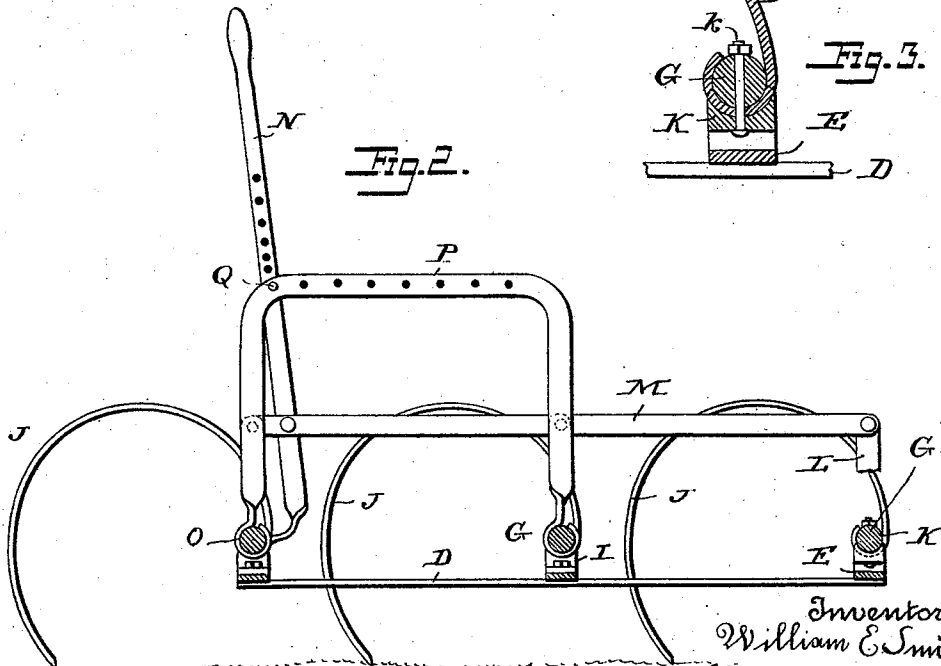
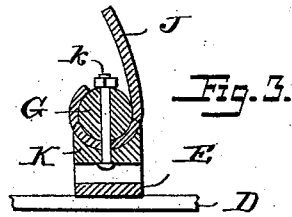
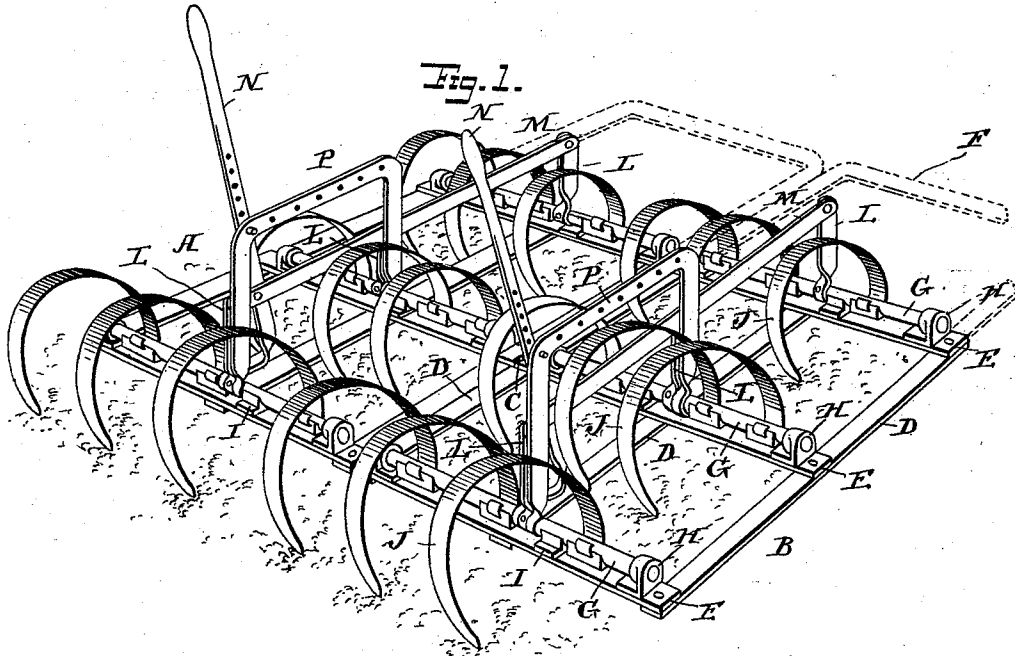


(No Model.)

W. E. SMITH.
LEVER ADJUSTING HARROW.

No. 522,434.

Patented July 3, 1894.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM E. SMITH, OF WATKINS, NEW YORK, ASSIGNOR OF ONE-HALF TO
MERCER B. TATE, OF HARRISBURG, PENNSYLVANIA.

LEVER-ADJUSTING HARROW.

SPECIFICATION forming part of Letters Patent No. 522,434, dated July 3, 1894.

Application filed March 25, 1892. Renewed January 18, 1894. Serial No. 497,331. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. SMITH, a citizen of the United States, and a resident of Watkins, Schuylers county, New York, have invented certain new and useful Improvements in Lever-Adjusting Harrows, of which the following is a specification.

My invention relates to harrows, and more particularly to that class of harrows which are provided with spring teeth attached to a suitable frame, and which are provided also with lever adjustments whereby the relations of the teeth to the frame may be varied.

It has for its object to improve and simplify the construction of such harrows, and to provide a cheap and effective device, that is not liable to get out of order.

Referring to the accompanying drawings: Figure 1, is a perspective view of a harrow embodying my invention. Fig. 2, is a longitudinal vertical section. Fig. 3, is an enlarged detail view showing the preferred manner of attaching the teeth to the transverse rods.

The harrow is shown as composed of two parts or sections A, B, hinged together as at C, and each part consists of a frame made up of flat or angle pieces of metal bolted or riveted together. Thus I have shown each part as having three longitudinal pieces D attached to three transverse pieces E, but of course it will be understood that any number of pieces may be used according to the size and dimensions of the harrow. It will further be observed that I have shown each part of the harrow as being rectangular in shape, and while this is the preferred form, it is evident that it may be in any other form. Thus the exterior side pieces may be placed at an angle converging toward the center so that the harrow is practically a V-shape, or the outside pieces may be curved or other form. The front of each section of the harrow is provided with a guard piece F, which protects the harrow, and this may be a separate piece of metal, or the sides may be extended and bent to form this guard. Mounted on this framework are the cylindrical bars G, and these may be either solid or hollow, and are shown as supported in collars or bearing pieces H, secured to the frame at their outside, while intermediate this frame are shown

yoke pieces I, forming bearings or supports for the circular bars between the collars. Mounted on the circular bars are a series of curved spring teeth J, and these are attached to the bars in the manner shown more particularly in Fig. 3, by having one end of each tooth bent so as to embrace the bar closely, and outside of this bent portion is placed a clip K adapted to conform to the shape of the bar and the end of the spring, and this is secured to the bar by suitable bolts or rivets $\frac{1}{2}$. In this way I find that the spring teeth can be securely attached to the bars, and that they can be readily removed or adjusted, by simply loosening the clip.

In order that the frame may be elevated or lowered with relation to the bearing points of the teeth, I attach to each rod G, an arm L which extends upward, and is connected to a cross arm M. This cross arm is also connected to a lever N, which is loosely pivoted on one of the bars G, as at O. By this construction it will be seen that by moving the lever, the bars can be rotated, so as to change the relations of the plane of the frame with the plane of the teeth. In order to secure the lever and maintain these relations, I provide a yoke piece P, which is shown as mounted upon two of the transverse bars, and as having a series of openings for the reception of a suitable pin Q, or may be secured with a spring latch connected with the lever and slots or teeth cut in the circle for holding the same, by means of which the lever may be secured in the proper position.

With this construction it will be seen that the harrow can be cheaply and simply made, ordinary bar or merchantable iron or steel being used, requiring no special manipulation, and when constructed, it forms an efficient harrow capable of adjustment in use, and well adapted for the purposes for which it is intended.

What I claim is—

1. In a harrow the combination with the metallic frame, of the transverse rods mounted in sockets of said frame, yokes supporting the rods intermediate the sockets, and spring teeth secured to said rods, substantially as described.

2. In a harrow the combination with the me-

talic frame, the transverse rods, the sockets, the yokes, the spring teeth secured to the rods, the clips for holding the teeth, the arms also secured to the rods, and the lever and
5 connections for adjusting the teeth with relation to the frame, substantially as described.

3. A harrow, the frame of which is composed of flat metal plates secured together forming two sections which are hinged each to the
10 other, transverse rods supported on each section, and carrying the spring teeth, clips se-

curing the teeth to the transverse rods, and a guard piece connected to the front of each section of the frame, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. SMITH.

Witnesses:

J. C. KLEIBER,

W. P. NOLAN.