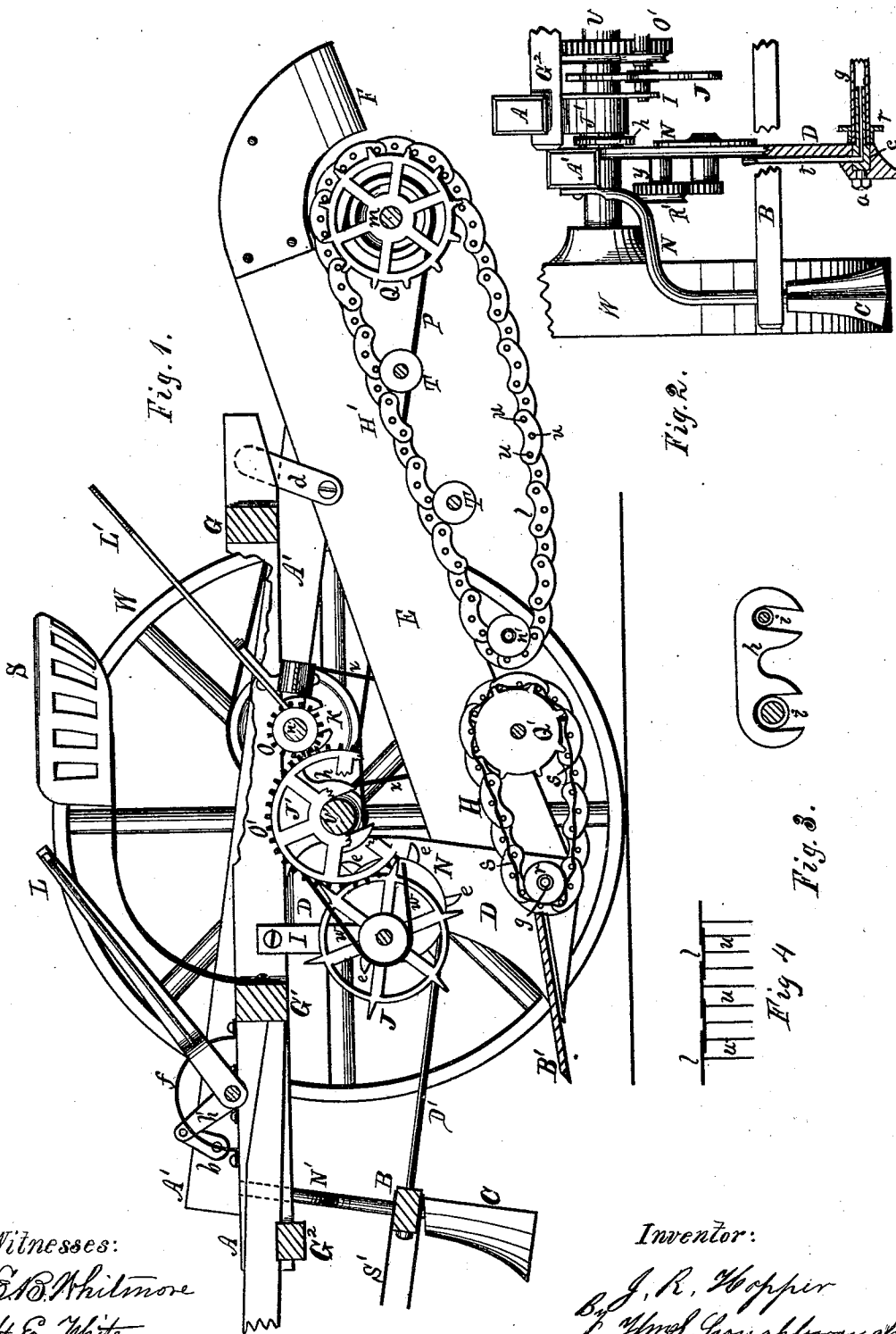


J. R. HOPPER.
POTATO-DIGGER.

No. 175,607.

Patented April 4, 1876.



Witnesses:
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UNITED STATES PATENT OFFICE

JOHN R. HOPPER, OF ROCHESTER, ASSIGNOR OF ONE-HALF HIS RIGHT TO
O. S. AND C. H. GILLAM, OF AUBURN, NEW YORK.

IMPROVEMENT IN POTATO-DIGGERS.

Specification forming part of Letters Patent No. **175,607**, dated April 4, 1876, application filed
December 8, 1875.

To all whom it may concern:

Be it known that I, JOHN R. HOPPER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Potato-Diggers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved potato-digger, showing the parts thrown up out of working position. Fig. 2 is a front or transverse sectional elevation of the right-hand portions of the same, with the frame A' thrown down. Fig. 3 is a detached view of the jaw *h*. Fig. 4 is a plan view of a section of one side of the chain-belts.

The following are among the many obstacles heretofore met with in operating potato-diggers: The difficulty of getting the earth and tubers sufficiently elevated to permit of their being properly separated, the proper action of the implement being prevented by clogging with vines and weeds.

To obviate these and other minor difficulties is the object of my present invention. Its nature will be better understood by reference to the drawings and specification.

The primary frame is composed of side bars A and cross-bars G, G¹, and G², and is hung upon the axle U by the pillow-block J'. The side bars A' of the auxiliary frame are each attached to the main frame by the pivoted links *d* at the rear end, and by the links *b* and the crank-arms *h'* of the shaft of the lever L at the front end. The shaft *n*, upon which is hung the pinion O and driving-pulley K, is hung to the side bar A'. The spur-wheel O', keyed to the main driving-shaft U, drives the pinion O, and, through this and the shaft *n*, the pulley K is made to drive the shaft *m* by the belt P. The sprocket-wheels Q, fixed upon the shaft *m*, drive the open or raddle belt H', the lower or front end running over the small pulley *n'*. The sprocket Q' also is driven from the pulley K by the belt *x*. This sprocket-wheel carries the upper end of the close or carrier-belt H, its lower or front end being sustained by the small pulleys *r*. The side

boards or guards E are bolted at the upper end to the side bars A', and their lower ends are rigidly fixed to the hanger-shanks D, their upper end being also bolted to the bars A'. The shovel-blade B' is rigidly fixed to the hanger-shanks D in the position shown. The belts H and H' are formed of flat links, curved edgewise, as shown, and their ends overlapping each alternate link inside and the next out. Each link *l* receives the end of three of the rods *u*.

Thus it will be seen that, owing to the curved links, the rods are alternately above or below the next adjacent one in a zigzag line. This increases their effectiveness for elevating and separating.

The carrier-belt H is prevented from acting as a separator to any extent by inserting a canvas belt, *s*, between the rods, as shown.

Any desired amount of agitation may be given to the separator-belt H' by the employment of one or more pulleys, T, for the links and rods to pass over.

The shaft of the weed and vine reels J is supported in the hangers I, and driven by the belt *w*, running in a groove on the side of the gear-wheel J'. The vine-cutter N has its axial bearing in the hanger-shank D, and is driven from the pulley K, through the intermediate combined pulley and gear R'. This is hung upon the stud-pin *y*. The disk N is provided with several cutters, *e*, the front edge of the shank D acting conjointly therewith as a fixed cutter. The draft-rod D' on each side of the machine is attached to the shank D at a point just above the sweep of the cutters *e*, and they are secured to the cross-bar B. The team is attached to the draft-straps S', fixed to the center of this cross-bar B. The latter is fitted to swing loosely upon the hanger N', which is bolted to the bar A' of the frame, as shown in Fig. 2, and is so bent as to carry the track-clearers C directly in front of the ground-wheels W, for the purpose hereinafter described.

I have heretofore found great difficulty in effecting a proper oiling of the small pulleys *r*, or the bearings of the shaft upon which they were hung. To obviate this difficulty, I now insert a hollow stem, *c*, into the shank D, where

it is firmly secured by the nut *a*. Then there is a hole drilled vertically through the offset formed upon the outside of the shank, and into the opening in the stem. The tube *t* is driven into this hole, so as to enter the pin *c*, and the upper end closed when the machine is in use by a suitable stopper. The sheaves or pulleys *r* are fixed upon a tube, *g*, instead of a solid shaft. This acts as a reservoir for the oil, the discharge of which, by the wear, being outward prevents the possibility of sand and grit from getting in between the working parts.

The machine is raised or lowered by means of the lever *L*, which is provided with a suitable spring-latch, to lock into openings formed in the arch *f*. The working parts are thrown into or out of gear by the lever *L'* in the usual manner.

The proper relative position of the pinion *O* and spur-wheel *O'* is secured at all times by means of the yoke *h*, fitted to grasp over a projecting boss, *i*, from the journal-box of each shaft.

By means of the close carrier or elevating-belt *H*, assisted by the vine-conveyer or picker-reels *J*, I am able to use a very narrow shovel-blade, *B'*, without the slightest danger of clogging. The material is thereby sufficiently elevated to enable the raddle-belt *H'* to thoroughly separate the tubers from the earth and discharge them upon the surface, the curved plate *F* on each side being designed to throw them centrally into a sort of winrow.

In cultivating potatoes by machinery, as usually practiced at the present day, the earth is left more or less in ridges in the direction of the last cultivation. Therefore, when they are to be dug by a machine, a great saving in the quantity of material the machine must handle may be effected by running the digger across the rows, or at right angles to the last cultivation. An objection to that with a machine having its working parts properly balanced and arranged with relation to the carrier-wheels has been that when the shovel was about to enter under the hill the wheels would

mount the ridge, which, of course, would not do. To obviate this difficulty I hang a tooth or small plow, *C*, directly in front of the wheels, and cut a track through the ridges as low as necessary for the wheels to run in.

It will be seen that by attaching the draft at a point near the shovel-blade, the downward draft upon the end of the pole, consequent upon drawing the machine by the main frame, in connection with locating the driver's seat *S* over the carrier-axle, or to the rear of it, is wholly obviated.

What I claim as my invention is—

1. In combination with the shovel-blade *B'*, the close carrier-belt *H* and open raddle-belt *H'*, the two latter being constructed substantially as shown and described, and arranged to revolve upon axes at right angles or transversely to the travel of the machine.

2. The inner frame *A*, hung upon the carrier-shaft *U*, and the outer frame *A'*, hung upon the counter-shaft *n*, both frames being hinged together at front and rear, as shown, in combination with the jaw or yoke *h*, whereby the two shafts are retained in a proper concentric position and the proper relative longitudinal position of the two frames is secured, in the manner and for the purposes set forth.

3. The revolving vine reel or reels *J*, in combination with the shovel-blade *B'* and the close chain-belt *H*, operating conjointly to assist in the passage of the vines and other material over said blade *B'* and belt *H*.

4. The tubular shaft *g*, constituting an oil-reservoir, as described, in combination with the hollow journal-arm *c*, fixed to the shank *D*, as and for the purposes set forth.

5. In combination with the tubular shaft *g*, hollow journal-arm *c*, and stock or shank *D*, the vertical oil-tube *t*, which latter also act as a key to secure the hollow journal *c* in position independently of the nut *a*.

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Witnesses:

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