corresponding series of pawls 40, fulcrumed intermediate of their ends on the frame of the harrow-section and all pivotally connected to a coupling-bar 41, which at its rear end is connected, by means of a link 42, with the crank 43 of a crank-shaft 44, which extends transversely of the rear of the harrow-section and is journalled in suitable bearings 45, connected to the frame-bars 22 and 23. The crank-shaft 44 is provided at its inner end with an arm 46, to which is pivotally connected one end of a link 47, which extends upward and is pivotally connected to one end of a trip-lever 48, which is fulcrumed on the cross-head 35 and adapted to be operated by the rider's foot. When said foot trip-lever 48 is rocked, the crank-

shaft is turned, thus moving the coupling-bar 41 and throwing all of the pawls out of engagement with the ratchet 39, thereby allowing the points of the ratchet-teeth to swing rearwardly in a manner that will readily be understood. It will thus be seen that by means of the lever 33 the driver may set all of the harrow-teeth at any desired inclination and by pressing upon the trip-lever 48 trip the locking mechanism and allow the harrow-bars to rock in their bearings and the harrow-teeth to swing rearward, so as to prevent injury thereto caused by the machine passing over hard and unyielding obstacles.

It will be understood that the setting and tripping mechanisms hereinabove described are duplicated on opposite sides of the machine for each of the harrow-sections, and the arrangement is such that the teeth of each harrow-section may be set and tripped independently of the teeth of the other section.

The harrow-elevating mechanism comprises a harrow-elevating lever 50, which is mounted on the riding-frame within reach of the driver in his seat on the machine. A cable or flexible connection 51 is attached at one end to the lever 50 and passes around direction-pulleys 52 and 53 on the cross-bar 17 and thence downward, where it is preferably bifurcated or branched, the branches 54 thereof extending forward and rearward and being permanently connected at their extremities to the central longitudinal bar 23 of one of the harrow-sections.

The harrow-elevating mechanism just described is duplicated at opposite sides of the machine, so that the harrow-sections may be simultaneously or independently raised and lowered or elevated entirely clear of the ground for the purpose of driving to and from the place of operation.

From the foregoing description it will be seen that the harrow-sections may be independently raised and lowered to properly adjust the same to their work or to swing the same entirely clear of the ground when the machine is not in operation: further, that the harrow-bars, with their teeth, may be simultaneously and uniformly rocked, so as to set the teeth at the desired pitch for effectively breaking up the soil, and that when the teeth are set the harrow-bars, to which the teeth are rigidly connected, are locked; further, that by means of the tripping mechanism described all of the harrow-bars may be simultaneously released for allowing the points of the teeth to swing backward for the purpose set forth. It will further be seen that the harrow-sections are followed by self-adjusting rollers, which serve to smooth and level the surface of the ground after the same has been treated by the harrow-sections. All of the adjusting devices are arranged under the immediate control of the driver in his seat on the machine.

It will be apparent that the machine is susceptible of various changes in the form, proportion, and minor details of construction, and I therefore reserve the right to make such changes as properly fall within the scope of the appended claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a riding-harrow, the combination with the riding-frame, rolling supports therefor, and harrow-sections, each harrow-section having an intermediate centrally-arranged bar and diagonal rods, of a cross-bar attached to the riding-frame and having its end portions extended over the harrow-sections and provided medially and at its ends with direction-pulleys, independently-mounted operating-levers, and flexible connections attached at one end to the respective operating-levers and passing over the respective sets of direction-pulleys and having the opposite end connected medially to the aforesaid central bar of the respective harrow-sections, substantially as set forth.

2. In a riding-harrow, the combination with the riding-frame, and rolling supports therefor, of harrow-sections suspended beneath the riding-frame in advance of the rolling supports, each harrow-section comprising a frame, parallel harrow-bars journaled therein and carrying rigidly-attached teeth, means for simultaneously rocking the harrow-bars, means for locking each of the several harrow-bars, and means under the control of the driver for tripping the locking mechanism, substantially as described.

3. In a riding-harrow, the combination with the riding-frame, and rolling supports therefor, of harrow-sections suspended beneath the riding-frame in advance of the rolling supports, each harrow-section comprising parallel harrow-bars with rigidly-attached teeth, means for simultaneously rocking all of the harrow-bars and setting the teeth at any desired pitch, harrow-bar-locking mechanism consisting of ratchet-wheels on the several harrow-bars, a corresponding series of pawls engaging said ratchet-wheels, a coupling-bar operatively connecting all of the pawls, and operating connections interposed between said coupling-bar and a lever under the control of the driver, whereby all the pawls may be simultaneously tripped, substantially as and for the purpose specified.

4. In a riding-harrow, the combination with the riding-frame, and rolling supports therefor, of harrow-sections suspended beneath the riding-frame in advance of the rolling supports, each of said harrow-sections comprising parallel harrow-bars carrying rigidly-attached teeth, teeth-setting mechanism embodying means for coupling together and simultaneously rocking the several harrow-bars, locking mechanism for the harrow-bars

consisting of ratchet-wheels fast on the harrow-bars, pawls for respectively engaging said ratchet-wheels, a coupling-bar pivotally connected with all the pawls for simultaneously
5 operating them, a crank-shaft journaled on the harrow-section and operatively connected with the coupling-bar, and a trip-lever fulcrumed on the riding-frame and operatively

connected with said crank-shaft, substantially as described. 10

In testimony whereof I affix my signature in presence of two witnesses.

BEN ALSUP. [L. S.]

Witnesses:

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