(No Model.)

F. C. MERRILL.

HARROW.

No. 471,719. Patented Mar. 29, 1892.

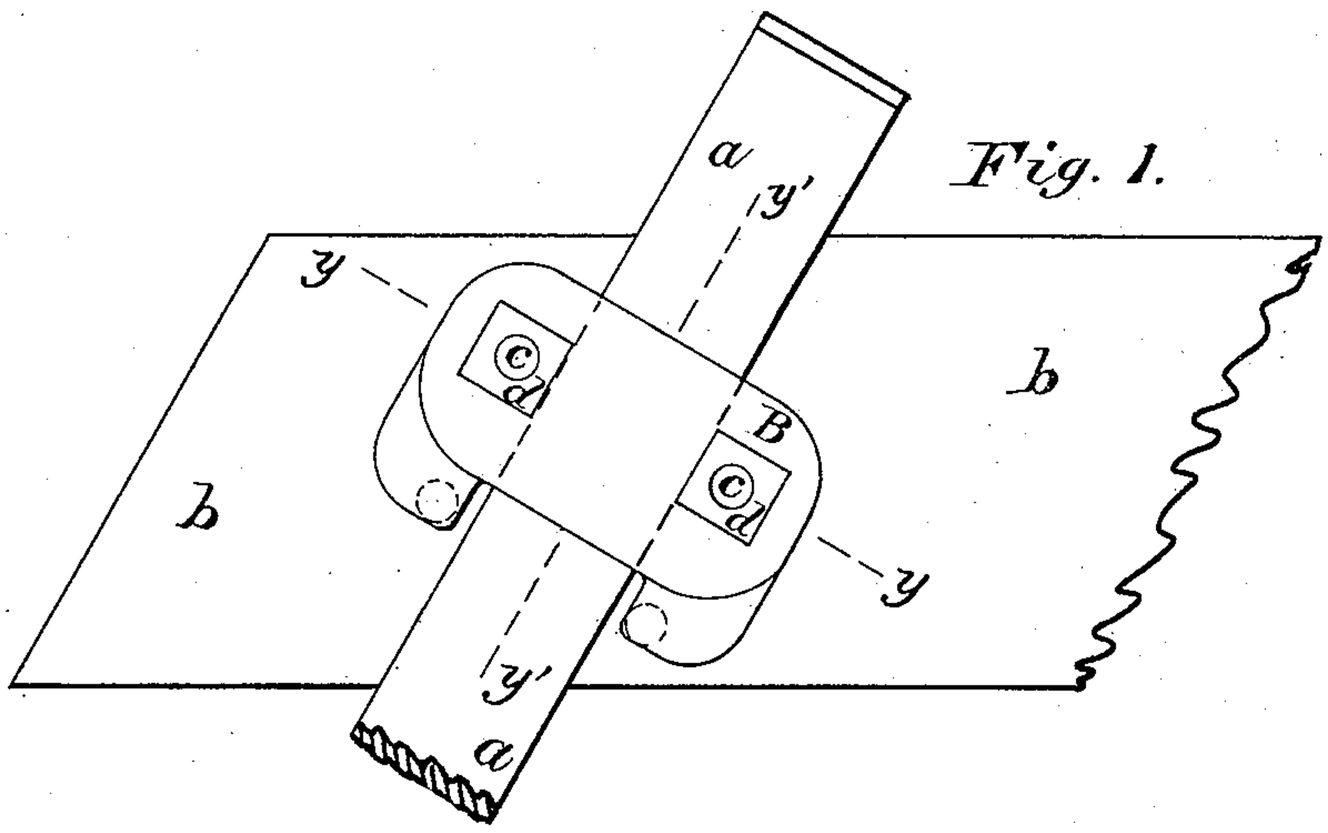


Fig. 1.

Fig. 2.

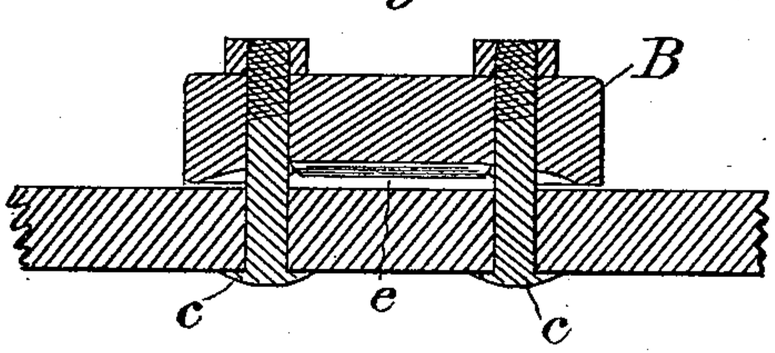


Fig. 3.

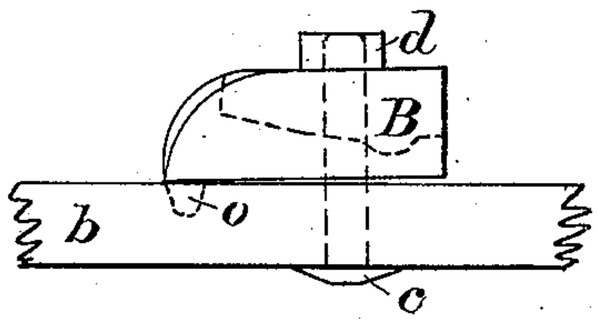


Fig. 4.

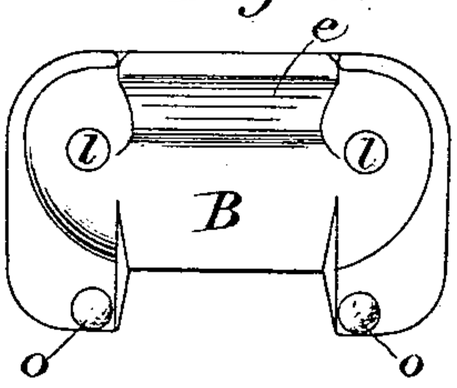
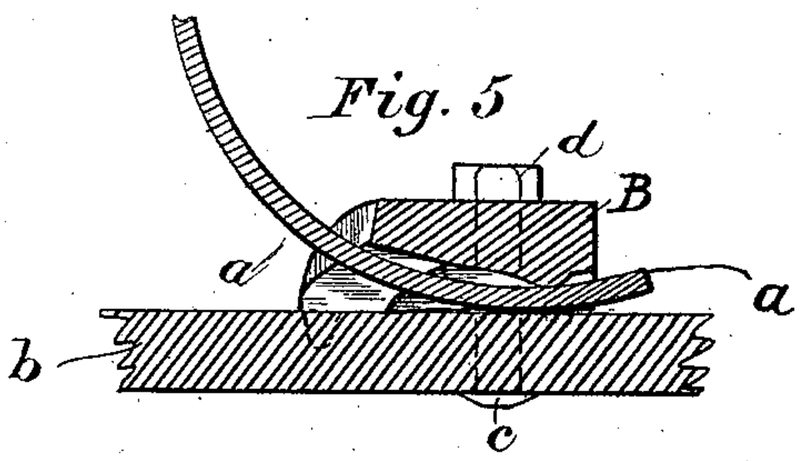


Fig. 5



Witnesses
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UNITED STATES PATENT OFFICE.

FREEMAN C. MERRILL, OF SOUTH PARIS, MAINE.

HARROW.

SPECIFICATION forming part of Letters Patent No. 471,719, dated March 29, 1892.

Application filed March 24, 1890. Serial No. 345,048. (No model.)

To all whom it may concern:

Be it known that I, FREEMAN C. MERRILL, a citizen of the United States, residing at South Paris, in the county of Oxford and State of Maine, 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.

My invention relates to an improvement in harrows, and particularly to harrows having spring-teeth.

My invention consists in improved means for fastening the teeth, in order that they may be adjusted so as to give their points more or less depression. This is effected by securing the curved tooth upon the surface of the frame and securing it thereon by a clip which engages it in a single transverse line and permits the tooth to be moved when the bolts or other means by which the clip is secured are loosened.

In the drawings, Figure 1 is a top plan of a portion of the frame provided with a tooth and clip. Fig. 2 is a vertical section of the same through the line *y y* of Fig. 1. Fig. 3 is a side elevation of the frame and clip. Fig. 4 is a bottom plan of the clip. Fig. 5 is a vertical section through the line *y' y'* of Fig. 1.

The tooth *a* is the ordinary curved or bow tooth having a curvature throughout its length.

B is the clip, of the general shape shown in the drawings. It is provided with bolt-holes *l l*, between which, on the under side, the metal is hollowed out from the front or toe of the clip to the rear or heel, (see Fig. 5,) leaving, however, slightly in the rear of the bolt-holes *l l* a ridge or bar *e* of metal, as seen in Figs. 2, 4, and 5. The distance between the bottom of the ridge *e* and the bottom of the clip should be somewhat less than the thickness of the tooth to be used. At the front or toe of the clip, upon the under side, may be placed the projections *o o*, (see Fig. 4,) if desired.

b is the frame of the harrow, the upper surface being preferably flat. In securing the tooth to the harrow, the end of the tooth is laid upon the surface of the frame and the clip laid upon it, as seen in Fig. 1. The bolts *c c* are passed up through the frame and held by the nuts *d d*, which upon being set down depress the toe of the clip upon the frame and force the ridge *e* firmly down upon the tooth. The tooth is thus rigidly held by means of the ridge *e*, which is in contact with the tooth in a single transverse line and directly above the bearing of the tooth on the frame, the tooth thus being permitted the greatest amount of play consistent with its being held in the same position. Adjustment is made in the obvious manner of loosening the bolts and sliding the tooth the required distance. If the tooth works loose, the nuts may be set down.

Strain upon the tooth when in use tends to raise the heel and force the toe firmly upon the frame, the bolts *c c*, as stated, being between the toe of the clip and the ridge *e*, and any desired pressure on the tooth may be obtained by tightening the nuts *d d*. Under no conditions of use, however, does the clip engage the tooth at any point, except in one transverse line, the clip being hollowed out on the under surface before and behind the ridge sufficiently for this purpose.

By forming the clip with a concavity on its under side an opening or space is formed, in which is located the binding ridge or rib. The shank of the tooth is passed under and between this ridge or rib and the frame, while the toe of the clip passes by and beyond the curve of the tooth upon either side and rests upon the frame. The bolts pass through the clip and frame upon each side of the tooth and between the contact of the ridge or rib with the tooth and bearing of the toes of the clip upon the frame firmly set up, and thus the clip holds the tooth rigidly upon the frame while at work.

What I claim as my invention is—

1. The combination of the tooth *a*, frame *b*, and clip B, the latter being hollowed out on the under side and having the ridge *e*, bolt-holes *l l*, and bolts *c c*, each passing through the clip between the contact of the clip with the tooth and with the frame, substantially as described, for the purposes set forth.

2. The combination of the curved tooth with the frame, the clip having the ridge *e*, and the bolts passing through the clip and the frame upon each side of the tooth and between

the contact of the ridge with the tooth and the contact of the toes of the clip upon the frame, substantially as set forth.

3. In combination with a harrow frame and tooth, a clip having a transverse ridge on its under side, and means for fastening the clip in place, said clip adapted to rest only at its toes on the frame and to hold the tooth in position between the clip and the frame by pressure of the ridge through its fastening means upon the tooth.

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 17th day of March, A. D. 1890.

FREEMAN C. MERRILL.

In presence of—

CHAS. A. HERSEY,

C. L. HERSEY.