No. 847,606. PATENTED MAR. 19, 1907.

J. & W. REUTHER.

POTATO DIGGER.

APPLICATION FILED NOV. 2, 1905.

3 SHEETS—SHEET 1.

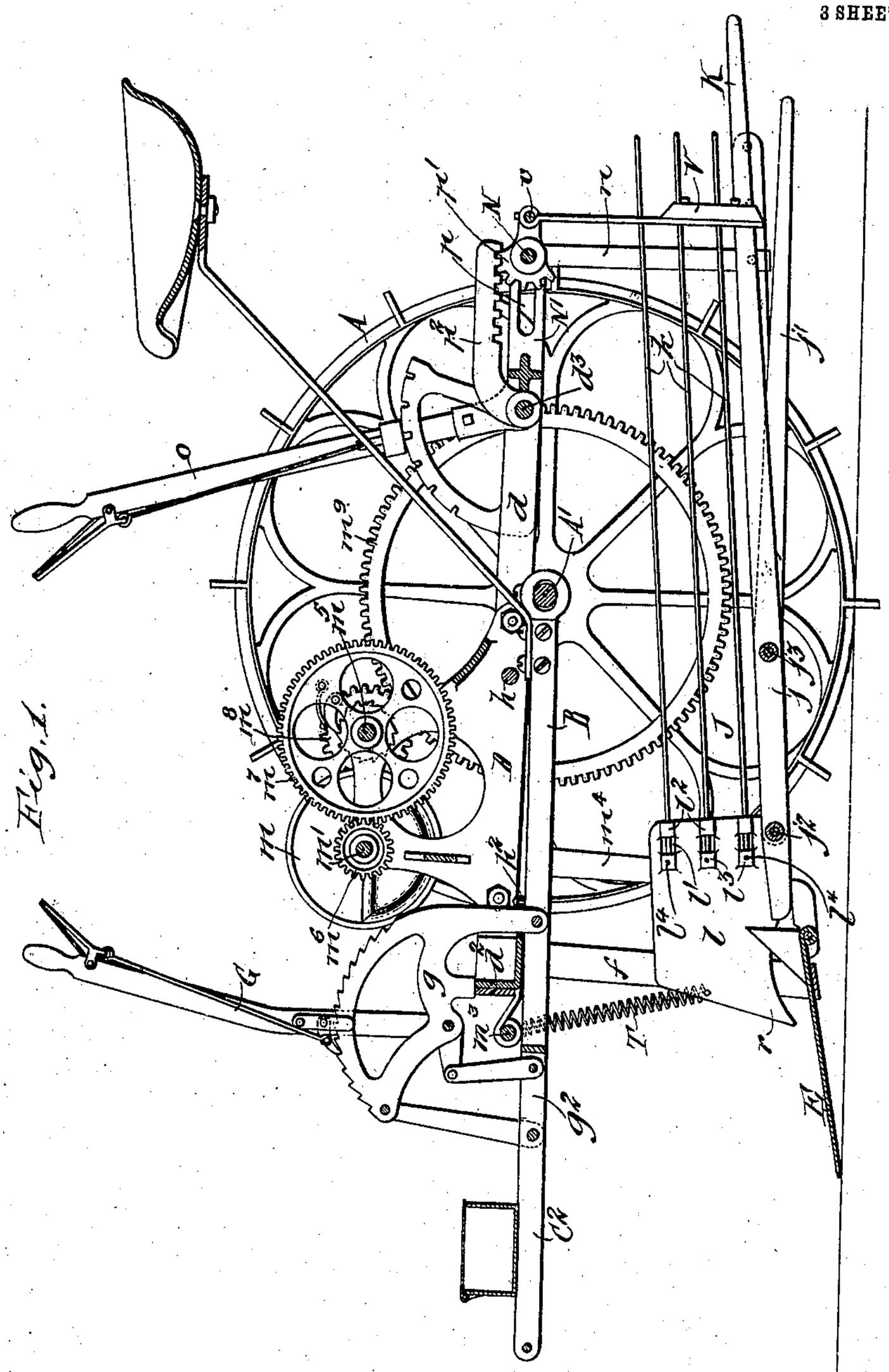


Fig. 1.

Witnesses:

Louis W. Gratz.

Emma M. Graham.

John Reuther,
William Reuther,
Inventors

by Geyer & Popp
Attorneys

No. 847,606. PATENTED MAR. 19, 1907.

J. & W. REUTHER.

POTATO DIGGER.

APPLICATION FILED NOV. 2, 1905.

3 SHEETS—SHEET 2.

Fig. 2.

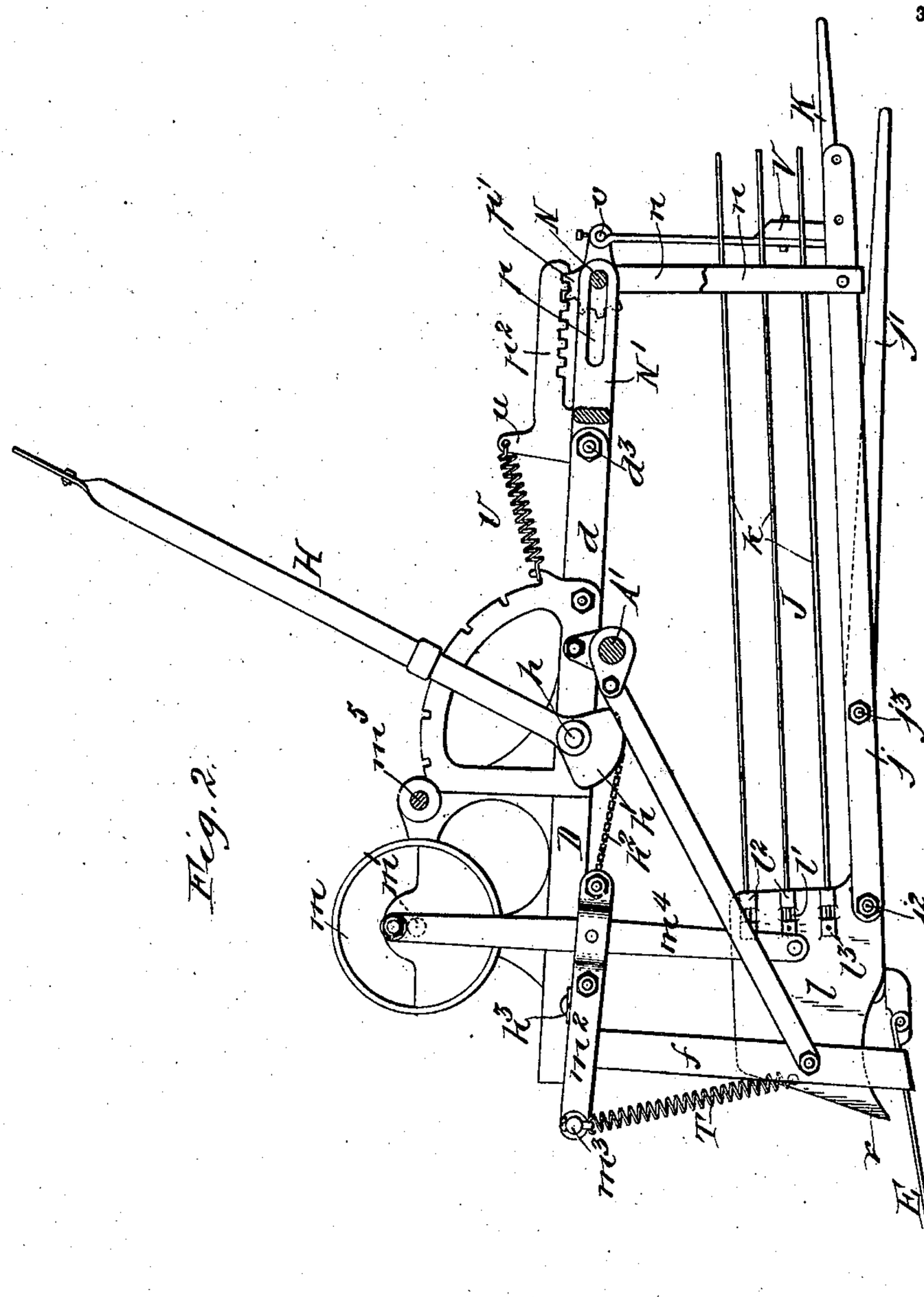
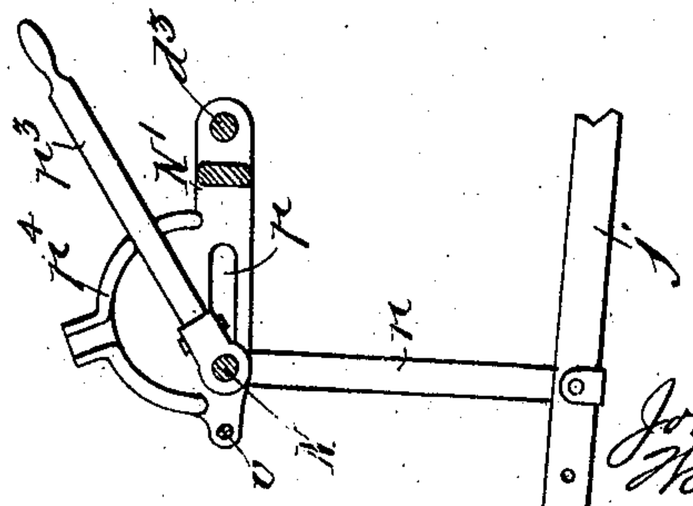


Fig. 3.



Witnesses;
Louis W. Gratz.
Emma M. Graham.

John Reuther,
William Reuther,
Inventors
by Geyer & Popp
Attorneys

No. 847,606. PATENTED MAR. 19, 1907.

J. & W. REUTHER.

POTATO DIGGER.

APPLICATION FILED NOV. 2, 1905.

3 SHEETS—SHEET 3.

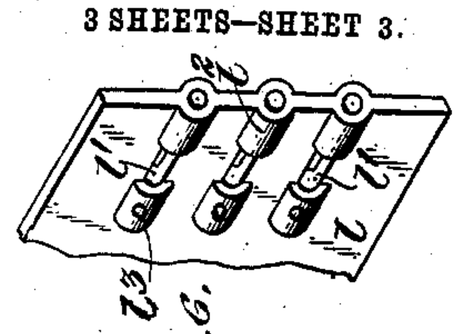


Fig. 6.

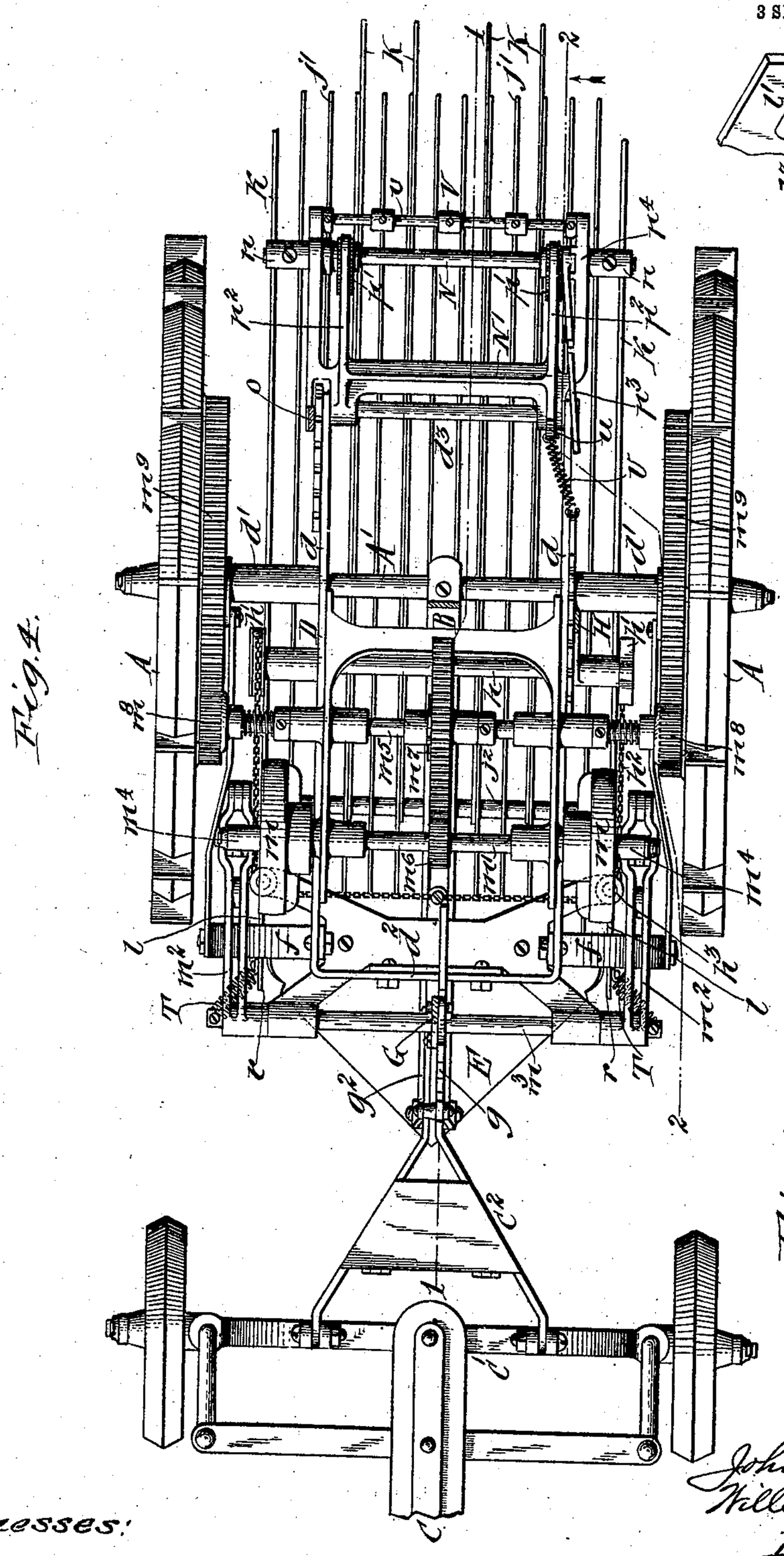


Fig. 4.

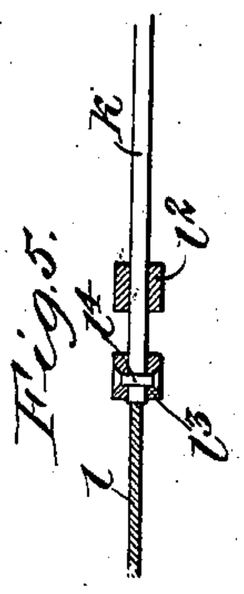


Fig. 5.

Witnesses:

Louis W. Gratz.

Emma M. Graham.

John Reuther,

William Reuther,

Inventors

by Geyer & Popp

Attorneys

UNITED STATES PATENT OFFICE.

JOHN REUTHER, OF LE ROY, AND WILLIAM REUTHER, OF MARILLA, NEW YORK.

POTATO-DIGGER.

No. 847,606. Specification of Letters Patent. Patented March 19, 1907.

Application filed November 2, 1905. Serial No. 285,621.

To all whom it may concern:

Be it known that we, JOHN REUTHER, a citizen of the United States, residing at Le Roy, in the county of Genesee and State of New York, and WILLIAM REUTHER, a citizen of the United States, and residing at Marilla, in the county of Erie and State of New York, have invented a new and useful Improvement in Potato-Diggers, of which the following is a specification.

This invention relates generally to potato-diggers of that class having a plow which enters the hills and elevates the soil, potatoes, and vines and a shaking-separator which receives the material from the plow and separates the potatoes from the earth and vines.

The invention has more particular reference to improvements in the machines described and shown in Letters Patent of the United States Nos. 675,139, dated May 28, 1901, and 777,806, dated December 20, 1904, and Letters Patent of Canada, dated April 18, 1905, No. 92,706, all issued to us.

One object of our present invention is to provide means for largely relieving the bearings of the separator from its weight and easing the draft.

A further object is to facilitate lifting the rear end of the separator in adjusting the same.

Another object is to improve the adjusting devices for varying the throw or tossing motion of the separator, according to the condition of the soil.

Additional objects of the invention are to improve the construction and arrangement of the separator-bars and the vine-retainers at the rear end of the separator.

In the accompanying drawings, consisting of three sheets, Figure 1 is a sectional elevation of the improved potato-digger, the plane of the section being in line 1 1, Fig. 4. Fig. 2 is a similar section in line 2 2, Fig. 4, viewed in the direction of the arrow. Fig. 3 is a fragmentary vertical longitudinal section on the same line looking in the opposite direction. Fig. 4 is a top plan view of the machine, partly in section. Fig. 5 is a horizontal section of one of the side plates of the separator, showing the means for fastening the guard-bars thereto. Fig. 6 is a fragmentary perspective view of one of said plates.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the ground-wheels, journaled on the axle A′.

B indicates the draft bar or frame, connected at its rear end to the axle, so that the bar is capable of swinging laterally relative to the axle, as in the Letters Patent hereinbefore referred to.

C indicates the tongue, supported at its rear end upon a suitable truck C′, which is connected with the draft-bar B by an intermediate frame C^2.

D represents the main or supporting frame for the plow and separator. This frame is substantially rectangular and consists of side bars *d*, which are rigidly secured to collars *d*′, Fig. 4, sleeved on the axle, a front cross-bar d^2, which rests upon the top of the draft-bar, and a rear cross bar or rod d^3.

E represents the plow or scoop, which may be of any suitable form and is carried by curved upright arms *f*, secured to and depending from the front end of the main frame.

The frame D is adapted to swing vertically on the axle with the draft-bar for the purpose of regulating the depth to which the plow enters the ground and for raising the plow clear of the ground when the machine is not in operation. In the construction shown the front end of the main frame is raised and lowered by a lever G, pivoted on a standard *g*, rising from the draft-bar. The lower arm of the lever is connected by a link with an arm g^2, extending rearwardly from the intermediate frame C^2, and the lever is provided with an ordinary locking-dog, which coöperates with a toothed segment on the standard *g*.

H is the hand-lever for turning the ground-wheels at a greater or less angle to the line of draft, so that in operating the machine on a hillside the wheels tend to run uphill and counteract the tendency of the machine to slide downhill. The lever H is secured to a transverse rock-shaft *h*, journaled on the main frame and provided at its ends with drums *h*′, to which are secured the rear ends of chains h^2, the chains being fastened to thier drums above and below the rock-shaft, respectively. These chains run around guide-pulleys h^3, mounted on the main frame, and are connected at their front ends to the draft-

bar, by which arrangement the front portion of the main frame is shifted to one side or the other upon swinging the hand-lever H forward or backward, turning the ground-wheels at an angle to the line of draft.

The parts thus far described form no part of our present invention, being subs antially shown and described in the Letters Patent hereinbefore referred to.

J represents the vibrating or shaking separator, which is arranged lengthwise of the machine in rear of the plow. The separator preferably consists of longitudinal side bars j and spaced intermediate separating tines or bars j', extending lengthwise of the separator and connected by transverse tie-rods j^2 j^3, passing through holes in said side and intermediate bars.

K represents supplemental bars or tines which are spaced farther apart than the main separator-bars. The supplemental bars and the main bars extend forwardly to or beyond the front tie-rod j^2 and are provided with holes for the passage of said rod and the rear tie-rod j^3, thus rigidly securing both the upper and lower bars or tines to the separator-frame. The front portions of the supplemental tines are preferably flush with the adjacent portions of the main tines j'. Their rear portions gradually rise above the latter, and they are straight or without angles or jogs from end to end, as shown in Fig. 1, by which construction all liability of the separator becoming clogged or chocked is avoided.

The separator is provided at opposite sides with longitudinal guard-rods k, which prevent the vines and soil from working sidewise off the separator. These guard-rods may be fastened to the separator-frame by any suitable means; but they are preferably secured at their front ends to the side plates l thereof, as shown in Figs. 1, 2, 5, and 6. Each of these plates is provided with a series of horizontal slots l', coinciding at their rear ends with eyes or perforated bosses l^2, extending to the rear edge of the plate, and at their front ends with similar bosses l^3. Each of these slots and the complemental end bosses receive the front portion of one of the guard-wires k, which latter are secured in place by pins or rivets l^4, passing transversely through the front bosses and the wires, as seen in Fig. 5. This forms a secure and inexpensive fastening for these wires.

The separator may be suspended from the main frame by any suitable means, and an up-and-down and back-and-forth pitching motion may be imparted thereto by any suitable mechanism; but we prefer to employ for these purposes the devices shown and described in Letters Patent No. 675,139, hereinbefore mentioned. These consist of the crank-disks m, mounted on the transverse shaft m', the links m^2 pivoted upon the transverse rod or shaft m^3, carried by the main frame, the rock-arms m^4, pivoted to said links and connecting the front portion of the separator with the wrist-pins of the crank-disks, and the counter-shaft m^5, connected with the transverse shaft m' by spur-gears m^6 m^7 and driven from the ground-wheels A by similar gears m^8 m^9.

The rear portion of the separator is suspended by links n from a transverse shaft N, which is carried by a substantially U-shaped frame N'. This frame is pivoted at its forward end upon the transverse rear rod d^3 of the main frame, so that it can be raised or lowered to change the inclination of the separator, this adjustment being desirable to better operate upon different soils. In the construction shown in the drawings the frame N' is adjusted by means of a hand-lever o, secured to its pivoted end and carrying a locking-pawl which engages a notched segment secured to the main frame. It is desirable to change the vertical throw of the rear end of the separator according to the condition of the soil, wet soil requiring a more vigorous tossing or pitching motion than dry soil. For this purpose the shaft N, which forms the upper pivot of the suspending-links n, is arranged to slide in longitudinal slots p, formed in the side bars of the frame N', as shown in Figs. 1, 2, and 3, and the shaft is provided with gear-segments p', which engage with longitudinal rack-bars p^2, formed on or secured to said frame. By this construction upon turning the shaft N in one or the other direction it is caused to slide forward or backward on the vertically-adjustable frame N', thereby changing the location of the upper ends of the suspension-links n accordingly. The shaft N has an actuating arm or lever p^3, adapted to interlock with a notched segment p^4, mounted on the frame N', as shown in Fig. 3. When the soil is dry, the shaft is shifted to its rearward position, as shown in Figs. 1, 2, and 3, that position producing the smallest vertical throw at the rear end of the separator, while when the soil is wet the shaft is shifted to its forward position to increase the throw and more vigorously toss and agitate the material. Two adjustments of the shaft are shown in the drawings; but it is obvious that the segment p^4 could be provided with more notches to afford a greater number of adjustments, if desired. It will be understood that the last-named adjustment of the separator is independent of its vertical adjustment, which is effected by means of the hand-lever o, and that the gear-racks p^2 take part in the vertical movements of the frame N', so as to maintain their proper relation to the gear-segments of the shaft N. The front portions of the side plates are arranged adjacent to the sides of the plow, and their front edges are inclined, so as to recede upwardly and rearwardly, as shown at r. By this construc-

tion, owing to the up-and-down motion of the front end of the separator, these edges serve to elevate or pick up the tops of the potatoes and direct them onto the plow, thereby preventing the tops from entering between the side walls of the separator and the plow-supporting arms *f* and interfering with the action of the separator.

T indicates counterbalancing devices, preferably springs, which connect the front portion of the separator with the main frame and are arranged at opposite sides of the separator. These springs have sufficient tension or power to counterbalance the weight of the separator and its load, thus largely relieving its driving mechanism and bearings of such weight, reducing the wear of these parts, and also easing the draft. A similar counterbalancing-spring U preferably connects the vertically-movable frame N′ with the main frame for relieving the operator from the full weight of the rear portion of the separator and its load in raising the separator. In the construction shown in the drawings, Fig. 2, this spring is secured at its front end to the notched segment and at its rear end to an arm *u*, projecting upwardly from the vertically-swinging frame.

V indicates vine-retaining fingers or weighted pendants suspended from a transverse rod or rock-shaft *v*, journaled in the rear portion of the vertically-swinging frame N′ and extending down between or near the supplemental separator-tines K. These fingers prevent the vines from passing off of said tines until they have collected in sufficient quantity to deflect the fingers rearwardly and escape between their lower ends and the rear ends of said tines, thus bunching the vines and preventing the same from falling promiscuously along the ground and covering the potatoes. The retaining-fingers are all rigidly secured to the rock-shaft *v*, so that they can only yield collectively, thereby preventing the vines from escaping irregularly past one or more fingers, which is liable to occur when the fingers are free to swing or yield individually.

We claim as our invention—

1. The combination of a frame, a plow, a support mounted on the frame and adjustable lengthwise thereof, a vibrating separator arranged in rear of the plow, and suspension-links connecting the rear portion of the separator with said adjustable support, substantially as set forth.

2. The combination of a frame, a plow, a transverse rod mounted on the frame and adjustable lengthwise thereof, means for adjusting said rod, a vibrating separator arranged in rear of the plow, and suspension-links connecting the rear portion of the separator with said adjustable rod, substantially as set forth.

3. The combination of a frame having longitudinal slots, a plow, a transverse rod guided in said slots, means for adjusting the rod in the slots, a vibrating separator arranged in rear of the plow, and suspension-links connecting the rear portion of the separator with said rod, substantially as set forth.

4. The combination of a frame having longitudinal slots, a plow, longitudinal gear-racks mounted on said frame, a transverse shaft slidable in said slots and having gear-wheels which mesh with said gear-racks, a vibrating separator arranged in rear of the plow, and suspension-links pivoted at their upper ends to said shaft and at the lower ends to the rear portion of the separator, substantially as set forth.

5. The combination of a frame having longitudinal slots, a plow, longitudinal gear-racks mounted on said frame, a transverse shaft slidable in said slots and having a hand-lever, means for retaining said lever in different positions, gear-wheels mounted on said shaft and meshing with said gear-racks, a vibrating separator arranged in rear of said plow, and suspension-links connecting the rear portion of the separator with said shaft, substantially as set forth.

6. The combination of a main frame, a plow carried by the same, a vertically-adjustable frame arranged on the rear portion of said main frame, means for adjusting said vertically-movable frame, a rod capable of forward and backward adjustment on the last-named frame, means for adjusting said rod, and a vibrating separator arranged behind the plow and having its rear portion suspended from said rod, substantially as set forth.

7. The combination of a plow, a separating-surface arranged in rear of the plow, means for vibrating the separating-surface, and longitudinal tines fixed to and movable with the separating-surface, the front portions of said tines being substantially flush with the adjacent portion of the separating-surface and their rear portions inclining upwardly and rearwardly above the same, said tines being straight and free from jogs throughout their length, substantially as set forth.

8. In a potato-digger, the combination of a frame, a vibrating separator suspended therefrom, means for actuating the separator, and a counterbalancing-spring connected at its upper end to the frame and at its lower end to the front portion of the separator, said spring partly carrying the weight and load of the separator, substantially as set forth.

9. The combination of a frame, a plow, a separator arranged in rear of the plow, means for vibrating the separator, a vertically-adjustable member mounted on the frame and from which the rear end of the separator is

suspended, and a counterbalancing-spring connecting said adjustable member with said frame, substantially as set forth.

10. The combination of a main frame, a plow, a separator arranged in rear of the plow, means for vibrating the separator, a vertically-swinging frame pivoted to the rear end of the main frame and having a hand-lever and an upwardly-extending arm, links connecting the rear portion of the separator with said swinging frame, and a counterbalancing-spring connecting said arm with the main frame, substantially as set forth.

11. In a potato-digger, the combination of the frame, the plow, and the vibrating separator arranged in rear of the plow and provided at its front end on opposite sides of the plow with means for picking up and directing the potato-tops onto the plow, substantially as set forth.

12. In a potato-digger, the combination of the frame, the plow, and the vibrating separator arranged in rear of the plow, the side walls of the separator having forwardly-inclined front edges for picking up the potato-tops and directing the same onto the plow, substantially as set forth.

Witness our hands this 23d day of October, 1905.

JOHN REUTHER.
WILLIAM REUTHER.

Witnesses:
C. F. GEYER,
E. M. GRAHAM.