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W. C. ROWE.  
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APPLICATION FILED APR. 21, 1909.

Patented Mar. 15, 1910.  
3 SHEETS—SHEET 1.

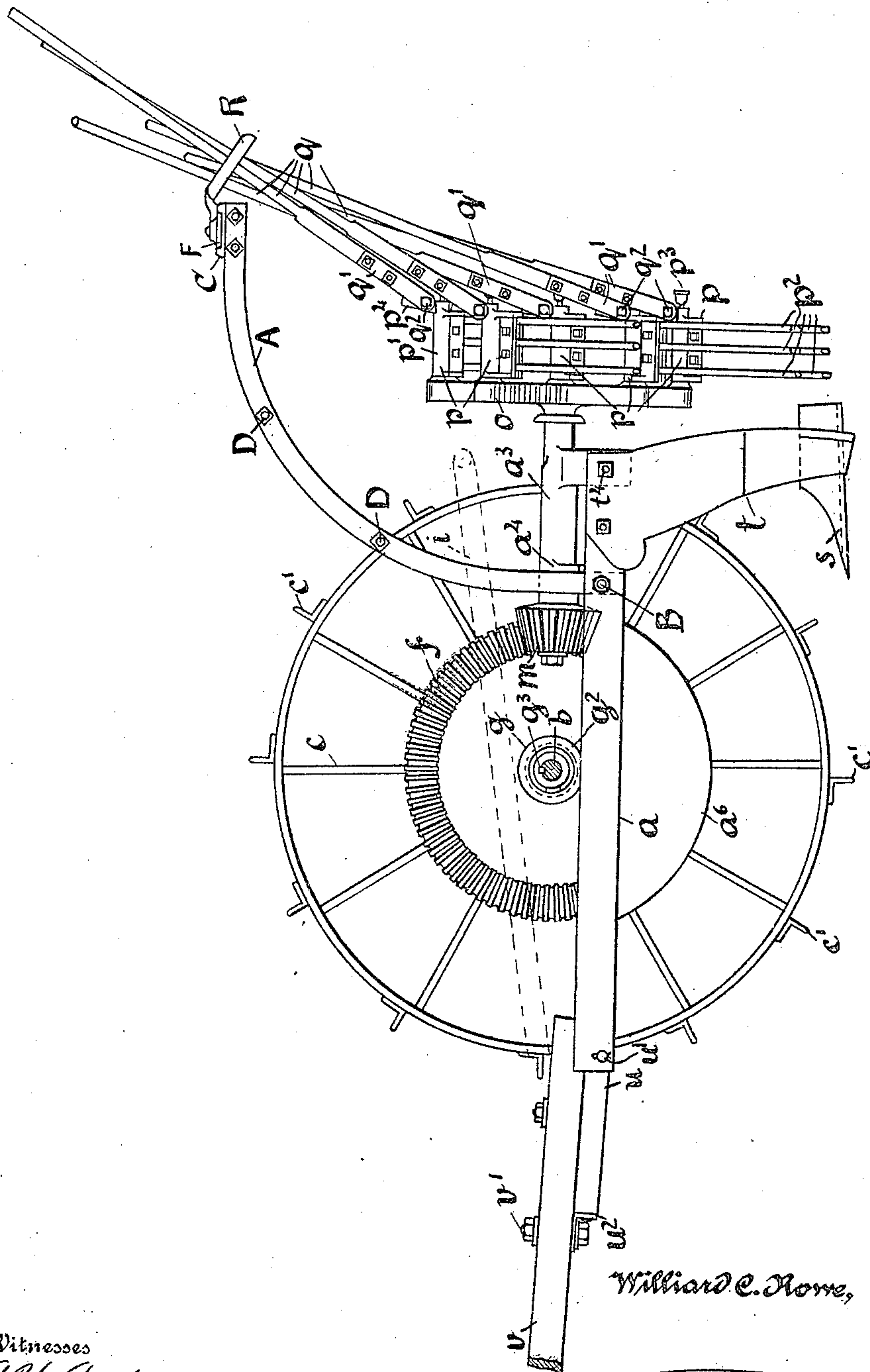


Fig. 1

Witnesses  
A. Y. Andrews  
Wilhelmina D. Schenkein

Willard C. Rowe, Inventor

By *George L. Moore*

Attorney

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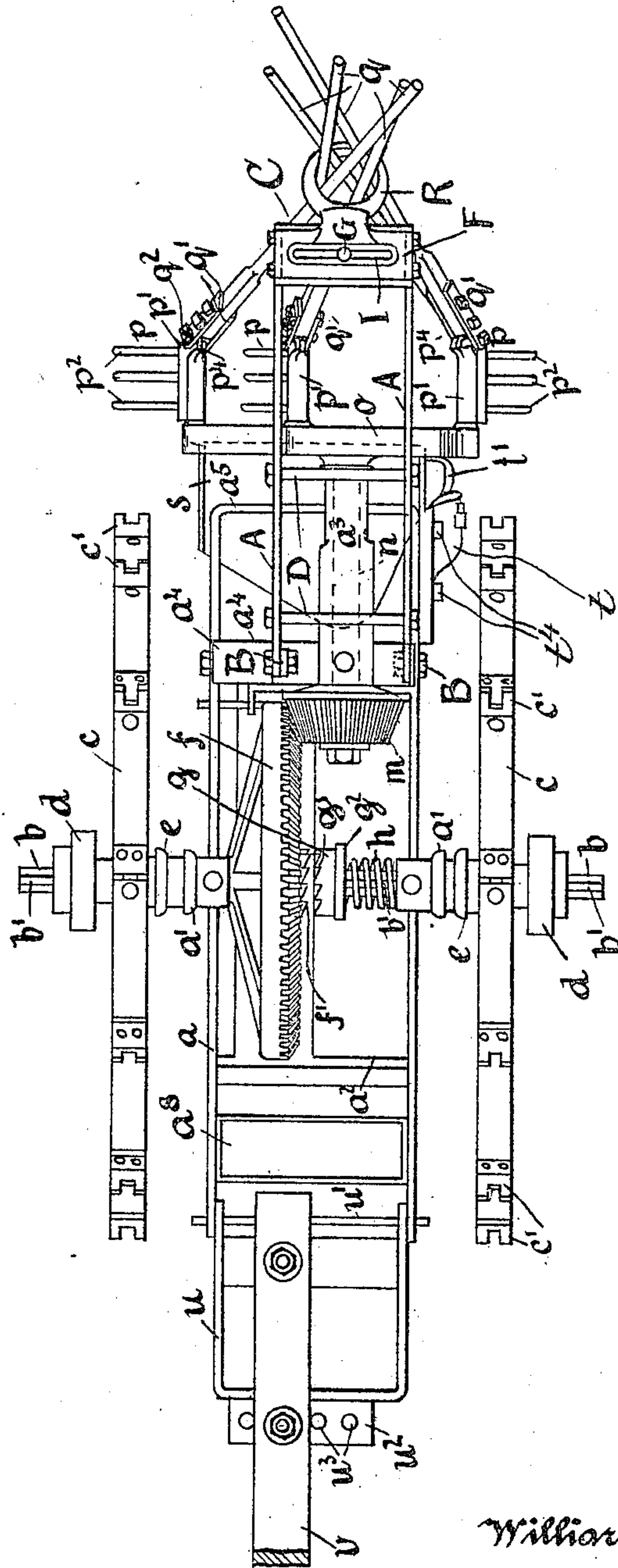


Fig. 2

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# UNITED STATES PATENT OFFICE.

WILLIARD C. ROWE, OF MARINETTE, WISCONSIN, ASSIGNOR TO STEVENS  
MANUFACTURING COMPANY, A CORPORATION OF WISCONSIN.

## POTATO-DIGGER.

952,082.

Specification of Letters Patent.

Patented Mar. 15, 1910.

Application filed April 21, 1909. Serial No. 491,330.

*To all whom it may concern:*

Be it known that I, WILLIARD C. ROWE, of Marinette, Wisconsin, have invented a Potato-Digger, of which the following is a specification.

The object of this invention is to improve that type of potato digger wherein a plurality of forks are pivotally mounted to turn upon a single spider or wheel around the circumference thereof, and are guided so as to remain in substantially upright position during their revolution about the axis of the wheel by means of a plurality of sticks one of which is attached to each fork and is guided in a ring supported above said rotating spider or wheel.

I have found by experience that differences in character of soil make this machine as heretofore constructed more efficient in some soils than in others because of its varying constituency. Potatoes are more easily extracted from a loose sandy soil than from a hard clay soil, and consequently if the forks of such a machine are set for the former, they will not extract the potatoes well from the latter, while on the other hand if the forks are set for the stiff soil they will throw the potatoes too far when working in light soils. To obviate this difficulty I arrange means whereby the angle of the digger-forks can be adjusted so that they can be given a somewhat forwardly directed angle for the heavier soils and a somewhat backwardly directed angle for the lighter soils; and I accomplish this construction by providing a slotted frame and sliding-ring for supporting the sticks, which can be adjustably clamped to said frame.

In the drawings hereto annexed I have shown for purposes of illustration so much of a complete machine of this type as is necessary to illustrate my improvement, and herein,

Figure 1 is a side elevation of a complete machine from the left side, the left wheel and shaft-bearing being removed; Fig. 2 is a plan-view thereof; Figs. 3 and 4 are rear end-views showing the forks set for digging in heavier and lighter soils respectively; and Fig. 5 is a longitudinal section through the adjustable ring and slotted frame.

In these drawings every reference letter and numeral refers always to the same part.

The machine as shown comprises a frame  $a$ , which as here shown is substantially a

piece of flat bar-steel bent into three sides of a rectangle, and which is suspended by bearings  $a'$  upon a shaft  $b$ , whereon are mounted the supporting and driving-wheels  $c$ . The shaft  $b$  is provided with key-ways  $b'$  on its ends and middle portion and is operatively connected with the wheels  $c$  by means of ratchet-clutches  $d$  such as are commonly used in agricultural machines for connecting the wheels with the axle to compensate differences in velocity between the two wheels. The wheels are shown as provided with projecting flanges  $c'$  at intervals, which prevent the wheels from slipping on the ground, but these are not an essential part of my invention. Spacing-pieces  $e$  of different lengths and number are inserted between the wheels  $c$  and bearings  $a'$  to accommodate the distance between the wheels to different spacings of the potato-rows. The shaft  $b$  has mounted thereon adjacent to the right-hand bearing  $a'$  a beveled gear  $f$ , which is loose upon the shaft, and is driven therefrom during operation of the machine by means of a clutch  $g$ , which has crown-teeth  $g'$  engaging with similar teeth  $f'$  on the hub of the gear  $f$ ; said clutch  $g'$  is nonrotatably connected with the shaft by a spline  $g^s$  sliding in the keyway  $b'$  and is pressed resiliently against teeth  $f'$  by a spring  $h$  abutting upon the opposite bearing  $a'$ ; so that the teeth  $f'$  and  $g'$  are held normally in engagement. When the machine is being drawn inoperatively, however, the clutch  $g$  is withdrawn from the gear  $f$  by means which are not here shown as they have no necessary connection with my invention.

With the gear  $f$  meshes a beveled pinion  $m$  mounted on a shaft  $n$  in a supporting-sleeve or bearing  $a^s$  which is mounted on the frame, the front end being supported by a transverse bridge  $a^t$  and the rear end upon the rear transverse member  $a^s$  of the frame. On the rear end of the shaft  $n$  is mounted a star-wheel  $o$ , on the arms of which are rotatably mounted the digger-forks  $p$ , each of said forks having a hub  $p'$  turning on a pin or stub-shaft mounted on the end of the arm and being provided with two or more removable tines or prongs  $p^2$  (three are shown in the drawing), the ends of the hubs  $p'$  being closed by grease-cups  $p^3$ . Each digger-fork has pivotally mounted thereon a sliding-stick  $q$ , said stick being provided on its end with a pair of flange-plates  $q'$  which



turn upon a pin  $q^2$  passing through a flange-lug  $p^4$  projecting from the upper side of each hub  $p'$ , which flange-lug lies between the plates  $q'$  and acts in connection with them to prevent the hub from turning transversely to the stick  $q$ . The ends of all the sticks  $q$  are gathered together and received in a ring R, which according to the old construction is mounted in a fixed position above and to the rear of the forks so that as the wheel  $o$  rotates said sticks  $q$  reciprocate within the ring R and also move consecutively around the circumference of the ring. Now according to my construction I am enabled to shift the ring laterally so as to tilt the angle of the forks forwardly or backwardly with respect to the digging movement, as clearly illustrated in Figs. 3 and 4. While I do not limit myself to any particular mounting or arrangement of the frame-elements, as these may manifestly be arranged in various ways, I accomplish this according to preferred construction by means of a supporting-frame which consists of a pair of curved bracket-arms A bolted at B to the framework of the machine and secured together in parallel relation at the top by means of a cross-bar C, and at intermediate intervals by bolts D. The cross-bar is grooved with a wedge-shaped groove E to receive the wedge-shaped base F of the ring R, and this is secured to the cross-bar E by a bolt G passing through a hole H in the middle of the cross-bar and through a slot I in the base F. It will be seen by this arrangement that the base F carrying the ring R can be shifted laterally as illustrated in Figs. 3 and 4, and clamped by setting the bolt G in various positions in the slot I.

Immediately in advance of the digger-forks is arranged a scoop-shaped share  $s$  which is mounted on a sheath  $t$  mounted upon the frame by bolts  $t^4$ . The share  $s$  passes through the earth beneath the potatoes and throws up the earth and potatoes contained therein into loose condition for the action of the digger-forks  $p$ .

At the front of the frame  $a$  is mounted a three-sided extension  $u$  thereof, pivoted upon a bolt  $u'$  connecting the two ends of the frame, and the draft-pole  $v$  is adjustably mounted upon the extension  $u$ , an angle-piece  $u^2$  containing a plurality of bolt-holes  $u^3$  being provided for the adjustable mounting of the pole; the bolt  $v'$ , passing through one of said holes.

As used in practice the gears and clutch-mechanism are inclosed in a casing of which the bottom-plate  $a^2$ , depressed at  $a^6$  to admit the gear  $f$ , forms one part and the other half is removed in the drawing (not being an essential part of the invention) to show the inclosed parts. A tool-tray is shown at  $a^8$ .

From the above description it will be readily seen that my invention will assume

a variety of forms all embodying the same principles and that a great number of changes and modifications are possible in the nonessentials without departing from the spirit of my invention, the scope of which is particularly defined in my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a potato-digger, the combination of a digging-tool, means for giving said tool a movement downwardly into, forwardly through and upwardly out of the ground, and a laterally shiftable device for guiding and determining the angle at which said tool stands relative to its direction of movement.

2. In a potato-digger, the combination of a digging-tool, a driving-member whereon said tool is pivotally mounted, means for giving said member a movement whereby the tool is carried downwardly into, forwardly through and upwardly out of the ground, a guiding-stick attached to said tool for holding it upright, and a laterally shiftable holding-member for the upper end of said stick.

3. In a potato-digger, the combination of a digging-tool, a driving-member whereon said tool is pivotally mounted, means for giving said member a movement whereby the tool is carried downwardly into, forwardly through and upwardly out of the ground, a guiding-stick attached to said tool for holding it upright, and a laterally shiftable ring in which the upper end of said stick is guided.

4. In a potato-digger, the combination of a rotating-wheel, a digging-tool pivotally mounted on said wheel so as to have a movement of revolution about its axis, said wheel being in position to carry the tool, in the lower part of its movement, downwardly into, forwardly through and upwardly out of the ground, a device for maintaining said tool in approximately upright position, and shiftable means for guiding said maintaining-device whereby the angle of said tool is tilted forwardly or backwardly with regard to the direction of motion.

5. In a potato-digger, the combination of a rotating-wheel, a plurality of digging-tools pivotally mounted upon said wheel around the circumference thereof, a plurality of sticks one of which is attached to each digger-tool so as to maintain it in upright position, a supporting-frame, and a ring encompassing the upper ends of said sticks to guide them, said ring being shiftable laterally upon said frame and having means for clamping it in its various positions thereon, whereby said tools are given a forward or backward tilt relative to the direction of movement.

6. In a potato-digger, the combination of

a wheel, and means for rotating the same, a plurality of digging-tools pivotally mounted on the circumference of said wheel, a plurality of guiding-sticks jointed to said digging-tools upon joint-pins lying in the plane of rotation, a supporting-frame having a cross-bar at the top thereof, a ring embracing the upper ends of said sticks, said ring being mounted on a base having a slot in a line parallel to the plane of rota-

tion of said wheel, and a bolt mounted in said cross-bar and passing through said slot whereby said ring may be clamped in various positions on said frame.

In witness whereof I have hereunto set my hand this 29th day of March, 1909.

WILLIARD C. ROWE.

Witnesses:

JOHN J. O'CONNELL,  
L. SCHAFER.