

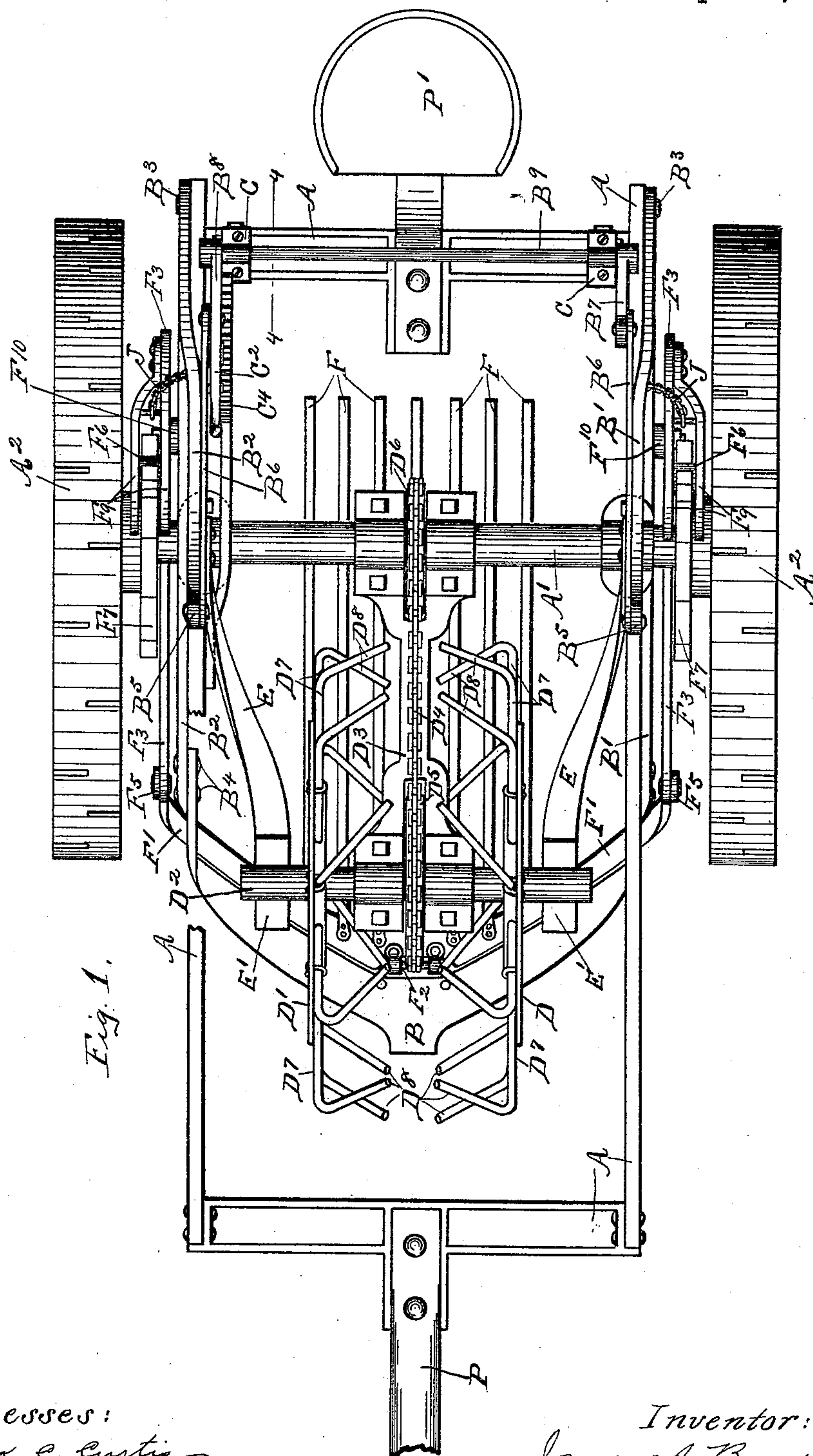
(No Model.)

3 Sheets—Sheet 1.

J. A. BUCK.  
POTATO DIGGER.

No. 517,516.

Patented Apr. 3, 1894.



Witnesses:  
Frank C. Curtis  
A. Edelman

Inventor:  
James A. Buck  
by Geo. A. Mowbray  
Atty.

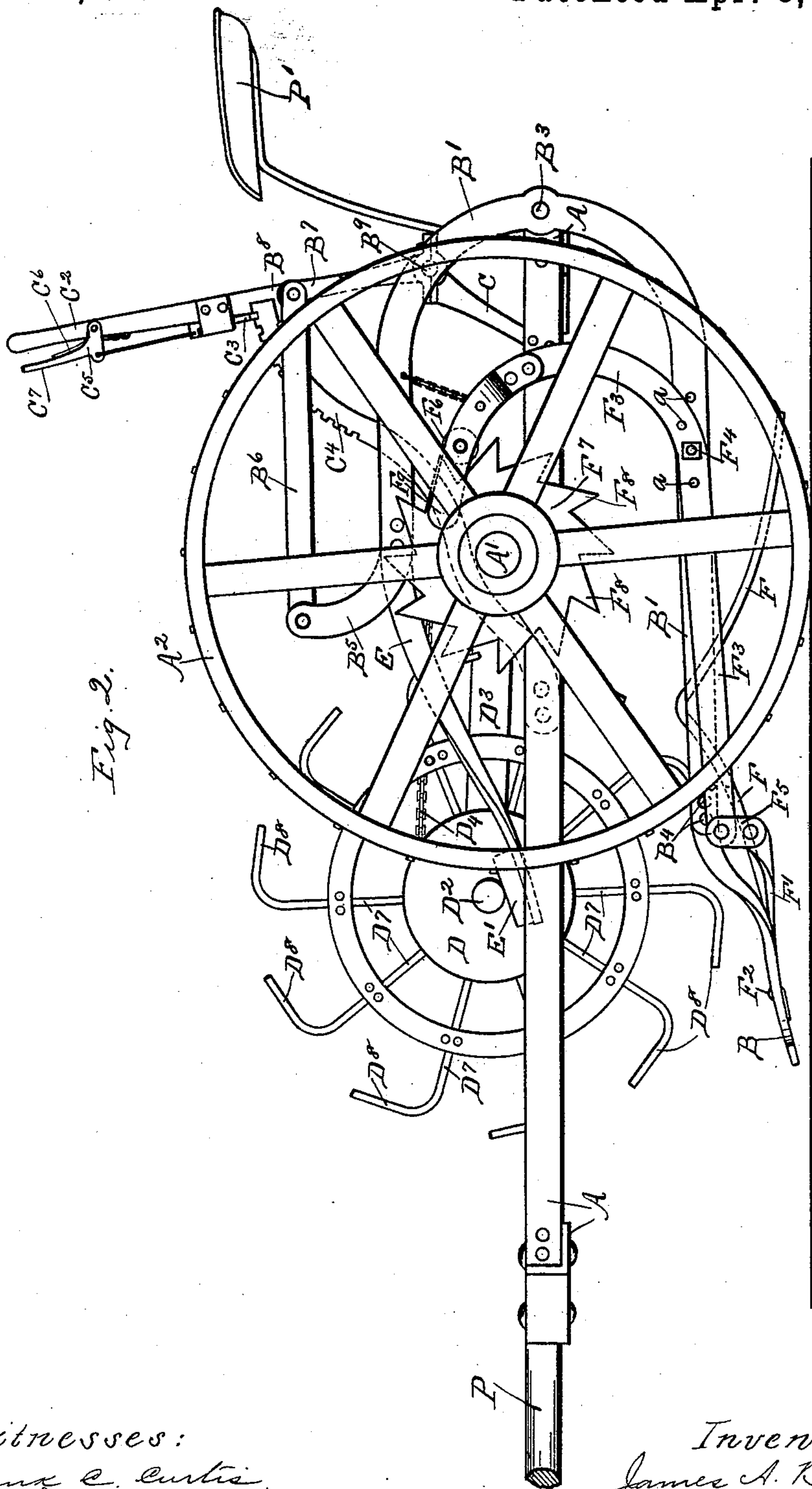
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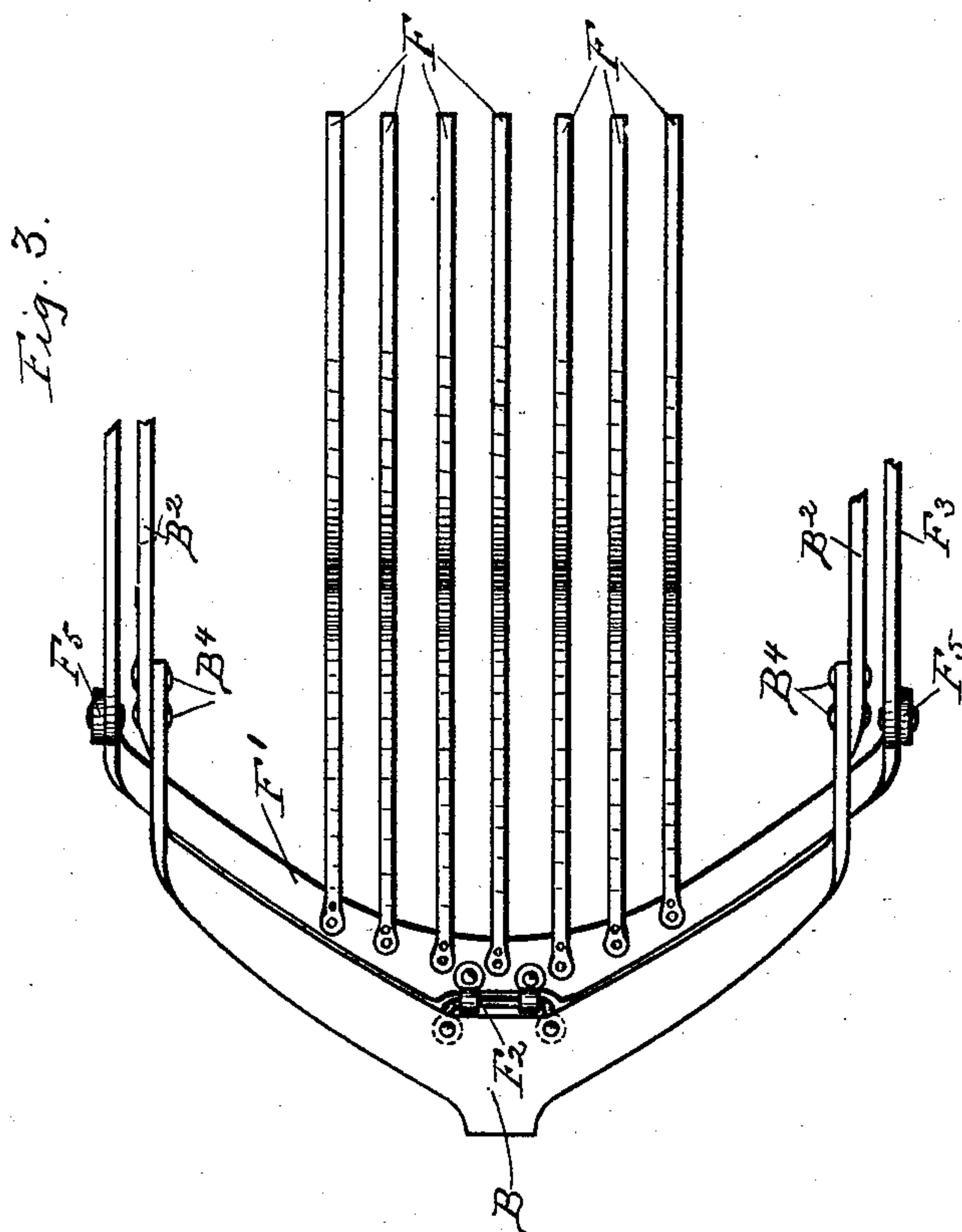
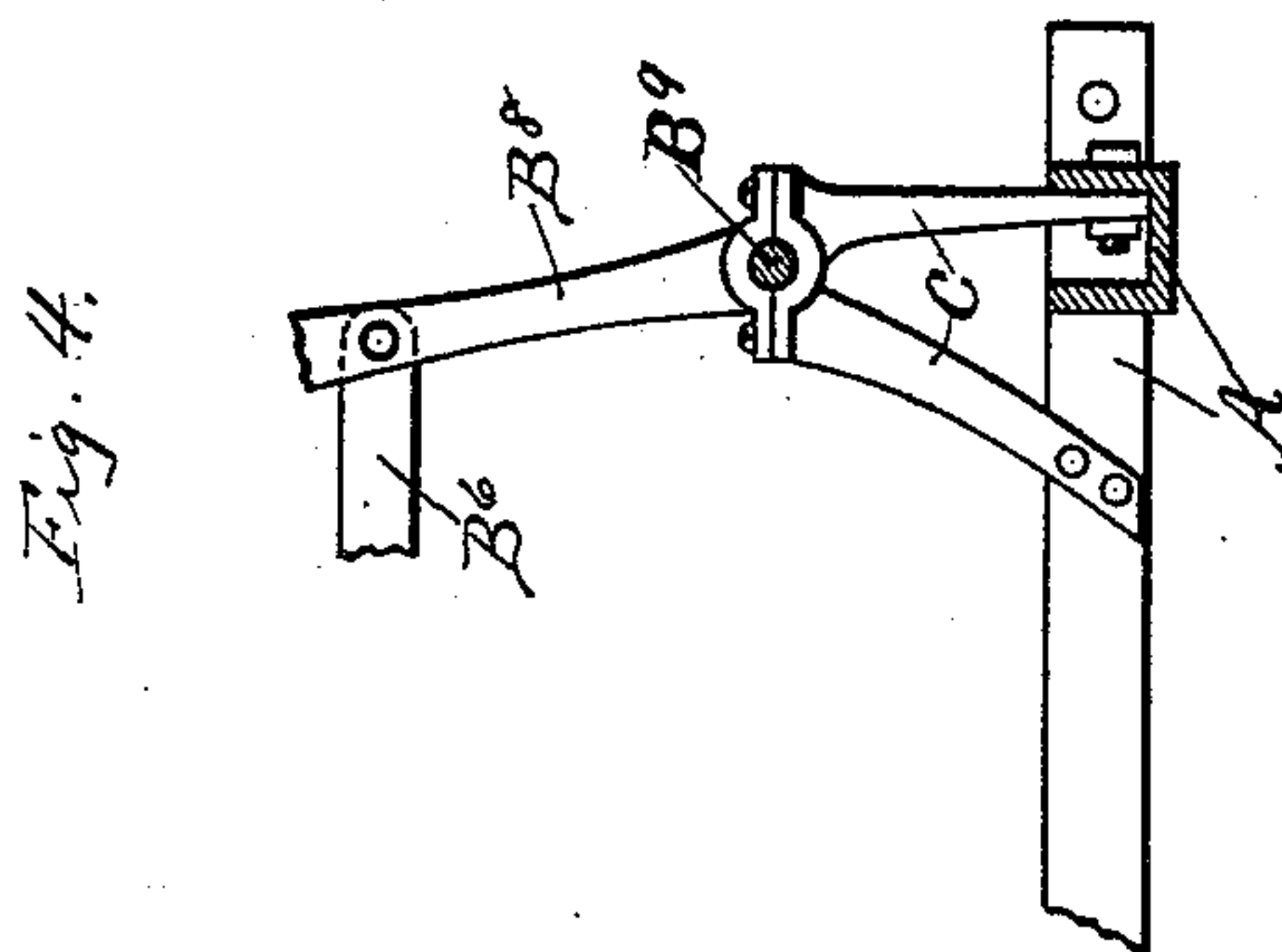
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# UNITED STATES PATENT OFFICE.

JAMES A. BUCK, OF CRESCENT, NEW YORK.

## POTATO-DIGGER.

SPECIFICATION forming part of Letters Patent No. 517,516, dated April 3, 1894.

Application filed March 18, 1893. Serial No. 466,574. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. BUCK, a citizen of the United States, residing at Crescent, county of Saratoga, and State of New York, have invented certain new and useful Improvements in Potato-Diggers, of which the following is a specification.

My invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a top plan view of my improved potato-digger. Fig. 2 is a view in side elevation of the same with the plow and separating mechanism in an elevated position out of use. Fig. 3 is a top plan view of the plow, tines and tine-cross-piece, detached. Fig. 4 is a transverse section of the truck-frame and the plow-actuating rock-shaft, showing the rock-shaft-supporting bracket in elevation, the section being taken on the broken line 4—4, in Fig. 1.

My present invention comprises an improvement upon the device shown and described in United States Letters Patent No. 441,928, granted to me December 2, 1890, for improvements in potato-diggers, to which patent reference may be had in connection with the following description for a complete understanding of my present invention.

Referring to the drawings, A— is the truck-frame supported upon the shaft A'— upon the opposite ends of which are fixed the traction-wheels, A<sup>2</sup>—.

B— is the plow supported by the plow-frame which comprises a pair of horse-shoe shaped levers B'—, B<sup>2</sup>—, pivoted at their bent portions upon the respective side-bars of the truck-frame, at the rear end of the machine, by the studs or pivots B<sup>3</sup>—. The lower arms of these levers project forwardly and are fixedly secured to upturned portions of the respective plow-shares by bolts or rivets B<sup>4</sup>—, the right-hand side-bar of the truck-frame being broken away in Fig. 1 to better show the

connection between the lever and plow-share on that side of the machine. The upper arms of these levers project forwardly and are upturned at their ends B<sup>5</sup>—, the upturned portions being connected by links B<sup>6</sup>— with rock-levers B<sup>7</sup>—, B<sup>8</sup>—, fixed upon a common rock-shaft B<sup>9</sup>—, whereby vertically oscillating movements may be imparted to both horse-shoe levers simultaneously, by means of the rock-shaft. The rock-shaft is rotatorily supported in bearings in the upper ends of brackets C—, secured to the truck-frame and projecting upwardly therefrom. One of the rock-levers B<sup>7</sup>— is extended upwardly to form a hand-lever C<sup>2</sup>— by means of which the horse-shoe-shaped plow-frame may be oscillated to raise or lower the plow. The hand-lever is provided with a slide-bar or catch C<sup>3</sup>— adapted to enter grooves or recesses in the segment C<sup>4</sup>—, secured upon the truck frame forwardly of the traction-wheels, and secure the hand-lever in any desired position. The slide-bar C<sup>3</sup>— is linked to the crank-lever C<sup>5</sup>—, pivoted upon the hand-lever, and controlled by the spring C<sup>6</sup>—. The upper arm C<sup>7</sup>— of the crank-lever is adapted to be grasped by the hand of the operator simultaneously with the hand-lever, to release the catch C<sup>3</sup>— and allow the plow-frame to be adjusted as desired.

D—, D'—, are a pair of clearing-wheels fixed upon a common shaft, D<sup>2</sup>— rotary in bearings in one end of a frame D<sup>3</sup>— pivoted at its other end upon the traction-wheel shaft A'—.

Rotary movements are imparted to the clearing-wheels by means of the sprocket-chain D<sup>4</sup>— connecting the sprocket-wheel D<sup>5</sup>— fixed on the clearing-wheel shaft with the sprocket wheel D<sup>6</sup>— fixed upon the traction-wheel shaft.

Each of the clearing-wheels is provided with a plurality of spokes D<sup>7</sup>— secured to the wheel hubs in approximately radial positions. The projecting end of each spoke is provided with an arm D<sup>8</sup>— projecting at approximately right angles to the spoke and obliquely across the track of the plow, as shown, the arms of one wheel extending toward those of the other wheel and being so inclined that the arms as they pass around the lower side in contact with the loose material raised by the plow, will tend to throw the potatoes toward the



central space between the wheels, to leave them uninjured in a compact row in the track of the plow.

The clearing-wheels are located above and slightly in the rear of the plow, being maintained at a definite distance from the traction-wheel shaft by means of the clearing-wheel frame  $D^3$ —pivoted upon such shaft. The clearing-wheels and frame are thus oscillatory upon the traction-wheel shaft, and to maintain the clearing-wheels the proper working distance above the plow, I provide the upper arm of each plow-frame lever with a forwardly-projecting extension  $E$ —secured to such arm to form a part of the horse-shoe shaped lever, and projecting beneath an end of the clearing-wheel shaft to support the same. The extension  $E$ —may be a flat bar riveted to the plow-frame at one end and provided at its other end with a bearing-block  $E'$ —upon which the wheel-shaft rests and is free to turn. The extension-bar  $E$ —may be twisted or given a half-turn intermediately of its ends, as shown, making the same resilient and thereby lessening the vibratory strain upon the plow-frame.

The clearing-wheels are unsupported on the upper side, being free to rise to accommodate large lumps of earth, &c., raised by the plow, and fall by gravity when such obstructions are beaten to pieces and passed, until the clearing-wheel shaft rests upon the bearing-blocks  $E'$ —.

By means of the supporting extension  $E$ —the clearing-wheels are prevented from approaching the plow too closely, and when the plow is raised or lowered the same operation operates to similarly raise or lower the clearing-wheels.

For the purpose of separating the potatoes from the soil, I provide a plurality of separator tines  $F$ —connected at their forward ends to a common cross-piece  $F'$ —hinged to the heel of the plow, as shown at  $F^2$ —, to swing vertically. The forward portions of the tines are curved upward concentrically with the path of the clearing-wheel arms, while the rear portions are inclined downwardly as shown in Fig. 2. Oscillating movements are imparted to the tines by means of the separator-frame comprising a pair of levers  $F^3$ —supported by and pivoted at  $F^4$ —upon the respective plow-levers, and connected at the front end with the tine cross-piece by the links  $F^5$ —. The other end of each lever  $F^3$ —is provided with a cam-follower  $F^6$ —adapted to ride the cam  $F^7$ —fixed on the traction-wheel shaft. The cam consists of a disk or wheel having a plurality of peripheral projections or teeth  $F^8$ — and the cam-follower  $F^6$  is a roller pivoted to the end of the separator-frame and adapted to ride the toothed periphery of the cam-wheel and impart oscillating movements to the tine-frame and tines, as the cam-wheel rotates. The cam-teeth  $F^8$ — are gradually beveled or inclined on the working face, and sharply cut away on the other face, whereby

the separator tines and frame are raised with a comparatively slow movement and then allowed to drop suddenly as the cam-follower falls from the highest point of one tooth upon the lower portion of the inclined face of the next succeeding tooth, by which its downward movement is suddenly arrested, imparting to the separator-frame and tines a vibratory jar which effectually shakes off the dirt and vines from the potatoes. The separator-frame levers  $F^3$ — are bifurcated at their upper ends, the cam-follower  $F^6$ — being pivotally supported by and between the bifurcate arms  $F^9$ — of the lever. A washer  $F^{10}$ — is inserted between the separator and plow-levers at their points of pivotal connection, the connecting bolt  $F^4$ —passing through registering apertures in such levers and washer. The plow and separator levers are provided with a plurality of such bolt-holes  $a$ —, arranged longitudinally of the respective levers, as shown in Fig. 2. By passing the connecting bolt through registering bolt-holes at different points along the two levers, the leverage of the separator-frame can be increased or diminished to give reciprocating movements of less or greater amplitude to the separator-tines. A chain  $J$ — or other flexible connection, connects each separator-frame lever with the plow-frame lever to which it is pivoted, to limit the distance to which such levers can be separated, the chain being sufficiently long to permit free oscillating movements of the separator-frame when the plow-frame is lowered as in use; yet so limited in length that when the plow-frame is elevated to raise the plow from the ground, the tightened chain will also elevate the separator-frame to raise the tines from the ground, as shown in Fig. 2. A draft-pole  $P$ — shown partly broken away, is secured to the front end of the truck-frame; and the rear end of such frame supports a seat  $P'$ —for the driver. As the machine is drawn across a potato field when in use, the lowered plow raises the potatoes, soil, &c., into the path of the clearing-wheels, the arms of which clear away the vines and weeds, reduce the lumps of earth, and throw the potatoes and broken earth toward the middle of the machine upon the separator-tines. The oscillating movements of the tines further reduce the lumps of earth, which when sufficiently small pass between the tines, leaving the potatoes to be delivered at the ends of the tines, uninjured in a compact row. The movement of the tines alternately increases and decreases the distance between them and the clearing-wheel, the tines approaching at times sufficiently close to properly reduce the lumps of soil, &c., and at other times separating sufficiently to allow stones or other obstructions to pass through without injuring either tines or clearing-wheel. All connections between the truck-frame and the plow and separator-frames are made rearwardly of the clearing-wheels by means of the horse-shoe-shaped levers, whereby weeds



and vines raised by the clearing-wheel arms cannot become entangled in such connections to prevent or retard the movements of the respective parts.

5 What I claim as new, and desire to secure by Letters Patent, is—

1. In a potato digger, the combination with the plow and a rotary clearing-wheel yield-  
10 ingly supported above the plow, of a plurality of separator-tines curved concentrically with the periphery of the clearing-wheel and piv-  
15 oted at their forward ends to swing vertically in the track of the plow toward and from the clearing-wheel, and means for oscillating the separator-tines, substantially as described.

2. In a potato-digger, the combination with the plow, a clearing-wheel rotatorily supported  
20 above the plow, and means for rotating such clearing-wheel, of a plurality of tines pivoted at their forward ends in the track of the plow  
25 and oscillatory toward and from the clearing-wheel, and means for oscillating the tines, substantially as described.

3. In a potato-digger, the combination with  
25 the traction-wheel truck and plow, of a plurality of separator-tines oscillatory in the track of the plow, a lever connected at one end with the oscillatory tines, a cam-connec-  
30 tion between the other end of the lever and the traction-wheel shaft and an adjustable fulcrum-connection between the lever and a relatively fixed support, substantially as de-  
scribed.

4. In a potato-digger, the combination with  
35 the traction-wheel truck and plow, a vertically movable clearing wheel, and means for rotating the clearing-wheel, of a horse-shoe

shaped plow frame pivoted at the bend of the frame to the rear part of the truck and hav-  
ing its upper and lower arms respectively 40  
in supporting connection with the clearing-wheel and plow, substantially as described.

5. In a potato-digger, the combination with the traction-wheel truck, plow, plow-frame  
45 pivoted upon the truck, separator-tines pivoted upon the plow, a separator-frame pivoted upon the plow-frame and connected with the tines, and means for imparting oscillating  
50 movements to the separator-frame; of a flexible connection between the plow-frame and separator-frame, and a hand-lever pivoted upon the truck and connected with the plow-  
55 frame, whereby oscillating movements may be imparted to the separator-tines independently of the plow, and both plow and tines lifted from the soil by the same hand-lever,  
substantially as described.

6. In a potato-digger, the combination with the plow, a clearing-wheel rotatorily supported  
60 above the plow, and means for rotating the wheel; of a plurality of separator-tines pivoted at their forward ends to the heel of the plow to oscillate vertically, the forward por-  
65 tions of the tines beneath the clearing-wheel being inclined upwardly and the rear portions inclined downwardly, and means for communicating oscillating movements to the tines, substantially as described.

In testimony whereof I have hereunto set my hand this 6th day of March, 1893.

JAMES A. BUCK.

Witnesses:

GEO. A. MOSHER,  
FRANK C. CURTIS.