E. KNAPP.

Horse Hay-Rake.

No. 202,833. Patented April 23, 1878.

Fig. 1.

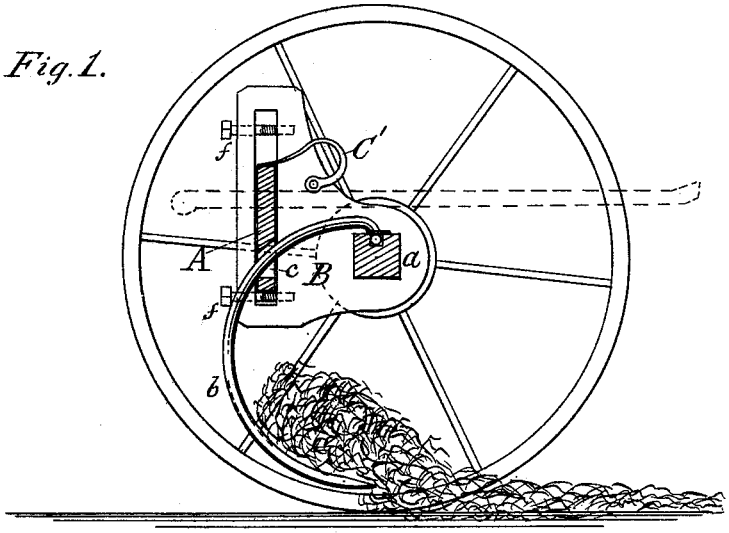


Fig. 2.

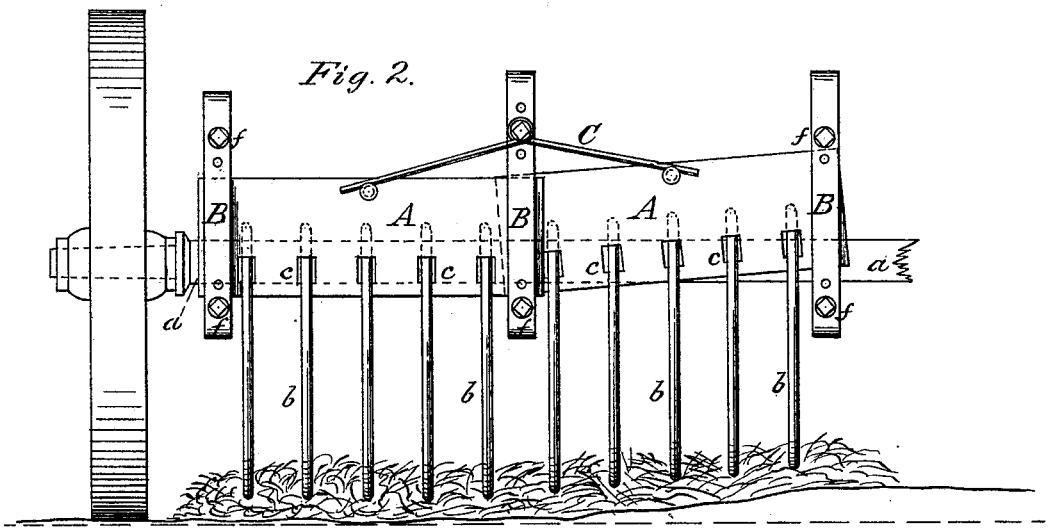
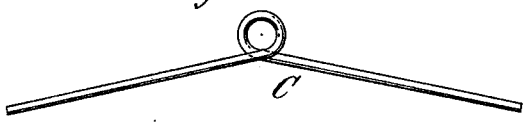


Fig. 3.



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EDGAR KNAPP, OF STANFORDVILLE, NEW YORK.

IMPROVEMENT IN HORSE HAY-RAKES.

Specification forming part of Letters Patent No. **202,833**, dated April 23, 1878; application filed January 3, 1878.

To all whom it may concern:

Be it known that I, EDGAR KNAPP, of Stanfordville, Dutchess county, New York, have invented certain new and useful Improvements in Horse Hay-Rakes, of which the following is a specification:

The chief object of my invention is to provide a means by which the rake-teeth may automatically adjust themselves in an effective manner to the irregularities of the ground over which they pass; and the leading features of the invention consist in an improved finger-board, which governs the teeth, so hung or arranged in its supports as to be capable of rising bodily or of yielding obliquely at either end to the action of the teeth, in correspondence with the irregularities of the ground over which they pass, the said finger board or boards being arranged in independent sections, supported at either end in slotted arms, and depressed by springs, which are centrally pivoted, and bear at each end on the centers of two adjoining boards, by which an equalizing effect is produced, as hereinafter set forth.

The annexed drawings present views of as much of a horse-hay-rake as is necessary to illustrate my invention.

Figure 1 is a view transversely of the axle, and Fig. 2 is a view lengthwise of the same.

The axle *a* is constructed and arranged in the usual way, and provided with the usual number of twenty teeth, *b b*, arranged at equal intervals along the axle, a portion only being shown. For the purposes of my invention I divide these twenty teeth into a number of independent sections, preferably into four sections of five teeth each, two of which sections are shown in the drawings. The teeth *b b* are pivoted to the axle at *e*, Fig. 1, in the usual manner, and each tooth is free to turn on this pivot, so as to freely rise or fall; but their rise or position is governed by the adjustable finger-boards A A, in and around which the essence of my invention consists.

The boards A A, as shown, extend parallel with the axle, and are provided with the usual slots or openings *c c*, through which the teeth pass, each board governing one section of teeth, and being independent of the other. The boards are supported at each end by slotted arms B B, which extend from and are fixed to the axle *a*, and they are free to move up and down in the slots of these arms; but the boards are pressed down, to hold the teeth to the work, by strong springs C, Fig. 2, which may be of the flat kind shown, secured at the center to one of the arms B, extending in opposite directions, and bearing on the centers of the adjoining boards A A; or the springs may be of the spiral form and bear at each end of the boards, or of the form shown at C′ in Fig. 1, or of any other equivalent construction. The springs C are, however, preferably pivoted at the center, and adjustable up or down on the arms B, to regulate their pressure on the boards, and they are made preferably in the manner shown in Fig. 3—viz., of strong spring-wire, wound in a coil at the center, and extending straight and equally in opposite directions, this form being very simple, cheap, and effective.

It will now be understood that as the boards A A are free to rise in the slotted arms B at either of their ends, they thus permit the rise of the teeth at either one end of the section or the other, or the whole section of teeth can rise up bodily, according as the irregularity of the ground occurs at one end of the section or at the other, or uniformly along one whole section of teeth, the springs in either case holding the teeth to the work in an equable manner, whether such rise of the teeth occurs on a slanting or one-sided direction, as shown on the right of Fig. 2, or otherwise.

It will be observed that the effect of the spring C being pivoted at the center and bearing at either end on the centers of the two adjoining finger-boards is to transfer and equalize the pressure over the two adjoining sections of teeth, so that although one section may rise and the other remain down, yet the same pressure will bear on one as on the other, notwithstanding their different positions—a result of considerable importance.

The whole number of the rake-teeth being thus divided into separate sections, each governed by an independent automatically-adjusting finger-board, the teeth along the whole line of the axle can thus adjust themselves in a perfect manner to the exact outline of the ground over which they pass.

Instead of the springs C, the position of the

boards may be governed from the driver's seat by a foot-lever bearing on the boards, as indicated by dotted lines in Fig. 1, or by a cord extending from the finger-board to the seat; but the arrangement shown is much preferred.

By means of the bolts or fastenings *f f*, the finger-boards may be raised more or less in the slots of the arms, so as to hold the points of the teeth at any required distance from the surface of the ground, and prevent their descent below this; and in heavy raking, where it is desired to have the teeth rigid and not automatically yielding, the finger-boards may be locked rigidly in the slots at the desired height by the bolts *f f*, and by a proper disposition of these fastenings any degree of play or rigidity may be given to the finger-boards.

What I claim as my invention is—

1. In a hay-rake, an automatically-adjusting finger-board, which controls a series of teeth, and which is so hung in its supports as to be capable of rising bodily, and of yielding obliquely at either end to the action of the teeth, in correspondence with the irregularities of the ground over which they pass, substantially as herein set forth.

2. In combination with the axle *a* and teeth *b b*, an adjusting sectional finger board or boards, A A, capable of rising bodily or obliquely, and depressed by springs C, pivoted at their centers, and bearing at each end on the centers of the adjoining finger-boards, substantially as and for the purpose herein set forth.

3. The combination, with the axle *a* and teeth *b*, of the adjusting finger-boards A and slotted arms B B, substantially as herein set forth.

4. The combination, with the axle *a* and teeth *b*, of the adjusting finger-board A, springs C, and slotted arms B B, substantially as herein set forth.

5. In a hay-rake, the centrally-pivoted and oppositely-extending spring C, in combination with the movable finger-boards A A, substantially as set forth.

EDGAR KNAPP.

Witnesses:
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