No. 659,576. Patented Oct. 9, 1900.

C. D. CARTER.

SULKY HARROW.

(Application filed Feb. 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

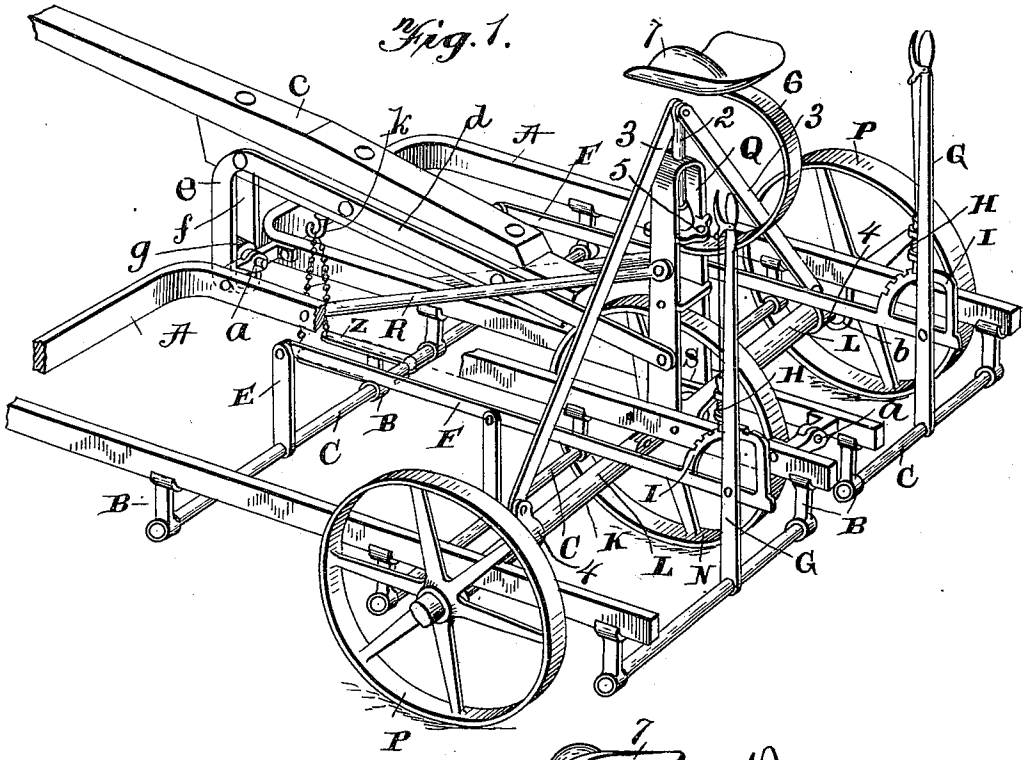
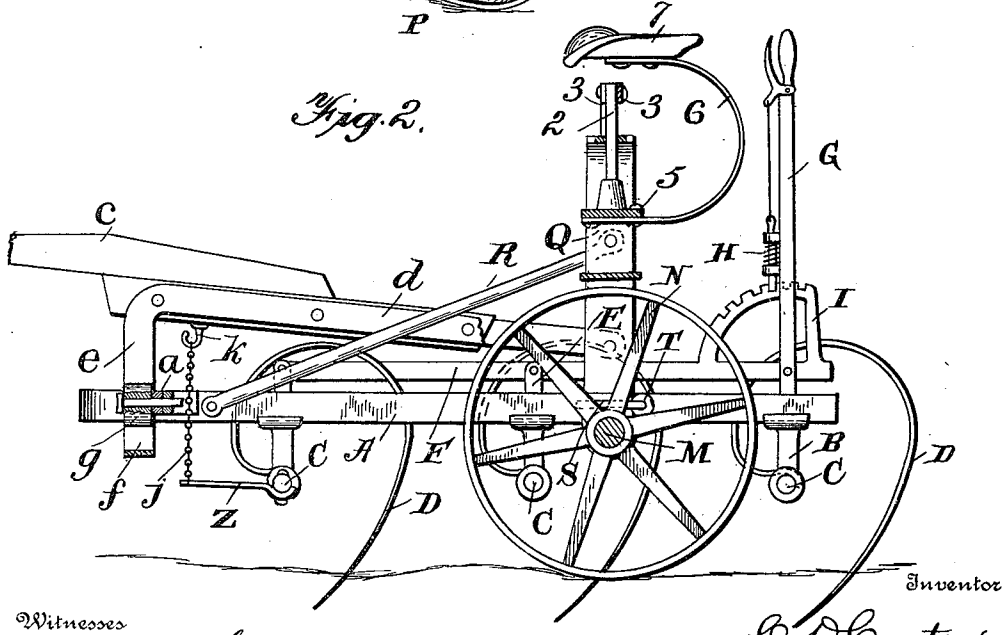


Fig. 2.



Witnesses
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Fig. 3.

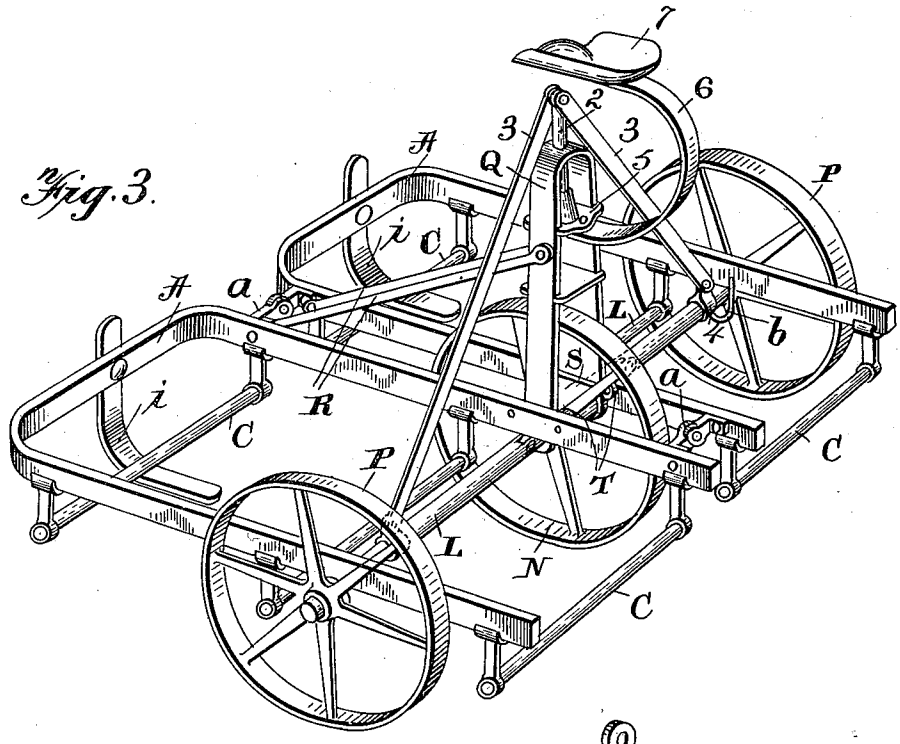


Fig. 4.

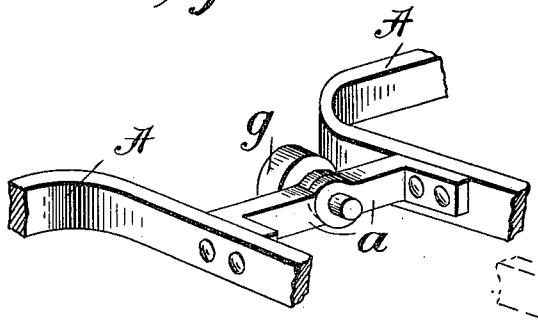
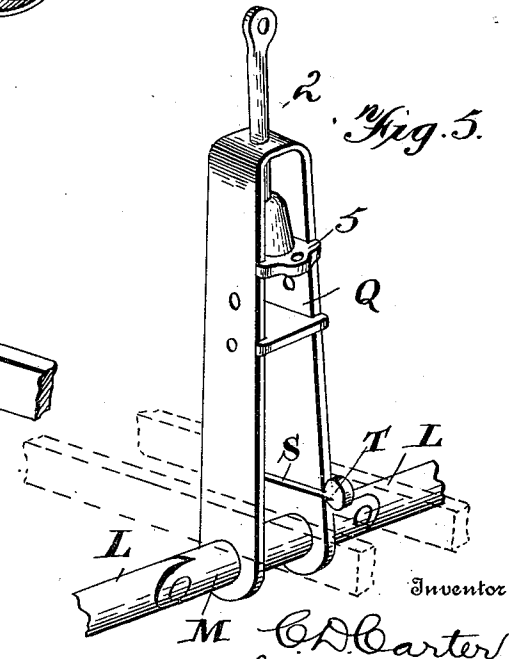


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES D. CARTER, OF SPRING ARBOR, MICHIGAN.

SULKY-HARROW.

SPECIFICATION forming part of Letters Patent No. 659,576, dated October 9, 1900.

Application filed February 13, 1900. Serial No. 5,096. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. CARTER, a citizen of the United States, residing at Spring Arbor, in the county of Jackson and State of Michigan, have invented new and useful Improvements in Sulky or Riding Harrows, of which the following is a specification.

My invention relates to improvements in sulky or riding harrows; and it pertains to providing harrow-sections with a combined supporting and riding attachment which permits the harrow-sections to have a free vertical movement within a predetermined downwardly-limited distance, all of which will be fully described hereinafter and particularly pointed out in the claims.

One object of my invention is to provide an improved support for harrow frames or sections whereby the said sections are more accurately supported and the depth of the teeth in the soil more certainly regulated over the whole area of the harrow section or sections by placing a third wheel in the center between the sections and which is so constructed and arranged that the harrow-sections are permitted a free vertical movement and the flexibility of the sections entirely unimpaired.

Another object of my present invention is to provide the harrow-supporting attachment with means for supporting the seat, which is at a point considerably elevated and out of the dust and which will evenly distribute the weight of the rider upon each of the three wheels, the said wheels adapted to run in an open furrow and the wheels being sufficiently removed from the teeth of the harrow-sections to prevent the harrow-teeth from throwing dirt upon the wheel-fellies.

Another object of my present invention pertains to providing a combined riding and supporting attachment for harrows in which the supporting-axle is made in sections, whereby the wheels are permitted a free and independent movement and at the same time equally distribute the weight of the rider upon the said wheels.

The object of my invention also pertains to certain details of construction, which will be fully described hereinafter and particularly referred to in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my invention, showing it connected with two harrow-sections, the front ends of the harrows being supported by a tongue. Fig. 2 is a transverse central sectional view of Fig. 1. Fig. 3 is a perspective view of my invention, showing it applied and constructed to have the front ends of the harrows supported by suitable shoes, in which event the tongue shown in Figs. 1 and 2 is omitted. Fig. 4 is an enlarged detached perspective view of the adjacent sides of the front ends of the harrows, showing the pivotal bolt or pin provided with a roller. Fig. 5 is a detached perspective view of the U-shaped guide serving to connect the inner rear portions of the harrow-sections to the vertically-extending seat-standards.

Referring now to the accompanying drawings, A indicates two harrow-sections which may be of any desired form, the said harrow-sections being here shown with depending toothed bar-brackets B, in which the spring-tooth bars C are suitably journaled, the said tooth-bars carrying any desired form of tooth D. These tooth-bars C are here shown with vertically-arranged cranks E, which are connected by means of a horizontal elongated link F. To one of the tooth-bars C (here shown as the rear one) a vertically-arranged lever G is attached, the said lever carrying the ordinary spring-catch H, adapted to engage a toothed segment I. The function of this construction is well understood and is for the purpose of raising or lowering the spring-teeth D by oscillating the rocking or oscillating tooth-supporting bars C. The construction thus far described is old and well known.

My invention pertains to providing a combined supporting and riding attachment for the harrow-sections, and consists in extending under the rear portions of the harrow-sections a supporting-shaft K. This shaft K is divided into the two end sections L and a central section M. The central section M has journaled thereon a central supporting-wheel N, which is arranged between the two harrow-sections, as clearly shown in Figs. 1 and 3. The end sections L of the supporting-shaft carry at their outer ends the end supporting-wheels P, the said end supporting-

wheels being situated outside of the frames of the harrow-sections, as is also clearly illustrated in Figs. 1 and 3.

Projecting upward from the central section M is a seat-standard Q, the said seat-standard being here shown as a single flat bar of iron doubled at its upper end and provided with downwardly-extending parallel portions having their lower ends suitably connected with the central section M of the supporting-shaft K, thus constituting an essentially inverted-U-shaped standard. For the purpose of supporting this standard in a vertical position I provide longitudinally-extending brace-rods R, the upper ends of the brace-rods being pivotally connected to the opposite sides of the seat-standard Q and their lower ends pivotally connected with the harrow-section A. As here shown and as I prefer, these braces R extend forward and have their forward and lower ends pivotally connected to the inner sides of the front ends of the harrow-sections, as clearly illustrated. It will be thus seen that these braces R serve to support the seat-standard Q in a vertical position.

The inner, rear, and front sides of the harrow-sections are hinged together, as shown at *a*, whereby they are flexibly connected, and the outer sides of the harrow-frames are provided with the downwardly-extending loops *b*, which embrace the adjacent portions of the end sections of the supporting-shaft, and thus loosely connect the outer sides of the harrow-sections with the supporting-shaft to permit the harrow-sections to have a free vertical movement independent of the supporting-shaft. The inner sides of these harrow-sections are preferably connected with the parallel sides or portions of the seat-standard Q, and in this event they are provided with the inwardly-extending U-shaped connections S, which embrace the said vertical parallel portions of the standard Q, as clearly shown. Since the draft is through the harrow-sections and upon a combined supporting and riding attachment, for the purpose of preventing any binding upon the attachment S, I provide these U-shaped attachments with rollers T, which engage the rear edges of the vertical portions of the seat-standard Q, and thus permit the sections a free vertical movement independent of the supporting-shaft and avoid any possibility of the binding of these parts under the draft caused when drawing the harrow.

In Figs. 1 and 2 I show another attachment, which consists of a tongue *c*, the said tongue being provided with rearwardly-extending arms *d*, which have their rear ends suitably connected to opposite sides of the vertically-disposed seat-standard Q, and the forward ends of these bars *d* extend downward, as shown at *e*, and constitute a vertical slot or guide *f*, into which a roller *g*, arranged upon the pivotal point or pin at the front end of the harrows, extends, and thus serves as a guide. The specific construction of this vertically-disposed tongue-guide and the arms *d* consists of forming the same of a single piece of flat bar metal doubled intermediate of its ends to constitute the guide *f* and then turned backward and secured to the tongue *c*, with the rear ends attached to the vertically-disposed seat-standard Q, all of which is clearly shown in the accompanying drawings.

In Fig. 3 I show my riding and supporting attachment adapted to be used without a tongue *c* and in which event the usual supporting-shoes *i* are used for the front ends of the harrow-sections, but in which event the harrow-sections are still permitted to have a free up-and-down movement independent of the supporting and riding attachment.

In Figs. 1 and 2 I show a means which is operated and controlled by the oscillating or rocking tooth-bars C for lifting and supporting the front end of the harrow-sections when the harrow is being transported. This consists in providing the front tooth-bars C with a forwardly-extending arm or lever Z, to which is connected the end of a chain *j*, the upper end of the chain adapted to be caught over a suitable hook *k*, which is suspended from the tongue *c*. From this it will be readily understood that when the harrow-teeth E are elevated by the oscillating of the tooth-bar C the forward end of the lever Z is carried downward, which lifts the front end of the harrow-section upward and serves to support the same.

Owing to the sectional supporting-axle K, it will be readily understood that the end supporting-wheels P are permitted to have a free vertical movement independent of each other and also a free independent movement in respect to the central wheel M and that the central wheel M is permitted to have a free vertical movement independent of the end wheels. For the purpose of having the weight of the rider equally divided upon the three wheels at all times I provide a seat-support which is connected with the end sections L of the supporting-shaft K and which therefore divides the weight between the three wheels. This arrangement consists in providing a vertically-arranged rod 2, which passes through an opening in the upper doubled portion of the seat-standard Q, the upper end of the said rod 2 being pivotally connected with the upper and inner ends of the weight-receiving braces 3, the lower ends of the said weight-receiving braces being pivotally connected to suitable clips 4, which are attached to the end sections L of the supporting-shaft at points intermediate of their ends. The rod 2 has a free vertical movement through the upper end of the seat-standard Q, and when either of the end wheels P moves upward the rod 2 is moved only one-third of the distance of the movement of the wheel. Attached to the lower end of this rod 2 is a seat-attaching socket 5, the said socket

having grooves adapted to receive the side portion of the seat-standard Q and to have a seat-spring 6 suitably bolted to the under side thereof, the said seat-spring carrying a seat 7 at its upper end. From this description it will be at once understood that when either one of the wheels P moves vertically by striking a stone or other obstruction the rider is lifted and the weight through the medium of the weight-receiving braces 3 is equally distributed upon the three supporting-wheels and that owing to the point of attachment of the braces 3 to the end sections L of the supporting-shaft the vertical movement of the rider is but about one-third of the vertical movement of the supporting-wheels.

I am aware that it is old to provide a combined supporting and riding attachment for harrows; but in this event they have been provided with two wheels, and I find in practice that the two wheels are not sufficient to support the weight of the driver and of the harrow without making considerable traction and therefore making the draft of the harrow heavy. By providing three wheels, as here shown, and arranging the weight of the rider equally upon each of the wheels I am able to make a construction which is of a light draft and which is also adapted to accurately support the harrow-sections at an even heighth from the ground over the whole width of the tool.

It will be gathered from the above description that my invention is especially adapted to be used in connection with spring-toothed harrows, which it is found are advantageously supported a considerable distance above the surface to permit a freer play of the spring-teeth and also to have the supporting attachment carry the rider and to support the sections of the harrow in an improved and advantageous manner.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A harrow comprising a plurality of harrow-sections, a combined support and riding attachment comprising a transversely-arranged shaft, supporting-wheels carried thereby, a vertically-arranged seat-standard connected with the said shaft, and longitudinally-arranged braces connected with the said seat-standard for supporting it in a vertical position, the said harrow-sections having a free and independent vertical movement in respect to the said supporting-shaft, and seat-support, substantially as described.

2. A harrow comprising a plurality of longitudinally-arranged harrow-sections situated side by side, a combined riding and supporting attachment comprising a shaft extending transversely of the said harrow-sections at a point intermediate of their ends, the ends of the said shaft projecting beyond the outer sides of the said harrow-sections, supporting-wheels carried by the projecting ends of the axle, and a supporting-wheel carried by the said supporting-axle at a point between the said harrow-sections, and a seat-support connected with the said axle independent of the harrow-sections, substantially as described.

3. A harrow comprising a plurality of independent vertically-movable harrow-sections, a supporting attachment comprising a transversely-arranged shaft, the said shaft composed of three independent portions, a supporting-wheel carried by each of the said independent portions, substantially as described.

4. A harrow comprising a plurality of harrow-sections, a combined supporting and riding attachment comprising a transversely-arranged sectional supporting-shaft, each section carrying a supporting-wheel, and a seat-support connected with the sections of the shaft to distribute the weight equally upon the several sections and consequently upon the supporting-wheels, substantially as described.

5. A harrow comprising a plurality of vertically-movable harrow-sections, a combined supporting and riding attachment comprising a transversely-arranged shaft divided into a central and end sections, the end and central sections carrying supporting-wheels, and a seat-support connected with the end sections and adapted to move therewith, substantially as described.

6. A harrow comprising a plurality of independently-movable harrow-sections, a combined supporting and riding attachment comprising a transversely-arranged shaft divided into a central and end independently-movable sections, the said end and central sections having supporting-wheels, a vertically-movable seat-support, and connections between the vertically-movable seat-support and the end sections of the sectional supporting-shaft, substantially as described.

7. A harrow comprising a plurality of independently-movable vertical harrow-sections, and a combined riding and supporting attachment comprising a transversely-arranged shaft having supporting-wheels, a centrally and vertically disposed seat-standard connected with the said shaft, and longitudinally-arranged seat-support braces having their upper ends connected with the seat-standard and their lower ends connected with the harrow-sections, substantially as described.

8. A harrow comprising a plurality of independent vertically-movable harrow-sections, and a combined riding and supporting attachment comprising a transversely-arranged shaft having supporting-wheels, a vertically-disposed seat-standard attached to the said supporting-shaft, and longitudinally-arranged seat-support braces having their upper ends pivotally connected to the said seat-standard and extending forwardly and their forward ends pivotally connected with the forward ends of the harrow-sections, substantially as described.

9. A harrow comprising a plurality of harrow-sections, and a combined riding and supporting attachment comprising a transversely-arranged supporting-shaft carrying supporting-wheels, a vertically-arranged seat-standard connected to the said supporting-shaft, longitudinally-extending standard-braces, a seat-support vertically movable upon and guided by the said seat-standard, and transversely-extending braces connected with the vertically-movable seat-support and the said supporting-shaft, substantially as described.

10. A combined riding and supporting attachment for harrow-sections comprising a transversely-arranged shaft, a vertically-disposed seat-standard, the said standard connected with the supporting-shaft, and longitudinally-extending standard-braces, substantially as described.

11. A riding-harrow comprising a plurality of harrow-sections, a transversely-arranged shaft divided into independently-movable sections, each independent movable shaft-section having a supporting-wheel, a vertically-disposed seat-support, transversely-arranged flexibly-connected braces attached to the sections of the supporting-shaft and to the said seat-support, a seat-standard connected with the shaft, and longitudinally-arranged braces connected with the seat-standard, substantially as described.

12. A harrow supporting and riding attachment comprising a transversely-arranged shaft divided into a central and end sections, the central and end sections having supporting-wheels, the central section provided with a vertically-disposed seat-standard, a seat guided by the said standard, and connections between the seat and the end sections of the sectional shaft, substantially as described.

13. A riding-harrow comprising a plurality of harrow-sections, a transversely-arranged shaft divided into independently-movable central and end sections, each section carrying a supporting-wheel, the central section provided with a vertically-arranged seat-standard, a seat-support vertically movable upon and guided by the seat-standard, transversely-arranged rods having their upper ends connected with the seat-support and their outer ends connected with the end sections of the supporting-shaft, and longitudinally-arranged braces connected with the seat-standard and to said harrow-sections, substantially as described.

14. A combined riding and supporting attachment for harrows comprising a transversely-arranged shaft, a vertically-disposed seat-standard connected with the shaft, a vertically-disposed rod movable upon the upper end of the seat-standard, and a spring connected with the vertically-movable rod at its lower end, the upper end of the spring carrying a seat and braces connecting the shaft and the said rod, substantially as described.

15. A combined riding and supporting attachment for harrows comprising a transversely-arranged shaft divided into a central and end sections, each section carrying a supporting-wheel, a vertically-arranged seat-standard carried by the central section, a vertically-movable rod moving through the upper end of the said standard, the vertically-moving rod having a spring connected therewith at one end and a seat connected to the opposite end of the spring, and transversely-arranged brace-rods having their upper ends connected with the vertically-movable rod and their outer ends connected with the end sections of the supporting-shaft, substantially as described.

16. A combined riding and supporting attachment for harrows comprising a transversely-arranged supporting-shaft divided into a central and end sections, each section carrying a supporting-wheel, a U-shaped seat-support having its lower ends connected with the central section of the shaft at opposite sides of the central supporting-wheel, a vertically-disposed seat-supporting rod having its upper end moving through the doubled portion of the U-shaped seat-standard, a block sliding between the parallel portions of the seat-standard and receiving the lower end of the vertically-movable rod, and transversely-arranged weight-receiving braces having their lower ends connected with the end sections of the sectional shaft, and their upper ends connected with the vertically-movable rod, and a seat connected with the vertically-movable rod, substantially as described.

17. The combination with a plurality of independently vertically movable harrow-sections, of a supporting attachment comprising a transversely-arranged shaft carrying supporting-wheels, said harrow-sections being pivotally connected, a centrally-arranged tongue having its rear end connected with the said supporting-shaft, the said tongue provided with a depending guide, and the front pivotal point of the said harrow-sections moving in the said vertically-arranged tongue-guide, substantially as described.

18. The combination with a plurality of vertically-movable harrow-sections, of a supporting attachment comprising a transversely-arranged shaft carrying supporting-wheels, a centrally and forwardly extending tongue having its rear end connected with the supporting-shaft, the harrow-sections having their inner sides pivotally connected, the said tongue provided with a depending vertical guide at the forward ends of the said harrow-sections, the pivotal point of the front ends of the harrow-sections provided with a roller extending into the said vertically-arranged tongue-guide, substantially as described.

19. The combination with a plurality of vertically-movable harrows, of a supporting attachment comprising a transversely-arranged shaft, a tongue having its rear end connected with the said shaft, the harrows pivotally connected at their inner sides, the tongue provided with a depending guide,

the front pivotal connection of the harrows extending into the said vertically-arranged guide, a vertically-arranged seat-standard carried by the shaft at its center, and guiding attachments between the inner rear portions of the harrows and the said vertically-disposed seat-standard, substantially as described.

20. The combination with a plurality of independently vertically movable harrow-sections, of a supporting attachment comprising a transversely-arranged shaft carrying supporting-wheels, the said harrows connected at their inner sides, a seat-standard connected with the said supporting-shaft at a point intermediate of its ends and between the said harrow-sections, the adjacent portions of the harrow-sections having guides engaging the said seat-standards, substantially as described.

21. A harrow comprising a plurality of independently-movable harrow-sections, a transversely-arranged supporting-shaft having supporting-wheels, a centrally-arranged seat-standard extending between the harrow-sections, the adjacent portions of the harrow-sections having guides with rollers at their rear sides engaging the rear edge of the seat-standard, substantially as described.

22. A harrow comprising a harrow-section, a transversely-arranged supporting-shaft, the harrow-section having an oscillating tooth-bar, teeth carried thereby, the rear portion of the harrow-section supported by the shaft, a tongue, one of the tooth-bars provided with a laterally-extending lever, a connection between the said lever and the tongue, whereby an oscillation of the tooth-bar will cause the forward end of the harrow-section to be raised and lowered and supported if desired, substantially as described.

23. A harrow comprising a plurality of independently vertically movable harrow-sections, a supporting attachment comprising a transversely-arranged sectional shaft, a supporting-wheel for the several sections of the shaft, and flexible connections between the adjacent ends of the several sections of said shaft, substantially as described.

24. A harrow comprising a plurality of independently vertically movable harrow-sections, a supporting attachment comprising a transversely-arranged shaft, said shaft composed of three independent portions, a supporting-wheel carried by each of the said independent portions, the adjacent ends of the several independent portions hinged together, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES D. CARTER.

Witnesses:
EARL J. FELLOWS,
JOHN A. BARNUM.