

(No Model.)

3 Sheets—Sheet 1.

E. A. DEWEY.
CELERY BANKING MACHINE.

No. 442,425.

Patented Dec. 9, 1890.

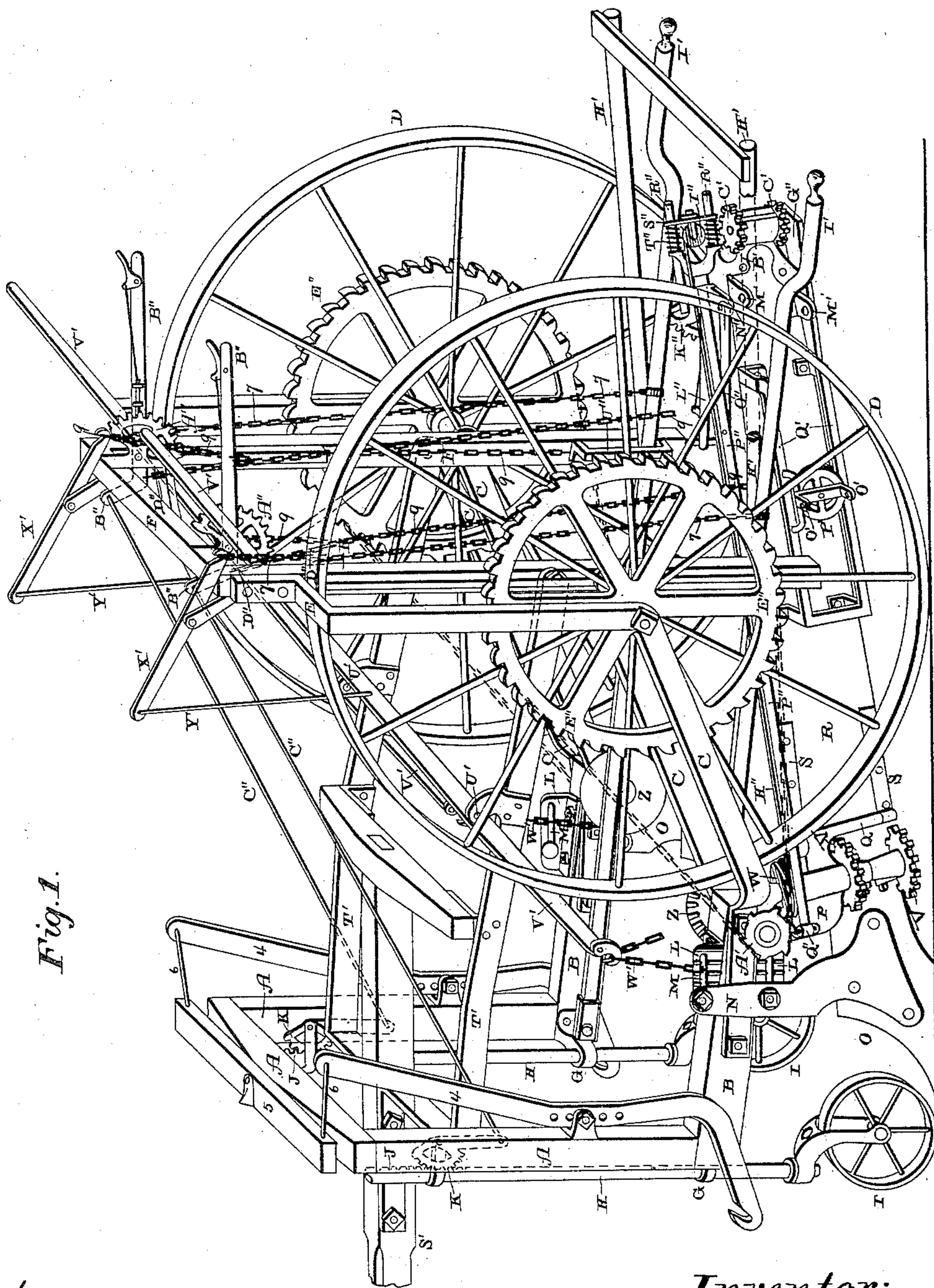


Fig. 1.

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per
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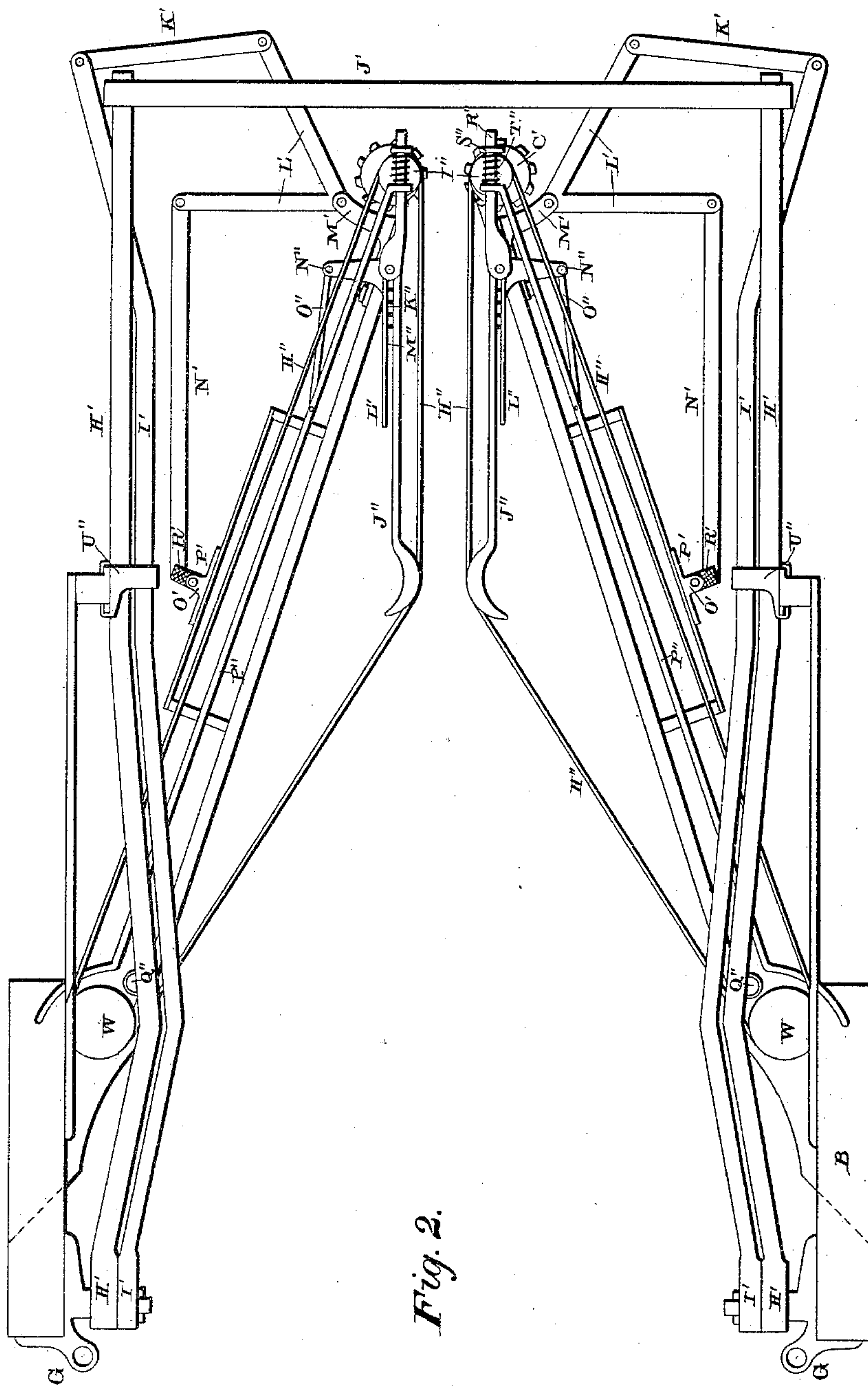
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3 Sheets—Sheet 2.

E. A. DEWEY.
CELERY BANKING MACHINE.

No. 442,425.

Patented Dec. 9, 1890.



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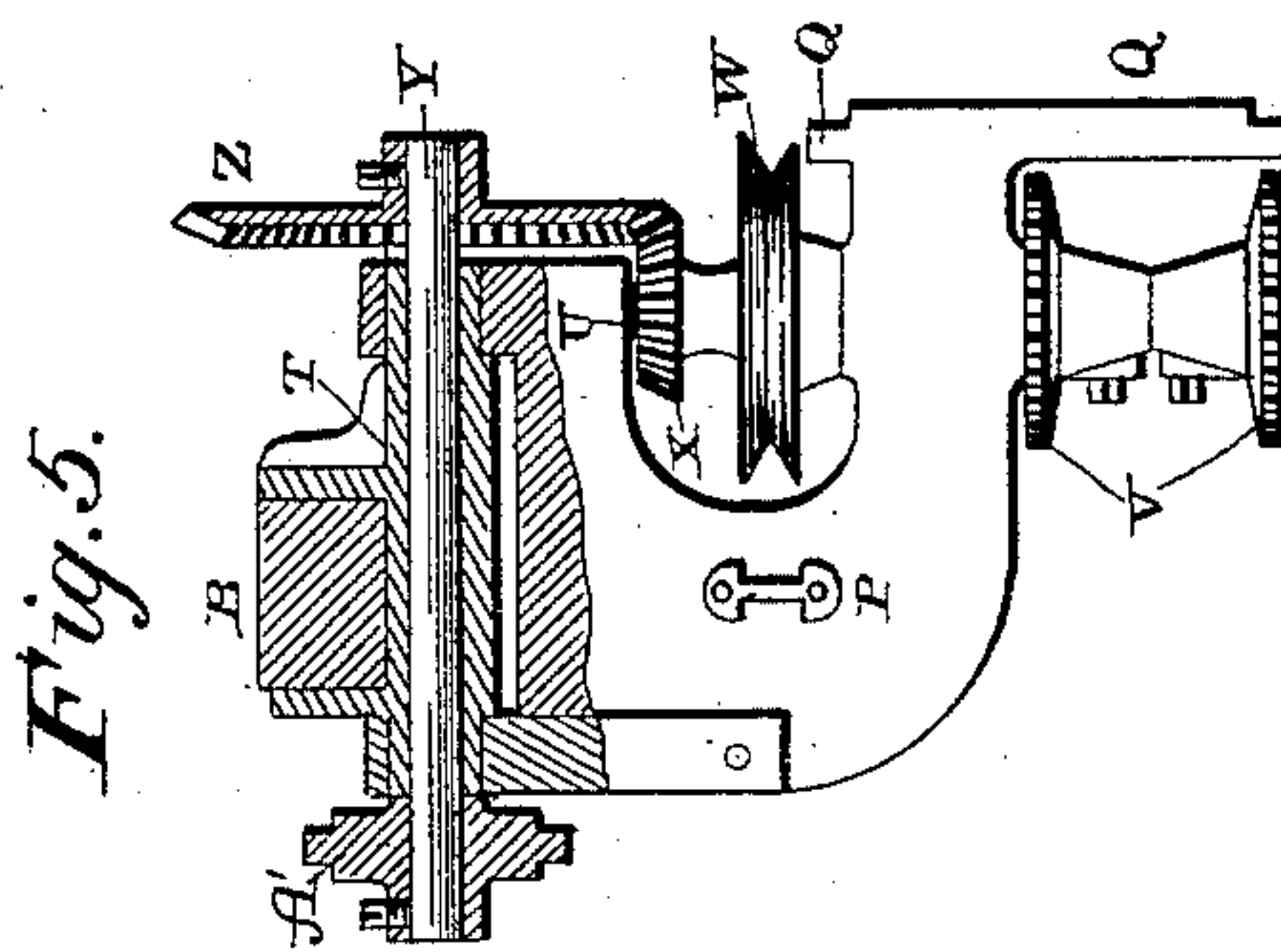
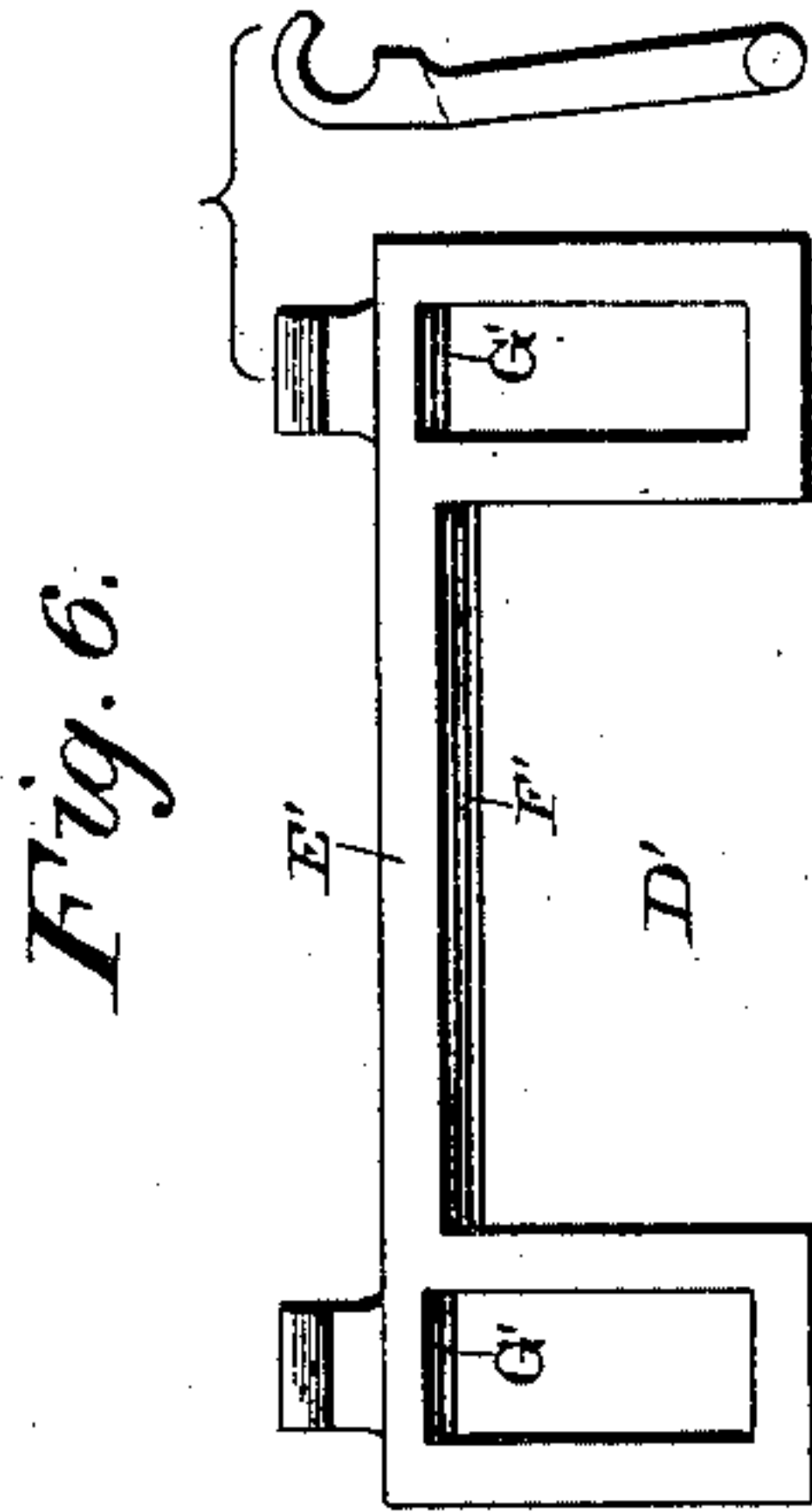
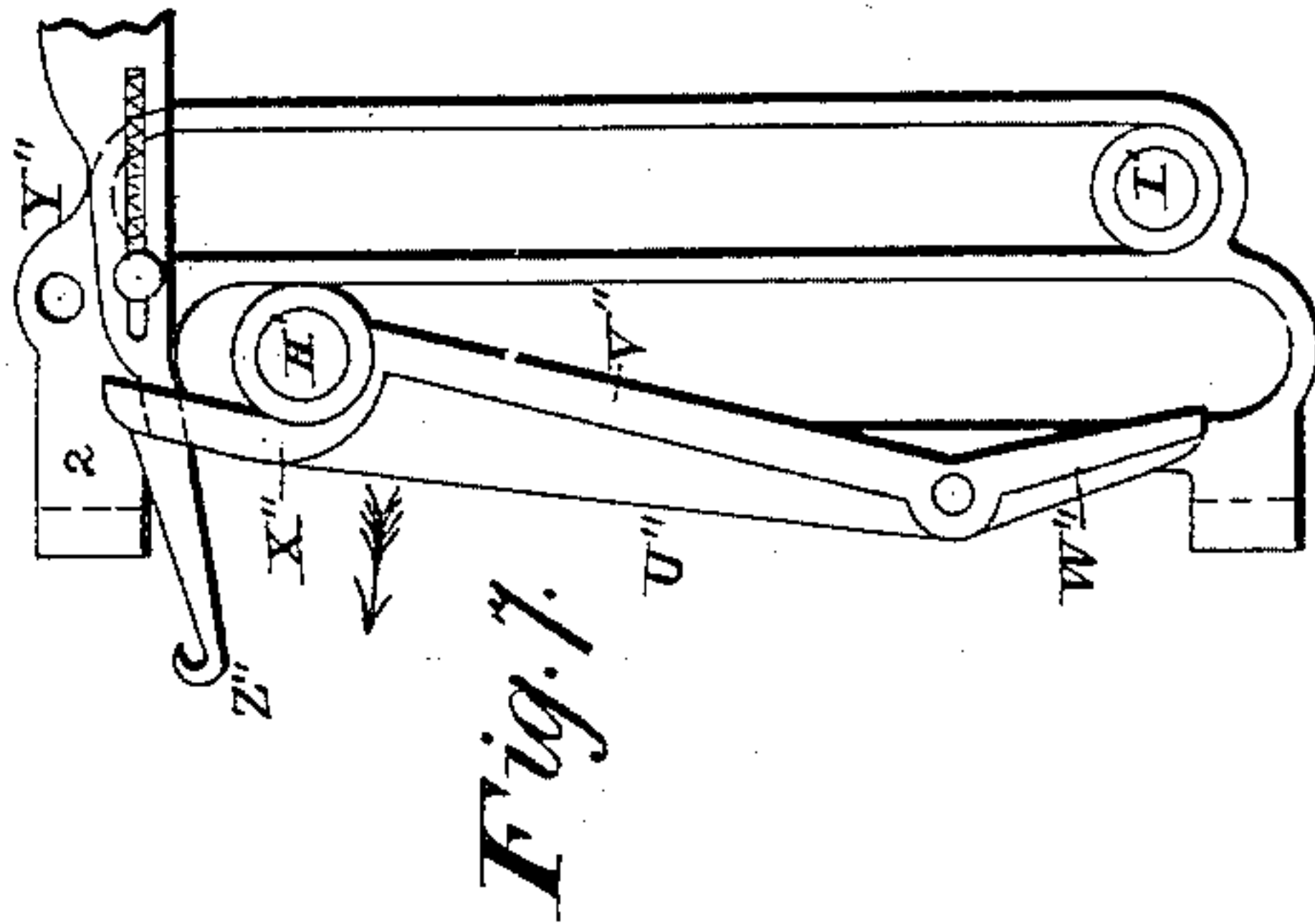
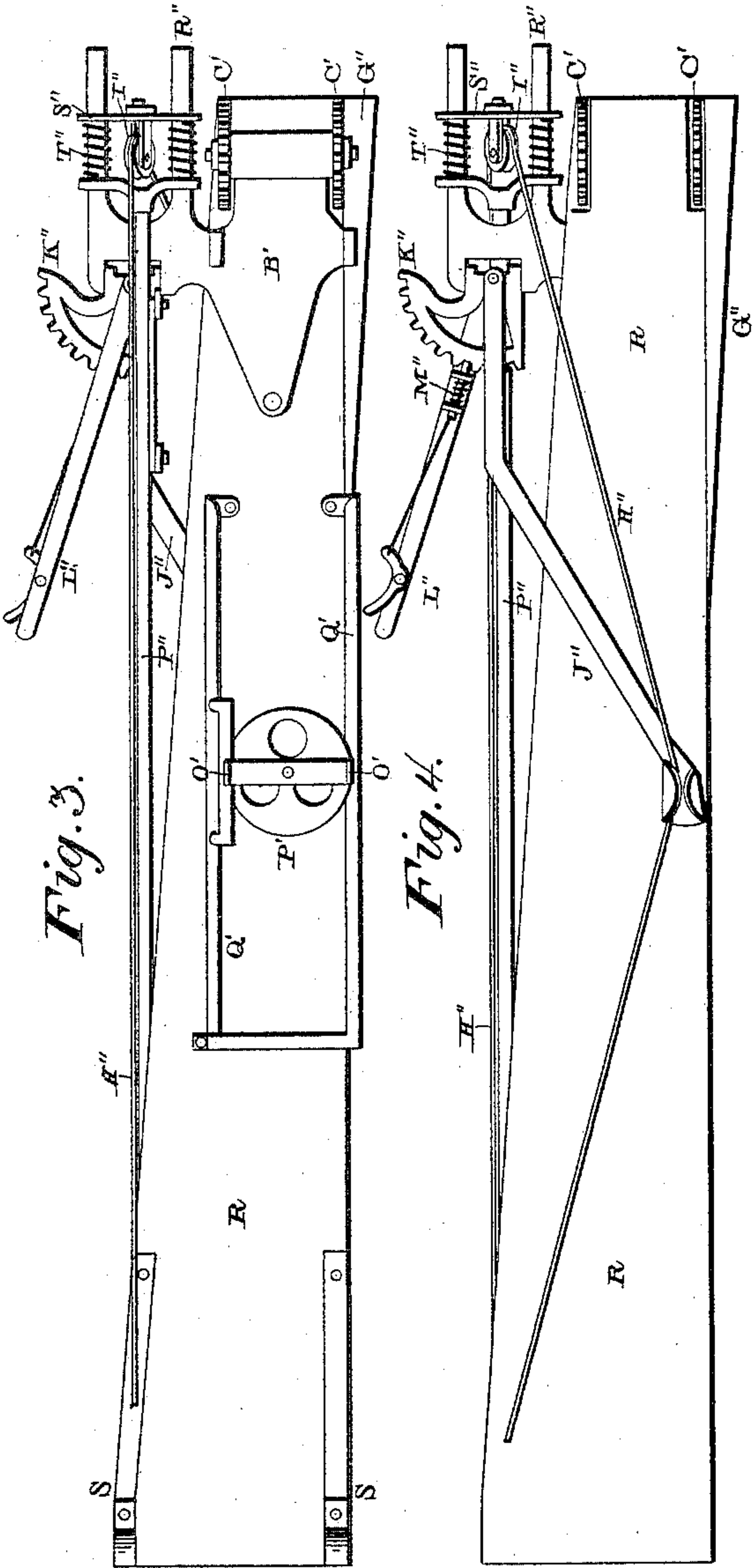
(No Model.)

3 Sheets—Sheet 3.

E. A. DEWEY.
CELERY BANKING MACHINE.

No. 442,425.

Patented Dec. 9, 1890.



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UNITED STATES PATENT OFFICE.

ELLSWORTH A. DEWEY, OF BATTLE CREEK, MICHIGAN.

CELERY-BANKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 442,425, dated December 9, 1890.

Application filed September 8, 1890. Serial No. 364,287. (No model.)

To all whom it may concern.

Be it known that I, ELLSWORTH A. DEWEY, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Celery-Banking Machines; and I do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in celery-banking machines; and it consists in the construction and arrangement of parts which will be fully described hereinafter.

The object of my invention is to provide a machine for banking celery-plants, having the characteristics and construction hereinafter shown and described, whereby the results hereinafter specified are accomplished.

Figure 1 is a perspective of a machine which embodies my invention, a part of the mechanism being omitted, as hereinafter pointed out. Fig. 2 is a plan view of the banking-elevators and the mechanism for operating them. Fig. 3 is an exterior side elevation of one of the elevator-boards. Fig. 4 is an interior side elevation of one of the elevators. Fig. 5 is a rear elevation of one of the castings, to which the front end of the elevators are pivoted and carrying the mechanism for driving the traveling elevator aprons or belts. Fig. 6 is a detached view of one of the links of the traveling elevator. Fig. 7 is a rear elevation of the left-hand casting through which the tubes H' I' pass and by means of which they are adjusted vertically and to which mechanism is secured for holding the tubes up when turning the machine.

The main frame of my machine consists of a front U-shaped arch A, to the lower ends of the vertical portions of which the rearwardly-extending horizontal beams B are secured at their front end. Secured to the rear ends of each of these beams B are the two upwardly and rearwardly extending flat metallic plates C, which together form a U-shaped frame, between the rear ends of which the supporting and driving wheels D are journaled. The rear ends of these plates C extend upward slightly

above the peripheries of the driving-wheels and extend inward, as at E, and have their ends secured to the upper end of the rear U-shaped arch F.

Extending from the inner front corners of the vertical portion of the front arch A, near their upper and lower ends, are the bearings G, through which the vertical bars or rods H pass, and to the lower ends of which the cast-er-wheels I are journaled. Fastened to these bars H, near their upper ends, are the rack-bars or cogged portions J, with which the circular cogged plates K engage, and by means of which the rods H are moved vertically, for the purpose hereinafter specified.

Secured upon the upper and lower sides of the beams B, near their inner ends, are the L-shaped castings L, which are provided with the longitudinal grooves M, through which and the standards N of the plows O bolts pass, by means of which the plows are adjustably secured to the beams. Castings P are pivotally connected to the under side of the rear ends of the beams B, and these castings are provided at their lower ends with the vertical bearings Q, to which the front ends of the elevator-boards R are hinged or pivoted by the bearings S, which allow their rear ends to move in and out horizontally for the purpose hereinafter specified. The upper ends of the castings P are pivoted upon the bearings T, which are firmly fastened to the beams B. Journaled in the castings P are the vertical shafts U, to the lower ends of which the two sprocket-wheels V are secured by means of set-screws, and to the upper ends of these shafts U the grooved wheels W and the bevel gear-wheels X are fastened. The bearings T are made hollow longitudinally, and through these bearings the horizontal shafts Y pass, which have secured to their inner ends the bevel-gears Z, which engage with the gears X, and to their outer ends the sprocket-wheels A'.

Secured to the outer sides of the rear ends of the elevator-boards R are the castings B', in the rear ends of which vertical shafts are journaled, to which shafts the sprocket-wheels C' are fastened. Passing around these sprocket-wheels C' and the sprocket-wheels V are the endless traveling elevators or belts D', which consist of the links shown in Fig. 6.

These links are connected by means of a web E', which have the sharp edges F', and the links proper are also provided with the sharp edges G'. As the belt travels around the elevator-boards the sharp edges of these links scrape against the steel sides of the elevator-boards and prevent the earth from adhering to it.

Pivoted to the inner lower ends of the vertical portions of the front arch A are the two tubes H' and I', the outer ones H' being largest, and to the rear ends of which the driver's seat J' is secured. The inner tubes I' have their rear ends turned outward, as shown, to which the outer ends of the connecting-bars K' are pivotally fastened, and the opposite ends of these bars are pivotally connected to the bell-crank or V-shaped levers L', which are pivoted between the outwardly-extending ears M' of the castings B'. To the opposite end of the levers L' are pivotally connected the connecting-bars N', the inner ends of which are pivoted between ears O' of a sliding car P', which moves back and forth upon the tracks Q', which extend outward from and parallel with the elevator-boards, as shown in Figs. 1 and 2. The connecting bars N' are provided with a foot rest or treadle R', by means of which the operator moves the outer ends of the elevator-boards in and out, as will be hereinafter described.

The tongue S' has its inner end connected to the outer ends of the L-shaped plates or bars T', which have their rear ends pivotally connected to the vertical standards of the rear arch F, as shown. Extending from the plates T' are the arms U', to which the levers V' are pivotally connected, and to the forward ends of these levers the chains W' are connected, and the opposite lower ends of these chains are connected to the inner ends of the beams B.

Extending from the horizontal portion of the rear arch F are the two arms Z', to which the levers X' are pivoted between their ends. The front ends of these levers X' are connected by means of the connecting-rods Y' with the levers V' in rear of their pivotal points U' upon the plates T', and the rear ends of these levers are connected to the chains 7, which have their lower ends connected to the elevator-boards at a suitable distance from their rear ends.

Secured to the under side of the horizontal portion of the rear arch F are the circular toothed castings A'', and to these castings the L-shaped levers B'' are pivoted. Connected to these levers at their upper ends are the rods C'', which have their opposite ends connected to arms of the toothed circular castings K. Short chains D'' are connected at their upper ends to the levers B'' slightly in front of their pivotal point, as shown.

The purposes and advantages of this arrangement of parts result from various conditions, as the operator may wish to increase or diminish the quantity of earth that is be-

ing elevated, according to whether small or large plants are being banked or from the softness of the ground. To diminish the quantity of earth being elevated, the plows must be raised, and as they are carried in a measure upon the caster-wheels I the wheels must be lowered. This is effected by pulling down upon the L-shaped levers B'', which raises the arms of the toothed castings K, which force the rods H downward, to the lower end of which the caster-wheels are connected, and this raises the beams B and with them the plows. When, however, the front end of the machine is raised, the rear end is lowered, (the axles of the wheels being the fulcrum of the frame,) but by means of the short chains D'', also connected to the levers B'' and to the long chains, the rear end of the machine is raised simultaneously with the front end by means of the levers B''.

Secured to the supporting-wheels D are the driving sprocket-wheels E'', around which and the sprocket-wheels A' a driving-chain passes, as shown in dotted lines in Fig. 1, and which through the medium of the gear-wheels Z X, shaft Y, and sprocket-wheels V the elevator-belts or chains D' are driven. The elevator boards extend at an angle inward, as shown in Fig. 2, and are adjusted independently by the feet of the operator upon the treadles R' by the in-and-out movement of the cars P', to which the treadles are connected. This in-and-out movement of the rear ends of the elevator-boards is effected by the V-shaped or bell-crank levers L' and the connections thereto as the treadle and car are moved back and forth, as will be readily understood.

The object of the traveling elevators or belt D' is that the belt or chain, moving as it does, carries the soil directly toward the plants, because all friction is removed by reason of the elevator-chain moving backward just fast enough as the machine moves forward to produce the practical effect of remaining still while the machine is moving. Were it not for these chains moving as above described, or if there were no chains, the friction of the soil against the boards as the machine moved forward would cause the furrow which is started on either side by the plows to take a forward motion in reaching the plants, and in so doing would crush them down in the same direction that the machine is moving, and also after the bank had become considerably high the friction would be so great that it would drag along with the machine and fall over the top of the elevator-boards rather than around underneath their rear ends.

At the bottom of the rear ends of the elevator-boards R are secured the outwardly-inclined steel plates G'' for the purpose of smoothing and packing the newly-elevated bank, and thus prevent the loose earth from falling again after it had been elevated if it were not pressed into a smooth solid bank.

The in-and-out movement of the rear ends of the elevator-boards before described en-

ables the operator, sitting on the seat J', to keep an equal pressure on either side of the row by the pressure of his feet upon the treadles R'. By this means the operator can
5 keep the pressure equal upon both sides of the row, though the row may not be exactly in the center of the machine between the wheels. This also enables him to increase or diminish the width of the opening between
10 the rear ends of the elevator-boards, as they are independent one of the other.

The character of the celery-plant while growing being to droop over near the ground, I provide means for straightening them up as
15 the machine passes along and before the dirt is packed around them, and hold them in this erect position while the earth is being elevated to and packed around them. This is accomplished by means of the cords or ropes
20 H'', which pass around the grooved pulleys W at the front ends of the elevator-boards, the spring-actuated pulleys I'' at the rear ends of the elevator-boards, and through a groove in the outer end of the pivoted shoe J''. This
25 shoe is horizontally pivoted upon a toothed casting K'', so as to swing vertically, and to this pivot is secured a handle L'', which is provided with a spring-catch M'', that engages the toothed casting K'', and thereby
30 supports the said shoe at any desired elevation, thus raising the cord H'' to the proper height as the elevator-boards are raised or lowered. The casting K'' is vertically pivoted upon the casting B', so as to swing horizontally, and
35 thus move the outer end of the shoe J'' in and out. The object of this in-and-out movement of the shoe J'' is to always keep the rope H'' in a line with the elevator-boards as they are moved in and out at their rear ends,
40 and consequently always in a line with the row, which is very desirable. The row of plants is always nearly parallel with the sides of the machine, and it is essential that these ropes should also be parallel with the row from the point of the shoe to the rear ends of the elevator-boards. In order to keep these
45 ropes parallel with the row as the rear ends of the elevator-boards are moved in and out, the castings K'' are vertically pivoted, as before described, so as to allow the ends of the shoes to move in and out, and these castings K'' are provided with laterally-extending arms N'', to which are connected the rods O''. These rods O'' have their opposite ends con-
50 nected to the rods P'', which rods have their forward ends pivotally connected to the castings P at the points Q''. The opposite ends of these rods P'' are bifurcated, and these bifurcated ends slide upon the rearwardly-extending ends R'' of the castings B'. Also sliding upon these ends R'' are the plates S'', to which the grooved pulleys I'' are connected, and placed between these plates S'' and the bifurcated ends of the rods P'' are the springs
60 T''. By means of this construction the ropes H'' are always held tight and straight as they travel around the pulleys W and I'', and the

rods P'' being pivotally connected to the castings B', as shown. When the rear ends of the elevator-boards are moved inward, the
70 bifurcated ends of the said rods move forward, and through the medium of the rods O'', which are connected to the arms N'' of the castings K'', turn the said castings upon their pivots and throw the outer grooved
75 ends of the shoes toward the center. This movement of the shoe W would require more rope; but this is provided against by the forward movement of the bifurcated ends of the rods P'', which also allow the plates S'', to
80 which the pulleys I'' are connected, to move forward, while at the same time it is held tight by the springs T''. By this construction the pulleys W and I'' and the end of the shoes always maintain practically the same
85 relative position to each other. This operation is reversed when the rear ends of the elevator-boards are moved outward, and which, as will be readily understood, always keeps the ropes H'' parallel with the row of plants
90 being banked. As the banks become elevated and the rear ends of the elevators are raised, the front ends of the elevators, turning upon the pivotal castings T, move rearward at their lower ends and away from the
95 plows. In order to always keep the plows in the proper relative position to the ends of the elevators so that they will receive the whole of the furrow, the slotted plates L are provided, by means of which the plows are ad-
100 justed forward and backward.

In Fig. 7 is shown a rear view of the left-hand casting U'', through which the tubes H' I' pass. These castings are each provided with two vertical slots, in the outer ones of
105 which the larger tubes H' move and in the inner ones the smaller tubes I' move. While the machine is in operation the tubes H' are at the bottoms of their slots; but when at the end of a row and it is desired to turn the
110 machine it becomes necessary to raise the elevator-boards and tubes. The operator first raises the tubes H' by taking hold of the seat J', and as the tubes move upward they engage the sides of the levers or catches V'',
115 which are pivoted near their lower ends upon the castings U''. These levers are provided with inwardly-inclined lower ends W'', which extend partially over the adjacent slots, and with the curved shoulders X'' at their upper
120 ends.

Y'' indicate slotted spring-actuated horizontal bars, which are provided with the hooks Z'' upon one end and the shoulders 2 between their ends, with which projections upon
125 the upper ends of the levers V'' engage. When the tubes H' have passed above the shoulders X'', the levers are drawn inward by the spring-actuated bars Y'', which cause them to catch and hold the tubes H', as shown
130 in Fig. 7. The operator then pulls down upon the rear ends of the levers V', which directly raise the front end of the machine and also pull down upon the forward ends of the levers

X', which raise the elevator-boards by means of the chains connected to them and the two outer or smaller tubes which are suspended upon the chains 7. When the smaller tube 5 I' reaches the top of its slot and strikes against the bottom of the spring-actuated bars Y'', it throws the opposite ends of the said bars down and releases the upper ends of the levers V''. Then the bar Y'' springs back until it is arrested by the slot in the said bar. The machine is now ready to be turned around. When turned around, the machine is lowered by allowing the rear ends of the levers V' to rise. Then taking hold of seat with both 15 hands and raising it slightly the tubes H' strike the points 3 of the upper ends of the levers or catches V'', which throws their upper ends toward the left until they strike the hooks Z'', thus leaving the slot unobstructed 20 and allowing the tubes H' to drop. As these tubes pass down they engage the inwardly-inclined lower ends of the catches or levers V'', which throw their upper ends inward until they again catch over the notches 2 of the spring-bars Y'', when they are again set 25 to repeat the operation just described at the end of the next row.

The animals are attached to the lower ends of the upright bars 4, which are pivoted between 30 their ends upon the rear sides of the vertical standards of the front arch A, as shown. Pivoted upon the horizontal portion of this arch is a bar 5, which has its ends connected to the upper ends of the vertical bars 4 by the rods 6, which together form an 35 evenner.

Having thus described my invention, I claim—

1. In a celery-banking machine, the combination of a frame, the driving-wheels, elevator-boards, a traveling belt which passes 40 around the elevator-boards, and a mechanism connected with the driving-wheel and the belt for revolving the belt, substantially as described.

2. In a celery-banking machine, the supporting-wheels, elevator-boards, and a revolving belt which substantially covers the inner 50 surface of the boards, for the purpose described, substantially as shown.

3. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards horizontally pivoted at their upper 55 front ends, and horizontally-adjustable plows at the front ends of the elevator-boards, substantially as specified.

4. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards, and a supporter for raising the 60 fallen plants, substantially as specified.

5. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards pivoted at their front ends, and levers connected with their rear ends for moving 65 them in and out, substantially as described.

6. In a celery-banking machine, the combi-

nation of a frame, supporting-wheels, elevator-boards, sprocket-wheels journaled at the front and rear ends of the said boards, the belts 70 or chains which pass around the said wheels and boards, and a mechanism connected with the supporting-wheels for revolving the said sprocket-wheels, substantially as specified.

7. In a celery-banking machine, the combination of a frame, the supporting-wheels, the 75 elevator-boards, pulleys at the front and rear ends of the said boards, a rope which passes around the said pulleys for raising the fallen plants, and a mechanism for revolving one of 80 said pulleys, substantially as specified.

8. In a celery-banking machine, the combination of a frame, elevator-boards, pulleys at 85 each end of the said boards, a rope which passes around them, and an inwardly-extending shoe around which the said rope also passes, and a mechanism for revolving one of said pulleys, substantially as described.

9. In a celery-banking machine, the combination of a frame, the elevator-boards, pulleys 90 at each end of the said boards, an inwardly-extending horizontally-pivoted shoe, a rope which passes around the pulleys, and a mechanism for revolving one of the pulleys, substantially as set forth. 95

10. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards vertically pivoted at their front 100 ends to move in and out at their rear ends, pulleys at each end of the said boards, inwardly-extending vertically-pivoted shoes, ropes which pass around the pulleys and shoes, and a mechanism connecting the shoes 105 and elevator-boards, whereby when the boards move the shoes turn upon their pivots, for the purpose described.

11. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards pivoted at their front ends to swing horizontally at their rear ends, tubes 110 connected at their front ends to the frame, and a mechanism connecting the tubes and the boards for moving the said boards in and out at their rear ends, substantially as described. 115

12. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards connected at their front ends to swing vertically, tubes pivoted at their front 120 ends to swing vertically, and levers connected to the said boards for raising them, substantially as described.

13. In a celery-banking machine, the combination of a frame, supporting-wheels, elevator-boards pivoted at their front ends to swing vertically, tubes pivoted at their front 125 ends to swing vertically, a seat connected thereto, a lever for raising the boards, and a catch for supporting the tubes in a raised position, substantially as specified. 130

14. In a celery-banking machine, the combination of supporting-wheels, a frame pivoted thereto, and elevator-boards pivoted horizontally to the frame, a lever, and connections

between the lever and the frame and boards, whereby the front end of the frame and the rear ends of the boards are raised simultaneously, substantially as described.

5 15. In a celery-banking machine, the combination of a front and a rear arch, a frame connecting them, a tongue pivotally connected to the rear arch, and a lever pivoted upon the tongue and connected at one end to the frame,
10 whereby the front end of the frame is raised by the levers and the weight transferred to the tongue, substantially as shown.

16. In a celery-banking machine, the combination of a frame, supporting-wheels at the
15 rear end of the frame, vertically-moving rods at the front of the frame, wheels on their lower ends, the elevator-boards, and a mechanism connected with the said rods and the elevator-boards for lowering the rods and
20 raising the boards, substantially as specified.

17. In a celery-banking machine, the combination of a frame, the elevator-boards pivotally connected thereto, the tubes H' I', and the slotted castings through which the tubes
pass, substantially as described. 25

18. In a celery-banking machine, the combination of the front arch, the horizontal beams connected thereto, the plates C, which are secured at their front ends to the beams and which extend upward at their rear ends, 30 the rear arch connected thereto, the supporting-wheels journaled between the plates, the elevator-boards, and the mechanism for operating them, substantially as shown.

In testimony whereof I affix my signature in
presence of two witnesses. 35

ELLSWORTH A. DEWEY.

Witnesses:

GEORGE W. GREEN,
ALLAN RAYMOND.