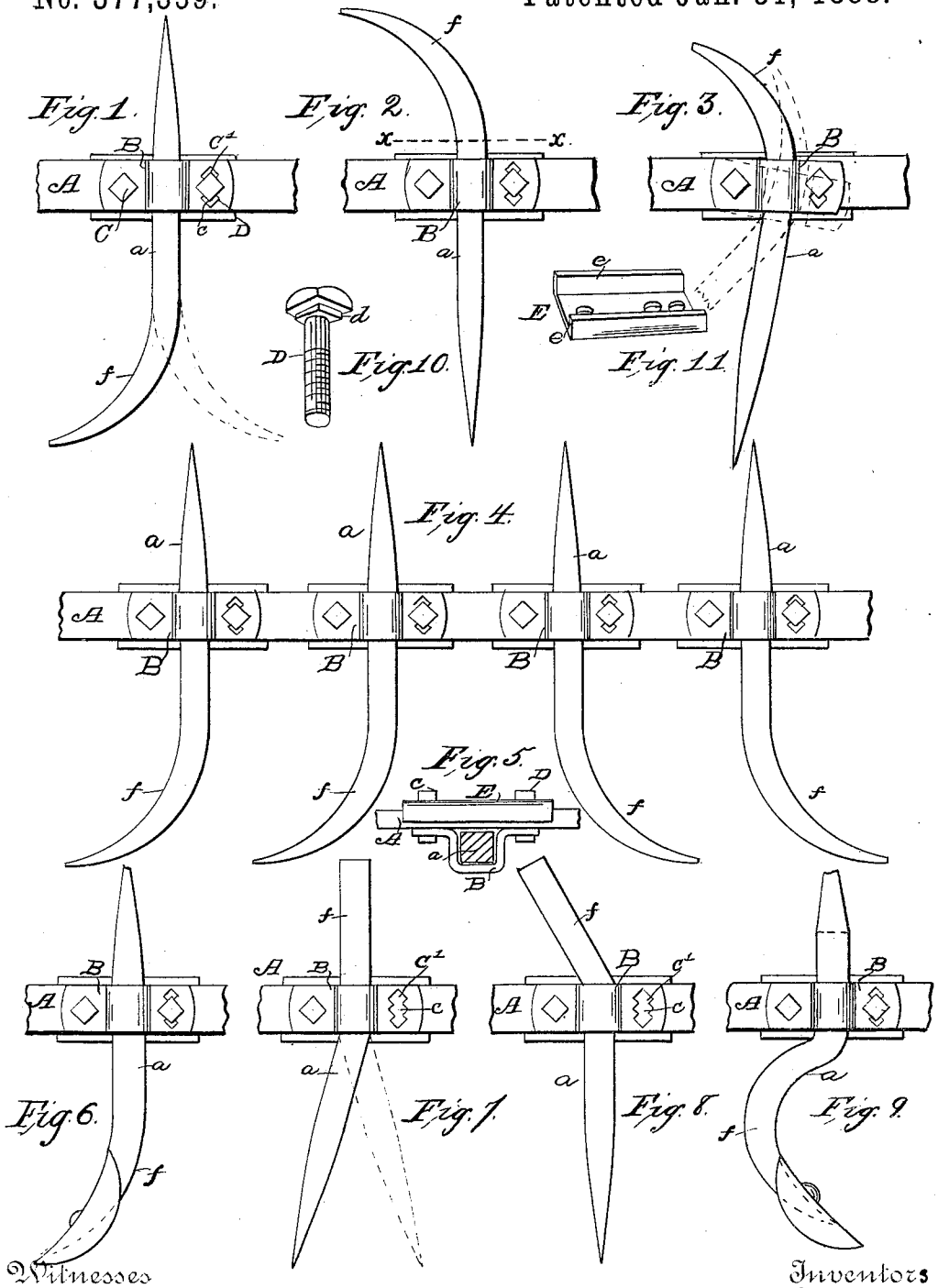
(No Model.)

H. L. HARWOOD & L. B. WHITE.

HARROW TOOTH.

No. 377,359. Patented Jan. 31, 1888.



Witnesses

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HENRY L. HARWOOD AND LEWIS B. WHITE, OF NORFOLK, VIRGINIA, ASSIGNORS TO S. R. WHITE & BRO., OF SAME PLACE.

HARROW-TOOTH.

SPECIFICATION forming part of Letters Patent No. 377,359, dated January 31, 1888.

Application filed April 13, 1886. Serial No. 198,703. (No model.)

To all whom it may concern:

Be it known that we, HENRY L. HARWOOD and LEWIS B. WHITE, citizens of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Harrow-Teeth; and we do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to harrows, and has for its object to combine therewith a tooth having a bent or curved end and a clip for holding the tooth in place, so that it may be adjusted vertically and have its inclination regulated as desired.

A further object is to make said tooth reversible, whereby its straight end may be presented to the ground, making a stand point, or its curved end presented, forming a scratching or smoothing harrow, according as the concave or convex side is caused to advance.

A still further object is combining with such tooth a clip pivotally connected with the harrow-frame on one side of the tooth and adjustably connected therewith on the opposite side of the tooth, whereby the latter may have a twofold adjustment—one of its own within the clip and the other with the clip about its pivotal point. It also has for its object to make such tooth perform the office of a standard and serve as a support for a cultivator-shovel.

It consists in the novel features of construction and combinations of parts more fully hereinafter set forth and claimed, and shown in the annexed drawings, in which—

Figure 1 is a side view of the portion of a frame of a harrow provided with our improvements. Figs. 2, 3, and 4 are similar views showing the various adjustments of the tooth. Fig. 5 is a sectional view on the line X X of Fig. 2. Figs. 6 and 9 are modifications showing the tooth utilized as a support for a cultivator-shovel. Figs. 7 and 8 show various adjustments of a modified form. Fig. 10 is a detail perspective view of the clip-adjusting bolt on an enlarged scale. Fig. 11 is a perspective view of the bar-strengthening clip.

The frame may be of any desired shape, and its bars A may be of metal or wood, and at the point where it is desired to attach a tooth a clip, B, is pivotally secured at one end by a bolt, C, and its other end is vertically adjustable by means of a bolt, D, passing through a slot, C', extending transversely to the bar. The sides of the slot are provided with series of corresponding depressions, *c*, to receive the points or corners *d* of an angular enlargement of the bolt D adjacent its head, and of a thickness the thickness of the clip. By this means the bolt is prevented from turning when its nut is slackened or being screwed home. It is evident that the slot may be formed in the bar and the bolt-opening in the end of the clip; but this is objectionable, as it weakens the bar; hence the form shown is preferred for durability and strength. To give additional stability to the bar at the point of attachment of the tooth and prevent the strain coming on the latter rupturing it, the bar is provided with a clip or plate, E, preferably having flanges *e* to lap over its top and bottom side, and held thereto by bolts C and D.

The tooth F has a curved or bent end, *f*, which, being adjusted vertically within the clip, regulates the inclination of the tooth, as clearly indicated in Figs. 3 and 8. When the curved or bent portion is wholly above the bar and clip, that portion of the tooth below occupies a vertical position, as shown in Figs. 2 and 8. If the concave side is foremost and the tooth adjusted so that the curved or bent part is within the clip, the tooth will be inclined forward, as shown in Figs. 3 and 7. The convex side being foremost and the tooth adjusted within the clip, it will be inclined rearwardly, as will be readily understood. The amount of inclination of the tooth in either direction depends on the vertical adjustment within the clip, as is manifest.

The tooth may be pointed on one end only, as shown in Figs. 7, 8, and 9, in which case it will have its inclination adjusted by vertical adjustment, the direction being regulated by shifting or reversing the position of the tooth. The curved end may be extended and pointed,

as shown in Figs. 1, 2, 3, and 4, and by inverting the tooth so that its curved end will be below the bar a scratching or smoothing harrow may be provided, according as the concave or convex side is foremost, as clearly shown in Figs. 1 and 4.

In case the bend or curvature of the ends of the teeth is not uniform and it be desired to have the teeth adjusted to a given length below the frame and at a certain inclination, it is manifest that the combined adjustment of the teeth and clips will effect the desired result.

It will be no departure from the spirit of our invention to provide the ends of the teeth with detachable points or shovels, as shown in Figs. 6 and 9, in which case they subserve the purpose of a standard, and the points may be of any desired shape, either for harrowing or cultivating purposes. The latter construction embraces the one general principle and soul of our invention, which is the combination, with a harrow frame or bar, of a tooth or shank having a curved end, the vertical adjustment of which relative to the bar or beam regulates the inclination thereof, as hereinbefore set forth.

To prevent trash, &c., riding the tooth and lodging and packing in the angle between it and the bar, it is made rounding, as shown in Fig. 9, so that the portion within the clip is nearly in line with the point or end of the tooth, the intervening portion bellying out, so that in the operation of the tooth the trash rides the tooth part way and then curves forward and is thrown to one side before it reaches the bar, thus wholly preventing any lodgment. A tooth of this construction may be pointed at both ends, and by inverting it be used as a slant or straight tooth. It may likewise be provided with a detachable point or shovel, as before referred to.

We are aware that it is old to construct a harrow having spring-teeth the ends of which are curved in opposite directions, adjustable up or down to gage the depth of work or to increase or decrease the spring of said teeth, and do not claim such as our invention, which differs essentially therefrom in having the teeth, which are rigid and unyielding, constructed with a straight and bent end, so that they can be used as stand, scratching, or smoothing teeth, as desired.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination, with the bar, of the rigid tooth or shank having a straight and bent end and vertically adjustable to bring the bent or straight portion of the tooth opposite the bar, and the clip for securing it in an adjusted position, whereby the tooth may be used as a stand, scratching, or smoothing tooth, substantially as set forth.

2. The combination, with a bar, of a rigid double-pointed harrow or cultivator tooth having a straight and bent end reversibly and vertically adjustably secured thereto to bring the straight or bent portion of the tooth opposite the bar, and a clip pivotally connected at one end with the bar and vertically adjustable at the other end for independently adjusting the inclination of the tooth relative to the bar, substantially as and for the purpose set forth.

3. The combination of the frame of the machine, the reversible tooth enlarged at one end and pointed at the other, and a clip recessed to receive the tooth in either of its positions, said holder engaging with the stem of the tooth between its opposite ends and serving to confine said tooth to a bar of the frame, all substantially as specified.

4. The combination of the fixed bar of the frame, the reversible tooth enlarged at one end and pointed at the other end, the clip pivoted to said fixed bar and constructed to clamp the tooth between its opposite ends and to receive the tooth in either of its positions, and means for securing the holder to the bar after adjustment, all substantially as specified.

5. The combination of the bar of the frame, a rigid tooth having a harrow-point at one end and a cultivator at the opposite end, and a clip whereby said tooth is secured to the frame, said clip being constructed to permit the end-for-end reversal of the tooth, and also a reversal front for back when the harrow-point is down, all substantially as specified.

6. The combination of the bar of the frame, a rigid tooth having a harrow-point at one end and a cultivator at the opposite end, and a pivoted clip whereby said tooth may be secured to the frame at different inclinations, and the tooth may be reversed end for end and front for back, substantially as specified.

7. The combination of the bar of the frame, the slotted clip pivoted thereto and having a recess on the inner side, the confining-bolt passing through the slot in the clip, and a rigid tooth having different working ends and confined between the bar of the frame and the recessed portion of the clip, all substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY L. HARWOOD.
LEWIS B. WHITE.

Witnesses:
S. P. MOORE,
CHAS. W. HUDGINS.