

(No Model.)

3 Sheets—Sheet 1.

W. H. HALL.
HORSE HAY RAKE.

No. 266,288.

Patented Oct. 24, 1882.

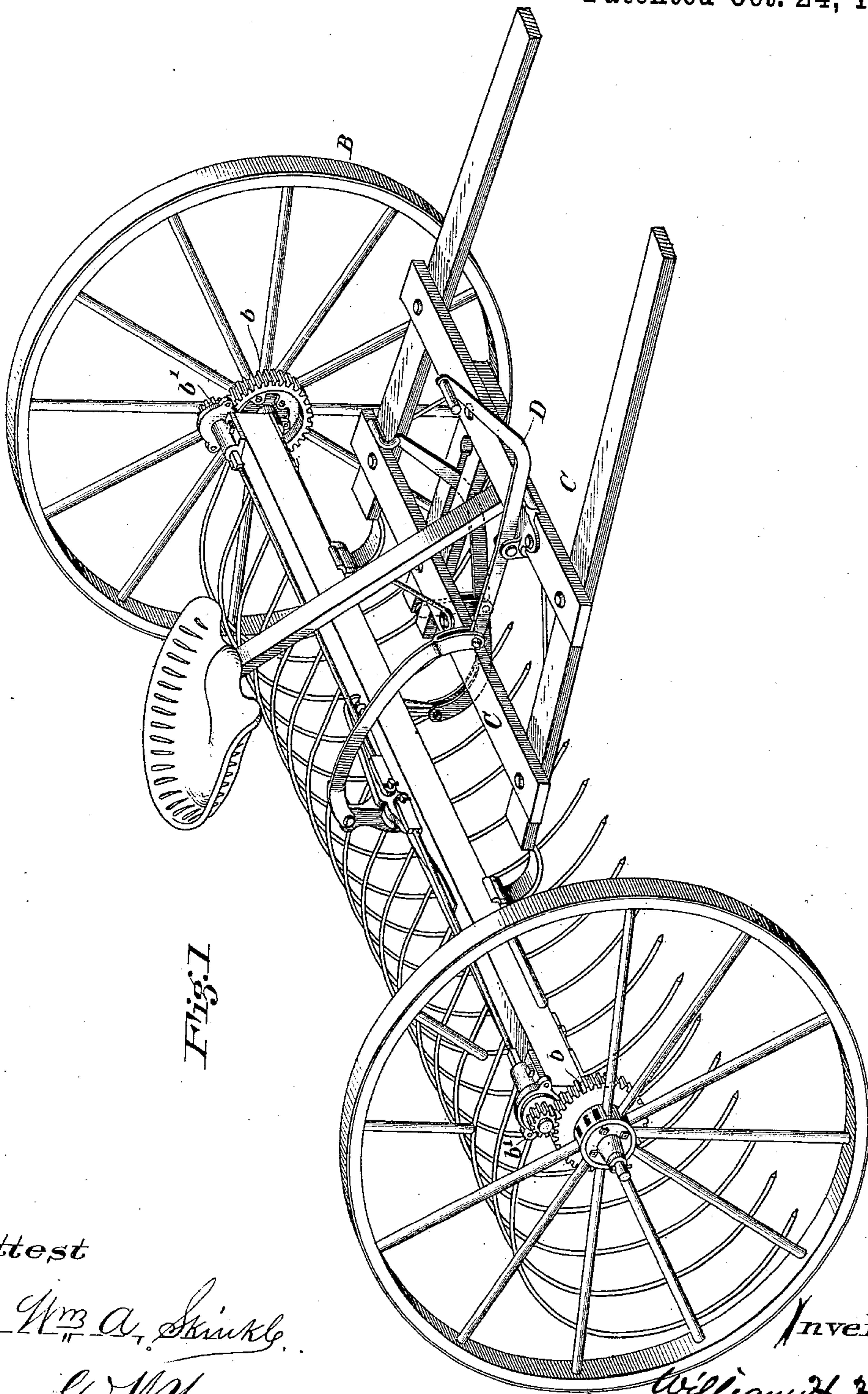


Fig. 1

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Wm A. Shinkle

Geo W Young

Inventor

William H. Hall
Pancison & Pancison

Attorneys

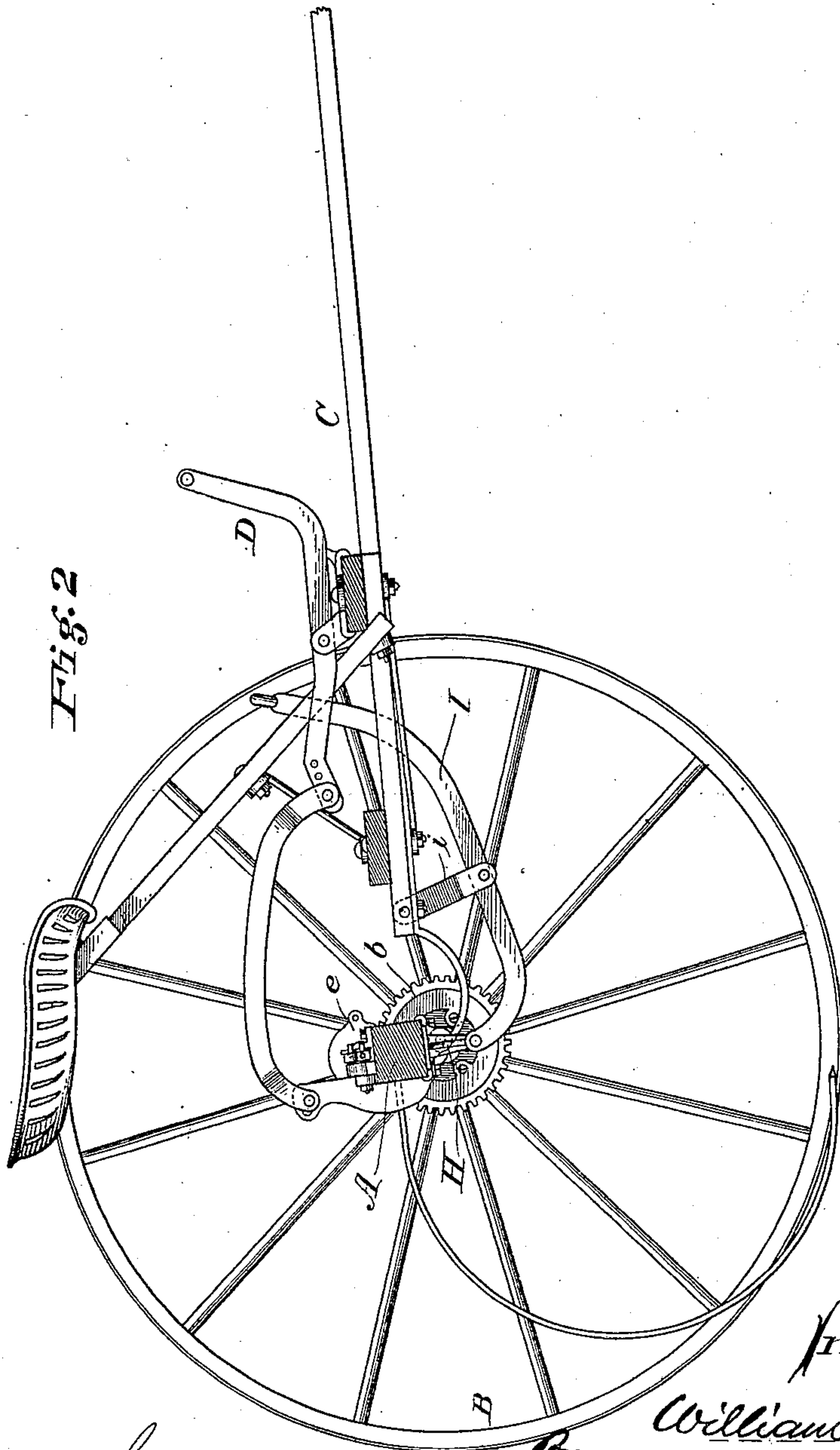
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Wm A. Shunk
Geo W. Young

Inventor

William H. Hall

By Parkinson & Parkinson

Attorneys

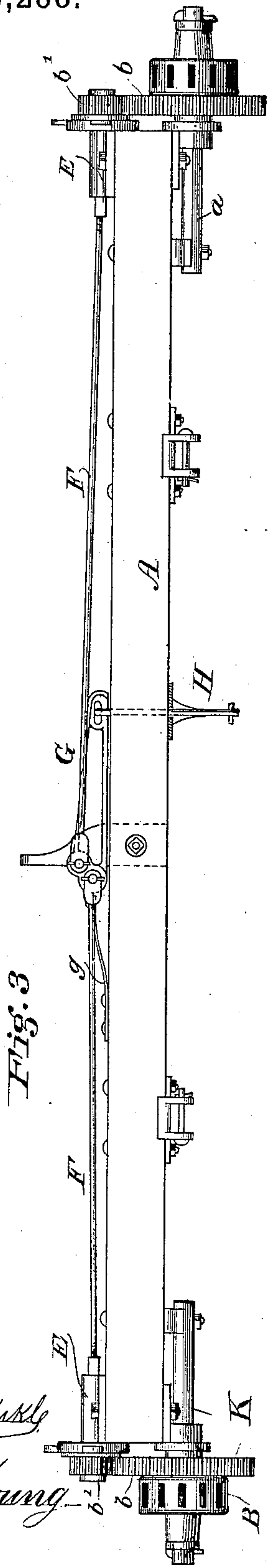
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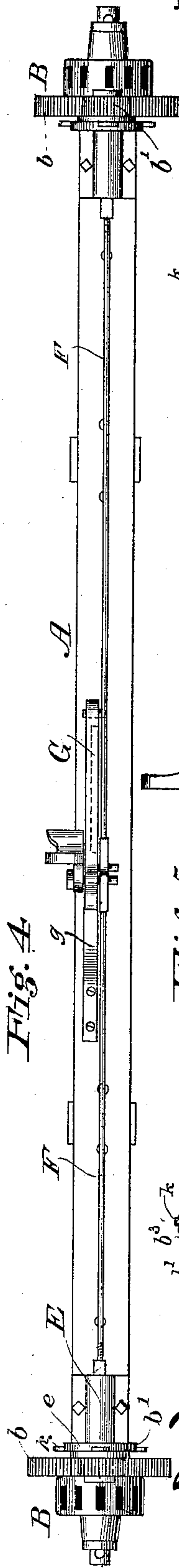


Fig. 4.

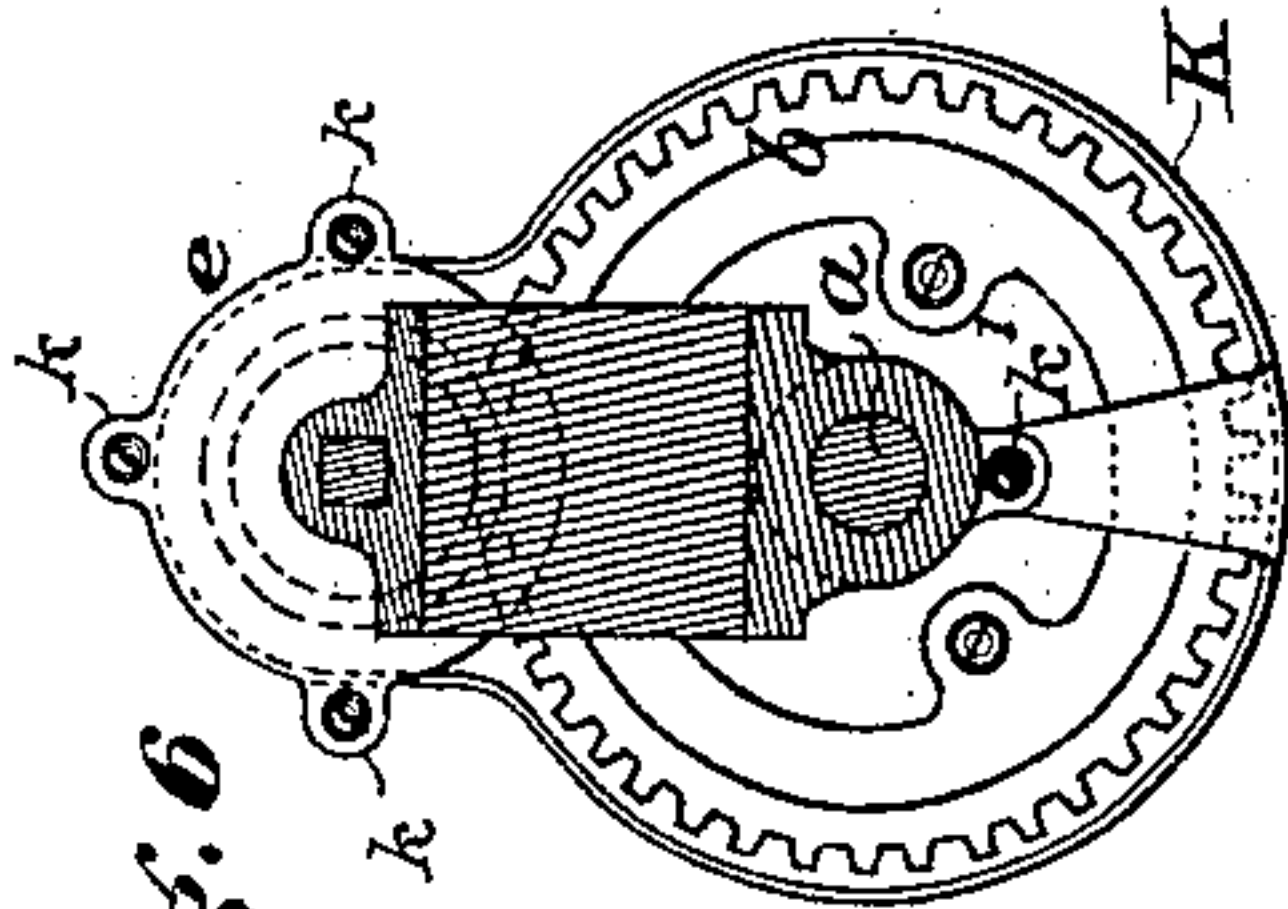


Fig. 6

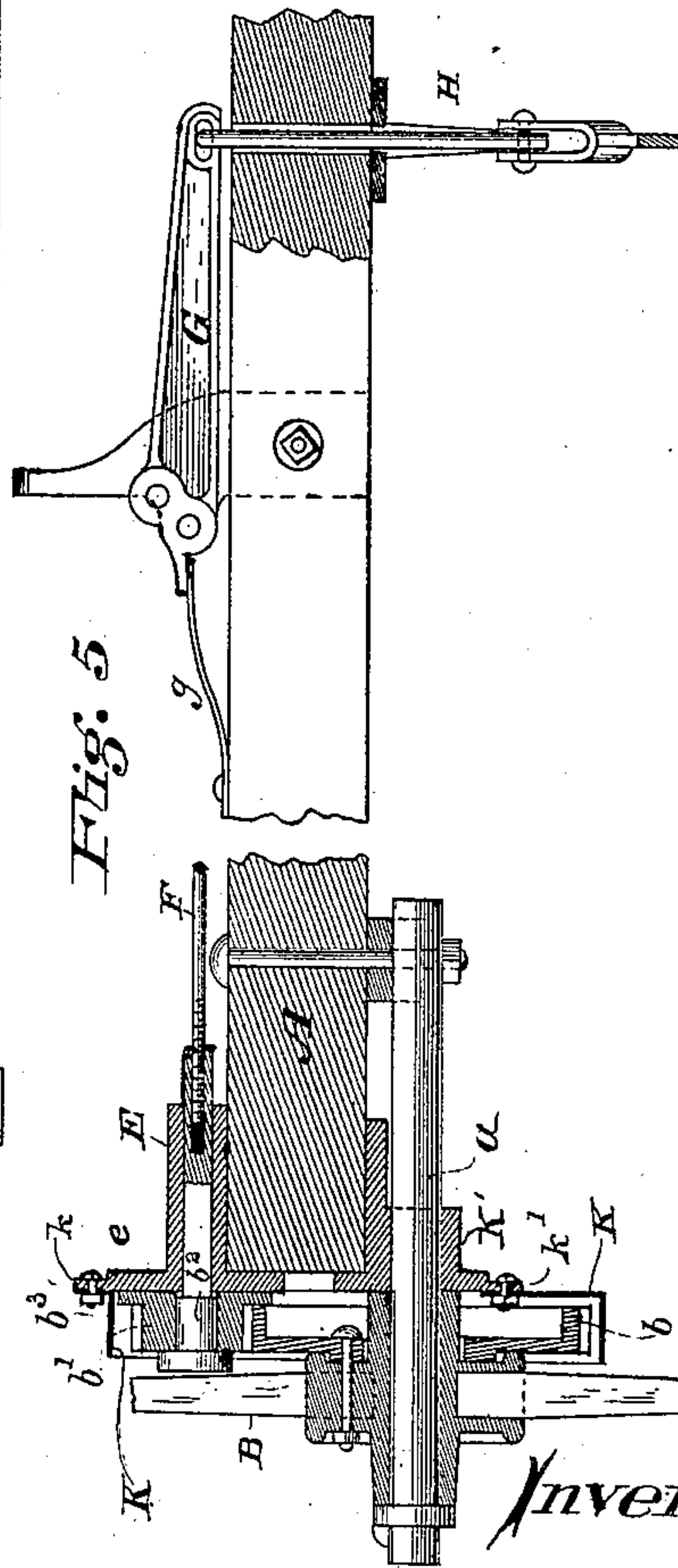


Fig. 5

Attest

Wm A Skinkle

Geo. W. Young.

Inventor

William H. Hall

Francis P. P. P. P.

Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM H. HALL, OF TIFFIN, OHIO.

HORSE HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 266,288, dated October 24, 1882.

Application filed September 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HALL, of Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful
5 Improvements in Horse Hay-Rakes, of which the following is a specification.

Various constructions have been adopted in order to so connect the power derived from the draft of the team with the rake-head as to roll
10 or oscillate the latter upon its bearings to dump the accumulated load. In the present case I propose to employ an oscillating rake-head, which may at the same time be a through-axle, and to connect loose spur-pinions carried in
15 bearings thereon and normally constantly driven by spur-gears on the hubs of the gearing-wheels, or in an axial extension therefrom, with a friction device in such manner that they may at any time be prevented from rotation,
20 and therefore carried on about the periphery of the spur-gearing in its continued revolution to cause the rake-head to rock upon its axis. I also propose to adopt certain novel constructions in carrying out this invention, such as
25 will hereinafter appear, and to embrace within it certain modifications, also alluded to in proper order in the ensuing description.

In the drawings, Figure 1 is a perspective view of a horse hay-rake embodying my invention in the simplest form now known to me;
30 Fig. 2, a side elevation of said rake, partly in section; Fig. 3, a longitudinal elevation of the rake-head and its attachments; Fig. 4, a plan of the rake-head and its attachments; Fig. 5,
35 a longitudinal section, in elevation, of a portion of the head enlarged; and Fig. 6, a transverse section through the head, near the end of the same.

A is the oscillating rake-head; B, the carrying-wheels, and C the thill-frame hinged to the rake-head. So far as the head, rake-teeth, and thill-frame are concerned, they may be of any of the usual and approved patterns. The head, as before stated, may be coincident with the
45 through-axle, the wheels running directly upon its ends, as in a wagon. I have, however, shown it as provided with short metallic stub-axles *a* to receive the wheels, which axles are secured substantially in the manner described
50 in an application heretofore filed by me for Letters Patent of the United States. An or-

inary link and foot-lever arrangement, D, or its equivalent, is provided to hold the head to its work or to return it thereto, if at any time necessary.

Upon the hubs of the carrying-wheels are
55 mounted spur-gears *b*, bolted to or cast as a part of such hubs, or, if desired, connected therewith by backing-ratchets for the usual purpose. With these gears engage loose spur-
60 pinions *b'*, carried by the rake-head, and under ordinary circumstances turning idly with the revolution of the gears. If, however, these pinions are locked against revolution, they will be carried forward by the gears in an arc con-
65 centric with the axis of said gears, which axis also corresponds with the axis of oscillation of the rake-head, carrying the latter along with them, and raising the teeth sufficiently to drop the accumulated load. Now in order to cause
70 this lock I adopt the following arrangement: The pinions are supported on short shafts or spindles *b²*, running either loosely on these shafts, or the shafts themselves fixed to the pinions and turning loosely in their bearings.
75 It will be sufficient to describe the first form. A casting or box-bearing, E, is secured to the top of the rake-head at each end, having at its outer extremity a broad disk or flange, *e*, which faces a corresponding disk, *b³*, upon the
80 inner side of the adjacent pinion. The spindle which bears the pinion is formed with a head or cap, so that if moved longitudinally toward the center of the rake-head it will tend to draw the pinion and its disk against the disk
85 upon the casting. A squared shank runs from the spindle through a corresponding sleeve in the casting longitudinally of the rake-head, and beyond this sleeve makes for the purpose of
90 nice adjustment to its work a screw-joint, with the rod F connected to a lever, G, near the center of the rake-head. There being two rods—one from each end of the rake-head—the same lever will serve for each, their pivotal connection therewith being outside their piv-
95 otal point and on opposite sides thereof, as will be understood. A spring, *g*, attached to the rake-head, presses against a lug or spur from the heel end of the lever, so as to hold it normally down, leaving the spur-pinions away
100 from the friction-disk and free to turn.

A sliding rod, H, is passed through a bore

in the rake-head, and connected with the force-arm of the lever G by a slot and pin or otherwise, so as to compensate for their divergence of motion when operated. To the free end of this rod, beneath the rake-head, is attached one arm of a foot-lever, I, fulcrumed in a pendulum, i, from the thill-frame, and upon its other or forward arm provided with a pedal conveniently reached by the driver in his seat. When this foot-lever is depressed the rod will be raised, carrying with it the free end of the double lever on the rake-head and drawing in the tension-rods forcibly, so as to clamp the pinion-disks against the disk on the rake-head, thereby locking the pinions, preventing their rotation, and causing them to be carried forward by the gear-wheels to lift the rake-head. As soon as the load has been dumped, and as soon as the pressure has been released from the foot-lever, the spring upon the rake-head will restore the double lever and the tension-rods to their normal position, again permitting the pinions to run free. In these movements—the rise and the fall of the rake-head—the pendular fulcrum of the foot-lever will permit it to play longitudinally to account for the hinging of the rake-head upon the thill-frame, as explained in another application prepared by me and about to be filed, in which this is made a special feature.

In order to prevent hay or other substances from getting in between the intermeshing gears and pinions, and thus clogging or breaking them, a shield, K, of the form shown may be employed to cover and protect the sets at each end. For this purpose the flanges of the box-bearings are provided with ears k, and the sleeve-casting K', forming the outer support of the stub-axle and abutment for the wheel-hub, has also an ear, k', whereby said shield may be readily attached.

The disks or flanges upon the pinions and the counter disks or flanges upon the boxes may be smooth-faced or corrugated, whichever is preferred. If smooth, they should be ground to a sufficient frictional fit. The box-flanges may be chambered and a button or seat of wood or other suitable material inserted, against which the flanges of the pinion will be clamped; or the flanges on the boxes may be removed and the periphery of the pinion-flange widened, so that a small friction-block held over it by a short bell-crank that is pivoted to the head and operated by suitable lever mechanism may be brought to bear to stop both it and the pinion from revolution. As heretofore suggested, also a rotating through-axle or half-axle may be employed with a single spur-gear keyed thereto at or near the center of the rake, and a spur-pinion carried upon a yoke from the integral or divided rake-head oscillating about this axle placed in mesh with said gear, and locked or released by a friction-clutch, as above, to dump or drop the rake. Hence I do not confine myself to the specific location of the gears and pinions shown, nor to the specific form of

the friction-clutch, nor yet to the precise mechanism referred to as employed for operating the latter; but

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of an oscillating rake-head, carrying-wheels by which it is supported, a gear-wheel driven by said carrying-wheels, a pinion turning in bearings upon the rake-head and meshing with said gear-wheel, and a friction clutch or device adapted to arrest the motion of said pinion, whereby it will be carried onward along the periphery of the gear-wheel to lift the rake-head and the teeth attached thereto.

2. The combination, substantially as hereinbefore set forth, of a rake-head, carrying-wheels by which it is supported, spur-gears upon the hubs of said carrying-wheels, pinions normally turning freely in or upon bearings connected with the rake-head and meshing with said gears, and friction-clutches with which said pinions may be caused to engage to prevent their rotation, whereby they will be carried along the periphery of the spur-gears to lift the rake-head.

3. The combination, substantially as hereinbefore set forth, of an oscillating rake-head, carrying-wheels by which it is supported, spur-gears upon the hubs of said carrying-wheels, pinions meshing with said spur-gears and mounted to turn loosely upon the ends of the rake-head, disks or flanges upon said pinions, and opposing disks or flanges upon the ends of the rake-head, with which the pinions may be forcibly brought into contact to prevent their revolution and cause them to be carried onward by the gears to oscillate the rake-head.

4. The combination, substantially as hereinbefore set forth, of an oscillating rake-head, carrying-wheels by which it is supported, spur-gears upon the hubs of said carrying-wheels, flanged spur-pinions meshing with said gears and mounted to turn idly in or upon bearings carried by the rake-head, boxes upon the rake-head for the bearings of said pinions, provided with opposing flanges, and mechanism for moving the bearings longitudinally within the boxes to clamp the flanges upon the pinions against the flanges upon the boxes, and thereby prevent the rotation of the latter to cause the dumping of the rake.

5. The combination, substantially as hereinbefore set forth, of the oscillating rake-head, draft or carrying wheels by which it is supported, spur-gears upon the hubs of said wheels, flanged spur-pinions engaging with said gears, stubs or spindles upon which these pinions turn loosely, boxes upon the ends of the rake-head through which the squared shanks of the spindles are carried, flanges upon said boxes opposing the flanges upon the pinions, and rods connecting said shanks to a double or compound lever at or near the center of the rake-head, whereby the pinions may be simultaneously moved in against the box-flanges

to prevent their rotation by frictional contact therewith.

6. The combination, substantially as hereinbefore set forth, of the oscillating rake-head, the draft-wheels, the spur-gears upon the hubs of said wheels, the flanged spur-pinions intermeshing with said gears, the stubs or spindles upon which said pinions turn, the box-flanges at the ends of the rake-head, and the rods operated by a central lever and connected to the squared shanks of said stubs by adjustable joints.

7. The combination, substantially as hereinbefore set forth, of the oscillating rake-head, the draft-wheels, the spur-gears upon the hubs of said wheels, the flanged spur-pinions meshing with said gears, the stubs or spindles upon which these pinions turn loosely, the flanged boxes mounted upon the ends of the rake-head and supporting said spindles, the rods connected at one end to the shanks of said spindles, the double lever to which the rods are connected at their meeting ends, a sliding link passing through the rake-head and taking into a slot in the force-arm of said lever, and the foot-lever for operating said link.

8. The combination, substantially as hereinbefore set forth, of the oscillating rake-head, the draft-wheels, the spur-gears upon the hubs of said wheels, the flanged spur-pinions intermeshing with said gears, the spindles upon which these pinions turn loosely, the flanged boxes fixed to the ends of the rake-head and supporting said spindles, the double lever pivoted near the center of the rake-head, the rods connecting it with the shanks of the spindles at each end of said head, the sliding rod passing through the rake-head and taking into a slot in the force-arm of said lever, the foot-lever pivoted to the thill-frame and operating said rod to clamp the pinions against the box-flanges, and the spring pressing against the heel-extension from the double lever on the

rake-head to return it and the pinions to their normal position when the foot-lever is released.

9. The combination, to form a means for operating the clutch of a horse hay-rake, of a lever pivoted near the center of said rake, rods pivoted to said lever on opposite sides of the lever-pivot and passing longitudinally to the respective ends of the rake-head, where they are connected with the clutching mechanism, a sliding rod passing through the rake-head and taking into a slot upon the force-arm of the lever thereon, and a foot-lever pivoted to the thill-frame and connected with said rod, whereby the lever upon the rake-head may be moved to project or retract the rods.

10. The combination, to form a means for operating the clutches in a horse hay-rake, of a lever pivoted near the center of the rake-head, rods pivoted to said lever on each side of the lever-pivot and passing to the clutching devices at the respective ends of the rake-head, a sliding rod passing through the rake-head and taking into the slotted force-arm of the lever thereon, a foot lever pivoted to the thill-frame and connected with said sliding rod, whereby the lever on the rake-head may be moved to cause the engagement of the clutching devices, and a spring mounted upon the rake-head and pressing against the heel-extension from the lever thereon to restore it to its normal position and throw the clutching devices out of engagement.

11. The combination of the oscillating rake-head, the draft-wheels, the spur-gears upon the hubs of said wheels, the idly-revolving spur-pinions meshing with said gears and supported by boxes on the rake-head, and shields or guards fixed to said boxes and covering or protecting the spur-gears and pinions.

WILLIAM H. HALL.

Witnesses:

ROBERT LYSLE,
B. G. ATKINS.