(No Model.)

J. D. TRACY.

HARROW.

No. 263,368. Patented Aug. 29, 1882.

Fig. 1.

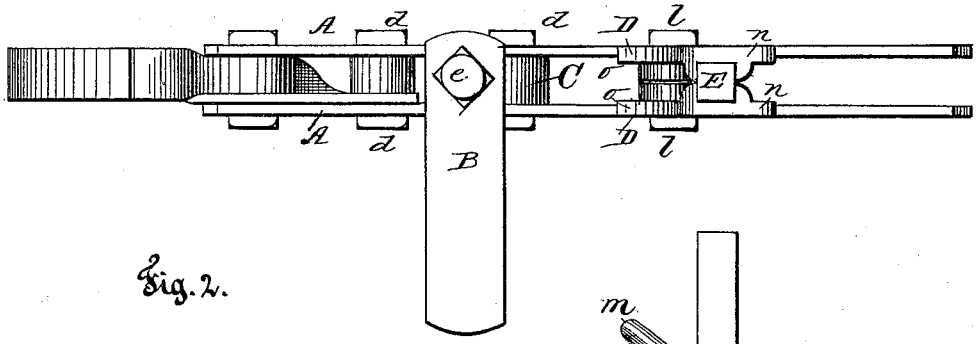


Fig. 2.

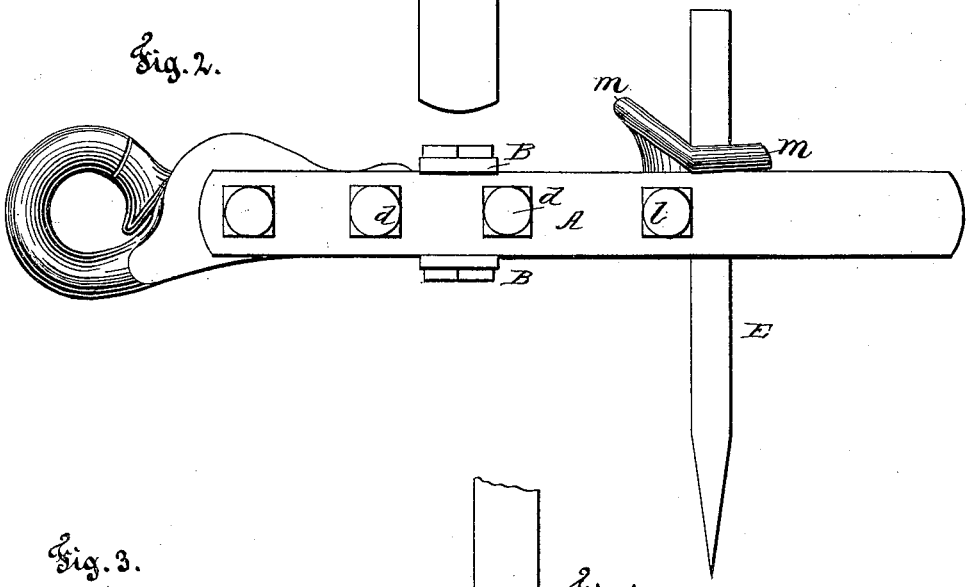


Fig. 3.

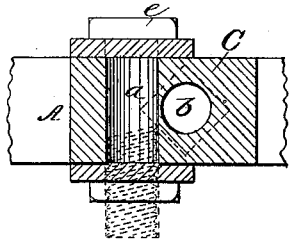
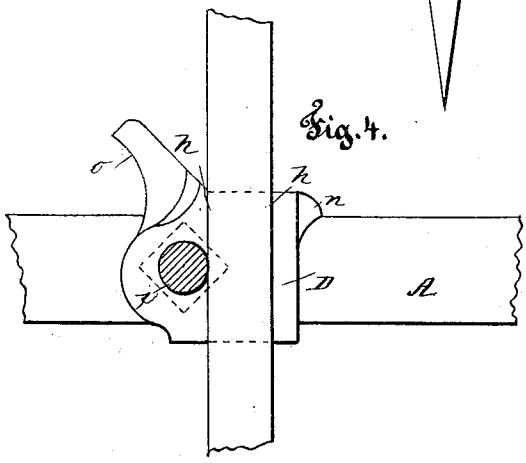


Fig. 4.



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HARROW.

SPECIFICATION forming part of Letters Patent No. 263,368, dated August 29, 1882.

Application filed June 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. TRACY, a citizen of the United States, residing at Sterling, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Harrows; and I do hereby 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 letters or figures of reference marked thereon, which form a part of this specification.

My invention has reference to certain improvements in harrows, and pertains to a mode of applying the truss principle to iron harrows, whereby the maximum of strength is obtained from a given weight of iron; to the improved mode of bracing and connecting the several parts, and to a novel and useful device for seating the harrow-tooth, by means of which the latter will automatically assume a perpendicular or oblique position as the harrow may be drawn from one or the other end.

In the drawings, Figure 1 is a top view of part of a section of a harrow embodying my invention. Fig. 2 is a side view of the same. Fig. 3 represents the head-block. Fig. 4 is a detached view of the clamps which hold the teeth.

A A are parallel iron bars, of about an inch in width and one-fourth inch in thickness, placed edgewise, and which constitute the harrow-beam. As my invention, in part, has reference to using such bars in pairs with an interval between them, I would here state that such construction, like that of a hollow pillar, gives the greatest strength in proportion to the amount of metal involved.

B B are cross-braces, made of iron, substantially the same in size as the bars A; but as the strain on the braces B is chiefly in a horizontal plane such braces are placed with their greatest diameter in that direction. The braces B also are used in pairs and parallel, one of each pair passing over and one under the bars A. At the points of intersection of the bars A and braces B, I interpose the square-sided head-block C, in which are formed the holes *a* and *b*, such holes being adjacent but perpendicular to each other.

The junction of the bars A and braces B at each intersection is formed by inserting, as aforesaid, between the four walls formed by crossing the braces B over and under the bars A, the head-block C, and passing the bolt *d* horizontally and laterally through the bars A A and the hole *a* in the head-block C, and passing the bolt *e* vertically through the braces B B and the hole *b* in head-block C.

D D are iron clamps, having on their inner faces the groove *h*, fitted respectively to receive the sides of the harrow-tooth E. In front of the groove *h* is formed, through both clamps D, the horizontal hole *i*. The tooth E is placed between the clamps D, extending into the grooves *h* therein. A bolt, *l*, is passed horizontally through the braces B and the hole *i* in the clamps D and tightened by means of a nut. The clamps D serve not only to hold the tooth E, but, with the tooth, serve also as a filling for the bars A to receive the strain on the bolt *l*. On the outer upper edges of the clamps D are formed the flanges *m m*. The front upper edges of the clamps D are extended upward, so as to permit the flanges *m m* to have two divisions, *n* and *o*, forming an obtuse angle with each other. The flanges *m* rest on the upper edge of the bars A and support and give position to the tooth E. The bolt *l* forms a pivot upon which the clamps D and tooth E rock. When the part *n* of the flanges *m*, which is at right angles with the tooth E, rests on the bars A, such tooth is in a perpendicular position. When the part *o* of such flanges rests on the bars A the teeth stand obliquely to the rear. The purpose of dividing the flanges *m* into the divisions *n* and *o* is to provide in one implement a stirring and a smoothing harrow.

Hooks for attaching the team are placed at both ends of the harrow. All of the teeth are inserted with the flanges *m* in the same position. When the draft is from one end of the harrow the points of the teeth E catch into the ground, and acting as a lever on the pivot-bolt *l* the clamps D are rocked over onto the division *n* of the flange *m* and the tooth is held in a perpendicular position. When the draft is applied at the opposite end of the harrow the clamps D are in like manner rocked onto the division *o* of the flanges *m* and the lower ends of all of the teeth point obliquely to the

rear. Thus the harrow is converted automatically from a smoothing to a stirring harrow, and vice versa, by merely changing the draft from one end to the other. The uses and advantages of both styles of harrow are too well known to require special mention.

Iron is being used, and is preferable, for all implements which are exposed to the vicissitudes of wet and dry. The truss form of bars and braces, by which each bar serves in turn to resist compression and tension, must be adopted if iron is to supersede wood in the construction of harrows.

In my invention I believe is presented the simplest, cheapest form of truss-harrow. All the joints and attachments are by means of holes and nutted bolts, so that the implement is readily taken apart or put together and defective or broken parts supplied.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In combination with bars A and braces B, the bolts *d*, the bolts *e*, and the head-block C, provided with the holes *a* and *b*, perpendicular to each other, substantially as shown, and for the purpose specified.

2. In a harrow, the clamps D, having the flanges *m*, such flanges being formed in divisions *n* and *o* in angular relation to each other, so as to furnish separate bearings for such clamps and hold the tooth E in different positions, substantially as shown, and for the purpose described.

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

JOHN D. TRACY.

Witnesses:

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