(No Model.)

W. H. DUNGAN.

HARROW.

No. 318,095. Patented May 19, 1885.

Fig. 1.

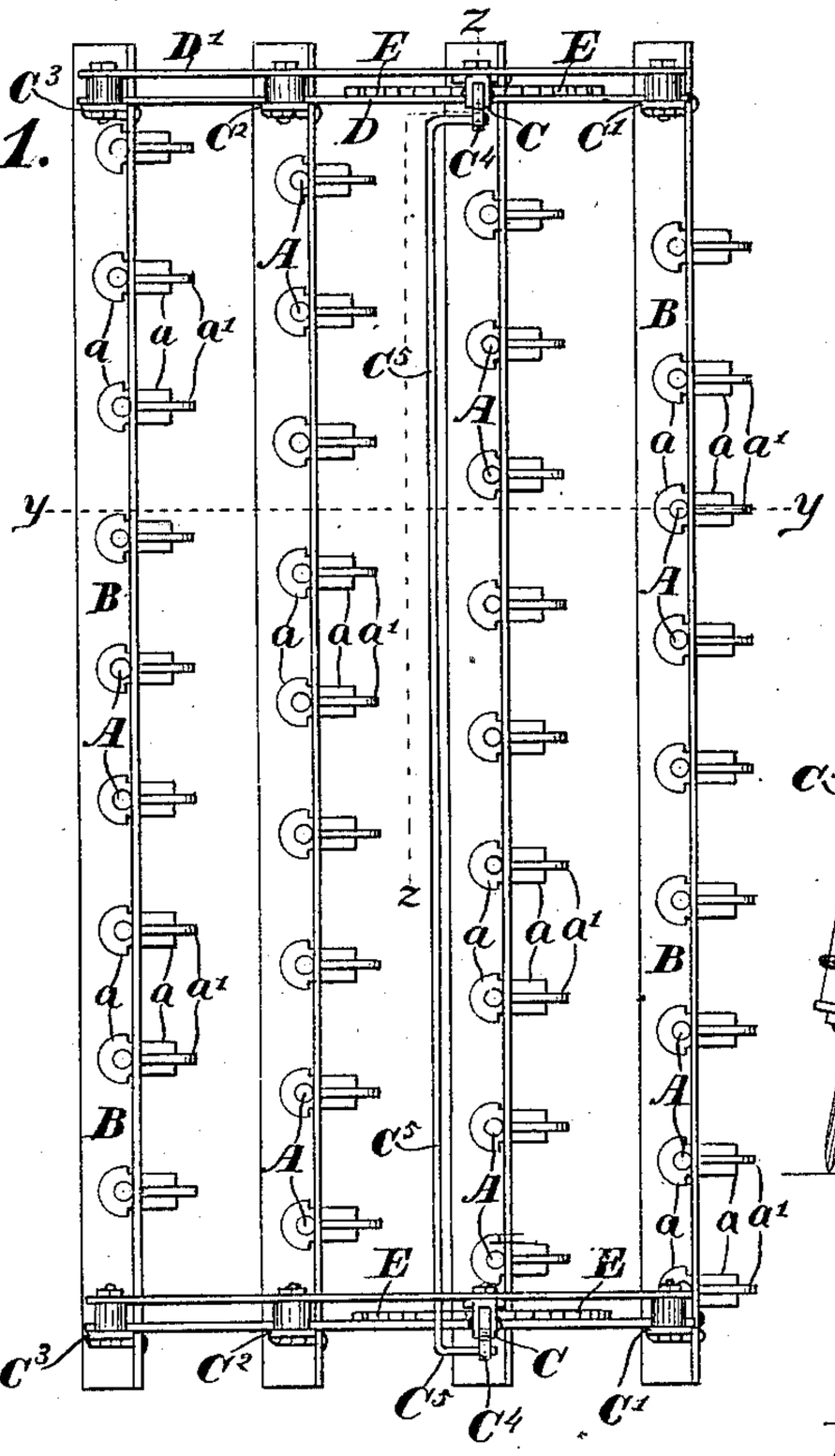


Fig. 2.

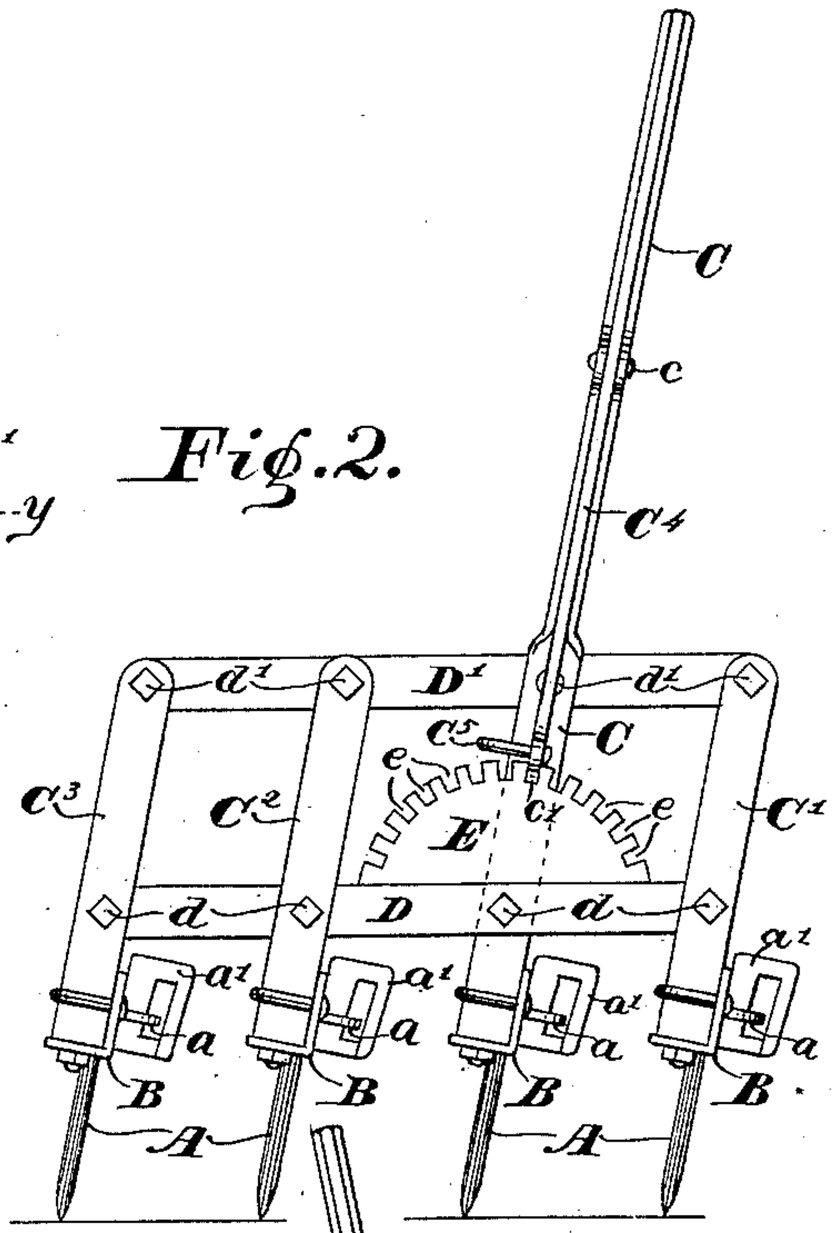


Fig. 3.

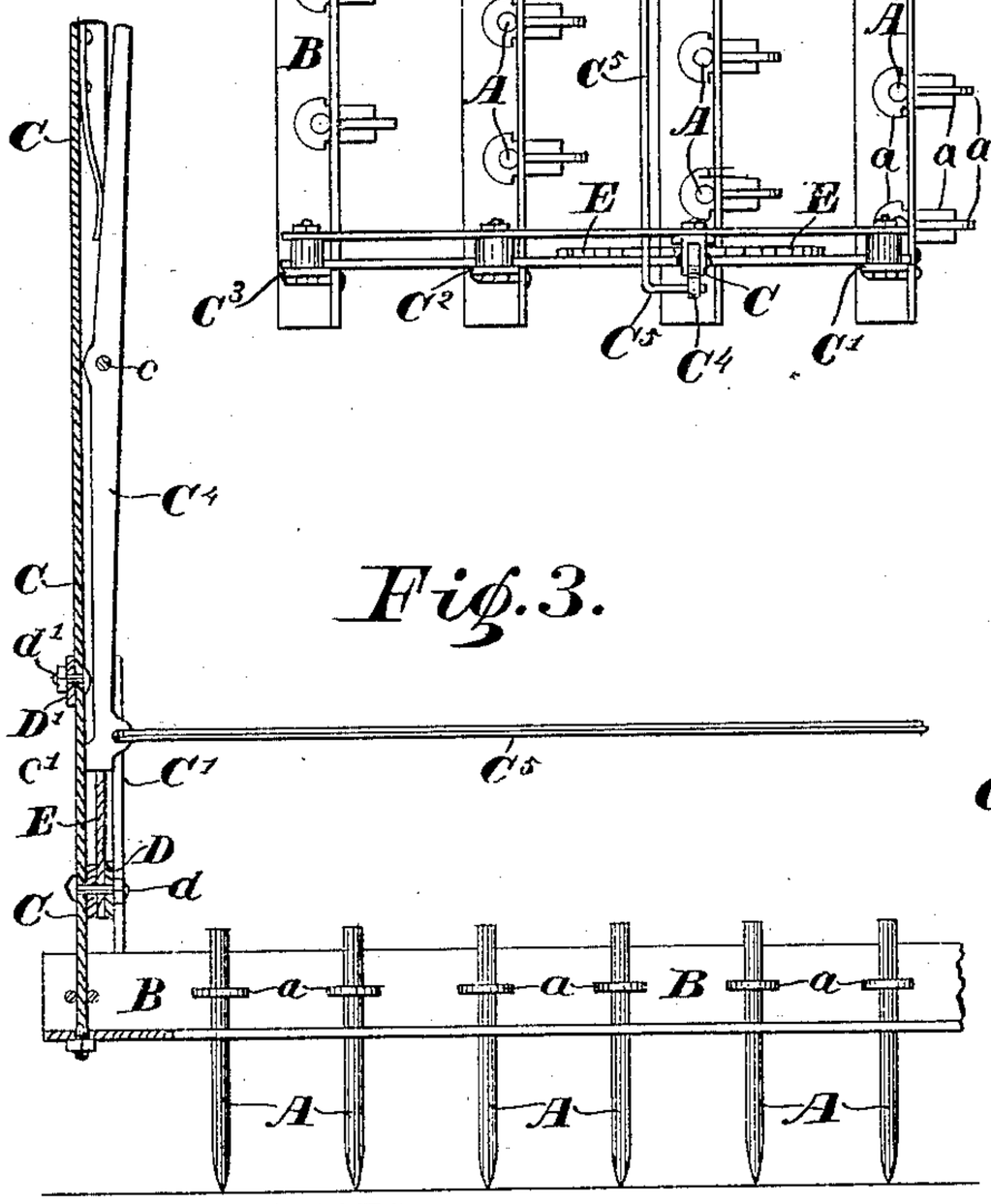
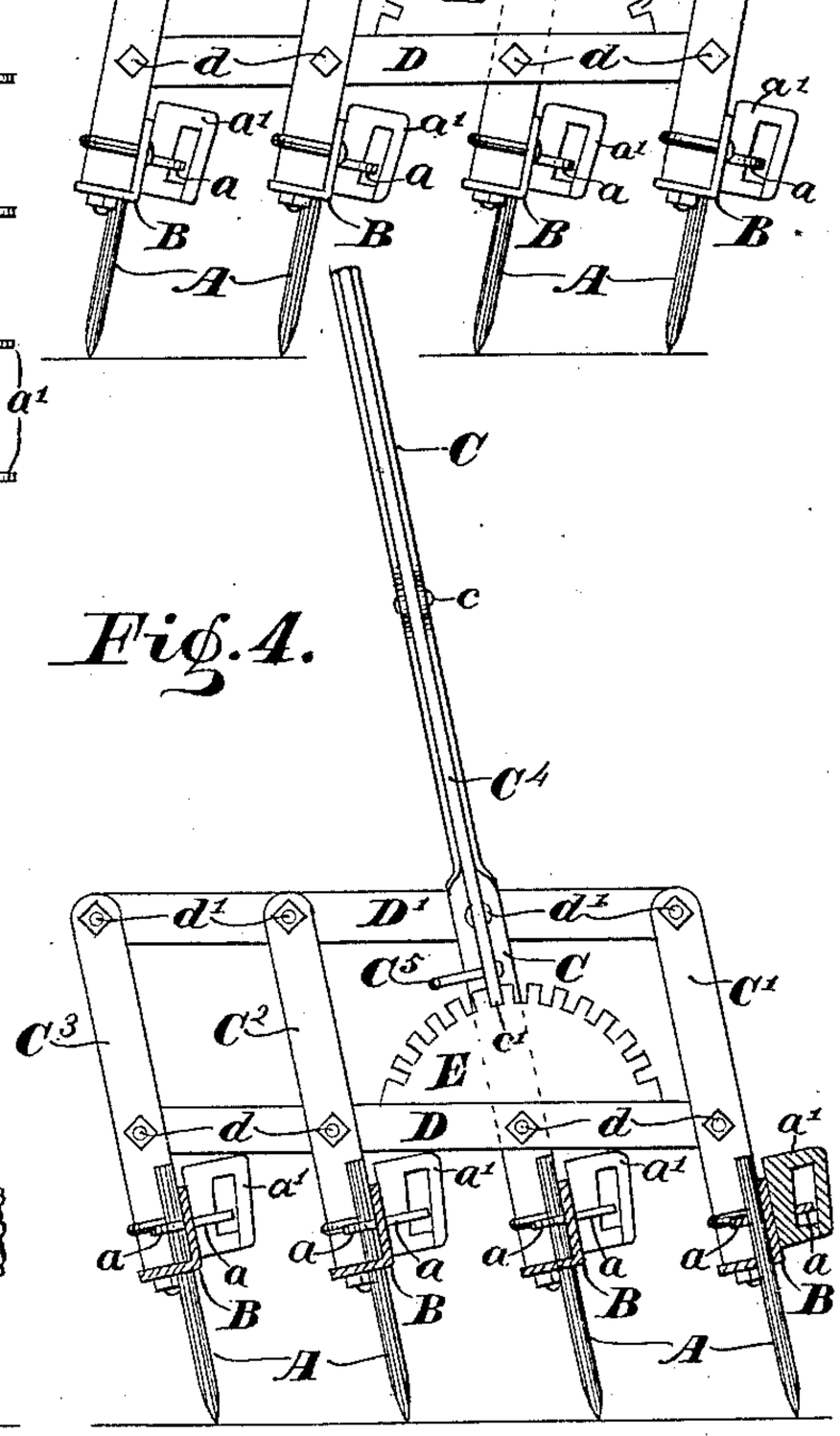


Fig. 4.



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HARROW.

SPECIFICATION forming part of Letters Patent No. 318,095, dated May 19, 1885.

Application filed June 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DUNGAN, of Rocklane P. O., county of Johnson, and State of Indiana, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

My said invention consists in certain improvements in the construction of harrows, whereby they are rendered reversible and adjustable, and whereby the teeth are adapted to be easily removed and replaced, as will be hereinafter more particularly described.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of a harrow embodying my said invention, the teeth and levers being in vertical position; Fig. 2, an end elevation of the same, the teeth and levers being inclined as when in use; Fig. 3, a longitudinal vertical sectional view looking toward the right from the dotted line *z z* in Fig. 1; and Fig. 4, a transverse vertical section on the dotted line *y y* when the position of the teeth, &c., has been reversed from that shown in Fig. 2.

In said drawings, the portions marked A represent the harrow-teeth; B, the bars or rails of the frame; C, upwardly-projecting levers connected to one of said rails; C′ C² C³, shorter levers or bars projecting upwardly from the other rails; D D′, cross-bars connecting said upwardly-projecting levers or bars together, and E a toothed segment. The teeth A are in themselves only ordinary teeth, but are provided with a peculiar fastening. This fastening consists of the clip *a* and link-wedge *a′*, the former of which encircles the tooth and passes through the rail B, and the latter of which passes down through said clip, alongside said rail, and draws it tightly against said tooth, thus clamping it between the clip and the rail, and holding it firmly in position. The clips are enlarged at the ends, through which the teeth pass, so that they will remain securely in the rails when the teeth are withdrawn. The wedges are formed like split links, so that when placed in the clips and sprung together they will be held there securely. This arrangement keeps all the other parts of the harrow in readiness for use, notwithstanding the removal or absence of any or all of the teeth, and secures said parts against loss. The bars or rails B are preferably constructed of angle-iron, as shown. They are provided with holes in their horizontal parts, through which the teeth pass, and with corresponding holes in their vertical parts, through which the clips pass, as will be readily seen by an examination of the drawings. They are secured together and operated as will be presently described. The levers C are secured firmly to one of the bars B, and extend up past the other frame-work and terminate in handles, whereby the harrow is adapted to be adjusted and reversed. The lower ends of these levers, together with the bars C′ C² C³, constitute the upright portions of the frame-work. Said upright portions are connected by the cross-bars D D′, and are secured thereto by the pivots *d d′*. The joints thus formed permit the position of the parts to be changed or adjusted by throwing the levers C back and forth, as will be seen by a comparison of Figs. 2 and 4 of the drawings. It will be understood, of course, that the limit of adjustment is not indicated by the positions shown by said drawings, but that the teeth may be adjusted to a much more nearly horizontal position in either direction, if desired. The frame is held in the position desired by an engagement between latches on the levers C and the notched segments E, as will be presently described. The bars D D′ are plain cross-bars, and serve to connect the upright portions C C′ C² C³, and thus maintain the proper distance between the bars or rails B. The bar D also serves to support the segment E. The segment E is an ordinary toothed segment or segmental rack, and serves to secure the levers C in position by means of the latches C⁴ on said levers, having engaging-points *c′*, which engage with the notches *e* on said segments. Said latches are pivoted to the levers by the pivots *c*, and are adapted to be thrown out of engagement by pressing the upper ends in toward the handles of said levers. Said latches are connected together by a rod, C⁵, which causes them to operate simultaneously, and thus engage or release both the segments at one operation.

The operation of my improved harrow may be recapitulated as follows: The teeth are first set at the desired angle by means of the levers, and secured by the segments and latches.

When it is desired to change or reverse the angle at which the teeth are set, the operator presses on one or both of the latches, thus disengaging them from the segments, and then moves the levers in the desired direction. When in position, the latches are released, and if, as is preferred, they are provided with springs, they automatically re-engage with the segments. The teeth are thus easily adjusted to any angle desired. By means of the clips *a* and wedges *a'* the teeth are also rendered separately adjustable, and may be used with as much or as little of their length projecting as is desired. In case it is desired to drag the ground more than to harrow it, they can be arranged to project very slightly, and the rows can be arranged to project to different lengths. In short, any adjustment may be made that may be wished for to accommodate the requirements of different soils or different crops.

In the construction I find angle-iron to be a superior material for the bars, being both light and strong, and easily prepared for use.

I am aware that mechanism for varying the angle of the teeth has heretofore been employed in harrows; I am also aware that angle-iron has been used for bars of harrow-frames, and that clips and wedges have heretofore been employed in securing harrow-teeth to the bars of the frames, and I do not therefore claim such devices, broadly; but,

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a harrow, of the teeth A, bar B, formed of angle-iron, said bar having a perforation in its horizontal part, through which the teeth are inserted, and clips *a* in its vertical part, which surround the upper end of said teeth, said clip *a*, and the link-shaped wedge *a'*, inserted in the rear end of said clip behind the rear face of the vertical portion of the bar, as a means for drawing said clip tightly against the tooth and securing it in position, substantially as set forth.

2. In a harrow, the combination of the teeth A, angle-iron bars B, clips *a*, and wedges *a'*, as a means for securing said teeth in said bars, levers C, connected to one of the bars B at their lower ends, uprights C' C^2 C^3, extending up from said bars B, cross-bars D D', connecting the levers C, and uprights C' C^2 C^3, segments E, and a bar, C^5, connecting a latch upon the lever at one end of the harrow with a similar latch at the other end, whereby both latches may be disengaged simultaneously and from one side of the harrow, said several parts being arranged and operating substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 14th day of June, A. D. 1883.

WILLIAM H. DUNGAN. [L. S.]

In presence of—
C. BRADFORD,
CHAS. L. THURBER.