(No Model.)

M. J. TODD.

HARROW.

No. 575,579. Patented Jan. 19, 1897.

Fig. 1.

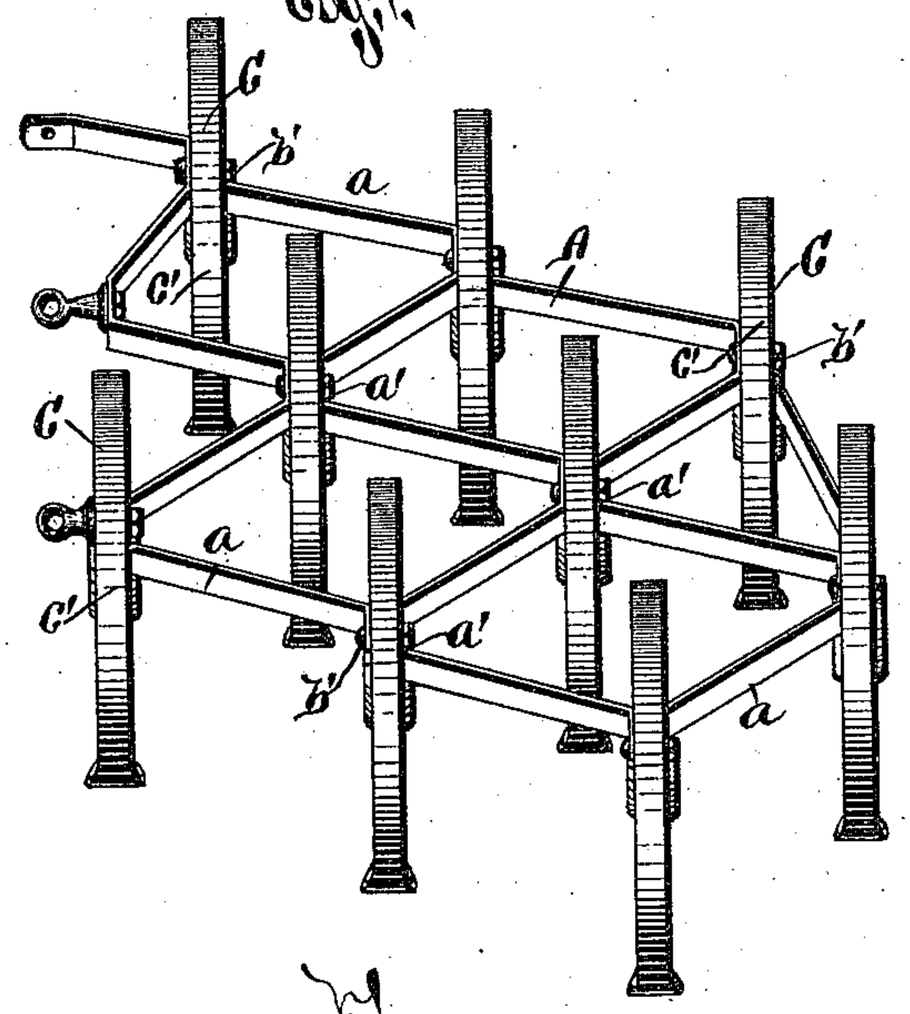


Fig. 2.

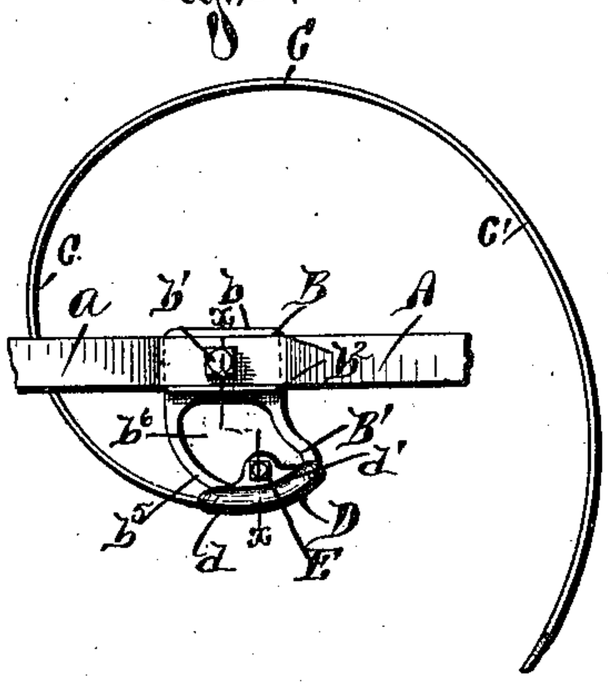


Fig. 3.

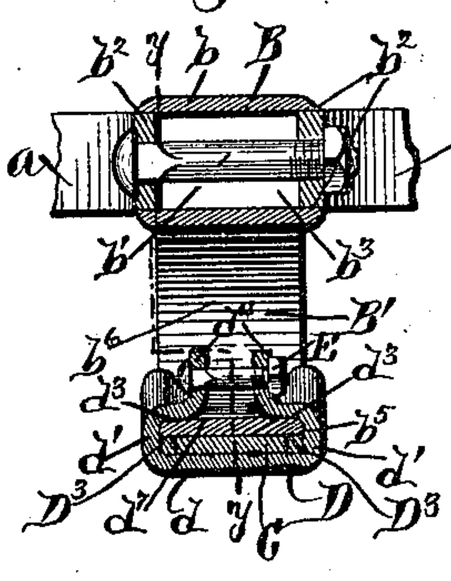


Fig. 4.

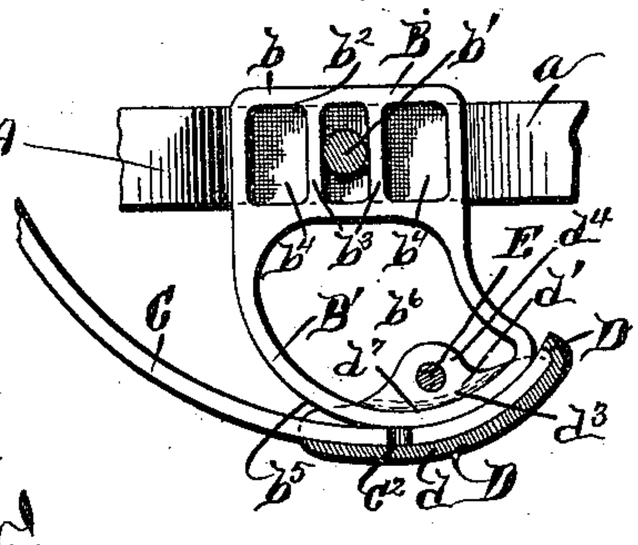


Fig. 6.

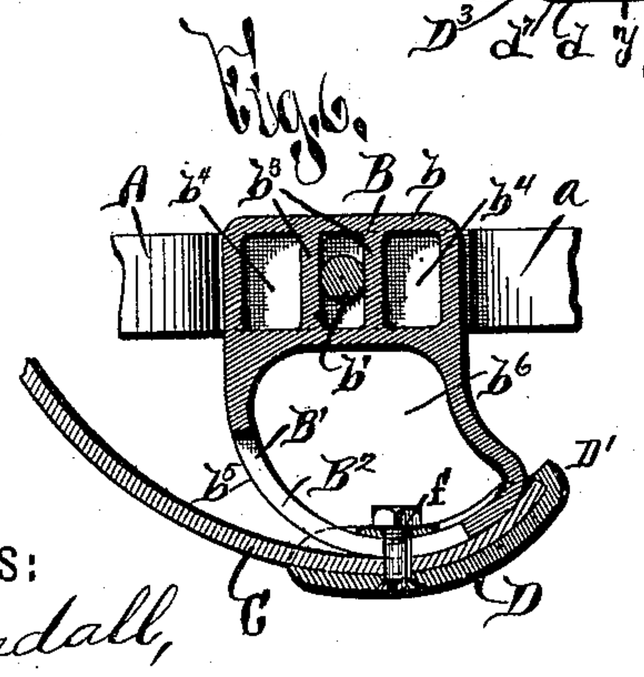
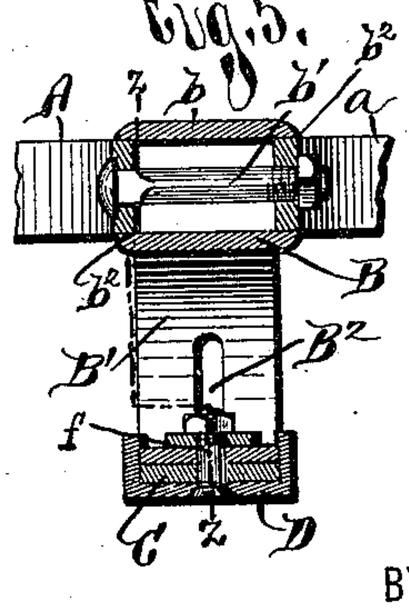


Fig. 5.



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HARROW.

SPECIFICATION forming part of Letters Patent No. 575,579, dated January 19, 1897.

Application filed December 22, 1890. Serial No. 375,457. (No model.)

To all whom it may concern:

Be it known that I, MARQUIS J. TODD, a citizen of the United States, residing at Corning, in the county of Steuben and State of New York, have invented new and useful Improvements in Harrows, of which the following is a specification.

My invention relates to improvements in spring-tooth harrows, and has for its object the production of a simple and effective construction of a harrow in which the frame is elevated above the ground and the tooth secured in a low-down plane and adjusted by a rocking movement.

In describing this invention reference is had to the accompanying drawings, forming a part thereof, in which like letters indicate corresponding parts in all the views.

Figure 1 represents an isometric perspective of one section of my improved harrow. Fig. 2 is an elevation of a portion of the harrow-frame, the tooth-support, the tooth, and the clip or holder. Fig. 3 is a vertical sectional view, on an enlarged scale, taken on line $x\,x$, Fig. 2. Fig. 4 is a vertical sectional view taken on line $y\,y$, Fig. 3, illustrating the tooth-support and the detached attaching end of the tooth in elevation and the holder or clip in vertical section. Fig. 5 is a similar view to Fig. 3 of a modified form of clip or holder; and Fig. 6 is a vertical sectional view taken on line $z\,z$, Fig. 5.

In my present invention I elevate the frame by securing thereto a downwardly-extending support provided on its lower face with a curved seat or bearing, to which the tooth is secured by a clip or support passing beneath the same and forming a wear-shoe upon which the harrow rides.

A represents the harrow-frame, which is of desirable form, size, and construction, being illustrated as composed of zigzag frame-bars a, that when operatively secured together form a series of diamonds.

The upper extremity b of the tooth-support B is interposed between the adjacent angles a' of the frame-bars and is rigidly secured thereto by a suitable clamping device, as a bolt b'.

b^2 represents shoulders in the opposite sides of said upper extremity b for receiving the adjacent surfaces of the frame-bars a and preventing up-and-down movement of said support.

To obviate forward-and-backward movement of the support, I provide the walls b^3, which bear against opposite points of the bolt b', and for the purpose of lightening this end of the clip as much as possible it is formed with a series of cut-outs b^4.

The lower extremity of the support B extends beneath the frame A, and consists, preferably, of a loop B′, having on its bottom or under side a curved face b^5, which extends from the lower rear edge forwardly and upwardly in a continuous curve to the front side of the support B.

C represents the tooth, having one extremity adapted to rest against the curved seat b^5 and preferably disposed in a curved plane for the purpose of affording a greater amount of friction.

The opposite end of the tooth extends forwardly and upwardly at c and then rearwardly and downwardly at c', with the lower digging extremity a suitable distance beneath the curved seat b^5. The tooth is firmly held in its desired position upon the support by means of a clip D of suitable form and construction.

The preferable form of clip consists of a single plate having its central portion d beneath the tooth and its extremities extending upwardly to form side walls d', which rest against the sides of the tooth-support and prevent lateral movement of the tooth. These side walls d' are preferably formed with the inwardly-extending shoulders d^3, which rest upon the tooth-support above the curved seat b^5 and preferably upon the shoulder or face d^7 of the loop.

The extreme ends d^4 of the clip are drawn together by a bolt E, which thus draws the tooth firmly against the curved seat and secures the same in its required adjustment.

When desired to vary the depth of cut of the tooth, the bolt E is loosened, the curved end of the tooth slid along its curved seat, and the bolt tightened.

Upon reference to Fig. 3 of the drawings it will be noted that by forming the clip D with the inwardly-extending shoulder d^3 the

ends of the bolt are within the plane of the outer sides of the tooth-support, and accordingly they do not encounter the lumps, stones, &c., and are not subjected to wear.

To further facilitate movement of the tooth, the clip or support D is provided with the rear shoulder D′, which bears against the end of the tooth, and with a projecting shoulder or shoulders D^3, which engage recesses c^2 in the edge of the tooth.

It is evident that the clip or holder forms the bearing-face which rides upon the ground, and thus prevents wear on the tooth. Moreover, when worn the clip may be readily replaced and the life of the tooth greatly lengthened.

At Figs. 5 and 6 I have shown a modified form of clip in which the support B is provided with a central slot B^2, in which moves a bolt *f*, that extends upwardly from the clip or holder D. In this construction the clip consists of a lower plate having upwardly-extending side walls and a washer movable above the bearing-face.

The tooth being secured in an extremely low plane it is not as greatly strained as would be the case were it secured in a higher plane.

The operation of my invention will be readily perceived from the foregoing description and upon reference to the drawings, and it will be noted that it is very simple in construction, effective in operation, and that the tooth may be readily and quickly adjusted to any desired depth of cut. It is evident, however, that the upper extremity of the tooth-support may be suitably changed to conform to any desired construction of frame, and that other changes in the exact detail construction and arrangement of the parts of my improved harrow may be made without departing from the spirit of my invention.

I claim as my invention—

1. The combination with a harrow-frame having zigzag frame-bars and a harrow-tooth, of a tooth-support rigidly secured between the angles of the frame-bars and provided with a depending portion having a curved bottom forming a curved seat for the tooth, a clip having a curved upper face resting against the under side of the tooth and having vertical side walls which rest against the sides of the tooth-support, and adapted to be adjusted along the seat and a clamping-bolt whereby the clip and the tooth are firmly secured to the tooth-support, substantially as set forth.

2. The combination with the harrow-frame and a harrow-tooth, of a tooth-support depending below the frame and provided on its bottom or under side with a curved seat for the tooth, a clip provided with a curved face and a rear shoulder which bears against the rear end of the tooth, and having vertical side walls which rest against the sides of the tooth-support and adjustable along the seat, and a clamping-bolt whereby the clip and the tooth are firmly fastened to the tooth-support, substantially as set forth.

3. The combination with a harrow-frame and a harrow-tooth, of a tooth-support depending below the frame and provided on its bottom or under side with a curved seat for the tooth and above said curved seat with a transverse opening, of a clip having a curved face adapted to bear against the under side of the tooth, and vertical side walls which rest against the sides of the tooth and the tooth-support, and tooth and clip adjustable along the curved face of the support, and a clamping-bolt passing through the opening in the support and connecting the vertical sides of the clip, substantially as set forth.

4. The combination with a harrow-frame and a harrow-tooth, of a tooth-support depending below the frame and provided on its under side or bottom with a curved seat for the tooth, of a clip having a curved face adapted to bear against the under side of the tooth, a rear shoulder which bears against the rear end of the tooth, and vertical side walls which extend above the sides of the tooth and the tooth-support, and having inwardly-bent shoulders overlapping the tooth-support and a clamping-bolt connecting the vertical sides of the clip, substantially as set forth.

5. In a harrow, the combination of a frame, a tooth-support depending beneath the frame and formed at its lower extremity with a curved seat and with an opening above the curved seat, a tooth, a clip having its central portion beneath the tooth and having side walls extending upwardly above the curved face, an inwardly-extending offset on the side walls for engaging the support at a point above the curved seat, and a bolt extending through the opening in the support and engaging said side walls of the clip for drawing the same together, substantially as set forth.

Witness my hand this 2d day of December, 1890.

MARQUIS J. TODD.

Witnesses:
T. C. GEYER,
ALICE G. CONNELLY.