

(No Model.)

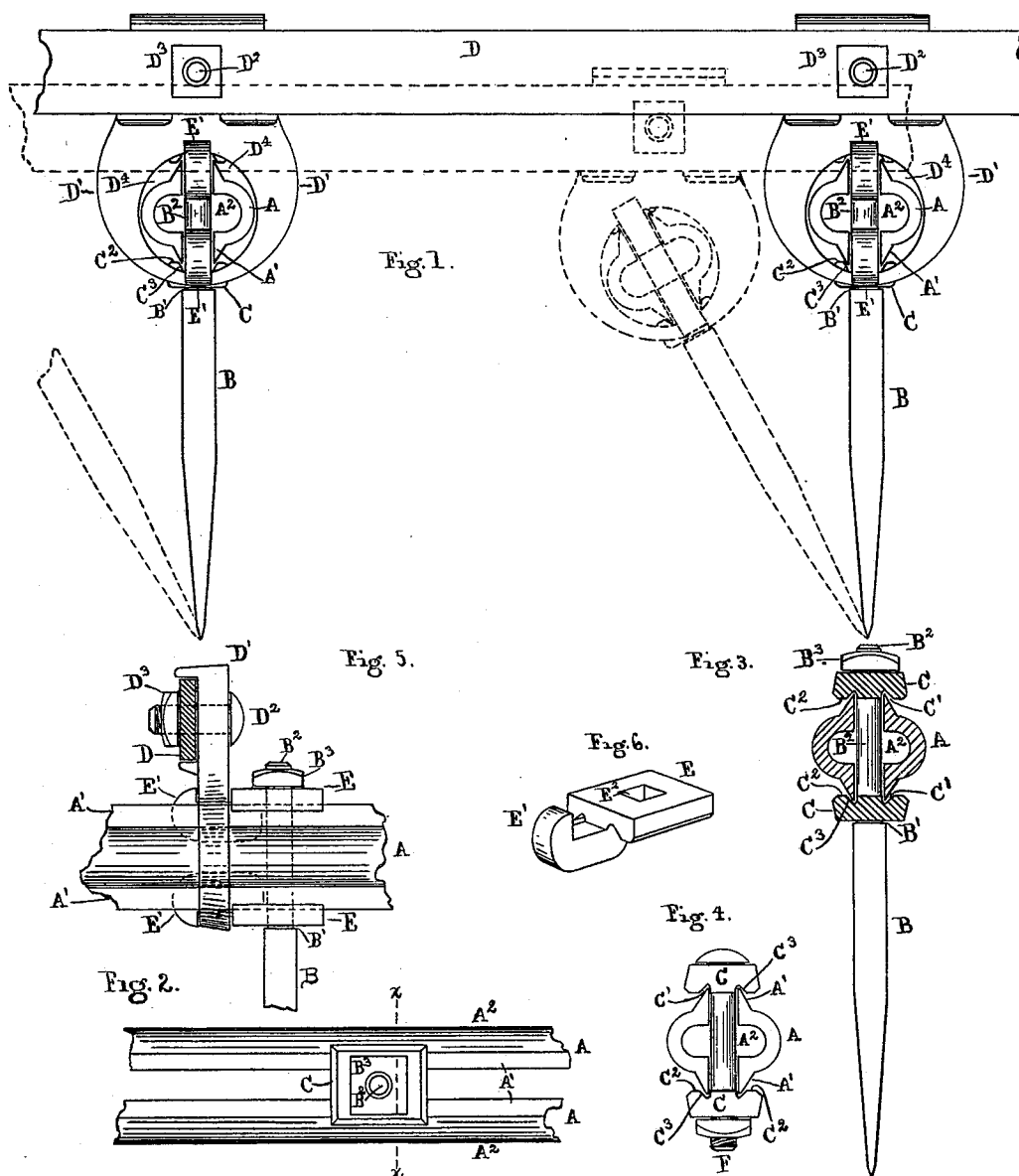
2 Sheets—Sheet 1.

J. MACPHAIL & F. M. NEEDHAM.

HARROW.

No. 404,010.

Patented May 28, 1889.



Witnesses:

W. H. Myers,

C. F. Dowling.

Inventors:

James Macphail,
per Franklin M. Needham,
L. L. Morrison,
Attorney.

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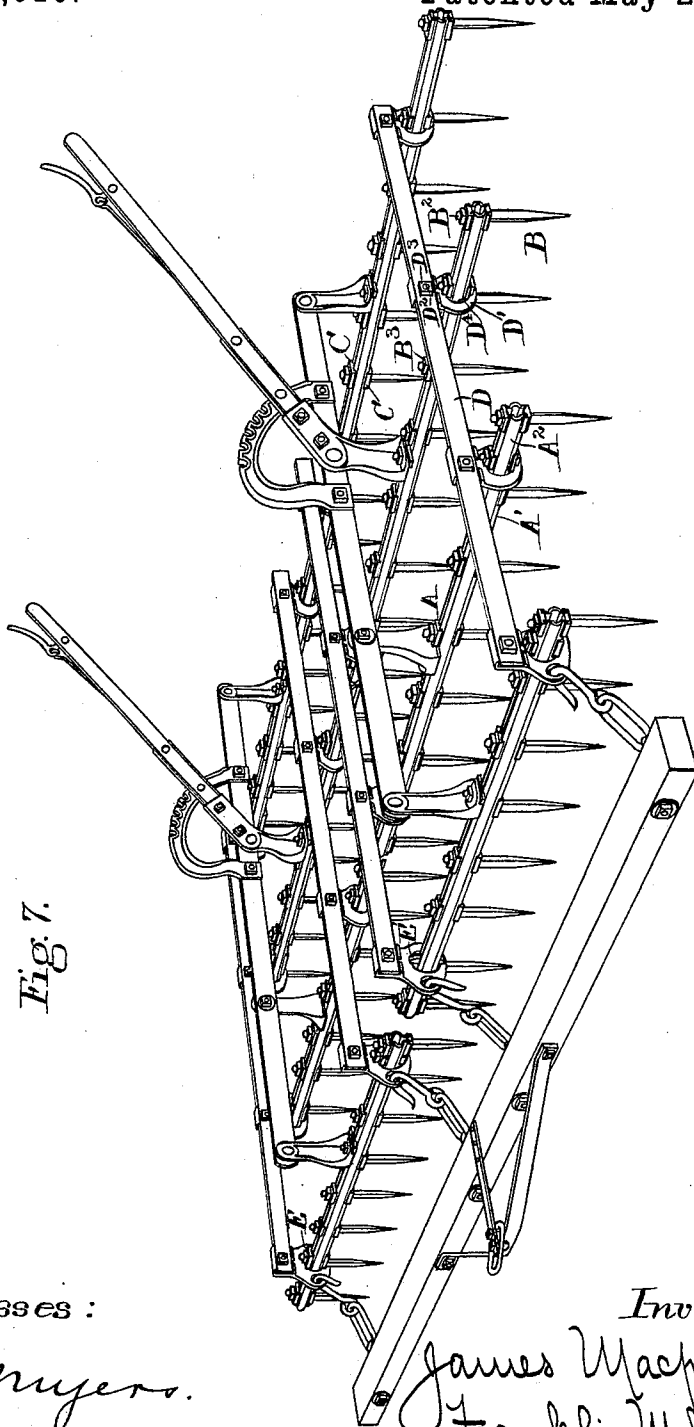


Fig. 7.

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UNITED STATES PATENT OFFICE.

JAMES MACPHAIL AND FRANKLIN M. NEEDHAM, OF ROCKFORD, ILLINOIS.

HARROW.

SPECIFICATION forming part of Letters Patent No. 404,010, dated May 28, 1889.

Application filed August 17, 1888. Serial No. 282,985. (No model.)

To all whom it may concern:

Be it known that we, JAMES MACPHAIL and FRANKLIN M. NEEDHAM, citizens of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Harrows, of which the following is a specification.

This invention relates to the production of two-part harrow-beams and means for securing the same together to form adjustable lever-harrows; and it consists of certain new and useful constructions and combinations of parts, which are hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is an end view of a portion of a harrow embodying our invention. Fig. 2 is a plan view of a fragment of a two-part harrow-beam secured together by means of a tooth, clamps, and nut. Fig. 3 is a view of a vertical section through the dotted line *xx* of Fig. 2 of the parts there shown. Fig. 4 is an end view of a two-part harrow-beam secured together by means of clamps and a bolt. Fig. 5 is a side view of a two-part harrow-beam secured together by means of clamps, a tooth, and nut, and connected with a cross-beam by means to be fully described hereinafter in a proper manner to form an adjustable lever-harrow embodying our invention. Fig. 6 is an isometric view in detail of a part shown in the foregoing figures, and will be fully described hereinafter. Fig. 7 is a view in isometric of a complete harrow composed of two sections.

Like letters of reference indicate corresponding parts throughout the several views.

A is a bar of metal having its edges *A'* preferably beveled and the longitudinal central portion, *A²*, thereof preferably bent in semi-cylindrical form to give greater strength thereto.

B is a harrow-tooth having a horizontal shoulder, *B'*, thereon to support a part to be described hereinafter, and a cylindrical portion, *B²*, threaded to receive a nut, *B³*.

C represents clamps having parallel grooves *C'* in the inner faces, *C²*, of the same, adapted to receive the edges *A'* of the bars A, and the outer sides, *C³*, of which grooves incline toward the center of said clamps sufficiently to draw the bars A into close contact with the harrow-teeth B when the nuts *B³* are tight-

ened on the same, thereby forming a two-part harrow-beam of the form and construction proposed. The clamps C have openings through their centers to admit the harrow-teeth B.

D represents cross-beams, of iron or other suitable material, to which a series of the two-part beams are transversely secured to form the harrow.

D' represents hangers secured to and depending from the cross-beams D by means of bolts and nuts *D²* *D³*.

D' represents horizontal circular openings in the lower portions of the hangers D' to admit the two-part beams and attachments, to be described hereinafter, for securing them in operative position in said hangers.

E represents clamps constructed exactly like the clamps C, except that the former are provided with integral hook-lugs *E'*, which extend through and engage with the hangers D', forming with them oscillating bearings, by which the two-part harrow-beams are supported and in which they may be operated. *E²* is an opening in the clamp E to admit a harrow-tooth or bolt.

A harrow-beam of the form and construction shown possesses several important advantages over metal harrow-beams of every other form and construction. The bars composing our beam are not weakened by being perforated with bolt-holes, slots, or other openings therein to admit fastenings for securing the bars together and the teeth and other attachments thereto. Therefore bars much lighter than those ordinarily used and upon which no labor has been expended in drilling or filing can be successfully employed in manufacturing harrow-beams after our improved pattern and an important saving thereby gained, both in the amount of material and labor required to manufacture metal harrow-beams.

The teeth B of the harrow may be adjusted so as to form any desired angle with the earth, as indicated by the dotted lines in Fig. 1, by means of an adjusting-lever, detent, and segment-rack of ordinary form and secured to the harrow in any of the ordinary and well-known ways.

Obviously a bolt, F, could be substituted for the teeth B in constructing a two-part beam like the one herein described, and some other

ordinary means of securing teeth therein be employed, without departing from the scope of our invention.

It is evident that any desired number of teeth may be used in a two-part harrow-beam of the form and construction herein shown.

We claim—

1. A harrow-beam consisting of two bars of metal secured together by means of teeth threaded at their upper ends or bolts transversely inserted between said bars, clamps having parallel grooves in their inner faces and openings therethrough adapted to engage with and secure said bars and teeth or bolts together, and nuts applied to said teeth or bolts to secure the herein-named parts together into a rigid whole.

2. In combination, two bars of iron having, preferably, beveled edges and their longitudinal central portions bent preferably in semi-cylindrical form, any suitable number of harrow-teeth inserted between said bars, each having a horizontal shoulder thereon at any desired distance below the top of the same and the upper portion thereof cylindrical in form and threaded to receive a nut, clamps having parallel grooves in their inner faces adapted to receive the edges of said bars and

the outer sides of said grooves being inclined toward the center of said clamps sufficiently to draw said bars into close contact with the harrow-teeth, and nuts for drawing said clamps together, substantially as described, and for the purpose specified.

3. In combination, the herein-described two-part harrow-beam secured together by means of harrow-teeth inserted between the two parts composing the same, clamps and nuts, as shown, the cross-beams, the hangers secured to and depending from said cross-beams and having horizontal circular openings in the lower portions of the same to admit said two-part harrow-beams, and hook-lugs connecting with the latter and extending through and engaging with said hangers and forming with them oscillating bearings, by which said two-part harrow-beams are supported and in which they may be operated, substantially as described, and for the purpose set forth.

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