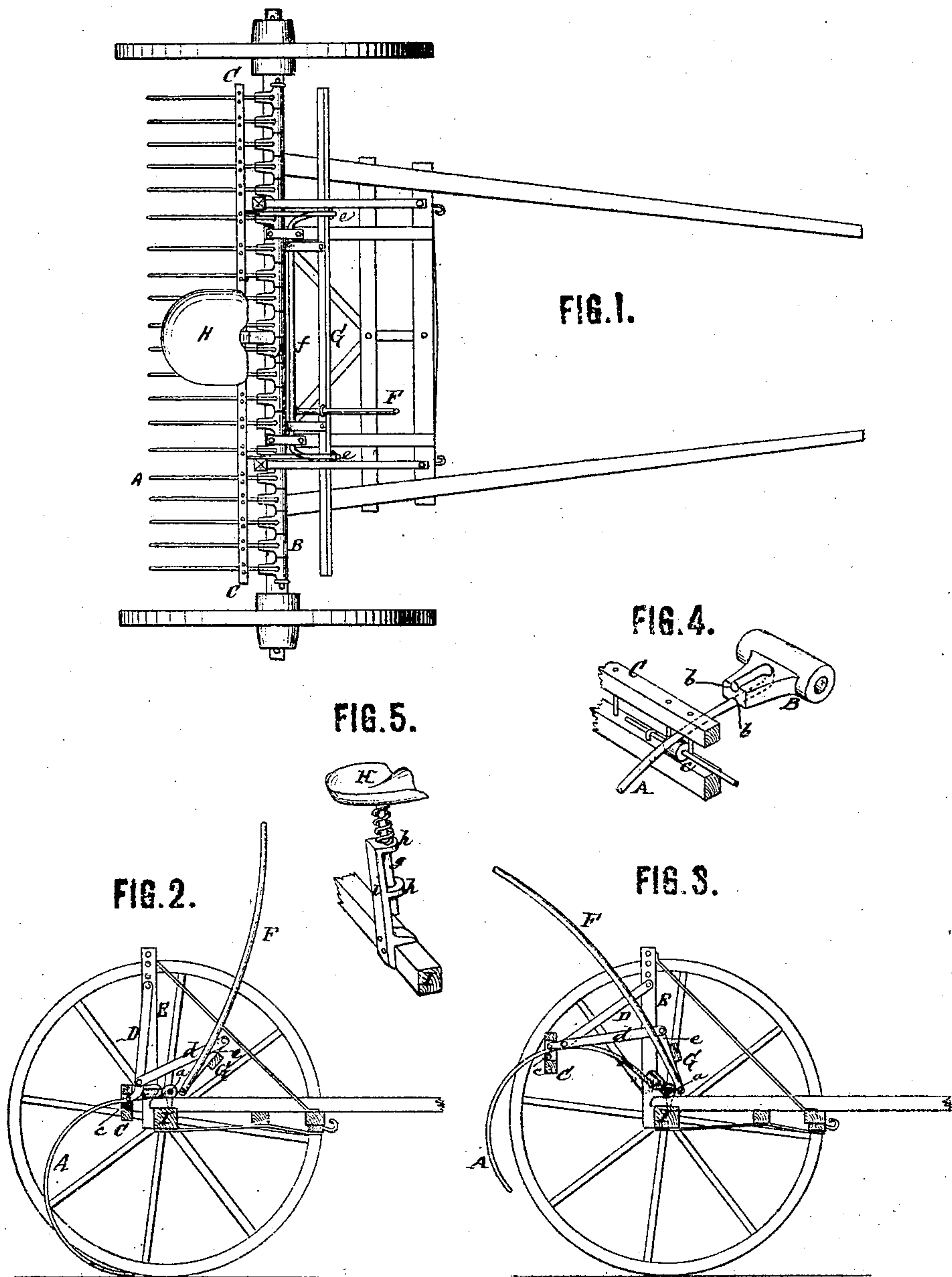


E. Zimmerman, Horse Rake.

No. 103,815.

Patented May 31, 1870.



Eli Zimmerman
by his Attorney
A. P. Pollard

WITNESSES.

W. Bailey
O. H. McCarroll

United States Patent Office.

ELI ZIMMERMAN, OF PAMELIA FOUR CORNERS, NEW YORK.

Letters Patent No. 103,815, dated May 31, 1870.

IMPROVEMENT IN HORSE HAY-RAKES.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, ELI ZIMMERMAN, of Pamela Four Corners, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Horse-Rakes; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 is a top view of a machine made in accordance with my invention;

Figure 2 is a vertical section of the same, representing the rake-teeth lowered;

Figure 3 is a like section, representing the rake-teeth raised.

Figure 4 is a view, on an enlarged scale, of one of the rake-teeth, and a portion of the reed by which the same is elevated and lowered, representing also the mode of uniting the tooth with its eye.

Figure 5 is a view of the driver's seat.

My invention consists of the combination with the teeth of a horse-rake and the reed by which said teeth are actuated, of a system of levers, arranged substantially as hereinafter described, to effect the movements of the reed, and the consequent elevation and lowering of the teeth.

The rake-teeth A are hinged, independently of one another, upon a suitable head or shaft, a.

Each tooth is united with an eye, B, which is formed with a sleeve, so as to fit upon the head a.

In order to unite the tooth and eye I form in that portion of the latter which projects from the sleeve an opening or socket, and two grooves or depressions on its top and bottom faces.

The end of the tooth is passed through the socket or opening, and is then bent, so as to enter and fit in both the top and bottom grooves b, as shown in fig. 4. This is all that is needed to properly hold the tooth, and I find that it forms a firm, secure, and cheap fastening, and one which will admit of the ready removal of the tooth whenever desired.

The teeth pass through a reed, C, a portion of which is shown on an enlarged scale in fig. 4, each tooth passing between wires extending between the top and bottom rails of the reed in the usual way.

In order to lessen the friction on both the reed and teeth, I arrange, in the reed and under the teeth, small friction-rollers, c, over which the teeth run when the reed is moved back and forth.

The reed is suspended from swinging arms, D, pivoted or hinged at one end to the reed, and at the other to standards, E, erected upon the frame of the machine.

Near the lower ends of the arms are pivoted connecting-rods, d, whose forward ends are pivoted to vibratory arms, e, formed on the horizontal rod f, which

is mounted in suitable bearings on the frame of the machine, and has connected with it a lever-handle, F, by means of which the rods, arms, and reed are actuated.

The devices described constitute, in effect, a system of levers by which the reed is swung back and forth in a path having for its axis the pivot which unites the arms D with their supporting standards, and the joints formed by the union of the different members of this system with one another are so arranged as to admit of the reed being readily operated to discharge the hay, while, at the same time, the teeth are held very securely in either of the positions represented in the drawing.

In fig. 1 the lever-handle F is thrown forward, drawing with it the connecting-rods d, and, consequently, the swinging arms D, thus causing the reed to be drawn near to the rake-head, and to hold the teeth in position to gather the hay.

While the teeth are thus, as a body, held to their work, they are, nevertheless, owing to being hinged independently of each other to the head, capable of a limited up and down play in the reed, which allows them to yield to any slight obstruction or unevenness of the ground.

The arrangement of the levers is such that the reed is held in its forward position without the need of other locking or holding devices, while the teeth are gathering the hay. As soon as sufficient hay has been gathered the lever is drawn back to the position shown in fig. 3, thus forcing back the arms D, by means of the connecting-rods d, and causing a backward and upward movement of the reed in the path above indicated, and the reed is thereby caused to lift the teeth in a body to a height sufficient to cause the discharge of the hay, after which the lever-handle is pushed forward to the position shown in fig. 2, and the teeth are again in operative position.

A bar or rail, G, may extend between and connect the upper ends of the lever-arms e, so as to give greater stiffness to the parts, and to serve also as a treadle, upon which the foot of the driver may be pressed, so as to bring the reed forward, and to hold it in such position, beyond the possibility of disturbance.

The standards E have a series of holes or sockets formed in their upper ends for the reception of the bolts or pivots upon which the arms D are hung.

By changing the bolts from one to the other of these holes, the arms D may be lifted or lowered, and the teeth can, consequently, be set at any desired distance from the ground, thereby enabling them to be used with any sized wheels, and also adapting the machine to be used on stubble as well as on sward ground.

The driver's seat H, as shown in fig. 5, is supported

upon the end of a bar, *g*, which plays up and down in two sockets, *h*, formed in ears projecting from the metallic frame *i*, the base of which is fixed to the axle *I*, or other suitable part of the machine. A spiral or other spring surrounding the bar *g*, and interposed between the frame *i* and the seat, gives the necessary springiness to the latter.

Having now described my invention, and the manner in which the same is or may be carried into effect,

What I claim, and desire to secure by Letters Patent, is—

1. The combination with the rake-teeth and the reed of the system of levers, arranged substantially as herein described, to effect the movements of the reed, and consequent elevation or lowering of the teeth.

2. In a rake having the reed and teeth combined with a system of operating levers, arranged as described, the combination of the swinging arms which hold the reed, with their supporting-standards and series of sockets formed therein for the reception of the pivots of the said arms; whereby the reed and teeth may be set at any desired distance from the ground, as and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

ELI ZIMERMAN.

Witnesses:

A. E. YORK,

D. P. SMITH.