

No. 757,061.

PATENTED APR. 12, 1904.

O. D. & D. W. SHIRK.
PUSH RAKE.

APPLICATION FILED AUG. 20, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

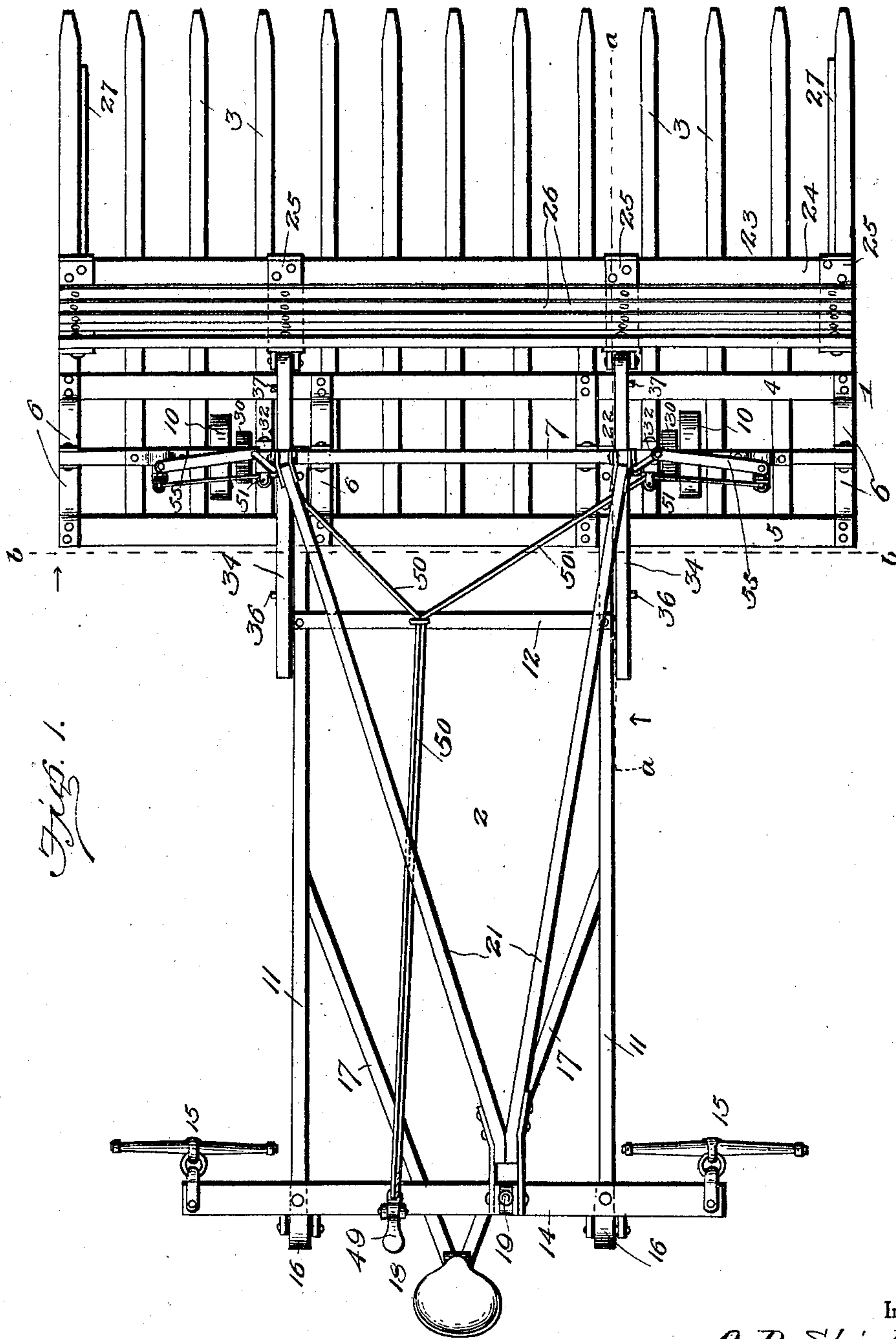


Fig. 1.

Witnesses

E. Hunt,

J. Wilson

Inventors

O. D. Shirk,

D. W. Shirk,

By

A. B. Wilson

Attorney

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3 SHEETS—SHEET 2.

Fig. 2.

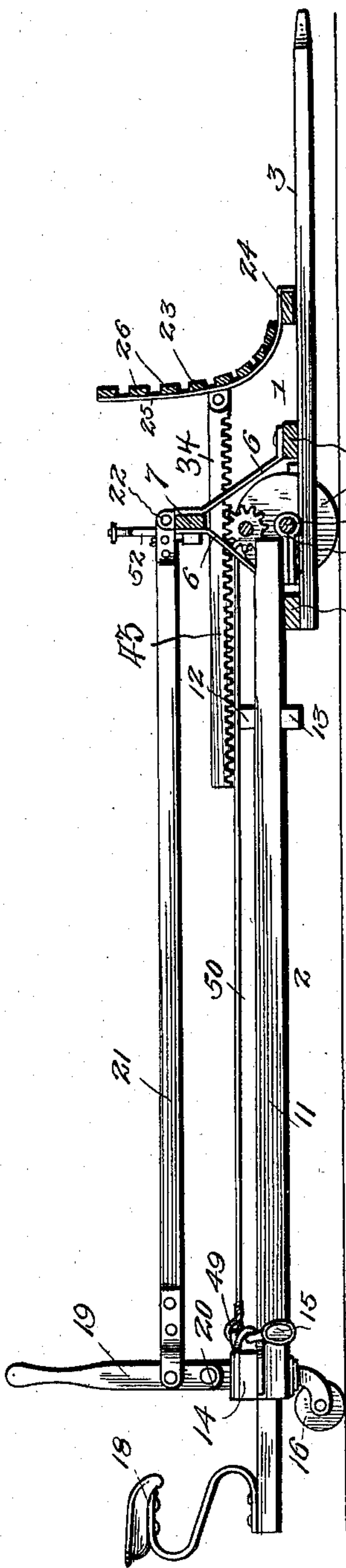
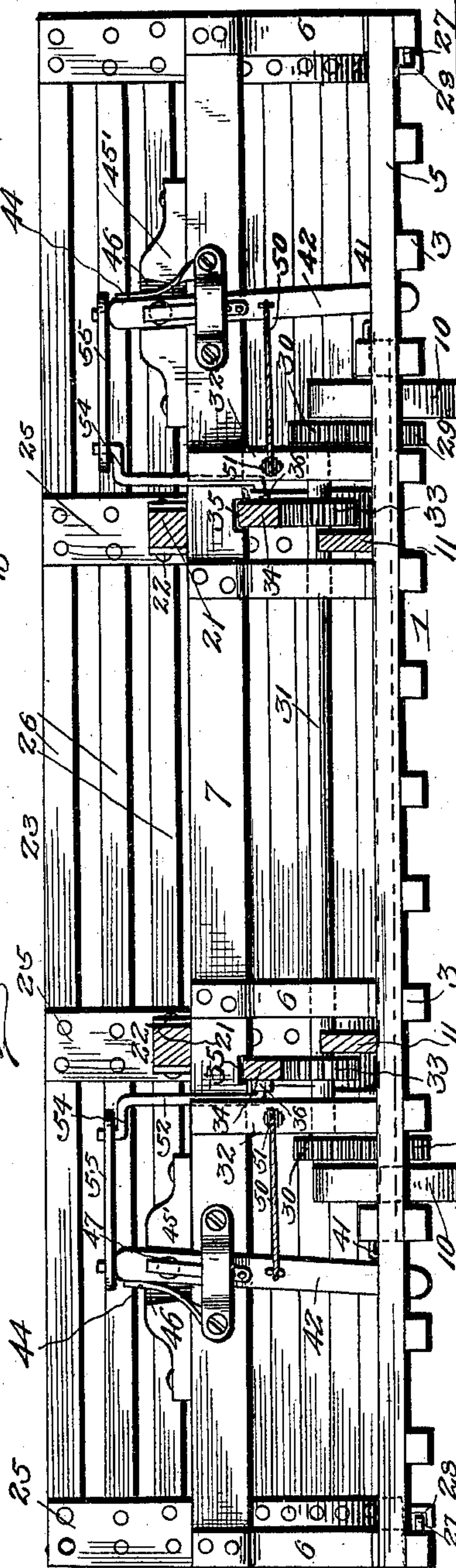


Fig. 3.



Inventors

O. D. Shirk

D. W. Shirk

By

A. B. Wilson

Attorney

Witnesses

E. Hunt
J. Wilson

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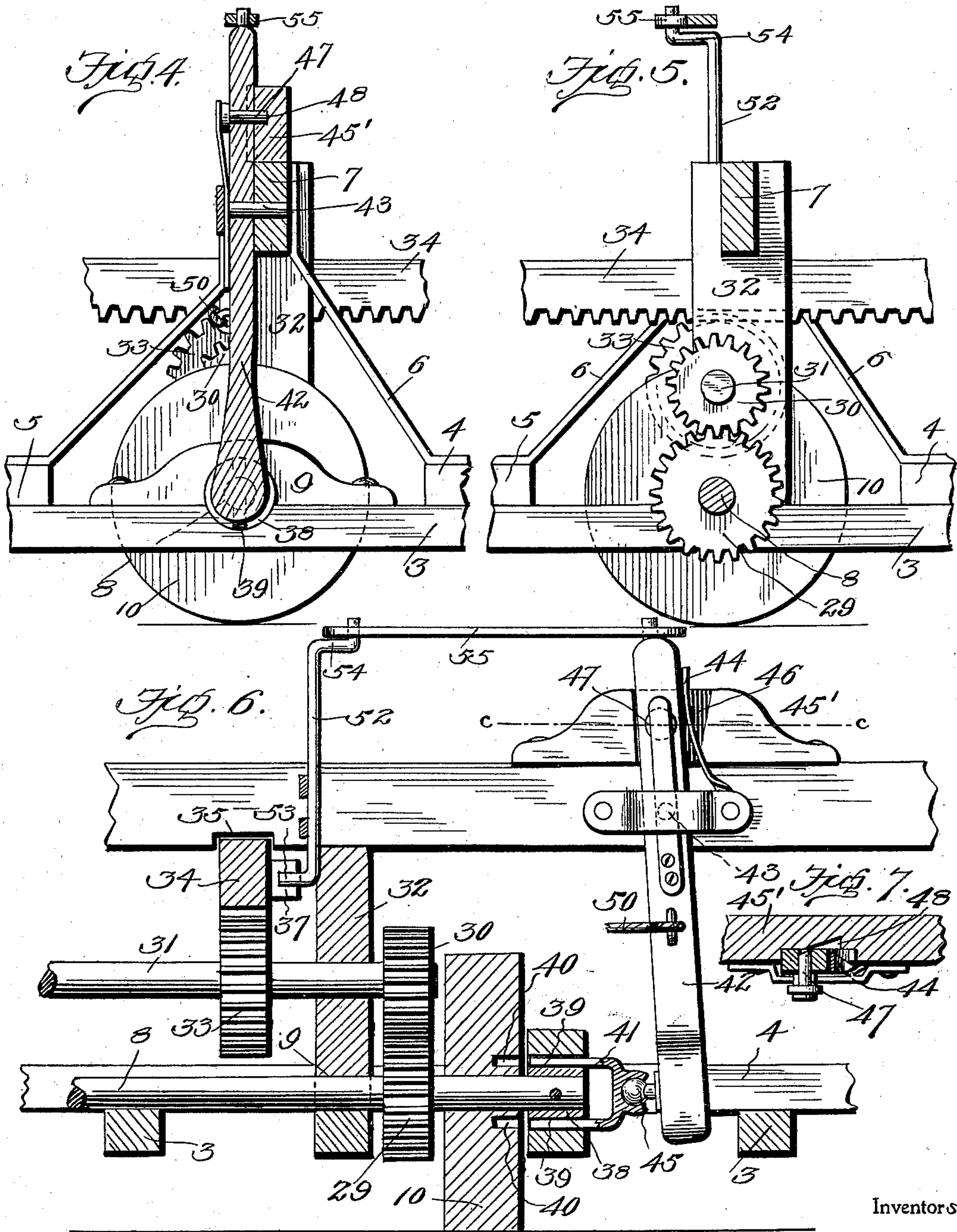
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3 SHEETS—SHEET 3.



Inventors,

O. D. Shirk,

D. W. Shirk,

By

A. B. Wilson

Attorney

Witnesses

C. E. Hunt,

A. B. Wilson

UNITED STATES PATENT OFFICE.

OLIVER D. SHIRK AND DANIEL W. SHIRK, OF MINATARE, NEBRASKA.

PUSH-RAKE.

SPECIFICATION forming part of Letters Patent No. 757,061, dated April 12, 1904.

Application filed August 20, 1903. Serial No. 170,203. (No model.)

To all whom it may concern:

Be it known that we, OLIVER D. SHIRK and DANIEL W. SHIRK, citizens of the United States, residing at Minatare, in the county of Scotts Bluff and State of Nebraska, have invented certain new and useful Improvements in Push-Rakes; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to push-rakes, and particularly to means for unloading the same by pushing the load from the rake-arms of the rake-head; and it consists in the construction and combination of devices hereinafter described and claimed.

The object of this invention is to provide means for pushing the load from off the head of a push-rake as the latter is backed.

A further object of this invention is to combine with a push-rake a load pushing or ejecting element movable thereon and means for automatically operating said pushing or ejecting elements.

In the accompanying drawings, Figure 1 is a top plan view of a pushing-rake provided with load-ejecting means embodying the present improvement. Fig. 2 is partly a side elevation and partly a sectional view of the same, taken on the plane indicated by the line *a a* of Fig. 1. Fig. 3 is a transverse sectional view of the same, taken on a plane indicated by the line *b b* of Fig. 1. Fig. 4 is a detail sectional view of one of the clutch-operating levers and its coacting elements. Figs. 5 and 6 are detail sectional views of the gears for operating the load-ejector or sweep element. Fig. 7 is a detail sectional view taken on the plane indicated by the line *c c* of Fig. 6.

In the embodiment of the invention here shown the push-rake comprises the rake-head 1 and pushing-frame 2, which extends rearwardly therefrom. The rake-head comprises the rake teeth or arms 3, a pair of cross-bars 4 5, secured thereon, the former at a suitable distance from their rear ends and the latter at their rear ends, standard-brackets 6, which connect the said cross-bars 4 5 together and are disposed at suitable distances apart, and a

cross-bar 7, attached to said standard-brackets and supported by them at a suitable distance above the rear portions of the rake-teeth. A shaft 8 is disposed between the bars 4 5 and is journaled in suitable bearings 9, which are secured on certain of the rake-teeth. Supporting-wheels 10 are revoluble on the said shaft.

The side bars 11 of the pushing-frame 2 have their front ends pivotally connected to the rear portion of the rake-head, the said connections being here shown as hinge-straps 13, which engage the shaft 8 and are attached to the front ends of the said side bars, the shaft being revoluble in the said hinge-straps.

The side bars 11 are connected together near their front ends by the pair of bars 12 13, which are disposed transversely with reference thereto and are respectively secured to the upper and lower sides thereof. The rear ends of the said bars 11 are connected together by a push-bar 14, the ends of which project outwardly therefrom and are provided with means, as at 15, for the attachment of the draft-animals. Caster-wheels 16 are here shown to support the rear end of the push-frame, and the latter is also shown as provided with rearwardly-converging brace-bars 17, which are attached to the side bars 11 and to the push-bar 14 and project rearwardly therefrom and support the seat 18 for the driver. A tilting lever 19 is fulcrumed at its lower end, as at 20, on the push-bar 14 and is connected by the forwardly-diverging rods 21 to the bar 7, the front ends of the said rods being pivotally connected to the said bar, as at 22. It will be understood from the foregoing that by operating the lever 19 the rake-head may be turned on the shaft 8, so that the points of its teeth may be raised or lowered, as may be required. Within the scope of this invention the push-rake may be of any suitable construction.

A load-ejecting or sweep element 23 is disposed transversely of the rake-head and is movable longitudinally with respect to the rake-teeth thereof, so that when the said sweep element is moved forwardly with respect to the rake-head it serves to move the load with it, and thereby cause the load to be

ejected from the rake-head, as will understood. This load-ejecting or sweep element may be of any suitable construction. It is here shown as comprising a sill 24, which bears and is slidable on the teeth of the rake-head, rib-irons 25, which rise and extend rearwardly therefrom, and slats 26, which are appropriately spaced apart and are secured to the front sides of the rib-irons. On the inner sides of the outer rake-teeth are track-irons 27, which are longitudinally disposed, and the same are engaged by slide-brackets 28 on the under side of the sill 24. These track-irons and slide-brackets slidably connect the sweep or load-ejecting element to the rake-head and adapt the same to be readily moved thereon longitudinally with respect to the rake-teeth. Other means may within the scope of this invention be employed to thus slidably connect the sweep or load-ejecting element to the rake-head without departing from the spirit of this invention.

Spur-gears 29 are fast on the shaft 8 and rotate therewith. The said spur-gears are engaged by gears 30 on the ends of a shaft 31, which shaft is here shown as journaled in bearings with which a pair of posts 32 are provided, the said posts connecting the bar 7 and certain of the rake-teeth together. The said gears 30 are fast on the shaft 31, and pinions 33 are also fast on said shaft. The said pinions are engaged by longitudinally-movable rack-bars 34, which have their front ends connected to the sweep or load-ejecting element, and the said rack-bars are guided and retained in position by suitable guides 35. The rack-bars are provided near their ends with outwardly-projecting tappets 36 37. Within the scope of this invention any suitable means may be provided for locking the wheels 10 to the shaft 8 and unlocking the said wheels, so that they may rotate either with the shaft or independently thereof. To accomplish this purpose, sleeves 38 are shown rigidly connected to the ends of the shaft and provided with longitudinal grooves 39, the wheels 10 being provided with openings 40, adapted to register with the inner ends of said grooves. Substantially U-shaped and longitudinally-movable clutch-yokes 41 have their arms slidably engaged by the grooves of the said sleeves, their inner ends being adapted to be moved into and out of engagement with the notches or openings in the wheels 10 to lock the latter to the shaft 8 or unlock them therefrom. Clutch-operating levers 42 are here shown as fulcrumed to the bar 7 near the ends of the latter, as at 43. A spring 44 engages each of the said levers and normally moves the same in the direction required to unclutch the wheels 10, so that they will be out of gear or operative connection with the shaft 8. These levers are here shown as connected to the clutch-yokes by ball-and-socket connections 45, which ad-

mit of the revolution of said clutch-yokes with the shaft 8 when the machine is in gear and of angular movement of the levers 42 with reference to the said clutch-yokes, as will be understood. Segment-plates 45' are here shown as secured on the bar 7 and notched on their rear sides, as at 46, to receive the upper portions of the levers 42. The latter are shown as provided with spring-pressed detent-studs 47, which when the levers are in position to lock the wheels 10 to the shaft 8 engage notches 48 in the segment-plates to lock the levers in such position. The inner ends of the spring-pressed detent-studs and the inner sides of the said notches are here shown as beveled, so that on the reverse movement of the levers 42 by the means hereinafter described said detent-studs will become automatically disengaged from said notches. The strength of the springs which press the detent-studs is such as to serve when said studs are engaged with said notches to cause said detent-studs to lock the levers against casual displacement; but the said springs do not prevent the studs from disengaging the notches on the movement of the levers by the means hereinafter described. A lever 49, here shown as a foot-lever, is mounted on a push-bar 14 or other convenient part of the push-frame, where it may be readily operated by the driver, and the said lever is shown as connected to the levers 42 by means of cords 50, which may in practice be wire ropes, chains, or other suitable flexible connecting elements, and the said cords are here shown as engaged by direction elements 51, which are preferably sheaves to reduce friction.

It will be understood from the foregoing that when the pushing-rake is in motion and the lever 49 is operated to draw upon the cords 50 the latter act on the levers 42 to move said levers against the tension of the springs 44 and cause the clutch-yokes 41 to become engaged with the wheels 10, thereby locking the latter to the shaft 8, and hence cause the sweep or load-ejecting operating mechanism, hereinbefore described, to be put in gear, so that rotary motion will be communicated from the shaft 8 to the shaft 31, and the pinions and rack-bars will be caused to move the sweep or load-ejecting element in one direction on the rake-head, according to the direction in which the push-rake is moved. If the push-rake is being backed, the said sweep or load-ejecting element will be moved forwardly with relation thereto, so as to discharge the load therefrom, as will be understood.

It is desirable to provide means for automatically throwing the sweep-element-operating mechanism out of gear when the sweep element has been moved an appropriate distance in either direction on the rake-head. One form of such automatic mechanism is shown in the drawings and is described as follows:

A vertically-disposed shaft 52 is mounted for oscillation on the inner side of each of the posts 32 at the upper end thereof. Each of the said shafts is provided at its lower end with a tappet-arm 53, which is disposed in the path of the tappets 36 37 of one of the rack-bars 34 and is provided at its upper end with a crank-arm 54, connected by a rod or link 55 to one of the clutch-operating levers 42. It will be understood that as the rack-bars reach the limit of their longitudinal movement in either direction when moving the sweep or load-ejecting element of the rake-head their tappets will coact with the tappet-arms of the said shafts 52 to partly turn the latter, and hence cause the links or rods 55 to automatically move the levers 42 to the required position to disengage the clutch-yokes from the wheels 10, and hence throw the mechanism for operating the sweep or load-ejecting element out of gear.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

It will be understood that modifications may be made within the scope of the appended claims without departing from the spirit of this invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A rake of the class described, having a sweep or load-ejecting element movable longitudinally thereon, a traction-wheel, and means driven by the traction-wheel to move the said sweep or load-ejecting element in the opposite direction to that of the movement of the rake, substantially as described.

2. A rake of the class described, having a

traction-wheel, a shiftable sweep or load-ejecting element movable longitudinally on the rake-teeth, mechanism operated by the said traction-wheel to move said sweep or load-ejecting element in the opposite direction to that of the movement of the rake, and means to throw said mechanism into and out of gear.

3. A rake of the class described, having a traction-wheel, a shiftable sweep or load-ejecting element, movable longitudinally on the rake-teeth, means operated by the traction-wheel to move said sweep or load-ejecting element in the opposite direction to that of the rake, and means to automatically throw the first-mentioned means out of gear when the sweep or load-ejecting element has been moved.

4. In a rake of the class described, having longitudinally-disposed rake-teeth, the combination of a power element, a shiftable sweep element movable longitudinally on the rake-teeth to eject the load, means actuated by the power element to operate the sweep element, means to throw said sweep-element-operating means in gear, and means to automatically throw the same out of gear.

5. The combination of a rake, a power-wheel, a pinion driven thereby, a sweep element shiftable on the rake to eject a load therefrom, a rack actuated by the pinion to operate the sweep, and means to throw the power-wheel into and out of gear with the pinion, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

OLIVER D. SHIRK.
DANIEL W. SHIRK.

Witnesses:

L. L. RAYMOND,
H. L. MERRIMAN.