

(No Model.)

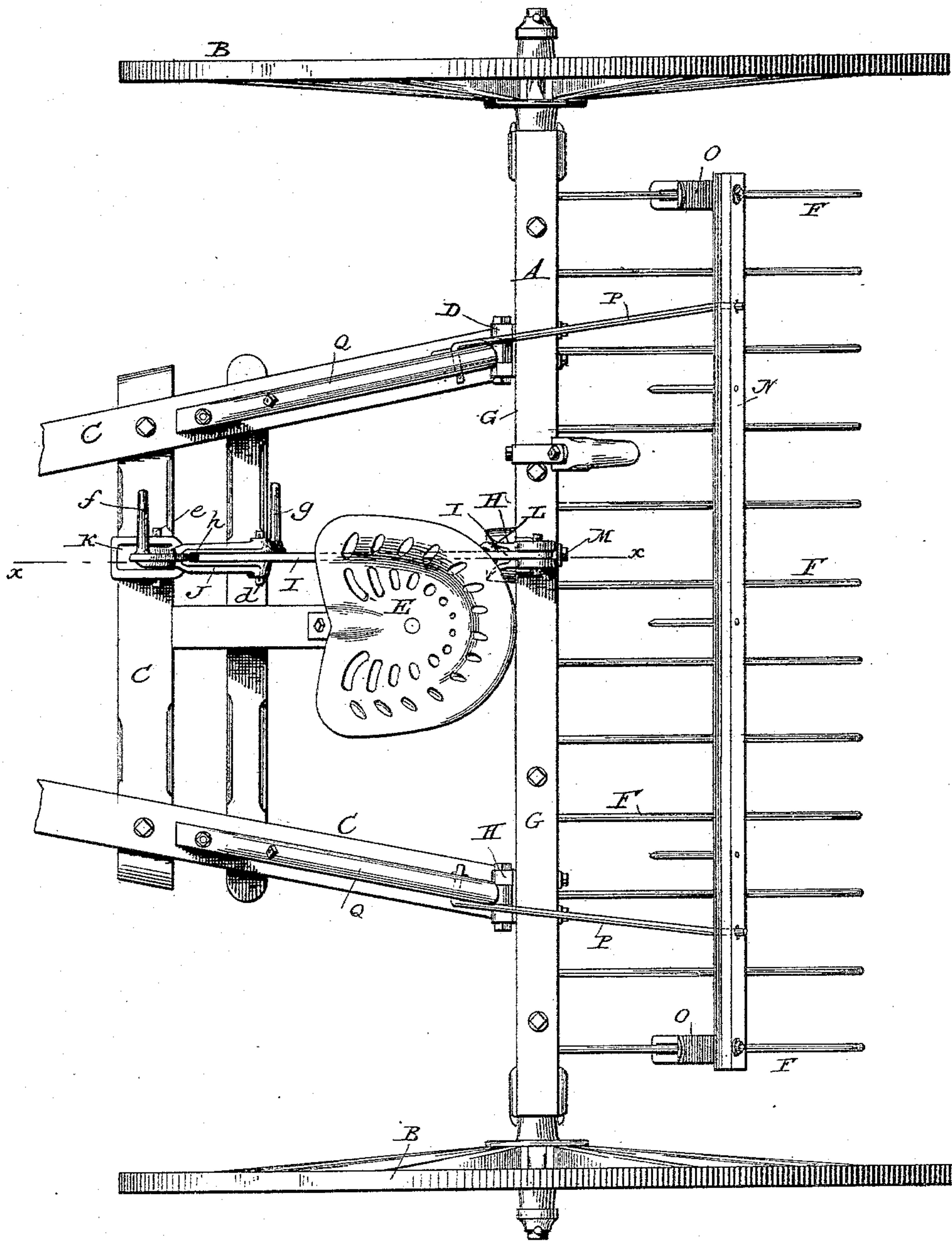
2 Sheets—Sheet 1.

P. P. MAST & G. W. STARTZMAN.
HORSE HAY RAKE.

No. 356,596.

Patented Jan. 25, 1887.

Fig. 1.



Attest.

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Fig. 2.

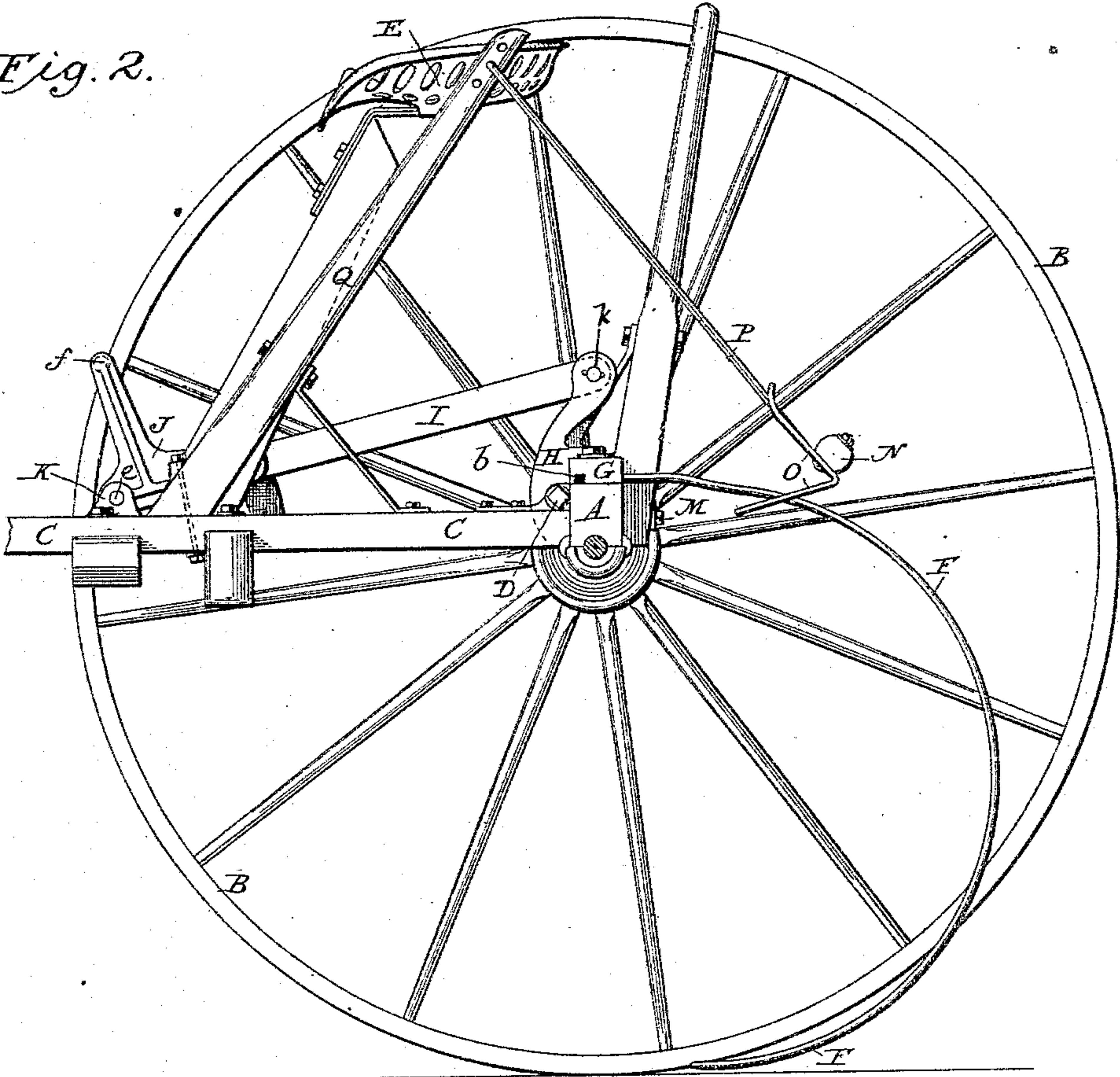


Fig. 3.

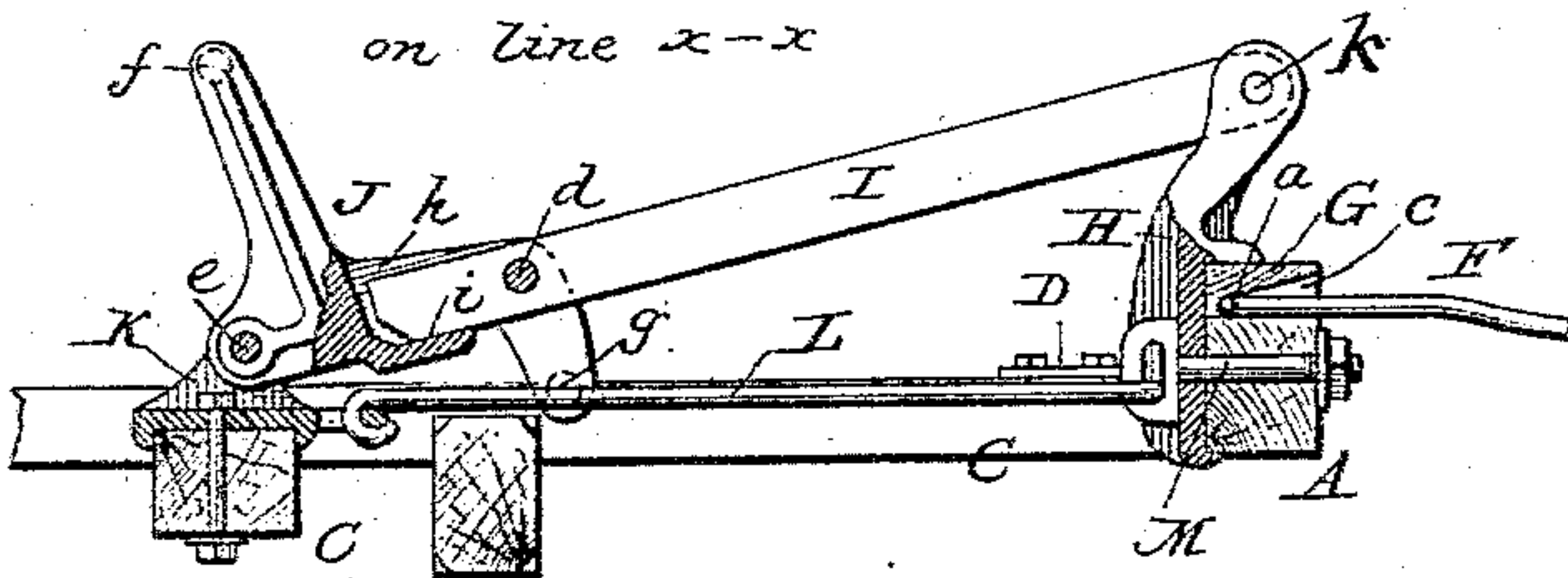


Fig. 4.

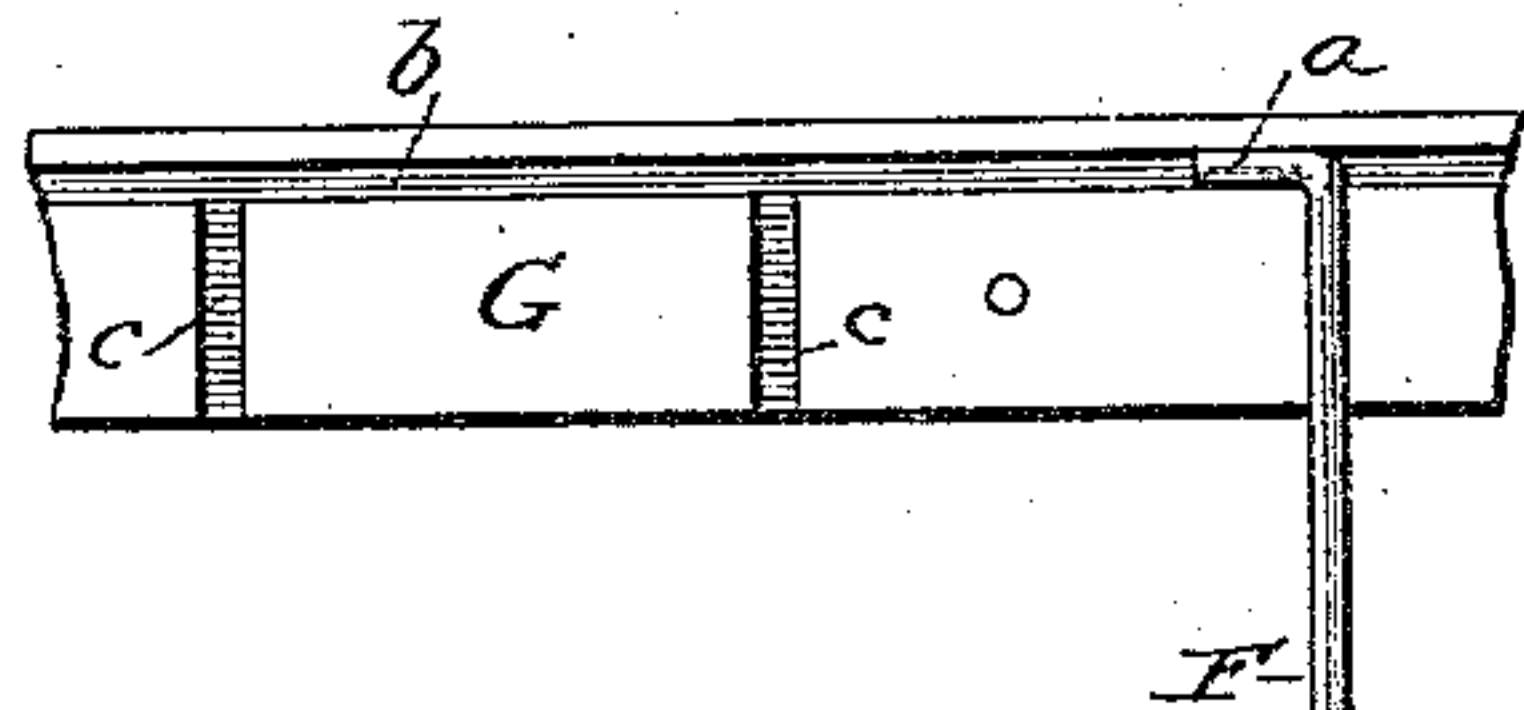


Fig. 6

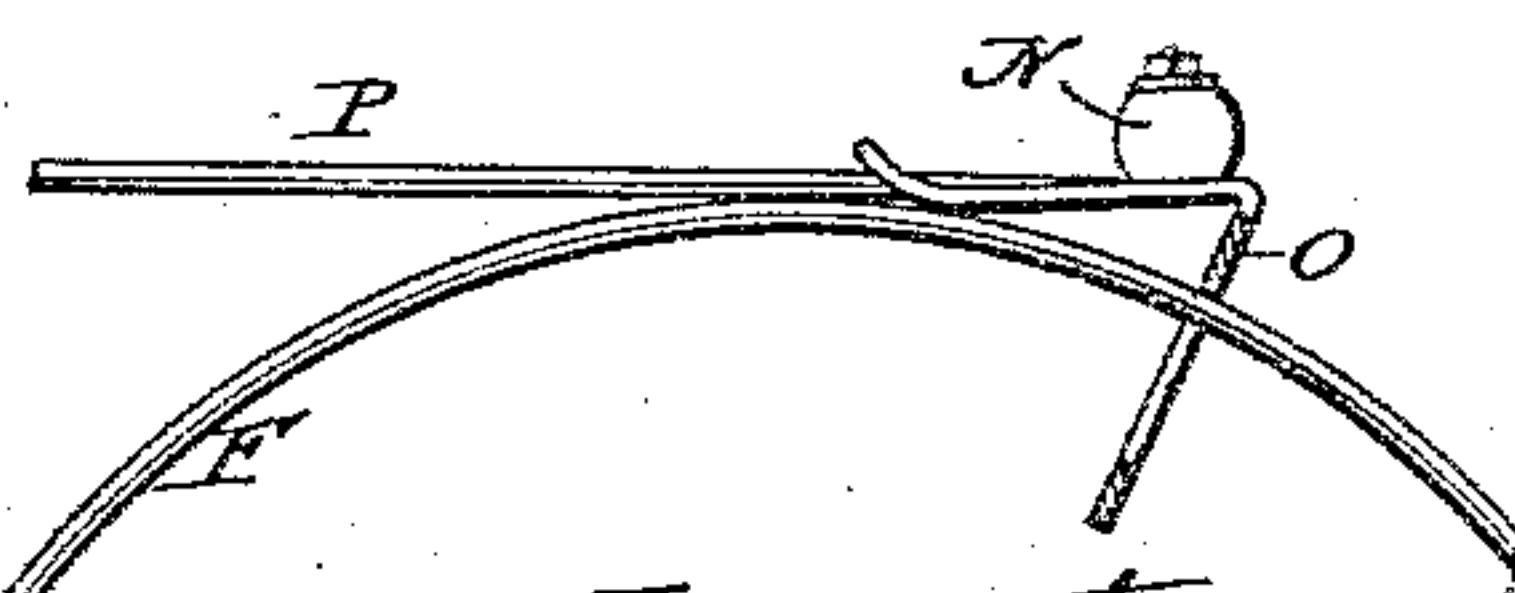
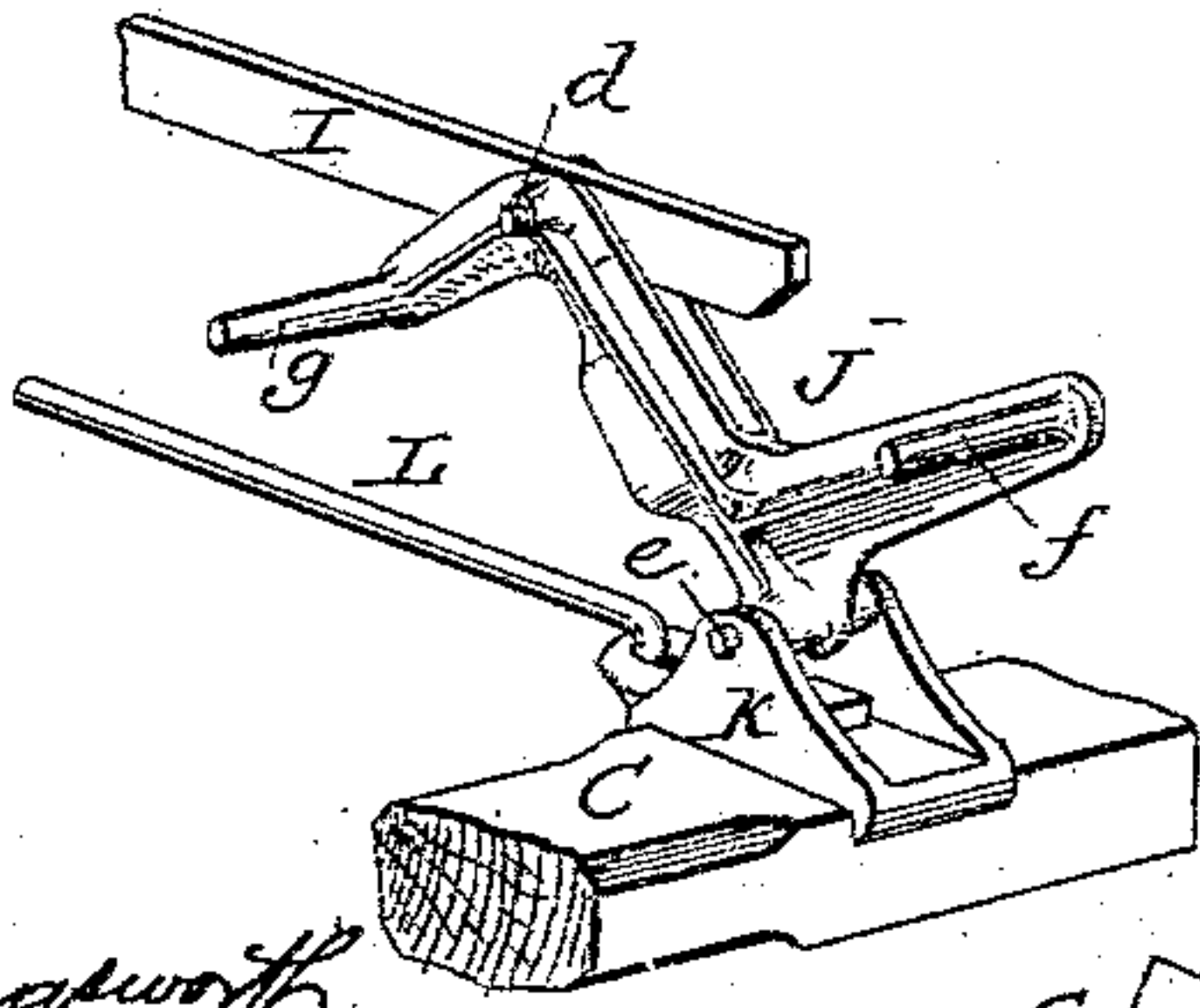


Fig. 5.



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UNITED STATES PATENT OFFICE.

PHINEAS P. MAST AND GEORGE W. STARTZMAN, OF SPRINGFIELD, OHIO,
ASSIGNORS TO P. P. MAST & COMPANY.

HORSE HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 356,596, dated January 25, 1887.

Application filed March 17, 1886. Serial No. 195,561. (No model.)

To all whom it may concern:

Be it known that we, PHINEAS P. MAST and GEORGE W. STARTZMAN, of Springfield, in the county of Clark and State of Ohio, have invented certain Improvements in Horse Hay-Rakes, of which the following is a specification.

This invention has reference to that class of rakes in which a rocking axle supported at its ends in ground-wheels is provided with elastic curved teeth and jointed to a draft-frame carrying the driver's seat in such manner that the weight of the driver assists in rolling the axle to lift the teeth.

The invention relates to various improvements, hereinafter described in detail, having as their object to simplify and strengthen the machine and improve its operation.

Referring to the drawings, Figure 1 represents a top plan view of the rake; Fig. 2, an end elevation of the same, one wheel being removed. Fig. 3 is a longitudinal vertical section of the same on the line *x x*, Fig. 1, the parts being in operative position. Fig. 4 is an under face view of the cap-bar in which the rake-teeth have their bearing. Fig. 5 is a perspective view of the foot-lever and its immediate connections through which the position of the axle and teeth is controlled, the view showing the parts in the position in which they appear when the teeth are partly raised. Fig. 6 is a side view showing the action of the clearer or stripper.

In the drawings, A represents the main axle, commonly consisting of a single bar of wood provided at its ends in the ordinary manner with metallic journals or axles, on which the two ground-wheels B are mounted.

C represents the draft-frame consisting of thills or draft-arms connected by suitable cross-bars, and united at their rear ends by hinges D to the forward face of the axle.

E represents the driver's seat, carried by a standard secured to the draft-frame, so that the weight of the driver is applied through the draft-frame and hinges to the front of the axle, so as to counterbalance the weight of the teeth extending in rear of the axle, and thus assist the operator in rolling the axle to lift the teeth in a manner well understood in the art.

F represents the rake-teeth, constructed of spring-steel or equivalent material, in the usual curved form, the upper end of each tooth being bent laterally, as shown at *a*, Fig. 4, to form a journal or pivot therefor. The entire series of teeth have their journals mounted in the under side of a cap-bar, G, which is bolted on top of the main axle, and which is recessed in the under side to receive the teeth in the manner shown in Figs. 3 and 4.

The bar is constructed by first forming a longitudinal groove or channel, *b*, in its under side from end to end, and then forming a series of transverse grooves, *c*, in its under face from the rear edge inward until they meet the channel *b*. These operations, which may be performed by ordinary mechanical appliances with great facility, adapt the bar to receive the teeth, as shown in Fig. 4, the journal of each tooth lying in the channel *b*, while the body of the tooth extends rearward through the groove *c*, which is of vertical depth sufficient to permit a limited play of each tooth around its journal.

When the cap-bar is bolted to the top of the axle, as shown, it connects the entire series of teeth securely thereto, at the same time permitting each tooth to play vertically and independently to a limited extent.

In order to effect the rolling motion of the axle or rake-head and to lock the same when required to hold the teeth in operative position, there is bolted firmly to the axle at its middle an upright arm, H, and pivoted thereto a bar, I, which extends thence forward to an angular lever, J, to which it is pivoted at *d*. The lever J is in turn pivoted at *e* to and between the ears of a bearing-plate, K, which is bolted firmly to one of the cross-bars of the draft-frame. The lever J is cast complete in one piece in the peculiar form represented in Figs. 3 and 5, with a front arm, *f*, by which to tip it forward, a rear arm, *g*, by which to tip it backward, a slot or curve, *h*, in its upper surface to receive the forward end of the bar I, and a stop or shoulder, *i*, at the under side to encounter the forward end of the bar I and serve as a stop to limit the movement of the lever and bearing when the pivot *d* stands in line with or slightly below the pivots *e* and

k; or, in other words, when the two parts stand upon the "center."

An operating-lever and a bar extending thence to a rolling rake-head have been hitherto arranged to lock upon the center for the purpose of holding the rake-head in position, and this is not broadly claimed herein; but it is believed that this is the first construction of an operating-lever in the particular form shown in the drawings, with its two operating-arms and with a stop-shoulder to directly engage the bar I.

In rakes of the present type much difficulty is encountered when they are of great width by reason of the springing or bending of the axle when subjected to the resistance and weight of the hay carried by the teeth.

An important feature of this invention resides in the provision of a brace connecting the axle at its middle with the draft-frame. This brace, as shown at L, Figs. 1, 3, and 5, consists of a rod, jointed at its rear end to the bolt M, which connects the arm H to the axle, and jointed at its forward end to the bearing-plate K on the draft-frame. The brace-rod thus applied connects the middle of the axle with the middle of the draft-frame in such manner that the axle cannot spring or bend in a backward direction. As it is in some cases inconvenient to arrange the rear end of the brace L in exact alignment with the hinges connecting the draft-frame and axle, it is necessary to provide against the cramping of the parts, which would otherwise occur when the axle is rotated. For this purpose the forward end of the bolt M is provided with a vertical slot, and, if necessary, the rear end of the bearing-plate with a horizontal slot, as shown in Fig. 3. When the axle is rotated, these slots permit a sliding motion of the brace sufficient to secure an easy action of the parts.

It is to be understood that the essence of the invention in this regard consists in the employment of the central brace or draft rod between the axle and draft-frame, and that the details of construction may be variously modified without departing from the scope of the invention.

For the purpose of insuring the delivery of the hay from the teeth as they are lifted there is employed, as usual, above the teeth a transverse clearer or stripper bar, N, having teeth which extend downward between and below the rake-teeth. Hitherto it has been the general practice to guide and support this bar by slotted ears encircling the rake-teeth, and it frequently happens that when the teeth are

raised these ears clinch or bind upon the teeth. To avoid this trouble, there is bolted rigidly to each end of the bar a plate, O, having a downwardly-extending slotted arm to encircle the adjacent tooth and a forwardly-extending arm, which is rounded upward and adapted to ride smoothly over the surface of the teeth when the rake is lifted, as shown in Fig. 6. The two ends of the bar are guided and held in position by rods P, extending to the upper ends of arms Q, rising rigidly from the sides of the draft-frame.

While it is preferred to make use of teeth jointed to the axle, as herein described, it is manifest that teeth which are secured to the axle in any other appropriate manner, either rigidly or by means of joints, may be employed.

Having thus described our invention, what we claim is—

1. In a wheeled hay-rake, the rocking rake-head having the wheels journaled on its end and the draft-frame hinged to the front of said rake-head near its end, in combination with the central rod or brace, L, connected with the rake-head and draft-frame, substantially as described, whereby the springing or yielding of the head in a backward direction is prevented.

2. The rocking wheeled axle having the teeth attached, in combination with a draft-frame jointed thereto, the central rod or brace, and a slotted connection at one or both ends of said brace, as described.

3. In a rake, the rocking axle, the operating-arm applied thereto, the draft-frame jointed to the axle, the lever mounted on the draft-frame, the bar connecting said lever with the arm on the axle, and the rod or brace connecting the axle with a plate to which the lever is pivoted, whereby the parts are maintained in position to secure the proper action of the lever.

4. In combination with a rake-tooth passing therethrough, a support for the clearing device, consisting of plate O, bent midway of its length to an angular form, one end provided with the longitudinal slot to receive the tooth and the opposite end curved outward to ride upon the tooth.

In testimony whereof we hereunto set our hands, this 18th day of February, 1886, in the presence of two attesting witnesses.

PHINEAS P. MAST.

GEORGE W. STARTZMAN.

Witnesses:

J. W. SPAHR,

C. C. KIRKPATRICK.