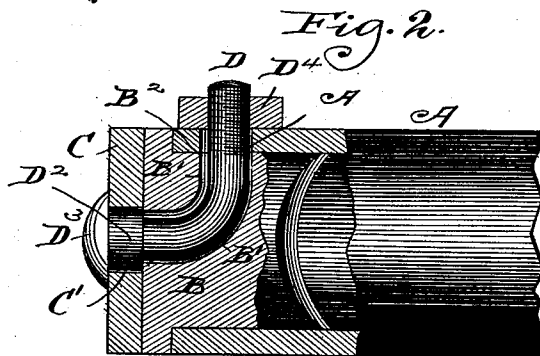
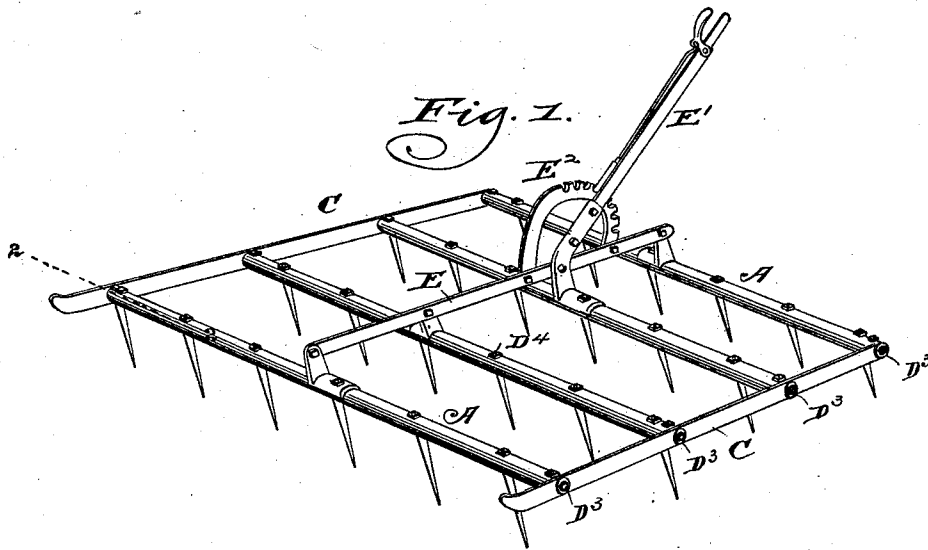


(No Model.)

G. JERNBERG.
HARROW.

No. 466,497.

Patented Jan. 5, 1892.



Witnesses,
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R. J. Jaeger.

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UNITED STATES PATENT OFFICE.

GUSTAF JERNBERG, OF ROCKFORD, ILLINOIS.

HARROW.

SPECIFICATION forming part of Letters Patent No. 466,497, dated January 5, 1892.

Application filed July 30, 1891. Serial No. 401,222. (No model.)

To all whom it may concern:

Be it known that I, GUSTAF JERNBERG, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

My invention relates to means for securing the beams and cross-beams of adjustable lever-harrows together to form harrow-sections; and it consists of certain new and useful features of construction and combinations of parts hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is an isometric view of a section of a harrow provided with my improvements. Fig. 2 is a view of a vertical partial section at the dotted lines 2 2 in Fig. 1 of a beam and a bushing and a complete section of an end cross-beam of the same.

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

A are harrow-beams, preferably cylindrical and tubular in form and having transverse holes A' extending therethrough for admitting curved bolts, to be described hereinafter.

B are bushings having their inner ends of suitable diameter to be inserted into the ends of the harrow-beams A and being provided with grooved passages B', extending from the outer and central portion of the ends of said bushings axially inward and then transversely outward through the peripheries of the same, the peripheral ends B² of said passages B' so terminating as to coincide with the transverse holes A' in the harrow-beams A.

C are cross-beams having transverse holes C' therein, said holes C' being preferably of greater diameter than the passages B' in the bushings B, for a purpose to be fully explained hereinafter.

D are bolts so curved as to be readily inserted through the holes C' in the cross-beams C, the curved passages B' in the bushings B, and the transverse holes A' in the harrow-beams A when all of said parts are in operative position and relation, as shown in Fig. 2. The curved bolts D are preferably provided with integral collars D² adjacent to their heads D³, which prevent the heads D³ from clamping the cross-beams C against the

bushings B, thereby insuring free pivotal connection between the harrow-beams A and the cross-beams C.

D⁴ are nuts, which should be turned onto their bolts D until the inner ends of the collars D² are drawn into close contact with the bushings B. Obviously the curved bolts D might be used without being provided with the collars D² by having the nuts D⁴ somewhat slack; but the result of so doing would be loose rattling joints between the harrow-beams A and the cross-beams C, whereas when said beams are connected by means of devices of the form and construction shown and described the disadvantages just adverted to are entirely obviated.

The harrow is also provided with the usual adjusting-beam E, adjusting-lever E', and segment-rack E², all connected together and therewith in the usual manner.

I claim—

1. In a harrow, in combination, harrow-beams having transverse holes extending therethrough, the bushings having their inner ends of suitable diameter to be inserted into the ends of the harrow-beams and being provided with curved passages extending from the outer end of said bushings axially inward and then transversely outward through the peripheries of the same, the peripheral ends of said passages so terminating as to coincide with the transverse holes in the harrow-beams, the cross-beams having transverse holes therein, the curved bolts inserted through the holes in the cross-beams, bushings, and harrow-beams, and means for securing said bolts therein, substantially as and for the purpose specified.

2. In a harrow, in combination, the harrow-beams A, having transverse holes A' therein, the bushings B, provided with the curved passages B', the cross-beams C, having transverse holes C' therein, of greater diameter than the passages B' in the bushings B, the curved bolts D, inserted through all the parts hereinbefore enumerated and provided with collars D² for preventing the heads D³ of said bolts from clamping the cross-beams C against the bushings B, all of said parts being constructed and connected substantially as and for the purpose specified.

GUSTAF JERNBERG.

Witnesses:

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