(No Model.)

DE WANE B. SMITH.

HARROW.

No. 453,672. Patented June 9, 1891.

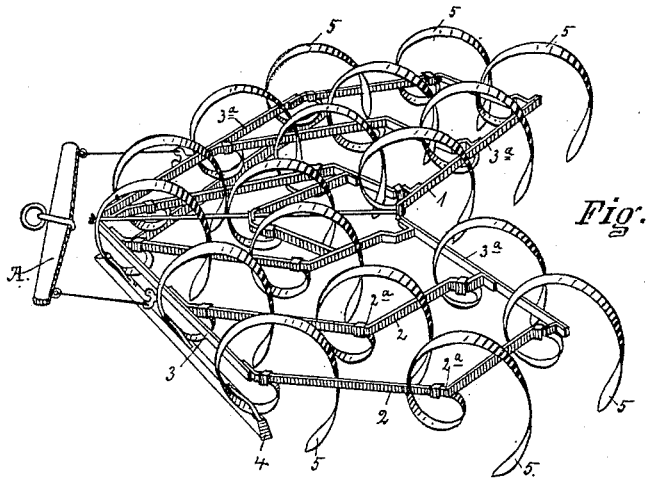

Fig. 1.

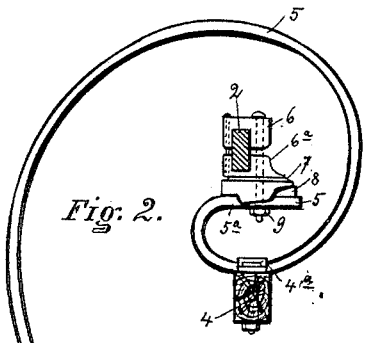

Fig. 2.

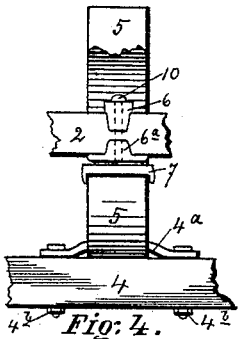

Fig. 4.

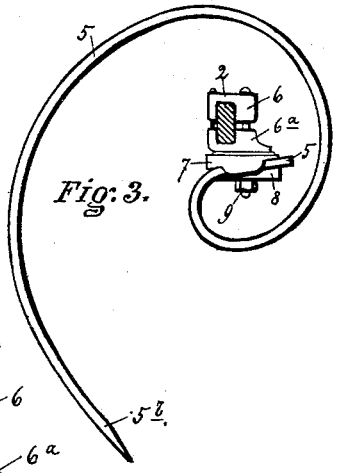

Fig. 3.

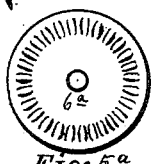

Fig. 5a.

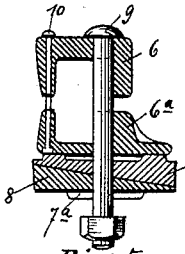

Fig. 5.

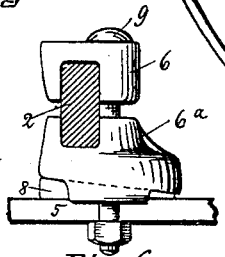

Fig. 6.

WITNESSES.

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HARROW.

SPECIFICATION forming part of Letters Patent No. 453,672, dated June 9, 1891.

Application filed November 1, 1889. Serial No. 328,971. (No model.)

To all whom it may concern:

Be it known that I, DE WANE B. SMITH, of Deerfield, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Harrows; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the figures of reference marked thereon, which form part of this specification.

My invention relates to an improvement in harrows; and it consists of particular features of construction.

In the drawings which accompany and form a part of my specification, and in which similar numerals of reference refer to like parts in the several views, Figure 1 shows a perspective top view of a harrow involving features of my construction. Fig. 2 shows a cross-section of the harrow-frame, a tooth, and the device for securing the tooth to the frame and an end view of my leveling-bar. Fig. 3 shows a harrow-tooth and a fastening device, the tooth being adjustable to a different depth of cut. Fig. 4 shows a rear view of the parts as shown in Fig. 2, a portion of the tooth being broken away. Fig. 5 is a vertical central section of the fastening device for securing the tooth to the frame. Fig. 6 is a modified form of construction of the fastening device. Fig. 5^a is a detail view relating to the fastening device.

I provide a harrow-frame 1, having front bars 3 and rear bar 3^a substantially parallel and at an angle to the line of draft. Between front and rear bars 3 and 3^a I provide bars 2, having an obtuse angle 2^a. The portion of the bar 2 in front of the angle 2^a thereof extends away from the line of draft of the harrow, and a portion of the bar 2, back of the angle 2^a, extends from the angle toward the line of draft, substantially as shown in Fig. 1. The angles in the cross-bars 2 are such that it permits of the tooth being secured to the bar on the under side and passing to one side of the bar above the front, thence over and downward and presenting its working-point below the frame, substantially as shown, and so as to admit of a free vibration of the tooth without striking the frame. The angle also permits of a spring or giving of the frame when any one of the several teeth catch an obstruction, such giving or spring aiding and permitting the tooth to release itself from an obstruction. The frame I prefer to construct of bar-iron or steel.

A indicates the bar by which the harrow is drawn, and the teeth 5 are secured to the under side of the frame and are provided with a short straight shank 5^a, Fig. 2, having a perforation through which the bolt passes for securing the teeth to the frame. From shank 5^a the tooth curves rearward and downward, forward and upward, and rearward and downward to the working-point 5^b, the form being substantially that of a scroll, with the exception of the shank 5^a, which is straight.

Secured to the lower bow of the front row of teeth on each half of the harrow I provide leveling-bar 4, secured to the spring-tooth by a clip 4^a and bolts 4^b. The bar 4 in operation acts as a leveler, and also prevents diving of the harrow when it catches an obstruction or is working on rough ground. For securing the tooth to the frame I provide clipping-pieces 6 and 6^a, each provided with a notch adapted to fit onto the bars of the harrow-frame and having perforations for the bolt 9, which passes through each of the parts 6 and 6^a and through a perforation in the tooth. Under the clipping-piece 6^a I provide a wedge-shaped washer-piece 7, which is provided upon the upper surface with teeth or projections adapted to engage in notches or recesses in the face or bottom piece 6^a. (See Fig. 5^a.) Piece 7 is provided with downwardly-projecting retaining-lugs 7^a, which hold the teeth in alignment. I also provide wedge-shaped piece 8, which is provided with a perforation for bolt 9. The bolt 10 may be provided, extending through the clipping-pieces 6 and 6^a on the other side of the bar 2 from that in which bolt 9 passes for more firmly securing the clipping-pieces to the frame-bar. The bolt 10 will also fasten the useful apparatus of holding the clipping-pieces 6 and 6^a to the frame while the adjustments, hereinafter explained, are being made. The tooth may be

secured between the wedge-shaped piece 8 and the nut of the bolt 9 as the device is shown in Figs. 2 and 5, in which position the tooth will be in a normal position, as shown in Fig. 2, or the tooth may be secured between the pieces 7 and 8, in which case the tooth will assume the position shown in Fig. 3, the working-point being projected farther downward and a little forward.

By the foregoing-described arrangements of clipping-pieces, washer, and wedge-shaped piece I secure three adjustments of the tooth, one of which is as shown in Fig. 2, in which the shank-piece 5^a is substantially level or parallel with the frame, the position shown in Fig. 3, in which position the shank-piece of the tooth slants upward toward the frame, or the position the reverse of Fig. 3, in which the shank-piece of the tooth slants downward from the frame, this latter position being obtained by turning the pieces 7 and 8 half-way around from that shown in Fig. 5.

Fig. 6 shows a modified form of construction of the clipping-pieces, in which pieces 6^a and 7, Fig. 5, are formed as one piece, having an inclined under face, as shown, against which the tooth or the wedge-shaped piece 8 may be made to bear. The upper end of bolt 9 may be made as a hook to engage the top of the frame-bars and piece 6 omitted.

It is evident that other alterations or modifications besides those described may be made in and to the device as shown without departing from the spirit of my invention or the equivalence of my construction.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a harrow, of a harrow-frame, curved spring-teeth secured to the frame and curving below the frame and above the frame and presenting their working-points below the frame, of a leveling-bar extending between two or more of the teeth secured to the downward or lower bow of the curved spring-teeth, substantially as described.

2. In a device for securing a tooth to a frame, the combination of the upper and lower recessed pieces adapted to embrace the bar of the frame, the lower piece having an inclined face, against which the tooth is adapted to bear, and a wedge-shaped piece adapted to engage the tooth either above or below, and a bolt passing through openings in the two clipping-pieces, the wedge-shaped piece, and the tooth, substantially as set forth.

3. In a device for securing a tooth to a frame, the combination of the upper and lower recessed pieces adapted to engage the bars of the frame from above and below, the wedge-shaped washer-piece adapted to bear on the under clipping-piece and having an inclined face, against which the tooth may be made to bear, and retaining-lugs upon either side, and the bolt passing through the two clipping-pieces and the wedge-shaped piece and the tooth, substantially as set forth.

4. The combination, in a device for securing a tooth to a frame, of the upper and lower recessed clipping-pieces adapted to embrace the bar of the frame, the wedge-shaped washer-piece having inclined face, against which the tooth may be made to bear, and retaining-lugs upon either side of the inclined face, and the wedge 8 and the bolt passing through perforations in the clipping-pieces to one side of the frame-bar and through the wedge-shaped washer and the wedge and tooth, substantially as set forth.

5. The combination, in a device for securing a tooth to a frame, of the clipping-pieces 6 and 6^a, adapted to grasp the frame, the wedge-shaped washer-piece 7, having the inclined face and retaining-lugs 7^a, the wedge-shaped piece 8, the bolt 9, passing through the pieces 6 6^a to one side of the frame-bar and through pieces 7 8, and the tooth and the bolt 10, passing through the clipping-pieces 6 and 6^a on the opposite side of the frame-bar from bolt 9, substantially as set forth.

6. The herein-described harrow-frame having a front and a rear draft-bar parallel with each other and disposed at an angle to the line of draft, and bracing cross-bars extending between the said front and rear bars and connected therewith only, and said bracing cross-bars having an obtuse angular bend between the draft-bars, substantially as set forth.

7. The herein-described harrow-frame having a front and a rear draft-bar disposed at an angle to the line of draft, and cross-bars extending between the front and rear draft-bars and secured only to each and having an obtuse angular bend therein, in combination with harrow-teeth secured to the cross-bars in advance of the angular bend therein, substantially as set forth.

8. The herein-described harrow-frame having a front and a rear draft-bar substantially parallel with each other and at an angle to the line of draft, and cross-bars extending between said front and rear draft-bars and connected to each only and having an obtuse angular bend therein, in combination with a curved spring-tooth secured to the cross-bar in advance of the bend, whereby the tooth will not strike the frame, substantially as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

DE WANE B. SMITH.

Witnesses:
M. E. ROBINSON,
JOSIAH PERRY.