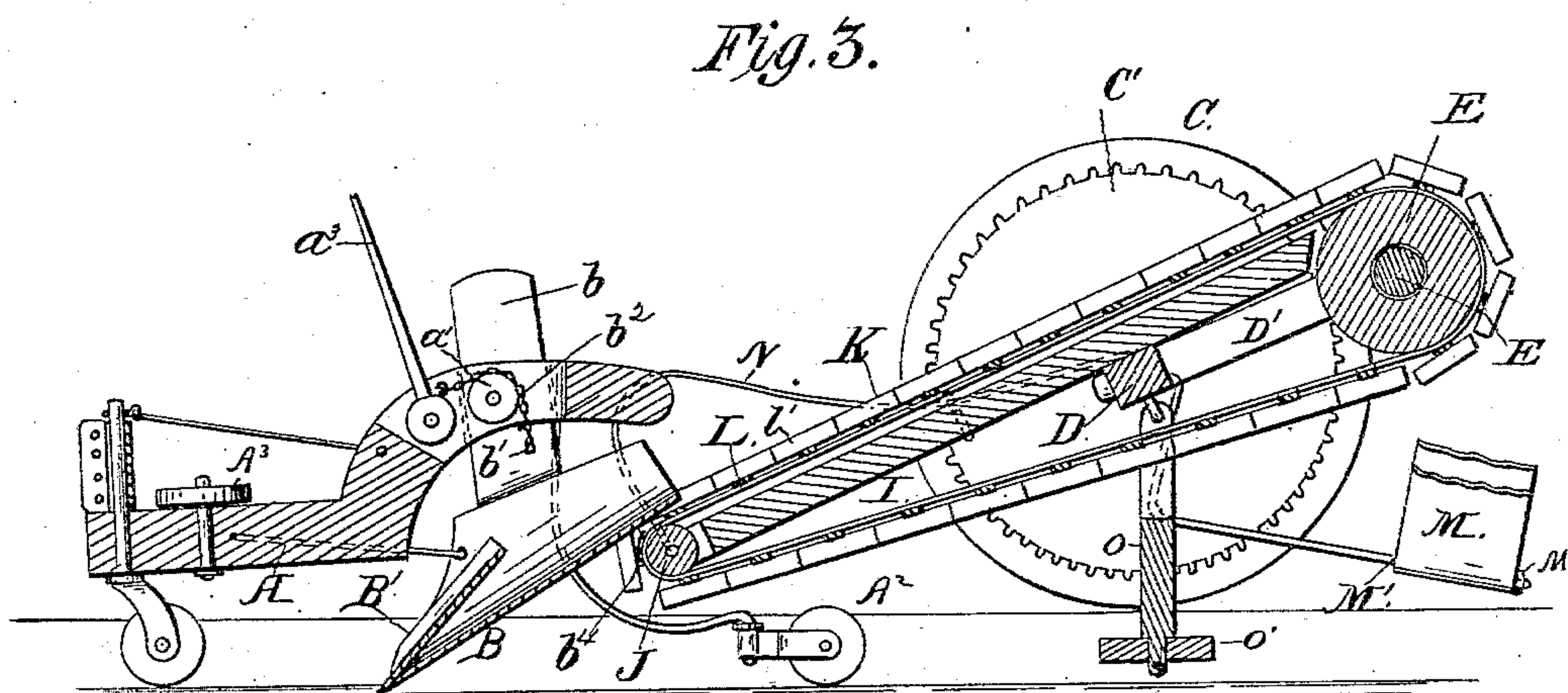
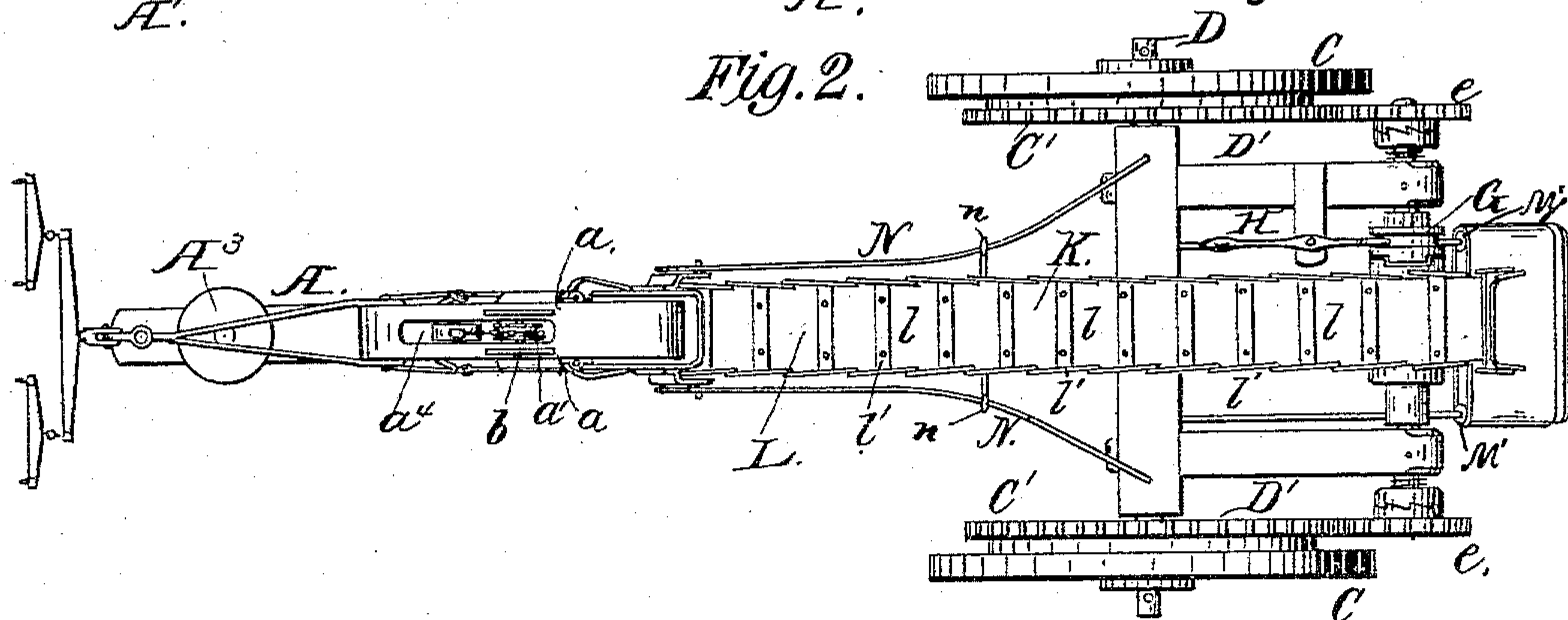
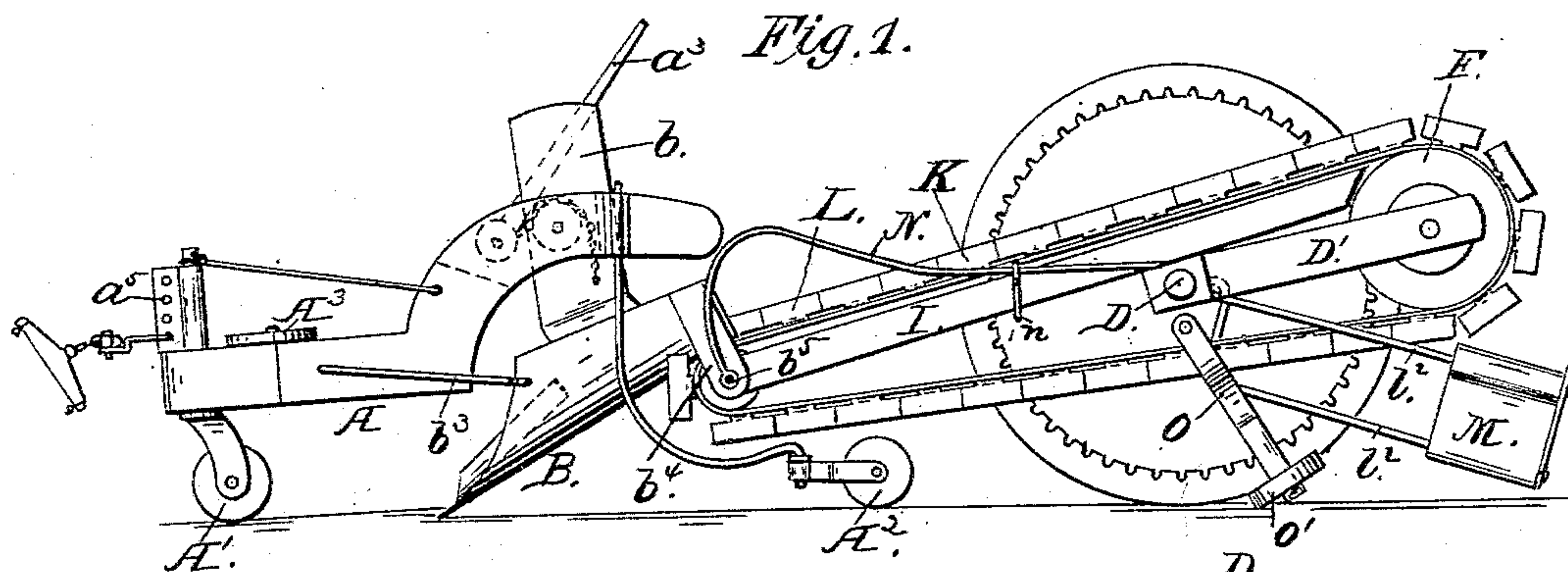


(No Model.)

D. FISHER.
DITCHING MACHINE.

No. 331,875.

Patented Dec. 8, 1885.



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID FISHER, OF GEAR, IOWA.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 331,875, dated December 8, 1885.

Application filed April 30, 1885. Serial No. 163,977. (No model.)

To all whom it may concern:

Be it known that I, DAVID FISHER, a citizen of the United States, residing at Gear, in the county of Madison and State of Iowa, have invented certain new and useful Improvements in Ditching-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of ditching-machines which plow the earth, loosen it, and at the same time conduct it to the surface of the ditch and throw it off some distance from the side thereof; and my invention has for its object the construction of a ditching-machine of the above-described class adapted to the making of ditches in a more perfect and cheaper manner than is accomplished by the machines now in use; and it consists in certain combinations and subcombinations which will be hereinafter fully described, and pointed out in the claims.

Referring to the annexed drawings, Figure 1 is a side view of my improved ditching-machine with one of the drive-wheels removed. Fig. 2 is a top plan view of the machine, and Fig. 3 is a longitudinal vertical sectional view through the center of the machine.

The same letters indicate corresponding parts in all the figures.

Referring to the several parts by letter, A represents the forward beam, which supports the plow B in its operative position, the rear elevated portion of this beam being provided with the vertical slots or openings a , through which work two upwardly-extending guide pieces or arms, b , projecting from the upper side of the plow B, these side pieces being connected below the frame A by a brace-rod, b' , to the center of which is secured the lower end of a chain or rope, b^2 , which passes over a roller, a' , and is adjustably connected at its upper extremity to an adjusting-lever, a^3 , the said roller and lever being pivoted in a longitudinal vertical slot, a^4 , in the rear portion of the beam A. The forward end of the plow is movably connected to the beam A by the

pivoted brace-rods b^3 . The front end of the beam A is supported upon a caster, A' , and its rear end is supported in a similar manner upon the caster A^2 , these casters being at liberty to turn in any direction with the draft. Upon the top of the beam A is pivoted the horizontal friction-roller A^3 , which is of a greater diameter than the width of the beam A, and serves to prevent the said beam from striking against the sides of the ditch.

C C indicate the drive-wheels of the machine, which turn upon the ends of the axle D, and have secured upon their inner faces the gear-wheels $C' C'$, adapted to mesh with pinions e , immovably secured upon the ends of the transverse shaft E, supported in rearwardly-extending arms D' , which are secured at their forward ends to the axle D. Upon the center of the shaft E is loosely journaled a drum, F, a suitable clutch mechanism, G, being arranged upon the shaft E, between the pinions e and the said drum, so that by a movement of a centrally-pivoted hand-lever, H, the clutching mechanism may be thrown into or out of engagement with the loosely-journaled drum, which may thus be disconnected from the drive-wheels when so desired, and instantly and readily thrown into engagement with the same at the will of the operator.

I indicates an inclined frame, secured upon the axle D, and having pivotally secured at its forward lower end a roller, J, the outer ends of the axle of this roller serving as pivots for the downwardly-projecting arms b^4 of the plow B. This plow is made double, as shown, being provided with the small auxiliary blade B' , which is much less in width and length than the main blade B, and which serves to cut out the middle of the strip of earth being cut out of the ditch, this central strip of earth falling over the rear end of the auxiliary blade upon the remainder of the earth which is passing over the main blade B, and thereby loosens and separates the earth as the plow removes it from the ditch.

The elevator consists of an endless belt, K, which passes around the drum F and roller J, and the metallic sections L, each of which consists of the side pieces, L' , which overlap each other when the sections are secured upon the

endless belt, and the central portion, l , which is of less width than the side pieces, l' . These sections are secured upon the endless belt with the sides l' overlapping each other, as shown, the sections not being connected together in any manner, by which arrangement the elevator is enabled to revolve freely around the roller and drum. Beneath the drum F are secured, upon the supports l^2 , the rollers M' , one being placed higher than the other, and around these rollers is placed the apron M , for the purpose hereinafter set forth.

N indicates curved brace-rods, which are rigidly attached to and extend from the axle D on either side and beneath the frame I , and are connected at their forward ends to the extremities of the axle of the roller J , which latter is supported in the outer end of the frame I , and as the latter is supported near its rear end on the axle said rods N serve both to brace the forward end of the frame which carries the roller and also serve as nuts to prevent the lower ends of the pivoted arms b^4 of the plow from working off of their pivotal bearings.

It will be noticed that the rods N are fastened rigidly to the axle, near the ends thereof, one on either side of the frame I , and that they curve inward and extend forward in a nearly horizontal plane for a part of their length, and are attached to the frame I by hooks n , from which point they gradually curve upward till nearly over the roller J , when they take an abrupt turn and terminate in and form bearings for the shaft of the roller J . As the rods N have a slight tension given them, and the belt-carrying frame is nearly balanced on the axle, they in a measure serve to brace the forward end of said frame. In addition, as the rods have an inward curve, they brace the frame I laterally when the draft is applied to one side of the machine more than the other, as when making a sinuous ditch or turning the machine around.

The rear end of the plow extends immediately above the roller J , so as to extend over the lower end of the inclined elevator between the upwardly-projecting side pieces, l' , of the sections L , as shown.

Upon the under side of the axle D is pivoted or hinged the upper end of the frame O , having at its lower end a horizontal wheel, O' , which falls within the ditch when the same is partly cut, and prevents the machine from sliding sidewise.

The operation of my improved ditching-machine is as follows: The forward end of the plow is first adjusted by means of the lever a^3 to regulate the depth at which it is desired that it should enter the ground, the plow turning readily on its pivotal point b^5 to admit of this movement. The draft may now be adjusted by the holes a^5 for the same purpose. As the plow cuts the earth from the ditch it falls upon the lower end of the inclined elevator, and is discharged from the upper rear end of the same upon the inclined

apron M , down which it slides to a point some distance to the side of the ditch. The wheel O' on the lower end of the hinged frame O falls within the ditch when the same is partially cut, and prevents the rear portion of the machine from sliding or moving sidewise, while the friction-wheel A^3 on the front beam, A , prevents the forward part of the machine from striking against the sides of the ditch.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of my improved ditching-machine will be readily understood without requiring further explanation.

It will be seen that my machine is simple in construction, and therefore not liable to get out of order, while at the same time it is very efficient in operation.

The drum F is preferably made with sprockets to engage a chain on the under side of the endless belt.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a ditching-machine, the combination of the drive-wheels, the elevator operated by said wheels, the inclined apron, and the vertically-adjustable plow pivotally secured at its rear upper end to the forward end of the frame supporting the elevator, brace-rods attached to said frame and connected to the pivotal connection between it and the plow, for the purposes set forth, and caster-wheels supporting said plow in the front and rear, substantially as specified.

2. The combination of the drive-wheels, the elevator operated by said wheels, and consisting of the endless belt having the sections secured thereon with the ends of their upright sides overlapping, the forward ends of the sides of each successive section overlapping the rear ends of the sides of the next succeeding section, the inclined apron, and the vertically-adjustable plow pivotally secured at its rear upper end to the forward end of the frame supporting the elevator, as set forth.

3. The combination of the drive-wheels, the elevator operated by said wheels, the inclined apron, and the vertically-adjustable double plow pivotally secured to the forward end of the frame supporting the elevator, and consisting of the outer blade, and the central inner blade of a less width and length than the outer blade, as set forth.

4. In a ditching-machine, the combination of the drive-wheels, the elevator operated by said wheels, the inclined apron, the guide-wheel secured in a hinged bearing below the axle of the drive-wheels, the front beam having the friction-roller, and the vertically-adjustable double plow pivotally connected to the forward lower end of the frame supporting the elevator, as set forth.

5. The combination, with a beam centrally and vertically slotted, and provided with contiguous vertical guide-openings on either side

of the slot, of a plow provided with standards passing loosely through said guide-openings, an adjusting-lever, a roller journaled within said central slot, and a chain attached to the
5 plow at a point below the roller over which it passes on its way to the adjusting-lever, to which it is connected, substantially as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID FISHER.

Witnesses:

C. A. ELDRIDGE,
B. A. WHIT.