

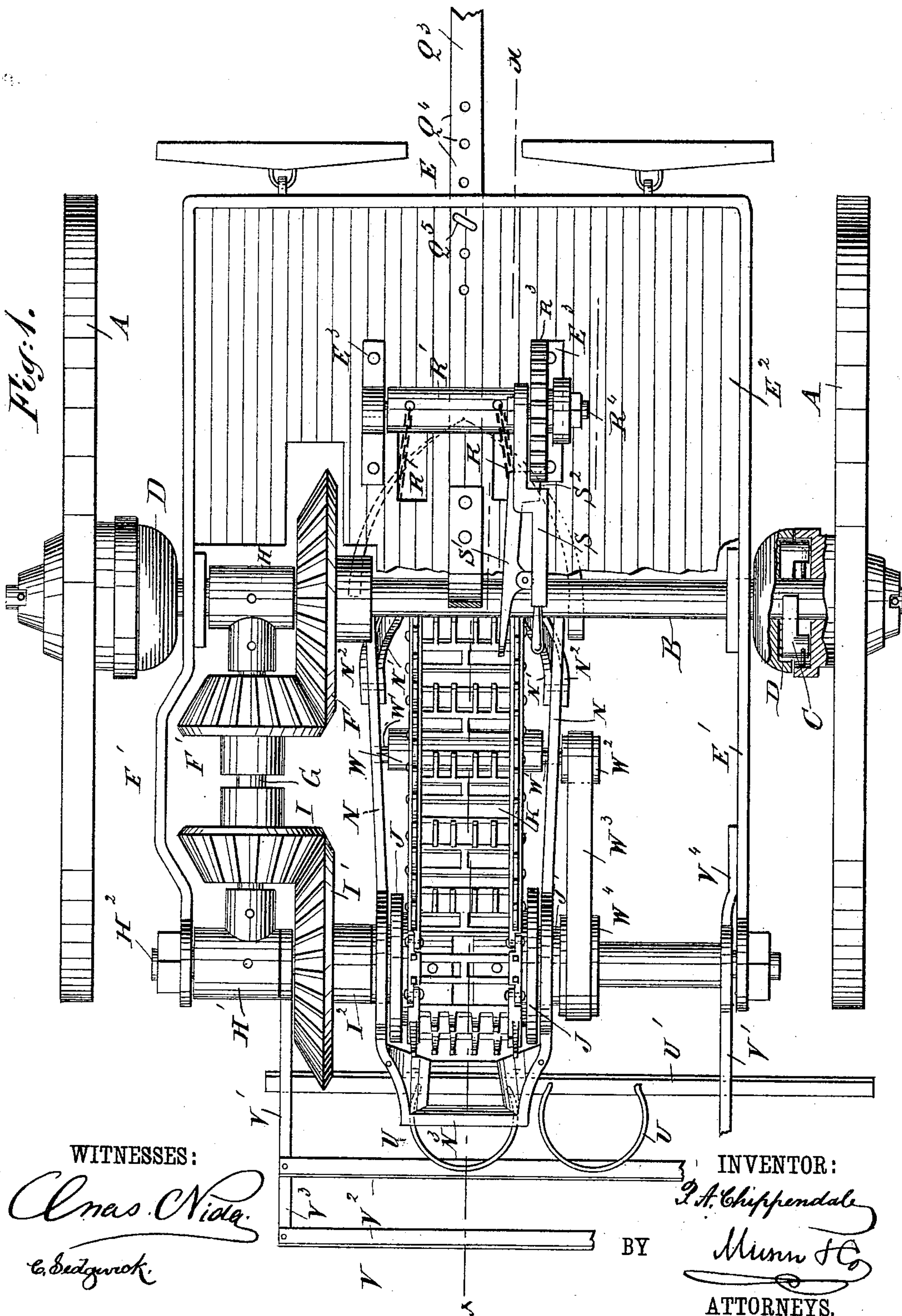
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3 Sheets—Sheet 1.

P. A. CHIPPENDALE.
POTATO DIGGER.

No. 379,682.

Patented Mar. 20, 1888.



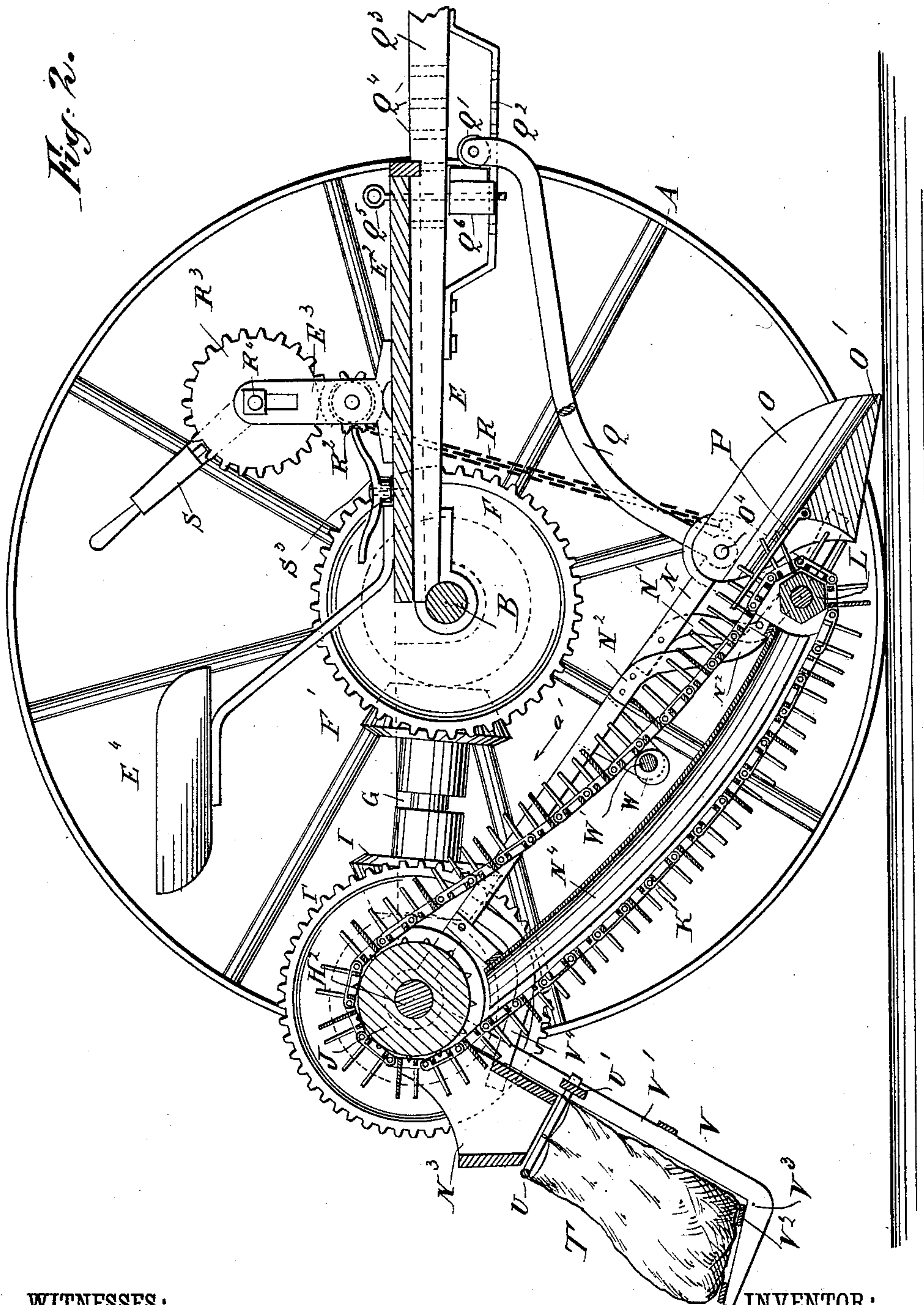
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WITNESSES:

Cnas. Nida.
C. Sedgwick.

INVENTOR:

P. A. Chippendale

BY

Munn & Co.
ATTORNEYS.

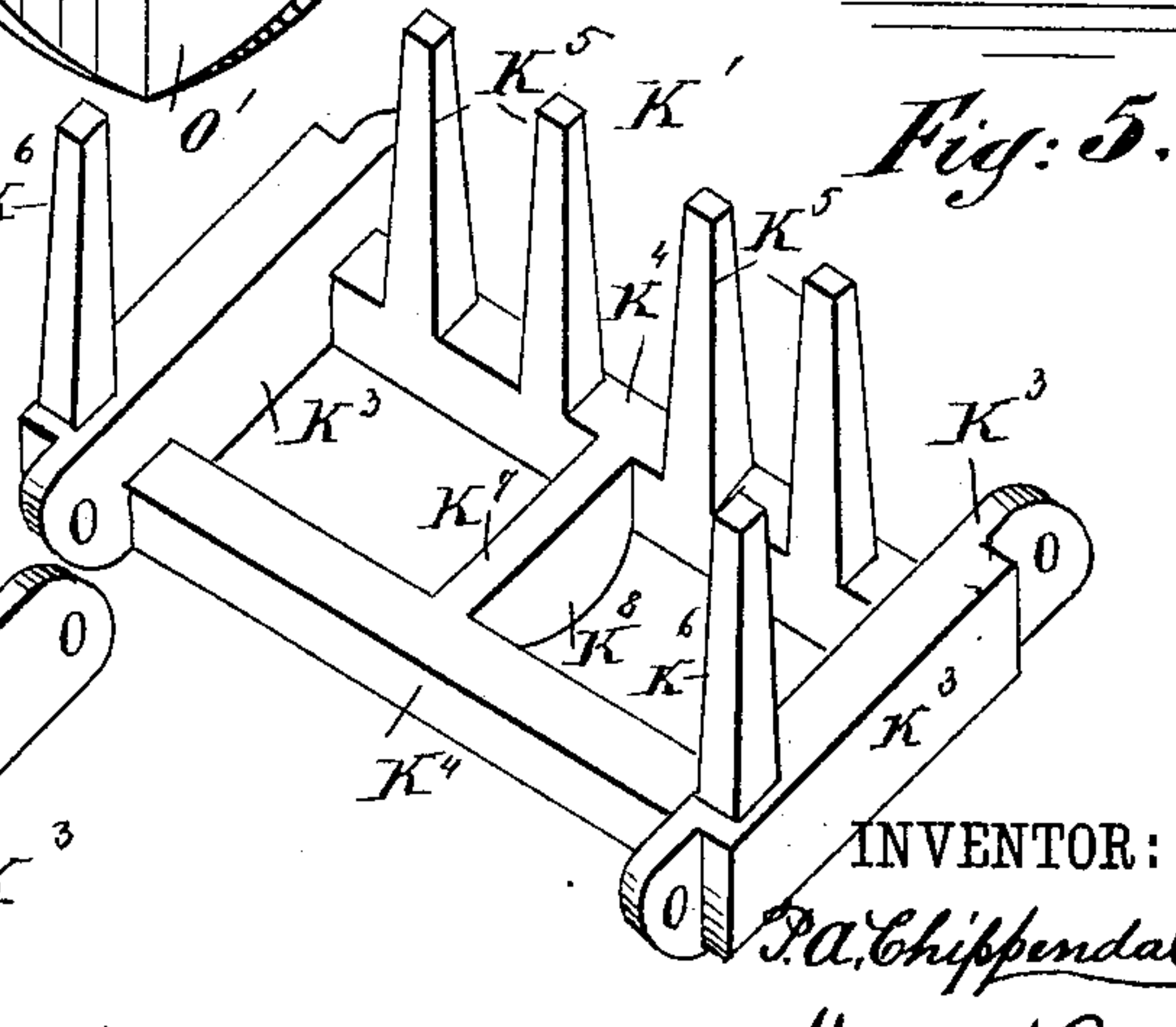
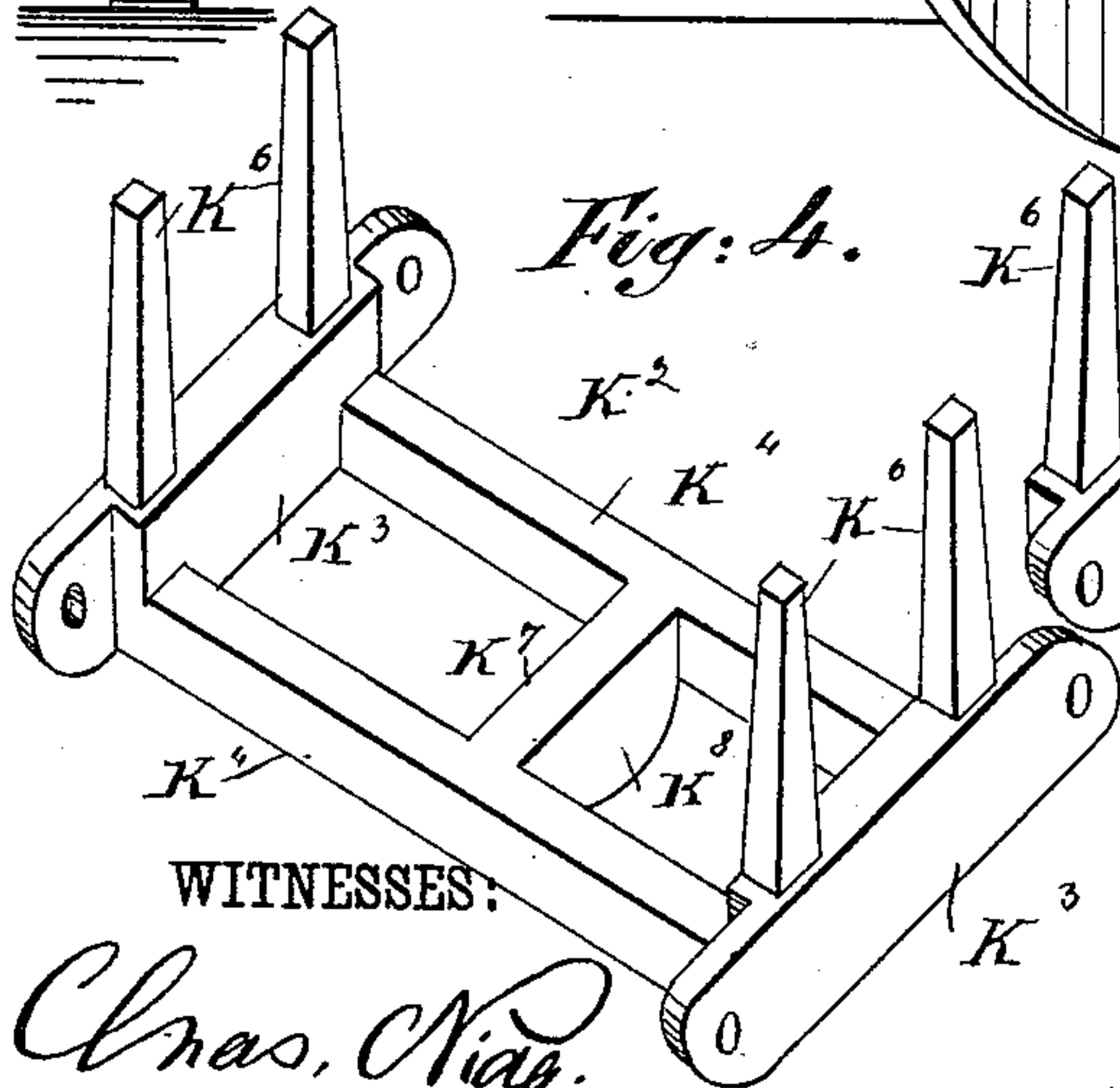
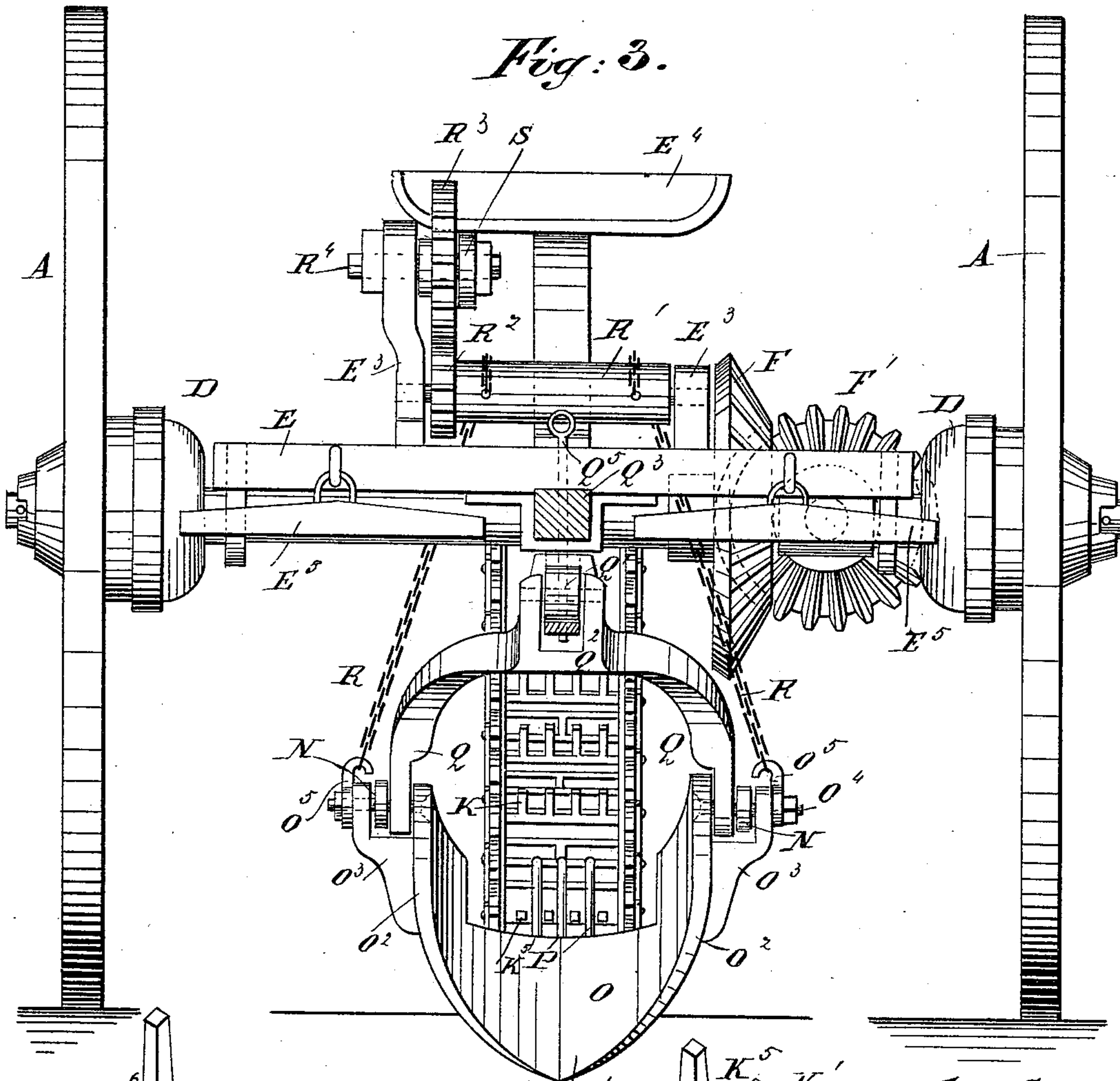
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UNITED STATES PATENT OFFICE.

PETER A. CHIPPENDALE, OF LEWISTON, MAINE, ASSIGNOR TO HIMSELF
AND CORNELIUS CHIPPENDALE, OF SAME PLACE.

POTATO-DIGGER.

SPECIFICATION forming part of Letters Patent No. 379,682, dated March 20, 1888.

Application filed July 5, 1887. Serial No. 243,473. (No model.)

To all whom it may concern:

Be it known that I, PETER A. CHIPPENDALE, of Lewiston, in the county of Androscoggin and State of Maine, have invented a new and Improved Potato-Digger, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved potato-digger by which the potatoes are dug out of the row, separated from the earth, and delivered into a bag.

The invention consists of a scoop-plow adapted to be raised and lowered to suit the depth of the row, of an endless chain of special construction, and upon which the potatoes and earth are delivered by the scoop-plow, means for regulating the endless chain, and means for transferring the potatoes from the chain to a bag.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improvement with parts of the platform broken out. Fig. 2 is a sectional side elevation of the same on the line *xx* of Fig. 1. Fig. 3 is a front elevation of the same, and Figs. 4 and 5 are perspective views of parts of the endless chain.

The main driving-wheels A A are loosely mounted to rotate on a shaft, B, and are connected with the same by the pawls C, pivoted in the hubs of the drive-wheels A, and engaging ratchets formed in the interior of a collar, D, secured to said shaft B, so that on the forward motion of the machine the drive-wheels A impart a rotary motion to said shaft B, and on a rearward movement of the machine the drive-wheels A rotate without revolving the shaft B. The latter has its bearings in the side beams, E' E', of the main frame E, provided in its front part with a platform, E².

On one end of the shaft B is secured a bevel gear-wheel, F, meshing into a pinion, F', secured to a shaft, G, mounted to rotate in the bearings H and H', of which the bearing H is held loosely on the shaft B, and the bear-

ing H' is held on a shaft, H², secured to the rear ends of the side beams E' of the frame E. On the shaft G is also secured a bevel-pinion, I, which meshes into the bevel gear-wheel I', provided with a hub, I², and mounted to rotate loosely on said shaft H². On the hub I² of the bevel gear-wheel I' is fastened a sprocket-wheel, J, over which passes an endless chain, K, also passing over the hexagonal roller L, mounted to rotate loosely in bearings formed in the ends of the branch arms N', secured to the arms N, supported loosely at their upper ends on the hub I² of the bevel gear-wheel I' and on the hub J' of the sprocket-wheel J.

The endless chain K is preferably constructed as illustrated in the drawings, and said chain consists, principally, of the links K' and K², hinged together, which links are fully illustrated in detail in Figs. 4 and 5. Each of the links K' and K² is provided with side beams K³, hinged at their outer ends to the next following respective links K' and K², and said side beams K³ are connected with each other by the cross-beams K⁴, of which the front cross-beam of the part K' is provided with the upwardly-extending prongs K⁵. The side beams K³ of both links K' and K² are provided with one, two, or more prongs, K⁶, similar in construction to the prongs K⁵, above referred to. The cross-beams K⁴ of both links K' and K² are connected with each other in their middle by the partition K⁷, extending at its bottom below the lower edges of the cross-beams K⁴, so as to form a rounded lug, K⁸, which is utilized, as hereinafter more fully described, for shaking the chain K.

On the lower ends of the arms N are secured branch arms N² similar to the branch arms N', but serving to support rigidly with the lower ends of the arms N the scoop-plow O, of semicircular form and having a pointed end, O', adapted to pass easily into the ground, and the body part of the plow being of such size as to include the entire width of a row of potatoes. The sides O² of the scoop-plow O are rounded off toward the front point, O', as shown in Figs. 2 and 3, and at the outside and in the rear of each of the sides O² is secured a bracket, O³, supporting, in connection with its re-

spective side O^2 , a pin, O^4 , which passes through the lower end of one arm N .

The ends of the branch arms N^2 are riveted or otherwise fastened to the outsides of the sides O^2 . In the rear end of the bottom of the scoop-plow O and in line with said bottom are pivoted the arms P , extending toward the rear and passing between the upright prongs K^5 of the link K' of the endless chain K , the lower end of which latter passes through a recess formed in the rear part of the scoop-plow O in such a manner that the pivoted arms P extend a suitable distance over said chain K , so that the potatoes passing up the bottom of the scoop-plow O are transferred to the links of the chain K .

On the pins O^4 , formed on the scoop-plow O , are fulcrumed the lower forked ends of the arm Q , extending upward and carrying on its upper end a friction-wheel, Q' , traveling on the bottom part of a bracket, Q^2 , secured to the under side of the tongue Q^3 , fastened in the usual manner to the main frame E . In the tongue Q^3 is a series of apertures, Q^4 , through one of which is passed a pin, Q^5 , also passing through a block, Q^6 , held to slide on the bottom of the bracket Q^2 , so that the friction-wheel Q' rests against the front edge of said block Q^6 . The pin Q^5 , after passing through the block Q^6 , also passes through corresponding apertures formed in the bottom of the bracket Q^2 , whereby said block Q^6 is securely held in place on the bracket Q^2 , and its position on the latter can be changed by passing the pin Q^5 through the corresponding apertures in the tongue Q^3 and bracket Q^2 .

It will be seen that the scoop-plow O is fulcrumed by means of the arms N on the hubs I^2 and J' of the gear-wheel I' and the sprocket-wheel J , respectively, and the position of the scoop-plow O is determined by the position of the block Q^6 in the bracket Q^2 —that is, when the block Q^6 is held in the front end of the bracket Q^2 the scoop-plow O is raised out of and held above the ground, and when the block Q^6 is held in the rear of the bracket Q^2 the plow O is adapted to engage and pass into the ground. Thus it will be seen that the scoop-plow O can be let into the ground at its point O' to any desired depth, according to the depth of the potatoes in the row.

On the pins O^4 on the scoop-plow O are held the hooks O^5 , on which are fastened the lower ends of the chains R , extending upward through slots in the platform E^2 of the main frame E , and then the other ends of the chains R are secured to a drum, R' , mounted in suitable bearings in the brackets E^3 , fastened on the platform E . The drum R' is provided with a gear-wheel, R^2 , meshing into a gear-wheel, R^3 , mounted to rotate loosely on a stud, R^4 , vertically adjustable in one of the bearings E^3 . On the stud R^4 is fulcrumed a hand-lever, S , on which is pivoted the pawl S' , adapted to engage at its lower end the teeth of the gear-wheel R^3 , so as to enable the operator, seated

on the seat E^4 , to revolve said gear-wheels R^3 , and thereby wind up or unwind the chains R from the drum R' , in order to raise the scoop-plow O a suitable distance above the ground when transporting the machine from place to place. When the scoop-plow O is in the ground, the chains R assist in supporting the plow, and the drum R' is held in a fixed position by the foot-pawl S^3 engaging the teeth of the gear-wheel R^2 , said foot-pawl S^3 being adapted to be thrown into or out of contact with said gear-wheel R^2 by the foot of the operator.

The fulcrumed ends of the arms N support the rearwardly and downwardly extending hopper N^3 , into which opens the upper part of the endless chain K , and said hopper N^3 discharges at its lower end into the mouth of a bag, T , secured at its open end to a bag-holder formed of a semicircular ring, U , secured to a cross-bar, U' , adapted to slide sideways in bearings formed in side bars, V' , of the rear platform, V . The side bars, V' , are held by their upper ends on the cross-shaft H^2 , and are supported by the branch arms V^4 , secured to the side beams E' , and extending toward the rear, so as to hold said side bars, V' , in a slightly-inclined position, as shown in Figs. 1 and 2.

The lower end of the bag T rests on the cross-bars V^2 , secured to the angular feet V^3 , formed on the lower ends of the side bars, V' . As shown in Fig. 1, I provide the bar U' with two bag-holding rings, U , which can be thrown alternately under the lower opening of the hopper N^3 , so that by the use of two bags secured to said rings U , I can facilitate the filling of the bags by sliding said cross-bar U' sideways when the bag under the hopper N^3 is filled, so as to bring the next empty bag into position under the hopper, after which the operator has time to remove the filled bag from its ring, and then throw it off the platform V on the ground or into a wagon traveling with the machine. A new bag is then fastened on the respective ring, and when the other bag is filled the cross-bar, U' , is moved sideways again, as above described.

Between the sprocket-wheel J and the hexagonal roller L is placed an eccentric, W , adapted to engage the lugs K^8 of the chain K , so that the eccentric W imparts a shaking motion to the upper part of said chain K . The eccentric W is secured to a shaft, W' , mounted to rotate in suitable bearings formed on the side arms, N , and one end of the shaft W' carries a pulley, W^2 , connected by the belt W^3 with the pulley W^4 , formed on the end of the hub J' of the sprocket-wheel J and rotating with the same. Below the eccentric W , and extending from the sprocket-wheel J to within a short distance of the hexagonal wheel L , is placed a curved cover, N^4 , supported by the side arms, N , and serving to protect the lower part of the chain K from the earth falling through the upper part of said chain.

The operation is as follows: On the forward

motion of the machine the drive-wheels A impart a rotary motion to the shaft B, which, by the gear-wheel F meshing into the pinion F', imparts a similar motion to the lateral shaft 5 G, and the latter, by its pinion I meshing into the gear-wheel I', imparts a rotary motion in the direction of the arrow *a'* to the sprocket-wheel J, which is directly connected with the hub I' of said gear-wheel I'. The scoop-plow 10 O has been previously adjusted to enter the ground to the required depth for the row of potatoes by adjusting the block Q⁶, as before described, so that the scoop-plow O takes up the entire row, whereby, on the forward motion of the machine, the earth and potatoes pass 15 up the bottom of the scoop O and upon the pivoted arms P, from which part of the earth which did not drop through the arms P and the potatoes are delivered upon the upper part of the 20 endless chain K in such a manner that the potatoes are held between the upright prongs, K⁵ and K⁶, and are carried upward by said chain K, and then are prevented from falling out of the chain by said prongs K⁵ and K⁶. The part 25 of the chain K carrying the potatoes and part of the earth receives a shaking motion from the eccentric W, engaging the lugs K⁸ of the chain K and receiving its motion from the sprocket-wheel J, as above described. The 30 earth held on the chain K between the potatoes is thus shaken off by the action of the eccentric W on the chain K, so that the potatoes arrive in a clean state at the upper end of the chain K and are dropped out of the prongs K⁵ and K⁶ and into the hopper N³, from which 35 they pass into the bag T, held at the lower end of said hopper. The bags are filled and removed, as above described.

Having thus fully described my invention, I 40 claim as new and desire to secure by Letters Patent—

1. In a potato-digger, the combination, with the supporting-frame and tongue, of forwardly-projecting and pivoted arms, a scoop-plow 45 on the free ends of the said arms, a forwardly-projecting and forked arm pivoted to the plow and provided with a friction-roller on its end, a bracket on the under side of the tongue, and an adjusting-block in the bracket, substantially as herein shown and described. 50

2. In a potato-digger, the combination, with the frame and the drive-wheels, of a shaft journaled in the rear part of the frame, a sprocket-wheel on the said shaft, forwardly-projecting arms having branch arms, a scoop-plow 55 on the free ends of the said arms, a roller journaled in the branch arms, a chain passing over the said sprocket-wheel and roller, and intermediate mechanism for operating the sprocket-wheel from the drive-wheels, substantially as herein shown and described. 60

3. In a potato-digger, the combination, with the frame, a shaft journaled in the rear part thereof, and a sprocket-wheel on said shaft, of 65 forwardly-projecting arms having branch

arms and pivoted on the said shaft, a scoop-plow carried by the said arms, a roller journaled in the branch arms, a downwardly-extending hopper supported from the rear ends 70 of the forwardly-projecting arms carrying the plow, a bag-support suspended from the shaft carrying the sprocket-wheel, and means for operating the said shaft and raising and lowering the scoop-plow, substantially as herein 75 shown and described.

4. In a potato-digger, the combination, with a scoop-plow and an endless chain connected at its lower end with the rear end of said scoop-plow, of side arms supporting the lower 80 end of said chain and said scoop-plow, said side arms being fulcrumed on the axis of the endless-chain sprocket-wheel, and means, substantially as described, for imparting a swinging motion to said side arms and said scoop-plow, as set forth. 85

5. In a potato-digger, the combination, with a scoop-plow and an endless chain connected with the rear end of said scoop-plow, of side arms supporting the lower end of said endless chain and said scoop-plow, said side arms 90 being fulcrumed on the axis of the endless-chain sprocket-wheel, an arm pivotally connected at its forked end with said scoop-plow and carrying on its other end a friction-wheel, a 95 bracket on which said friction-wheel travels, and an adjustable block held on said bracket, substantially as shown and described.

6. In a potato-digger, the combination, with a scoop-plow and an endless chain connected 100 with the rear end of the scoop-plow, of side arms supporting the lower end of said endless chain and said scoop-plow, said side arms being fulcrumed on the axis of the endless-chain sprocket-wheel, an arm pivotally connected at its forked end with said scoop-plow 105 and carrying on its other end a friction-wheel, a bracket on which said friction-wheel travels, an adjustable block held on said bracket, and means, substantially as described, for adjusting said block in said bracket, as set forth. 110

7. In a potato-digger, the combination, with a scoop-plow and an endless chain connected at one end with the rear end of said scoop-plow, of side arms supporting the lower end 115 of said chain and said scoop-plow and fulcrumed at their upper end on the axis of said endless-chain sprocket-wheel, chains connected with said scoop-plow, a drum on which said chains are wound, and means, substantially 120 as described, for turning the said drum so as to wind up or unwind said chains, as set forth.

8. In a potato-digger, the combination, with a scoop-plow and an endless chain connected 125 with the rear ends of said scoop-plow, of a hopper into which the upper end of said endless chain discharges, bag-holder rings adapted to be held at the lower end of said hopper, and a sidewise-sliding bar on which said rings 130 are secured, so that said rings may be alternately brought directly below the lower end

of said hopper, substantially as shown and described.

9. In a potato-digger, an endless chain made of the links K^1 and K^2 , each provided with
5 prongs K^3 , extending transversely from the connecting-beams of said links, and the prongs K^4 , extending upward from the side beams of

said links, substantially as shown and described.

PETER A. CHIPPENDALE.

Witnesses:

THOMAS VOSMUS,
WALTER A. GOSS.