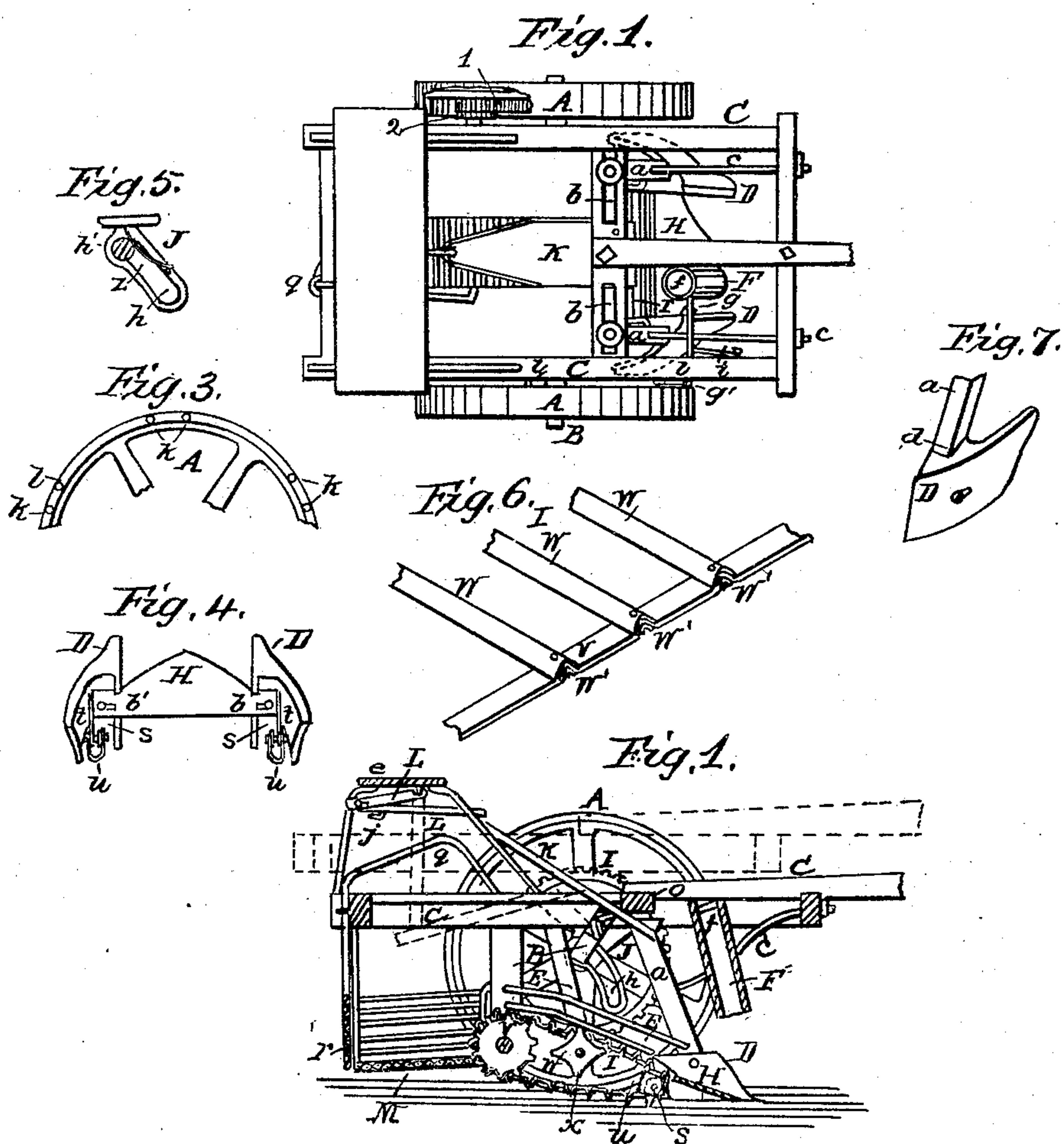


H. B. NORTON.

Potato Digger.

No. 78,473.

Patented June 2, 1868.



Witnesses,  
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# United States Patent Office.

H. B. NORTON, OF ROCHESTER, NEW YORK.

*Letters Patent No. 78,473, dated June 2, 1868*

## IMPROVEMENT IN POTATO-DIGGER.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, H. B. NORTON, 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 and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a plan of the machine.

Figure 2, a longitudinal vertical section in plane  $x x$  of fig. 1.

Figures 3, 4, 5, 6, and 7, detail views.

Like letters of reference indicate corresponding parts in all the figures.

I obtained a patent, dated October 22, 1867, for improvements in potato-diggers. This present invention has some resemblance to that in principle, but the general details are entirely different.

In the drawings, A A represent the driving-wheels, and B the axle upon which they rest. This axle, instead of being straight, in the usual form, is made arched or curved, so as to stride the row of potatoes above the vines, and still allow the driving-wheels to be made desirably small. This arched axle is absolutely essential, to give sufficient space between it and the endless apron running beneath, (presently to be described,) so as to allow a free passage of the vines over the apron.

On the axle rests a main frame, C, of any convenient form, and so arranged and connected, that, when the team is backed up, the said frame will be elevated to a certain degree above the axle, to disengage the gearing, 1 2, in going into the field, or in turning corners. To make this connection of the main frame and axle, I prefer the following arrangement: To the under side of the main frame, on opposite sides, are attached two concentric guide-arms, J J, with curved slots,  $h$ , in which rest the ends of the axle, so as to move up and down the extent of the slots. At one end of the slots are made offsets or notches,  $h'$ , fig. 5, in which the bearings of the axle strike at the extent of up motion, to throw the gearing out of engagement. When the axle thus strikes into the offsets, springs  $z$  bear over them, to retain them in place, as shown.

To the axle B is attached a foot-lever, K, the end of the same resting under a cross-piece,  $o$ , of the frame, so that, as the lever is depressed in the rear, the frame itself will be thrown up, as indicated in red lines, fig. 2. The object of this lever is to assist in the elevation of the frame, by the transferring of the weight of the operator from the seat to the lever, thereby not only lightening the load of the frame, but also applying that load to act upon the leverage.

A pair of jointed bars, L L, connect the long end of the foot-lever with the under side of the seat, which fold compactly when the frame is lowered, (black lines, fig. 2,) but straighten when the frame is elevated, (red lines, same figure,) and retain it in that position. When thus straightened, the contiguous ends of the bars lock together by means of a slot and pin,  $e$ , and a hook,  $j$ .

The arrangements above described for elevating and retaining the frame are very simple and effective. I am not aware that a main frame has ever before been so arranged as to be elevated by the joint action of the team and the operator.

In the front of the machine are situated two shares or ploughs, D D, at a suitable distance apart, to cut closely on each side of a row. They are attached to standards or stocks,  $a$ , whose upper ends rest in slots,  $b b$ , of the frame, and have thus an adjustment nearer together or further apart, as may be desired. The standards are braced by tension-rods,  $c c$ , extending to the front cross-piece of the frame, where they have screw-threads for tightening up at any time, whereby the endless apron, hereafter described, is made straight or taut when necessary.

The land-sides or vertical faces of the shares D D are placed inward, toward each other, and are set angling or converging forward. Between them is situated the scraper or scoop H, for taking up the potatoes. This scoop is connected with the shares in front by fitting in notches, while in the rear the ends project beyond, and have slots,  $b' b'$ , through which pass set-screws, to fasten them to the ends of standards  $a$ . This is shown in fig. 4, which is a bottom view of the shares and scraper.



This arrangement of the shares, with the land-sides set inward and angling, and with the plain scraper intervening, is of much importance in digging potatoes. The shares turn off a furrow each side of the row, leaving the latter, as it were, standing up in the form of a square ridge, which is thus easily and readily cut and raised by the scraper. In all other machines, with which I am acquainted, the scraper has to scoop down into the soil, and cut out a groove to get the potatoes, and the earth is thus pushed and crowded before the machine, which not only renders the action very imperfect, but also requires great power.

By throwing off the sides of the row, the earth is scraped up easily, and in good condition.

In addition to this, the land-sides forming the vertical walls of the scraper, and being set angling, as described, retain and guide the mass of earth in the proper direction to fall on the endless apron in the rear, and also prevent sticking to the land-sides.

The adjustment of the shares laterally, by means of the slots *b b'*, is of much importance in gauging the width cut to the size of the rows, to the rankness of the vines, and to the different kinds and conditions of the soil.

In the rear of the scraper is situated the endless apron *I*, which, at the front, passes over small rollers, *s s*, while at the rear it passes over spur-wheels, *V V*, which receive motion by the pinion *2*, on the shaft, gearing into cog-wheel *1* of the driving-wheel.

The rollers *s s* rest in bearings *t t* of the scraper, and they have, on their inner ends, heads or flanges *s'*, while at the rear they are enclosed by curved caps or covers, *u*, fig. 4, which are attached firmly to the projecting bearings *t t*, being bent around in such a manner as to present an acute angle towards the opening of the endless apron.

These flanges of the rollers hold the apron in place, and prevent wear to the flexible sides of the latter; also serve as a guide to hold the apron in its proper extended form in the rear of the scraper. The caps or covers serve as a protection or shield to the rollers against stones or other objects, that might otherwise be drawn in by the action of the apron. This they accomplish by perfectly enclosing the rollers, so that no harm can ensue. The acute angle of these cups being presented towards the openings of the apron, effectually ward off any stones or impediments that present themselves.

The construction of the apron is as shown in fig. 6, being composed of flexible side-pieces *v v*, with cross-slats or rods *w w*. These slats I prefer to make of  $\Lambda$  or half circular form, in cross-section, as shown, and they are attached to the side-pieces *v* by resting on top, while small stay-pieces, *w' w'*, are placed under the bands *v*, and the whole are then secured by rivets.

This construction has a peculiar effect in obviating strain upon the parts in passing over the rollers *s* and wheels *V*, for in the act of passing, the said bands, in a degree, free themselves of the bars by bending downward away from them, conforming to the circle, and leaving but a slight attachment. The construction and arrangement are also very cheap.

At a suitable position within the endless apron is situated an agitator, *W*, consisting of two spur-wheels, *x x*, at the ends of a shaft, which simply has its bearings in projections from the frame. These spur-wheels simply intermesh with the bars of the endless apron, and, preferably, alternately, in order to produce a better action.

This agitator, being elevated, holds the apron up from sagging, and the agitating action is such as to most effectually sift out the dirt from the potatoes, and leave the latter free to be deposited in the rear. The alternative action above described is most effective in this respect.

On the sides of the apron, but disconnected from it, are situated guards *E E*, which serve to retain the potatoes in the apron, but still allow a free sifting of the dirt.

In the rear of the apron is situated a skeleton receptacle or basket, *M*, made of wire or other suitable material, for holding the potatoes. The bottom of this receptacle is made inclined downward, as it extends backward, for the purpose of concentrating the potatoes in the rear, and facilitating their discharge.

At the rear, the receptacle is provided with a hinged door, *r*, having a lever, *q*, extending up, and resting with its end on top of the frame, in such position as to be easily acted upon by the foot. By opening this door at intervals, the potatoes that have been gathered will be dumped in charges.

The machine thus arranged as a potato-digger is very effective in operation. The earth containing the potatoes is easily scooped up, and in its passage becomes rapidly freed from dirt. The arched axle allows a free passage over the vines, and a free action of the apron. The frame is easily raised or lowered, to engage or disengage the gearing. The whole action is simple and effective.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the loose frame *C*, carrying the operating-apparatus, with the axle and driving-wheels, when said frame is capable of being elevated by the joint action of the team and operator, as herein set forth.

2. The combination of the folding bars *L L* with the lever *K* and frame *C*, in the manner and for the purpose specified.

3. The arched axle *B*, when employed in combination with the driving-wheels *A* and endless apron *I*, whereby the edge of the wheels may be reduced to the minimum, and a free passage for vines is left over the apron, as herein set forth.

4. The shares *D D*, set angularly, and with the land-sides inward, in combination with the scraper *H*, whereby the sides of the row are first ploughed off, and then scooped up, as herein set forth.

5. Adjusting the shares *D D* centrally, irrespective of the scraper, both at the top and bottom, by the slots *b b'*, as herein described.

6. The construction and arrangement of the bearings *t*, rollers *s s'*, and angular caps *u*, as herein specified.



7. The combination of the enclosed and alternating agitator *W* with the endless apron *I*, as herein set forth.
8. The combination of the side guards *E E* with the endless apron *I*, as herein specified.
9. The construction and arrangement of the endless apron, the same consisting of the flexible sides *v v*, the  $\Lambda$ -shaped or half circular slats *w*, and the stay-pieces *w'*, united by rivets, the whole operating in the manner and for the purpose specified.
10. The combination of the tension-rods *c* with the plough-standards *a* and endless apron *I*, whereby the ploughs, scraper, and apron are drawn forwards at pleasure, to make them taut, as herein set forth.
11. The combination and arrangement of the offsets or notches *h'*, and the springs *z*, with the curved slots *h*, in the manner and for the purpose specified.
12. The combination of the door *r* and lever *q* with the open receptacle *M*, arranged and operating as herein set forth.
13. The employment of two bearing-rollers *s s*, on opposite sides, for sustaining the front end of the apron without a connecting-shaft, as herein set forth.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

H. B. NORTON.

Witnesses:

J. A. DAVIS,

W. J. CREELMAN.