No. 697,058. Patented Apr. 8, 1902.

G. T. WILLIS & J. PORTEOUS.

HARROW TOOTH FASTENING.

(Application filed Sept. 9, 1901.)

(No Model.)

Fig. 1.

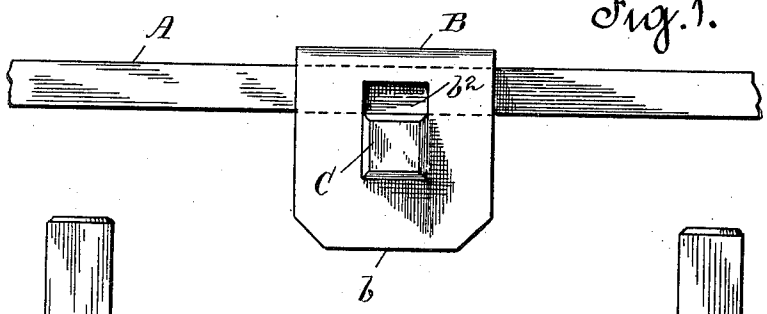


Fig. 3.

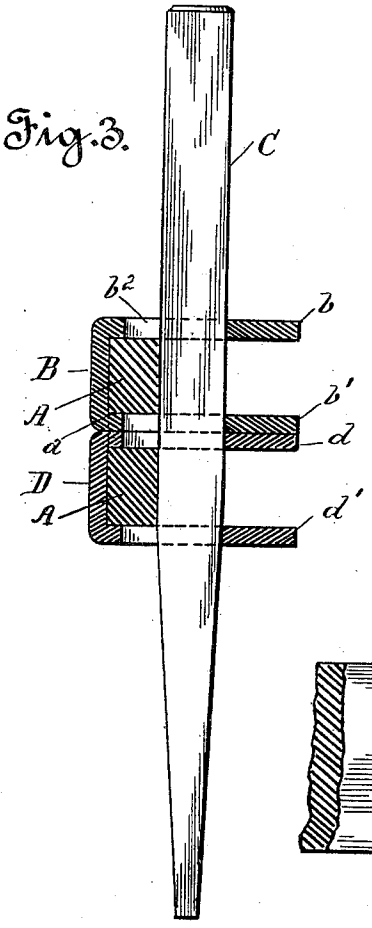


Fig. 2.

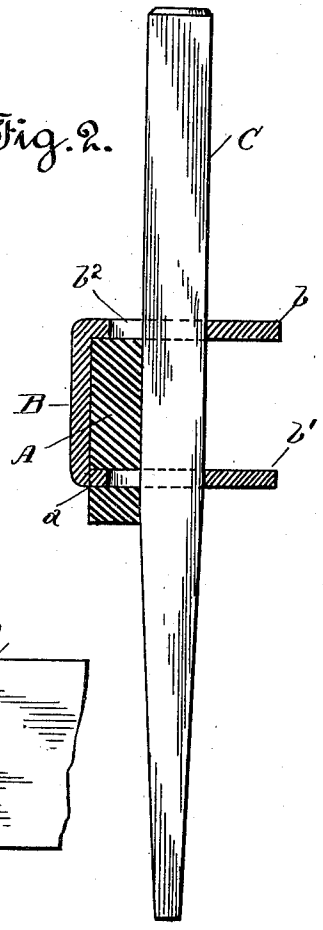


Fig. 4.

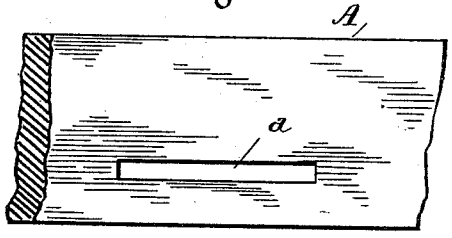
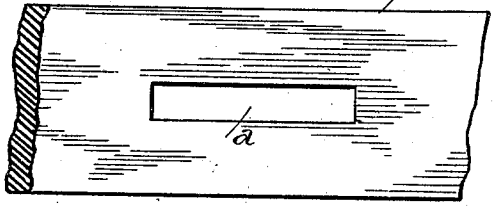


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

GLENN T. WILLIS AND JAMES PORTEOUS, OF FRESNO, CALIFORNIA; SAID WILLIS ASSIGNOR TO SAID PORTEOUS.

HARROW-TOOTH FASTENING.

SPECIFICATION forming part of Letters Patent No. 697,058, dated April 8, 1902.

Application filed September 9, 1901. Serial No. 74,787. (No model.)

To all whom it may concern:

Be it known that we, GLENN T. WILLIS and JAMES PORTEOUS, citizens of the United States, residing at Fresno, county of Fresno, State of California, have invented certain new and useful Improvements in Harrow-Tooth Fastenings; and we do hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the class of devices for securing or fastening harrow-teeth to their carrying-bars. In securing strength, together with adaptability to be readily made and broken for the removal of and the replacing or substitution of teeth, the general style of fastening illustrated by Letters Patent of the United States No. 670,071, Glenn T. Willis, March 19, 1901, has in practice demonstrated the necessity of a further improvement—namely, a novel arrangement of the clip relatively to the bar—which will result in preventing wear of the lower arm of the clip by contact with the ground, thereby avoiding weakening of the fastening and the consequent loss of the tooth. This is the object of our present invention, the nature of which will hereinafter fully appear by reference to the accompanying drawings, in which—

Figure 1 is a top view of our fastening. Fig. 2 is a cross-section showing a single clip, the lower arm of which passes through the carrying-bar. Fig. 3 is a cross-section showing said clip so arranged and in addition thereto a second clip, the upper arm of which passes through the bar under the lower arm of the first clip. Figs. 4 and 5 are views of the bars A of Figs. 2 and 3 to show slot *a*.

A is a portion of a harrow-bar.

B is a clip, having a top member or arm *b* and a lower member or arm *b'*. In these arms are slots or holes b^2 to receive the tooth C, which being tapering and the holes b^2 being longer than the width of the cross-section of the tooth will when driven down in said holes wedge itself against the face of the bar and at the same time will thereby tighten the clip to the bar.

Heretofore the top arm of the clip has passed over the top edge of the bar and the bottom arm has passed under it. Practice has shown that the under side of the bar is subject to decided wear, and especially in a revolving harrow where the frame-bars are of gas-pipe the under surface continually rolling in the sand gets so worn and the bar or pipe becomes so thin that it will not hold the teeth. Obviously if such great frictional wear falls on the under surface of the bar or pipe the lower arm of the clip passing and exposed under the bar will receive equal and even greater wear than the bar and will wear out as soon, if not faster, than the bar or pipe, and there will soon not be enough of the clip left to hold the tooth, which will be lost in the field. By our present invention we avoid this wear on the lower arm of the clip, thereby preserving the strength and life of the fastening and avoiding the loss of the tooth. In Fig. 2 it will be seen that the lower arm or member *b'* of the clip instead of passing under the bar, as heretofore, passes through a slot *a* in the bar. Thus the bar alone receives the wear, the clip being fully protected and preserving its full strength during the practical life of the frame.

In a fastener of this type in which a clip is used it is essential to get as much frictional contact between the clip, the bar, and the tooth as possible in order to make a secure grip. It follows that the clip should have a maximum height. Consequently the slot *a* of the bar should be as low down as is consistent with the wear of the bar; but it is also evident that whatever distance the slot is from the bottom that distance must be deducted from the bar in considering the twisting strain on the harrow-tooth—that is to say, if the slot *a* be punched one-quarter of an inch from the bottom that much should be added to the top of the bar and the bar would therefore be a quarter-inch wider in order to retain the same frictional gripping-surface for the parts and to be able to equally resist the twisting strain on the tooth. In any case, however, as the bottom of the bar would be entirely exposed to the wear of the sand it will wear out in time and the whole frame of the harrow would have to be renewed. For these reasons we prefer in order to secure the best results of our invention to add to the clip B a second clip, as shown in Fig. 3. In

this the clip B has its lower arm passing through a slot *a* in the bar, as it does in Fig. 2; but the slot is higher up in the bar. In addition to this clip, which we may term the "permanent" or "protected" clip, there is a second clip D, the top arm *d* of which passes through slot *a* directly under the lower arm of clip B. The bottom arm *d'* of clip D passes under the bar, and the arms of clip D are provided with holes in alinement with those of clip B, so that the tapering tooth C passes through all the arms and by its wedging action clamps the parts together. This second clip D may be termed the "replaceable" or "wearing" clip. Now although the lower arm of the second clip D by rolling in the sand will finally wear out there will still be enough of the fastening left—to wit, the entire protected and uninjured upper clip B—to hold the tooth in place and prevent it from being lost until a new wearing or second clip D can be put on, whereupon the harrow would be as good again as new. It is not the loss of the clip by wear which is the most serious disadvantage, for that can be easily renewed. The serious feature is the loss of the tooth, occasioned by the wear and weakening of the clip. In both forms shown—that in Fig. 2 and that in Fig. 3—the loss of the tooth is entirely guarded against, for the clip B, whether alone or in conjunction with a second clip, is always protected against wear and will always hold the tooth; but by the use of the second clip we are able to secure a maximum friction gripping-surface, thereby holding the tooth firmer and givingt he implement a decided advantage in hard or stony ground.

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

1. In combination with a harrow-tooth, and a slotted carrying-bar for the same, a clip bearing against one face of the bar, and having an upper and a lower arm extending beyond the plane of the opposite face of the bar, the lower arm passing through the slotted bar, both arms being provided with holes to receive the tooth.

2. In combination with a harrow-tooth and a slotted carrying-bar for the same, a clip bearing against one face of the bar, and having an upper arm passing over the top of the bar, and a lower arm passing through the slotted bar, both arms being provided with holes to receive the tooth.

3. In combination with a harrow-tooth and a slotted carrying-bar for the same, a clip bearing against one face of the bar, and having an upper and a lower arm extending beyond the plane of the opposite face of the bar, the lower arm passing through the slotted bar, and a second clip bearing against the bar under the first clip, and having an upper and a lower arm extending beyond the plane of the opposite face of the bar, the upper arm of said second clip passing through the slotted bar, the arms of both clips being provided with holes to receive the tooth.

4. In combination with a harrow-tooth, and a slotted carrying-bar for the same, a clip bearing against the upper portion of one face of the bar, and having an upper arm passing over the top of the bar, and a lower arm passing through the slotted bar, and a second clip bearing against the lower portion of one face of the bar, and having an upper arm passing through the slotted bar, and a lower arm passing under the bar, the arms of both clips having holes, to receive the tooth.

In witness whereof we have hereunto set our hands.

GLENN T. WILLIS.
JAMES PORTEOUS.

Witnesses:
JAMES GALLAGHER,
MILUS K. HARRIS.