

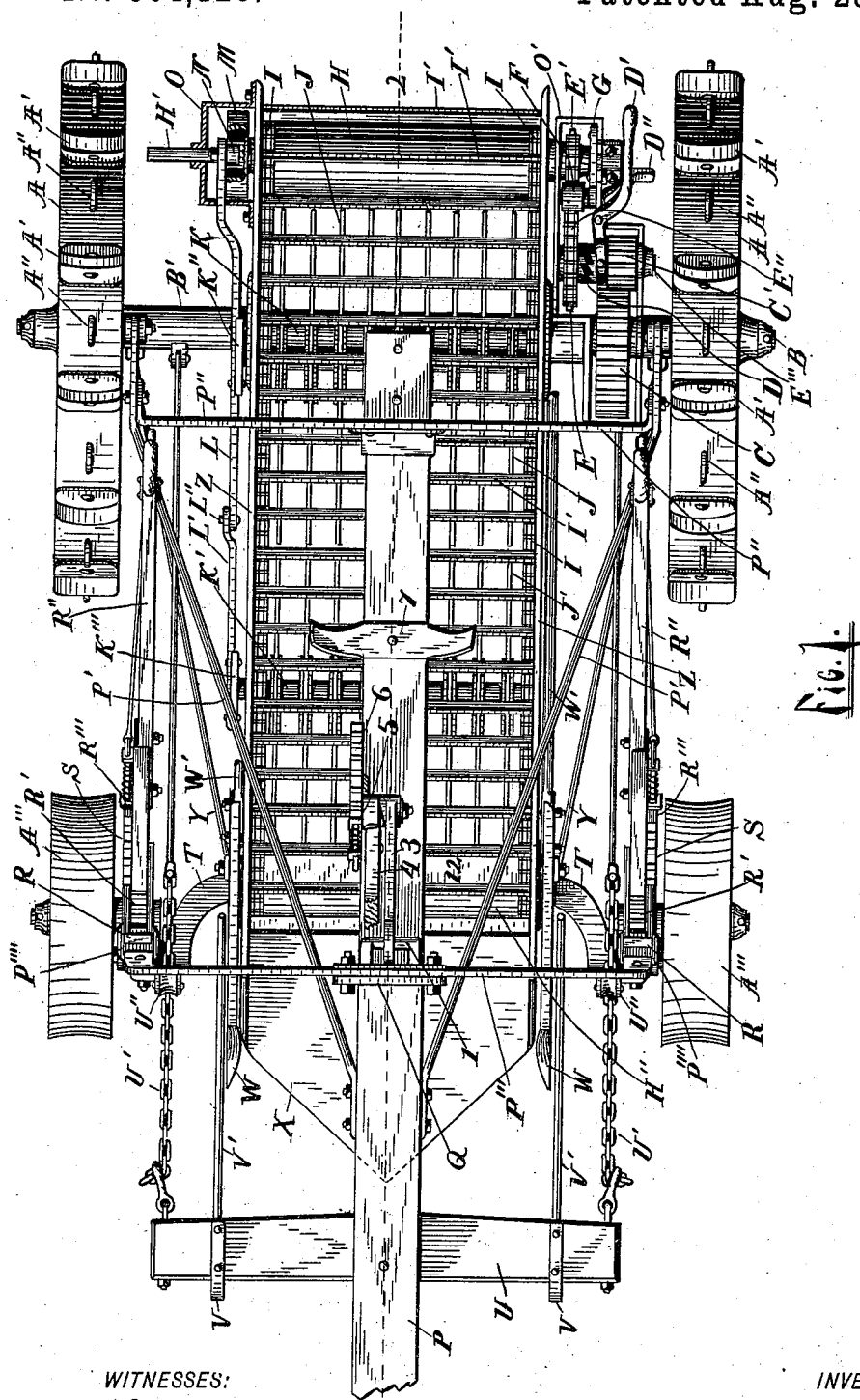
(No Model.)

3 Sheets—Sheet 1.

O. L. GOSS.
POTATO DIGGER.

No. 504,128.

Patented Aug. 29, 1893.



WITNESSES:

Lois Moulton
Ernest E. Moulton

INVENTOR

Orrin L. Goss,
BY

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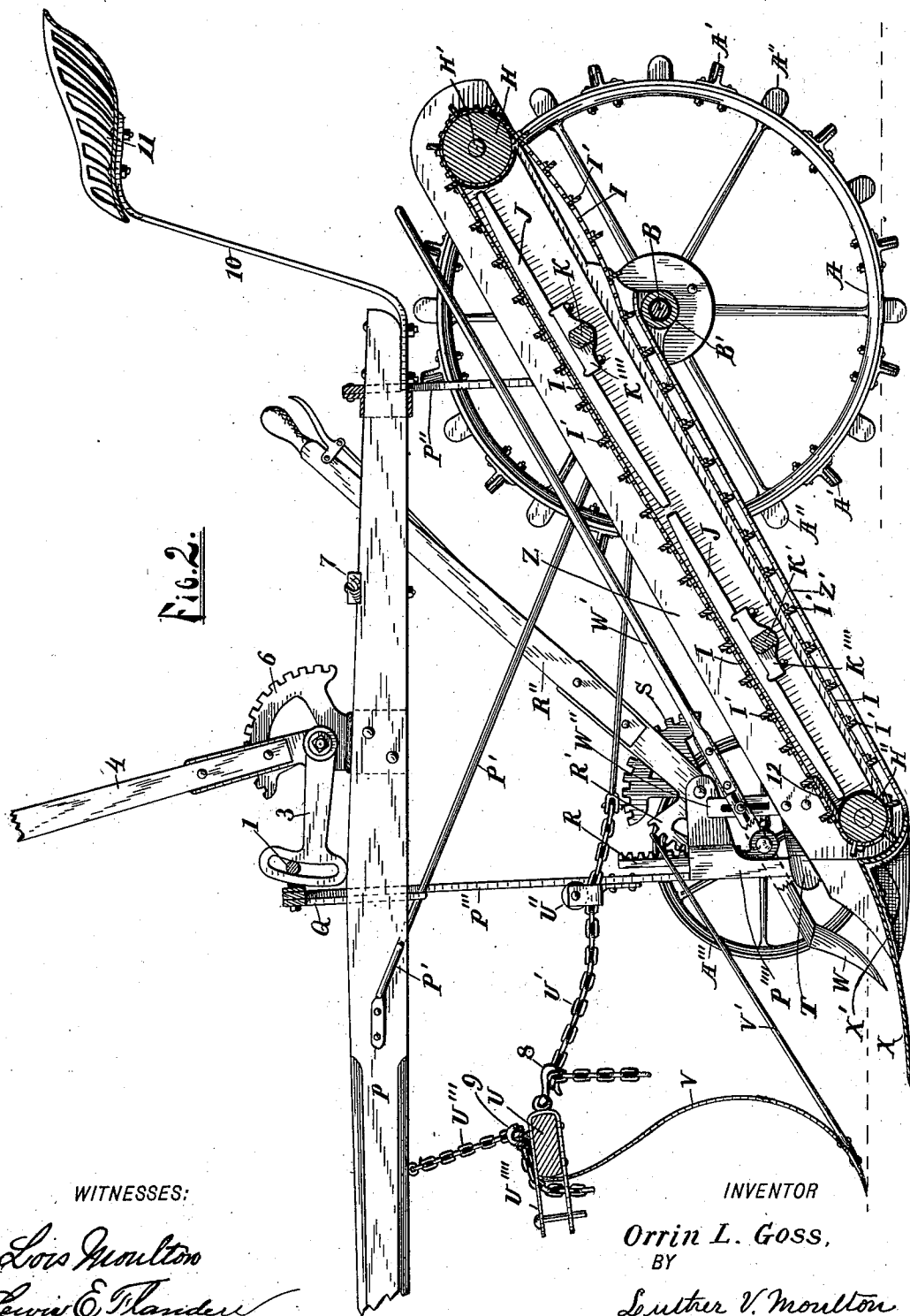
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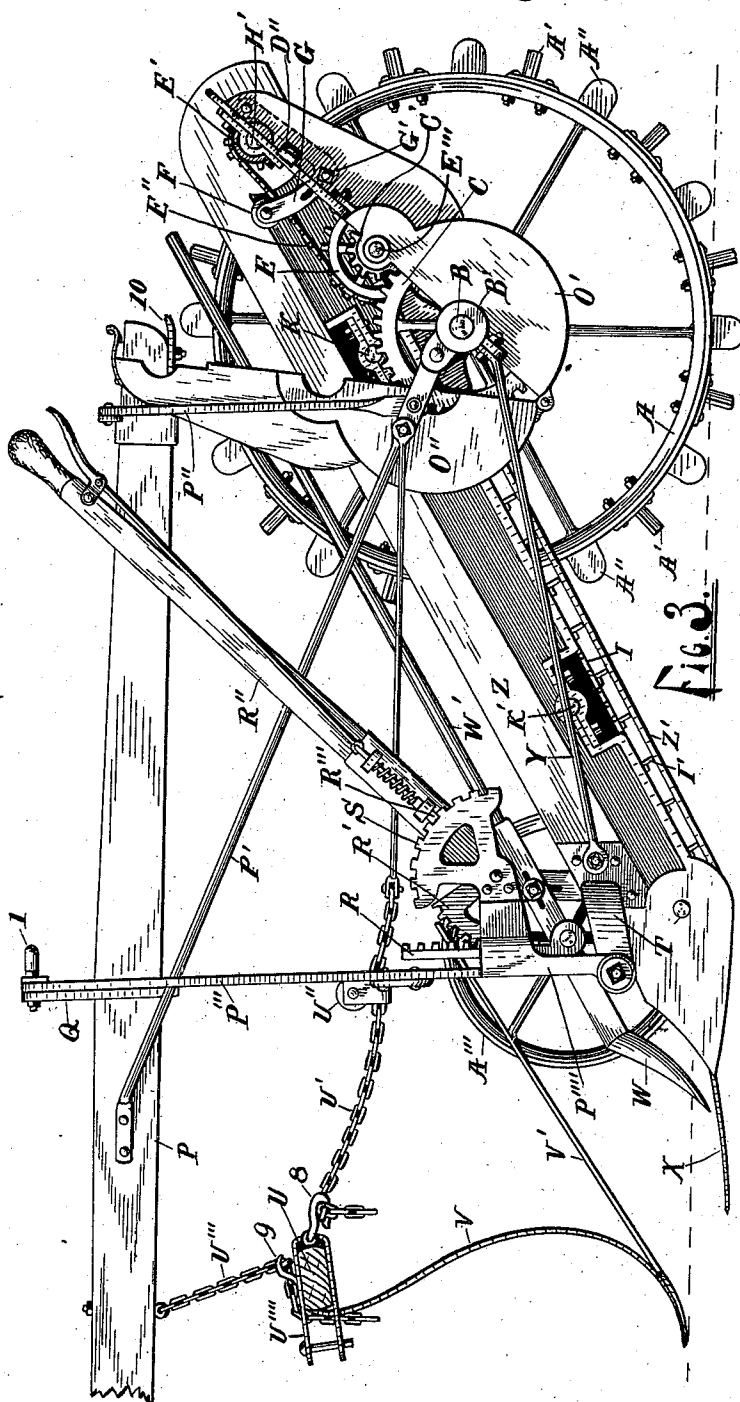
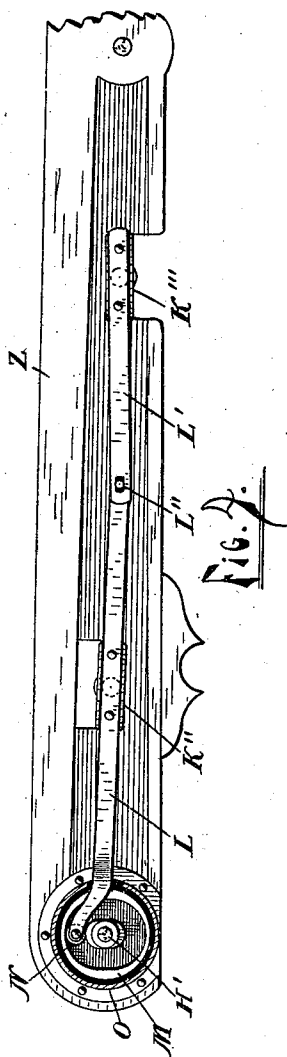
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UNITED STATES PATENT OFFICE.

ORRIN L. GOSS, OF GRAND RAPIDS, MICHIGAN.

POTATO-DIGGER.

SPECIFICATION forming part of Letters Patent No. 504,128, dated August 29, 1893.

Application filed December 9, 1892. Serial No. 454,671. (No model.)

To all whom it may concern:

Be it known that I, ORRIN L. GOSS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Potato-Diggers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved potato digger, and its object is to provide the same with certain new and useful features, herein-after more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings in which—

Figure 1 is a plan view of a device embodying my invention. Fig. 2 is a vertical section of the same on the line 2—2 of Fig. 1. Fig. 3 a side elevation of the same, with the wheels of one side removed; and Fig. 4 a detail showing the mechanism for vibrating the grated bottom.

Like letters refer to like parts in all of the figures.

A A are the drive wheels, which are provided with a series of concavo-convex blades A' and flat blades A'', arranged alternately, and projecting from the rims of said wheels. The blades A' are arranged in the plane of the axis of said wheels, with their concave sides forward as they enter the ground to prevent said wheel from slipping forward, and the blades A'' are arranged in a plane at right angles to the axis of the said wheels to prevent the same from slipping laterally over the ground.

B is the driving shaft to which the wheels A are attached, which shaft is inclosed in a casing B' forming a bearing for the same.

C is a gear fixed upon the shaft B, which engages a pinion C', longitudinally movable and loose upon its shaft E'', upon which shaft is also a sprocket wheel E; said pinion and sprocket wheel are provided with a clutch D, which is engaged by moving the pinion C' on the shaft E'', by means of the pivoted lever D', which lever at one end engages a groove in the hub of said pinion C', and at the other end engages a catch D''.

The sprocket wheel E is connected to and drives another sprocket wheel E' by a chain

E'', which chain is tightened to prevent lost motion, by a roll F, which roll engages one side of said chain and is journaled on the movable end of a lever G, pivoted to the case O', and adjustably secured by a bolt G' passing through said case and a slotted opening in said lever. The wheel E' is fixed upon and drives a shaft H' upon which is fixed a roll H, around which passes endless chains I, having drag-bars I' attached at regular intervals; said chains I extend to and pass around another roll H'', located near the forward end of the inclined bed of the machine, which bed consists of two series or sets of grate bars J, each set being arranged parallel to each other and to said chains I, and attached to rock shafts K and K', having lateral projections K''' to which said bars are bolted; said bed is arranged close to and beneath the upper portions of the chains and drag bars described, and is traversed by the same. Said bed is vibrated by means of a wheel M on the shaft H', said wheel having a cam groove engaging a roll N on the end of a lever L, which lever is attached to a T head K'' on the upper rock shaft K; said lever is also prolonged to a point midway between said rock shafts K and K', and is there connected to the end of the lever L' by a pin and slot L''; said lever L' being connected to a T head K''' on the lower rock shaft K'.

Suitable side frames Z Z are provided in which the shafts H' K, K' and roll H'' are journaled; said frames being attached at their lowersides to the casing B' and extended diagonally forward and downward at each side of the grated bottom, terminating a short distance in front of the roll H'', where they are firmly secured to the respective sides of the horizontal scoop or blade X, which blade is curved upward at its rear side adjacent to the roll H'' terminating in a downwardly and rearwardly extended concave X' arranged concentric to the axis of said roll, and at such distance from the surface thereof as to permit the passage of the chains I and drag bars I'.

12 is a fixed plate at the rear of the upper side of said roll H'' to carry everything taken up by the blade X over the ends of the grate bars J and deposit the same upon said bars.

P is the pole, or tongue, which is pivotally

attached to the respective ends of the casing B', by means of the side braces P' and the arch P''. Said braces are attached at their forward ends to said pole, and pivoted to said casing at their rear ends, and the arch P'' is attached at its respective ends to the braces P', and at its middle to the rear end of the said pole.

Near the forward end of the sides Z Z are attached outwardly and forwardly curved arms T T, to the outer ends of which are pivoted the lower ends of the castings P''', to which castings are attached the respective ends of an upwardly arched bail P''', which bail passes above the pole P, and has attached the guide Q, consisting of downwardly projecting parallel arms engaging the respective sides of the pole and between which said pole is free to move vertically. At the rear of the respective ends of said bail, and vertically movable in suitable recesses in the castings P''' are the racks R, to the lower ends of which are attached by suitable journals, the forward wheels A'', said wheels having concave rims engaging the ground when in action. Said racks and wheels are vertically adjusted by means of the levers R'' pivoted at their lower ends to suitable arms on the castings P''', and provided with segment pinions R' engaging said racks, and spring latches R''' engaging suitable notched sectors S also attached to said casting P'''. On the bail P''' above the pole is a loop 1, which passes through a vertically slotted opening in the end of the horizontal arm 3 of a bell crank lever pivoted upon said pole, the vertical arm 4 of which lever is provided with a spring catch 5 engaging a notched sector 6, whereby it is held in position.

The device is drawn by two chains U', connected at the rear to the rear of the braces P' and extended forward, passing under guide rolls U'' on the bail P''', and attached to the respective ends of a transverse beam U by means of hooks 8, whereby they may be adjusted for length. Said beam is connected to, and suspended beneath the pole P by a chain U''', engaging a hook 9 on said beam U, and the team is attached to the said beam by the clevis U'''. To the beam U are also attached rake teeth V having fingers V' attached, which latter extend diagonally backward and upward within the bail P''', said beam, teeth and fingers being vertically adjustable by means of the chain U''' and hook 9.

W W are blades or colters which form the ends of guide bars W', said bars being arranged above and parallel with the upper edges of the sides Z Z being secured to the same by being bolted to posts W''. An upwardly projecting spring bar 10 is attached at its lower end to the pole P, and is provided at its upper end with a seat 11 for the operator. A foot rest 7 is also attached to said pole at a suitable point.

To prevent sand and other obstructions from getting in and upon the gearing, I pro-

vide a case O inclosing the wheel M, said case having a suitable opening to permit the passage of the lever L, and also surrounding the mechanism to connect the driving shaft B with the shaft H', I provide a case divided in the plane of the various inclosed shafts into two parts O' and O'', the lower part O' being integral with the casing B', and having suitable bearings for the various inclosed shafts, and the upper part O'' being hinged thereto at its lower end, and arranged to open as shown in Fig. 3. Beneath the sides Z Z are guide bars Z' Z', which engage the ends of the drag bars I' and guide the same over the casing B' and thence downward and into the space between the roll H'' and the concave H'.

The operation of my device is as follows: When out of action and moving from place to place, or turning at the end of the row, the lever 4 is thrown backward. This lifts the entire front of the machine clear of the ground, and suspends it upon the pole P by means of the bail P'''. By throwing said lever forward the said front is lowered and the blade X enters the ground passing beneath the earth and potatoes. The depth of the cut is determined by the vertical adjustment of the wheels A''; said wheels running upon the surface of the ground and resisting the downward pressure of the earth upon the blade X. The rake teeth V and rods V' serve to divide and turn the vines, &c., inward at each side and the blades W separate the earth and sods and turn the same inward before the sides Z Z. Thus all the vines, sods, &c., on the surface are passed between the sides Z Z and are further retained as they pass upward by the guide rods W'. When the earth is dry and sandy its escape between the rear of the blade X and the front of the roll H'' is prevented by the concave X', which engages at least one drag bar I at all times, which thus closes the opening between said concave and roll. The plate 12 also prevents too early escape of the earth between the grates J, and also prevents contact of potatoes with the ends of the same. The drag bars I' carry the earth and all else taken up by the blade X upward over the bars J, which being vibrated by the levers and cam wheel as described, rapidly sifts the earth from the potatoes and tops, said earth passing beneath the bars J and falling upon the ground, the potatoes and tops passing upward over the roll H and being discharged last, will fall upon the surface of the earth, which has passed through the vibrating grated bottom.

In guiding the device to follow the row the tongue and mechanism below are held parallel by the bail P''' and guide Q, the blades A'' preventing the wheels A from moving laterally. The front of the machine moves laterally with the pole, thus enabling the driver to follow the row accurately; the tongue moves vertically in the guide Q, and the loop 1 moves vertically in the slot in the arm 3; thus there is avoided any downward draft on the pole P.

By making the blades A' concave I find that they hold better than flat blades, so also by making the rim of the wheels A''' concave I find that they do not as readily sink into the soft earth and the outward incline the inner surface is more quickly freed from any earth on the same as it rises.

What I claim is—

1. In a potato digger, the combination of the frame, the driving shaft at the rear end of the frame, said driving shaft carrying a roll and a cam wheel, a roll at the forward end of said frame, an endless carrier engaging said rolls, rock-shafts, grate bars rigidly secured at points intermediate of their lengths to said rock-shafts, a lever attached intermediate of its length to one of said rock-shafts and engaging at its rear end said cam wheel, and another lever connected at one of its ends to the other of said rock-shafts and having its other end pivoted to said first-mentioned lever, substantially as described.

2. In a potato digger, the combination with a blade for lifting the earth, the inclined side frames, the driving shaft at the rear end of the frame, said driving shaft carrying a roll and a cam wheel, the roll at the forward end of said frame, and the endless carrier engaging said rolls, of rock-shafts having lateral projections, grate-bars secured to said lateral projections, a lever attached intermediate of its ends to one of said rock-shafts and engaging said cam-wheel at its rear end, and another lever connected at one end to the other of said rock-shafts and having its rear end pivoted to said first-mentioned lever, substantially as described.

3. In a potato digger, in combination a driving shaft, and driving wheels and a bed consisting of rock shafts, and parallel bars attached to the same and chains and drag bars traversing said bed, and a roll having a projecting shaft, and driving said chains and bars, a gear on the driving shaft a pinion movable on its shaft, a lever to move said pinion, sprocket wheels on said pinion shaft and said roll shaft, a chain connecting said sprocket wheels, a clutch connecting said pinion and one of said sprocket wheels, an adjustable roll engaging said chain, a cam wheel on said roll shaft, levers attached to the rock shafts, and connected by a pin and slot, one of said levers also having a roll engaging said cam wheel, substantially as described.

4. In a potato digger, the combination of the pole, the frame pivotally connected near its rear end with said pole, a bail pivoted near the front of the machine, said bail having vertical guides engaging the sides of the pole and also having a loop, and a bell-crank lever having in one arm a slotted opening engaging said loop, substantially as described and for the purposes specified.

5. In a potato digger, the digging and elevating mechanism thereof, and a pivoted frame inclosing the elevating mechanism and

to which the digging mechanism is secured, in combination with the pole to which said frame is secured, a bail connected at one end with said frame, said bail having vertical guides engaging said pole, and a lifting lever connected with said bail, substantially as described.

6. In a potato digger, the combination of the pole, pivoted frame, a bail pivotally connected at its lower ends with said frame, a loop on said bail, and a bell-crank lifting lever pivoted to said pole and having in one of its arms a slotted opening engaging the loop on said bail, substantially as described.

7. In a potato digger, the combination with the pole and the pivoted frame, of braces, secured to said pole at their forward ends and pivoted at their rear ends, an arch, secured at its ends to said braces and at its center to said pole, and a lifting lever connected with said frame, substantially as described.

8. In a potato digger, the digging and elevating mechanism thereof, a pivoted frame inclosing the elevating mechanism and to which the digging mechanism is secured, in combination with the pole, braces secured to said pole at their forward ends and pivoted at their rear ends, an arch secured at its ends to said braces and at its center to said pole, a bail connected at its ends with the forward portion of the frame and engaging the sides of the pole, and a bell-crank lifting lever connected with said arch, substantially as described and for the purposes specified.

9. In a potato digging machine, having a pole pivoted to the same, a bail pivoted near the front of said machine, vertical guides on said bail engaging the sides of said pole, a loop on said bail, a bell crank lever pivoted to said pole, having a slotted opening in one arm engaging said loop, and a spring latch on the other arm engaging a notched sector, substantially as described.

10. In a potato digger, the digging and elevating mechanism thereof, and a pivoted frame inclosing the elevating mechanism and to which the digging mechanism is secured, in combination with the pole, curved arms secured to said frame, castings secured to said arms, a bail secured at its ends to said castings, said bail having vertical guides engaging the pole, and also having a loop, and a bell-crank lever having in one of its arms a slotted opening engaging said loop, substantially as described.

11. In a potato digger, the combination with a pole, of braces secured at their forward ends to said pole and pivoted at their rear ends, and an arch attached at its ends to said braces and at its middle to the rear end of said pole, substantially as described.

12. In combination with a potato digging machine, substantially as described, a pole attached to the same by braces attached to said pole at one end and to the driving shaft casing at the other end, and an arch connected at its ends to said braces, and connected near

its middle to said pole, a bail pivoted near the front of the machine at its lower ends, guides on said bail engaging the sides of said pole, a loop on said bail, a bell crank lever 5 pivoted on said pole, having a slotted arm engaging said loop, and an arm having a spring latch engaging a notched sector, substantially as described.

13. In combination with a potato digger, 10 having a pole pivoted to swing in a vertical plane only, a transverse beam adjustably attached to said pole and also attached to said machine, a clevis on said beam to attach the team and rake teeth, attached to said beam 15 at each side of the machine, and inclined fingers extending rearwardly from said teeth, substantially as described.

14. In a potato digger having a pole pivoted to swing in a vertical plane and a bail pivoted at its lower ends to the sides of the machine, and having guides engaging said pole, 20 vertically movable racks on said bails, guide wheels journaled on said racks, levers pivoted on projecting arms on said bail segment 25 pinions on said levers engaging said racks, notched sectors on said arms, and spring latches on said levers engaging said sectors, substantially as described.

15. In a potato digger, the drive wheels, 30 concavo-convex blades attached to and projecting from the rims of said wheels, said blades having their surfaces in the plane of the axes of said wheels with their concave sides forward, and separate straight blades 35 arranged between the respective pairs of said first-mentioned blades in a plane at right angles to the axes of the wheels, substantially as set forth.

16. In a potato digger, the driving shaft; driving wheels on said shaft; an endless carrier; the frame; and a driving roll at the upper end of said frame over which said carrier passes; in combination with a gear wheel on the driving shaft; a shaft, having a movable pinion, a clutch and a sprocket wheel mounted on it; a lever for moving said pinion into and out of engagement with said gear wheel; a sprocket wheel on the driving roll shaft; a chain connecting said sprocket wheels; and a pivoted lever engaging said chain at one end and adjustable to tighten the same, substantially as described. 40 45 50

17. In a potato digger, the driving shaft, driving wheels on said shaft, an endless carrier, and a driving roll at the rear end of the machine over which said carrier passes, in combination with a shaft, E''', geared with the driving shaft, a sprocket wheel on said shaft, E''', a sprocket wheel on the shaft of the driving roll, an endless chain connecting said sprocket wheels; an adjustable bent lever pivoted at one end and having at its other end a roller engaging said chain; said lever also having a slotted opening; and a bolt passing through said opening for holding the lever in any position within the limits of its adjustment; said lever thereby serving to tighten said chain, as specified. 55 60 65

In testimony whereof I affix my signature in presence of two witnesses.

ORRIN L. GOSS.

Witnesses:

LUTHER V. MOULTON,
LOIS MOULTON.