(No Model.)

J. MAUNDER.

HARROW.

No. 323,705. Patented Aug. 4, 1885.

Fig. 1.

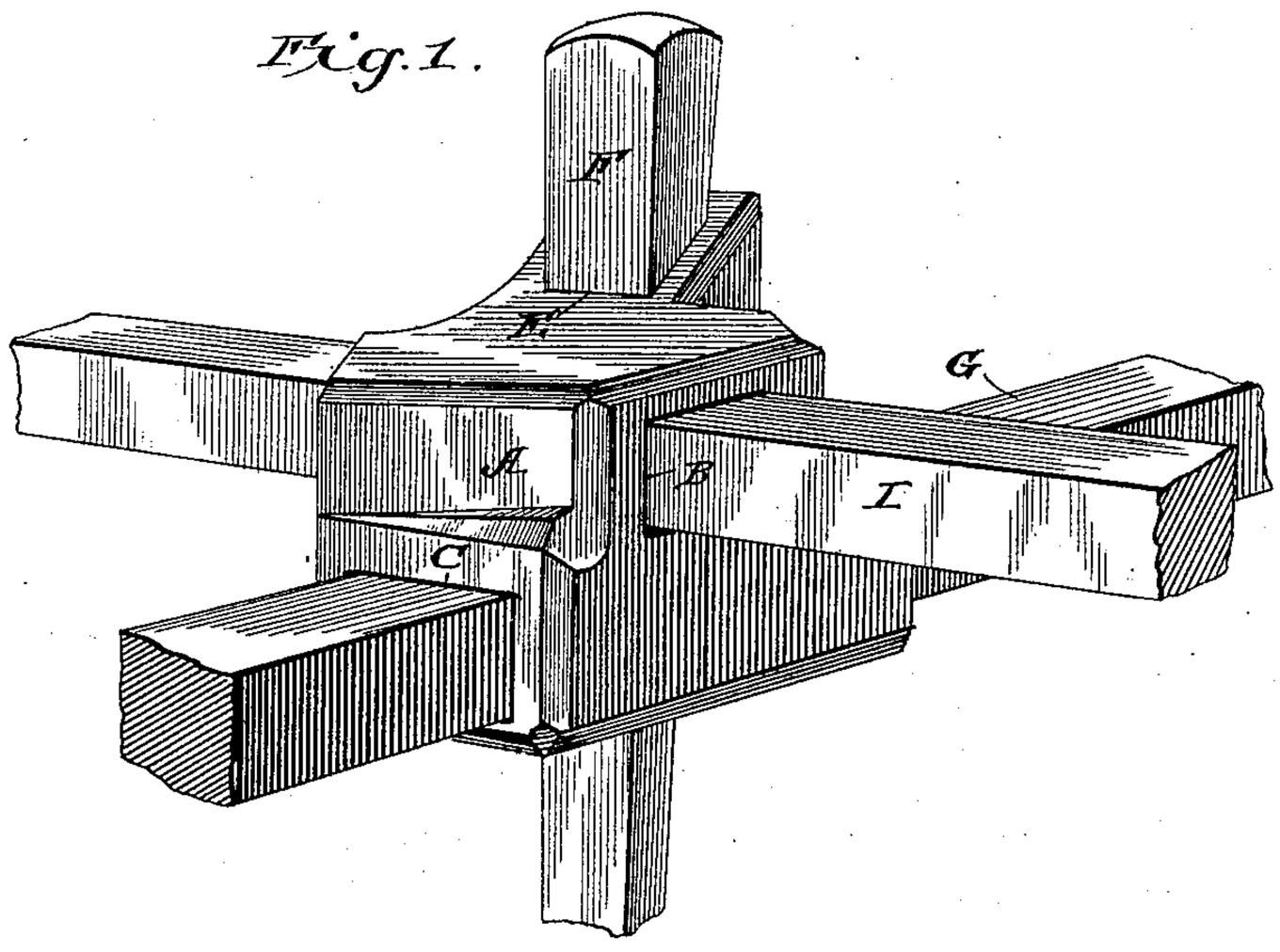


Fig. 2.

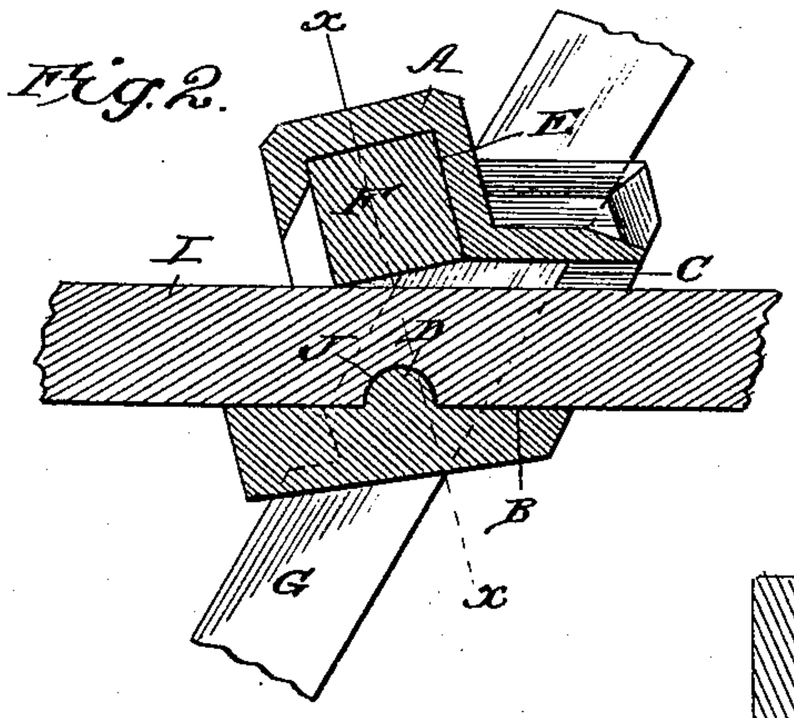


Fig. 3.

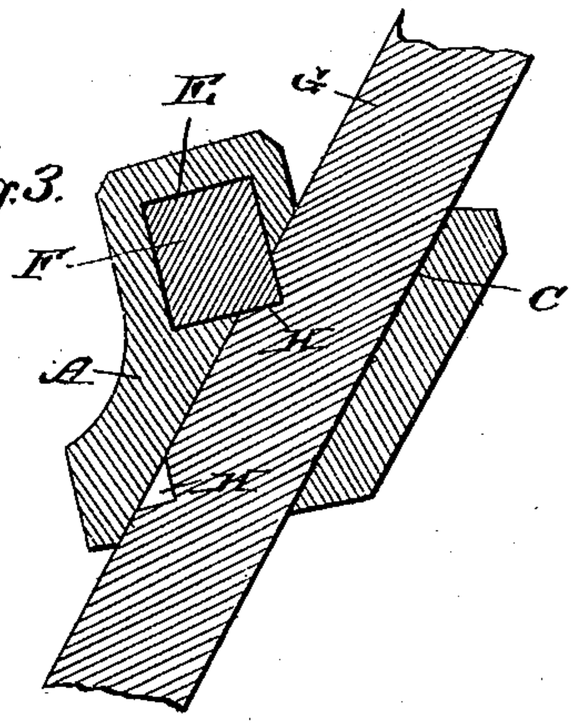
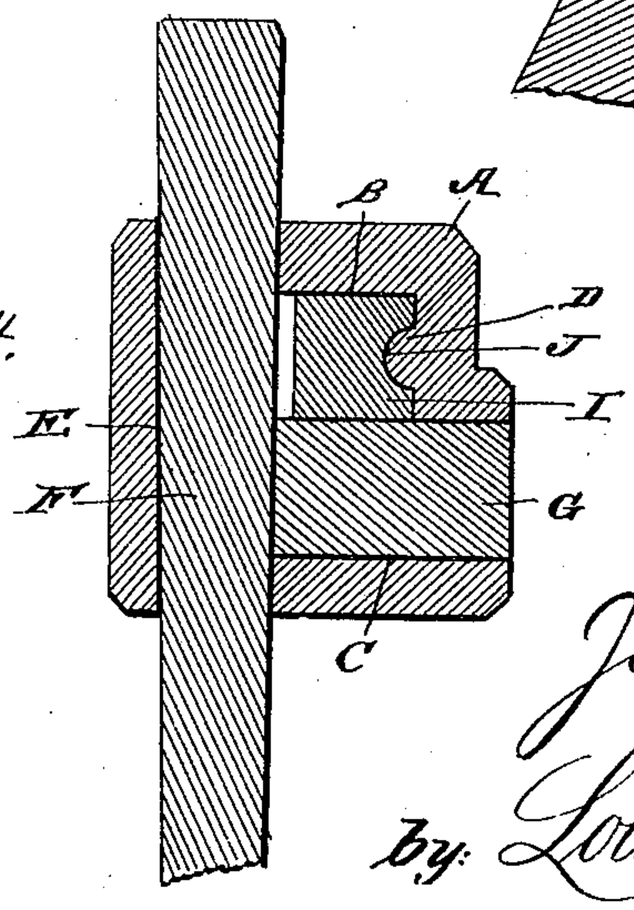


Fig. 4.



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HARROW.

SPECIFICATION forming part of Letters Patent No. 323,705, dated August 4, 1885.

Application filed April 8, 1885. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MAUNDER, a subject of the Queen of Great Britain, and a resident 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, 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, which form a part of this specification, and in which—

Figure 1 is a perspective view showing a portion of a harrow-frame, the main and cross bars and teeth of which are connected by my improved clip or fastening device. Fig. 2 is a horizontal sectional view taken through the cross-bar of the harrow-frame. Fig. 3 is a horizontal sectional view taken through the main bar of the frame, and Fig. 4 is a vertical sectional view taken on the line *x x* in Fig. 2.

The same letters refer to the same parts in all the figures.

This invention relates to harrows, and more particularly to that class of harrows in which the frame is made of iron; and it has for its object to provide a clip or clamp for connecting the main bars and the cross-bars of the frame and the harrow-teeth, which shall possess superior advantages in point of simplicity, durability, and general efficiency, and in which the several parts shall be securely locked together by the insertion of the tooth.

With these ends in view the invention consists in the improved construction, combination, and arrangement of parts, which will be hereinafter fully described, and particularly pointed out in the claim.

In the drawings hereto annexed, A designates the clip or clamp, which may be constructed of cast-iron or other suitable material, and which is provided with two horizontal openings or passages, B and C, arranged one above the other, as shown, and intersecting each other at an angle which is equal to the angle at which it is desired that the main bars and the cross-bars of the harrow-frame shall be placed to each other. The back wall of the upper passage, B, is provided on its inner side with a lug or stud, D. The walls of the lower passage, C, are smooth and straight.

The passages B and C are intersected by a vertical opening, E, which is made slightly tapering, as shown, being somewhat wider at the top than at the bottom for the reception of the tooth F, which is made tapering, as shown, so as to fit in the said socket.

G is one of the main bars of the harrow-frame, one of the edges or sides of which is provided with vertical triangular notches or recesses H H. I designates one of the cross-bars, which is provided with recesses or indentations J, adapted to register with the stud or lug D of the clamp or fastener.

The operation of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The main bars and the cross bars of the harrow-frame are assembled by passing them through the openings C and B in the fastening-clamps, each of which is so arranged as to cause the opening or socket E to register with one of the notches H in the main bar, while the lug D shall enter the recess J, provided for its reception in the cross-bar. The tooth F is then driven into its socket, thereby binding the several parts securely in position, and connecting the harrow-frame bars.

By this invention the cost of manufacturing the harrow is reduced. It may be easily knocked down for shipment. Its parts may be easily and quickly assembled or put together. Any of the parts may be easily replaced in case of breakage or injury without skilled labor, and the device is strong and durable, none of the parts being weakened by holes for the reception of bolts or rivets or other like fastenings.

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

A connecting clamp or fastening for harrow beams and teeth, consisting of a clip or clamp having two horizontal openings or passages arranged one above and at an angle to the other, the upper passage being provided with an inwardly-extending lug, and a verti-

cal tapering socket or opening intersecting the said openings or passages, in combination with the main harrow-beam having vertical triangular notches or recesses, the cross-bar having recesses or indentations, and the tapering harrow-tooth, all arranged and operating substantially as and for the purpose herein shown and specified.

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

JOSEPH MAUNDER.

Witnesses:
ISAAC FINLEY,
JOHN KELLEY.