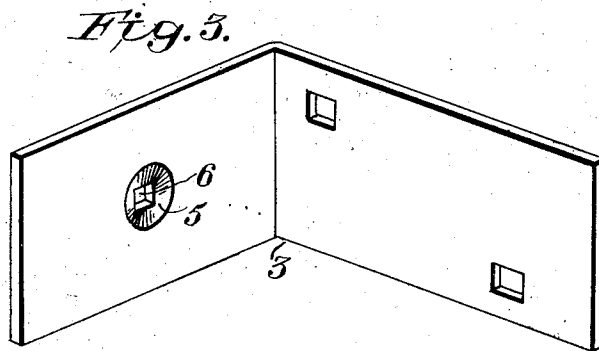
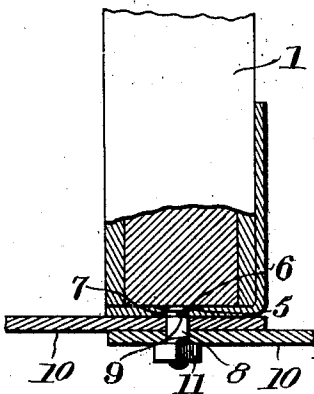
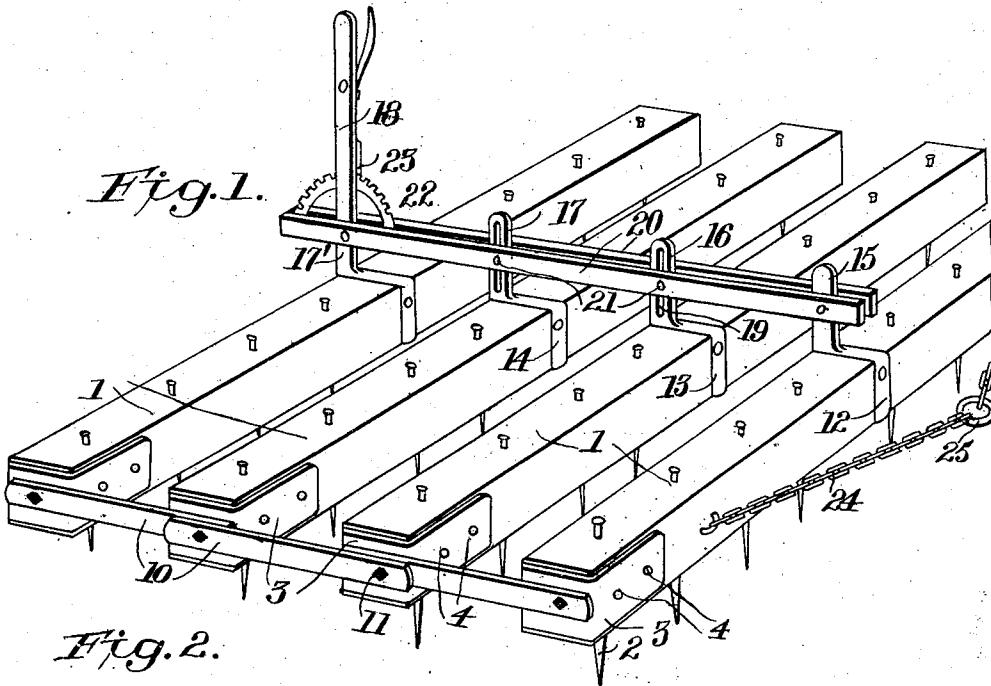


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HARROW.
APPLICATION FILED DEC. 31, 1908.

973,975.

Patented Oct. 25, 1910.

3 SHEETS-SHEET 1.



Witnesses

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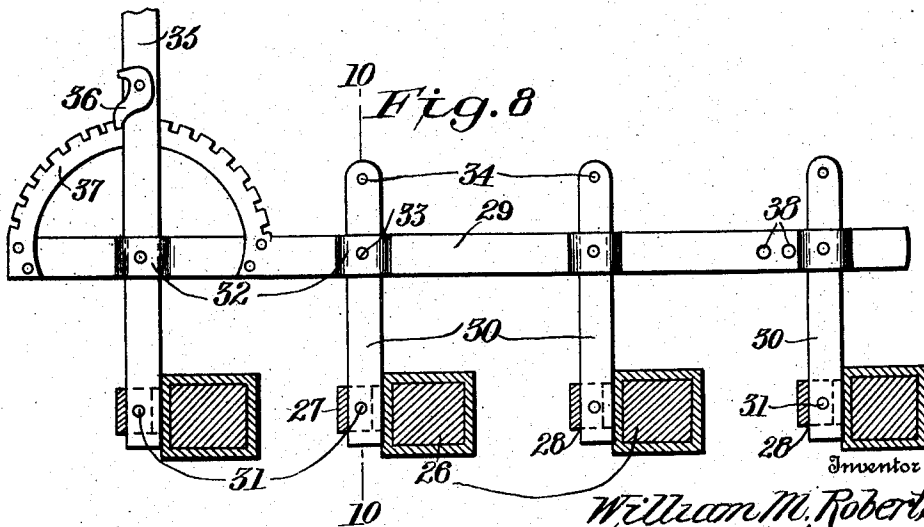
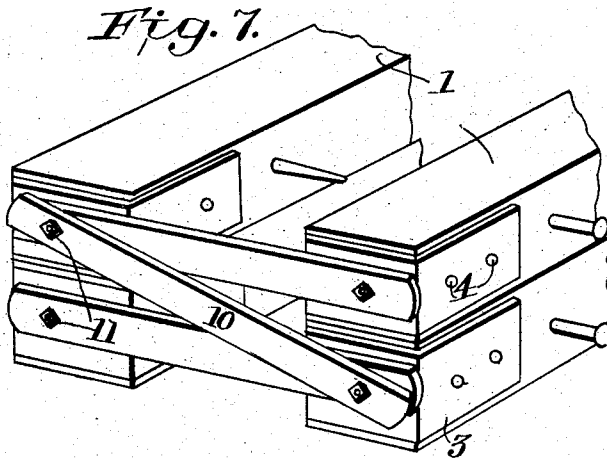
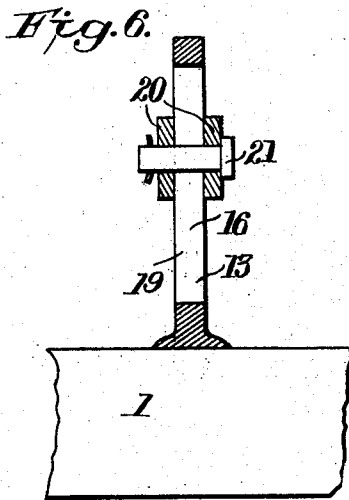
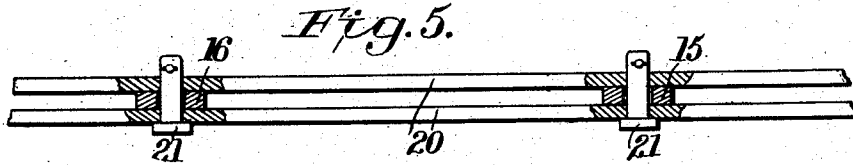
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3 SHEETS-SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 9.

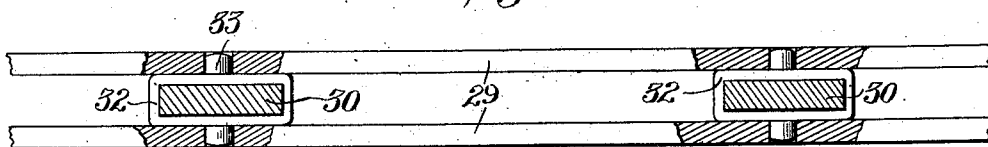


Fig. 10.

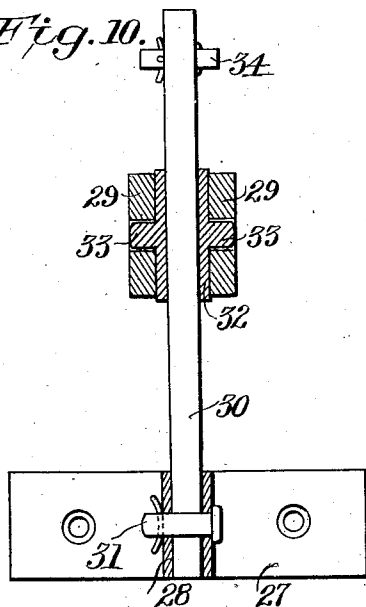


Fig. 11.

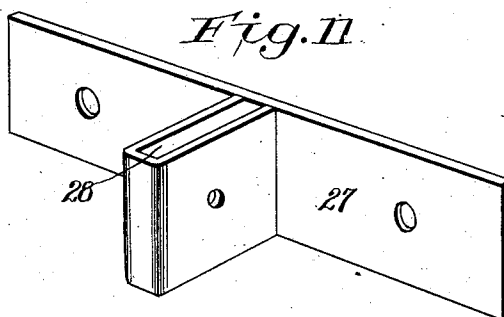


Fig. 12.

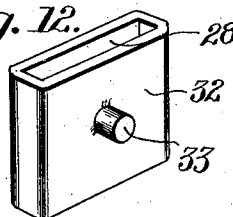


Fig. 13.

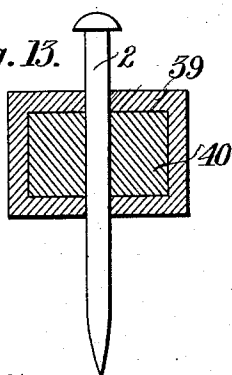
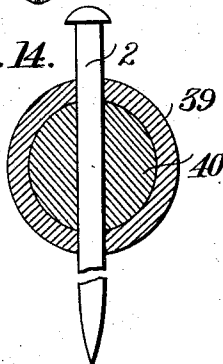


Fig. 14.



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UNITED STATES PATENT OFFICE.

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HARROW.

973,975.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed December 31, 1908. Serial No. 470,214.

To all whom it may concern:

Be it known that I, WILLIAM MARVIN ROBERTS, a citizen of the United States, residing at Columbia, in the county of Maury and State of Tennessee, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

The present invention relates more particularly to that class of harrows known as spike tooth harrows, but is not necessarily limited thereto.

One of the principal objects is to provide a novel and very simple structure having means for adjusting the beams to any position desired, said means also locking the beams against turning and yet permitting their relative up and down play in order that they will accommodate themselves to the roughness of the surface over which they move.

A further and important object is to provide a harrow in which the beams are respectively held against endwise play, thus preventing the teeth of one beam moving in the paths of the teeth before them.

Still another and important object is to provide a harrow that can be compactly folded for storing or transportation.

These and other objects are secured by the embodiment of the invention disclosed in the accompanying drawings in which,

Figure 1 is a perspective view of one type of structure. Fig. 2 is a detailed sectional view through one of the end portions thereof. Fig. 3 is a perspective view of one of the caps. Fig. 4 is a similar view of one of the stud bolts. Fig. 5 is a horizontal sectional view through the holding mechanism for the beams. Fig. 6 is a vertical cross sectional view therethrough. Fig. 7 is a view showing the harrow folded. Fig. 8 is a vertical sectional view through a slightly modified form of construction. Fig. 9 is a horizontal sectional view therethrough. Fig. 10 is a vertical sectional view on the line 10-10 of Fig. 8. Fig. 11 is a perspective view of one of the socket members. Fig. 12 is a similar view of one of the yoke members. Fig. 13 is a cross sectional view through one of the beams illustrating the preferred form of construction. Fig. 14 is a similar view through a modified form of beam.

Referring first to the embodiment disclosed in Figs. 1-7 inclusive, a plurality of

beams 1 are employed, through which pass the usual spike teeth 2. Located on one of the end portions of these beams are caps comprising right angular plates 3. Each cap has one leaf located against one side of the beam to which it is secured by suitable fasteners 4. The other leaf is disposed across the end of the beam and has in its inner side a socket 5, from which extends an angular opening 6. Stud bolts are employed having heads 7 that fit in the sockets 5, said stud bolts being provided with shanks 8 projecting through the openings 6 and beyond the caps, these shanks having angular portions 9 that fit in the openings and thus prevent rotation of the studs. The beams are flexibly connected by separate links 10 arranged at the ends of said beams and having openings through which the studs are passed. Nuts 11 are screwed upon the ends of the studs in order to hold the links in position. It is to be noted that the studs are not located directly at the ends of the links, but said links overlap to a considerable extent and provide sufficient bearing surface to effectively prevent the endwise play of the beams.

Secured to the central portions of the beams are brackets 12, 13 and 14, these brackets having standards respectively designated 15, 16, 17 and 17'. The standard 17' continues upwardly to form a suitable lever 18. The intermediate standards 16 and 17 have longitudinally disposed slots 19, while the standard 15 is preferably provided with the circular opening. Positioning bars 20 are located transversely of the beams on opposite sides of the standards and are connected by detachable pins 21 that pass through the end standards and through the slots 19 in the standard 16. One of the bars 20 has a rack 22 and a suitable dog 23 mounted on the lever 18 which engages the rack to hold the lever in different positions.

Any suitable draft mechanism for the harrow may be employed, if desired. Thus in the present embodiment a draft chain 24 is employed, secured to the front beam and having a ring 25 to which the draft animals may be hitched. With this construction it will be evident that the beams can be set with the teeth at any inclination desired, and while said beams are effectively held against turning, each may rise and fall independently of the other, because of the slots 19 in the intermediate standards 16 and 17', in

which the pins 21 play. By removing one or more of these pins, the beams will be released and will turn sidewise, thus being thrown out of action and constituting drags.

5 The lever 18 can be swung far enough to carry the teeth entirely out of engagement with the ground. If it is desired to store or transport the harrow, by detaching the pins 21 and the lever, the beams can be folded 10 upon one another, as illustrated in Fig. 7, the points being placed inwardly, so that they are completely out of the way. The end caps constitute effective bearings for the links, and said links being overlapped, as set 15 forth, prevent any endwise play of the beams, thus prohibiting the teeth of one beam moving in the path of the teeth operating in advance of them.

As an indication of how the structure may 20 be modified, attention is invited to Figs. 8-12, inclusive. In this embodiment, the beams are designated 26, and each has secured to its rear side an element 27 provided with a vertical socket portion 28. Position- 25 ing bars 29 are employed that are located on opposite sides of the standards 30. The lower ends of these standards fit in the sockets 28 and are secured in place by detachable pins 31. Located between the bars 30 29 are guide boxes or yokes 32 that slide upon the standards 30 and have outstanding gudgeons 33 pivotally engaged in the bars 29. The yokes 32 are prevented from disengaging from the standards by transverse 35 pins 34 located in the upper ends of said standards. A lever 35 is employed that is connected to the bars 29, and at its lower end detachably engages in the rearmost socket 28. This lever carries a dog 36 that 40 coöperates with the rack 37. The foremost standard 30 operates in a yoke 32, which can be adjusted to different positions by engaging the gudgeons 33 thereof in different openings 38. It will be evident that this 45 structure has all the advantages as that above described, in that it permits the flexing of the harrow while holding the beams thereof against rotation and in different positions. Moreover, by detaching the stand- 50 ards 30 from the beams, said harrow can be folded in the manner already described.

While the beams may be wholly of wood, in the preferred form of construction as

shown in Figs. 13 and 14, an outer metallic casing 39 is employed containing a wooden 55 core 40. The spikes 2 pass through the casing and core as shown. By this construction all the advantages of the metallic beam are secured, while the wooden core, which 60 binds upon the teeth, snugly holds said teeth in place. It will be observed by reference to Figs. 13 and 14 that the beams may be either angular or circular in cross section.

While the invention, as shown, is particularly intended where wooden beams are em- 65 ployed, it will be obvious to those skilled in the art that the novel features may be utilized in structures where the beams are metal either wholly or in part.

What is claimed is:— 70

1. In a harrow of the character set forth, the combination with a plurality of harrow beams, of end caps secured thereto and hav- 75 ing projecting studs, separate links connecting the different beams and pivotally engaging the studs, and means for controlling the position of the beams on their pivot axes.

2. In a harrow of the character set forth, the combination with harrow beams, of end caps secured thereto and having sockets in 80 their inner sides, an angular opening extending therefrom, studs having heads located in the sockets, and shanks projecting through the opening, said shanks having an- 85 gular portions in said openings, separate links connecting the separate beams and pivotally engaging the studs, and means for turning the beams on their axes and holding them in different positions.

3. In a harrow of the character set forth, 90 the combination with harrow beams, of caps secured thereto and comprising right angularly disposed metal plates having outstand- 95 ing threaded studs, links located on the studs, nuts screwed on said studs and maintaining the links in position, and means for securing the beams against pivotal movement on the studs and in different positions, said means 100 permitting the relative up and down play of the beams.

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

WILLIAM MARVIN ROBERTS.

Witnesses:

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CARRIE BRIGGS.