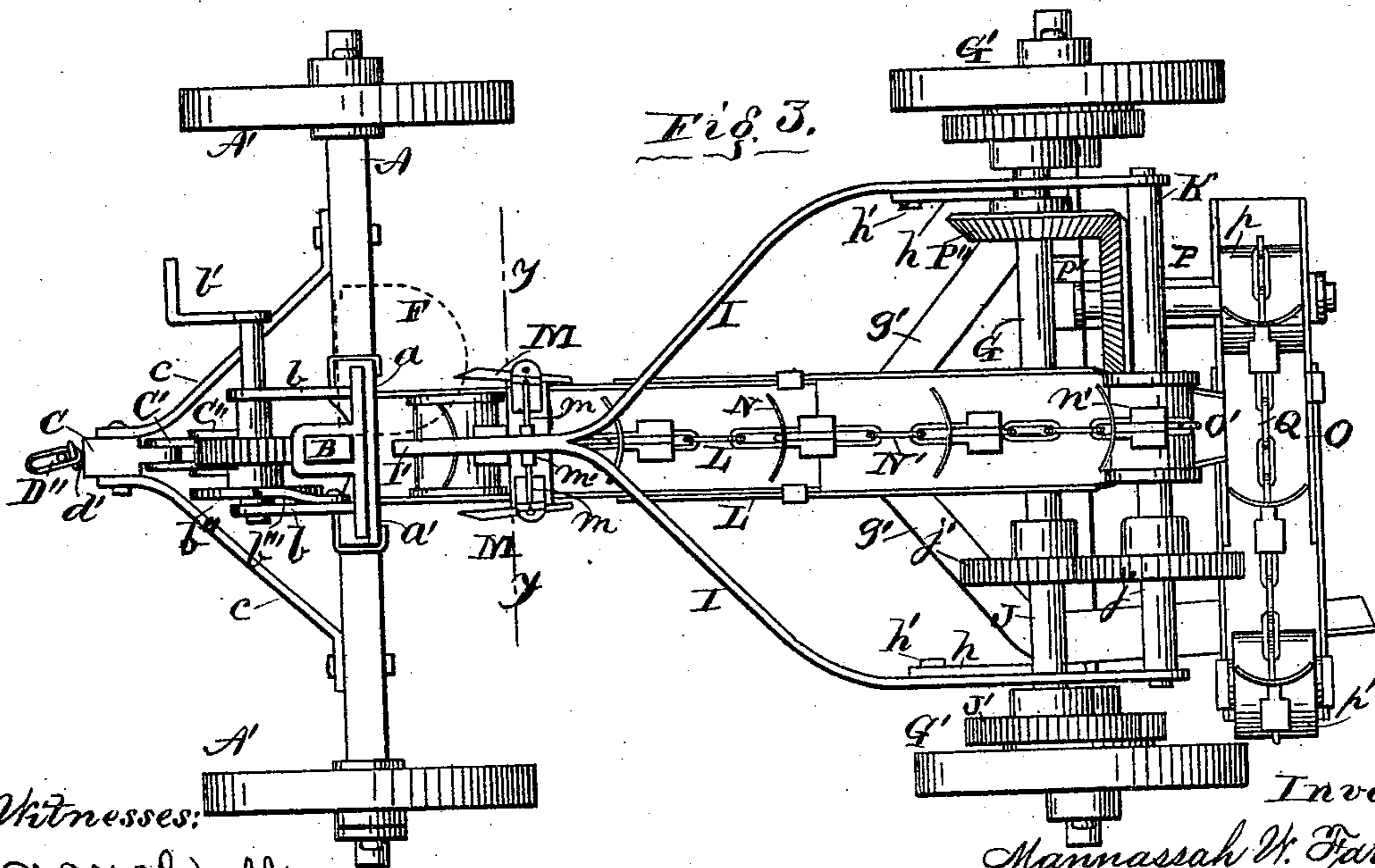
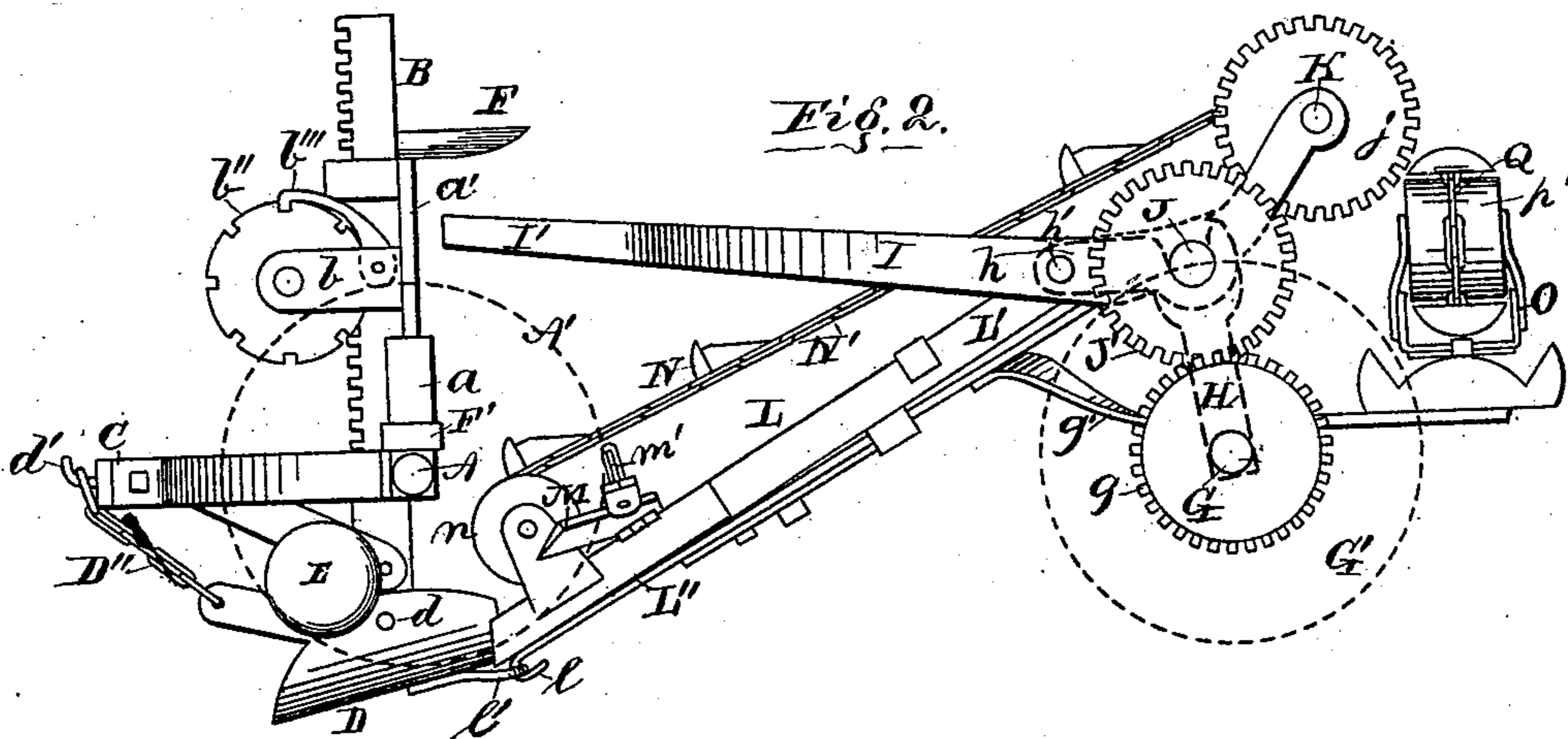
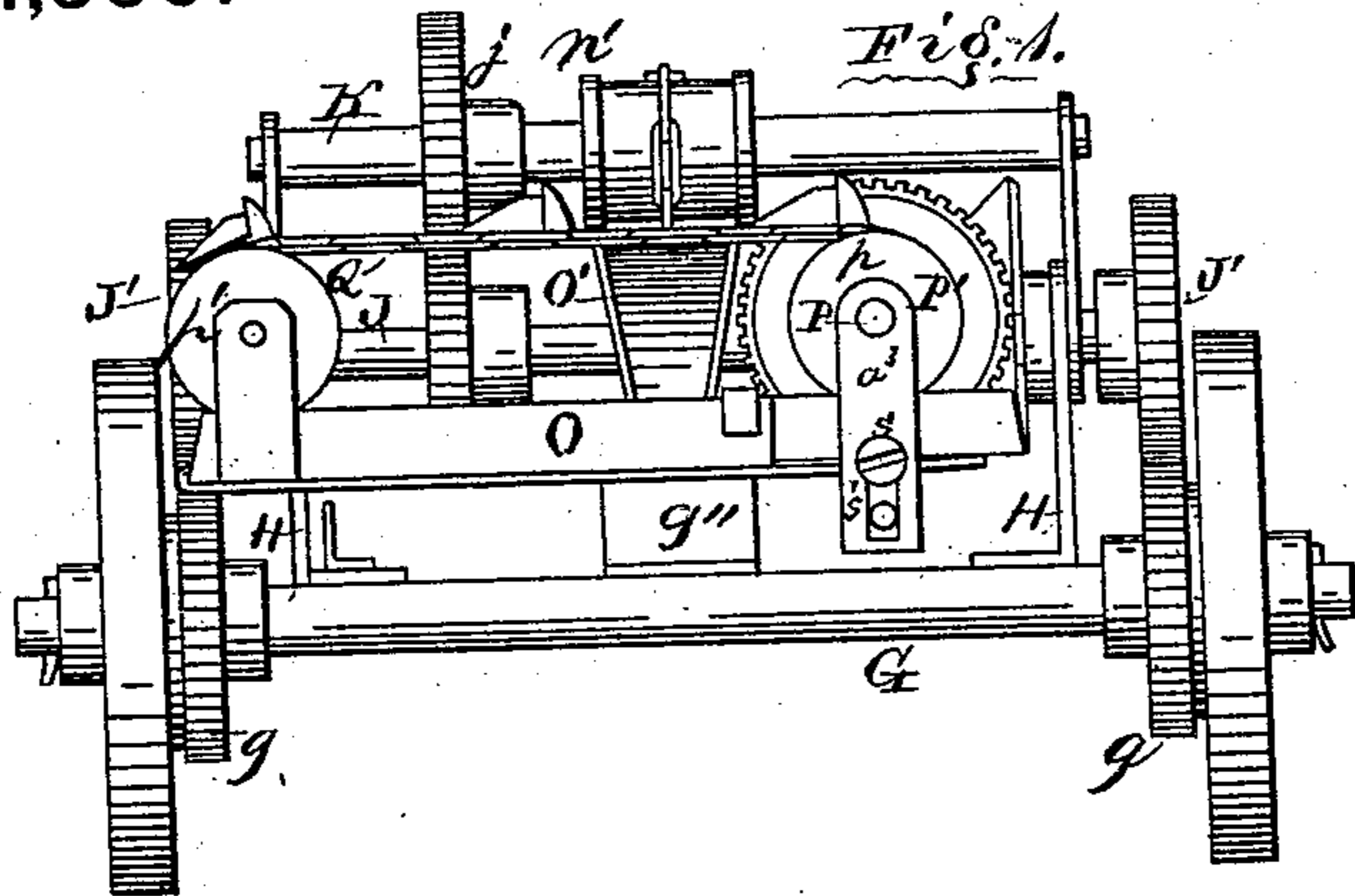


M. W. FARBER.  
Ditching-Machine.

**No. 211,560.**

**Patented Jan. 21, 1879.**



Witnesses:

A. McCallum  
D. G. Stuart

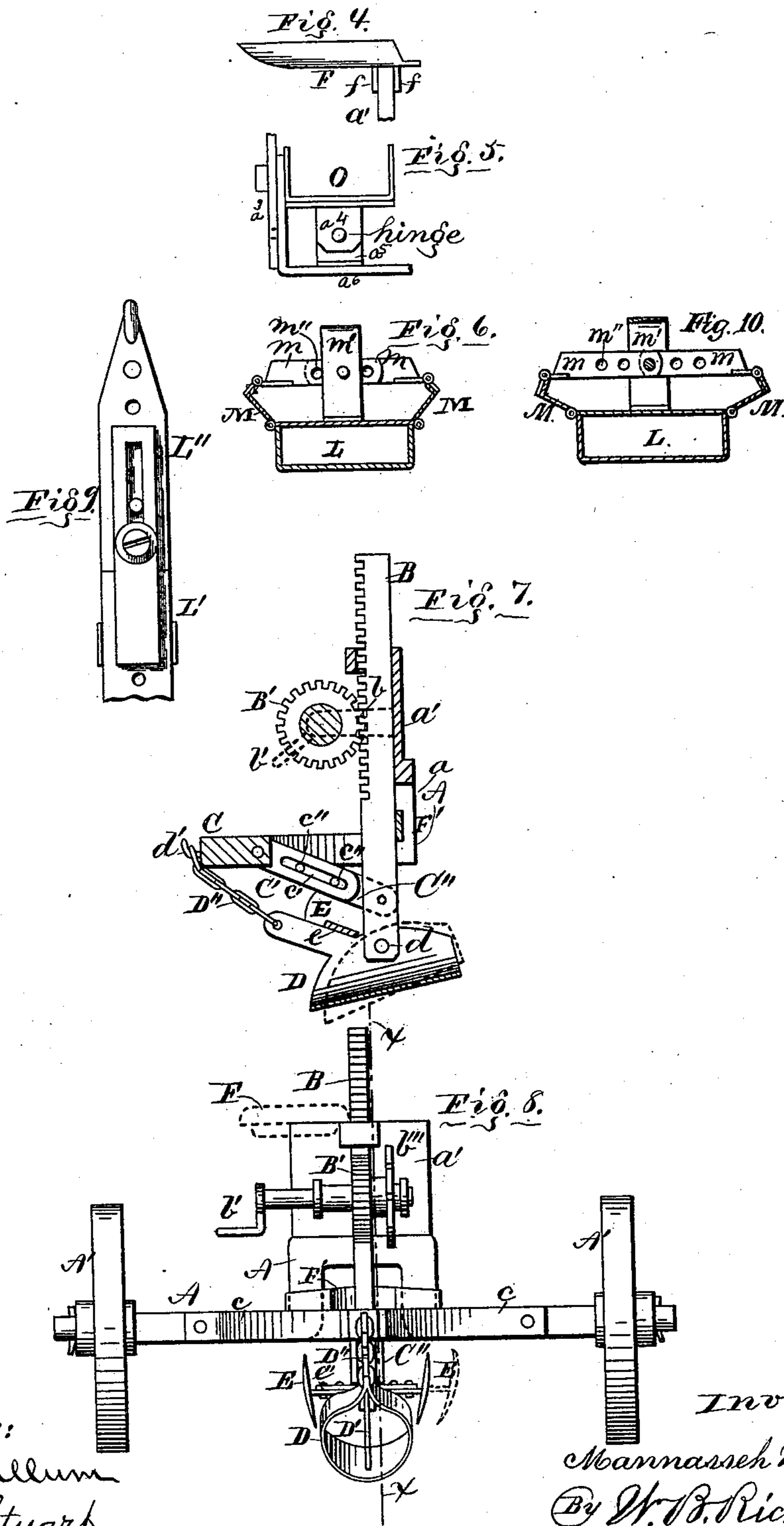
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# UNITED STATES PATENT OFFICE.

MANNASSEH W. FARBER, OF MOUNT PLEASANT, IOWA, ASSIGNOR OF ONE HALF HIS RIGHT TO CHAS. H. SMITH AND JESSE STUBBS, OF SAME PLACE.

## IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. 211,560, dated January 21, 1879; application filed April 3, 1878.

*To all whom it may concern:*

Be it known that I, MANNASSEH W. FARBER, of Mount Pleasant, in the county of Henry and State of Iowa, have invented certain new and useful Improvements in Ditching-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a rear elevation of a machine embodying my invention. Fig. 2 is a side elevation, the near wheels removed, and the distant wheels shown in dotted lines. Fig. 3 is a top-plan view. Figs. 4, 5, and 6 are detail views, hereinafter referred to. Fig. 7 is a vertical sectional view of the forward part of the machine in the line *x x* in Fig. 8. Fig. 8 is a front elevation of the forward part of the machine. Fig. 9 is a bottom view of the dirt-elevating spout. Fig. 10 is a sectional view, showing the adjustment of the wing cutters.

My invention relates to improvements in ditching-machines of that class having devices for cutting the ditch, in combination with devices for removing the excavated dirt; and the invention consists in the construction and combination of parts hereinafter referred to, described, and claimed.

Referring to the parts by letters, A represents the axle, and A' the wheels, of the forward part of the machine. The axle A has a centrally-elevated part, *a*, above which is fixed a plate or frame, *a*<sup>1</sup>, to which is adjusted a vertically-operating rack-bar, B, which gears with a pinion, B', carried in standards *b*, which standards project from the plate *a*<sup>1</sup>.

The pinion B' has a crank, *b*', on one side, by means of which it may be operated to raise and lower the rack-bar B, and has a ratchet-wheel, *b*'', and detent *b*''' on the other end, by means of which it may be locked in position to hold said rack-bar at any desired elevation.

C is a short draft-bar, connected to the axle A by braces *c*, and has plates C', pivoted one to each side of its rear end.

The plates C' have slots *c*', through which bolts *c*'' pass to connect them with plates C'', which are journaled to the lower end of the rack-bar B, thus connecting the draft-bar by plates C' C'' directly with the lower end of the rack-bar B, and connecting the plates C' C'' by slots and bolts, so as to permit of adjusting them to allow the rack-bar to be moved in a vertical path.

D is the scoop-shaped shovel or cutter, journaled or hinged on a transverse shaft, *d*, to the lower end of the rack-bar, so that it may be oscillated in a vertical plane on said journal, to raise or lower its front end, to cause it to cut deeper or shallower.

D' is a vertical fixed blade, dividing the cutter D into two parts, and intended to divide and loosen the excavated dirt, to cause it to follow the elevator better, and to reduce the draft.

D'' is a chain, attached at its lower end to the front end of the cutter D, and its other end may be engaged with a hook, *d*', on the draft-bar C, to hold the cutter at the desired cutting-angle.

E E are gage-wings, arranged one at each side of the cutter D on adjustable arms *e*'', so that either one may be set outward, as shown by dotted lines at Fig. 8, for the purpose of pressing against the distant side of the ditch, and holding the cutter over to the other side in going through the same ditch the second passage.

F is the driver's seat, and has transverse ledges *f* on its lower side, by means of which it can be readily and easily mounted on or dismounted from the upper part and one side of the plate *a*<sup>1</sup>, as shown at Figs. 2, 3, 4, and 8.

F' is a stay for the lower end of the rack-bar B, and extends across the centrally-elevated part of the axle.

G is the rear axle, supported on wheels G', which wheels have spur-pinions *g* on their inner sides. H H are standards, projecting upward from the axle G, and their upper ends, *h*, bent forward. I I are bars, converging at their forward ends to form a handle, I', and hinged or journaled one to the forward end of each part *h* of a standard, H, at *h*'. J is a

shaft, journaled in bearings in the bars I, immediately over the vertical parts of the standards H, so that when the bars I are in their normal positions the shaft J will rest in semi-circular grooves in the upper ends of the standards H, as shown by dotted lines at Fig. 2, and the pinions J', on the outer ends of the shaft J, at the same time be in gear with the pinions g. To throw them out of gear the forward ends of the bars I may be lowered.

K is a shaft, journaled in the rear projecting ends of the bars I, and has a pinion, j, which gears with the pinion J' on the shaft J. L is a dirt-carrier trough, fixed to the axle G by braces g' and a bar, g''. The trough L is in two parts, L' L''.

The part L' is rigidly attached to the bar g'', and the part L'' is made adjustable thereon by set-screw and slotted plate, as plainly shown at Fig. 9, which is a bottom view of the trough and adjusting devices. By means of said adjustment the trough may be lengthened or shortened, as desired.

To the forward end of the trough L is fixed a hook, l, which may be engaged with an eye, l', on the rear end of the cutter D, and forms the coupling between the forward and rear frames. Near the forward end and above the trough L are hinged blades M, one on each side of the trough, and each provided with an arm, m, hinged to the blade and passed through a slotted standard, m', through which a bolt passes, which may be fixed in either of a series of holes, m'', in the arm m, for adjusting the inclination and the distance apart of the blades M, (see Figs. 6 and 10,) and thus adjust said blades to cut the sides of the ditch at any desired slope.

The dirt, as it is excavated by the cutter D, is forced backward to the trough L, up which it is carried by elevators N, attached to an endless chain, N', which passes over a pulley, n, at the lower end of the trough L, and a driving-pulley or chain-wheel, n', on the shaft K.

O is a trough, fixed transversely at the rear end of the machine, and is adjustable in length; so as to discharge the dirt at any desired distance from the machine, and is adjustable in height at one end, as shown at Figs. 1 and 5, and is hinged, as shown, so as to permit of adjusting and keeping it in a horizontal position when the forward ends of the elevator-trough and cutters are lowered in cutting deep ditches.

This adjustment of the height of one end of the trough O is made by the following construction:  $a^4$  (see Fig. 5) is a projection on the bottom of the trough O, which is hinged by a pin to the projection  $a^5$ , attached to an arm,  $a^6$ , secured at its inner end to the axle, and bent upward around the trough O at its outer end.  $a^3$  (see Fig. 1) is a plate, having an orifice near its upper end, which forms one of the journal-bearings of the shaft P of the pulley p. The plate  $a^3$  is slotted near its lower end at s', which slot receives a set-screw, s, by means of which one end of the shaft P of the pulley p

can be raised or lowered. When the shaft P is thus adjusted by means of the set-screw s and plate  $a^3$  the trough O can also be adjusted on its pivotal connections  $a^4$   $a^5$  to conform to the adjustment of the shaft P and to preserve its horizontal position.

P is a shaft, journaled in suitable standards, and has a bevel-pinion, P', which gears with and receives motion from a bevel-pinion, P'', on the shaft J, and carries a chain-wheel, p, which gives motion to an endless-chain carrier, Q, which passes around the wheel p, and a pulley, p'. The dirt falls by a chute, O', from the trough L to the trough O, along which it is carried or forced by the carriers Q, and discharged at the side of the ditch or in a wagon, or other suitable device, drawn alongside of the machine.

The principal operations of the machine are hereinbefore described in connection with the description of the parts. It will be evident that the cutter D may be raised above the ground and out of operation by means of the crank, pinion, and rack-bar; and that the driver may operate the crank for the purpose from his seat, and may also throw the dirt-elevating devices in and out of gear by raising and lowering the forward ends of the bars I by means of their handle I', and thus throw the pinions J' in or out of gear with the pinions g.

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

1. The cutter D, hinged to the lower end of the rack-bar B, and arranged to operate with said rack-bar, substantially as described, and for the purpose specified.

2. The rack-bar B, pinion B', and cutter D, in combination with draft-bar C, to which the rack-bar is coupled by an adjustable link, C' C'', substantially as and for the purpose specified.

3. The wings E, arranged to operate with the cutter D, substantially as described, and for the purpose specified.

4. The chain D'', arranged to operate with the cutter D, hinged to the rack-bar B, and with the draft-bar C, substantially as and for the purpose specified.

5. The driver's seat F, removably seated on the plate  $a^1$ , substantially as and for the purpose specified.

6. The wing cutters M, hinged to the trough L, and having arms m, with holes m'', in combination with standard m', substantially as and for the purpose specified.

7. The wing cutters M, hinged to the trough L, substantially as and for the purpose specified.

8. The dirt-carrier trough L, constructed in two parts, L' L'', the former rigidly attached to the bar g'', and the latter made adjustable by a set-screw and slotted plate, as described, so as to lengthen the carrier as desired.

9. The bars I, carrying shafts J and K, having pinions and chain-wheel, as described,

arranged to operate with pinion *g*, axle *G*, and wheels *G'*, substantially as described, and for the purpose specified.

10. The carrier *O*, hinged as described, to permit of its being inclined, as set forth, in combination with shaft *P*, pinions *P' P''*, shaft *J*, and hinged arms *I*, substantially as described, and for the purpose specified.

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

MANNASSEH W. FARBER.

Witnesses:

JOHN F. LEECH,

JOHN J. FITZGERALD.