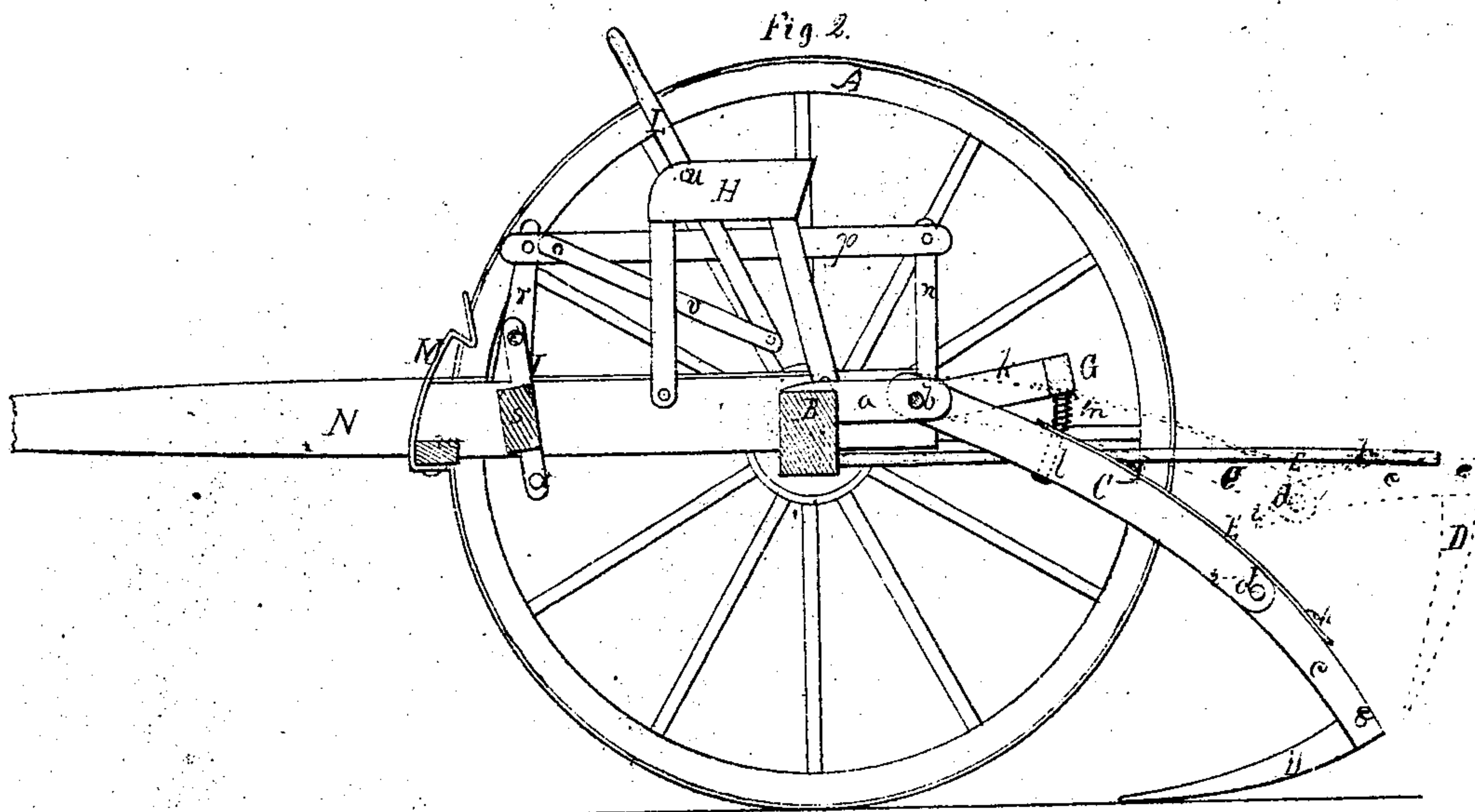
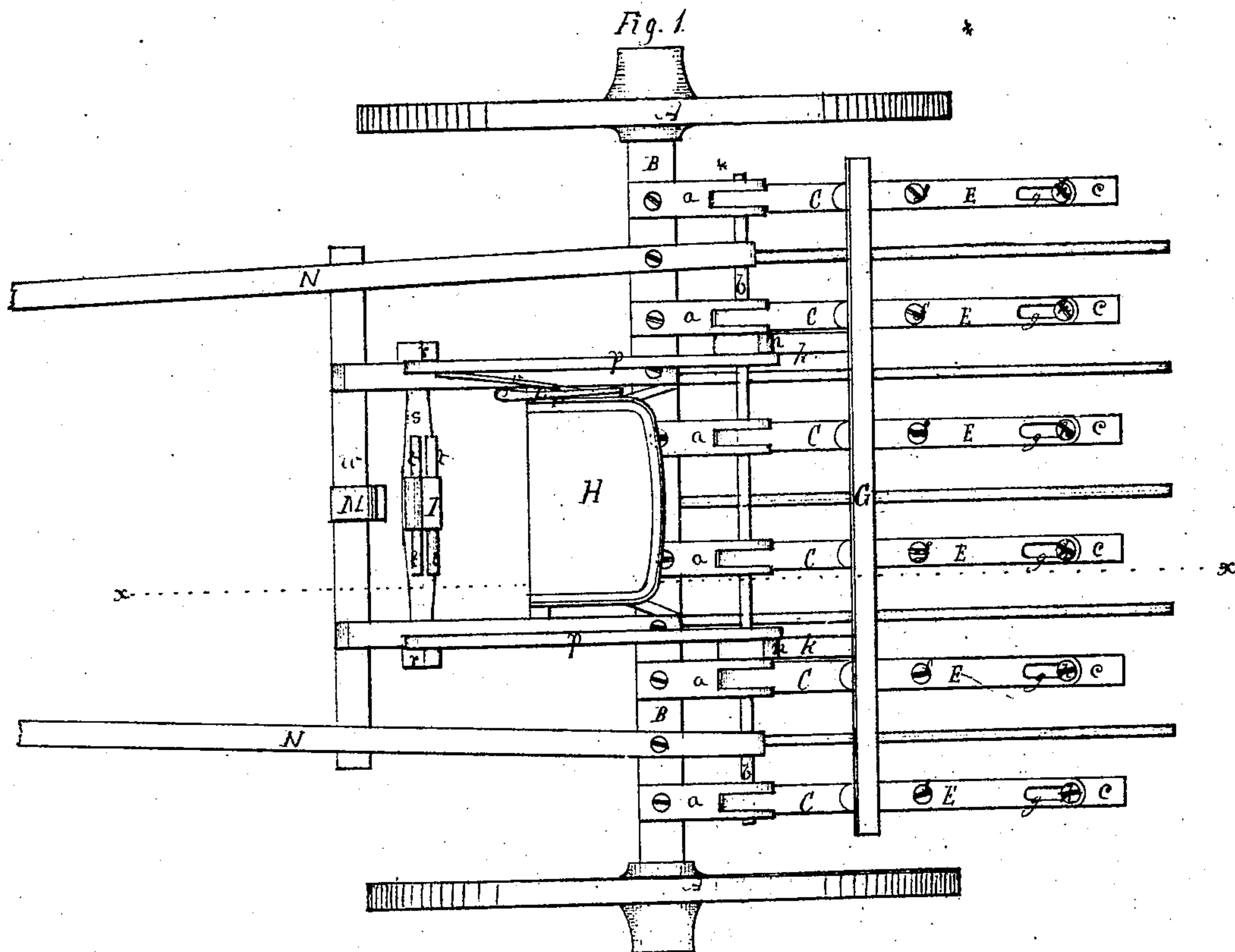


J. K. O'Neil, Horse Rake.

No. 99,939.

Patented Feb 15, 1870.



Witnesses:

J. S. Brown,
D. J. Brown

John K. O'Neil

United States Patent Office.

JOHN K. O'NEIL, OF KINGSTON, NEW YORK.

Letters Patent No. 99,939, dated February 15, 1870.

IMPROVEMENT IN HORSE HAY-RAKES.

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

To all whom it may concern:

Be it known that I, JOHN K. O'NEIL, of Kingston, in the county of Ulster, and State of New York, have invented an improved Horse Hay-Rake; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings making part of this specification,

Figure 1 being a top view of a horse hay-rake constructed with my improvements.

Figure 2, a longitudinal vertical section thereof, in a plane indicated by the line *x x*, fig. 1.

Like letters designate corresponding parts in both figures.

The rake is mounted on wheels A A, upon the axle B of which are secured blocks *a a*, where to the bars or heads C C of the rake-teeth D D are severally pivoted around a pivot rod or rods, *b*.

In order to allow the rake-teeth D D to yield separately on striking an obstruction, I joint the bars C C at points *d d*, preferably at a shorter distance from the upper ends *c c* of the rake-teeth than the length of the said teeth extend, and I cover the joints by springs E E, which are secured upon the upper sides of the bars, most properly extending the greater part of the length of the said bars, and having their forward ends rigidly attached to the main parts of the bars by screws *f f*, or their equivalent, while the rear ends thereof, overlapping the short jointed pieces *c c* of the bars, are provided with longitudinal slots, *g g*, that play on screws or bolts *h h*, driven into the said jointed pieces.

The joints of the bars at *d d* are of such form, as shown at *i*, or otherwise, that the bars cannot bend downward beyond their proper form, as shown in fig. 2, but that they can bend freely upward, having only the force of the springs E E to resist them. This force of the springs should be sufficient to hold the rake-teeth firmly, and without yielding, to their work, as long as only the hay resists their advancement, and yield only to a real obstruction. By thus rendering the springs inactive except when an obstruction overcomes their force, an important advantage is gained over springs which continually act on the teeth, and yield in proportion to the resistance of the hay as well as to obstructions, and, for the same reason, over rake-teeth or bars which are elastic in themselves.

The form which the springs assume in yielding is indicated clearly in fig. 2 by dotted lines.

The slots *g g* allow the required flexure of the bars, and at the same time, in connection with the screws or bolts *h h* and the rigid attachment of the forward ends of the springs to the main bars, hold the rake-teeth firmly against lateral yielding.

The location of the joints *d d* so near to the rake-teeth causes a rapid change of the angle of the teeth in yielding, so that though when running they incline forward

nearly in a horizontal direction, they rapidly change to a vertical position, or even to an inclination backward from a vertical line, and thus quickly and easily free themselves from obstructions. This is a valuable feature of the invention. I am thus enabled to give elasticity and facility of yielding to obstructions, to rake-teeth running on the ground nearly in horizontal positions, a thing impracticable to accomplish with elastic rake-teeth or with other elastic arrangements of yielding rake-teeth, and thereby am enabled to employ such horizontal teeth, so desirable to use.

In order to give the horizontal position to the rake-teeth, and yet have sufficient length of teeth-bars C C and avoid an acute angle between the bars and their teeth, the said bars are curved downward, as shown in fig. 2, particularly at the rear ends. The purpose is thus easily and well accomplished.

The rake-teeth are held down to their work together by means of a cross-bar, G, which is pivoted by arms *k k* around the pivot rod *b* of the teeth-bars. From this cross-bar curved bolts *l l* extend downward into and through the teeth-bars, as represented; and in order that the bars may have room and capability of rising separately to a certain extent when yielding to an obstruction, as shown by dotted lines in fig. 2, there is a certain distance between the cross-bar and the teeth-bars for the reception of coiled springs, *m m*, which will yield and allow the teeth-bars to play upward on their bolts *l l*, while the other bars remain pressed down to their work. This cross-bar also serves, by means of the curved bolts *l l*, with heads below the teeth-bars, to lift all the rake-teeth simultaneously from the ground when required. The mechanism for raising and lowering the cross-bar is connected therewith by means of arms *n n*, projecting upward from the pivoted arms *k k*, and connecting bars or rods *p p*, extending forward to vibratory arms *r r*, which project upward from the shaft *s* of a treadle, I, situated at a proper position in front of the driver's seat, H. This treadle extends both above and below its shaft, so that the feet of the driver may act either to raise the rake-teeth by pressing against the upper end of the treadle, or to hold the rake-teeth down to their work by pressing against the lower end of the treadle. Pins *t t* project from the sides of the treadle, as shown, on which to rest the feet in controlling the rake.

In addition to the foot-treadle for raising and lowering the rake-teeth, a hand-lever, L, is employed for the same purpose, it being pivoted at *u* to the side of the driver's seat, and connected by a rod, *v*, with one of the bars or rods *p p*, as shown. This lever is generally used in connection with the treadle I, the action upon it by drawing back with the arm, while that upon the treadle is by pressing forward with the feet, to raise the rake-teeth from the ground, being very advanta-

geous to the operator in applying his strength, since one action braces the other.

A spring-catch, M, being attached to a cross-bar, *w*, between the thills N N of the rake, and catching over the treadle I when the rake-teeth are completely raised, serves to hold the same up when required. It is readily detached by the foot. Any equivalent device for the purpose may be employed.

Any other form or arrangement of springs which will fulfil the same purpose may be used instead of the flat springs E E. So, also, the joints *d d* may be constructed or produced in any equivalent manner.

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

The jointed teeth-bars C C, substantially as and for the purpose herein specified.

Also, the downwardly curved jointed teeth-bars C C, in combination with nearly horizontal rake-teeth D D, substantially as herein represented and described.

Also, springs E E, in combination with jointed teeth-bars C C, substantially as and for the purpose herein set forth.

Specification signed by me December 8, 1869.

JOHN K. O'NEIL.

Witnesses:

JOS. BROWN,

D. J. BROWN.