

(No Model.)

A. HIRSHHEIMER.

HARROW.

No. 413,230.

Patented Oct. 22, 1889.

Fig. 1.

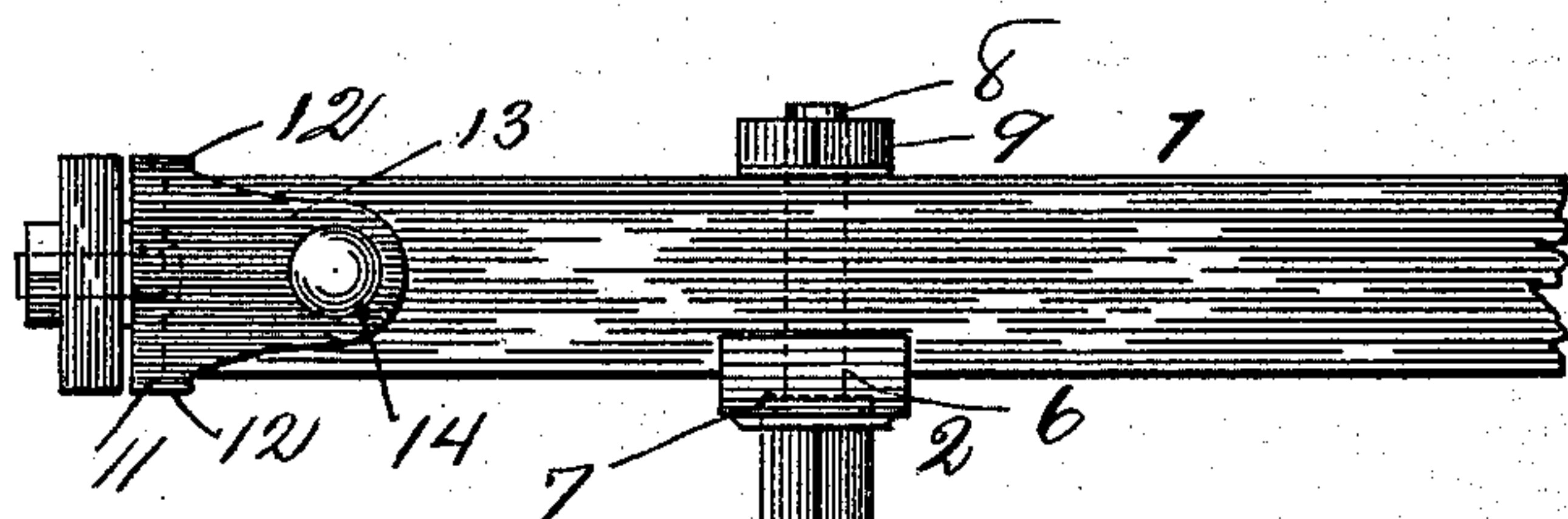


Fig. 2.

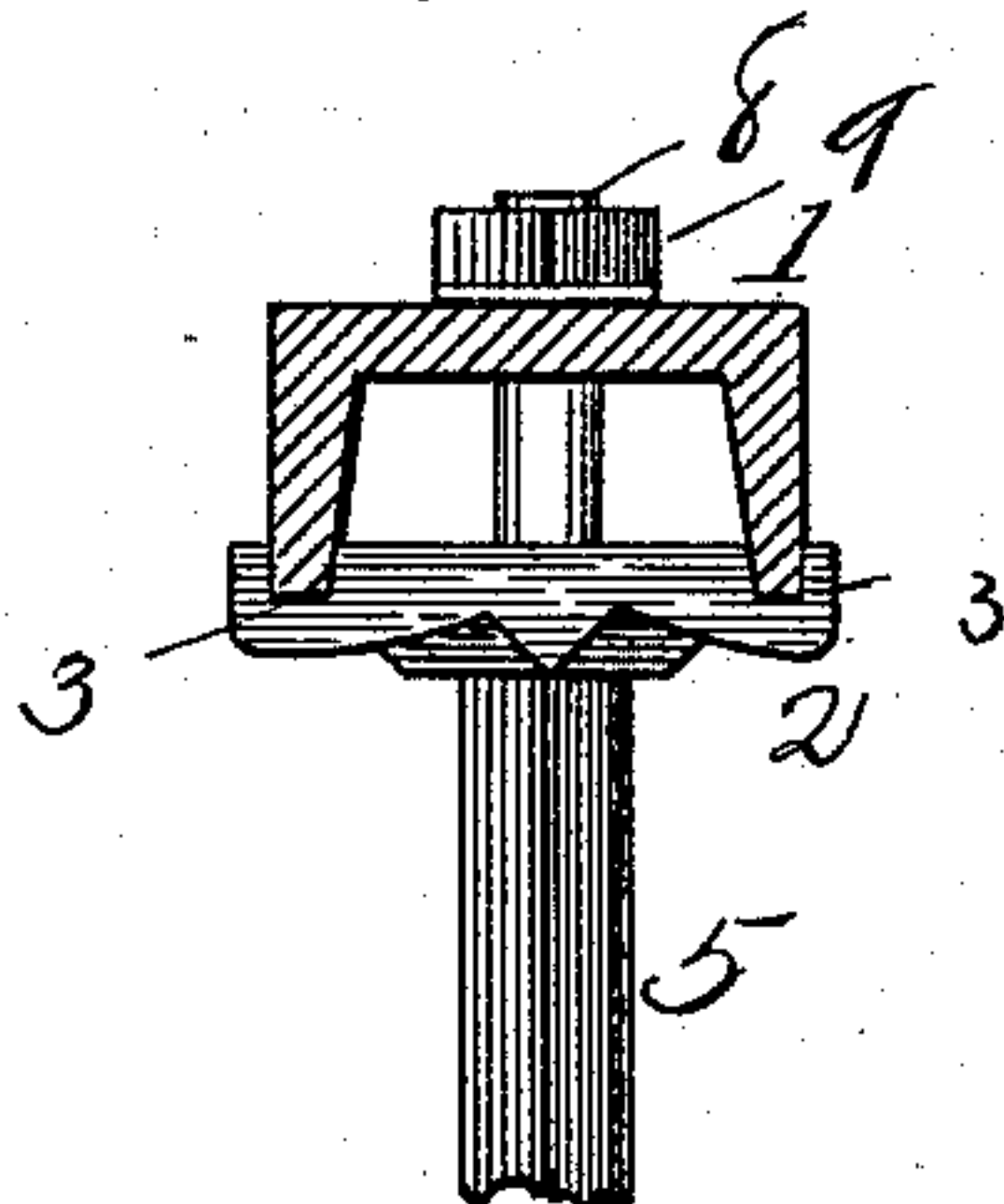


Fig. 3.

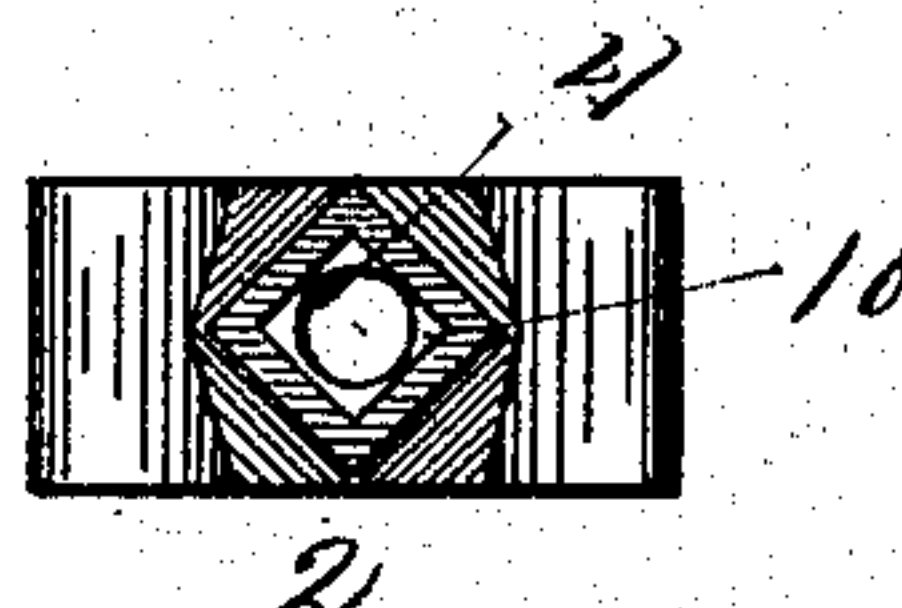


Fig. 4.

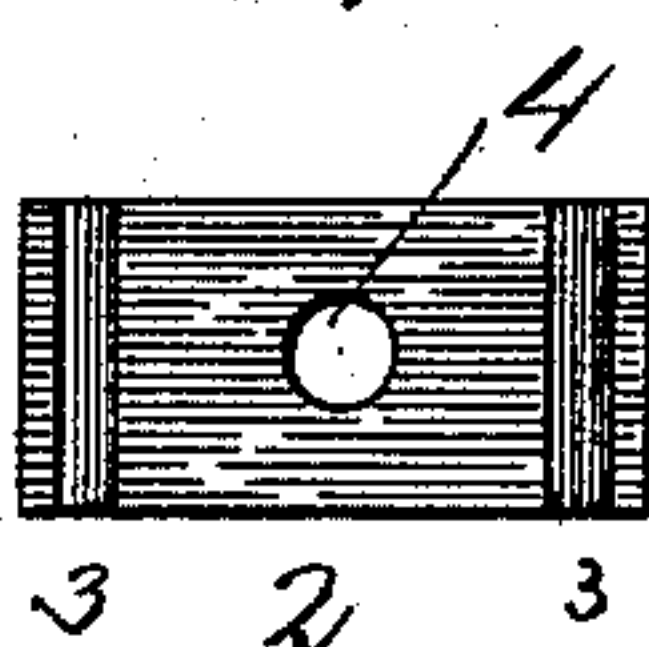


Fig. 5.

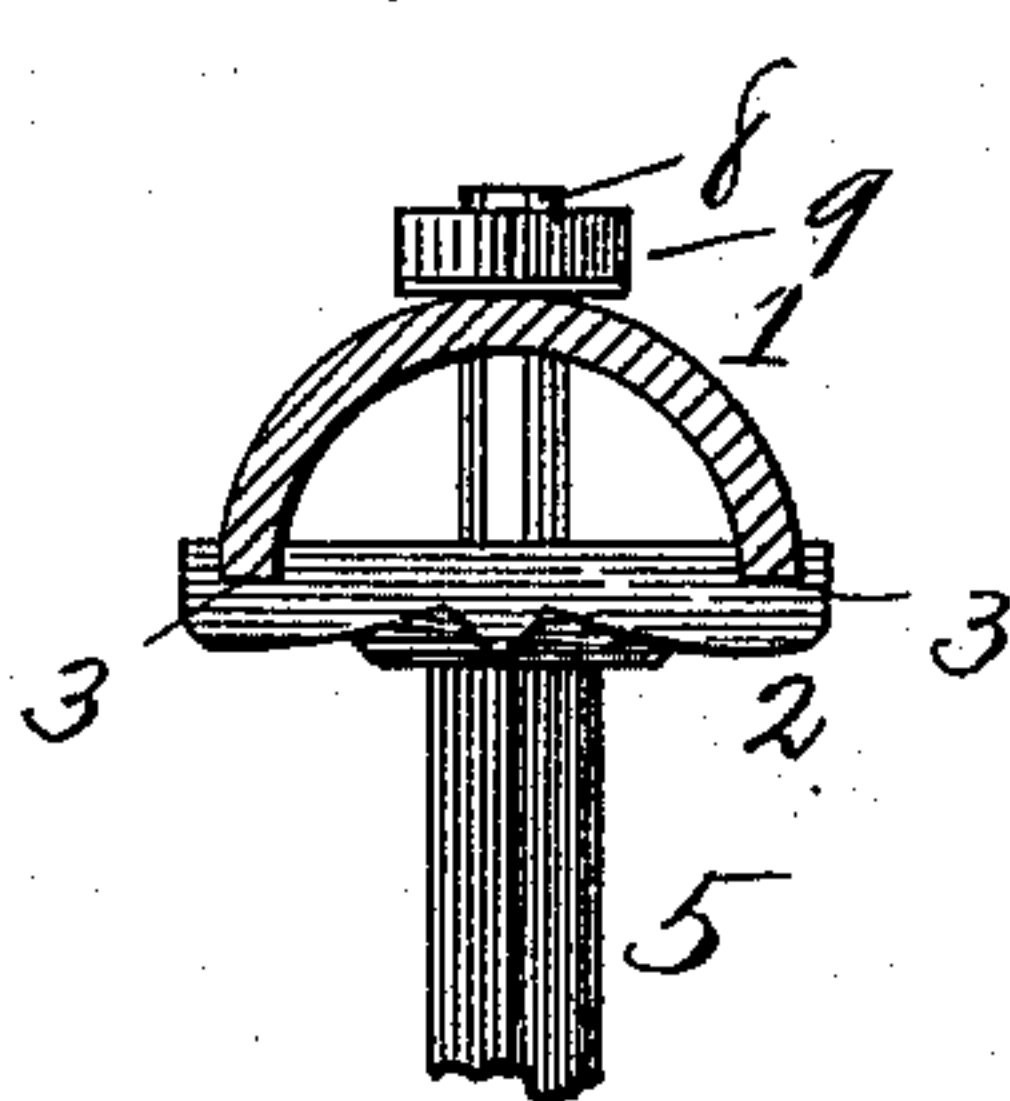
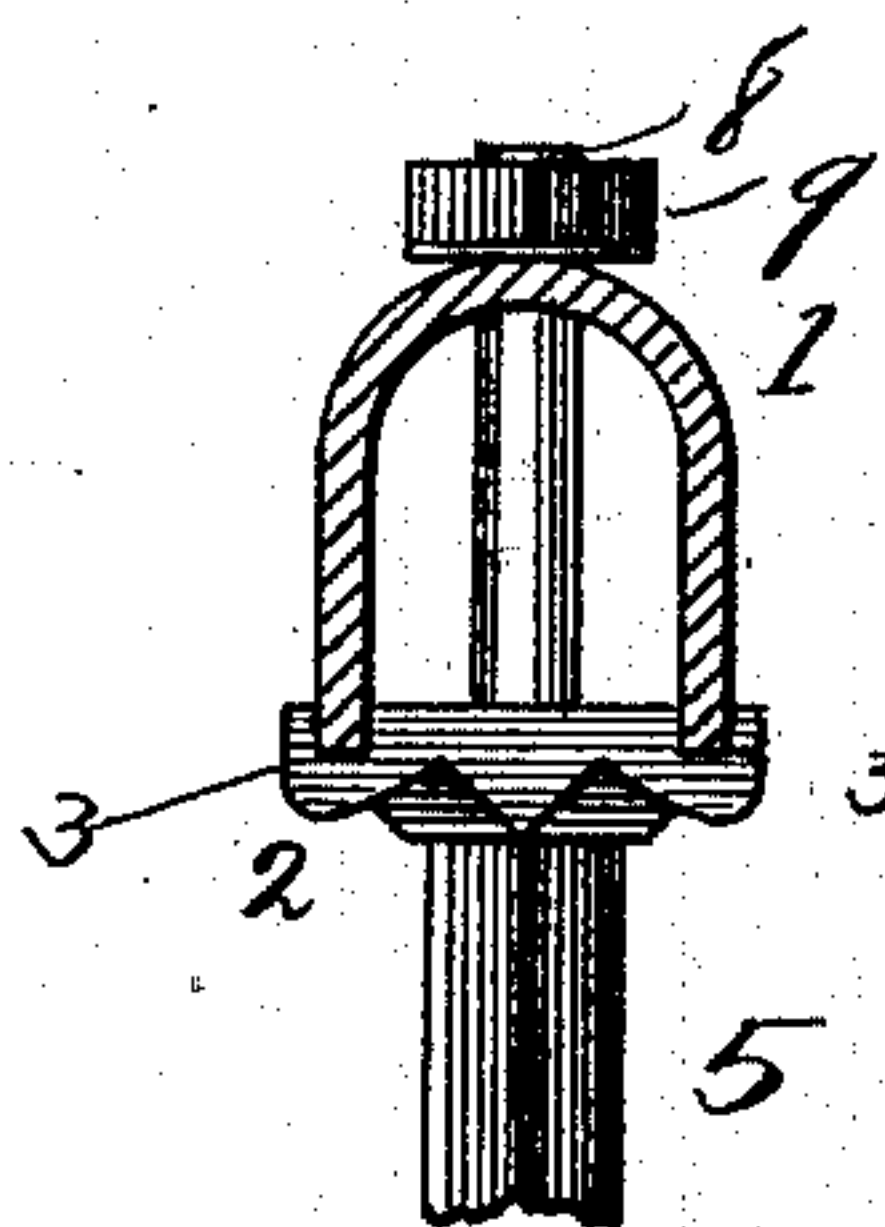


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALBERT HIRSHHEIMER, OF LA CROSSE, WISCONSIN.

HARROW.

SPECIFICATION forming part of Letters Patent No. 413,230, dated October 22, 1889.

Application filed December 18, 1888. Serial No. 294,013. (No model.)

To all whom it may concern:

Be it known that I, ALBERT HIRSHHEIMER, a citizen of the United States, residing at La Crosse, in the county of La Crosse and State of Wisconsin, 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to the manufacture of harrows; and it consists, generally, in a metal beam or tooth-bar of the form commonly known as "channel iron or steel," or of U shape or semi-tubular in cross-section, having the teeth inserted in the back of the same and supported between the open edges of the beam by means of a plate or clamp embracing the edges of the same through which the tooth passes, and held in position with reference thereto by means of a shoulder formed upon the tooth abutting against the under side of the said clamp, the tooth being drawn into place and the clamp retained by means of a screw-thread and nut formed upon the upper end of the tooth.

The invention further consists in the form of the clamp, which is provided with an angular countersink in its under side, into which the angular portion of the tooth at the shoulder is adapted to fit, the upper end of the tooth being rounded, so as to turn easily in its seat when the angular portion is released from the countersink in the clamp.

The object of the invention is to provide a beam or tooth-bar for harrows combining the qualities of strength, durability, and lightness, and to provide means whereby the teeth may be readily inserted and securely held therein and easily removed therefrom. A further advantage gained by this construction is that as one angle of the tooth becomes rounded by wear, and thus loses its cutting qualities, by simply loosening the nut at the upper end of the tooth the latter can be turned to present another angle to the line of draft, and the operation may be continued as

each corner becomes worn until each edge has been in turn so used, by which time the first angle used has become partially sharpened and may be used again.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a portion of a harrow-beam constructed in accordance with my improvements. Fig. 2 is a cross-sectional view of the same. Fig. 3 is an under side view of the clamp-plate; Fig. 4, an inner or upper side view of the same; and Figs. 5 and 6 are cross-sections showing modifications of the form of the beam.

In the drawings, 1 represents the beam or tooth-bar, constructed, preferably, of wrought or malleable iron or steel, and of semi-tubular form, U-shaped, or of the form known as "channel-iron," or of any equivalent form having two sides with two parallel edges and a connecting back or web. These forms are especially adapted to give great strength and durability, combined with small expense and lightness. In position, as forming a part of a harrow, the beam is placed, preferably, with its back or web up, though it may be used in the reverse position, and the teeth are inserted through the web and pass between the two sides. To the under side of the beam are fitted clamp-plates 2 2, consisting of a casting of malleable iron or other suitable material of a little greater length than the width of the beam, and having parallel grooves 3 3 near the ends, adapted to fit the edges of the sides of the beam, the clamp-plate thus serving as a truss or brace to the sides of the beam to prevent springing of the sides either in or out, and thus greatly increasing the strength. The object of the grooves is to form a double flange to bear upon both sides of the edge of the beam, and this portion of the plate may be constructed in any desired manner to effect this purpose. Through the center of the plate is formed a circular aperture 4 for the passage of the tooth 5, which is of ordinary or any desired form for the most part, but having the upper end rounded off, as shown at 6, forming a square shoulder 7 a little more than the vertical height of the beam from the upper end. The outer end of this rounded portion is provided with a screw-

thread 8 and nut 9, by means of which it is secured in place, the shoulder being drawn against the under side of the clamp-plate by the tightening of the nut.

5 To prevent the teeth from turning and thereby presenting a side instead of a cutting-edge toward the line of draft, an angular countersink 10 of the form of the angular portion of the tooth is formed in the under
10 side of the clamp-plate around the aperture 4, into which the shoulder 7 is adapted to fit closely when the nut 9 is tightened. This countersink may be formed with its angles in any direction relative to the sides of the
15 clamp-plate to so hold the tooth that an angle of the same shall always be presented toward the line of draft whether the beam be at right angles or any other angle thereto.

It is often desirable to change the position
20 of the teeth as the angles become worn or rounded by use and turn them so as to present a new edge toward the line of draft. By means of this invention this can be easily and quickly done by simply loosening the
25 nut 9 at the end of the tooth sufficiently to allow the shoulder 7 to be disengaged from the countersink 10 on the under side of the clamp-plate, when the tooth may be turned as desired, engaged again with the counter-
30 sink, and the nut tightened. This may be done until each angle has been in turn presented toward the line of draft, when the first, by the wear in the opposite direction, will have become sufficiently sharpened for use a
35 second time. It is calculated, therefore, that the wearing qualities of the teeth, and consequently the life of the harrow, will be largely increased, while the position of the teeth may be changed as often as may be de-
40 sired or new teeth inserted without the least wear or injury to the beam. The beams may be attached to the side bars in any approved manner—as, for instance, the method of fast-
45 ening shown and described in Letters Patent granted to me October 27, 1885, No. 329,040, (harrows;) but I prefer to use the construction shown in the drawings, which consists of a cap 11, adapted to fit over the end of the
50 tooth-bar and having a narrow flange 12 at the upper and under side of the same to fit closely against the top and bottom of the bar. Upon the sides the flanges are lengthened and extend far enough along the sides of the beam, as shown at 13 13, to allow of a bolt
55 passing through the same and the beam to hold the cap in place. In the center of the end of the cap is an aperture through which passes a bolt or rivet 14, by means of which it is mounted in the side bar and upon which
60 as a pivot the beam turns. The beam may thus be turned on its center, instead of eccentrically, as is the usual method of mounting, and by means of lever and bar connections the teeth may be set at any desired angle or
65 pitch. By hanging the tooth-bars upon the center a better control of the bars is obtained—that is, the bar can be thrown farther

forward by the same movement of the lever when used in a lever-harrow, and the tooth-bars can be folded so as to lie wholly within
70 the side bars, which cannot be done if the tooth-bars are hung outside the center.

The clamp-plate may be used with a beam of any form or material, as in the form of a flanged plate having suitable aperture and
75 countersink, and thus used in connection with an ordinary wooden beam, the object being to retain the tooth firmly in place when the nut is tightened and to allow of the same being turned or removed by simply loosening
80 the nut without injury to the beam.

I claim as my invention—

1. In a harrow, a tooth-bar of channel or equivalent form having two sides with parallel edges and connecting back, and a clamp-plate
85 adapted to embrace the outside of said edges to prevent the same from spreading, in combination with a tooth passing through said plate and the back of said bar and means, substantially as described, for securing the
90 same therein, as and for the purpose specified.

2. In a harrow, a tooth-bar of channel or equivalent form having two sides with parallel edges and a connecting back, and a clamp-plate having flanges adapted to abut against
95 the inside of said parallel sides and rest against said edges, in combination with a tooth passing through said plate and the back of said bar and means, substantially as specified, for securing the same therein, as and for
100 the purpose set forth.

3. In a harrow, a tooth-bar of channel or other equivalent form having two sides with parallel edges and a connecting back, and a clamp or truss plate having grooves adapted
105 to receive said edges, in combination with a tooth passing through said plate and the back of said bar and means substantially as described, for retaining the said tooth and plate removably in position, as and for the purpose
110 set forth.

4. In a harrow, a tooth-bar of channel or other equivalent form having two sides with parallel edges and connecting back, a clamp or truss plate adapted to embrace said par-
115 allel edges, and a tooth having its upper end adapted to pass through said plate and back, having a shoulder adapted to abut against the under side of said plate, and a screw-thread and nut at the upper end of said tooth
120 outside of said back, substantially as and for the purpose specified.

5. In combination, in a harrow, a tooth-bar of channel or other equivalent form having two sides with parallel edges and connecting
125 back, a clamp or truss plate adapted to embrace said parallel edges, said plate and back having a circular aperture therein for the insertion of the tooth, and said plate having an angular countersink on its under side around
130 said aperture, and a tooth having an upper cylindrical portion adapted to pass through said apertures, a lower angular portion terminating in a shoulder adapted to fit said

countersink, and a screw-thread and nut at said cylindrical end, substantially as and for the purpose herein specified.

6. The combination, with a tooth-bar of a
5 harrow, of a flanged clamp-plate fitting the bottom and sides thereof, said tooth-bar and clamp-plate being provided with a circular aperture therethrough, and the said clamp-plate having an angular countersink around
10 said aperture on the under side thereof, and a tooth having an upper cylindrical portion adapted to fit said apertures and a lower an-

gular portion terminating in a shoulder adapted to fit said countersink, and a screw-thread and nut on said upper portion, sub- 15
stantially as and for the purpose herein specified.

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

ALBERT HIRSHHEIMER.

Witnesses:

HARRY MARSH,
F. W. LANE.