(No Model.) 3 Sheets—Sheet 1.

D. D. KUHLMAN.

DITCHING AND GRADING MACHINE.

No. 379,705. Patented Mar. 20, 1888.

Fig. 1.

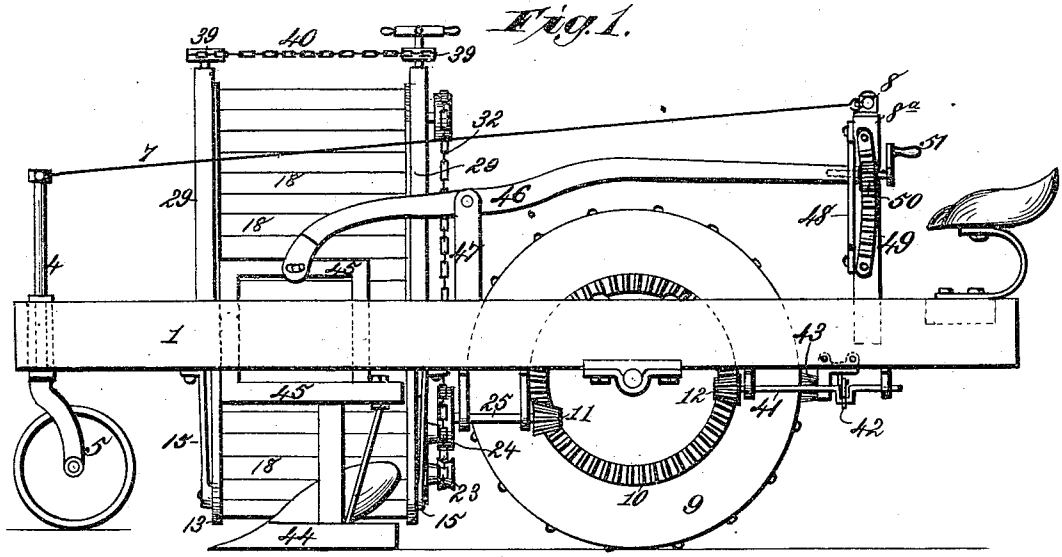
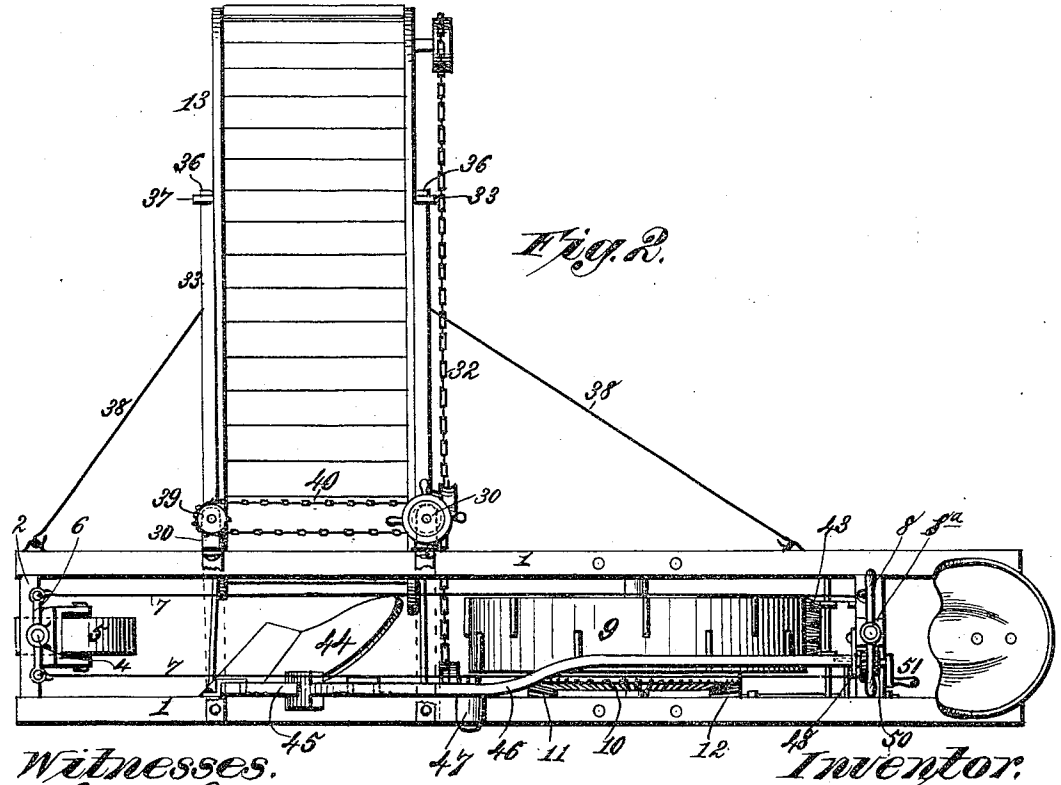


Fig. 2.



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Fig. 3.

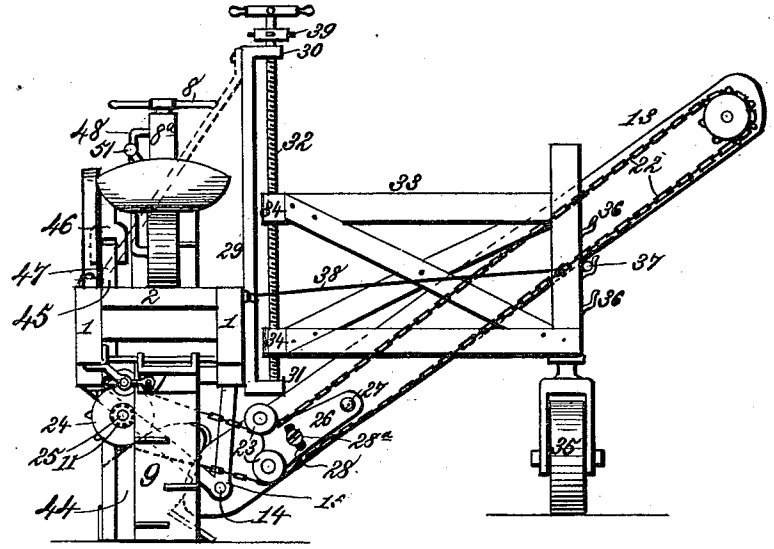


Fig. 4.

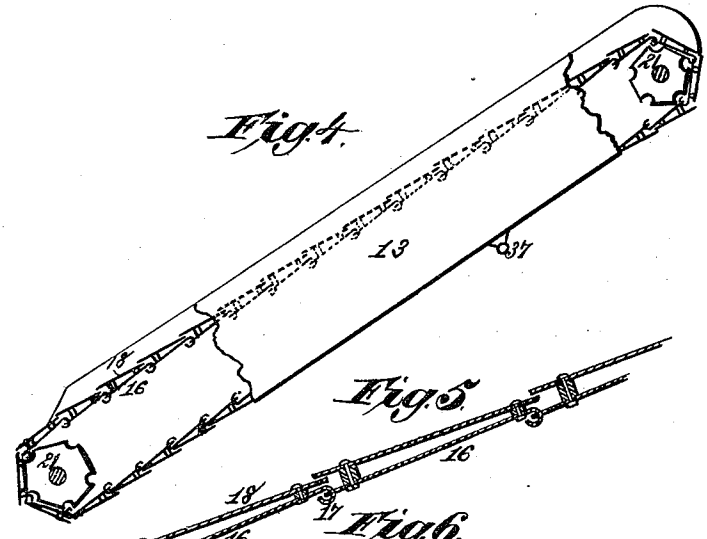
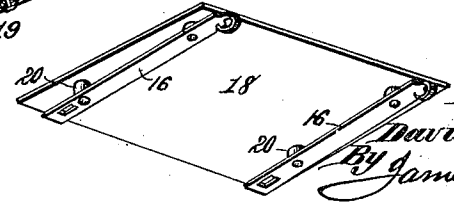


Fig. 5.

Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 7.

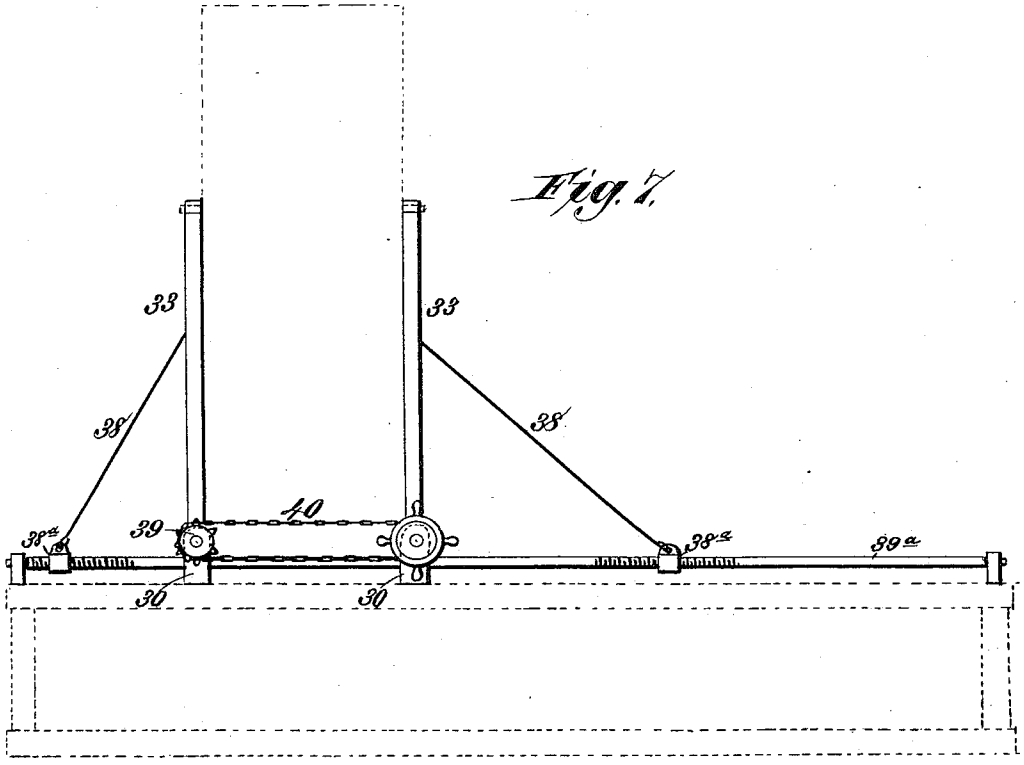
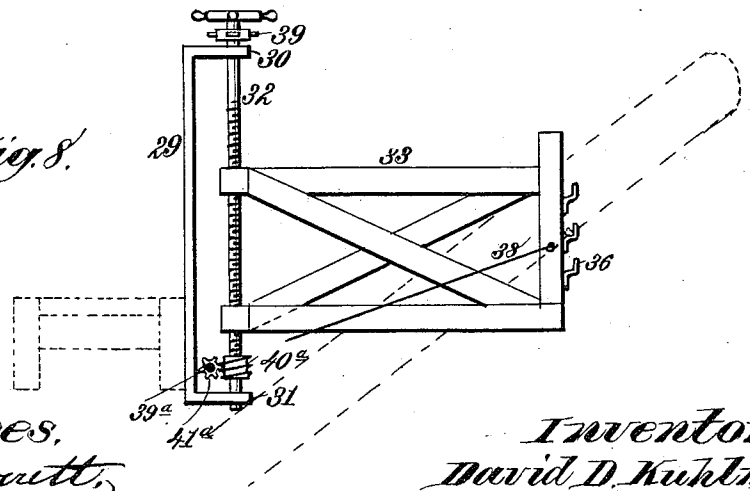


Fig. 8.



Witnesses,
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UNITED STATES PATENT OFFICE.

DAVID D. KUHLMAN, OF OAKLAND, NEBRASKA.

DITCHING AND GRADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 379,705, dated March 20, 1888.

Application filed July 19, 1887. Serial No. 244,767. (No model.)

To all whom it may concern:

Be it known that I, DAVID D. KUHLMAN, a citizen of the United States, residing at Oakland, in the county of Burt and State of Nebraska, have invented new and useful Improvements in Ditching and Grading Machines, of which the following is a specification.

This invention relates to ditching and grading machines wherein a plow detaches the earth and discharges it upon an elevator for moving the earth from the ditch at each side of the road, for raising the same above the usual level, or for loading wagons with the earth from the ditch, to be carried and deposited at any desired point.

The objects of my invention are to provide novel means for operating the elevator; to provide novel means for keeping the periphery of the ground-wheel free from adhering matter; to provide novel means for supporting and vertically adjusting the elevator as the ditch increases in depth and the ground-wheels and main frame descend; to provide a novel frame for bracing the elevator-frame and maintaining the ground-wheel and main frame in perpendicular position; to provide novel devices for vertically adjusting the plow from the driver's seat, and to otherwise simplify and improve the construction and efficiency of ditching and grading machines.

The objects of my invention I accomplish by the features of construction and combination of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying my invention; Fig. 2, a top plan view; Fig. 3, a rear end view; Fig. 4, a broken side view of the elevator and its frame; Fig. 5, a longitudinal sectional view of a part of the elevator; Fig. 6, a perspective view of one of the plates and links comprising a section of the elevator; Figs. 7 and 8, a detail plan and a side elevation, respectively, showing a modification.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, where it will be seen that the main frame is composed of parallel side bars, 1, connected by front and rear end bars 2, in the former of which is journaled the shank 4 of a caster-wheel, 5, said shank having a cross-bar, 6, connected by rods 7, or otherwise, with the steering-handle 8, mounted on a post, 8^a, adjacent to the driver's seat at the rear end of the main frame. The ground and driving wheel 9 is journaled in the main frame, and at one side is provided with a crown gear-wheel, 10, meshing with pinions 11 and 12, that drive the elevator and ground-wheel-cleaning device, as hereinafter explained.

The elevator-frame 13 is pivoted at 14 to a pendent bracket, 15, on the main frame, and the endless traveling elevator comprises links 16 in hooked engagement with each other, as at 17, Fig. 5. A plate, 18, of sheet-iron or other material, is riveted, as at 19, to each pair of links, there being preferably arranged between the plates the blocks 20. The adjacent ends of the plates overlap to prevent the escape of the soil before it is discharged. The links of the elevator pass around the upper and lower chain-wheels 21, journaled in the elevator-frame, and the upper chain-wheel is operated by an endless chain, 22, passing around guide-pulleys 23, and thence to and around a chain-wheel, 24, on the shaft 25 of the pinion 11. The guide-pulleys 23 are journaled on a plate, 26, pivoted at one end, as at 27, to the elevator-frame adjacent to its lower end, and provided with a slot, 28, and set-screw 28^a, whereby the plate can be adjusted, and with it the guide-pulleys, to tighten or loosen the driving-chain 22.

To the side of the main frame are secured two standards, 29, having lateral lugs 30 and 31 at the top and bottom, which receive the screw-rods 32, one of the latter having a suitable hand-wheel or other handle, and both rods are so secured that they can freely rotate, but cannot move lengthwise. A laterally-braced frame, 33, is provided at its inner end with screw-nuts or screw-tapped projections 34, engaging the screw-rods, and at the outer end said braced frame is provided with a supporting-wheel, 35. The vertical part at the outer end of the braced frame is furnished with a series of brackets or hooks, 36, located one above the other and receiving lateral pins 37 at the sides of the elevator-frame in such manner that by adjusting the pins from brackets

to brackets the elevator-frame can be raised or lowered, as conditions may require. By turning the screw-rods 32 the braced frame can be bodily adjusted in a vertical plane to raise the said frame and the elevator as the depth of the ditch increases and the ground-wheel and main frame descend. The frame 33 is connected by brace-rods 38 with the main frame, the connection of the said rods with the two frames being loose to permit of their adjustment relatively to each other. This braced frame and its supporting-wheel perform important functions, in that they support and serve to adjust the elevator, while at the same time they preserve the driving-wheel and main frame in perpendicular position, and, besides, admit of the elevator being adjusted vertically independent of any movement of said braced frame. The forward brace-rod 38 receives the draft-strain and prevents back movement of the said frame. The upper ends of the screw-rods 32 are provided with chain-wheels 39, connected by an endless chain, 40, so that by turning one rod the other is likewise turned. The pinion 12 is mounted on a crank-shaft, 41, the crank being connected by a pitman, 42, with a steel-wire or other brush, 43, mounted on suitable guideways to operate on the periphery of the ground-wheel, and thereby keep it free from adhering matter. The rotation of the crank-shaft causes the brush to reciprocate across the periphery of the ground-wheel; but I do not confine myself to this particular means of causing the brush to move, as other equivalent means may be employed.

The plow 44, which dislodges the earth and turns it upon the elevator, is carried by a frame, 45, movable vertically in guides on the main frame, Fig. 2, and to the upper part of said plow-carrying frame is pivotally connected one end of a lever, 46, pivoted to a standard, 47, and having its rear end portion passing through a guide, 48, on the post 8^a. To this post is attached a curved rack, 49, which engages a pinion, 50, mounted on a spindle having a handle, 51, and journaled in or on the rear end of the lever 46, so that the spindle can turn. By turning the pinion in the proper direction it is caused to ride along the rack, and thereby raise or lower the plow, as occasion may demand. This constitutes a rapid means of adjustment, which is desirable, in that it is frequently necessary to lift the plow over obstructions, and also to lift the plow to move the machine from place to place.

The standards 29 may be braced to the main frame by inclined braces, as in dotted lines in Fig. 3, to sustain said standards in vertical positions.

In Figs. 7 and 8 I have shown the braces 38 provided at their inner ends with sleeve-nuts 38^a, engaging right and left hand screw-threads on a shaft, 39^a, journaled on the main frame. This shaft is rotated by a gear-wheel, 40^a, on the lower end of one of the screw-rods 32 engaging a gear, 41^a, on the screw-shaft. The object of this is to keep the braces 38 always tight. When the elevator is raised by the screw-rods 32, the inner ends of the braces are drawn toward each other, and when the elevator is lowered the said inner ends of the braces are moved away from each other, thereby keeping the braces tight as the elevator is raised and lowered.

Having thus described my invention, what I claim is—

1. The combination, with the main frame, the ground-wheel, the elevator, and the elevator-operating chain, of the adjustable plate on the elevator-frame carrying two guide-pulleys, around which said chain passes, substantially as described.

2. The combination of the main frame, the plow, the elevator, the ground-wheel having a crown-wheel, the pinion engaging the latter, and having its shaft located at right angles to the axis of the ground-wheel and provided with a chain-wheel, the adjustable plate on the elevator-frame carrying two guide-pulleys, and the elevator-operating chain passing around said guide-pulleys, and thence around the chain-wheel on the pinion-shaft, substantially as described.

3. The combination, in a ditching and grading machine, of the plow, the elevator, the ground-wheel, and the brush operated by the ground-wheel for cleaning the latter, substantially as described.

4. The combination, in a ditching and grading machine, of the main frame, the plow, the elevator and its endless operating-chain, the ground-wheel having a crown-wheel, the brush, and the two pinions, one operating the elevator-chain and the other moving the brush, substantially as described.

5. The combination, in a ditching and grading machine, of the main frame, the lateral elevator, the plow-carrying frame movable vertically on the main frame, the pivoted lever connected with the plow-carrying frame, the rack, and the pinion connected with the lever and engaging the rack, substantially as described.

6. The combination, in a grading and ditching machine, of the main frame, the plow, the ground-wheel, the pivoted elevator, and the vertically-adjustable lateral frame, on which the elevator is supported and can be raised or lowered independent of any movement of said lateral frame, substantially as described.

7. The combination, in a grading-machine, of the main frame, the plow, the pivoted elevator, the lateral frame supporting the elevator, and the screw-rods engaging the lateral frame to raise and lower the same with the elevator, substantially as described.

8. The combination, in a ditching and grading machine, of the main frame, the ground-wheel, the plow, the lateral frame supporting the elevator, the standards, and the screw-rods supported by the standards and engaging the lateral frame to raise and lower the latter with the elevator, substantially as described.

9. The combination, in a ditching and grad-

ing machine, of the main frame, the plow, the ground-wheel, the elevator, the lateral frame supporting the elevator, the standards, the screw-rods for raising and lowering the lateral frame with the elevator, and the braces connecting the lateral frame with the main frame, substantially as described.

10. The combination, with the main frame, of the pivoted elevator having lateral pins and the vertically-adjustable lateral frame having brackets or hooks, with which the lateral pins on the elevator engage, substantially as described.

11. The combination, with the main frame, of the pivoted elevator having lateral pins, the lateral frame having brackets or hooks, with which said pins engage, and the screw-rods for raising and lowering the lateral frame, substantially as described.

12. The combination, with the main frame, of the pivoted elevator, the lateral frame, the screw-rods for raising and lowering the lateral frame, and the chain and chain-wheels connecting the screw-rods, substantially as described.

13. The elevator consisting of the links 16, in hooked engagement, the plates 18, overlapping at their adjacent edges, and the blocks 20, secured between the ends of said links and plates, substantially as described.

14. The combination, with the main frame, the vertically-movable frame, the elevator, and the screw-rods, of the horizontal shaft having right-and-left screw-rods, and the braces having sleeve-nuts engaging the said right and left screw-threads, substantially as described.

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

DAVID D. KUHLMAN.

Witnesses:
JOS. BAYER,
M. S. MCGREW.