(No Model.)

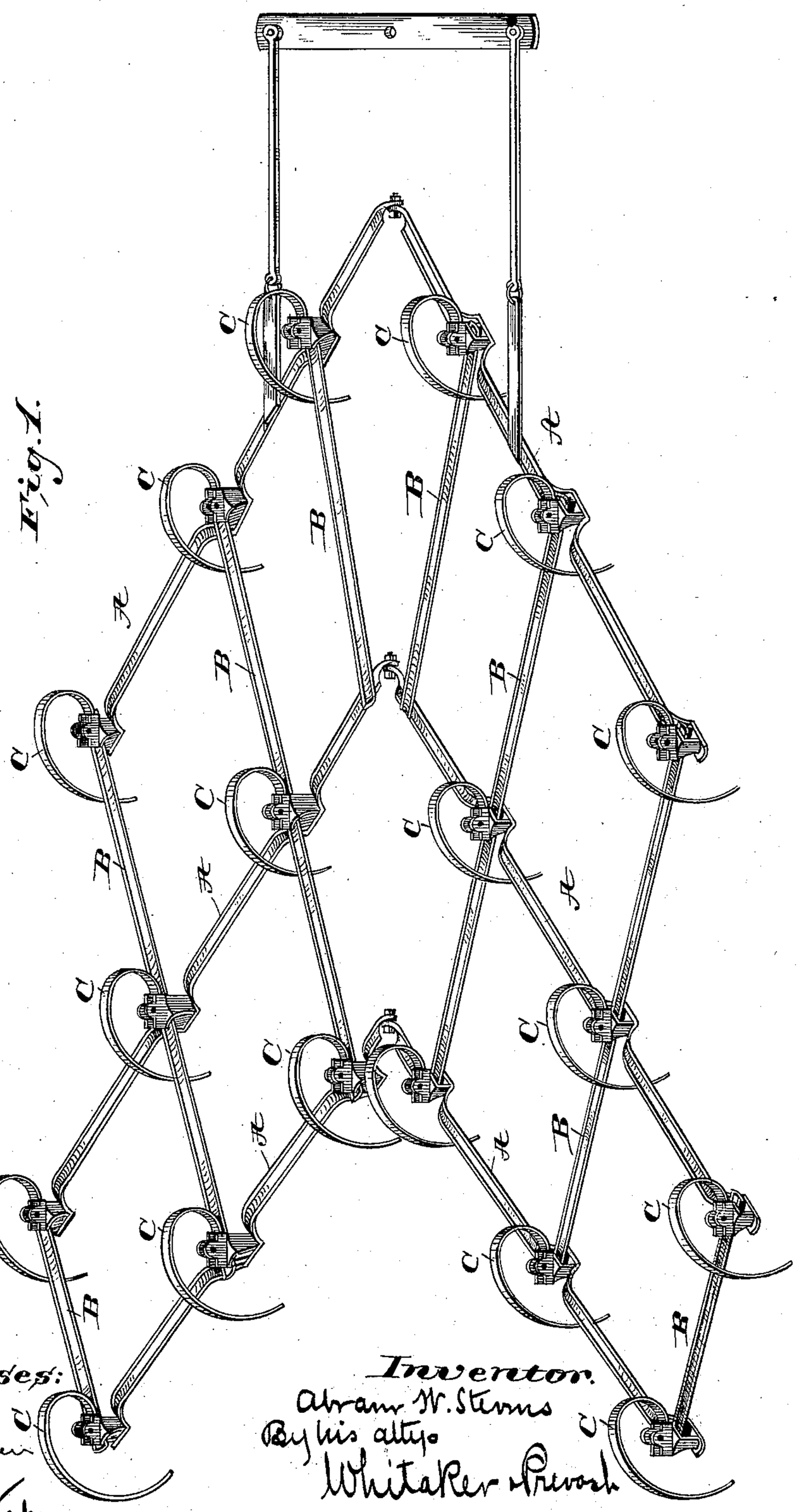
2 Sheets—Sheet 1.

A. W. STEVENS.

HARROW.

No. 375,510. Patented Dec. 27, 1887.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

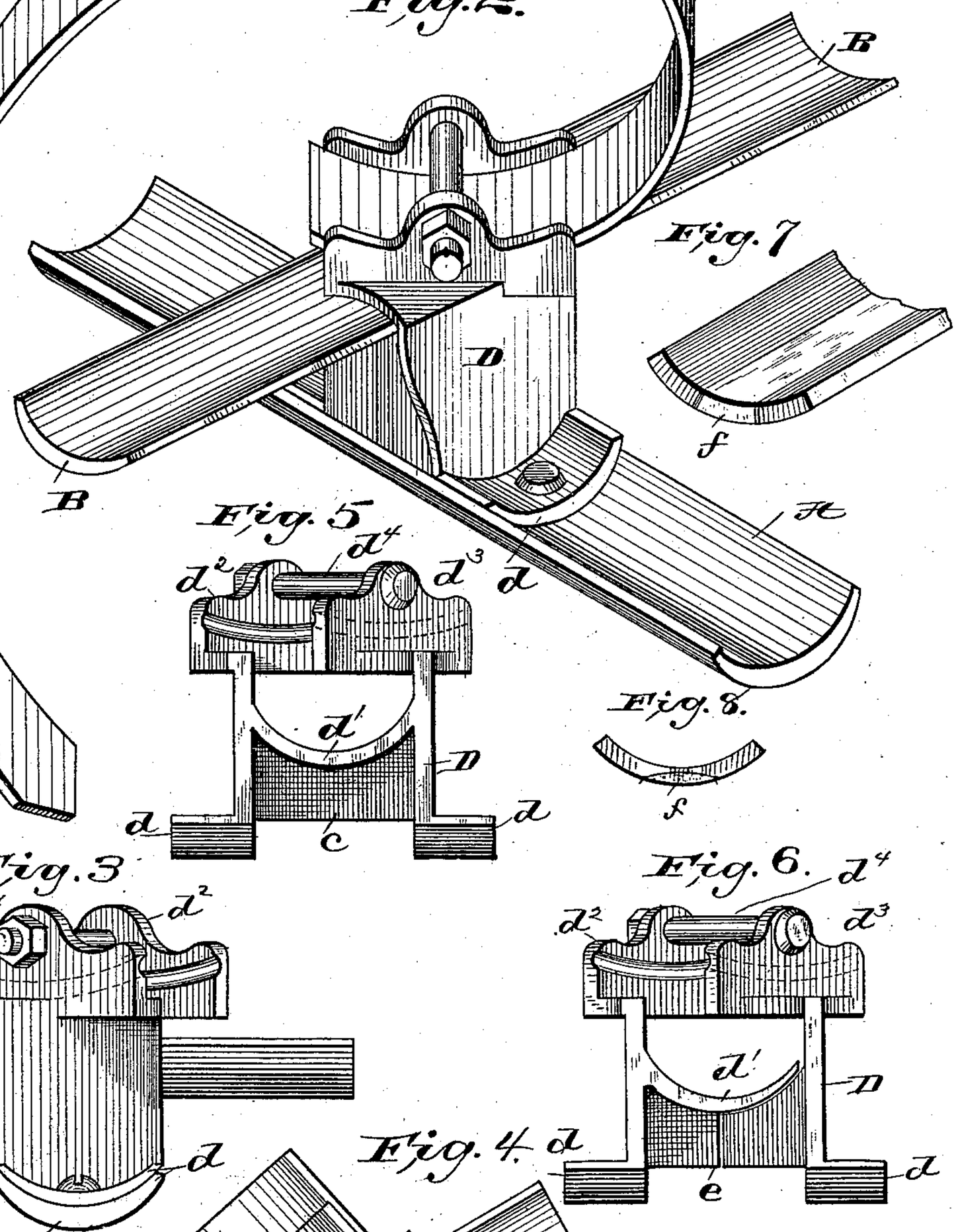


Fig. 7

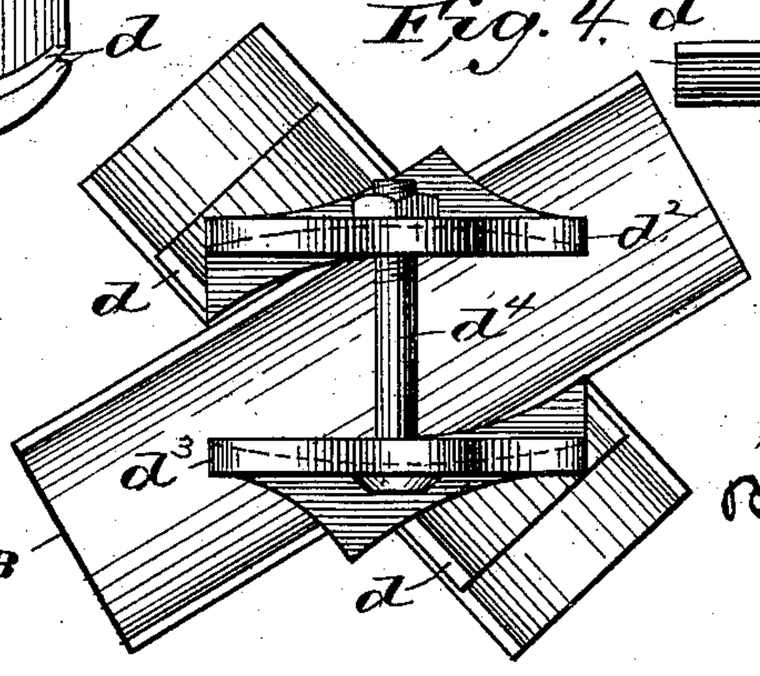
Fig. 5

Fig. 8.

Fig. 3

Fig. 6.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ABRAM W. STEVENS, OF AUBURN, NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 375,510, dated December 27, 1887.

Application filed October 14, 1887. Serial No. 252,371. (No model.)

To all whom it may concern:

Be it known that I, ABRAM W. STEVENS, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Harrows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improvement in harrows, and is more particularly designed for the class in which spring-teeth are used, though some features are capable of wider application and might be employed with advantageous results in harrows having rigid teeth.

The several features which constitute my present invention are illustrated in the accompanying drawings, and such invention is fully disclosed in the following specification and claims.

Figure 1 is a perspective view of a harrow embodying my present invention. Fig. 2 is an enlarged perspective view of the construction at the intersection of the draft and cross bars. Fig. 3 is an end view, and Fig. 4 is a top view, of such construction with the harrow-tooth removed. Figs. 5 and 6 are side views of two different forms of post and clip. Figs. 7 and 8 are perspective views of portions of other forms of draft and cross bars designed by me.

The frame of the harrow is composed of intersecting draft and cross bars, and it may consist of one continuous frame, or it may be composed of two or more parts connected together in any preferred manner. I have shown a frame composed of two parts hinged together.

In the drawings, A A′ are the draft-bars, and B B are the cross-bars. These bars are curved in form with the convex side downward, so as to pass or ride more easily over the ground or the objects with which they come in contact. The central portion of each bar is made capable of sustaining greater wear than its edges by making the bar in crescent form, as shown in Fig. 2, or by making the bar of uniform thickness and the center harder or of increased density, so as to make it less friable by making the center of steel, as shown in Fig. 7, by giving it a steel or other hard-wearing surface, as shown in Fig. 8, or by giving the metal along the center greater compression in rolling the bar, or by constructing it in some other manner, so that it will be capable of sustaining a greater amount of wear with less loss of material.

The draft-bars A have depressed portions at the points at which the cross-bars cross them, and a connecting construction is employed, which secures the bars at such points, but holds them out of contact with each other. The teeth C are attached to the frame above such depressed portions and above the device connecting the bars, preferably by means of a combined post and tooth clip, D. This post may be made in a single piece, as shown in Fig. 5, or it may be made of two or more parts united. One form of the latter is shown in Fig. 6. The base of the post is provided with flanges *d d*, having convex lower faces fitting the concavity of the upper face of the draft-bars. The post is attached to the bars by rivets or bolts passing through these flanges, or in any other preferred manner. At a proper distance above the base the post is provided with a curved seat, *d′*, to receive a cross-bar which is rigidly secured in such seat. Above the cross-bar seat the post is provided with a tooth-clip, which consists of two vertically-disposed walls, d^2 d^3, provided with guides to receive the edges of the tooth C, which is firmly clamped in position by the bolt d^4. The tooth being connected in this manner and independent of the connection of the bars to the post, the bolt d^4 can be loosened and the tooth adjusted longitudinally without loosening the connections of the bars or affecting their attachment to the post in any way.

The front of the post is provided with a web, *e*, to prevent the lodgment of small stones and dirt within the post. In the form shown in Fig. 2 the post is made in two pieces. The curved seat *d′* is attached to one of said pieces and extends nearly or quite to the other part of the post, and the web is made in two parts, meeting near the center of the post. The web might, however, be made integral and connected only to one of the parts of the post.

It will be seen that the seat *d′* for the cross-bar is placed at such a height above the base of the post that such bars are on a level with the most elevated part of the draft-bars. This gives effective clearance for stones and other loose materials to pass through the harrow

without clogging. It will also be noticed that by employing the post provided with a clip at its upper end the tooth-clip and the base portion of the tooth are raised to a position in which they are almost entirely freed from contact with the soil. This I deem an important feature of my invention, as the soil is almost always moist, and if it is allowed to remain in contact with the clip and base of the spring more or less rusting or corrosion of the parts takes place and the parts are injured thereby. In my construction there is little or no liability of particles of sand or gravel crowding under the base portion of the tooth to interfere with the free action of the same. The elevation of the tooth-clip serves, also, to keep the parts dry, even though the wet earth should at intervals come in contact with the base of the tooth or clip, as the action of the air thereon would readily dry the same.

The depressed portions of the draft-bars form guards for the teeth and protect them from injurious contact with heavy stones or immovable obstacles in the ground. While I prefer to have the cross-bars B B in about the same plane as the elevated portions of the draft-bars, this is not essential, as they may be above or below such plane and good results obtained thereby. It will be noticed that in this construction, whether the elevated portions of the draft-bars are in the same plane of the cross-bars or not, the posts perform effective service as guards for the depending portion of the teeth and prevent loose and other obstacles from coming in contact with the same. When the draft-bars are elevated as described, obstacles which would not be diverted from coming in contact with the depending portions of the teeth by the diverging portions of the draft-bars are encountered by the posts and thrown out of the path of the teeth. This result is accomplished however much or little the draft-bars are elevated. The posts therefore alone form valuable guards for the teeth, while with the diverging portions of the draft-bars they form guards which are still more effective and complete in their operation.

By reason of the elevated seat for the spring-teeth and the guards extending below the same I am enabled to employ a tooth having an increased length between the tip and the highest point of the curve of the same, thereby securing greater elasticity. The post construction also protects the forwardly-curving portion of the tooth by raising the same so far above the surface of the ground that the obstacles encountered come in contact with the post instead and rarely or never in contact with this portion of the tooth.

The crescent-shaped bars may be made with the central hard-metal wearing-strip, when desired.

I do not desire to limit myself to the exact constructions shown, as the parts may be greatly varied without departing from the spirit of my invention.

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

1. A bar for a harrow-frame elongated in its horizontal cross-section, having a convex wearing-surface, the central portion of said bar being below the horizontal plane of its edges and adapted to sustain greater wear than the other portions, substantially as described.

2. A bar for a harrow-frame of crescent shape in cross-section, substantially as described.

3. In a spring-tooth harrow, the combination, with intersecting draft and cross bars, of spring-teeth connected to said harrow, said harrow being also provided with teeth-guards extending downwardly from a point adjacent to the point at which the said teeth are connected to the harrow, a portion of said guard lying intermediate the intersecting bars and holding them out of contact with each other, substantially as described.

4. A harrow consisting of intersecting bars, a supporting connection holding them separated, and a tooth-clip permitting of the longitudinal adjustment of the tooth in a horizontal direction, said tooth-clip being located in substantially the vertical plane of the supporting connection, substantially as described.

5. A harrow-frame consisting of draft and cross bars, one of said bars being depressed out of the plane of the main portion of the bar at each of the points of crossing, and a vertical post connecting the said bars at such points and holding them out of contact with each other, substantially as described.

6. A harrow-frame consisting of draft-bars having downwardly-deflected portions, straight cross-bars, and vertical posts secured to said draft and cross bars at the points of deflection, substantially as described.

7. In a harrow, a post for connecting and holding the draft and cross bars out of contact with each other, said posts at their upper ends having flanges extending above each side of the bar for engagement therewith, substantially as described.

8. In a harrow, a post intermediate the draft and cross bars and provided with seats for attachment to said bars, and a tooth-clip permanently connected with the post and in the vertical plane of the same, substantially as described.

9. In a harrow, a post for connecting draft and cross bars, provided with flanges extending laterally from each side of the base of said post for attachment to one bar, a substantially horizontal seat above said flanges for attachment to the other bar, and a tooth-clip above said post and permanently secured thereto, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ABRAM W. STEVENS.

Witnesses:
W. A. NYE,
L. W. STEVENS.