(No Model.) 2 Sheets—Sheet 1.

B. M. BARBER.

HARROW.

No. 412,827. Patented Oct. 15, 1889.

Fig. 1.

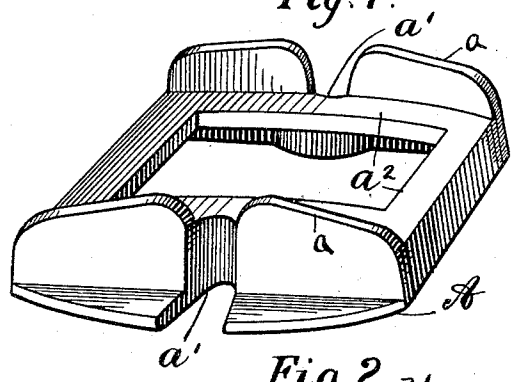


Fig 2.

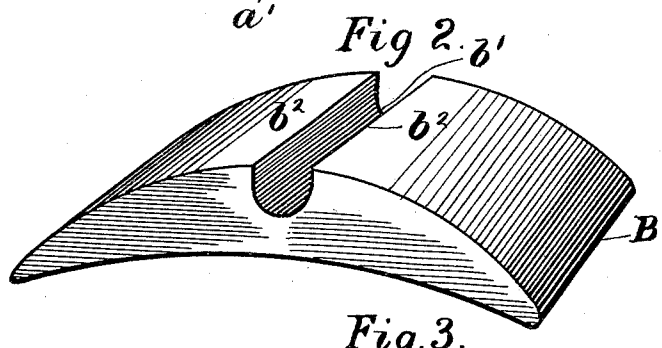


Fig. 3.

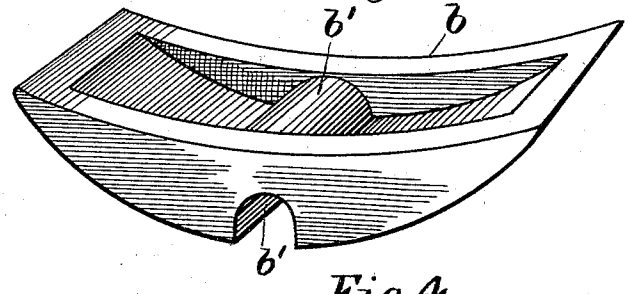
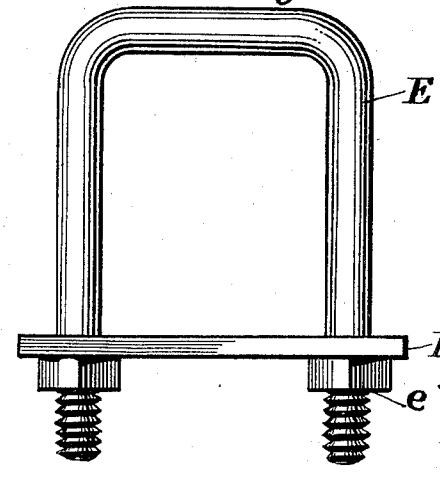


Fig. 4.



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Walter Mellen

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his Atty

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(No Model.) 2 Sheets—Sheet 2.

B. M. BARBER.

HARROW.

No. 412,827. Patented Oct. 15, 1889.

Fig 5.

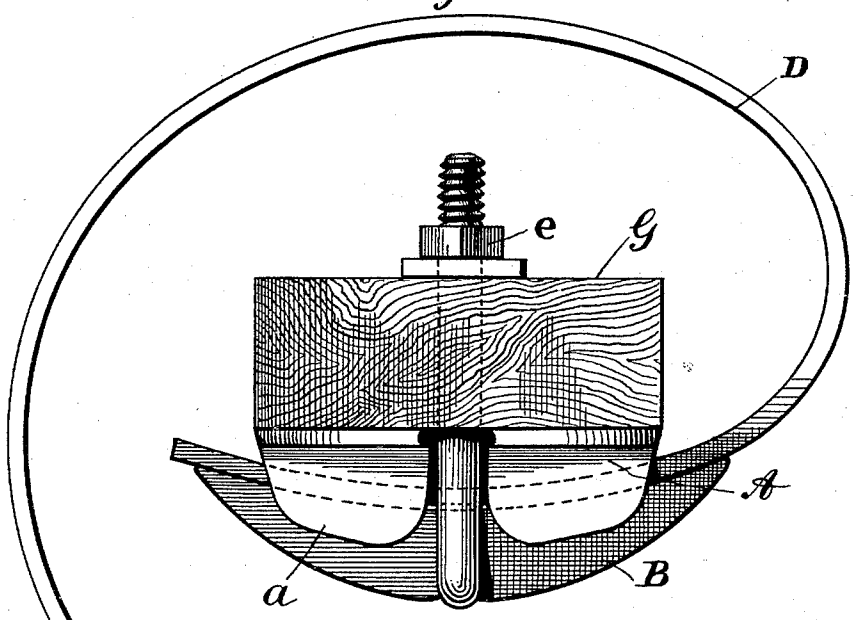


Fig 6.

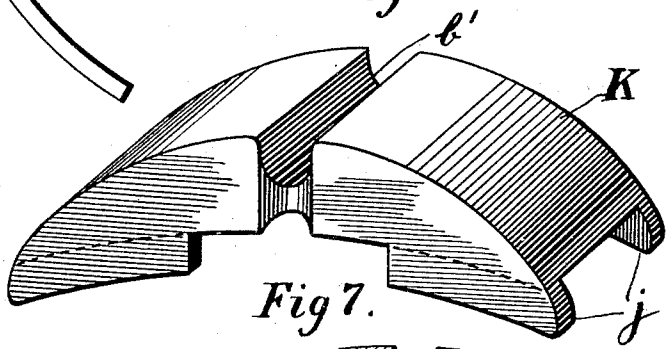
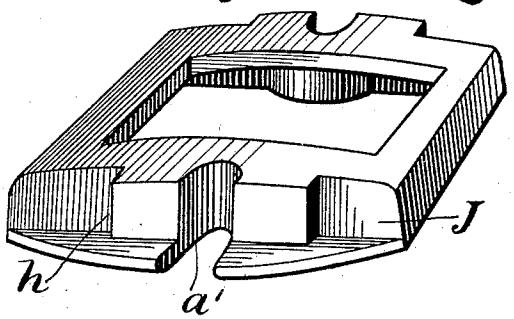


Fig 7.



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UNITED STATES PATENT OFFICE.

BYRON M. BARBER, OF ASHTABULA, OHIO.

HARROW.

SPECIFICATION forming part of Letters Patent No. 412,827, dated October 15, 1889.

Application filed January 4, 1889. Serial No. 295,481. (No model.)

To all whom it may concern:

Be it known that I, BYRON M. BARBER, a citizen of the United States, and a resident of Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

The object of my invention is to construct means for securely fastening the end of a spring-tooth to a bar of a harrow-frame, and at the same time permit the tooth to be readily adjusted so as to give to its point a greater or less depth of cut. This I accomplish by means of a clip, consisting of a base provided with a bearing-surface curved to correspond with the curve of the tooth, and provided with perpendicular recesses on the sides of the base, in combination with a cap-piece or runner having a curved clamping-surface corresponding nearly or quite to the curve of the tooth, and having a groove extending crosswise of the cap-piece and communicating with the grooves of the sides of the base, and a clip-bolt resting in said grooves so as to bind the base, tooth, and cap-piece rigidly to a bar of a harrow-frame.

In the drawings, Figure 1 represents a perspective view of a clip-base. Fig. 2 represents a perspective view of a cap-piece or runner adapted to clamp the tooth when in position. Fig. 3 represents a perspective view of the clamping-surface of the cap-piece or runner. Fig. 4 represents a clip-bolt and engaging-nuts with a clamping-plate. Fig. 5 represents a side elevation of the several parts bound together. Fig. 6 represents a side elevation of a modification of a cap-piece. Fig. 7 represents a perspective view of a modification of clip-base.

A represents a base, the tooth-bearing surface of which is curved and provided with ribs or flanges *a*, extending lengthwise of the base, adapted to hold the tooth against side movement. The sides of the base are also provided with perpendicular grooves *a'*, adapted to hold the clip-bolt securely in place. The curved bearing-surface of the base may be an unbroken surface, or it may be cut away centrally, as shown in Fig. 1, so as to form bearing-ledges a^2, for supporting the tooth.

B represents a cap-piece having a clamping-surface curved to correspond nearly or quite with the curve of the tooth. The cap-piece is preferably made longer than the base, so that the ends of the cap-piece will extend beyond the ends of said base and bear against the tooth at points outside of the base, so as to adapt the cap-piece to serve also as a runner. The cap may have an unbroken clamping-surface, or the surface may be cut out centrally, as shown in Fig. 3, so as to form ledges *b*, adapted to bear against the tooth. This cap may, if desired, be made of the same length as the base, as shown by K in Fig. 6, and made with a curved bearing-surface corresponding exactly with the curve of the tooth. I prefer, however, to curve the bearing-surface of the cap-piece slightly more than the tooth, so that when the cap is drawn against the tooth the ends of the cap-piece will bear against the tooth at points outside of the base before the central portion of the cap-piece touches the tooth, thereby giving a slight additional bend and support to the harrow-tooth, which will tend to more securely hold the tooth in position. The ribs *a* on the upper surface of the base may be omitted, and similar ribs or flanges may be attached to the cap-piece, so as to overlap the sides of the base, as shown by *j* in Fig. 6. End movement of the cap-piece may be avoided by means of offsets having perpendicular shoulders *h*, formed on the sides of the base, (shown in Fig. 7,) in addition to the clip-bolt engaging with the grooves in the sides of the base.

When the harrow-tooth D is placed in position on the base and the cap-piece is placed against the tooth, the groove *b'* of the tooth will communicate with the groove *a'* of the base, so that the clip-bolt E may be placed in the grooves, the curved or upper portion of the bolt resting in the groove *b'* of the cap-piece and the shanks or prongs of the bolt in the grooves *a'* of the base. A cross-plate F, or an ordinary washer, may then be placed on the opposite side of the bar of the harrow-frame and secured in position by means of the nuts *e*, engaging the threaded ends of the bolt.

When the clip-bolt is in position in the groove *b'*, the sides of the groove *b'* form shoulders b^2, which bear against the clip-bolt E, so as to form in effect one integral piece there-

with, whereby any backward strain which may be exerted upon the cap-piece by the tooth may be sustained by the bolt, and the backward bending of the ends of the cap-piece thereby prevented. The groove *b'* of the cap-piece serves also as means for protecting the clip-bolt against wear and consequent weakness, which would otherwise result when the bottom of the cap-piece drags along the ground as a runner.

Instead of the clamping-plate F, washers of ordinary construction may be used where the ends of the clip-bolt are inserted through holes made in the bar of the frame. Where no such holes are made, I prefer to use a clamping-plate similar to that shown herein, for the purpose of holding the prongs of the clip-bolt in their proper position.

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

1. The combination, with a bar of a harrow-frame and a harrow-tooth, of a base having a curved tooth-bearing surface and sides provided with vertical grooves, a cap-piece provided with a groove extending crosswise thereof communicating with the grooves of the base, and a clip-bolt and engaging-nuts, substantially as shown and described.

2. The combination, with a spring harrow-tooth and the bar of a harrow-frame, of a base having a curved tooth-bearing surface provided with vertical ribs or flanges extending lengthwise of the base, and sides provided with vertical grooves, a cap-piece provided with a groove extending crosswise thereof communicating with the grooves of the base, and a clip-bolt and engaging-nuts, substantially as shown and described.

3. The combination, with a spring harrow-tooth and a bar of a harrow-frame, of a base having a curved tooth-bearing surface and sides provided with vertical grooves, a cap-piece provided with a groove crosswise thereof, the ends of the cap-piece extending beyond the ends of the base adapted to bear against the tooth at points outside of the base, and a clip-bolt and engaging-nuts, substantially as shown and described.

4. The combination, with a spring harrow-tooth and a bar of a harrow-frame, of a base having a curved tooth-bearing surface provided with vertical ribs or flanges extending lengthwise of the same, the sides of said base being provided with vertical grooves, a cap-piece provided with a groove extending crosswise thereof, the ends of said cap-piece projecting beyond the base and adapted to bear against the tooth at points outside of the base, a clip-bolt adapted to engage with the grooves of the cap-piece and base, and engaging-nuts, substantially as shown and described.

5. The combination, with a spring harrow-tooth and a bar of a harrow-frame, of a base having a curved tooth-bearing surface provided with vertical ribs or flanges extending lengthwise thereof, the sides of the base being provided with vertical grooves, a cap-piece having a tooth-clamping surface curved slightly more than the tooth, and having a groove extending crosswise of the reverse side of said cap-piece, and a clip-bolt and engaging-nuts, substantially as shown and described.

6. The combination, with a spring harrow-tooth and a bar of a harrow-frame, of a base having a curved tooth-bearing surface and sides provided with vertical grooves, a cap-piece provided with a groove extending crosswise thereof, a clamping-plate, clip-bolt, and engaging-nuts, substantially as shown and described.

BYRON M. BARBER.

Witnesses:
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JAMES MURPHY.