H. I. LUND.

HARROW.

No. 191,604. Patented June 5, 1877.

Fig. 1.

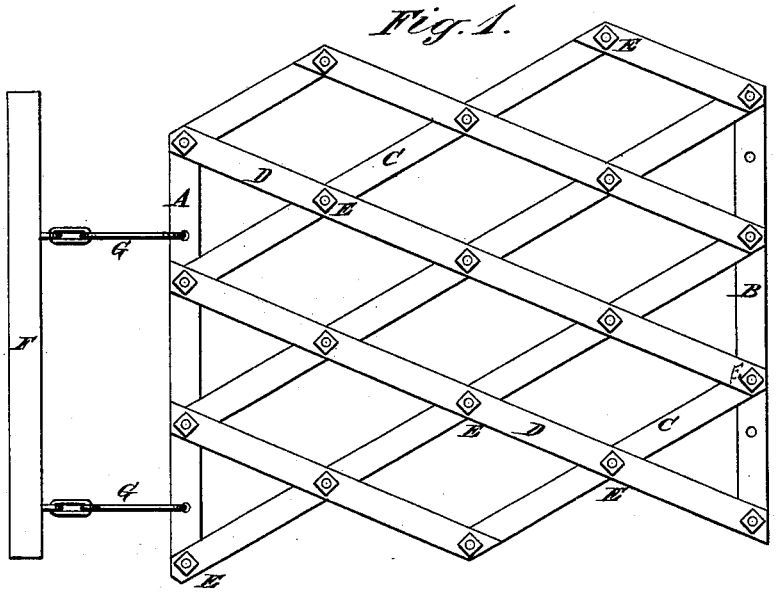


Fig. 3

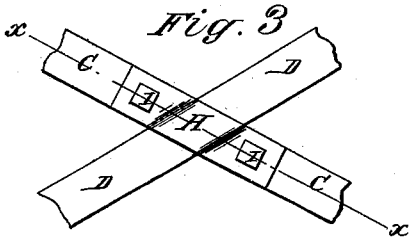


Fig. 4.

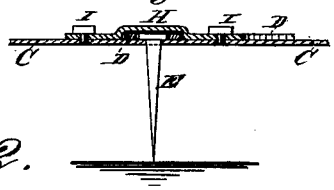
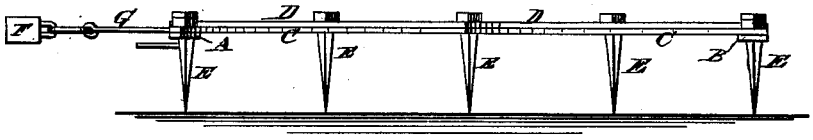


Fig. 2.



WITNESSES:

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HANS IVER LUND, OF CHARLOTTE, IOWA.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **191,604**, dated June 5, 1877; application filed April 16, 1877.

To all whom it may concern:

Be it known that I, HANS I. LUND, of Charlotte, in the county of Clinton and State of Iowa, have invented a new and useful Improvement in Harrows, of which the following is a specification:

Figure 1 is a top view of a section of my improved harrow. Fig. 2 is a side view of the same. Fig. 3 is a top view of a portion of the harrow-frame, showing a modification. Fig. 4 is a detail section taken through the line *x x*, Fig. 3.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved iron harrow, which shall be simple in construction, light, strong, and durable, of less draft than an ordinary harrow, of less size, inexpensive in manufacture, and effective in operation, breaking up the lumps thoroughly, and stirring up the soil evenly.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

The harrow is designed to be made in three sections, all exactly alike, one, two or three of which may be used at a time, and one of which is shown in the drawings.

A and B are the front and rear bars of the harrow, which are parallel with each other, and at right angles with the line of draft. The bars A B are connected to each other by bars C D, which are inclined and cross each other at acute angles, forming diamond-shaped spaces between them. E are the teeth, which are inserted at the points where the bars C D cross each other, and where they meet the bars A B. The teeth E are made with a shoulder, which rests against the under side of the bars, and with screw-threads upon their upper ends to receive the nuts by which they are secured to the bars and the bars are clamped together.

If desired, the teeth E may have heads formed upon them, may be passed through the bars C D at their points of intersection, and secured in place by a clamping-bar, H, placed upon their heads, made with shoulders to fit against the edges of the bars D, and secured to the bars C by two bolts, as shown in Figs. 3 and 4. The bars C D are placed at such an angle that the paths of the teeth E may be equally distant from each other, and that no two teeth may travel in the same path. The teeth E are made square, and are set with a corner forward, so that they may more readily cut the soil. Each of the bars A B has two holes formed in it for the attachment of the draft, so that when the teeth E become worn upon one side the draft may be attached to the other bar, and the other side of the teeth used. By this arrangement, also, clods will be passed back from one tooth to another, and will be thoroughly broken up before they can escape.

F is the draw-bar, which is made so long that all the sections used may be attached to it side by side. The draw-bar F is connected with each section by two short chains or rods, G, so that the said sections may be drawn forward squarely, and may be kept from swinging around so as to bring two teeth into the same path.

Having thus described my invention, I I claim as new and desire to secure by Letters Patent—

In a harrow, the combination of bars C D and teeth E with bars H, which bear upon the heads of the teeth, and bind together the crossed bars of the frame, substantially as shown and described.

HANS IVER LUND.

Witnesses:
H. MUGER,
MAURICE TESTER.