(Model.)

J. MAUNDER.

HARROW.

No. 262,448. Patented Aug. 8, 1882.

Fig. 1.

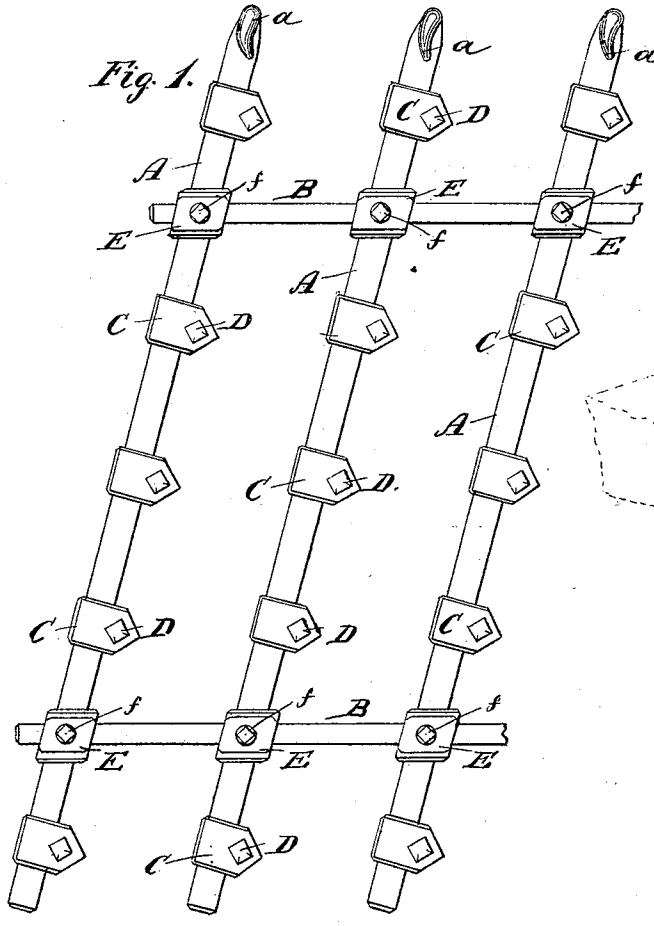


Fig. 4.

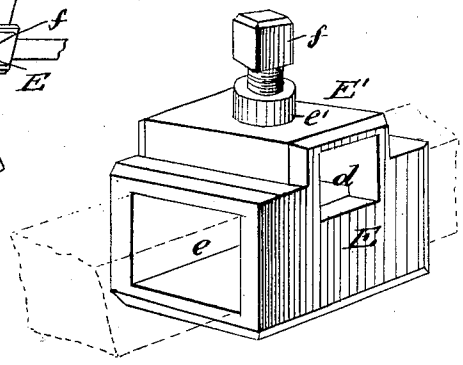


Fig. 3.

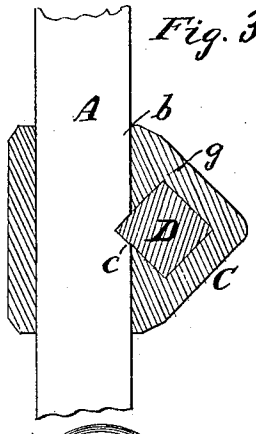
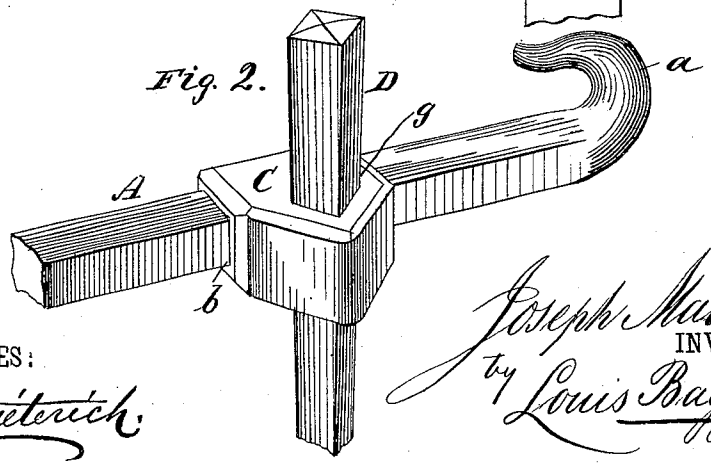


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH MAUNDER, OF LITTLE BRITAIN, ONTARIO, CANADA.

HARROW.

SPECIFICATION forming part of Letters Patent No. 262,448, dated August 8, 1882.

Application filed June 20, 1882. (Model.) Patented in Canada November 17, 1881, No. 13,712, and February 15, 1882, No. 14,184.

To all whom it may concern:

Be it known that I, JOSEPH MAUNDER, of Little Britain, in the province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Harrows; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to harrows, and the novelty consists in the manner and means for securing the braces, tooth-bars, and teeth together, as will be more fully hereinafter set forth, and specifically pointed out in the claim.

The object of the invention is to provide a simple and efficient harrow-tooth clip, said clip being adapted to secure the beams and teeth together, and the whole to comprise a device useful in service, easy of manufacture, and ready of adjustment.

To these ends the invention consists essentially in a clip formed of malleable iron or any suitable material, and being provided with apertures which receive the beams of the harrow and the tapering harrow-teeth in different directions in such a manner that when the teeth are driven home the beam, clip, and tooth are firmly locked together.

The invention is fully represented in the accompanying illustrations, in which Figure 1 is a top plan view of a section of the harrow. Fig. 2 is an enlarged perspective view of one end of one of the tooth-bars, with one of the teeth and its clip. Fig. 3 is a sectional view of the tooth-clip, illustrating one of the teeth locked in place upon the tooth-bar; and Fig. 4 is a perspective view of the brace-clip.

Referring to the drawings, in which similar letters of reference indicate like parts in all the figures, A A denote the tooth-bars, which are connected by parallel braces or cross-bars B B, and of which there may be three or more in each harrow-section. Each tooth-bar has a hook, *a*, at one end for its attachment to the draft-beam, and a series of equidistant triangular notches, *c*, adapted to receive and interlock with the vertical teeth D. These teeth, which are tapering from top to bottom, and square in cross-section, are fastened upon and interlock with the notched tooth-bars A by means of the tooth-clips C, which have longitudinal slots or apertures *b* for the insertion of the tooth-bar A, and vertical square slots or apertures *g* for the insertion of the teeth D. The slots or apertures *b* and *g*, crossing each other at right angles, open up into or communicate with each other at their point of intersection, so that when the tooth-bar is inserted through its horizontal aperture *b* and the point of intersection of the slots *b* and *g* brought to register with the triangular notch *c* in the tooth-bar the square tooth D, when inserted, will project with one of its corners into the notch *c*, thus interlocking clip C with the tooth-bar, while, on the other hand, the clip fastens the tooth firmly but removably in its appropriate place upon the tooth-bar.

The parallel brace-bars B are connected obliquely to the parallel tooth-bars A by means of the clip. (Shown more clearly in Fig. 4 of the drawing.) This consists of a box, E, having a head or raised part, E′, provided with a screw-threaded sleeve, *e′*, through which works a set-screw, *f*. The clip-box E E has two rectangular apertures or slots, *d* and *e*, opening up into each other and intersecting each other horizontally at right angles. The tooth-bars A are inserted through the apertures *e*, while the brace-bars B are inserted through the upper apertures, *d*, so as to rest upon or bear against the tooth-bars, against the top of which they are clamped by the set-screw *f*. It follows that the distance between the tooth-bars may be regulated at will by loosening the set or binding screw *f* and adjusting the position of the clips E E′ upon the brace-bars.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In a harrow, the tooth-clips C, having the horizontal apertures *b* and vertical apertures *g* intersecting each other, in combination with the tooth-beams A, having triangular notches *c* and removable tapering teeth D, substantially as and for the purpose herein shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

JOSEPH MAUNDER.

Witnesses:

JOHN KELLY,

WILLIAM MORGAN.