

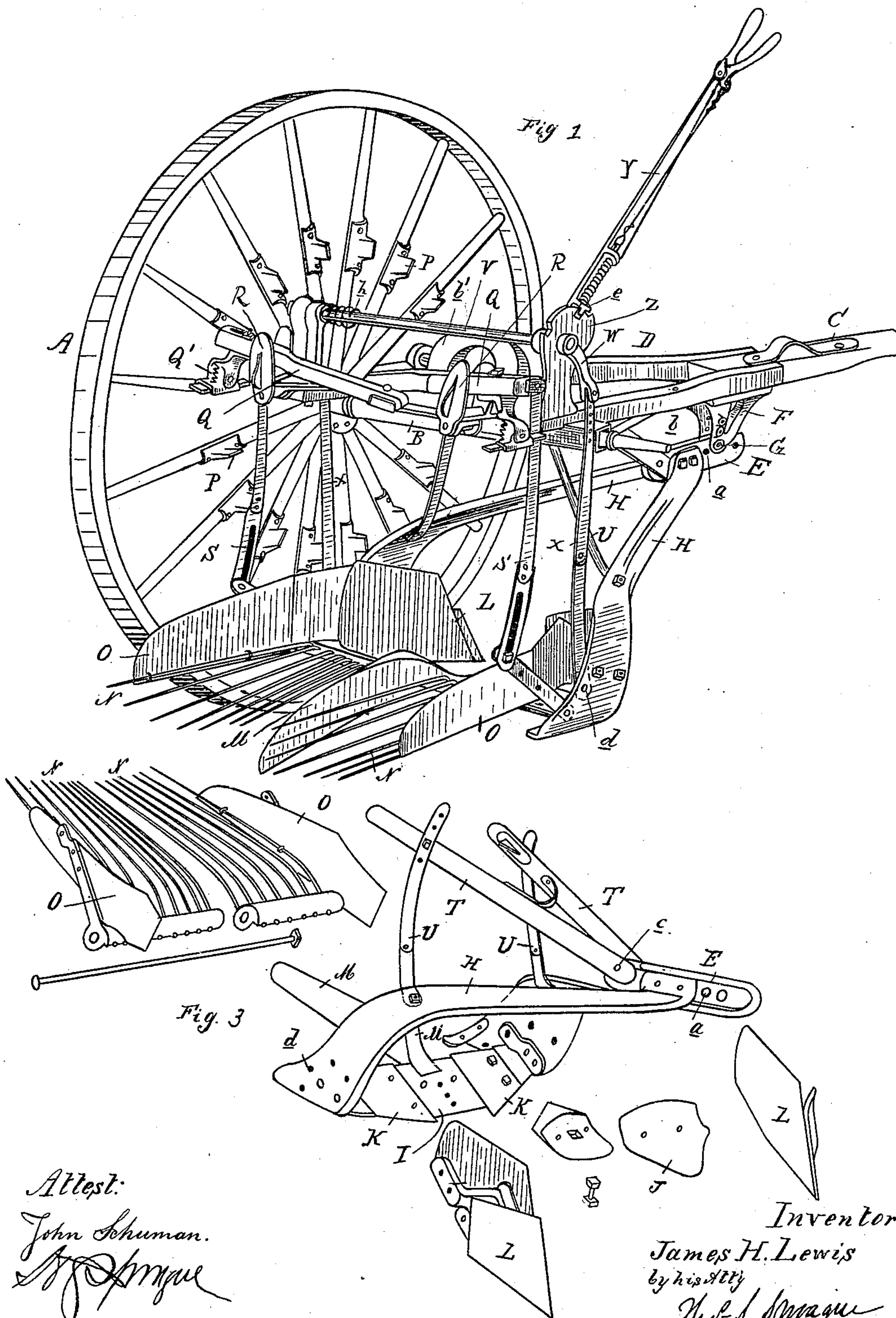
(No Model.)

3 Sheets—Sheet 1.

J. H. LEWIS.
POTATO DIGGER.

No. 337,169.

Patented Mar. 2, 1886.



Attest:
John Schuman.
[Signature]

Inventor:
James H. Lewis
by his atty
[Signature]

(No Model.)

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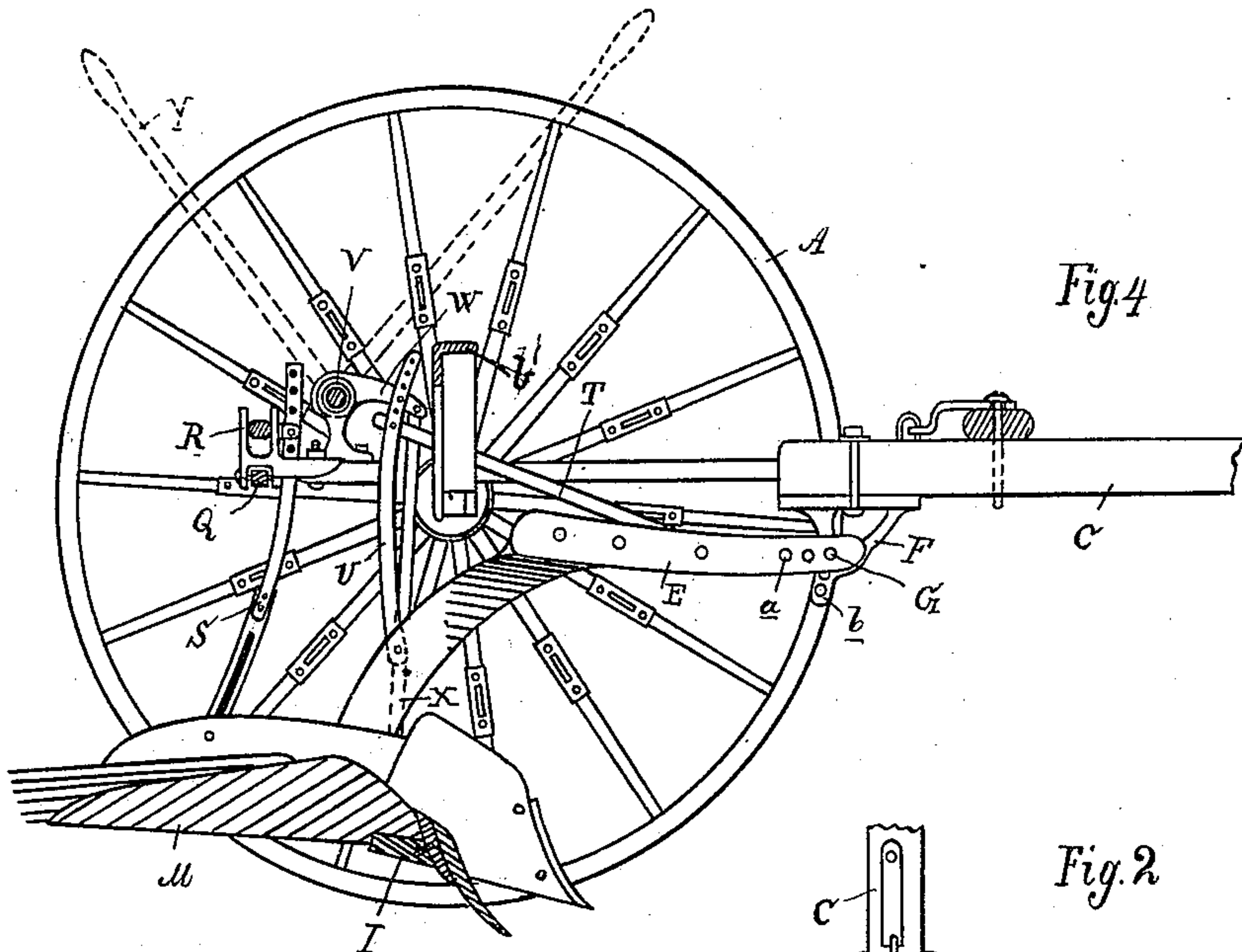


Fig. 4

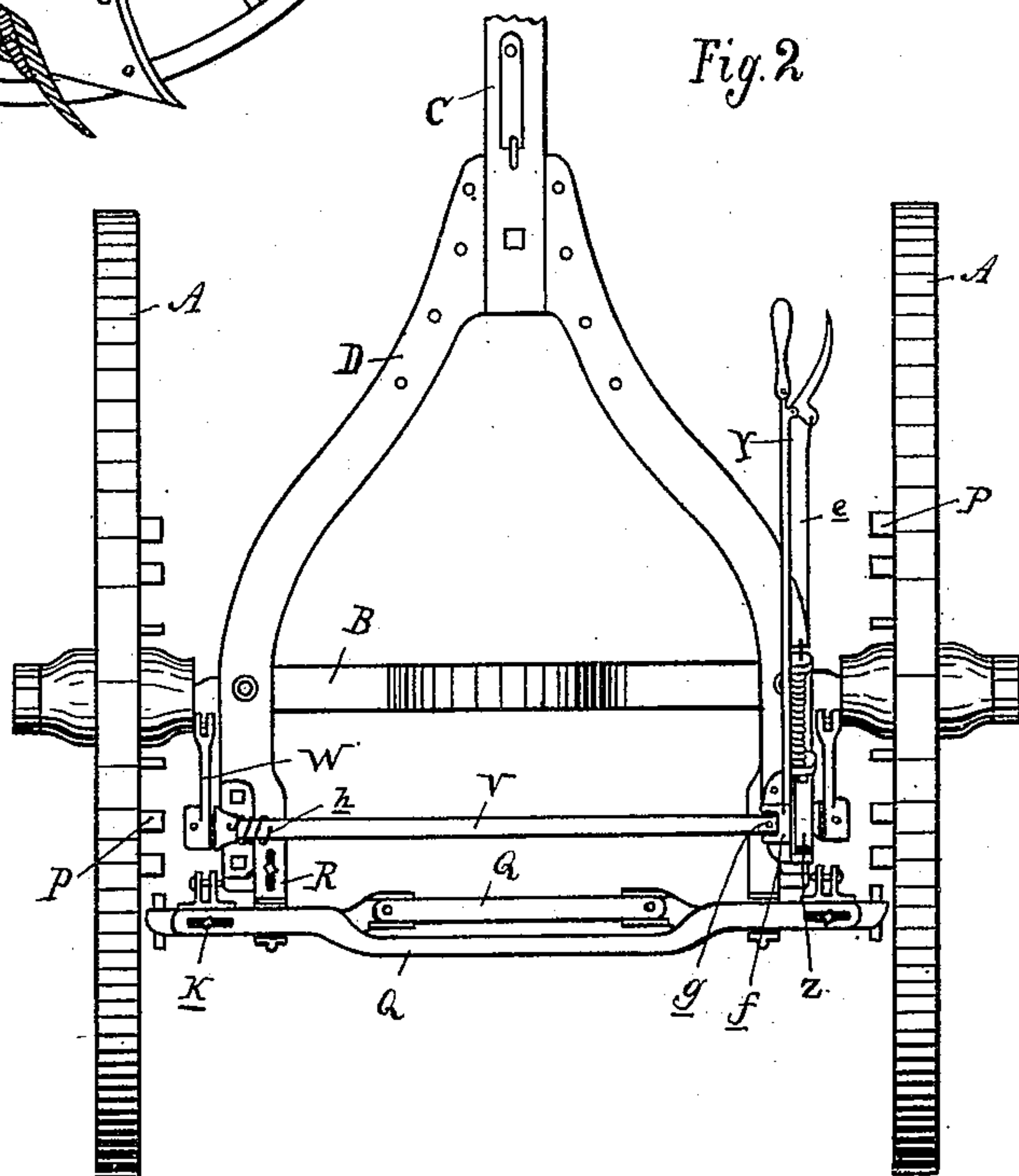


Fig. 2

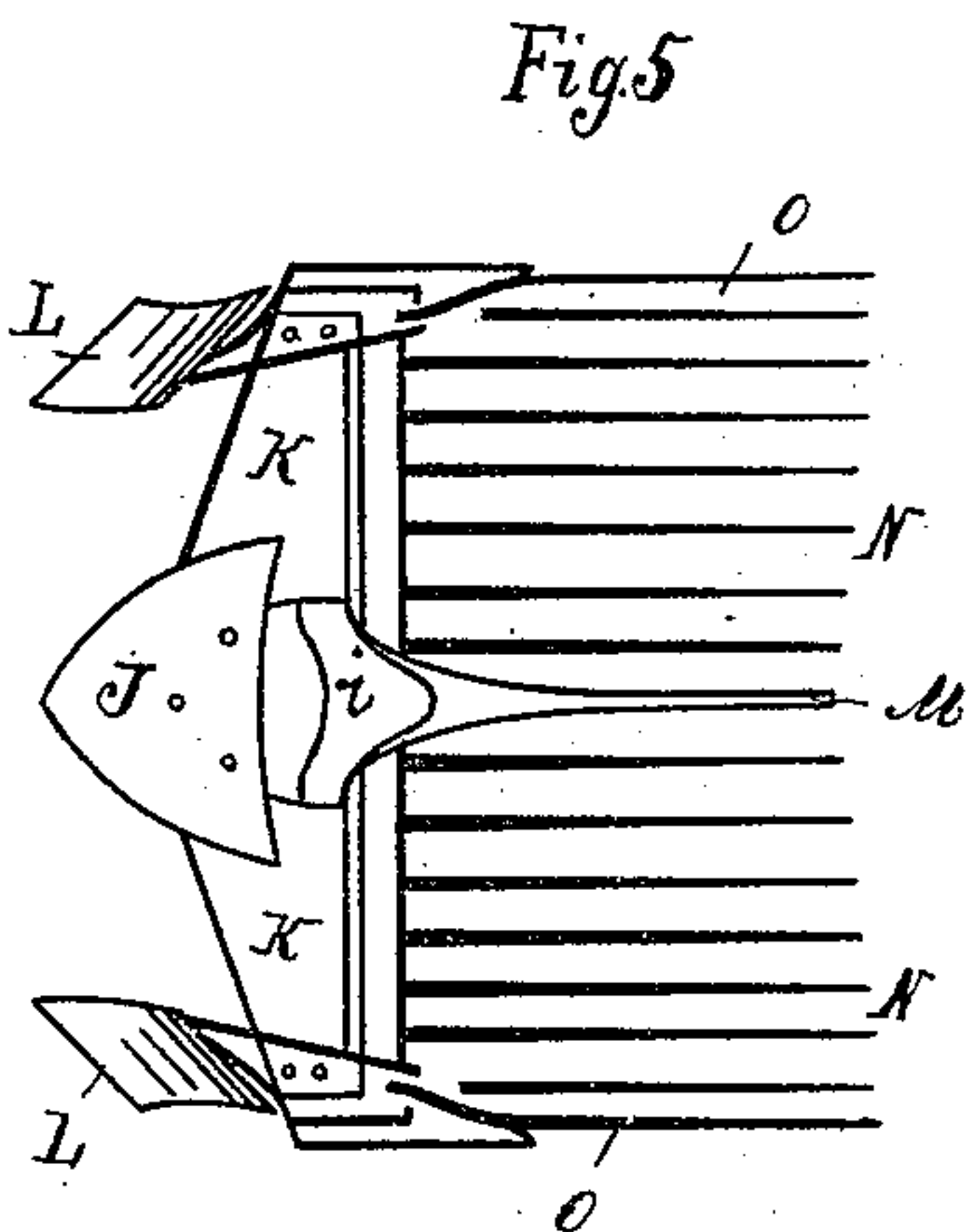


Fig. 5

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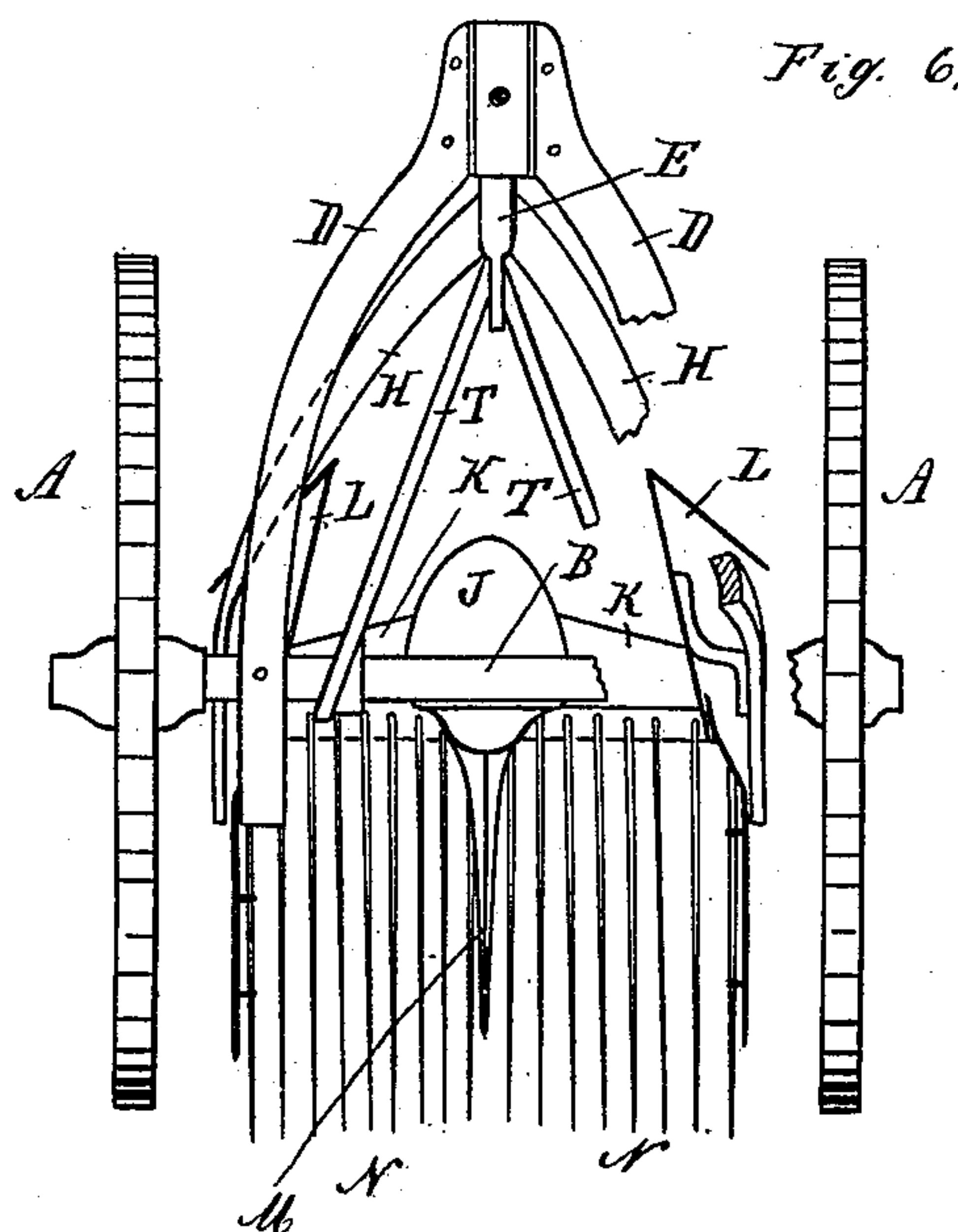
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UNITED STATES PATENT OFFICE.

JAMES H. LEWIS, OF DETROIT, MICHIGAN.

POTATO-DIGGER.

SPECIFICATION forming part of Letters Patent No. 337,169, dated March 2, 1886.

Application filed January 14, 1885. Serial No. 152,869. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. LEWIS, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Potato-Diggers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention relates to certain new and useful improvements in potato-diggers; and the invention consists in the peculiar construction and arrangement of its parts as hereinafter described, and which are intended to form an improvement on the construction of the potato-digger heretofore patented to me by Letters Patent dated May 25, 1880, and No. 227,984.

20 The potato-digger which my improvements refer to belongs as far as its operation is concerned to that class of potato-diggers which plow up the whole potato-hill and separate the tubers from the soil by means of shaking grates, leaving the tubers exposed upon the ground.

30 In the drawings which accompany this specification, Figure 1 is a perspective of my improved potato-digger with one of the wheels removed. Fig. 2 is a plan with the plow and plow-beam removed. Fig. 3 is a perspective of the potato-digger proper with all the parts dismounted and shown detached. Fig. 4 is a vertical central longitudinal section of my potato-digger. Fig. 5 is a detached plan view showing the construction of the plow proper. Fig. 6 is a plan of the potato-digger with the truck partly broken away.

40 A A are the wheels of the device. B is the axle on which the wheels revolve, and C is the draft-pole, centrally secured to the axle by means of the curved hounds D, these parts forming together the plow-truck.

45 E is the plow-beam the forward end of which is detachably secured to the under side of the draft-pole by means of the bifurcated hanger F and pin G. A series of holes, *a*, in the plow-beam afford the means for adjusting the plow in the direction from front to rear, while another series of holes, *b*, in the hanger afford the means of raising or lowering the forward end of the plow-beam.

Near the rear end of the plow-beam are rigidly secured thereto (or integrally formed therewith) the curved standards H, which project sidewardly, downwardly, and rearwardly from the plow-beam, and have their lower ends connected by a horizontal bearing plate or shoe, I, to which the plow is attached.

This plow is of a composite nature, and consists of the central shovel-plow, J, the scraper-blades K, and the side plows, L. The shovel-plow J is adjustably secured in any suitable way upon the shoe I, so that it may be adjusted to dig more or less deep in relation to the scraper-blades. The scraper-blades are placed between the side plows and the shovel-plow, and the side plows are provided with outside mold-boards or deflectors.

M is a fender, secured centrally upon the shoe and extending in a rearward direction. (See Figs. 5 and 6.)

N are two grates, pivotally attached near the rear edge of the shoe, and O are guards or shields, secured to the outer edges of the grates. The fender M, which is stationary, forms a similar shield or guard for both of the inner edges of the grates.

50 The shaking of the grates is produced in the following manner: P are a series of lugs projecting from the inner sides of the wheels and secured to the spokes thereof in a circle concentric to the hub. R R are two brackets adjustably secured to the rear ends of the hounds. To the under side of each of these brackets is pivotally secured at one end a shaker-arm, Q, which, near its other end, is supported upon the other bracket. The free ends of these two shaker-arms Q Q extend sufficiently to contact during the travel of the wheels with the lugs P, and, being free to vibrate vertically, receive a shaking motion, which, by means of the adjustable connecting-bars S, is communicated to the shaking grates.

55 T T (see Figs. 3 and 4) are plow-handles, pivotally attached to the plow-beam at their forward ends by means of the bolt *c*. They rest with their rear ends upon the axle, which latter is provided in the middle, between the plow-handles, with an upward bend, *b'*. This bend or arch prevents the plow-handles from lateral displacement.

The rear end of the plow is suspended from

the frame by means of the hangers U. These hangers, which are preferably made in two parts, as shown, are secured at their lower ends to the plow-standards and at their upper ends, which are provided with a series of vertical holes, by which they are adjustably secured to the plow-handles by means of a removable bolt. As the plow-handles are pivotally secured to the plow-beam, it is clear that by means of the adjustable hanger U, in connection with the adjustable pivot-connection between the forward end of the plow-beam and the frame, the plows may be adjusted to any desired height and any desired angle within the limit of these parts.

The devices for raising the plow out of the ground or lowering it to its work are arranged as follows: V is a rock-shaft journaled in suitable bearings upon the rear ends of the hounds. This rock-shaft is provided near its ends with the arms W W, to the free ends of which the connecting-bars X X are pivotally secured. The lower ends of these connecting-bars are pivotally secured at *d* to the plow-standards or to the outer ends of the shoe. Y is a handle-lever, loosely sleeved upon the rock-shaft V. It is provided with a latch-dog, *e*, by means of which and the notched segment Z the handle-lever can be locked in position. Upon the hub of the handle-lever is a notch, *f*, and a lug or pin, *g*, which lug is fast upon the rock-shaft, engages into this notch. The notch *f* is larger than is necessary to accommodate the pin *g*, and a coil-spring, *h*, is placed upon the opposite end of the rock-shaft, with one of its ends secured to it, while the other is attached to the stationary bearing near it.

The operation of these devices is as follows: The segment Z has two notches, into which the latch-dog *e* of the handle can engage and lock the handle in one position. The plow is raised out of the ground in one position and in the other position the plow is lowered into the ground. When the plow is in the ground and it is desired to raise the same out of the ground, the lever Y has to be swung some distance back before the engagement of the pin *g* with the notch *f* operates the rock-shaft. The object of this arrangement is to give the plow in digging perfect freedom to rise sufficiently out of the ground when it strikes an obstruction—such as a bolder, for instance—to pass over the obstruction. To bring the plow quickly to its work again, and also to deprive the plow of too great freedom to rise at every slight obstruction, the spring *h* is so arranged as to oppose its tension to the rising of the plow out of the ground.

The hangers *u*, by means of which the plow is suspended from the plow-handles, must be so adjusted that in digging the weight of the plow and all the strain occasioned by the digging is entirely supported from the plow-handles, which rest upon the axle.

To enable the lifting device to operate without being interfered with by the connecting-bar S, which operates the shaking grates, the

bar S is slotted upon its lower end, which allows the grates to be freely raised and lowered together with the plow.

The different parts of the plow have been described above, and I will now proceed to describe its peculiar features in connection with its operation. The fender, it will be seen, forms at its point of departure in rear of the shovel-plow a convex-shaped face, *i*, which forms a corresponding continuation of the convex rear edge of the shovel-plow. It then tapers gradually upward and rearward until it drops off again. The object of this arrangement is to gradually break up in the center the potato-hill which has been lifted up by the shovel-plow and guide the potatoes and the ground onto the grates without turning the hill over, which would throw the stalks underneath, and defeat in a large measure the operation of the grates. Now, the potato-stalks do not become mixed with the ground at all, and the breaking up of the hill, together with the shaking of the grates, is sufficient to tear them from the tubers. The scraper-blades have receding edges, which help to spread the ground evenly over the grates. The side plows clear a path of sufficient width to give free passage to the whole plow, and they project sufficiently forward to prevent any part of the hill from falling outside. Their mold-boards prevent any accumulation of stalks or other debris upon the plow-standards, and by allowing a greater width of the grates enables the ground to spread upon them. For this purpose the landsides of these plows are placed inclined, so as to present a gradually-enlarging passage to the ground back of their plow-points.

The fingers of the grates are made of spring-steel, and, being free to act by their resiliency, give a more dancing motion in the work. The fingers at their base start at a slight upward incline, which also helps their operation and retards the too sudden influx of material upon them. The faces of the grates are slightly dished toward the center, so as to collect the tubers more in the center; but the discharge of the grates is entirely to the rear.

The outer ends of the shaker-arms have suitable contact-plates for the lugs to strike against. These contact-plates are adjustably secured, as shown at *k* in Fig. 2, by means of which adjustment the shaker-arms may be lifted more or less high by the lugs, and thereby produce a more or less violent shaking of the grates.

Some of the principle advantages of my machine are the following: First, the plow-standards form an arch above the plows, and, as they spring from the plow-beam at a point forward of the plows, they present a very large and unobstructed passage above the plows, which allows any possible amount of stalks and weeds to pass without liability to cause obstruction; second, the weight of the plows and all the strain produced by the digging is supported upon the axle by the hang-

ers U, which at the same time serve as braces to prevent any wobbling or lateral displacement of the parts if more strain is exerted upon one side of the plow than upon the other; 5 third, the shaking devices are simple and very effective; fourth, the ground is well broken up and distributed before it is passed upon the grates, and the whole operation is one of digging instead of one of plowing, thus 10 overcoming the liability of forming lumps in wet ground; fifth, the stalks and weeds cannot interfere with the operation of the grates; sixth, the plow has entire freedom to pass over obstructions in digging without undue interference in its work; seventh, all 15 the parts, where desirable, are provided with simple devices for adjustment to meet all possible contingencies.

What I claim as my invention is—

20 1. In a potato-digger, the combination of the draft-pole, the plow, the plow-beam E, adjustable vertically and longitudinally on said pole, and the arched plow-standards H, secured to a point forward of the plow and 25 extending rearward and outward, and the hangers U, arranged to adjustably support the said plow and standards, substantially as and for the purposes described.

30 2. In a potato-digger as described, the combination of the shoe I, the shovel-plow J, adjustably secured to the center thereof, the scraper-blades K, and side plows, L, provided with outside mold-boards, all supported from the standards H and arranged in relation to 35 each other substantially as described.

40 3. In a potato-digger, the combination of the plow-beam E, arch-standards H, shoe I, connecting the free ends thereof, shovel-plow J, scraper-blades K, side plows, L, and shaking grates N, pivotally secured to the rear side of the shoe, with the fender M, centrally secured back of the shovel-plow, substantially as described.

45 4. In a potato-digger, the combination of the shoe I, and the shovel-plow J, adjustably secured upon the shoe, with the fender M, secured to the shoe in rear of the shovel-plow, and having the intervening convex and rearwardly-tapering face *i*, substantially as described. 50

55 5. In a potato-digger, the combination of the shoe I, adjustable shovel-plow J, scraper-blades K, and side plows, L, all secured to the shoe, and the latter having outside mold-boards and landsides which diverge from the plow-point rearward, with the shaking grates N, pivotally secured to the rear of the shoe each independent of the other and extending the whole width of the path made in digging,

and the guards O, attached to said screens, 60 substantially as described.

6. In a potato-digger as described, the combination, with the shaping screens operated independently, and with the plow J, arranged centrally on the shoe I, of the fender 65 M, arranged in rear of the plow J and between the said screens, and the guards O for said screens, as set forth.

7. In a potato-digger, the combination of the wheels A, having inwardly-projecting 70 spurs P, secured to the spokes thereof, the shaker-arms Q, pivotally secured at one end and having their free ends arranged in the path of the spurs, the shaking grates N, pivotally secured to the rear end of the plow, and 75 the connecting-bars S, connected to the shaker-arms by adjusting-holes, and to the shaking grates by pins passing through slots in their lower ends, substantially as described.

8. In a potato-digger, the combination of 80 the wheels A, having inwardly-projecting spurs P, secured to their spokes, the hinged shaker-arms Q, the brackets R, adjustably secured to the rear end of the frame and forming hinge-connections, with the shaker-arms on 85 their under side, and guide-supports for the same upon their upper sides, the connecting-bars S, and grates N, all arranged substantially as described.

9. In a potato-digger, the combination of 90 the plow-beam E, pivotally and adjustably supported at its forward end, the handles T, pivotally secured to the plow-beam and supporting the plow upon the axle, the arched plow-standards H, and the adjustable hangers 95 U, secured at their upper ends to the plow-handles and at their lower ends to the arched plow-standards, substantially as described.

10. In a potato-digger, a lifting device consisting, substantially, of the rock-shaft V, 100 rock-arms W, connecting-bars X, and actuating-handle Y, with its locking device, in combination with the notch *f* on the hub of the handle, and the pin *g*, engaging therein, all combined and operating substantially as described, whereby the plows are allowed to 105 rise over obstructions without affecting the elevating parts, as set forth.

11. In a potato-digger, a lifting device consisting, substantially, of the rock-shaft V, rock- 110 arms W, connecting-bars X, actuating-handle Y, pin *g*, and notch *f*, in combination with the coil-spring *h* upon the rock-shaft, all combined and operating substantially as described.

JAMES H. LEWIS.

Witnesses:

E. J. SCULLY,
E. W. ANDREWS.