

(No Model.)

2 Sheets—Sheet 1.

O. J. CHILDS.
HARROW.

No. 463,594.

Patented Nov. 17, 1891.

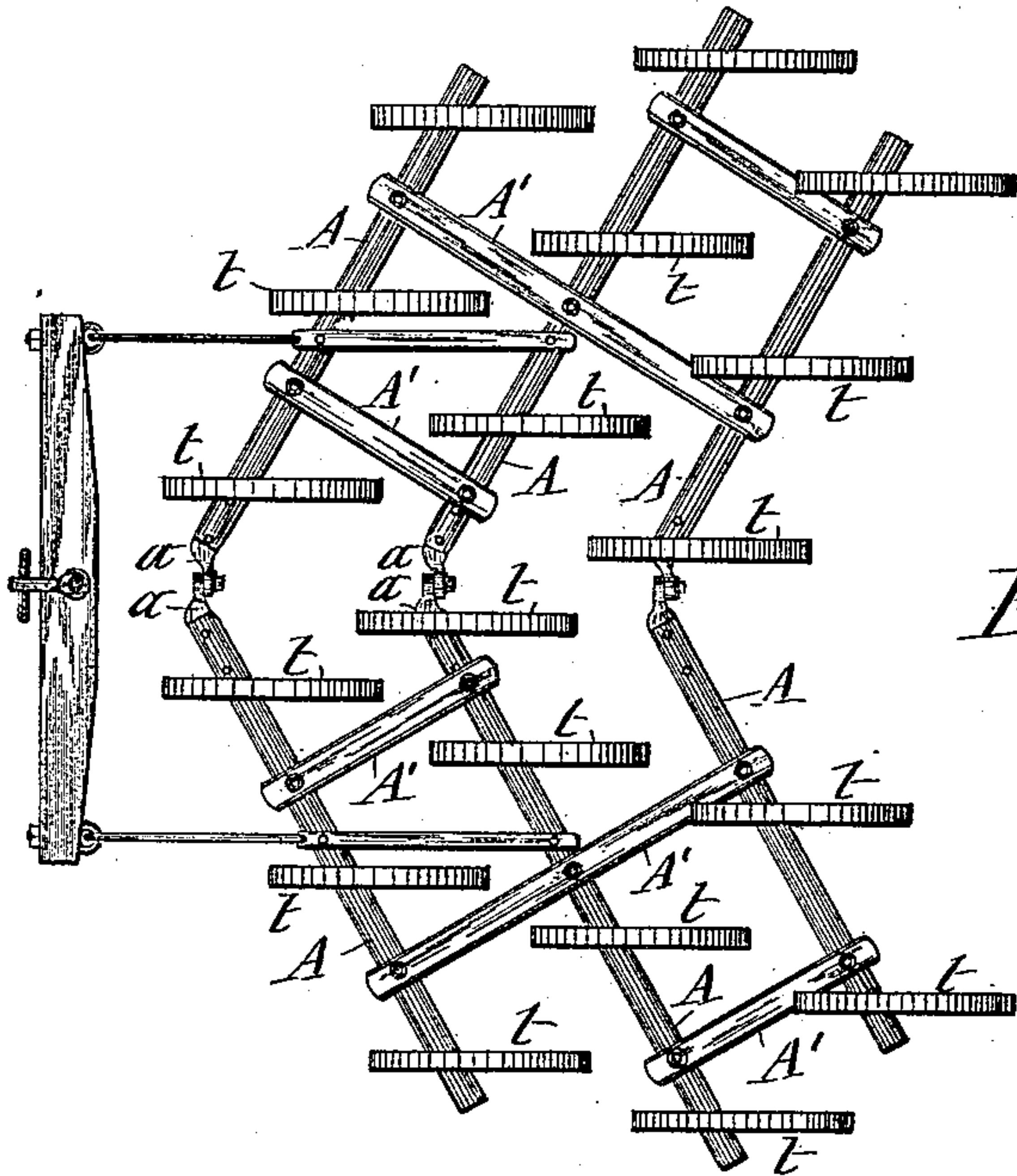


Fig. 1

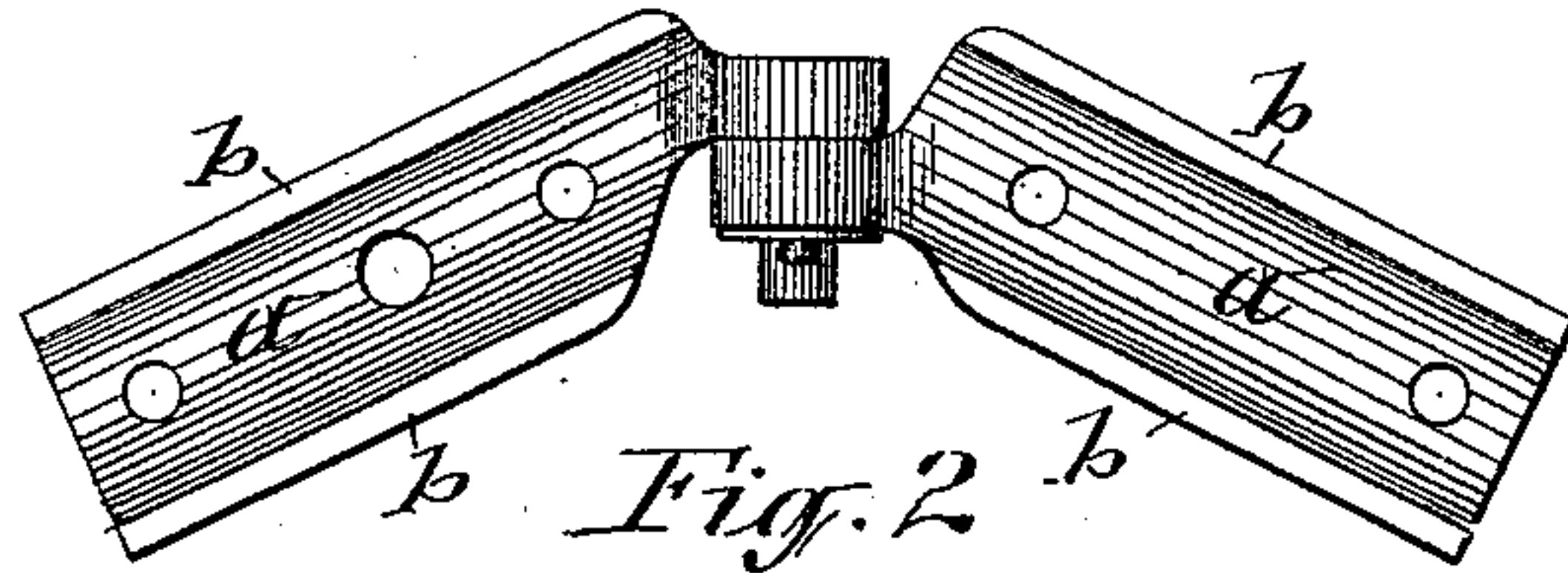


Fig. 2

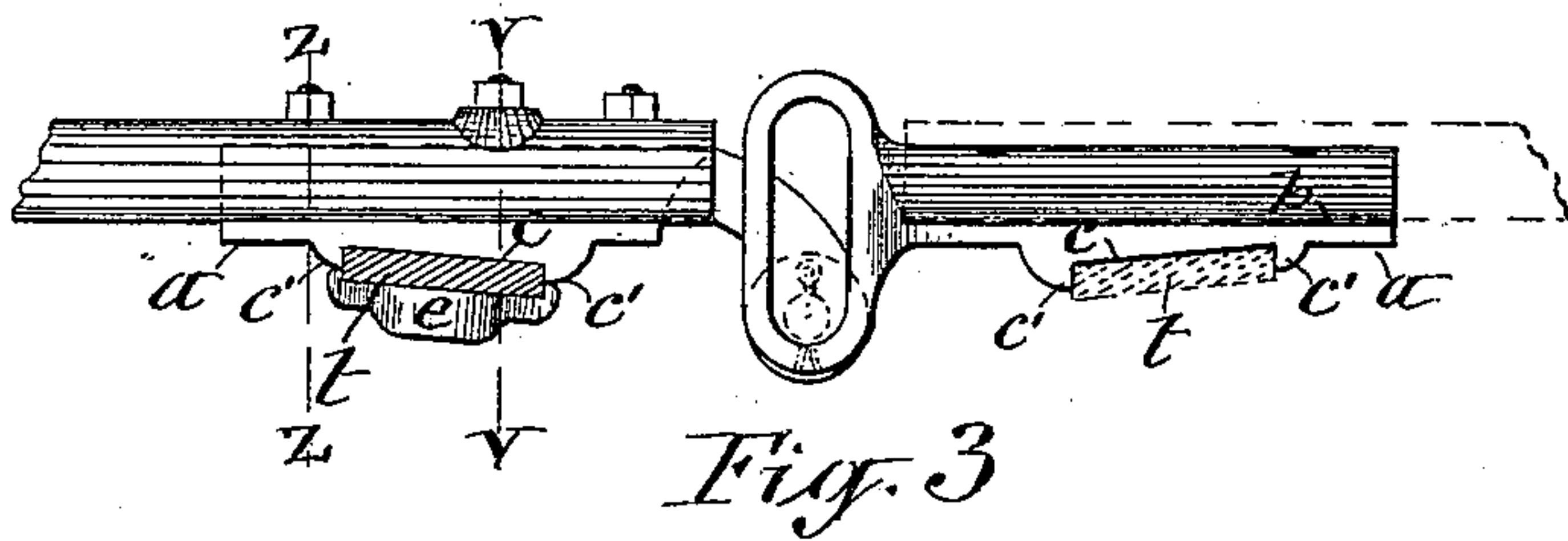


Fig. 3

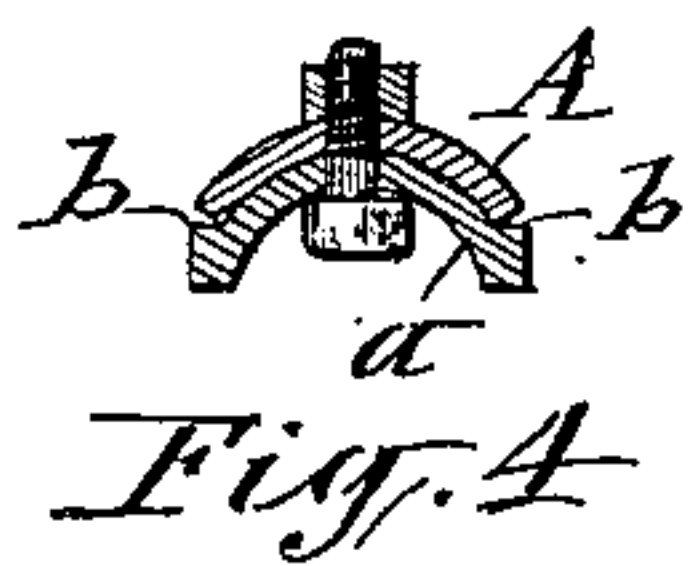


Fig. 4

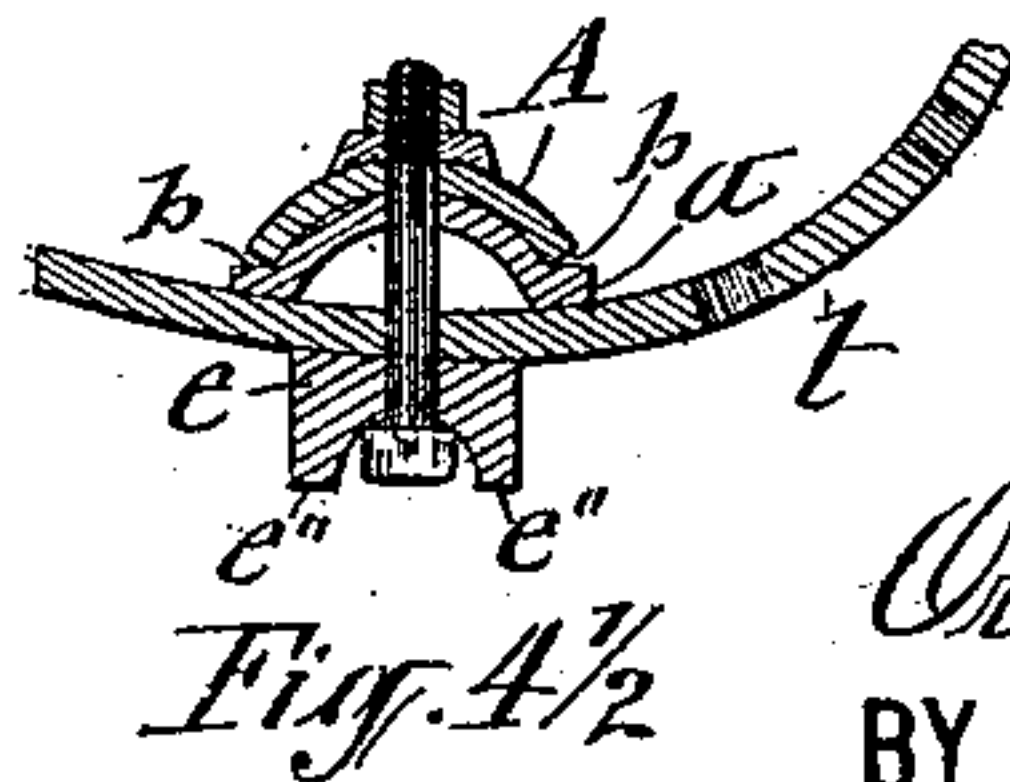


Fig. 4 1/2

WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

O. J. CHILDS.
HARROW.

No. 463,594.

Patented Nov. 17, 1891.

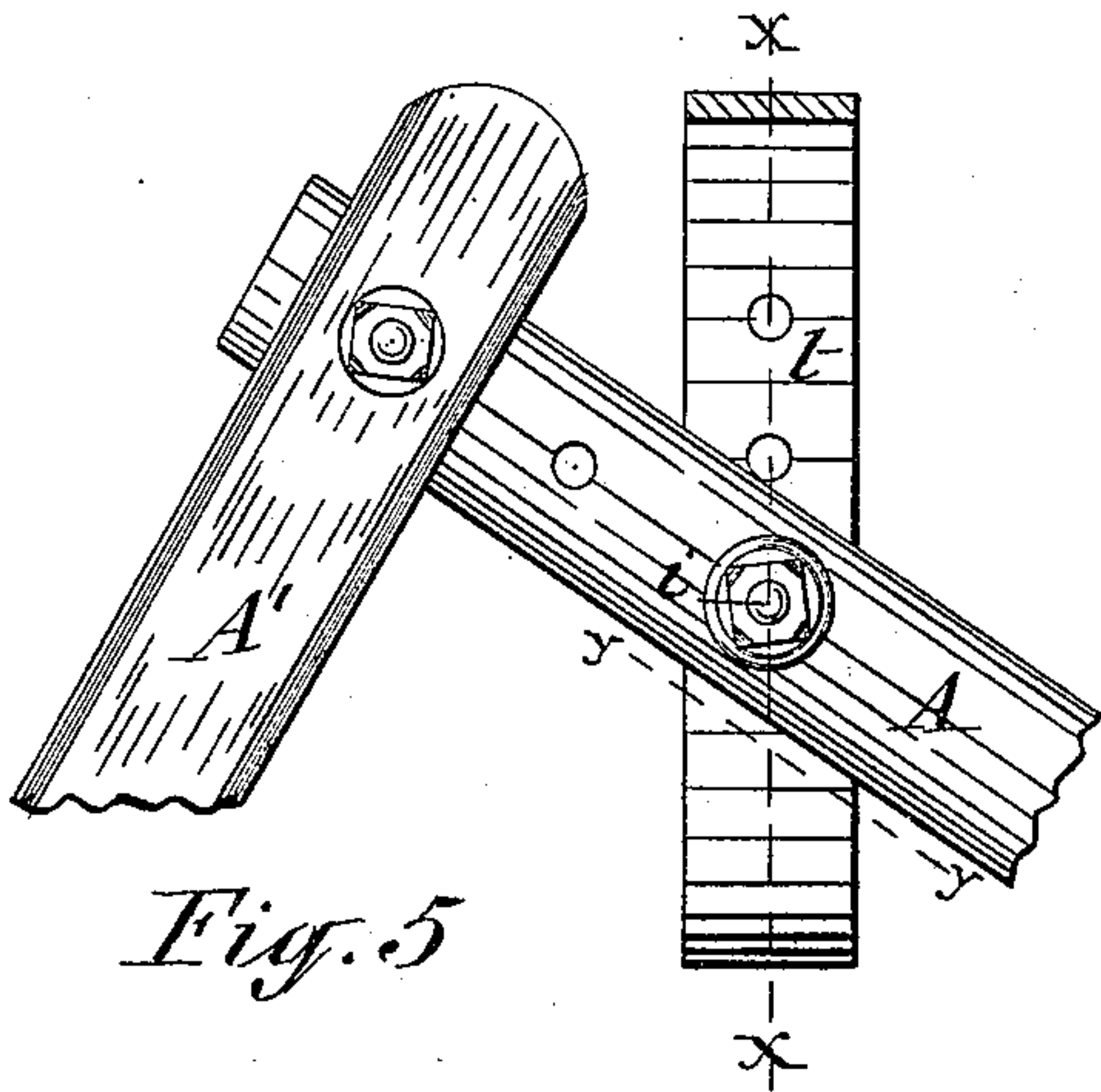


Fig. 5

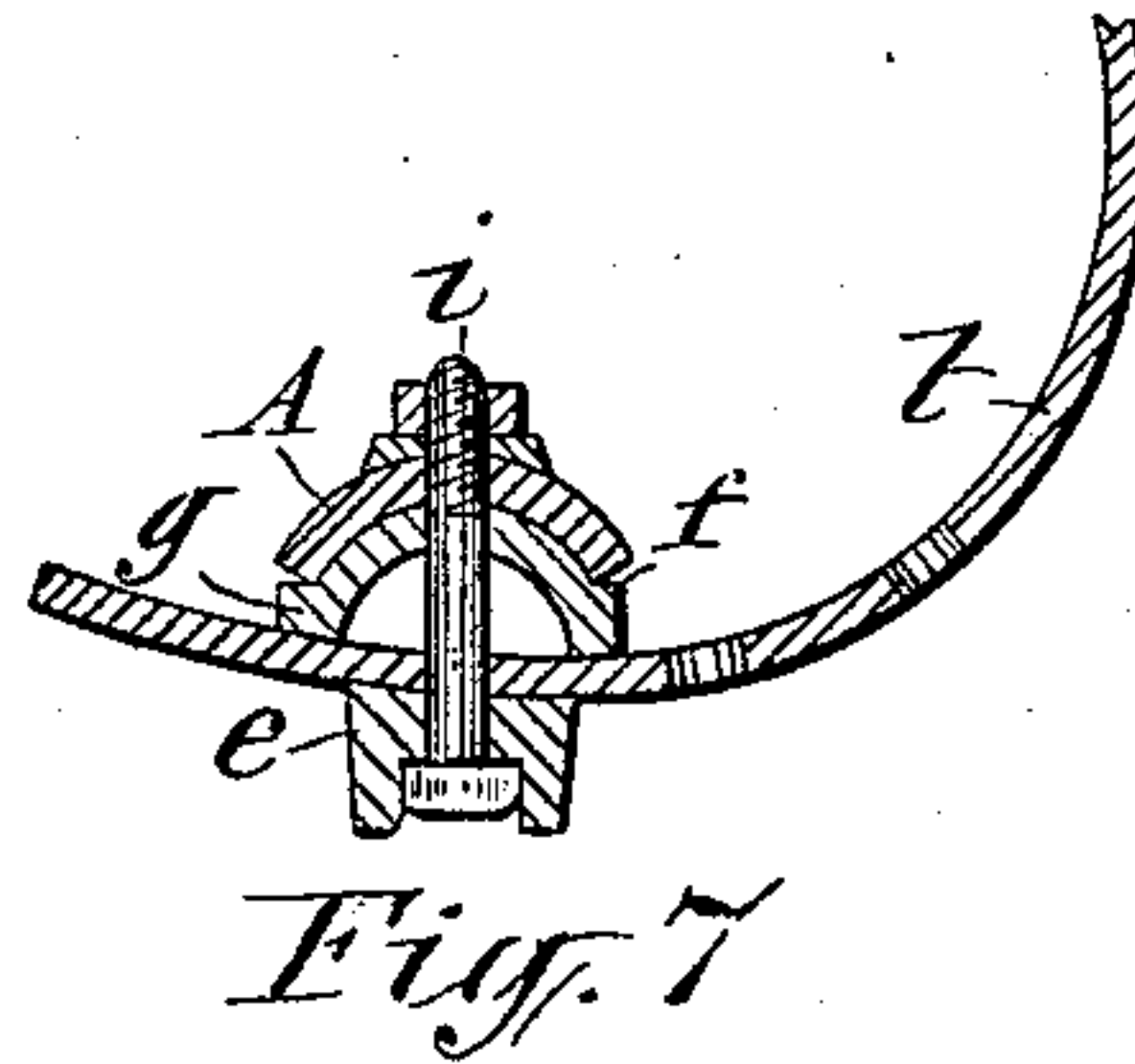


Fig. 7

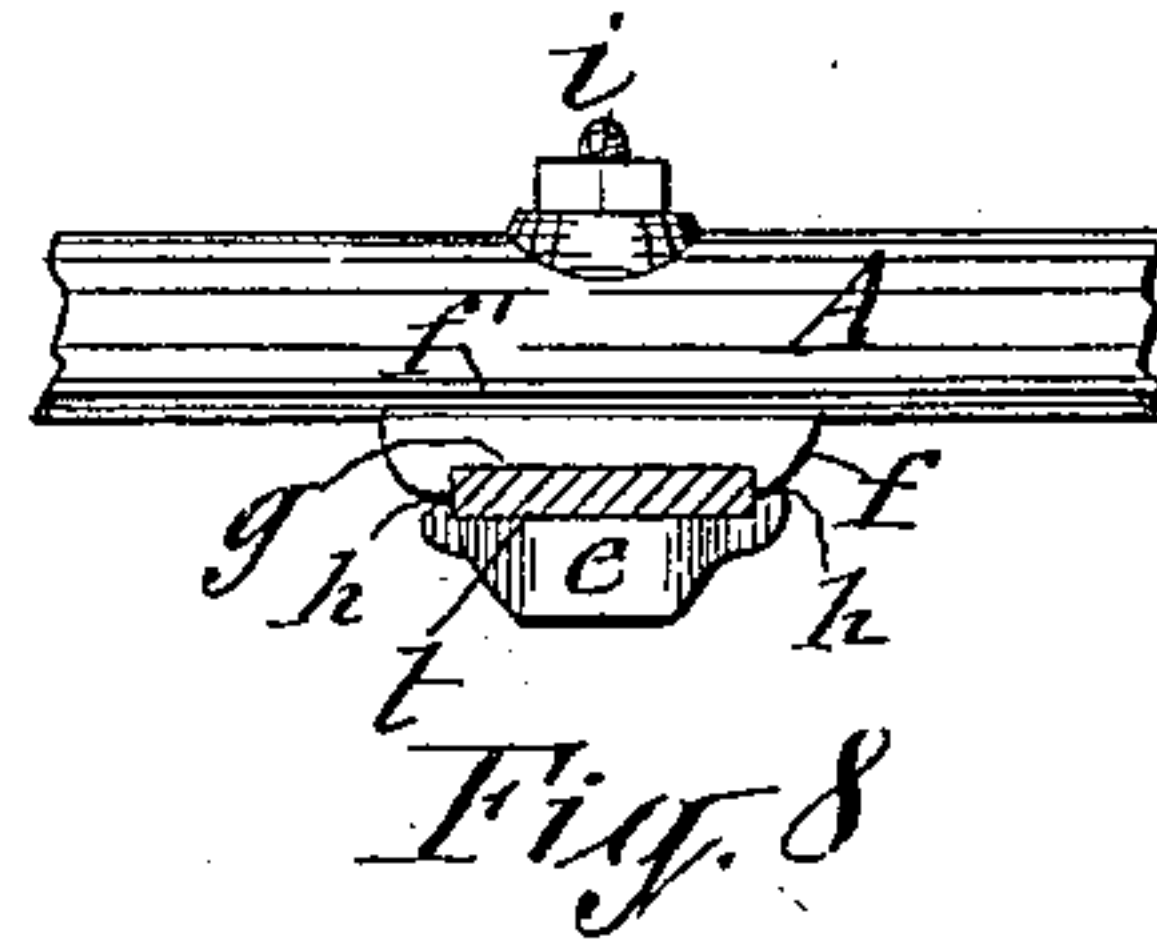


Fig. 8

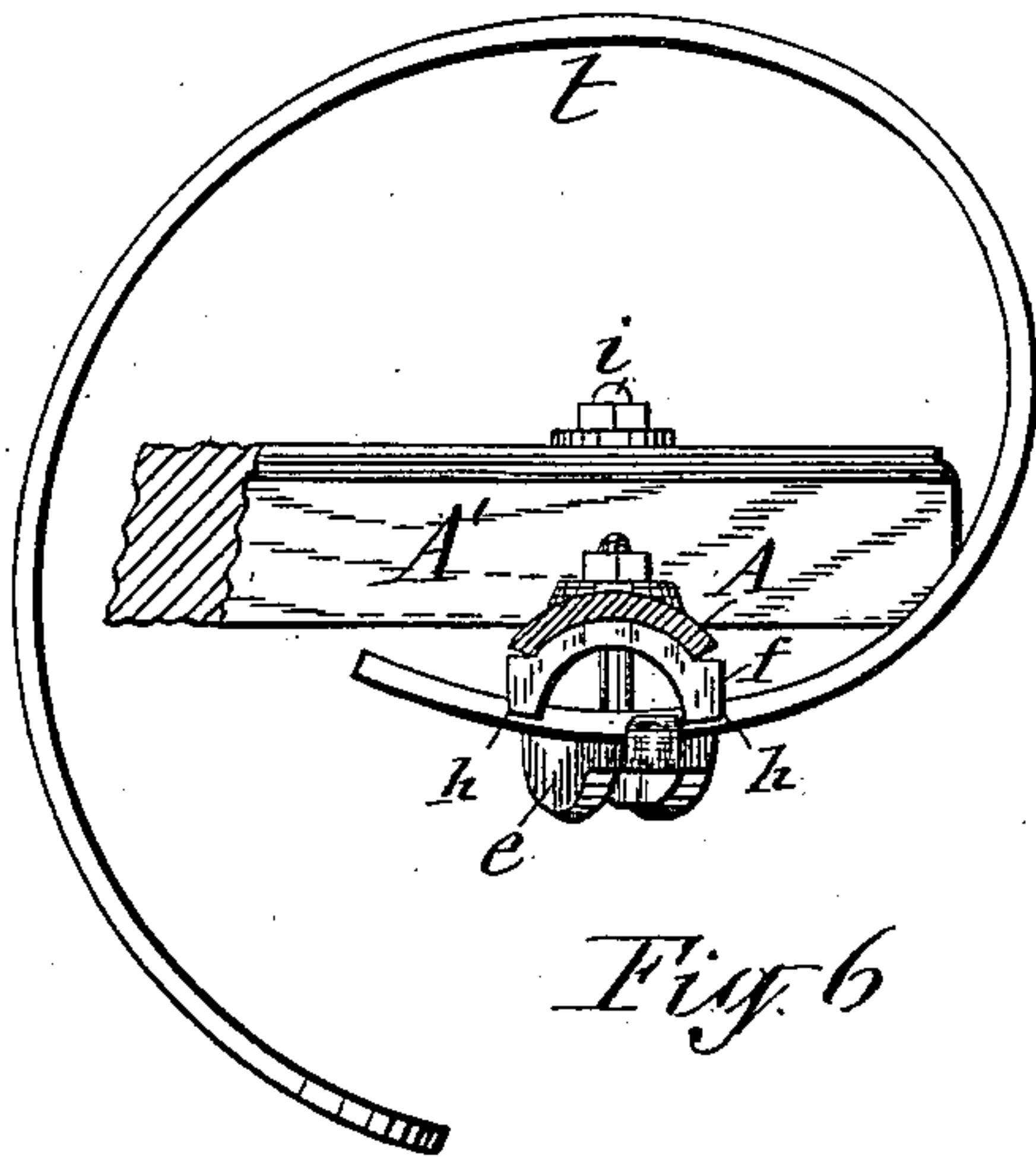


Fig. 6

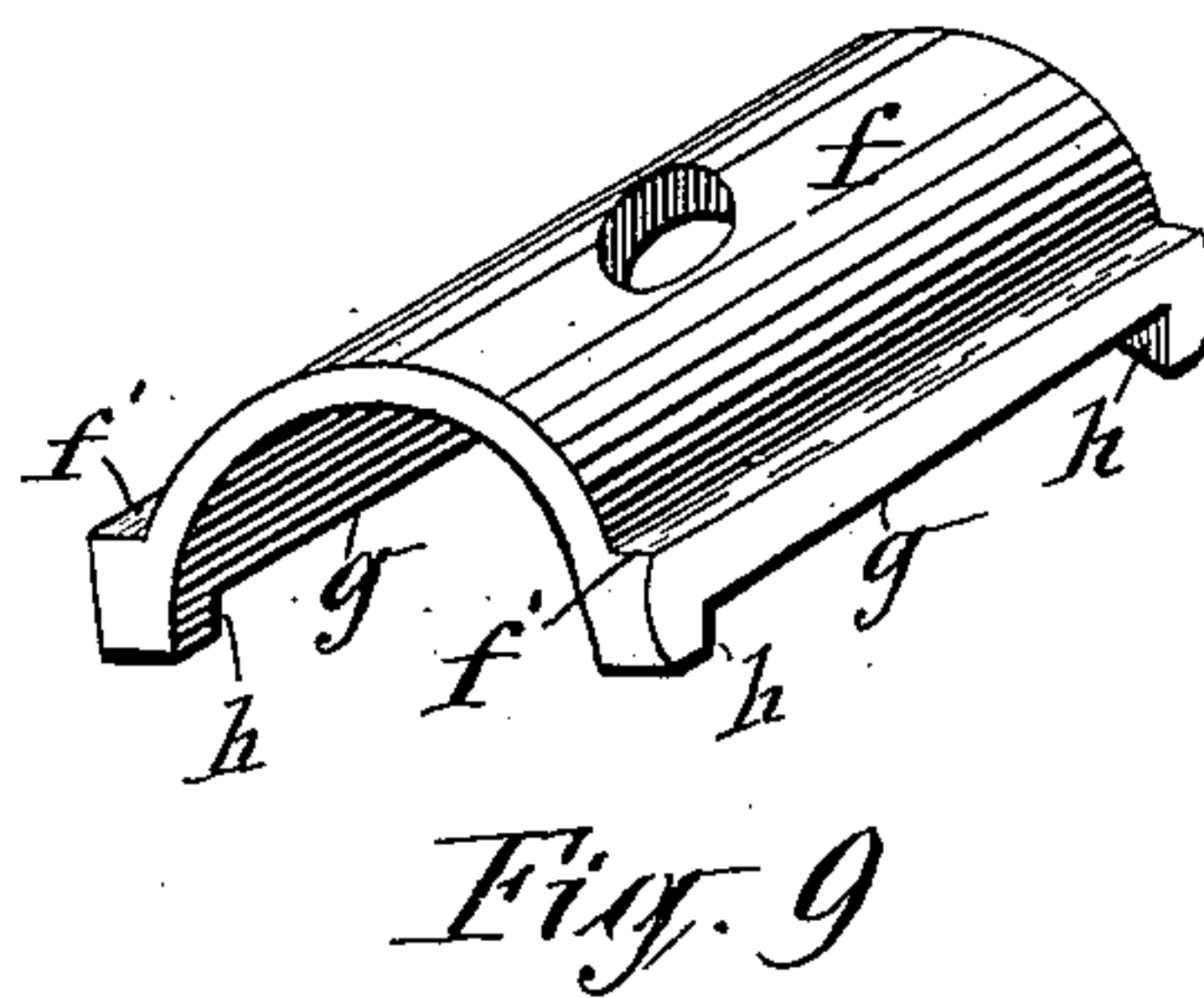


Fig. 9

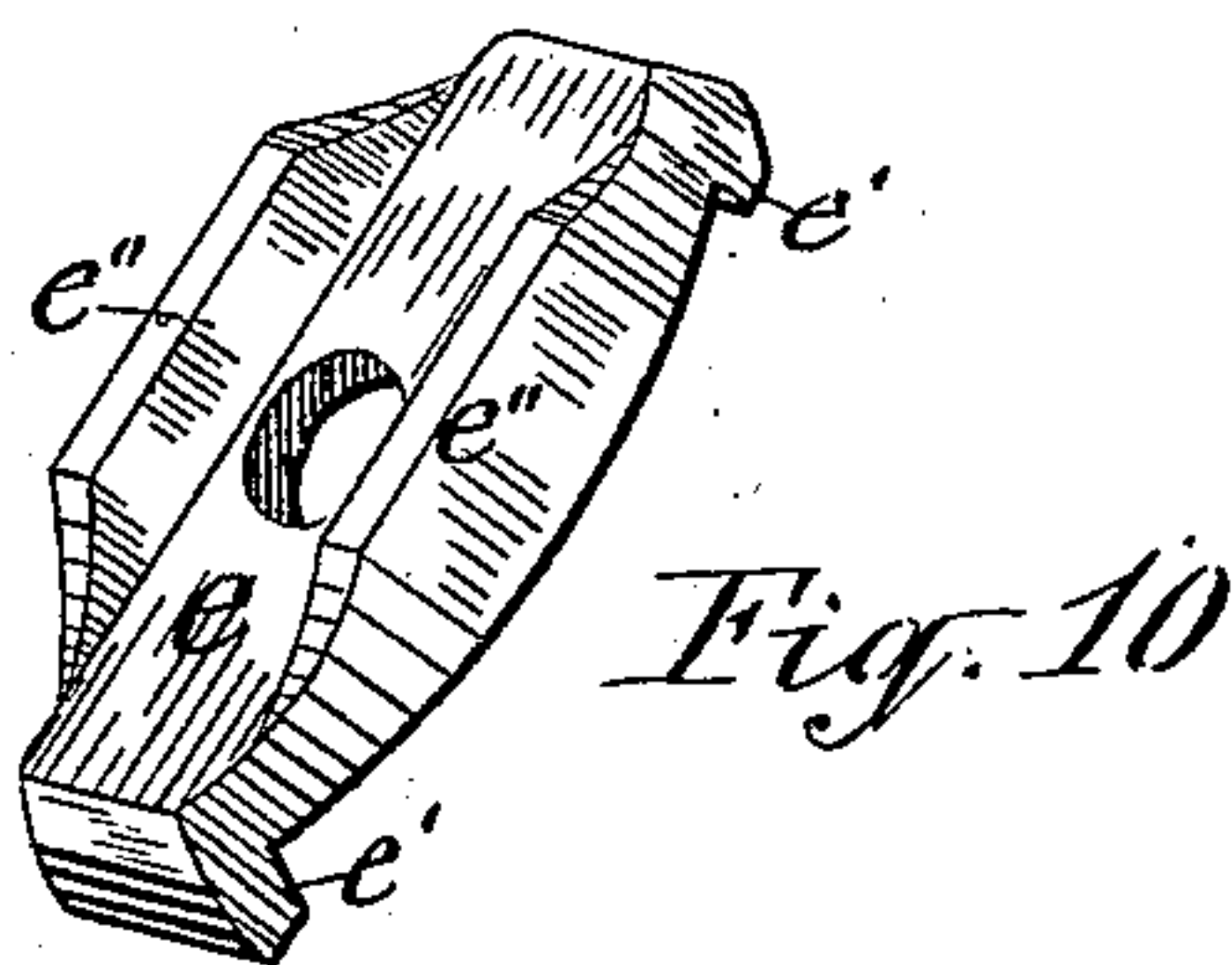


Fig. 10

WITNESSES:

A. F. Walz,
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INVENTOR:

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his ATTORNEYS

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. 9 is a detached enlarged perspective view of one of the tooth-sustaining plates, and Fig.
30 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 *b b*, which abut against the edges of the draft-bar and aid in retaining the coupling-iron in
65 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 spring-tooth *t*, and with shoulders *c' c'*, which abut against the edges of the tooth and there-
70 by prevent the said tooth from twisting on its seats. The tooth is secured to the coupling-iron by a bolt *d*, passing vertically through the draft-bar, coupling-iron, and tooth, and provided with a nut *d'*, by which
75 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 plate *f*, which I also form with longitudinal
90 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 5 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, 10 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 15 *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, 20 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. 25

3. The combination of the coupling-iron *a*, having its body portion formed concavo-convex in cross-section and with longitudinal 30 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, substan- 35 tially 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.