

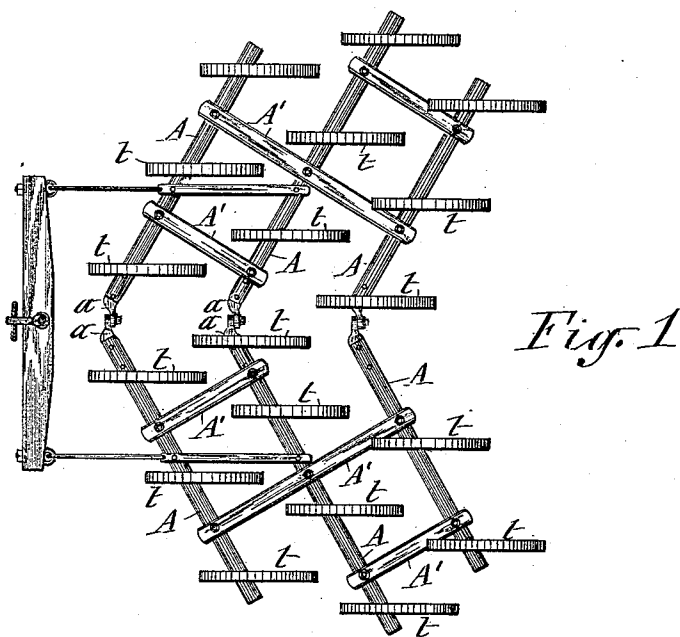
(No Model.)

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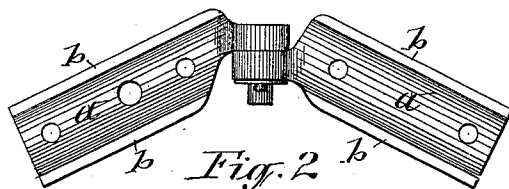
O. J. CHILDS.  
HARROW.

No. 463,594.

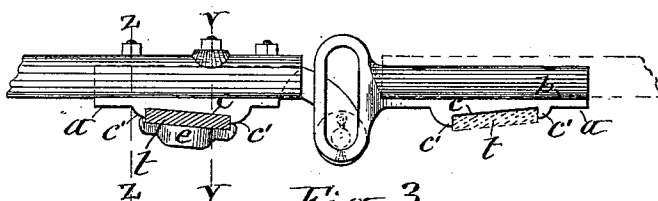
Patented Nov. 17, 1891.



*Fig. 1*



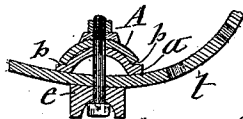
*Fig. 2*



*Fig. 3*



*Fig. 4*



*Fig. 4 1/2*

WITNESSES:

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INVENTOR

Orlando J. Childs

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(No Model.)

2 Sheets—Sheet 2.

O. J. CHILDS.  
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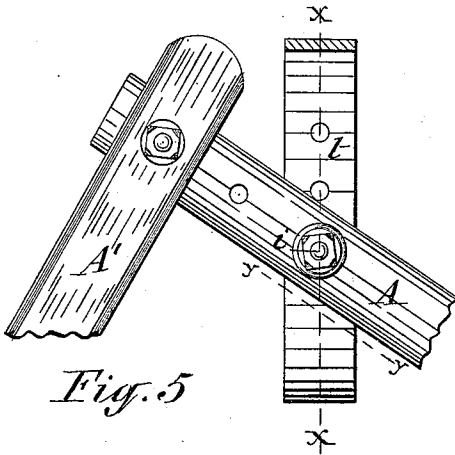


Fig. 5

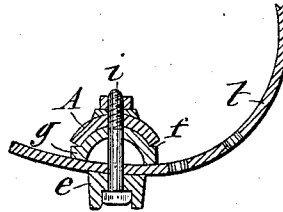


Fig. 7

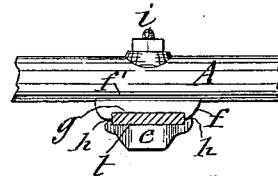


Fig. 8

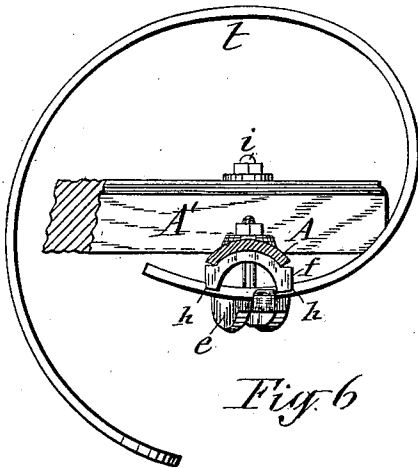


Fig. 6

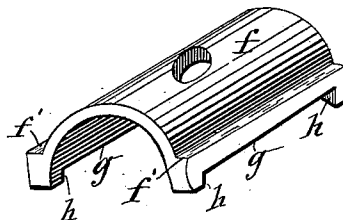


Fig. 9

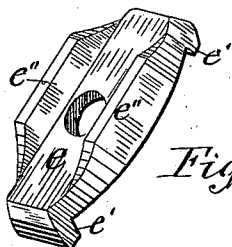


Fig. 10

WITNESSES:

A. F. Walz,  
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# UNITED STATES PATENT OFFICE.

ORLANDO J. CHILDS, OF UTICA, NEW YORK, ASSIGNOR TO THE NATIONAL HARROW COMPANY, OF SAME PLACE.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 463,594, dated November 17, 1891.

Application filed September 14, 1889. Serial No. 323,928. (No model.)

*To all whom it may concern:*

Be it known that I, ORLANDO J. CHILDS, of Utica, in the county of Oneida, in the State of New York, have invented new and useful  
5 Improvements in Harrows, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel construction of a harrow-frame and means for attaching thereto curved spring harrow-teeth, as hereinafter fully described, and specifically set forth in the claims.

In the accompanying drawings, Figure 1 is  
15 a plan view of a harrow embodying my improvements. Fig. 2 is an enlarged detached plan view of the coupling-irons of the harrow-frame. Fig. 3 is a side view of the same, with the draft-bar attached to one of said irons.  
20 Figs. 4 and 4½ are transverse sections on lines *z z* and *v v*, Fig. 3. Fig. 5 is a top plan view of a section of the harrow with the top portion of the tooth broken away. Fig. 6 is a side view of one of the teeth and its attachment to the frame. Fig. 7 is a vertical longitudinal section on line *x x*, Fig. 5. Fig. 8 is a transverse section on line *y y*, Fig. 5. Fig.  
25 9 is a detached enlarged perspective view of one of the tooth-sustaining plates, and Fig. 10 is a perspective view of one of the bolt-washers in an inverted position.

Similar letters of reference indicate corresponding parts.

*A A* represent the draft-bars, and *A' A'* the  
35 cross-bars, of the harrow-frame. Said draft-bars are composed of iron or steel and channeled longitudinally or concavo-convex in cross-section, as shown in Figs. 6 and 7 of the drawings. The cross-bars may be composed  
40 of either wood or metal, preferably of wood, in the under side of which are cut crosswise grooves, which are concaved transversely and of a depth to receive and fit closely to the backs or convex side of the draft-bars, which  
45 are perforated and secured to the wooden cross-bars by bolts passing vertically through the same. The draft-bars being boxed in the cross-bars causes said bars to be retained at the requisite angles to each other without the  
50 aid of extra braces.

*aa* represent the coupling-irons by which the two frame-sections are hinged to each other in the usual manner. The body portion of each of said irons is formed concavo-convex in cross-section or with a longitudinal recess  
55 in its under side and with a convex top of such dimensions as to fit the under side of the draft-bar *A*, which has its end portion mounted on the said coupling-iron and secured thereto by bolts or rivets passing  
60 through coinciding perforations in the said parts. I preferably also form the top of the coupling-iron *a* with longitudinal shoulders  
65 *b b*, which abut against the edges of the draft-bar and aid in retaining the coupling-iron in its position on the draft-bar. The longitudinal edges of the under side of the coupling-iron *I* form with seats *c c* for the curved  
70 spring-tooth *t*, and with shoulders *c' c'*, which abut against the edges of the tooth and thereby prevent the said tooth from twisting on its seats. The tooth is secured to the coupling-iron by a bolt *d*, passing vertically  
75 through the draft-bar, coupling-iron, and tooth, and provided with a nut *d'*, by which to tighten it, as shown in Fig. 4½ of the drawings.

In order to facilitate the tightening of the bolt and also partly guard against the accidental loosening of the nut on the bolt, I insert the bolt with its threaded end upward and place on the under side of the tooth *t* a washer *e*, formed with upward-projecting lips  
80 *e' e'*, which engage the edges of the tooth, and with downward-projecting flanges *e'' e''*, between which the head of the bolt is held. Other teeth *I* attach to the draft-bars *A A* by inserting in the under side or concave side thereof the convex side of a concavo-convex  
90 plate *f*, which I also form with longitudinal shoulders *f' f'*, by which it abuts against the edges of the draft-bar, and thus hold said plate more securely in its position. The edges of the concave under side of the plate *f* I form with seats *g g* for the tooth *t*, on which  
95 the said seats bear transversely, and also form said plate with lugs or shoulders *h h*, which abut against the edges of the tooth to more effectually retain the same in its requisite position. The aforesaid plate is clamped  
100

on the draft-bar by a bolt *i*, passing up through perforations in the tooth, plate, and draft-bar, and provided with a nut on top of the draft-bar. I also preferably employ at said attachment a washer *e* on the under side of the tooth, and having lips *e' e'*, engaging the edges of the tooth to prevent the bolt and washer from turning, and provided with lips *e'' e''*, holding between them the head of the bolt, as hereinbefore described.

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

1. The combination of the coupling-irons *a a*, having their body portions formed convex on one side and the draft-bars formed with a corresponding concavity and seated thereby on the body portion of the coupling-irons, and bolts passing through said parts, as set forth.

2. The combination of the coupling-iron *a*, having its body portion formed concavo-con-

vex in cross-section, the draft-bar formed concavo-convex in cross-section and seated with its concave side on the convex side of the coupling-iron, and bolts uniting said parts, as set forth.

3. The combination of the coupling-iron *a*, having its body portion formed concavo-convex in cross-section and with longitudinal shoulders on the edges of its convex side, the draft-bar formed concavo-convex in cross-section and seated with its concave side on the convex side of the coupling-iron and abutting with its edges against the aforesaid shoulders, and bolts uniting said parts, substantially as set forth and shown.

In testimony whereof I have hereunto signed my name this 7th day of September, 1889.

ORLANDO J. CHILDS. [L. S.]

Witnesses:

E. LAASS,  
MARK W. DEWEY.