T. V. BARNARD.

HARROW.

APPLICATION FILED AUG. 19, 1913.

1,128,283.

Patented Feb. 16, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

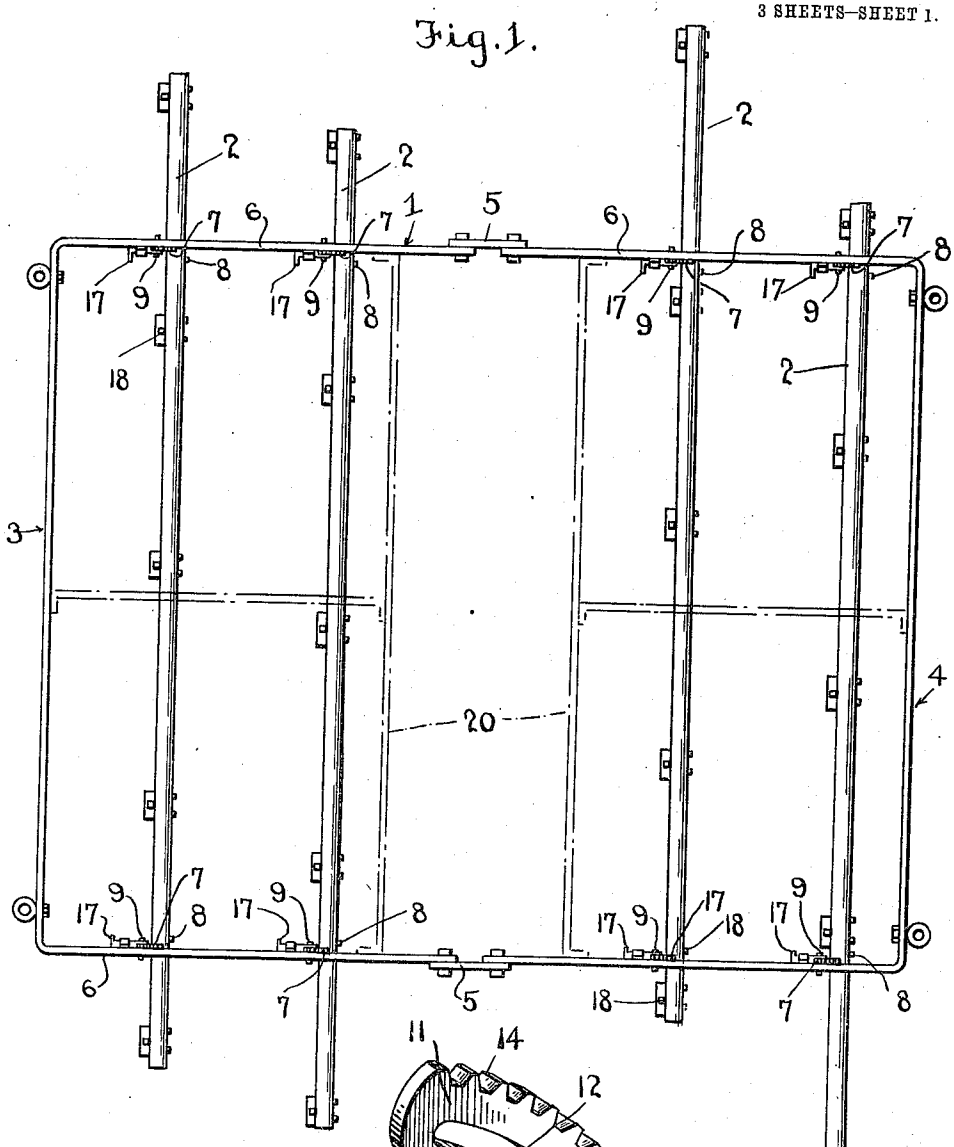
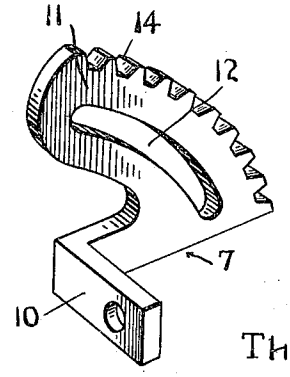


Fig. 6.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

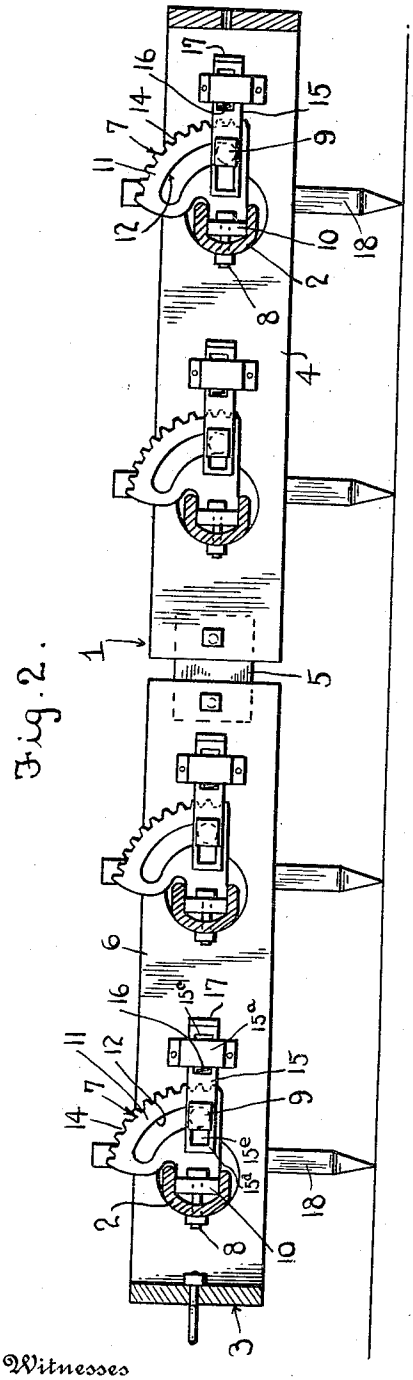


Fig. 9.

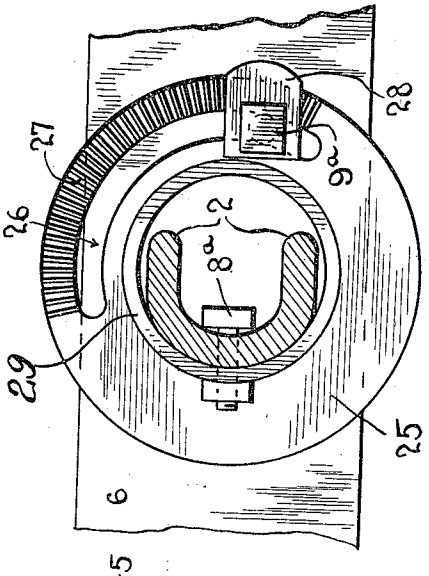
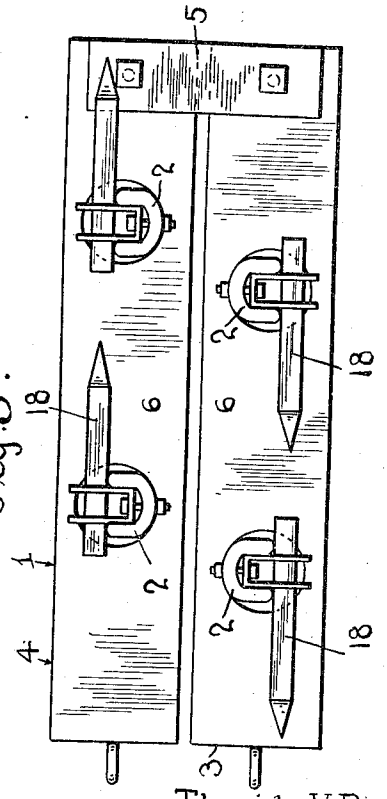


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

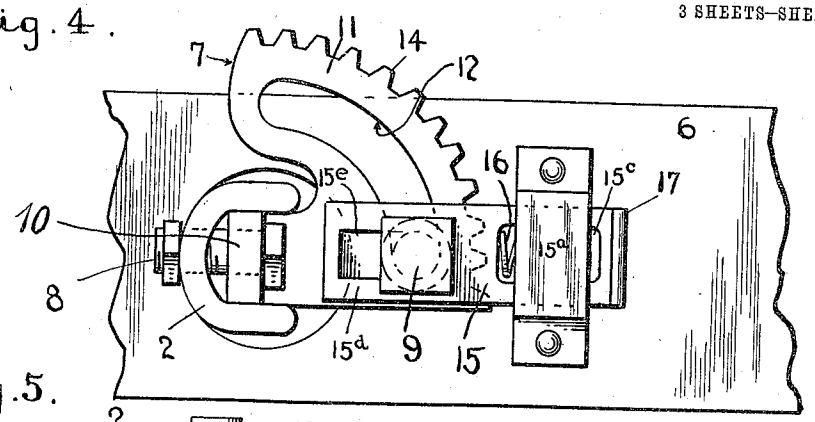


Fig. 5.

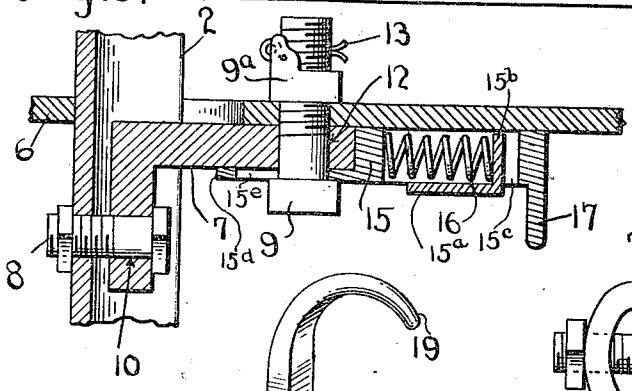
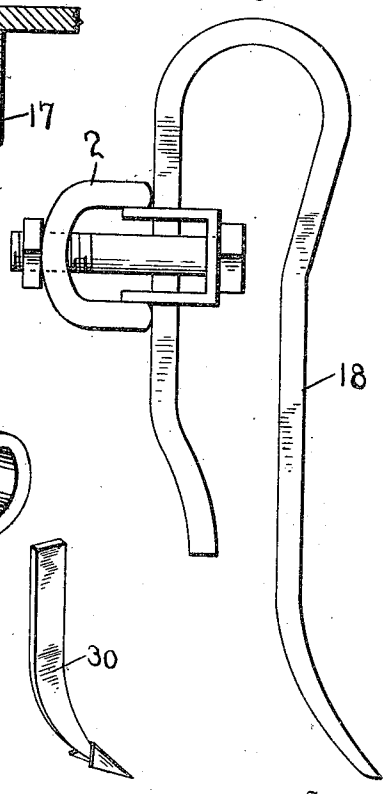


Fig. 7.



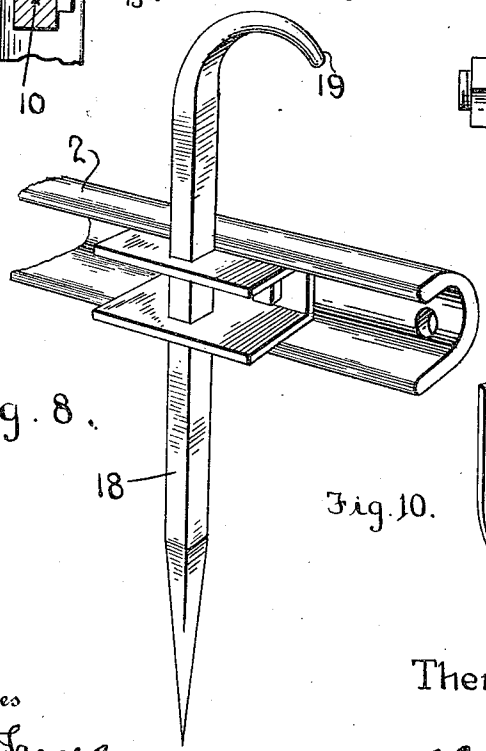


Fig. 8.

Fig. 10.

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UNITED STATES PATENT OFFICE.

THERIDES V. BARNARD, OF SCHALLER, IOWA.

HARROW.

1,128,283. Specification of Letters Patent. Patented Feb. 16, 1915.

Application filed August 19, 1913. Serial No. 785,575.

To all whom it may concern:

Be it known that I, THERIDES V. BARNARD, a citizen of the United States, residing at Schaller, in the county of Sac and State of Iowa, have invented certain new and useful Improvements in Harrows; and I do 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 appertains to make and use the same.

This invention relates to improvements in harrows.

The principal object of the invention is to provide a flexible harrow having an adjustable anchor arm.

Still another object of the invention is to provide a double U-shaped harrow frame having an anchor arm adjustment which admits of the folding of the frame with the tooth bars folded to position the teeth thereof parallel to the frame.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 represents a top plan view of one section of this improved harrow; Fig. 2 is a vertical cross sectional view thereof; Fig. 3 is a side elevation of one section of the harrow folded ready to ship or for storage; Fig. 4 is an enlarged detail side elevation of the anchor or lever arm; Fig. 5 is a detail horizontal section; Fig. 6 is a detail perspective view of the adjustable anchor arm; Fig. 7 is a side elevation of the duplex spring tooth which may be used in this improved harrow; Fig. 8 is a detail perspective view of a runner tooth designed for use on the corners of this improved harrow; Fig. 9 is a detail horizontal section of another form of anchor arm and its connection; Fig. 10 is a detail view of a colter foot tooth which may also be employed in connection with my improved harrow.

This improved harrow comprises a plurality of sections 1 which are adapted to be connected together but only one of which is here shown as they are duplicates of each other. Each of these sections 1 is composed of a plurality of tooth carrying bars 2 which are supported in U-shaped frames 3 and 4 which face each other and the free ends of which are connected by coupling links 5 secured by suitable bolts which may be loosely inserted to provide for the flexibility of the frame and permit it to move or vibrate in the movement of the harrow over clods. By means of the double bearing of these links buckling of the frame is prevented. Mounted on each of the side bars 6 of the frames 3 and 4 are a plurality of adjustable anchor arms 7 constructed as shown in detail in Figs. 2 and 4 which are designed to permit free adjustment of the tooth carrying bars and permit either side of the frame to be used by rendering unnecessary the use of levers, float bars and the like. These anchor arms 7 are secured to the tooth bars 2 by suitable bolts 8 and to the sides of the frames 3 and 4 by means of bolts 9. These anchor arms 7 each have a right angular extension 10 apertured to receive the bolt 8 which secures it to the tooth bar 2. Said anchor arm is also provided with a segmental plate 11 having an arc shaped slot 12 therein and through which the bolt 9 is designed to pass, said bolt also extending through the adjacent side member of the frame to which the tooth bar 2 is secured. The bolt 9 is provided with a nut 9^a which when tightened up causes the bolt to rigidly clamp the anchor arms to the side bars of the U-shaped frame. This bolt 9 may also be held against accidental loss by means of a cotter pin 13 engaged therewith as shown. The segmental plate 11 is preferably toothed on its outer edge as shown at 14 for engagement by a sliding dog 15 which is actuated by a suitable coiled spring 16 and provided with a thumb piece 17 for retracting and disengaging the same from the toothed edge of the anchor arm when desired. The dog 15 is slidably mounted in a guide frame 15^a having an inwardly projecting right angular stop lug 15^b which projects through a slot 15^c in the dog and against which one end of the spring abuts. The opposite end of the spring bears against the opposite end of the slot 15^c whereby the pressure of the spring is applied to project the dog into operative engagement with the teeth of the segmental plate 11 of the anchor arm. On the inner end of the dog 15 is a longitudinal extension in the form of a plate 15^d having a slot 15^e. The plate 15^d projects over the outer side of the segmental plate 11 of the anchor arm and the bolt 9 passes through the slot 15^e, as shown.

When the nuts 9^a are loosened on the bolts

9 the tooth carrying bars 2 are free to be adjusted in the frames 3 and 4 and to be fastened by the engagement of the dog 15 with the anchor arms of the tooth bars in the manner described. By means of the toothed segmental plates on the anchor arms and the spring projected dog 15, it will be seen that the toothed bars may be secured for holding the teeth thereof at any desired angle. The toothed bars 2 are preferably made U-shaped in cross section, as clearly shown in Figs. 2 and 4 of the drawings.

The corners of each U-shaped frame are preferably provided with runner teeth 18 which are preferably constructed as shown in detail in Fig. 8 with their curved or runner ends 19 normally disposed above the upper face of the harrow frames and which may be secured to said frames by any suitable means and are designed to serve as runners for conveying the harrow over the road, the harrow frames having been first turned over or inverted for this purpose leaving the teeth projecting upwardly and being supported on these runners 19.

The U-shaped frames 3 and 4 are preferably made of channel iron to render them stronger but this is not imperative, and frame braces 20 may be employed, if desired.

When it is desired to store or ship one of these harrows each section may be folded intermediately of its ends where the free ends of the U-shaped members are connected by the links 5 as shown in Fig. 3 and when these U-shaped frames 3 and 4 are folded on each other, the tooth bars 2 are turned to position the teeth 21 of the harrow parallel with the side members of the U-shaped frames as is shown clearly in Fig. 3.

In the form shown in Fig. 9 the anchor arm or device for securing the tooth bars in adjusted position is shown in the form of an annular plate 25 having a segmental slot 26 therein through which the clamping bolt 9^a is designed to pass for securing said plate to one of the side members of the frame section. This plate 25 has one face thereof corrugated as shown at 27 outside the slot 26 and with which is adapted to interlock a corrugated washer 28 mounted on the bolt 9^a to provide for the clamping of said plate 25 in adjusted position. A circular collar 29 is arranged around the opening in the plate 25 and is adapted to encircle one of the tooth carrying bars 2 which is secured to said collar by means of a bolt 8^a passing through the center of said bar and through said collar. It will be obvious that this plate 25 is the equivalent of the anchor arm 7 shown in the other figures and accomplishes the same purpose in a slightly different manner. In the form shown in Fig. 9 the clamping plate encircles the tooth carrying bar while in the other figures it is shown as fitted within said bar.

In Fig. 10 of the drawings is shown a detail view of a colter foot tooth 30 which is designed to be employed in connection with my improved harrow.

I claim as my invention:

A harrow comprising a frame, tooth carrying bars revolubly mounted in said frame, a segmental anchor plate secured to each of said tooth carrying bars and provided with teeth, and a spring pressed dog mounted on said frame and adapted to engage said teeth for locking said plate in adjusted position.

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

THERIDES V. BARNARD.

Witnesses:
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E. W. SCHAEFER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."