

No. 645,779.

A. ANDERSON.  
HARROW.

Patented Mar. 20, 1900.

(Application filed Dec. 1, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

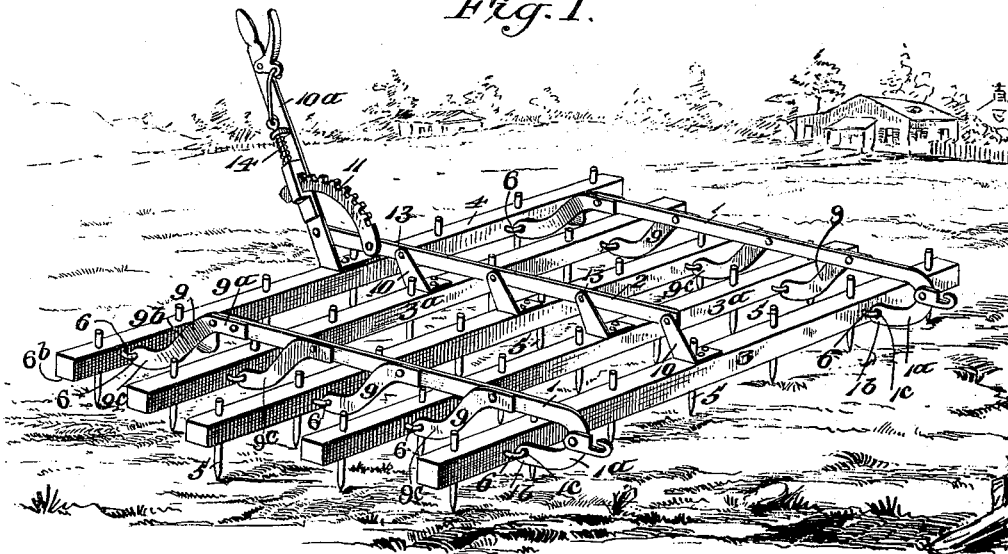
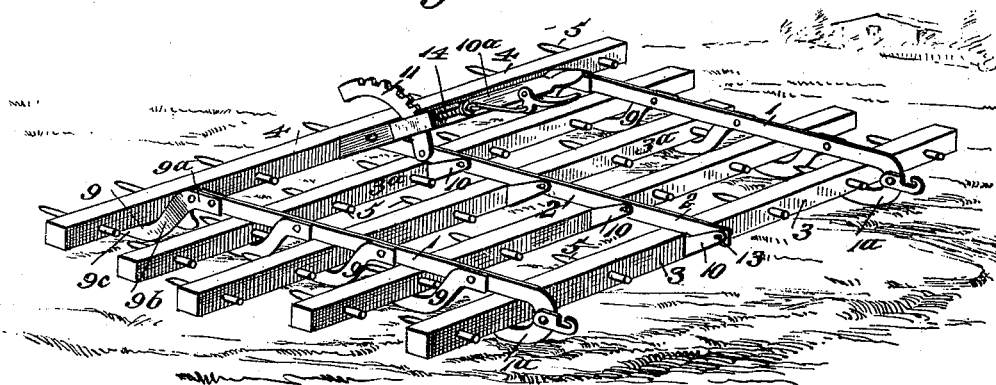


Fig. 2.



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Fig. 3.

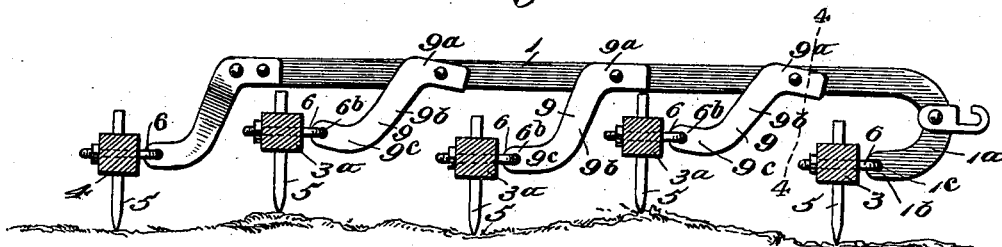


Fig. 4.

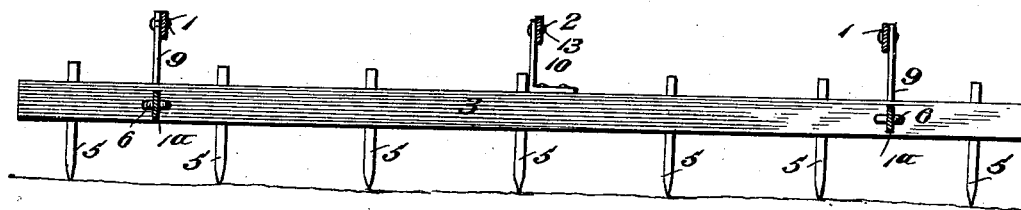


Fig. 5.

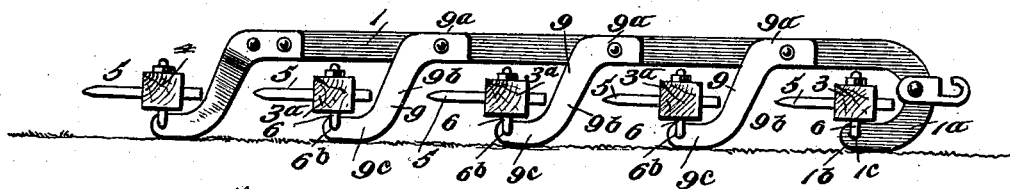


Fig. 6.

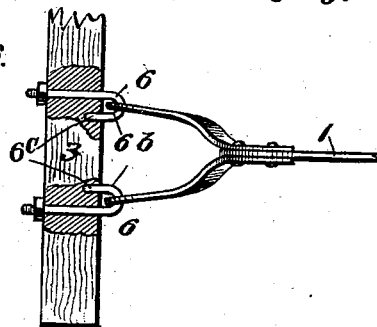
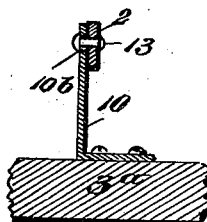


Fig. 7.



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## HARROW.

SPECIFICATION forming part of Letters Patent No. 645,779, dated March 20, 1900.

Application filed December 1, 1899. Serial No. 738,891. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON ANDERSON, residing at Menomonie, in the county of Dunn and State of Wisconsin, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

This invention relates to improvements in that class of harrows having lever-operated means for adjusting the tooth-bars; and it primarily seeks to provide a harrow of this kind of a very economical and durable construction, which can be readily manipulated, and which will effectively serve for its intended purposes.

This invention also comprehends a novel arrangement of the several parts capable of being conveniently adjusted whereby to keep the machine from tracking and whereby the tooth-bars are the more perfectly braced and rendered flexible.

The invention also involves certain structural combinations whereby the tooth-bars can be readily adjusted to lift the teeth from engagement with the ground during the transportation of the machine, and in its subordinate features this invention comprehends certain details of construction and peculiar arrangement of parts, all of which will be hereinafter fully described and then pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved harrow, the parts being shown in position for use. Fig. 2 is a similar view, the parts being adjusted for transportation, the teeth being held from engagement with the ground. Fig. 3 is a central longitudinal section of the same, the parts being in an operative position, the tooth-bars being shown in different horizontal planes to illustrate their independent pivotal movement. Fig. 4 is a transverse section taken practically on the line 4 4 of Fig. 3, showing the tooth-bar in an incline plane transversely and illustrating the flexibility of the said bar. Fig. 5 is a side elevation of the harrow, the bars being swung back and supported upon the pivotal or drag hangers. Fig. 6 is a plan view, partly in section, of the bifurcated or brace end of one of the draft-bars. Fig. 7 is a detail horizontal section of the pivotal joint of one of the hangers.

Referring now to the accompanying drawings, in which like numerals indicate like parts in all the figures, 1 1 indicate the draft-bars, and 2 the lever-bar, the said bars 1 1 and 2 being parallelly arranged in the same horizontal plane.

3 4 designate, respectively, the front and rear tooth-bars, and 3<sup>a</sup> the intermediate tooth-carrying bars, the said tooth-bars being staggeredly arranged, so that the teeth 5 of the said bars will lie in diagonal lines, whereby to produce an effective crushing operation.

The draft-bars 1 terminate at the front end in inverted-gooseneck extensions 1<sup>a</sup>, the ends 1<sup>b</sup> of which are loosely joined with the front face of the front tooth-bar 3, the connection being in the nature of a staple 6, that passes through the aperture 1<sup>c</sup> of the gooseneck end 1<sup>b</sup>.

All of the staple connections for joining the several tooth-bars with the draft-bars are constructed alike, and each comprises a threaded rod having a staple-like end 6<sup>b</sup>, said rods in practice passing horizontally through the tooth-bars and provided upon the rear end with an adjusting-nut, the staple ends 6<sup>b</sup> having portions 6<sup>c</sup>, that engage sockets in the tooth-bars, as clearly shown in Fig. 6.

The harrow-teeth 5 may be of the conventional kind and secured to the tooth-carrying bars in any well-known manner.

To each draft-bar 1 is connected a series of what I term "drag-hangers," one for each end of the intermediate tooth-carrying bars 3<sup>a</sup>. All of the drag-hangers (indicated by 9) are constructed alike, and each consists of a head portion 9<sup>a</sup> and a pendent member 9<sup>b</sup>, which terminates in a rearwardly-extending horizontal member 9<sup>c</sup>, which is adapted to alternately serve as a draft member for pulling the tooth-bars forward when adjusted in an operative position and as supports upon which the said bars will rest when they are adjusted to an inoperative position, as will be presently further described.

The hangers 9 are all pivotally hung upon the draft-bars 1, and the extremities of the lower ends 9<sup>c</sup> of said hangers are apertured to receive the staple ends 6<sup>b</sup> of the connections 6, which are constructed the same as the connection 6 that joins the draft-bars to the front and rear tooth-bars 3 and 4.

To the top of each tooth-carrying bar is fixedly secured an upwardly-extending bracket 10, said brackets inclining rearwardly, the rear bracket 10 being extended to form a lever 10<sup>a</sup>.

2 designates a lever-bar which is disposed in the same horizontal plane with the draft-bars 1 and which is connected to the upper end of all of the brackets 10, including the lever-brackets, the connections being made by means of rivets or bolts 13, that are fixedly held upon the bar 2 and project through apertures 10<sup>b</sup> in the brackets 10, and to provide for a flexible movement of the tooth-bars in the direction of their length the said apertures 10<sup>b</sup> are somewhat elongated, as shown in Fig. 7. Upon the rear end of the bar 2 is fixedly secured a rearwardly-projecting segmental rack 11, and the lever 10<sup>a</sup> is equipped with the usual spring-actuated detent 14.

So far as described it will be clearly understood that by reason of all of the tooth-bars being connected to the draft means by the staple connections, such as illustrated and described, the said bars will have independent transverse movement, and as the bars 3<sup>a</sup> have at their opposite ends hangers that in themselves have independent vertical movement it follows that said bars are capable of moving irregularly, as indicated in Fig. 3, such movement being also producible without a too-great strain on the pivotal connection of the brackets 10 and the lever-bar 2 by reason of the flexible manner in which the said brackets 10 and bar 2 are joined. Furthermore, as the hanger-supports for the bars 3<sup>a</sup> are each pivotally connected with the draft-bars 1 it also follows that the several bars 3<sup>a</sup> will readily adapt themselves to the different irregular surfaces, such manner of securing the tooth-bars producing, as it were, a maximum amount of flexibility, thereby supporting the several intermediate tooth-carrying bars for independent awry movement transversely as well as longitudinally. Another and essential advantage in constructing the hanger 9 and connecting the lever-bar and lever mechanism thereto, as described, is that by simply swinging the lever forward, as indicated in Fig. 2, the entire set of tooth-bars will be turned at right angles to their operative positions and caused to lie flatwise upon the extensions 9<sup>c</sup>. The hangers are then projected under the tooth-bars and form runners therefor, and thereby greatly facilitate the transportation of the harrow from place to place, it being understood that during this latter adjustment of the harrow the teeth lie in a horizontal plane.

My construction of harrow is exceedingly simple and economical, and the inclination of the teeth can be readily governed by adjusting the lever, and by reason of the manner in which the draft-bars are arranged the pull strain will always be from the center thereof.

Having thus described my invention, what

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

1. A harrow, comprising draft-bars, the front and rear ends of which have flexible draft connections with the front and rear tooth-bars; intermediate tooth-bars; hangers pivotally connected at their upper ends to the draft-bars, their lower ends forming runners; flexible draft connections joining the intermediate tooth-bars and the hangers and means for imparting an axial movement to the bars, whereby to turn them sidewise onto the runner members.

2. In a harrow, the combination with the tooth-bars; of the draft-bars, said draft-bars having their front and rear ends extended down in a plane with the tooth-bars; flexible connections joining the said front and rear ends of the draft-bar respectively with the front and rear tooth-bars; the hangers pivotally connected with the draft-bars; flexible connections joining the lower ends of the said hangers with the intermediate tooth-bars; and lever mechanism for adjusting the tooth-bars, as specified.

3. In a harrow, the combination with the draft-bars; flexible connections joining the front and rear tooth-bars with the draft-bars; of the intermediate tooth-bars, said intermediate bars each having independent pivotal hangers connected with the draft-bars; and lever-operated means for adjusting all of the tooth-bars in unison, for the purposes described.

4. The combination with the tooth-bars; and draft-bars, each tooth-bar having an independent flexible connection for joining each tooth-bar with the draft-bars, said tooth and draft bars lying in different horizontal planes; of lever mechanism connected with the draft-bars adapted to simultaneously shift the draft-bars and axially turn the tooth-carrying bars whereby to bring the rear sides of the tooth-bars and the draft-bars in close contact and hold the teeth in a horizontal plane as the harrow is transferred from place to place.

5. In a harrow; the combination with the tooth-bars; the draft-bars; the flexible connections joining the opposite ends of the draft-bars and the front and rear tooth-bars and the intermediate tooth-bars; of the hangers 9, pivotally connected with the draft-bars; the flexible connections joining the lower end of the said hangers with the front edges of the intermediate tooth-bars; the brackets 10, secured to the top of all of the tooth-bars; the lever-bar 2, pivotally connected with the said brackets; and a mechanism for holding the said lever 2 to its adjusted position, as specified.

6. The combination with the tooth-bars, each tooth-bar having an upwardly-projecting fixedly-attached bracket, and a lever-bar pivotally connected to the upper end of all of the brackets; of the draft-bars 1, said bars having their front and rear ends extended

down in a plane with the front face of the front and rear tooth-bars; flexible connections joining the front and rear ends of the draft-bars with the front and rear tooth-bars; and  
5 the hangers 9 pivotally connected at their upper ends to the draft-bars, their lower ends forming horizontal extensions disposed in a plane with the axial line of the tooth-bars when the said bars are in an operative position; flexible connections joining the extremities of said portions of the hanger-bars and  
10 the intermediate tooth-bars, and a lever-and-rack mechanism for axially turning all of the tooth-bars in a plane above the extensions of the front and rear ends of the drag-bars and  
15 the lower extensions of the pivotal hangers, all being arranged substantially as shown and for the purposes described.

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Witnesses:

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