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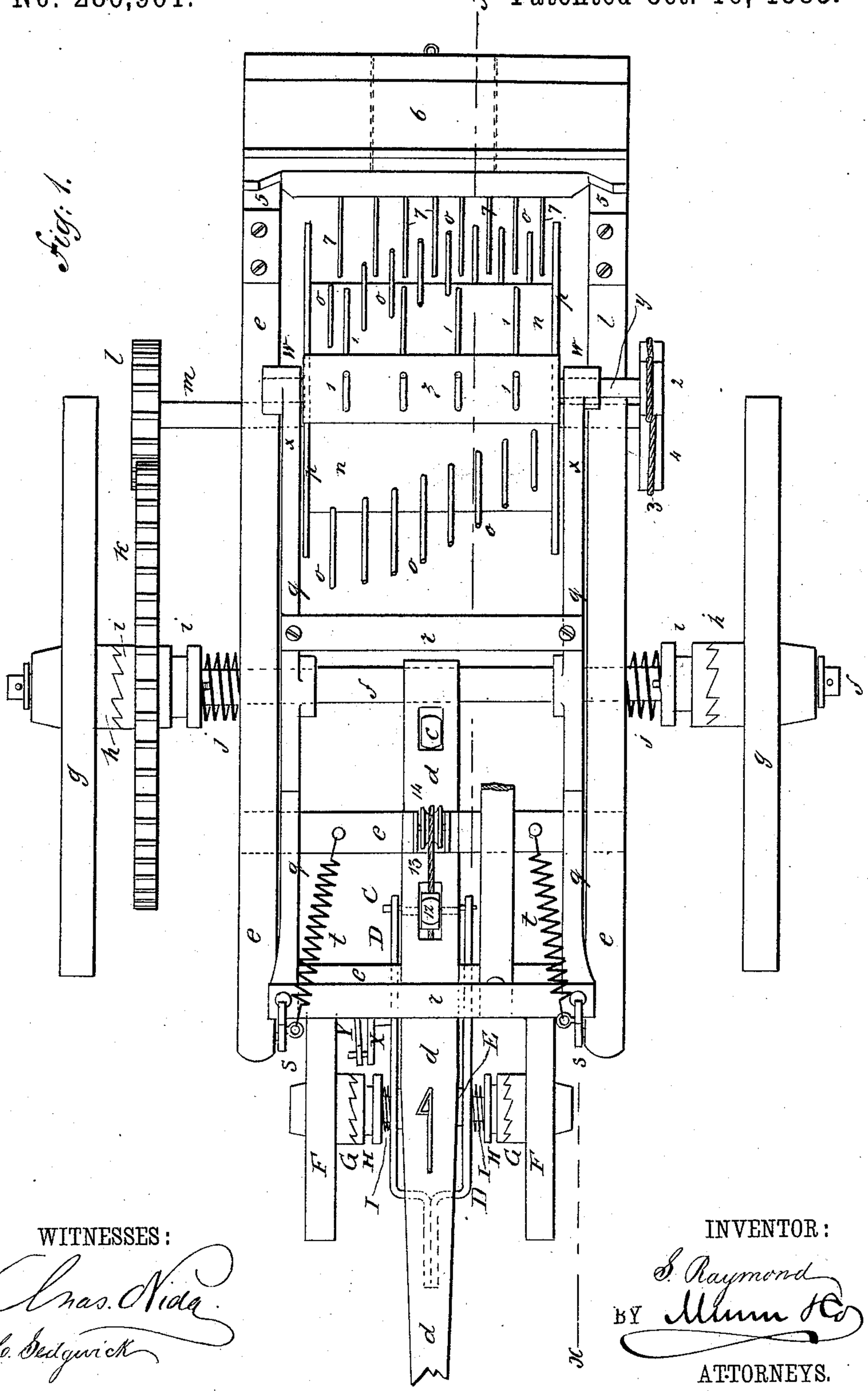
S. RAYMOND.

POTATO DIGGER AND PICKER.

No. 286,961. Patented Oct. 16, 1883.

Fig. 1.



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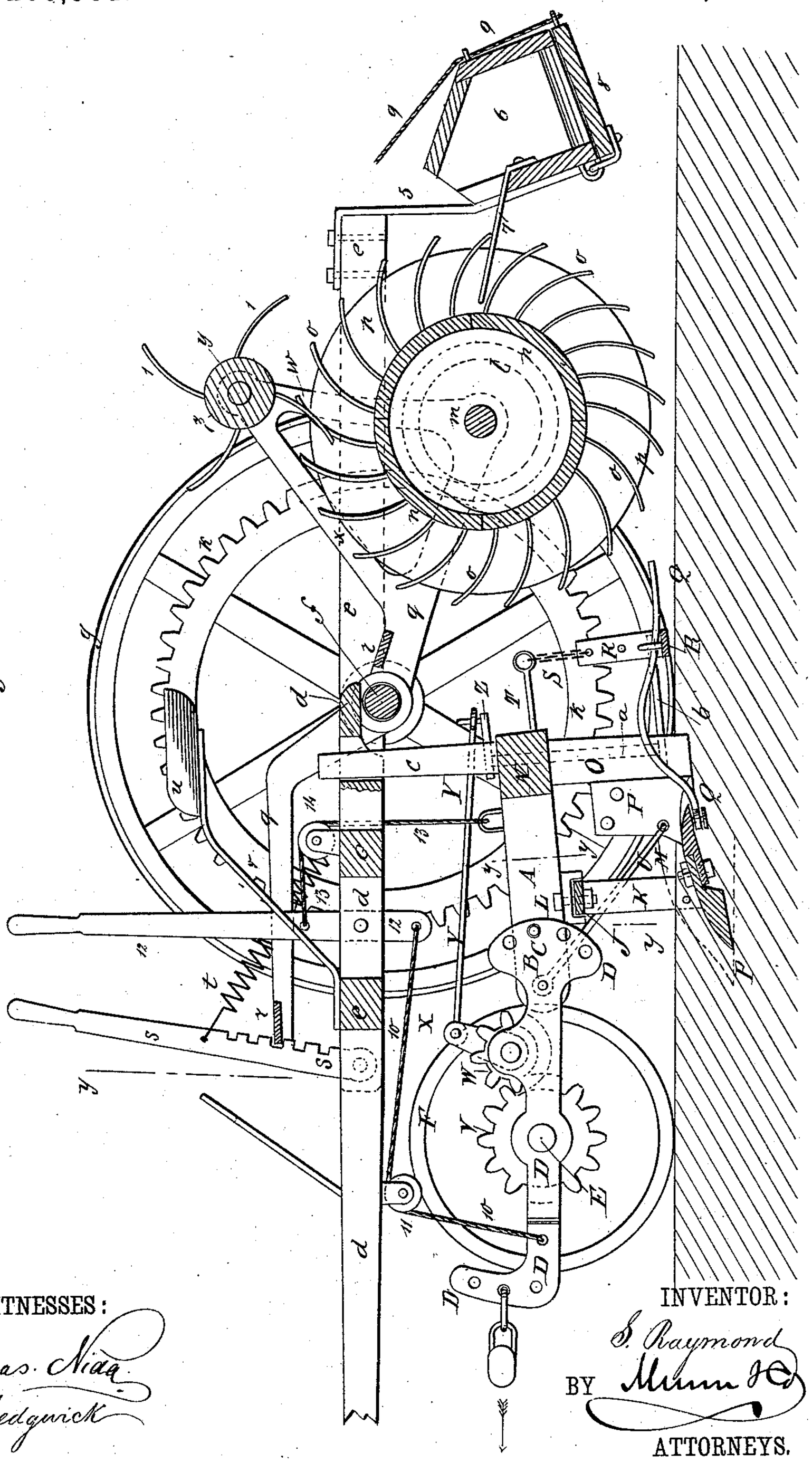

Fig. 2.

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Fig: 3.

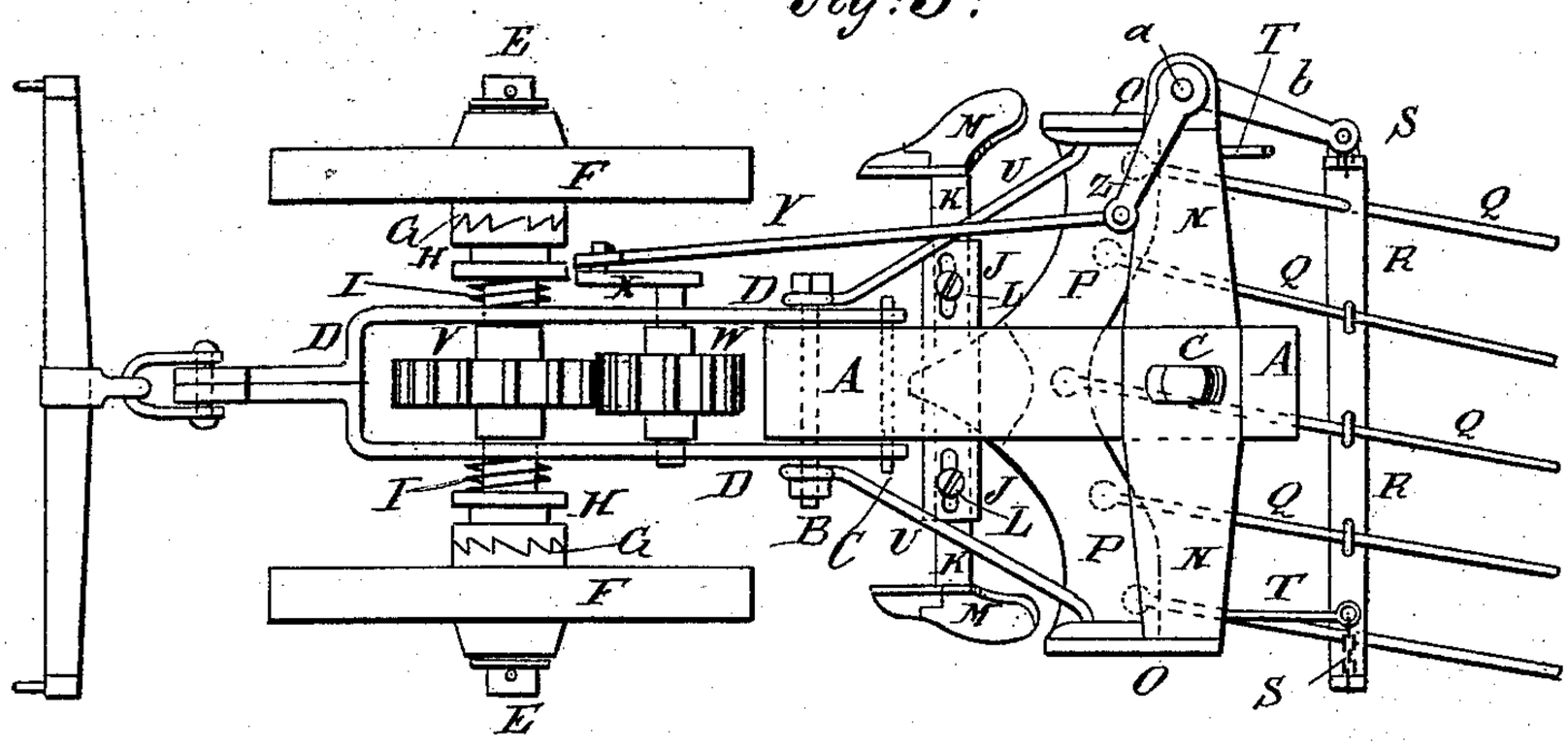

Fig: 4.

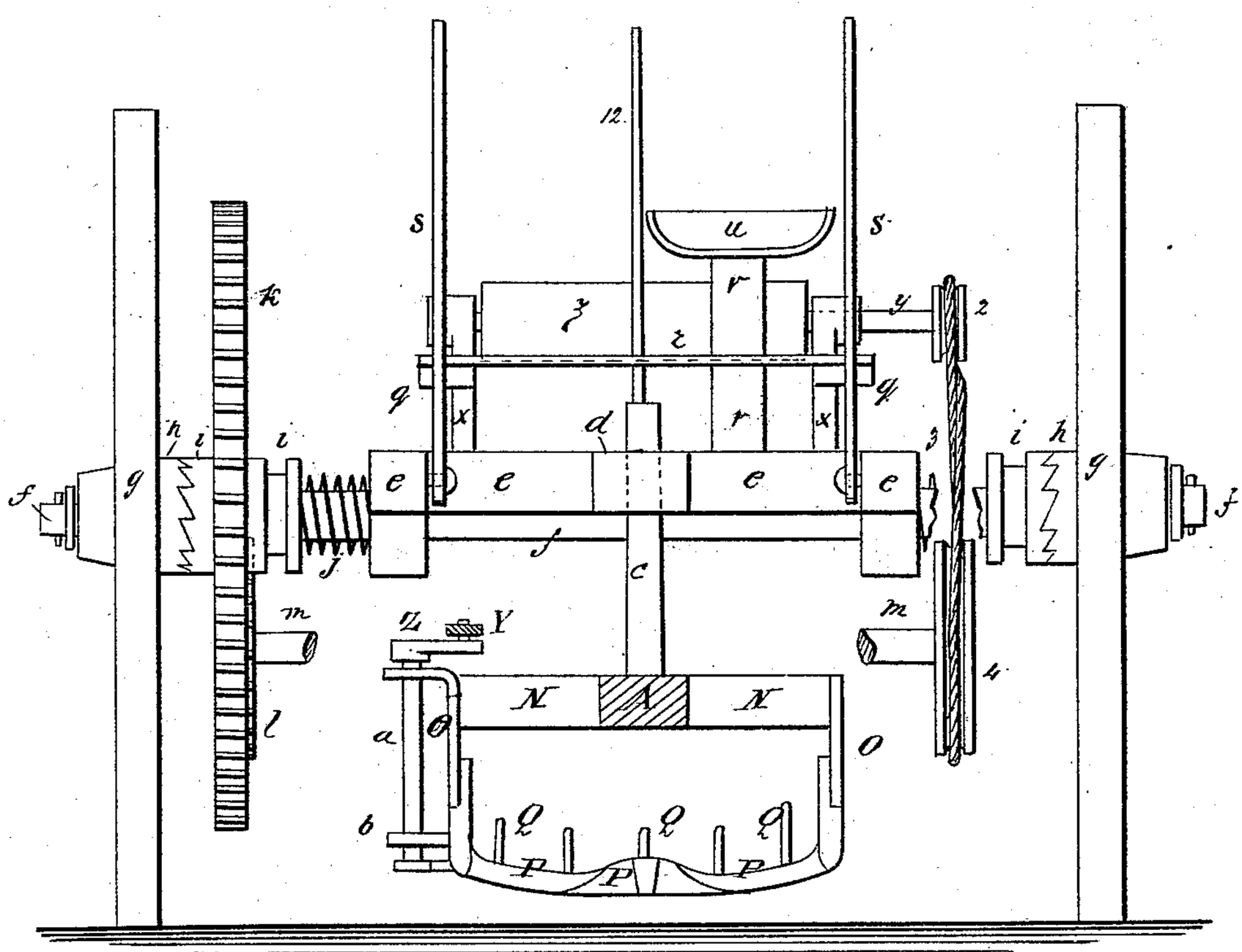

Fig: 5.

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UNITED STATES PATENT OFFICE.

SQUIRE RAYMOND, OF EAST VENICE, NEW YORK.

POTATO DIGGER AND PICKER.

SPECIFICATION forming part of Letters Patent No. 286,961, dated October 16, 1883.

Application filed April 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, SQUIRE RAYMOND, of East Venice, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Potato Diggers and Pickers, of which the following is a full, clear, and exact description.

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

Figure 1, Sheet 1, is a plan view of my improvement, the plows being omitted. Fig. 2, Sheet 2, is a sectional side elevation of the machine, with the plows taken through the broken line *x x*, Fig. 1. Fig. 3, Sheet 3, is a plan view of the plows. Fig. 4, Sheet 3, is a sectional front elevation of the machine, taken through the line *y y y y*, Fig. 2. Fig. 5, Sheet 3, is a front elevation of the shaker-bar.

The object of this invention is to facilitate the harvesting of potatoes.

The invention consists in the peculiar construction and arrangement of parts, as hereinafter fully described, and pointed out in the claims.

A represents the plow-beam, to the forward end of which are secured by the bolts B C the arms of the clevis D. The ends of the arms of the clevis D, in the rear of the bolt B, are widened vertically, and have curved rows of holes formed in them to receive the rear bolt, C, so that the plows can be adjusted at any desired pitch by moving the bolt C from one to another of the said bolt-holes, the bolt B serving as a pivot in making the adjustment. The forward end of the clevis D is bent upward and has a number of holes formed in it to receive the draft, so that the point of draft attachment can be raised and lowered to cause the plows to work deeper or shallower in the ground, as the depth of the potatoes may require.

In bearings in the forward part of the arms of the clevis D revolves an axle, E, upon the ends of which are placed the wheels F. Upon the inner end of the hubs of the wheels F are clutch-teeth G, to engage with the teeth of the clutches H, to cause the said wheels to carry the said axle with them in their revolution. The clutches H are held outward against the hubs of the wheels F by spiral springs I, placed upon the axle E, between the said clutches H and the clevis D.

To the under side of the middle part of the beam A is attached a cross-bar, J, the lower side of which is grooved to receive the horizontal upper parts of the standards K. The arms of the cross-bar J are slotted longitudinally to receive the bolts L, that secure the standards K in place, so that the said standards K can be readily adjusted to move the plows M, attached to the lower ends of the said standards, toward or from each other, as may be required. The outer parts of the standards K are bent downward to bring the plows M into proper working positions.

To the rear end of the plow-beam A is attached a cross-bar N, to the ends of which, or to connecting-plates O, attached to the said ends, are bolted or otherwise secured the upwardly-projecting side arms of the plow P, so that the said plow will be drawn from the plow-beam A. The plow P is made angular in plan view, is concaved upon its rear edge, is slightly concaved upon its upper side, between its center and ends, and has its upper side smooth, so that it will readily pass through the soil. The plows M P are made with separable points, so that the said points can be readily removed when worn and replaced with new points.

To the under side of the rear edge of the plow P are hinged, by bolts or other suitable means, the forward ends of a number of rods, Q, the rear parts of which pass through eyes attached to the bar R, or are otherwise loosely connected with the said bar R, so that the rods Q will be securely supported and the rods and bar will have a free lateral movement. The middle part of the bar R is slightly concaved, and its end parts are bent upward into vertical positions and have short chains S attached to them. The upper ends of the chains S are attached to the rear ends of arms T, the forward ends of which are attached to the end parts of the cross-bar N, so that the cross-bar R and the rods Q will be supported in such a manner as to allow them to have a free lateral vibration. The rods Q are curved upward, downward, and rearward, and project in the rear of the cross-bar R, which shape causes them to separate the potatoes more thoroughly

from the soil as the potatoes and soil pass back along the said rods, while the concavity of the bar R collects the potatoes into the middle part of the rear end of the shaker as they pass off the said shaker. With this construction, as the machine is drawn forward, the plows M throw the soil from the sides of the hills, while the plow P passes beneath and raises the potatoes and the soil in which they are embedded, and the shaker separates the potatoes and soil and delivers the potatoes at the rear end of the said shaker, the said soil falling through the shaker to the ground. The plow P is further strengthened against the draft-strain by the rods U, the rear ends of which are attached to the lower parts of the upright arms of the said plow P. The forward ends of the rods U are secured to the beam A by the clevis-bolt B or other suitable means.

To the axle E, between the arms of the clevis D, is attached a gear-wheel, V, the teeth of which mesh into the teeth of a smaller gear-wheel, W, pivoted to projections formed upon the upper edges of the arms of the clevis D.

To one of the journals of the gear-wheel W is attached a crank, X, to which is pivoted the forward end of the connecting-rod Y. The rear end of the connecting-rod Y is pivoted to the crank Z, formed upon or attached to the upper end of the vertical shaft *a*, which rocks in bearings attached to the end of the cross-beam N or the plate O, and the upright arm of the plow P.

To the lower end of the shaft *a* is attached a crank-arm, *b*, the rear end of which is connected with the upwardly-projecting end of the cross-bar R. By this construction the shaker will be vibrated laterally, to remove the soil from the potatoes, by the advance of the machine.

To the center of the cross-bar N is attached the lower end of an upright bar, *c*, which passes up through a slot in the rear end of the tongue *d*. The tongue *d* is attached to the forward part of the frame *e*, to the side bars of which are attached bearings in which revolves the axle *f* of the wheels *g*.

Upon the inner ends of the hubs of the wheels *g* are formed clutch-teeth *h*, with which engage the teeth of the clutches *i*, sliding upon the axle *f*, and held out against the wheels *g* by spiral springs *j*, placed upon the axle *f*, between the clutches *i* and the side bars of the frame *e*, so that the machine can be backed without operating the mechanism, and so that one of the wheels *g* can run slower than the other, or even be turned back in turning and in following crooked rows without stopping the proper operation of the mechanism.

To one of the clutches *i* is attached a large gear-wheel, *k*, the teeth of which mesh into the teeth of the small gear-wheel *l*, attached to the end of the shaft *m*. To the shaft *m*, between the side bars of the frame *e*, is attached a drum, *n*, to which are attached a number of spiral rows of teeth, *o*, and which is formed by attaching staves to heads, as many staves being used as the drum has rows of teeth *o*. The teeth *o* are curved, as shown in Fig. 2, so as to take the potatoes from the rear parts of the shaker-rods Q, or from the ground, and carry them over the said drum.

To the ends of the drum *n* are attached flanges *p*, to prevent the potatoes from escaping at the ends of the said drum. The journals of the shaft *m* revolve in bearings in the rear ends of the levers *q*, which ride upon the axle *f*, and are fulcrumed at their middle parts to the said axle *f* at the inner sides of the side bars of the frame *e*. The levers *q* are held parallel with each other while supporting the drum *n*, and are made to move together, when raising and lowering the said drum, by cross-bars *r*, attached to them a little in the rear of their fulcrum-points and at their forward ends, as shown in Figs. 1 and 2. The levers *q*, and with them the drum *n*, are held in any position into which they may be adjusted by two catch-levers, *s*, pivoted to the forward corners of the frame *e*, and which engage with the forward cross-bar *r* of the said levers. The rear edges of the catch-levers *s* are toothed to engage with the forward edge of the cross-bar *r*, and are held against the said cross-bar by spiral springs *t*, attached to their upper parts, and to a cross-bar of the frame *e*. With this construction the driver, while sitting upon the seat *u*, can adjust the picking-drum *n* by pushing the levers *s* forward with his hands and operating the levers *q* with his feet placed upon the forward cross-bar *r*. The driver's seat *u* is attached to the upper end of the spring-standard *v*, the lower end of which is attached to the forward cross-bar of the frame *e*.

Upon the rear ends of the levers *q* are formed upwardly-projecting arms *w*, which are strengthened in position by the inclined braces *x*, and to the upper ends of which is journaled the shaft *y*.

To the shaft *y* is attached a cylinder, *z*, which is placed directly above the drum *n*, and is provided with rows of rearwardly-curved teeth 1, arranged to pass between the teeth *o* of the drum *n*, and clear the said teeth *o* of any vines or weeds that may be carried up by them.

To one of the journals of the shaft *y* is attached a pulley, 2, around which passes a belt, 3, which is crossed, and passes around a larger pulley, 4, attached to the end of the shaft *m*, so that the cylinder *z* will be driven from the drum *n*, but in the opposite direction.

To the rear ends of the side bars of the frame *e* are attached the upper ends of bars or straps 5, the lower parts of which are inclined to the rearward, and to them is attached a box, 6, to receive the potatoes. To the upper edge of the forward side of the box 6 are attached teeth or

fingers 7, which project in such positions as to pass between the teeth *o* of the drum *n* to receive the potatoes from the said teeth *o* and guide them into the box 6. The top of the box 6 is inclined, to guide the potatoes into and prevent them from jumping out of the said box 6, and cause the vines and weeds thrown back by the teeth 1 to pass over the said box without entering it. The bottom of the box 6 is made hopper-shaped, and is provided with an opening in its lowest part, which is closed by a door, 8, which is hinged at its forward edge to the lower edge of the forward side of the said box, and is held closed by a cord, 9, attached to its rear edge. The cord 9 passes through staples or other guides attached to the rear side of the box 6, and extends forward into such a position that it can be readily operated by the driver from his seat to release the door 8 and allow the potatoes to drop to the ground in a heap.

To the forward part of the clevis D is attached the end of a cord, 10, which passes over a pulley, 11, pivoted to the tongue *d* or to a support attached to the said tongue. The other end of the cord 10 is attached to the lower end of a lever, 12, which is pivoted at a little distance from its lower end in a slot in the tongue *d*.

To the rear part of the plow-beam A is attached the end of a cord, 13, which passes through a slot in the tongue *d* over a guide-pulley, 14, pivoted to a support attached to the said tongue *d*, and its other end is attached to the lever 12 at the same distance above its pivoting-point that the cord 10 is below the said point. With this construction, by moving the upper end of the lever 12 forward, the front and rear parts of the plow mechanism will be raised from the ground at the same time.

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

1. In a potato digger and picker, the combination, with the plow P, of the bar R, suspended from the rear of the plow-beam, the curved rods Q, pivoted to the plow and loosely connected to and projecting in the rear of the suspended bar, and means for vibrating said bar, substantially as herein shown and described.

2. In a potato digger and picker, the combination, with the plow-beam A, the shaker Q R, and the clevis D, of the axle E, journaled in the clevis, the wheels F on the axle, the gear-wheels V W, the crank X, connecting-rod Y, and the shaft *a*, provided with the cranks Z *b*, respectively, at its upper and lower ends, substantially as herein shown and described.

3. In a potato digger and picker; the clevis D, made, substantially as herein shown and described, with widened and perforated rear ends to receive the fastening-bolts, an upwardly-projecting and perforated forward end to receive the draft, and apertures in its arms to receive the axle and gear-wheel journals, as set forth.

4. In a potato digger and picker, the combination, with the frame *e*, the axle *f*, and the gear-wheel *k*, of the levers *q*, connected together by cross-bars *r*, and provided with the arms *w* and braces *x*, of the toothed drum *n*, journaled in said levers, the toothed cylinder *z*, journaled in the arms *w*, the pinion *l*, the pulleys 2 4, band 3, and notched lever *s*, substantially as herein shown and described.

5. In a potato digger and picker, the combination, with the frame *e* and the toothed picker-drum *n*, of the box 6, having a hopper-shaped bottom and inclined top, and provided with the guide-fingers 7, projecting between the teeth of the picker-drum, and the door 8, hinged at its forward edge to the lower edge of the forward side of the box, and the cord 9, for holding said door closed, substantially as herein shown and described.

SQUIRE RAYMOND.

Witnesses:
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J. W. JOHNSON.