

(No Model.)

2 Sheets—Sheet 1.

H. HORNER
POTATO DIGGER AND PICKER.

No. 412,619.

Patented Oct. 8, 1889.

Fig. 1.

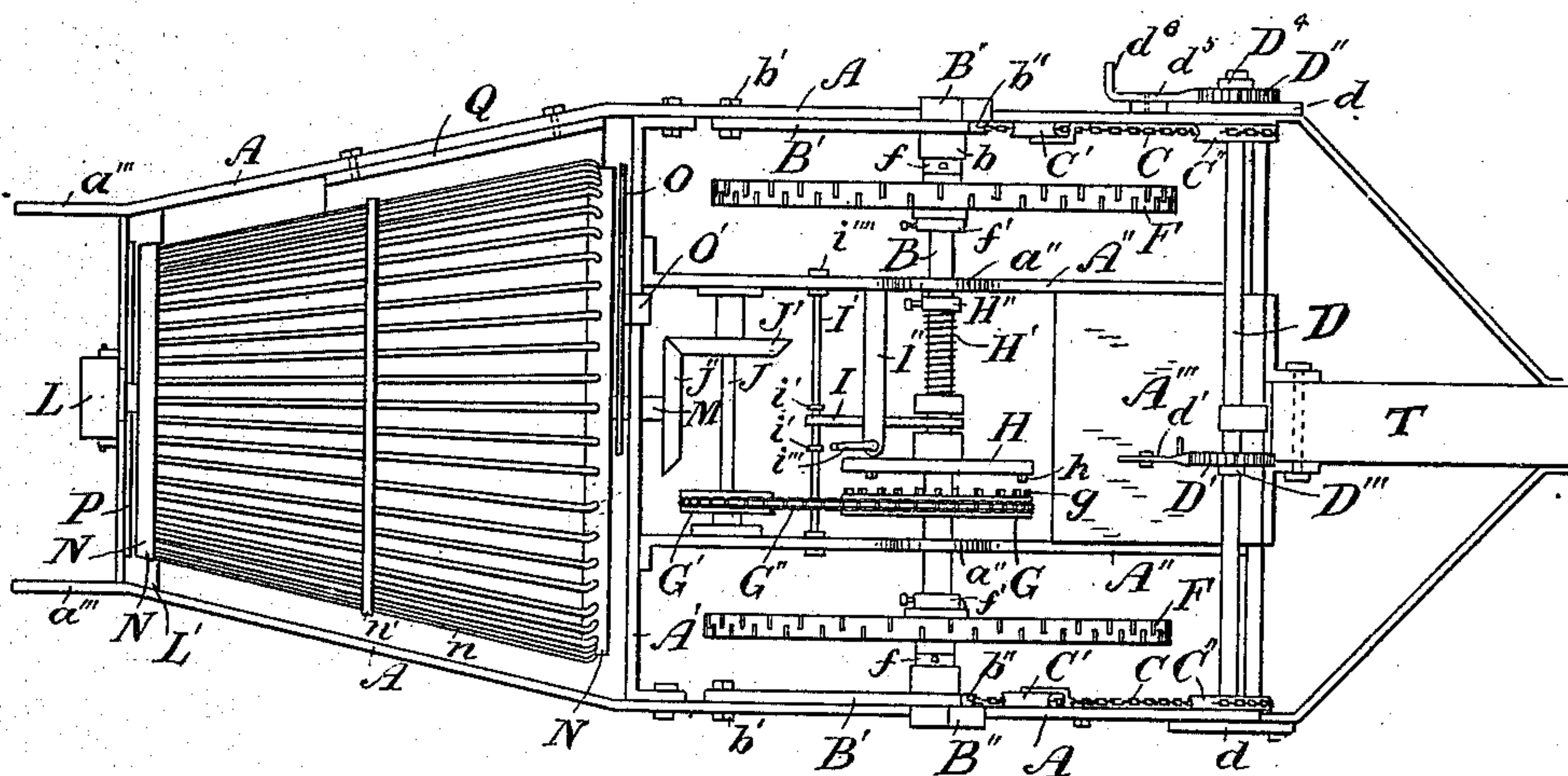


Fig. 10

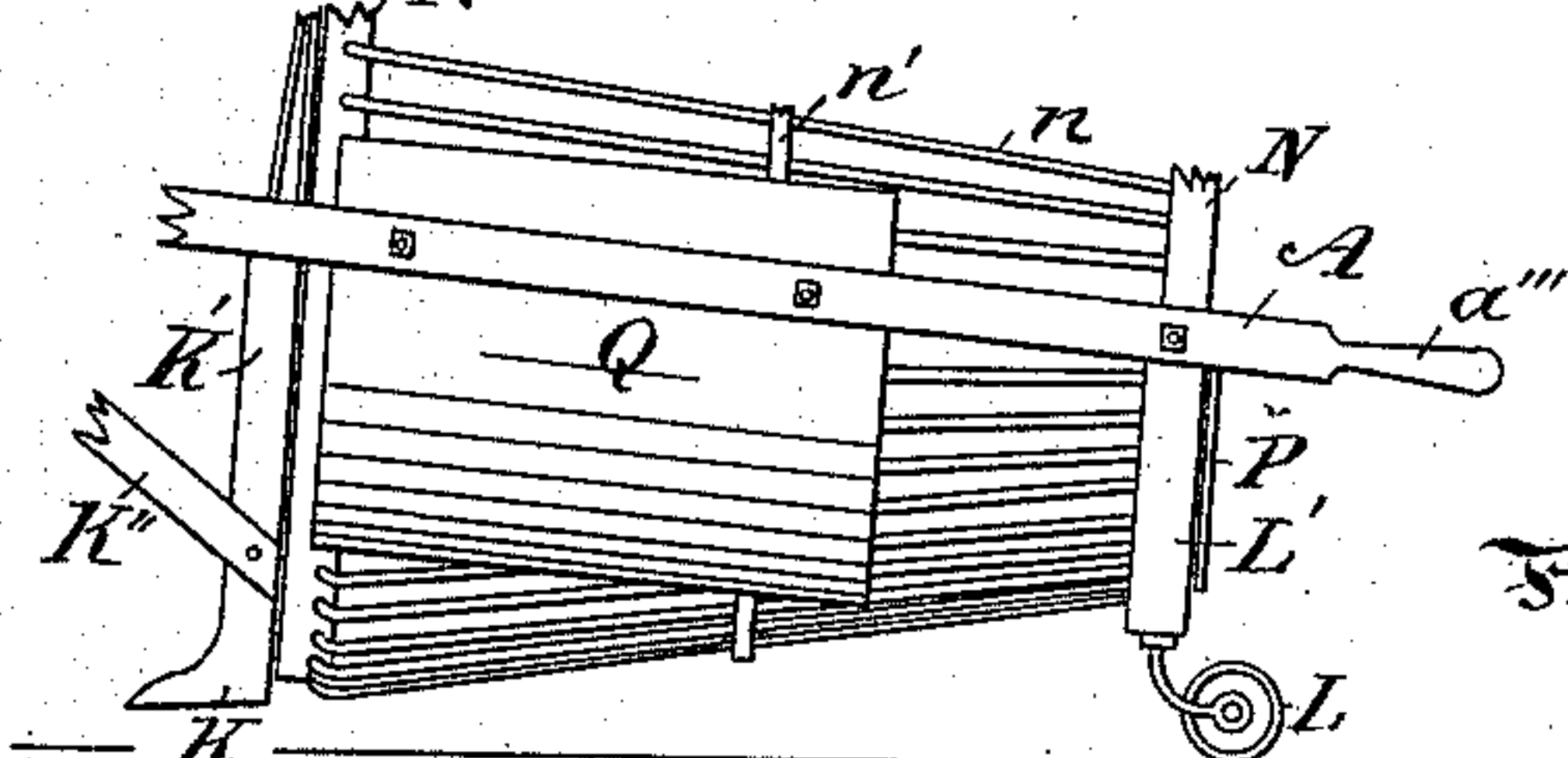
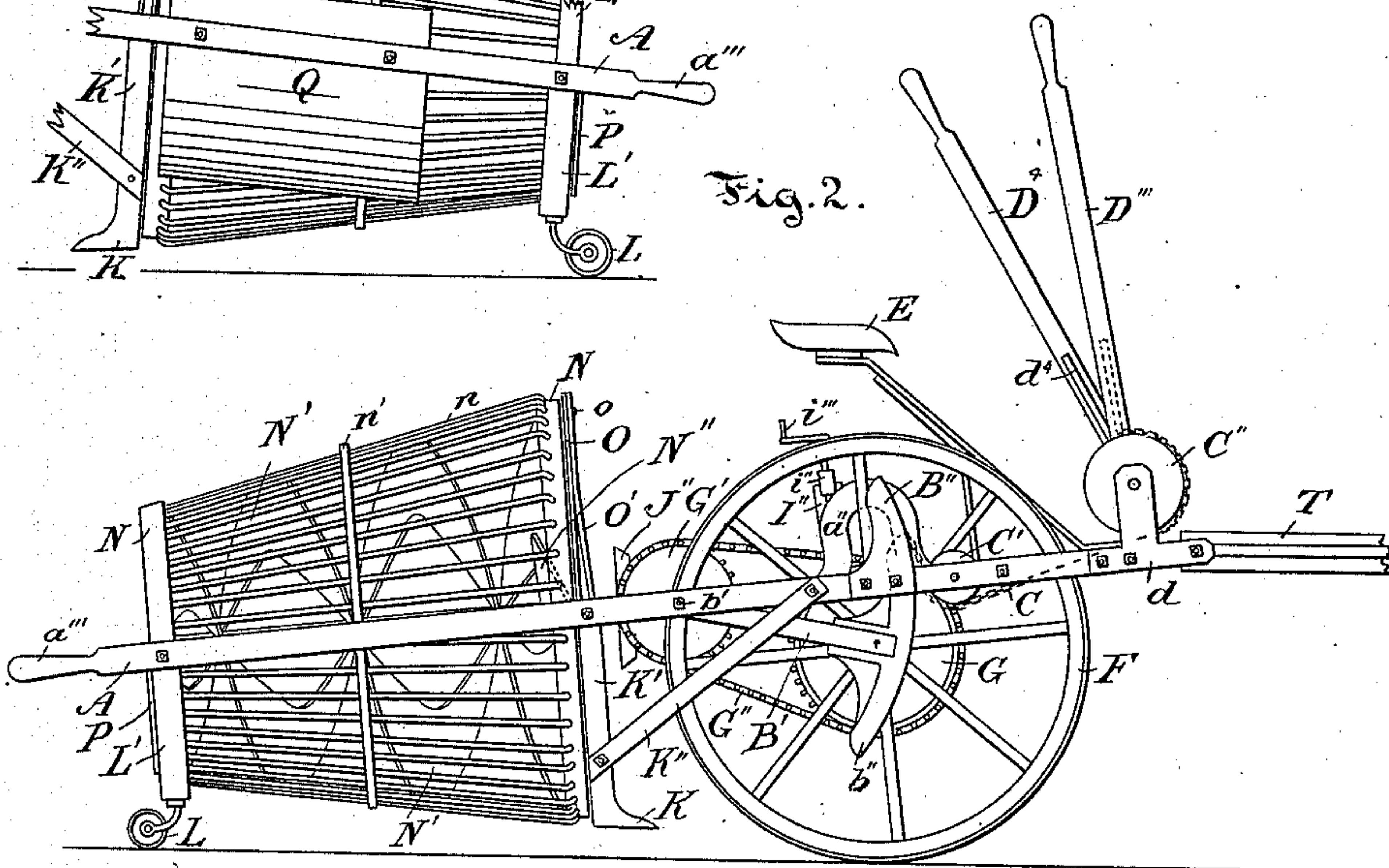


Fig. 2.



Witnesses:
Chas. Raley,
W. Barney,

Herbert Horner
Inventor
A. Harney
Attorney.

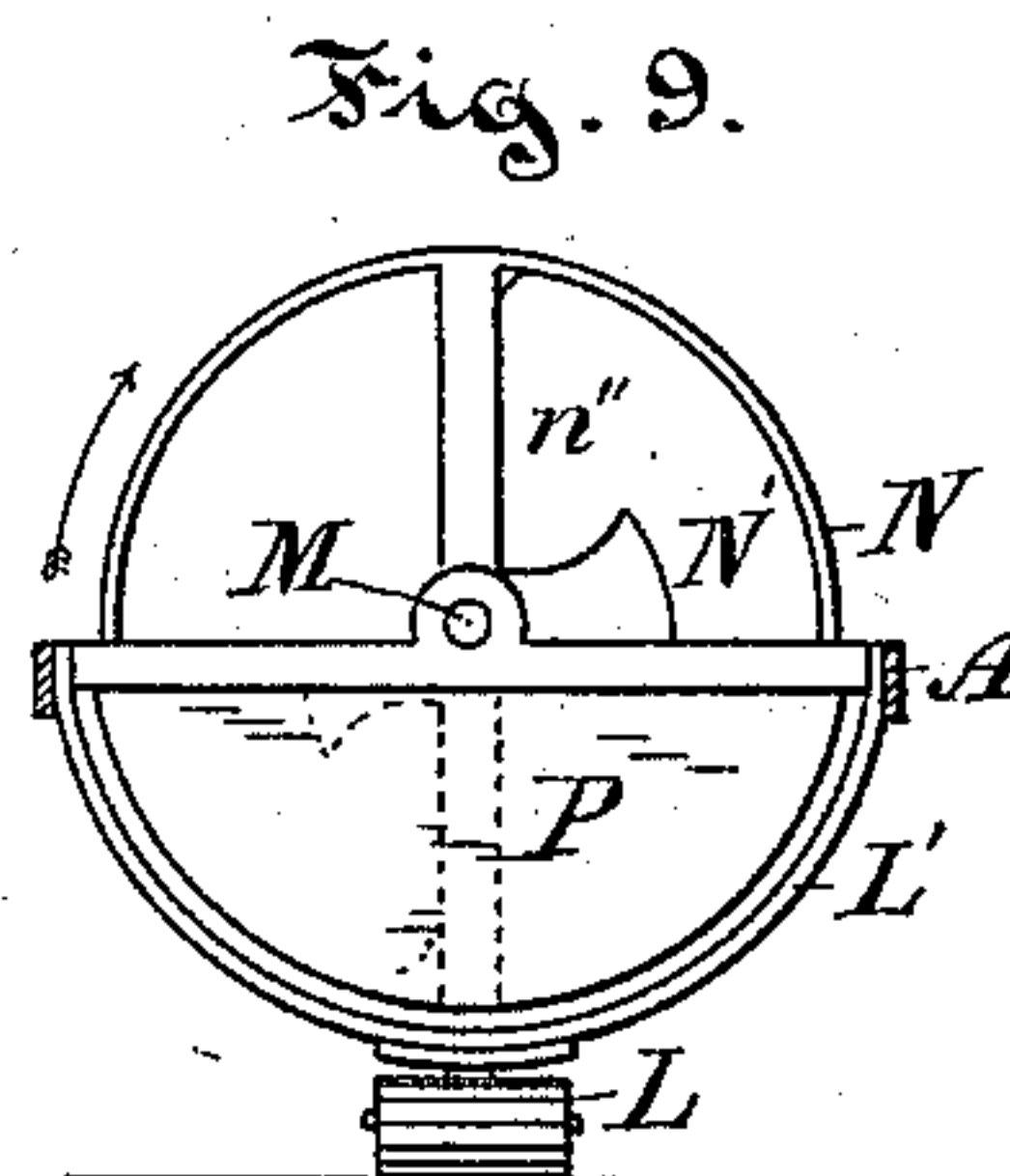
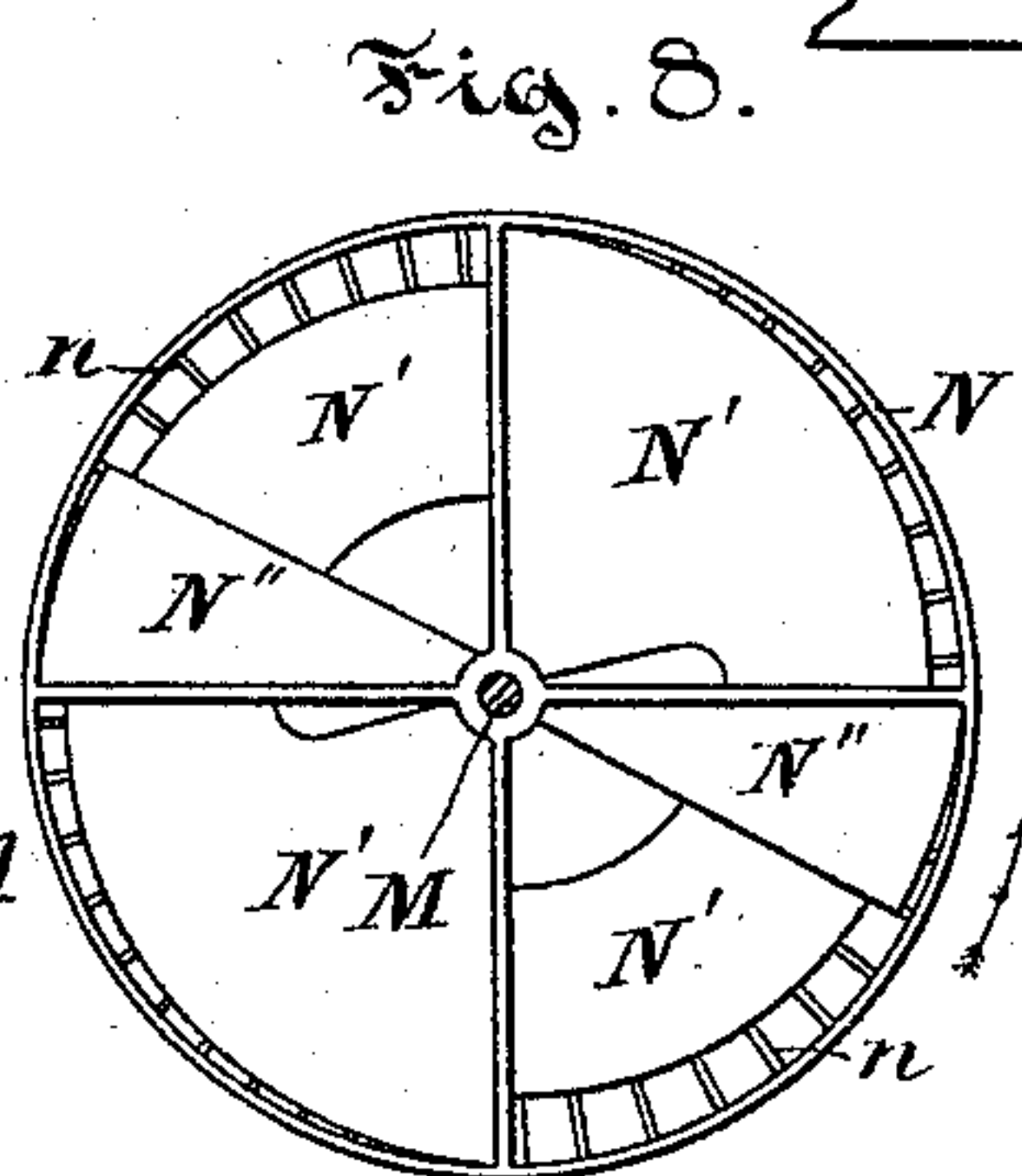
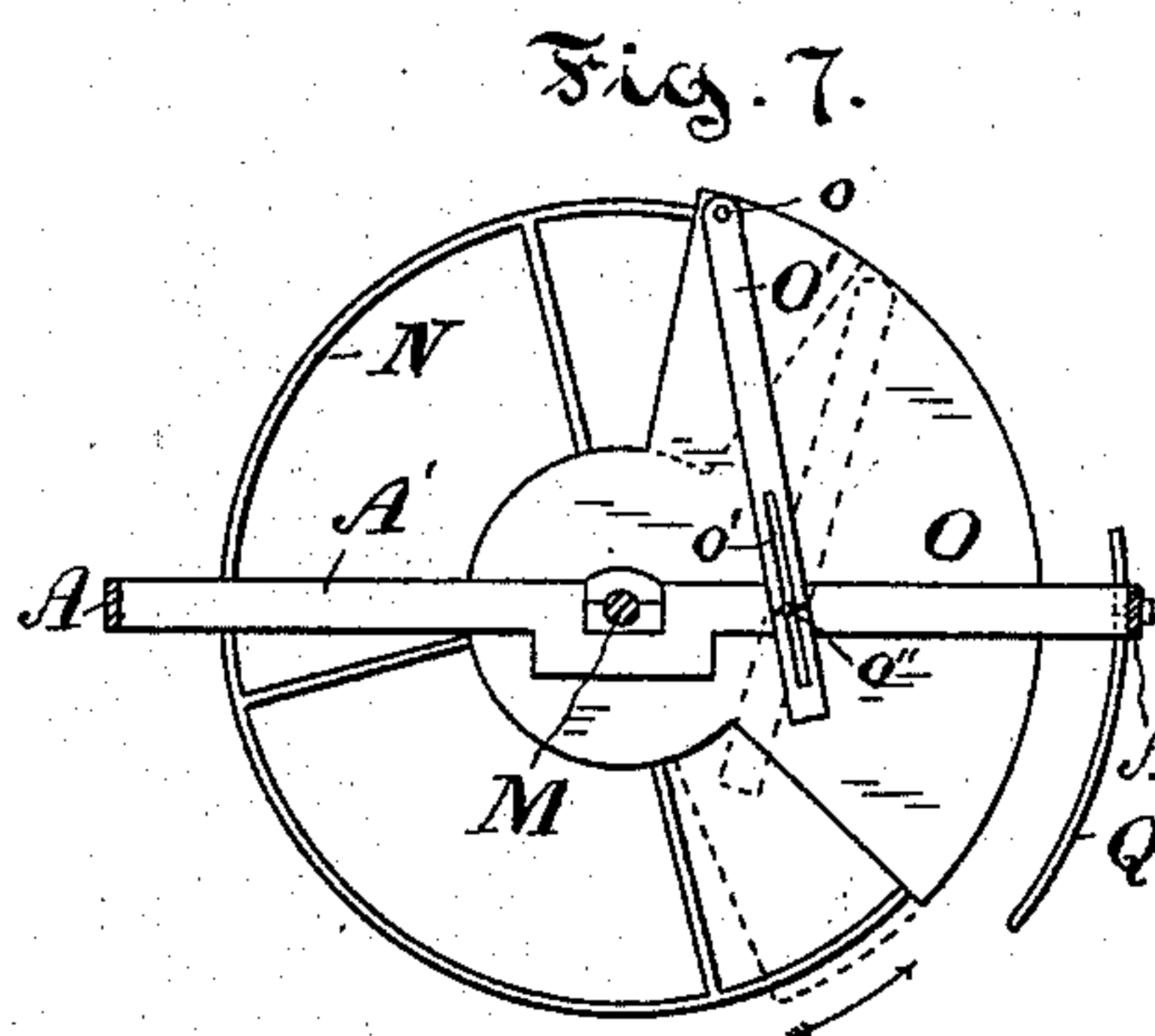
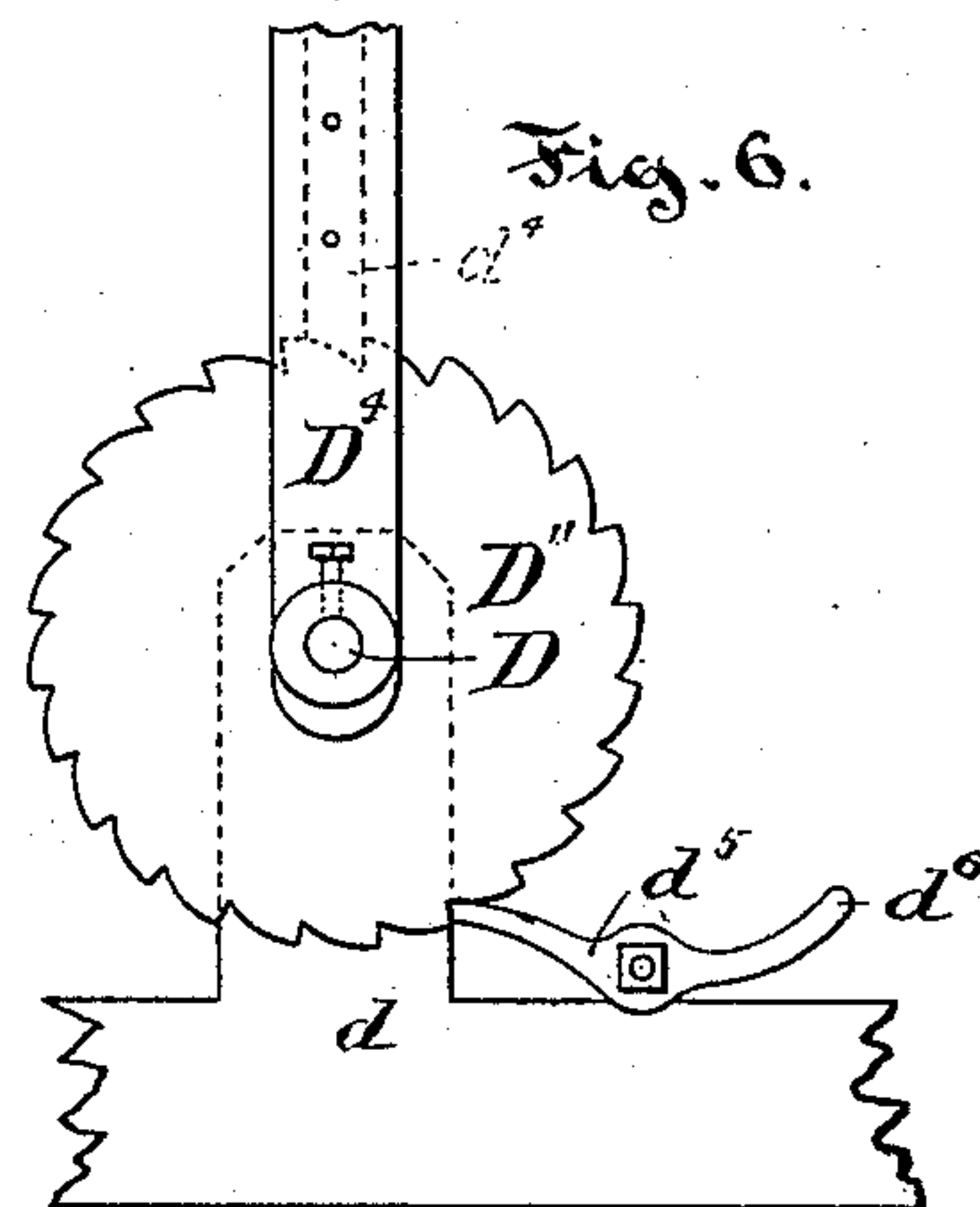
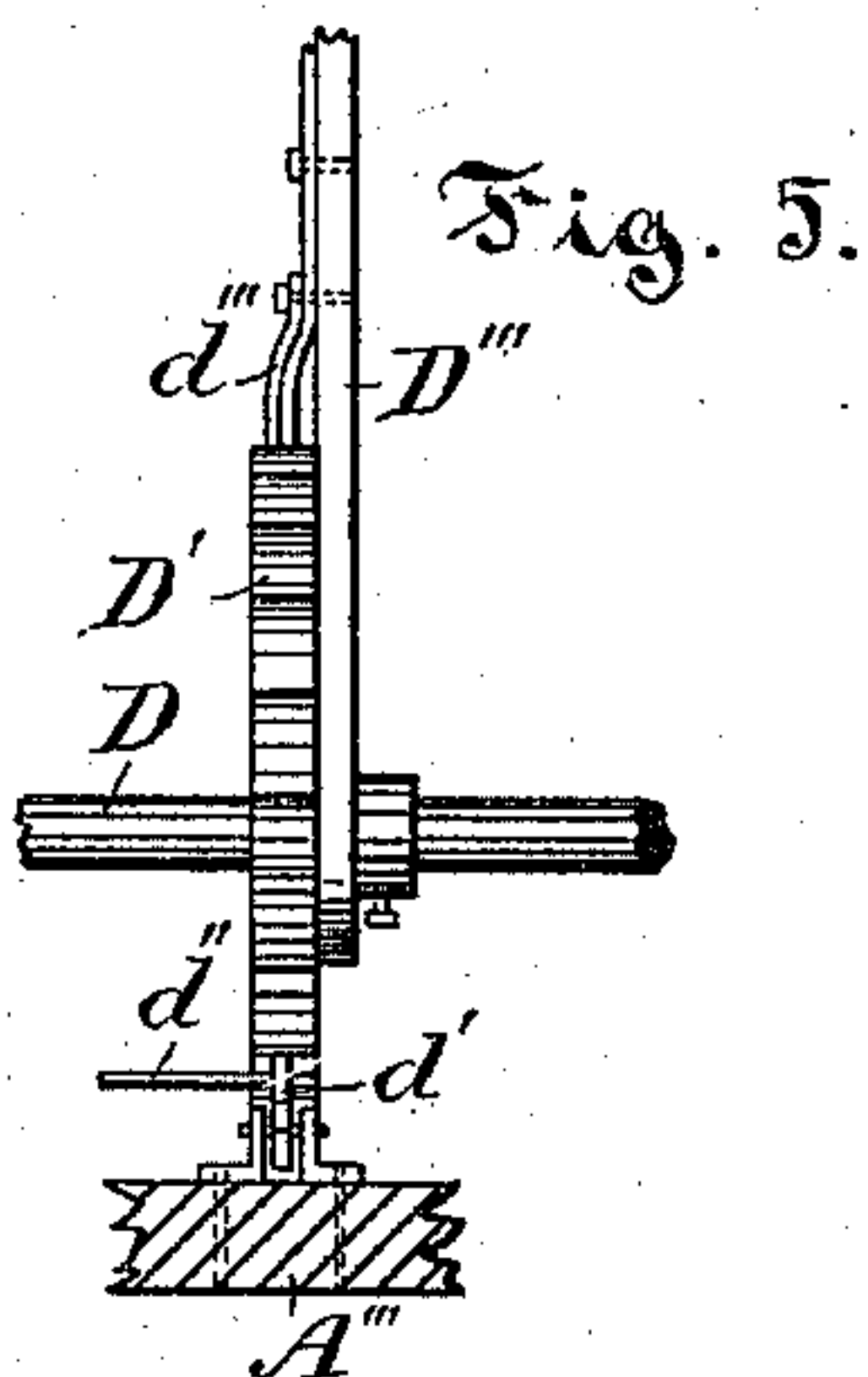
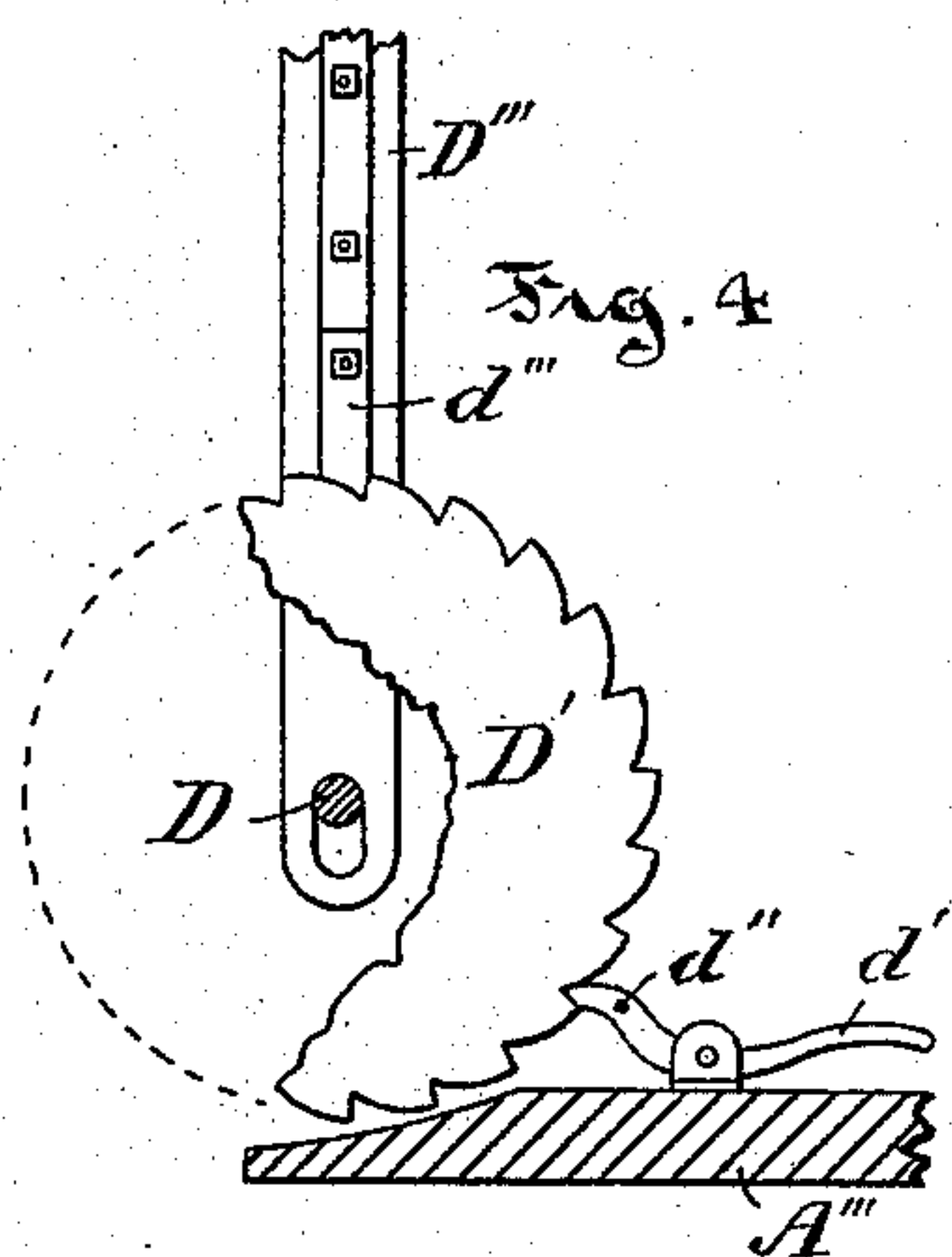
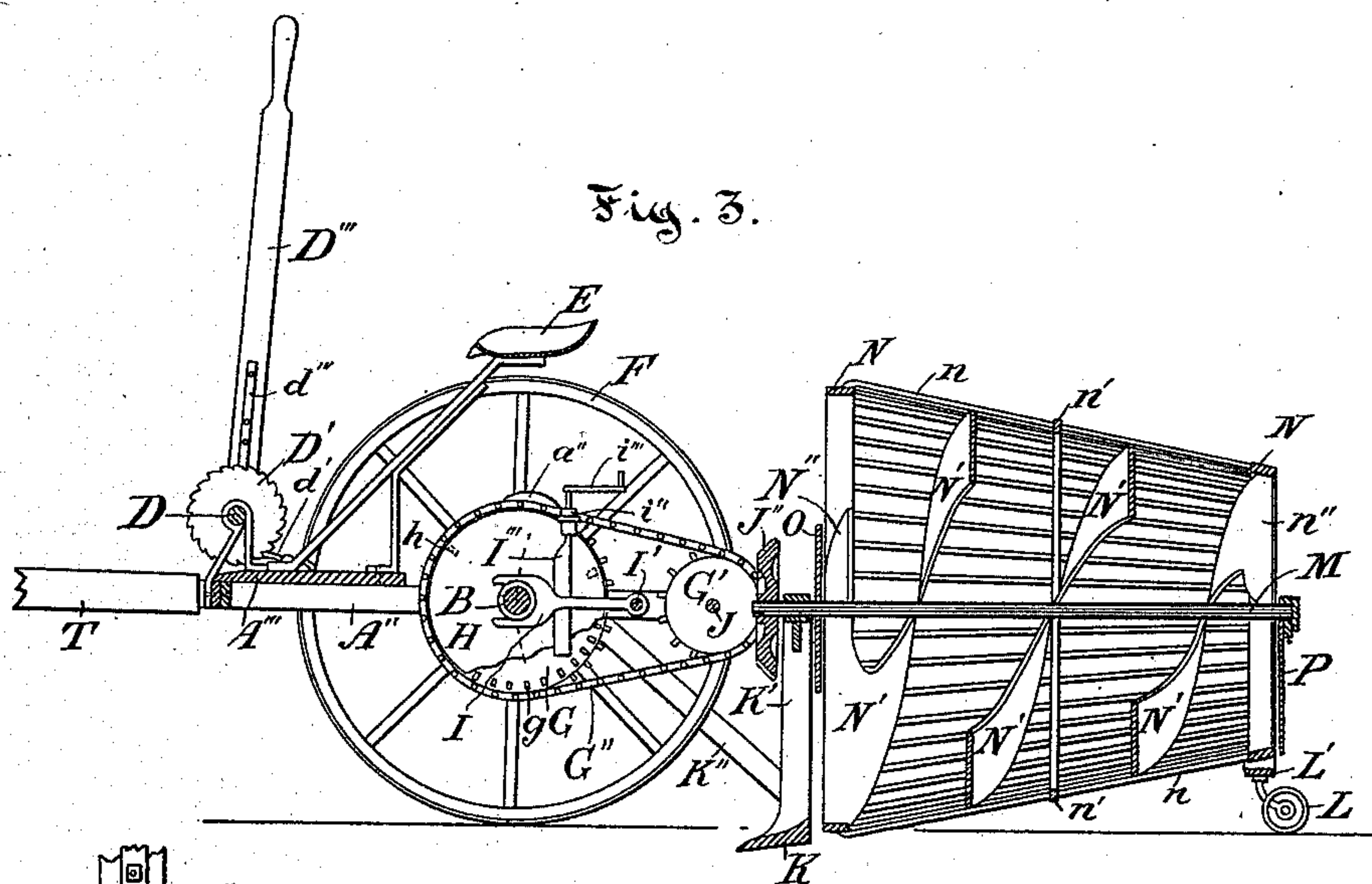
(No Model.)

2 Sheets—Sheet 2.

H. HORNER
POTATO DIGGER AND PICKER.

No. 412,619.

Patented Oct. 8, 1889.



Witnesses:
Chas. Kaley
B. Harvey

Herbert Horner
Inventor
A. Harney
Attorney.

UNITED STATES PATENT OFFICE.

HERBERT HORNER, OF PORT PERRY, ONTARIO, CANADA.

POTATO DIGGER AND PICKER.

SPECIFICATION forming part of Letters Patent No. 412,619, dated October 8, 1889.

Application filed February 9, 1889. Serial No. 299,333. (No model.)

To all whom it may concern:

Be it known that I, HERBERT HORNER, of Port Perry, in the Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Potato Diggers and Pickers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part hereof.

My invention, which will be hereinafter fully set forth and claimed, relates to machines for digging and picking potatoes and other roots.

Figure 1 is a top view of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal vertical section of the same. Figs. 4 and 5 are side and end views of the central lever-and-ratchet movement for raising and lowering the machine. Fig. 6 is a side view of the outside lever-and-ratchet movement for raising and lowering the machine. Fig. 7 is an elevation of the large end of the sifting-cone, showing the adjustable shield. Fig. 8 is an elevation of the large end of the sifting-cone, showing the screw-blades. Fig. 9 is an elevation of the small end of the sifting-cone. Fig. 10 is a partial side elevation of the sifting-cone, showing the side shield.

A is a bar-iron frame provided with a cross-bar A', bolted to the frame and dividing it into the rectangular front portion for accommodating the wheels and gearing and the rear portion carrying the sifting-cage.

A'' are two longitudinal intermediate stays extending from the front cross-bar to the cross-bar A', to both of which their ends are bolted. These are arched upward over the axle at a'', to allow the latter to rise above the frame level. The bars A'' carry the stationary gearing and the foot-board.

B is the main axle. It is journaled in boxes b, cast on or attached to the levers B', pivoted at their rear end to the inside of the side bars of the frame A by bolts b', and carrying at their front end segments b'', to the upper end of which the carrying-chain C is attached, the front edge of said segments being hollowed or grooved to accommodate the chain. The chains C pass under the friction-pulleys C', which are pivoted to the frame A close to

the front edges of the segments b'', but allowing room for the chains between the pulleys and segments. The other end of each chain is secured to the rim of a chain-wheel C''.

B'' are castings corresponding to the upper portion of the segments b'', and are secured on the outside of the frame A in line with the segments b'', so as to form a lateral support to the latter.

D is a shaft journaled in T-brackets d, secured to the front end of the frame A, and having the chain-wheels C'' keyed upon them.

D' is a ratchet-wheel, Figs. 1, 3, 4, and 5, secured to the shaft D by a set-screw and in a position so that the lever connected with it is handy to the driver when on the seat.

D''' is a lever pivoted on the shaft D by an oblong eye, and having a dog d''' secured to it, which gears into the teeth of the ratchet-wheel. The oblong eye allows the lever to rise and the dog to glide over the reverse side of the ratchet-teeth. A detent is formed by a foot-lever d', pivoted to the foot-board A''' and gearing into the ratchet-wheel, Figs. 4 and 5, and having a side projection d'' at the gear end, by which said dog may be depressed by the foot and ungeared, while pressure on the tail end raises the gear end and brings it into engagement.

D'', Fig. 6, is another ratchet-wheel similar to D', and similarly secured, but placed near the end of the shaft.

D⁴ is a lever, with a dog d⁴, similar to the lever D''', and dog d''', pivoted to the shaft near the ratchet-wheel D''. A lever d⁵, acting as a detent and gearing with the ratchet-wheel D'', is pivoted to the outside of the frame A and is provided with a lateral projection d⁶, which may be used as a handle. The levers D⁴ and d⁵ are used only when the driver is walking, the ratchet-wheel D' being then loosened from the shaft D by loosening the set-screw securing it thereto.

E is the driver's seat, secured to the foot-board A'''.

The frame A A' may be raised or lowered from the driver's seat by the levers D''' and d', and when off the seat by the levers D⁴ d⁵, by winding or unwinding the chains C upon the wheels C''.

F are the main wheels, Figs. 1 and 2, which are journaled loose upon the axle B, and are

adjustable thereon in gage, to suit different widths of drills, by collars f , secured to the axle by set-screws, and by ratchet-wheels f' , also secured to the axle by set-screws. The hubs of the main wheel F gear into the ratchet-wheels f' by means of a dog, in the usual way.

G is a sprocket-wheel journaled upon the axle, and is provided with lateral teeth g , adapted to engage with the teeth of a clutch.

H is a disk-clutch, provided with one or more lateral teeth h , adapted to engage the teeth of the sprocket-wheel G . It is feathered upon the axle B , so as to be movable thereon longitudinally, and its hub is provided with a circular groove adapted to engage a shifting-fork.

H' is a spiral spring coiled upon the axle and retained by a collar H'' , and adapted to push the clutch H into gear with the sprocket-wheel G .

I is the shifting-fork engaging the hub of the clutch H by the groove, its opposite end being held and guided between the two collars i' upon a rod or cross-bolt I' , secured to the bars A'' parallel to the axle B and in rear thereof.

I'' , Figs. 1 and 2, is a bracket secured to one of the bars A'' and bent over at the top at a right angle, and provided with a hub or bearing i'' , into which is journaled a flat bar I''' , having a suitable neck and a handle i''' , which may be turned so that the edge of the downward-projecting flat bar passes against the fork I against the pressure of the spring H' , thus shifting the fork and ungearing the clutch H from the sprocket-wheel G . The rod I' is screwed at the ends and provided with nuts i'''' , and acts also as a stay to the bars A'' . Parallel to the said rod, and between it and the cross-bar A' , and journaled in boxes secured to the bars A'' , is a shaft J , carrying keyed to it, opposite the sprocket-wheel G , a small sprocket-wheel G' , by means of which and the pitch-chain G'' motion is given to the said shaft. The same shaft has a miter-wheel J' keyed upon it, gearing into another miter-wheel J'' , keyed upon a sifting cone-shaft and giving motion to the latter and the cone.

K is the shoe held on the curved bracket K' , which is secured to the frame A close to the front of the cone, and is further secured by a brace K'' , bolted to the frame A .

The rear end of the frame A A' is carried upon a caster L , secured to the frame-bar L' .

M is the cone or cage shaft journaled upon the rear end of the frame A and the intermediate cross-bar A' , and carrying the miter-wheel J'' , from which it receives motion.

N is the shifting cone or cage consisting of open ends or rings, to which the shaft M is secured by bars or spiders, which said ends are connected by longitudinal bars or wires n , close enough together to prevent the potatoes or other roots to be gathered from passing between them, and sufficiently wide apart to allow the soil to pass. As its name

implies, it is made conical, the front end being larger than the rear end. The bars n are stayed centrally by a hoop n' . The interior of this cone or cage is fitted with two Archimedean screw-blades N' , running continuously from end to end, making a turn and a half, and with two additional short ones N'' , extending into the cage only some six inches from the front end toward the rear. The front end of the cage (see Fig. 7) is partially closed by an adjustable sector plate or shield O , centered upon the shaft M , and held at the top by a bar O' , having its upper end o riveted to the upper corner and its lower end being slotted and adjustably secured to the cross-bar A' by a set-screw o'' passing through the slot o' into said cross-bar. This plate or shield serves the purpose of preventing the material at the front edge of the cage from falling out. The rear end of the cage (see Fig. 9) is partially closed by a plate P , removably secured to the rear cross bar of the frame A , closing the lower portion of the mouth of the cage. The rear ends of the screw-blades N' are formed into brackets n'' by turning the ends at the right angle and making them wider, so as to form a discharge-chute when raised over the cross-bar of the frame A . The shield or plate P is only used when the potatoes are to be gathered into receptacles placed upon projections a'' provided at the rear of the frame. If not to be gathered, the shield P may be removed and a chute placed at the rear of the cage, so as to throw them all in a row.

Q , Fig. 10, is a side shield consisting of a piece of sheet metal secured to the frame-bar A at that side of the shifting-cone toward which the lowermost portion of the cone turns, being at the left of the driver. It is bent to the curvature of the cone, so as to prevent any earth which passes through the side of the cone being thrown out sidewise, said plate guiding the same toward the center to prevent the covering up of the lifted potatoes or the unlifted drills.

The tongue T is secured to the front cross-bar of the frame A by gussets, or in other convenient manner.

It has been pointed out in the above that the frame A may be raised or lowered at will by drawing down or allowing to rise (by the weight of the frame) the segments b'' , in which the axle is journaled, by means of the levers D''' , d' , and $D^4 d^5$, the former to be used when the driver is on the seat and the latter when walking. The cage or cone can be thrown in or out of motion by means of the crank-handle i''' , which shifts the fork I and engages or disengages the clutch H from the sprocket-wheel G . The shoe K lifts the potatoes and soil and throws all into the mouth of the cage, along which it travels between the screw-blades and is sifted and the potatoes are thrown out at the back.

I claim as my invention—

1. A potato-digger consisting of a bar-iron

frame carrying a platform, the gearing, shoe, and a sifting-cage, and supported at the rear by a caster-wheel and near the front by wheels at an adjustable height, an axle journaled in levers having their rear end pivoted near the rear of the front portion of the frame and within the same, and having their segmental fronts attached to chains secured to chain-wheels upon a shaft carrying ratchet-wheels held by detents and operated by hand-levers, wheels journaled upon the axle and operated by ratchet-connections and adapted for lateral adjustment, a sprocket-wheel journaled upon the axle, a clutch feathered upon the axle and pressed into gear by a spring, and controlled by a shifting-fork controlled by an operating device, a shaft parallel to the axle and in the rear thereof, carrying a smaller sprocket-wheel and geared to the other sprocket-wheel by a pitch-chain, said shaft carrying a miter-wheel, the conical sifting-cage composed of ends connected by longitudinal wires or bars and having a shaft journaled longitudinally upon the rear portion of the main frame and carrying a miter-wheel gearing in the miter-wheel upon the rear cross-shaft, said cage having internal Archimedean screw-blades and provided with shields at the front, rear, and on one side, and a shoe K, carried on a bracket K', secured to the frame in front of the cage, substantially as set forth.

2. In a potato-digger, the combination of the bar frame A A' A'', the longitudinal bars A'' being arched over the axle to allow the axle to rise above the level of the frame, and carrying a platform A''', the axle B, journaled in the levers B', the levers B, having segmental front ends b'', and having their rear ends pivoted at the rear of the front portion of the frame and to the inside thereof, and the upper end of each of the segments having the end of a chain secured thereto, the platform A''', secured upon the bars A'', a shaft D, journaled upon the front of the frame A, chain-wheels C'', secured to said shaft, chains C, each having one end secured to one of the chain-wheels C'' and the other to the segments b'' and passing over a friction-pulley C', ratchet-wheel D', secured upon the shaft D by set-screw and having a detent d' gearing into it, lever D'', pivoted upon the shaft by an oblong eye, and having a dog d'', adapted to engage the teeth of the ratchet-wheel, substantially as set forth.

3. In a potato-digger, the combination of the frame A A' A'' and foot-board A''', the shaft D, journaled thereon, chain-wheels C'', keyed to said shaft, ratchet-wheel D'', secured upon one end of said shaft by set-screw, a lever D⁴, pivoted to said shaft by an oblong

eye, and having a dog d⁴, adapted to engage the teeth of said ratchet-wheel, a detent d⁵, pivoted to said frame A and engaging the teeth of said ratchet-wheel and having a handle d⁶, substantially as set forth.

4. In a potato-digger, the combination of the frame A A' A'', the levers B' and axle B, the wheels F, journaled upon said shaft, and connected therewith by a ratchet movement, the sprocket-wheel G, journaled upon said axle and provided with lateral teeth adapted to be engaged by a clutch, the clutch H, feathered to said axle and adapted to engage said sprocket-wheel and controlled by a shifting-fork, the spring H', held by a collar on said axle and adapted to push the clutch H into gear, the shifting-fork I, engaging said clutch H and held at one end upon a rod, the rod or bolt I', holding one end of said fork and secured to the bars A'' parallel to the axle B, the bracket I'', secured to one of the bars A'' and having a hub or bearing i'', the flat bar I''', journaled in said bracket I'' and provided with handle i''', and adapted to bear with one edge on the shifting-fork I and press the same so as to push the clutch H out of gear, substantially as set forth.

5. In a potato-digger, the combination of the frame A A', the bracket K', braced by a brace K'' and carrying the shoe K, and the shoe K, secured to said bracket, substantially as set forth.

6. In a potato-digger, the combination of the frame A A' A'', the conical sifting-cage N, having open ends, mounted upon a shaft M, journaled upon said frame, and connected by gearing, said ends connected by longitudinal bars or wires n and held by a hoop n', and said cage provided with internal Archimedean screw-blades N' N'', and with an adjustable front shield O and side shield Q, substantially as set forth.

7. In a sifting-cage of a potato-digger, the combination of the central shaft M, the open ends N, connected by longitudinal bars or wires n, held by a hoop n', said ends varying in diameter, being larger in front and smaller at the rear, so as to give a conical shape, the Archimedean screw-blades N', extending through the cage, and the short screw-blades N'', the front shield O, held adjustably to the cross-bar of the frame by a slotted bar O', pivoted to said plate, and the side shield Q, secured to the frame, substantially as set forth.

In testimony whereof I have signed in the presence of the undersigned witnesses.

HERBERT HORNER.

Witnesses:

JOHN A. CULL,

EMILE LEFROY CULL.