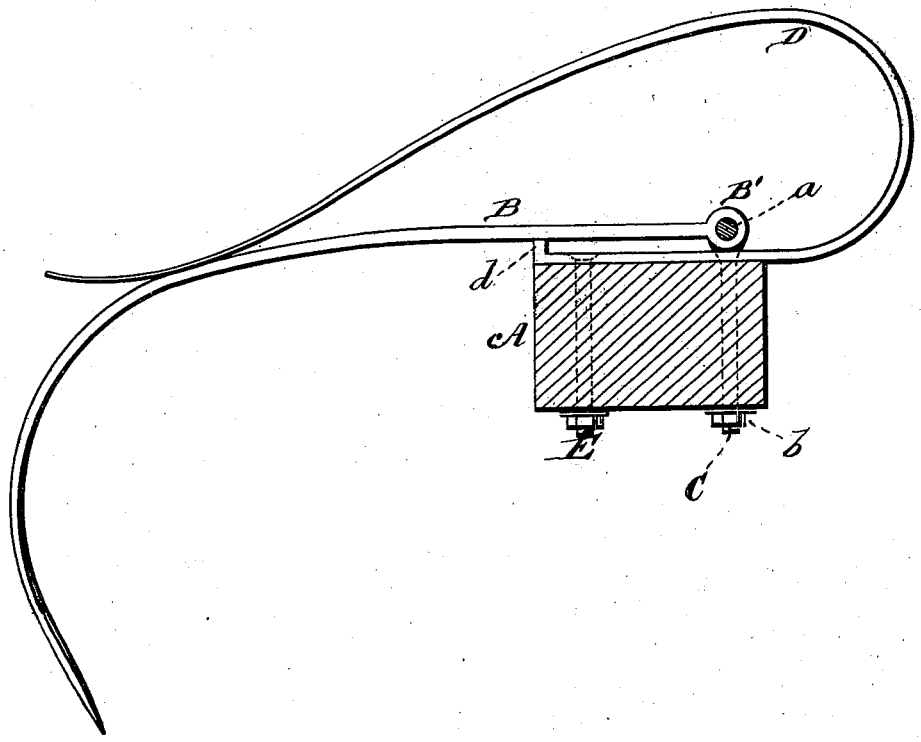
D. WATERBURY & F. MILLER.
Harrow-Teeth.

No. 197,703. Patented Nov. 27, 1877.



WITNESSES
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UNITED STATES PATENT OFFICE.

DANIEL WATERBURY AND FRANK MILLER, OF KALAMAZOO, MICHIGAN.

IMPROVEMENT IN HARROW-TEETH.

Specification forming part of Letters Patent No. **197,703**, dated November 27, 1877; application filed November 20, 1877.

To all whom it may concern:

Be it known that we, DANIEL WATERBURY and FRANK MILLER, of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a new and valuable Improvement in Harrow-Teeth; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

In the drawing the figure represents a side view our invention.

The nature of our invention relates to that class of harrow-teeth which are hinged to the frame, and have separate and independent springs acting thereon; and it consists in the construction and arrangement of the tooth and spring, as will be hereinafter more fully set forth.

The annexed drawing, to which reference is made, fully illustrates our invention.

A represents a bar of the harrow-frame, to which the teeth are attached. B represents the harrow-tooth, made of a flat steel bar, and curved substantially in the form shown. At the inner or upper end of the tooth B is formed an eye, B′, for the passage of a bolt, *a*, which pivots the tooth between two eyebolts, C C, said eyebolts being passed down from the top through the bar A and fastened by nuts *b b*.

D represents the spring, also made of flat steel, and curved in the manner shown. The inner end of this spring lies flat on the bar A, under the inner end of the tooth B, between the eyebolts C C, and it is held firmly in place by tightening the nuts *b* on the ends of said eyebolts.

A bolt or screw, E, may be passed through the inner end of the spring and the bar, for more securely holding the spring, if desired. At this end of the spring is formed a flange, *d*, extending upward, and upon which the tooth rests. This flange is of great importance for many reasons. It prevents the lodgment of any dirt between the tooth and the bar, which would otherwise change the position of the tooth sufficiently in some cases to make a serious variation in the depth at which the tooth will work. It also makes a space between the tooth and the bar sufficiently large to render it easy to insert keys or wedges between them when it is desired to raise the tooth more or less for the purpose of changing its working depth.

The spring D curves upward and rearward, and its free end rests upon the curved portion of the tooth B, in such a manner that when the tooth is raised the end of spring slides over the curved surface of the tooth.

The harrow-tooth and spring thus constructed can be manufactured cheaper and lighter than in cases where the tooth and spring are all in one piece.

Iron may sometimes be profitably substituted for steel in the manufacture of the tooth.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The combination of the harrow-tooth B, hinged at its inner end, and the curved spring D, passed under the end of the tooth, and formed with the flange *d*, substantially as and for the purposes herein set forth.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

DANIEL WATERBURY.
FRANK MILLER.

Witnesses:
S. H. WATTLES,
G. M. GATES.