(No Model.)

5 Sheets—Sheet 1.

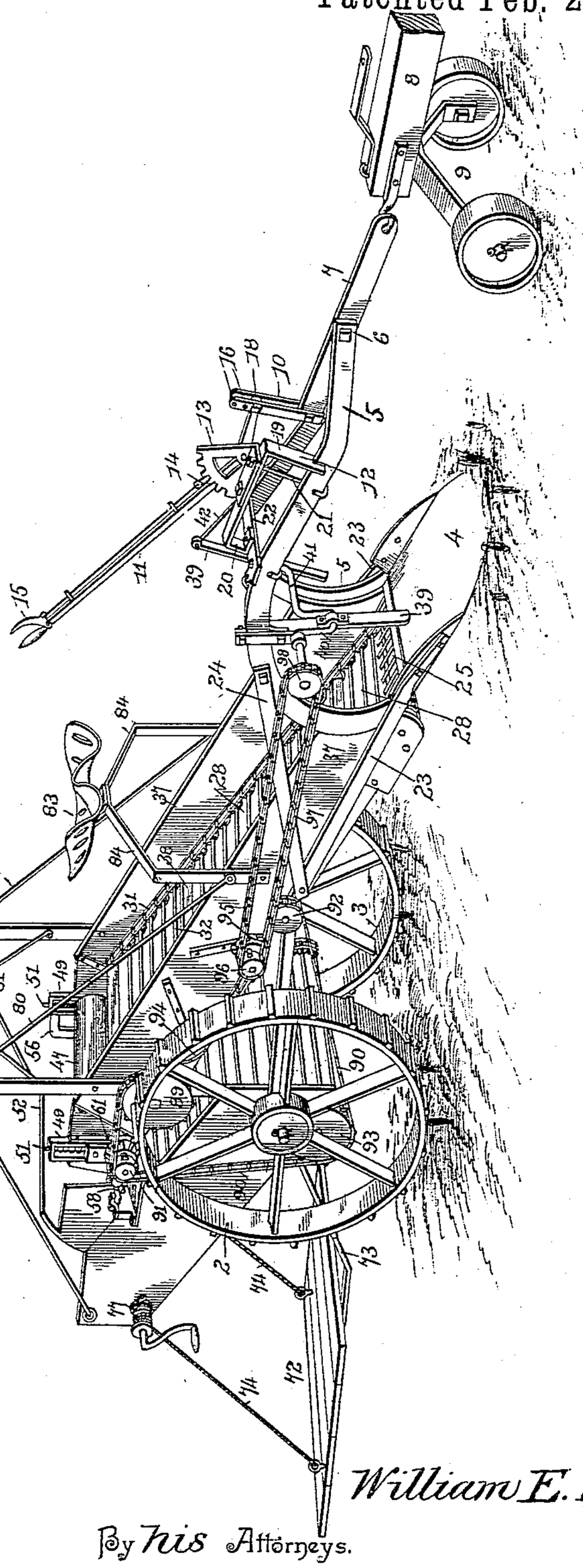
# W. E. LEIDIGER.

## POTATO DIGGER.

No. 555,251.

Patented Feb. 25, 1896.

FIG. 1.



Witnesses
Jas. K. McCathran
J. C. J. Riley

Inventor
William E. Leidiger
By his Attorneys.
C. A. Snow & Co.

(No Model.) 5 Sheets—Sheet 2.

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## POTATO DIGGER.

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FIG. 2.

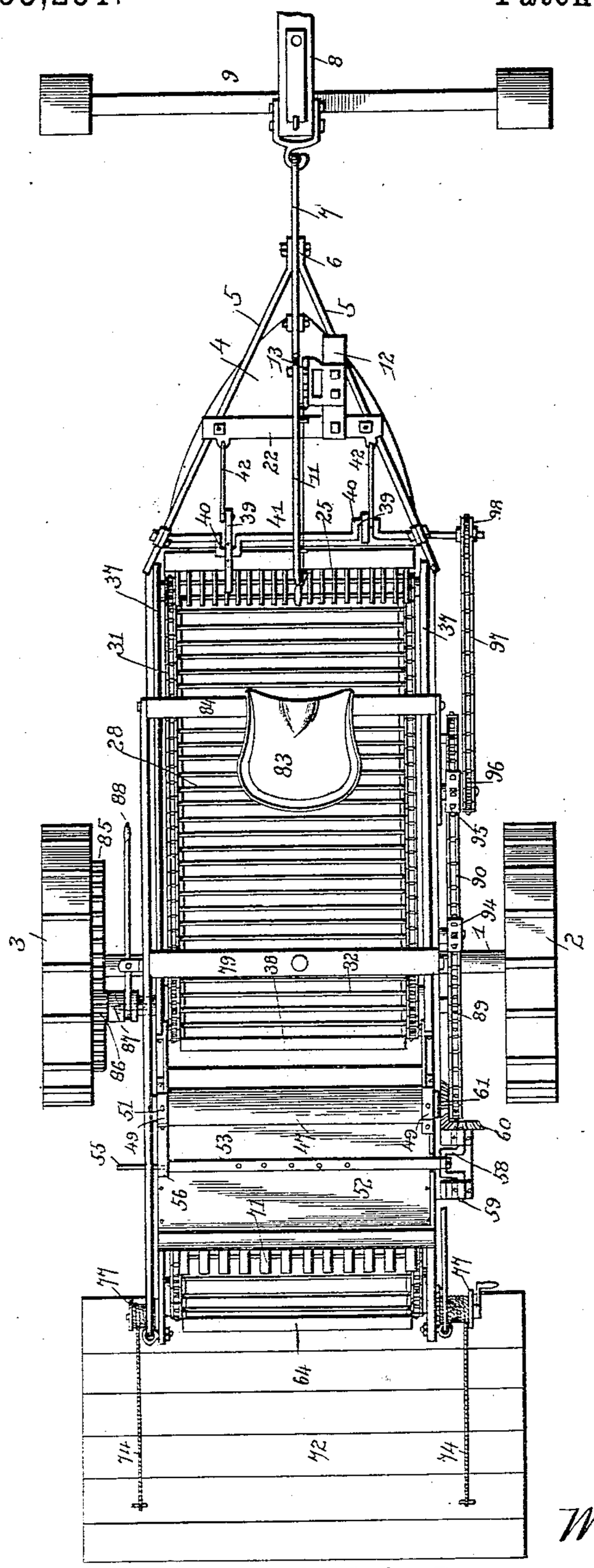



FIG. 11.

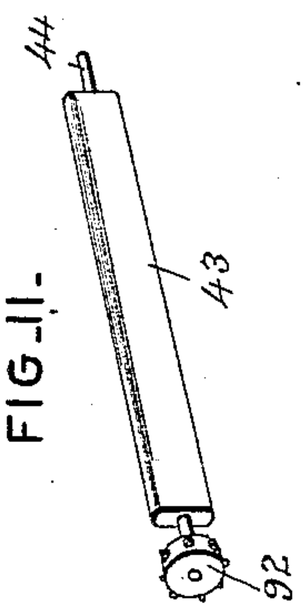
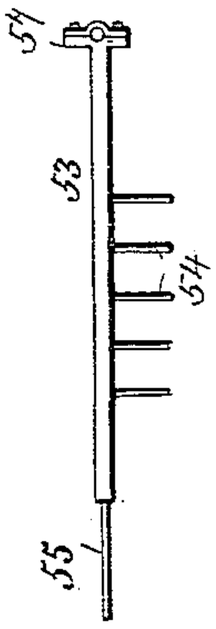



FIG. 10.




Witnesses

Jas. K. McCathran

H. J. Riley

Inventor

William E. Leidiger

By his Attorneys.

C. A. Snow & Co.

(No Model.) 5 Sheets—Sheet 3.

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## POTATO DIGGER.

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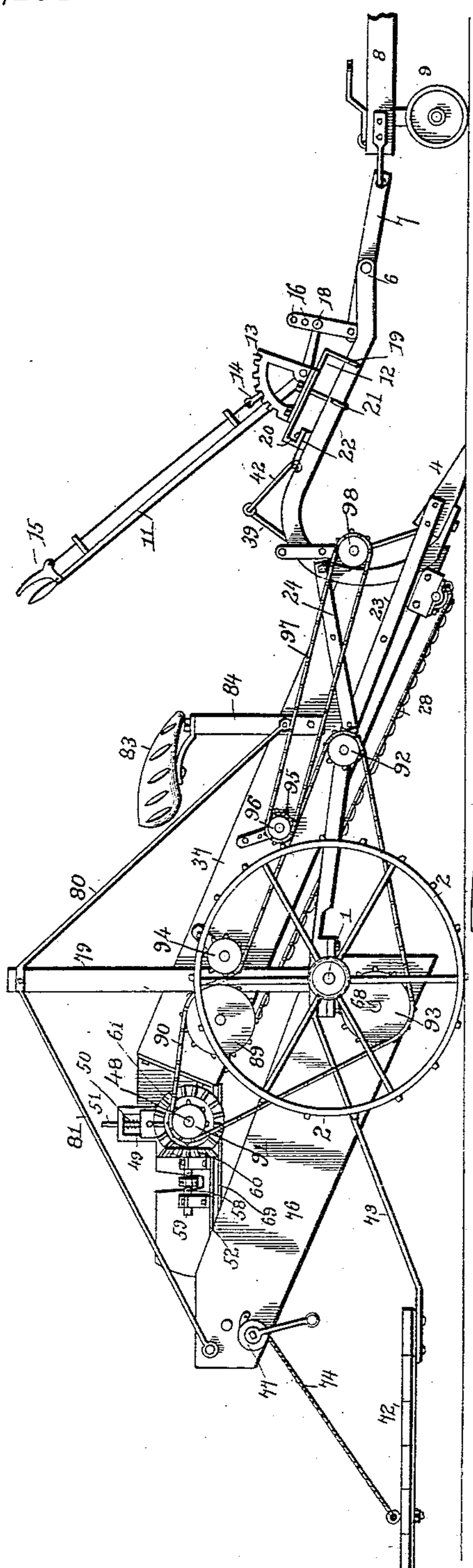
FIG. 3.



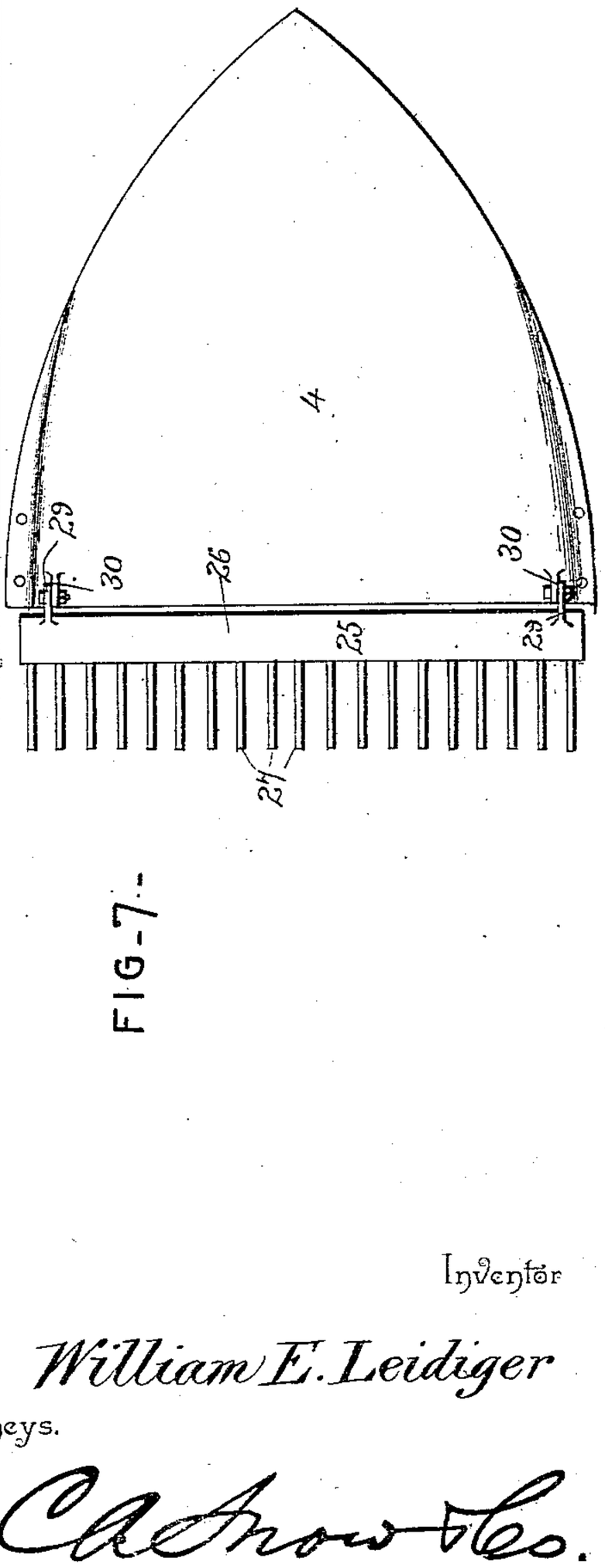


FIG. 7.

Witnesses
Jas. K. McCathran
J. F. Riley

Inventor
William E. Leidiger
By his Attorneys.
C. A. Snow & Co.

(No Model.) 5 Sheets—Sheet 4.

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## POTATO DIGGER.

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FIG. 4.

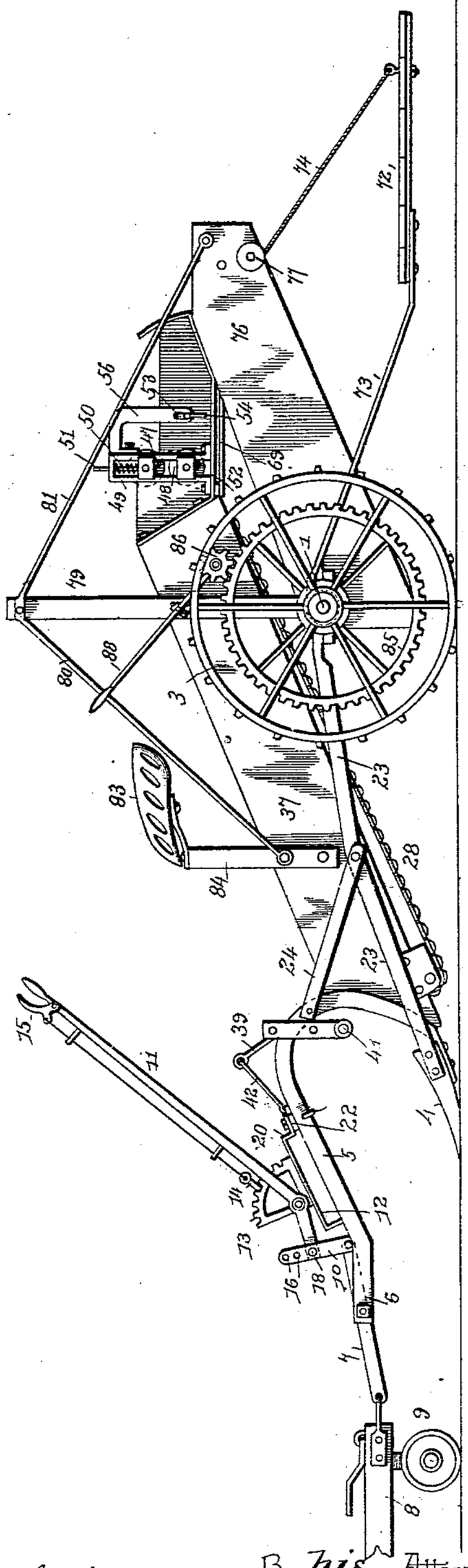


FIG. 9.

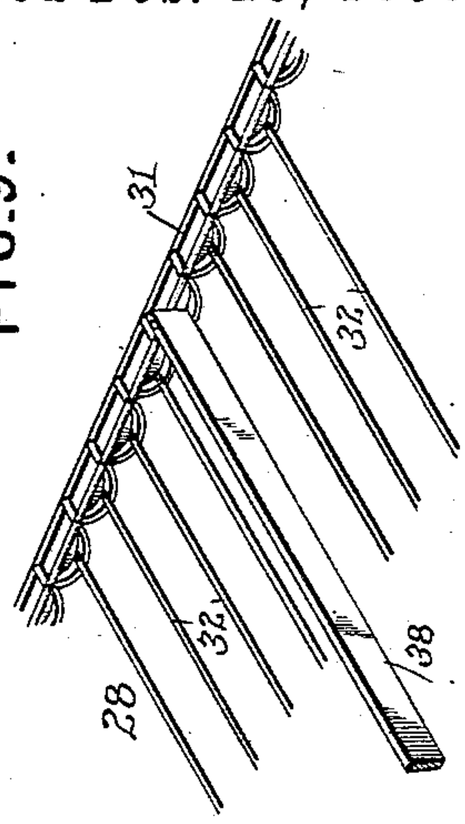
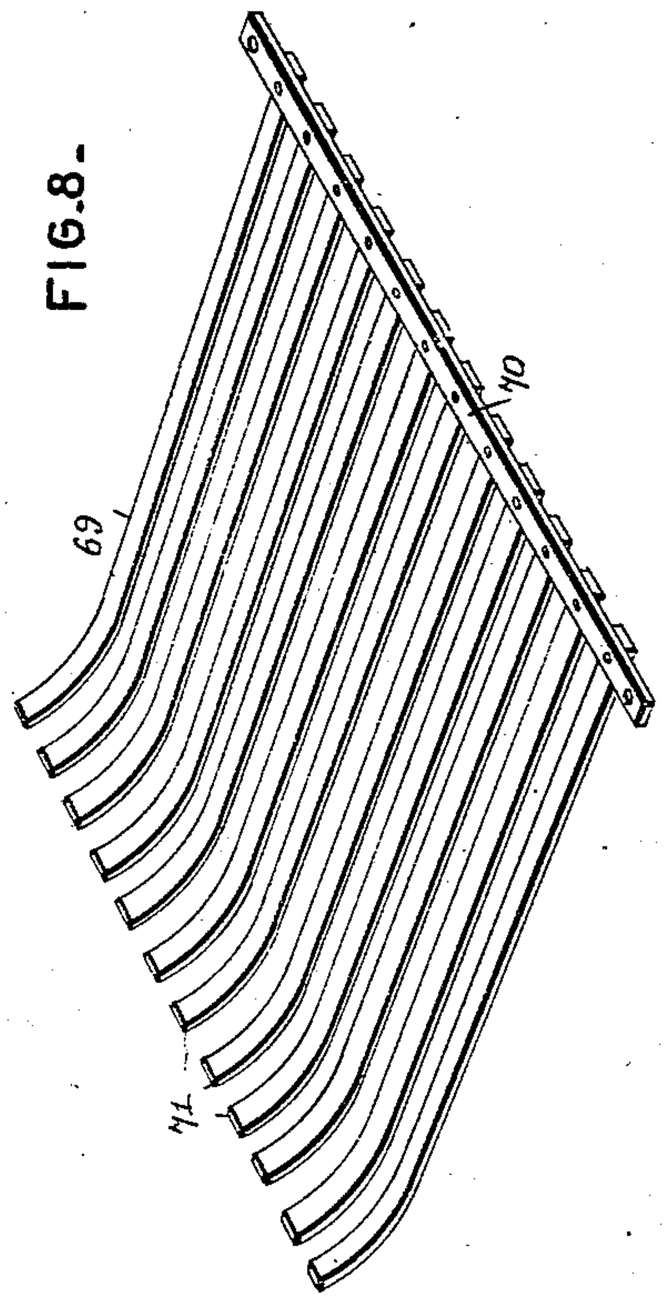


FIG. 8.



Witnesses
Jas. K. McCathran
J. H. Riley

Inventor
William E. Leidiger
By his Attorneys.
C. A. Snow & Co.

(No Model.) 5 Sheets—Sheet 5.

# W. E. LEIDIGER.

## POTATO DIGGER.

No. 555,251. Patented Feb. 25, 1896.

FIG. 5.

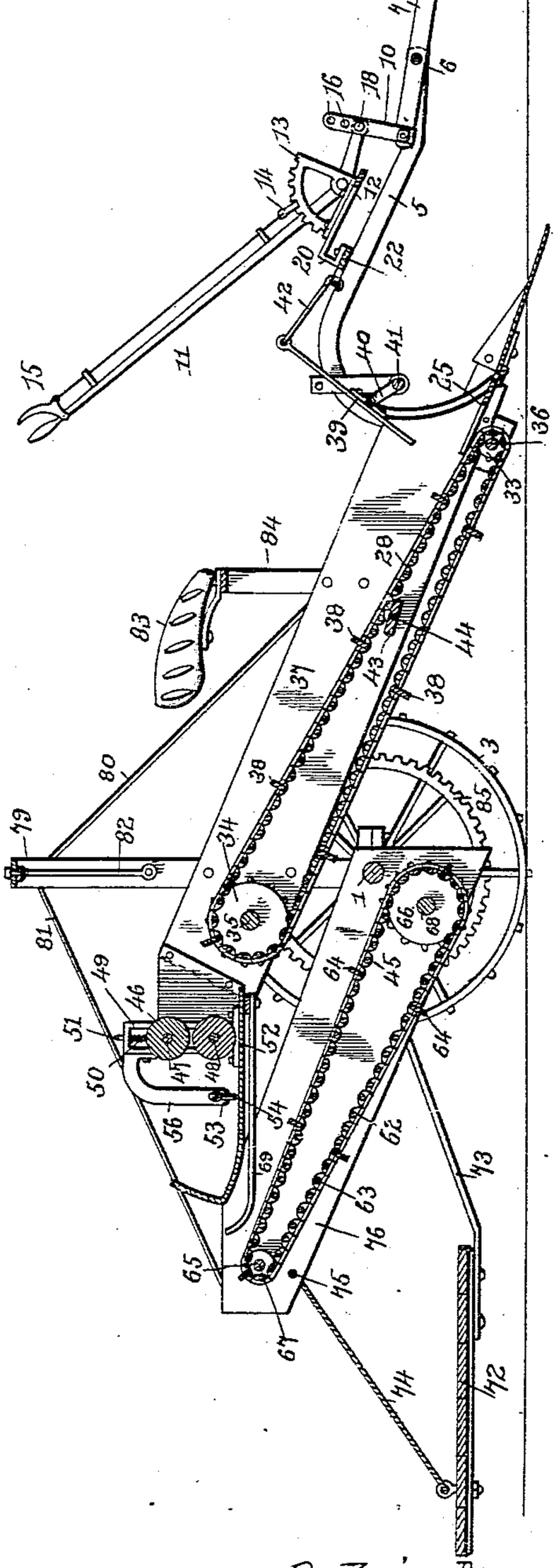
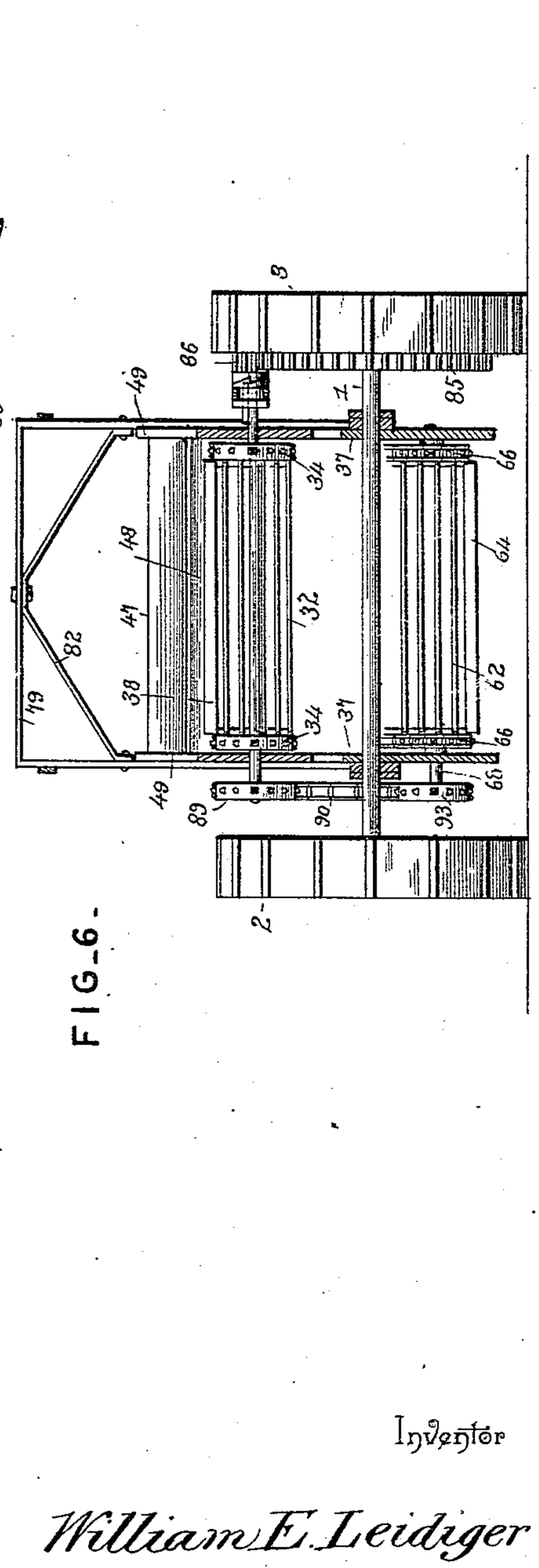


FIG. 6.



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Jas. K. McCathran
J. F. Riley

Inventor
William E. Leidiger
By his Attorneys.
C. A. Snow & Co.

# UNITED STATES PATENT OFFICE.

WILLIAM E. LEIDIGER, OF FALL CREEK, WISCONSIN.

## POTATO-DIGGER.

SPECIFICATION forming part of Letters Patent No. 555,251, dated February 25, 1896.

Application filed October 2, 1894. Serial No. 524,757. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. LEIDIGER, a citizen of the United States, residing at Fall Creek, in the county of Eau Claire and State of Wisconsin, have invented a new and useful Potato-Digger, of which the following is a specification.

The invention relates to improvements in potato-diggers.

The object of the present invention is to improve the construction of potato-diggers and to provide a simple and comparatively inexpensive machine capable of readily extracting potatoes from the ground and of separating them from vines and weeds and of cleaning and freeing them from clods of earth and delivering them in a marketable condition to an attendant.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a potato-digger constructed in accordance with this invention. Fig. 2 is a plan view. Fig. 3 is a side elevation. Fig. 4 is a similar view showing the other side of the machine. Fig. 5 is a longitudinal sectional view. Fig. 6 is a transverse sectional view. Fig. 7 is a detail view of the shovel. Fig. 8 is a similar view illustrating the construction of the resilient cleaner-arms. Fig. 9 is a detail perspective view illustrating the construction of the endless carriers. Fig. 10 is a detail view of the transversely-disposed reciprocating rake. Fig. 11 is a detail perspective view of the rotary agitator for shaking the front endless carrier.

Like numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates an axle supporting the frame of the potato-digger and having journaled on its spindles carrying or ground wheels 2 and 3, from one of which motion is communicated to the machine by means hereinafter described.

At the front of the machine is located a tapering-pointed shovel 4, secured to the lower rear ends of a pair of forwardly-diverging beams 5, which have their front terminals 6 pivoted at opposite sides of a link or lever 7 connecting the shovel-beams with a tongue 8. The tongue 8 has its rear end supported by means of a two-wheeled truck 9 and is hingedly connected to the front end of the link or lever 7, which is pivoted intermediate of its ends to the shovel-beam. The rear end of the link is adjustably connected by a pair of upward-extending links 10 with an arm of an operating-lever 11, which is fulcrumed at its angle on a bracket 12 of the shovel-beams. The operating-lever is pivoted directly to a ratchet-plate 13, which is secured to the bracket 12, and it carries a pawl or detent 14, which is operated by a latch-lever 15, arranged adjacent to the handle of the operating-lever, whereby the latter may be secured at any desired adjustment. The links 10, which extend upward from the rear end of the link or lever 7, are provided with perforations 16, adapted for the reception of a pivot-bolt 18, to enable the arm of the operating-lever to be secured at the desired adjustment, whereby the connection between the operating-lever and the link or lever 7 may be increased or diminished.

By means of the operating-lever and its connection with the rear end of the tongue, the depth of the shovel may be readily governed.

The bracket 12 is substantially rectangular, and consists of a longitudinally-disposed portion to which the said ratchet-plate is secured, and front and rear legs, 19 and 20. The leg 19 is bifurcated and straddles the upper edge of one of the shovel-beams, and is secured in that position by a hook-bolt 21, engaging the lower edge of the shovel-beam and extending through the longitudinal portion of the bracket and a flange of the ratchet-plate 13. The rear leg of the bracket is substantially L-shaped, and is bolted to a cross-bar 22, which connects the shovel-beams.

The shovel is further supported by front longitudinally-disposed connecting bars or braces, 23, extending forward from the axle and secured at their front terminals to opposite sides of the shovel, and they are connected intermediate of their ends with the shovel-beams by inclined bars 24.

At the rear edge of the shovel is hinged a shaking-screen 25, consisting of a transverse plate 26 and a series of rearward-extending fingers or bars 27, which rest upon a front endless carrier, 28. The transverse plate 26 is provided with forward-extending perforated ears 29, which are pivoted by means of a bolt to similar ears 30 of the shovel 4. The screen 25 has the rear ends of its fingers or bars resting upon the end of the carrier, and they terminate at the front thereof, and they operate to shake a great deal of the loose earth from the potatoes before they arrive at or are delivered upon the endless carrier, and prevent a great deal of earth from coming in contact with the endless carrier.

The endless carrier 28 receives the potatoes from the shovel 4, it inclines upward and rearward, and it is composed of links 31 and cross-bars 32. The links form a sprocket-chain at the side edges of the endless carrier, and are arranged on sprocket-wheels 33 and 34 of upper and lower transverse shafts 35 and 36, journaled in suitable bearings of the inclined sides 37 of the front conveyer or carrier.

Outward-extending bars 38 are arranged at intervals on the carrier 28, they are disposed transversely thereof to form buckets for conveying the potatoes upward, and they also serve as the means for agitating the shaking-screen 25. The transversely-disposed projecting bars come in contact with the lower face of the shaking-screen 25 and lift the latter and produce a continuous jolting of the same, whereby a large quantity of the soil clinging to the potatoes is separated from them before they reach the conveyer or carrier 28.

The clods are broken to free the potatoes, and the vines and weeds are crowded on the front carrier by means of a pair of oscillating arms or bars 39, located above the shaking-screen at the front of the endless carrier and mounted intermediate of their ends on crank-bends 40 of a transverse shaft 41, which is journaled in suitable bearings of the shovel-beams. The upper ends of the oscillating bars 39 are connected by link-rods 42 with the cross-bar 22, whereby the rotation of the shaft 41 will produce an oscillatory motion in the bars 39. The crank-bends 40 are disposed diametrically opposite each other, and when one of the bars 39 is moving rearward the other one is being carried forward preparatory to engaging the potatoes, earth and vines, whereby the potatoes and vines are continuously operated on.

As the potatoes are conveyed upward on the front carrier the latter is shaken, to free it of accumulated soil and to effect the cleaning of the potatoes, by means of a rotary agitator 43 located between the upper and lower portions of the front endless carrier and arranged to engage the lower face of the upper portion. It consists of a flat bar having rounded longitudinal edges, and it is mounted on a transverse shaft 44, journaled in suitable bearings of the sides 37 of the carrier.

A rear endless carrier is located below the upper end of the front carrier, and it extends upwardly and rearwardly, and the potatoes on arriving at the upper terminus of the front carrier fall upon the rear carrier, 45, and drop about eighteen inches, which serves to free them from the clinging soil. The vines and weeds do not fall with the potatoes, but are carried rearward between a pair of upper and lower transversely-disposed rolls 46, which draw the weeds and vines rearward and compress the same.

The rollers 46 are mounted upon upper and lower shafts 47 and 48, which are journaled in suitable boxes, and the boxes of the upper shaft 48 are slidingly arranged in vertical guides 49 and are compressed or forced downward by springs 50, disposed on rods 51. The springs operate to maintain the rollers a certain distance apart normally, but permit the rolls to separate to accommodate the weeds and vines passing between them.

Beneath the rolls and extending rearward from them is a transversely-disposed apron 52, which is separated a sufficient distance from the front endless carrier to afford an opening for the downward passage of the falling potatoes, and it is adapted to receive the vines and weeds leaving the rolls. The vines and weeds are discharged from the machine by a transversely-disposed reciprocating rake 53, which is provided with a series of depending fingers 54 for engaging the weeds and vines. One end, 55, of the rake is slidingly mounted in an opening of a support 56, and the other end, 57, is connected to a crank-bend 58 of a shaft 59, disposed longitudinally of the machine and connected by bevel-gears 60 and 61 with the transverse shaft 47 of the lower roll 46. As the crank-shaft 59 rotates the transversely-disposed rake 53 will be reciprocated and will cause the vines and weeds to be discharged from one side of the machine.

The rear endless carrier, 45, is constructed similar to the front carrier and is composed of links 62 and cross-bars 63, and is provided at intervals with outward-extending bars 64, and it is mounted on upper and lower sprocket-wheels, 65 and 66, of shafts 67 and 68.

Before the potatoes arrive at the top of the rear carrier the soil still clinging to them is removed by a series of parallel longitudinally-disposed spring-bars 69, constructed of resilient material and arranged slightly above the rear conveyer or carrier. The front ends of the resilient bars 69, are secured to a transverse bar 70, arranged beneath the apron 52, and the rear terminals 71 of the bars 69 are curved upward slightly. The potatoes passing beneath the resilient bars are rubbed and the dirt is completely removed, and the potatoes are delivered at the back of the machine

in a marketable condition and are received in suitable bags or other receptacles carried by attendants.

The attendant stands upon a rear platform 72, which has its front supported by bars 73 extending from the platform and hinged to the axle, and the platform is adjustably connected with the back of the frame by means of a windlass consisting of a cable, rope 74, or the like, and a transverse shaft 75, journaled in suitable bearings of the sides 76 of the rear carrier and provided with drums or spools 77, and having at one end a crank-handle. The platform may be raised or lowered, and it is retained at the desired adjustment by a pawl and ratchet or any suitable means for holding the transverse shaft 75 against retrograde rotation.

The main or supporting frame of the machine has a centrally-arranged rectangular support or frame 79 extending upward from the axle and having secured to its sides, near its top, forward and rearward extending rods or braces 80 and 81, having their lower ends connected with the sides of the carriers. This construction forms a truss, and the rectangular frame or support 79 is supported by upwardly-converging braces 82.

The driver occupies a seat 83, which is supported by oppositely-disposed arched standards 84, extending upward from the sides of the front carrier a short distance from the operating-lever, in order that the latter may be in convenient reach of the driver.

The carrying-wheel 3 is provided with a cog-wheel 85, which may be fixed to or formed integral with the carrying-wheel 3, and which meshes with a pinion 86 of the upper shaft 36 of the front carrier, and the pinion is connected with the shaft 36 by means of a clutch 87, operated by a lever 88 and adapted to throw the machine into and out of operation, as will be readily understood. The pinion 86 is located at one side of the machine, on the exterior thereof, and the shaft 36 is extended through the opposite side of the same and has fixed to it a sprocket-wheel 89 on which is arranged a sprocket-chain 90.

The sprocket-chain 90 is arranged on a sprocket-wheel 91 of the shaft 47, a sprocket-wheel 92 of the agitator-shaft 44, and a sprocket-wheel 93 of the lower shaft 68 of the rear carrier. It passes under an idler 94, and under a sprocket-wheel 95, which is connected with a similar sprocket-wheel 96, receiving a sprocket-chain 97 for rotating the crank-shaft 41, which carries a sprocket-wheel 98. By this arrangement of sprocket wheels and chains the endless carriers are operated, the agitator for shaking the front carrier is rotated, and the crank-shafts 41 and 59 are rotated for operating the oscillating bars and the reciprocating rake.

It will be seen that the potato-digger is simple and comparatively inexpensive in construction, that it is capable of rapidly harvesting potatoes, and that it requires but two men, a driver and an attendant, for manipulating the bags or other receptacles.

It will also be seen that the machine delivers the potatoes in a marketable condition free from dirt, and that the weeds and vines are separated from the potatoes and discharged at one side of the machine.

It will also be apparent that the depth of the plow may be readily controlled, and that the mechanism for accomplishing this result is located within convenient reach of the driver.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

What I claim is—

1. In a potato-digger, the combination of a frame, a shovel, an endless carrier located in rear of the shovel, and separated therefrom by a space, and a shaking-screen located at the space between the shovel and the endless carrier and hinged at its front to the latter and having its rear resting upon and supported by the endless carrier, whereby the screen is agitated by the carrier and potatoes are shaken and sifted before arriving at the endless carrier, substantially as described.

2. In a potato-digger, the combination of a frame, a shovel, an endless carrier located in rear of the shovel, and a shaking-screen hinged at its front to the shovel and located in advance of the endless carrier, and provided with rearwardly-extending fingers or bars having their rear ends supported by the front of the endless carrier, whereby the screen is agitated by the carrier and potatoes are shaken and sifted before reaching the endless carrier, substantially as described.

3. In a potato-digger, the combination of a frame, an endless carrier, a pair of rolls located in rear of the carrier and arranged one above the other, and adapted to receive and carry rearward the vines and weeds from the carrier, and a transversely-reciprocating rake arranged in rear of the rolls for discharging the vines and weeds, substantially as described.

4. In a potato-digger, the combination of a frame, an endless carrier, an apron located in rear of the carrier, and adapted to receive the vines and weeds, and a transversely-reciprocating rake mounted above the apron, substantially as described.

5. In a potato-digger, the combination of a frame, an endless carrier, an apron located in rear of the carrier, the upper and lower rolls arranged above the apron, the upper roll being yieldingly mounted, and a reciprocating rake disposed transversely of the frame and located in rear of the rolls, substantially as described.

6. In a potato-digger, the combination of a frame, a transversely-disposed rake provided with depending fingers or teeth and having one end slidingly mounted, and a crank-shaft

disposed longitudinally of the frame and having its crank connected with the other end of the rake, substantially as and for the purpose described.

7. In a potato-digger, the combination of a frame, an endless carrier, vertical guides disposed at opposite sides of the frame and located in rear of the carrier, the upper and lower rolls, the upper roll being slidingly mounted in the guides, springs for forcing the upper roll downward, and means for discharging the vines and weeds at one side of the frame, substantially as described.

8. In a potato-digger, the combination of a frame, an endless carrier, and a series of longitudinally-disposed resilient bars located above the carrier and arranged to engage the potatoes conveyed by the carrier for cleaning the same, substantially as described.

9. In a potato-digger, the combination of a front carrier, a rear carrier, a weed-receiving apron located above the rear carrier and arranged a short distance in rear of the front carrier and forming an intervening space for the passage of potatoes to permit the latter to fall from the front carrier to the rear one, and the series of resilient bars located below the said apron and arranged to engage the potatoes conveyed upward by the rear carrier, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM E. LEIDIGER.

Witnesses:
J. A. THWING,
L. D. LANGWORTHY.