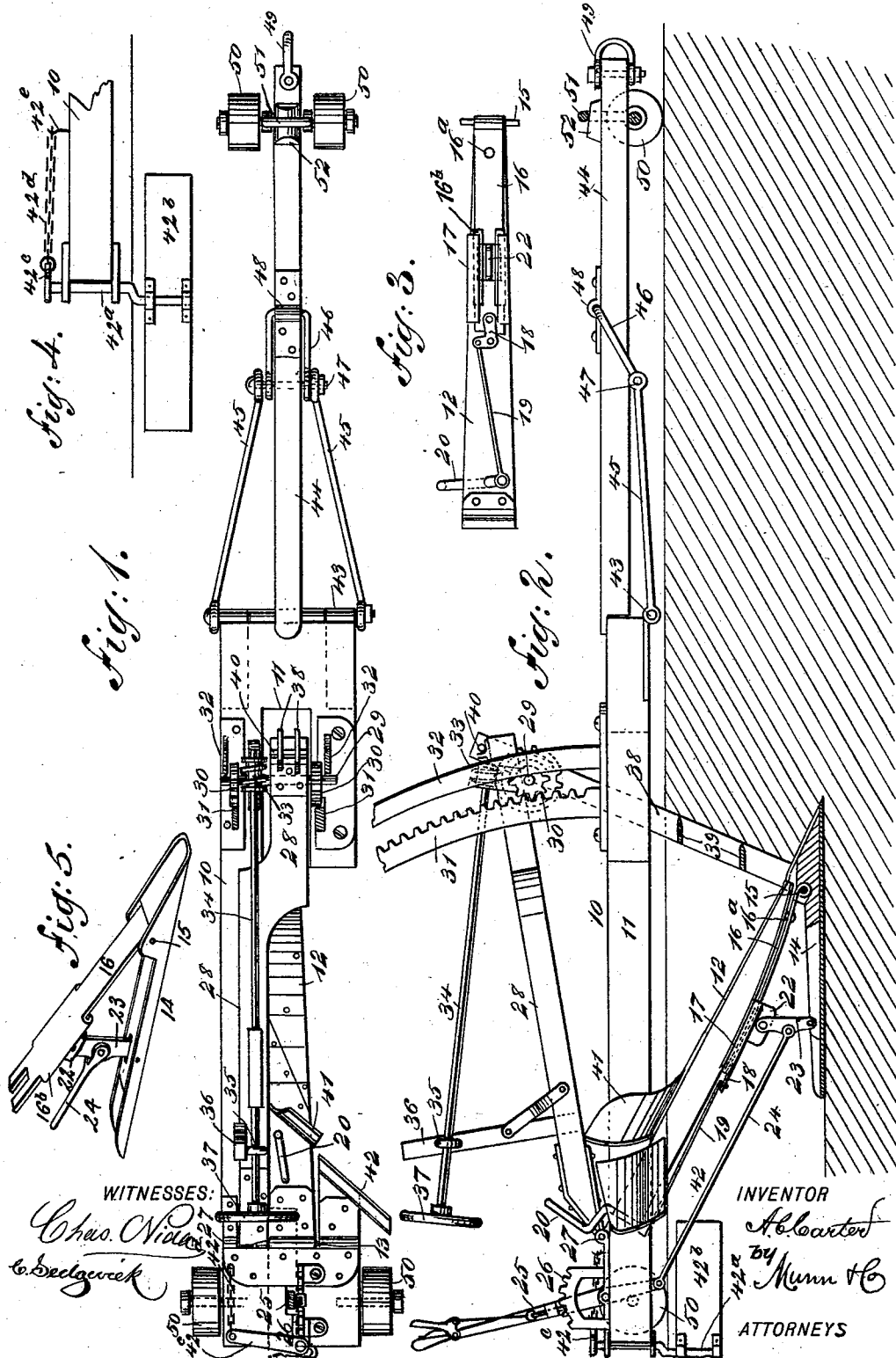


(No Model.)

A. C. CARTER.
DITCHING MACHINE.

No. 531,097.

Patented Dec. 18, 1894.



UNITED STATES PATENT OFFICE.

ALFRED C. CARTER, OF GREENFIELD, IOWA.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,097, dated December 18, 1894.

Application filed December 9, 1893. Serial No. 493,240. (No model.)

To all whom it may concern:

Be it known that I, ALFRED C. CARTER, of Greenfield, in the county of Adair and State of Iowa, have invented a new and Improved Ditching-Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of machines which are used for digging narrow trenches in which tile may be laid; and the object of my invention is to produce a simple and efficient machine which operates somewhat after the manner of a plow, and which, when drawn across a field, will dig a ditch of a uniform width and depth and deposit the loosened earth at one side of the ditch.

A further object of my invention is to provide a simple and efficient means for regulating the pitch and direction of the plow-point, so that the depth and course of the ditch may be very readily controlled.

To these ends, my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken plan view, with parts in section, of the digging machine embodying my invention. Fig. 2 is a sectional side elevation of the same, showing the machine in position to dig a ditch or trench. Fig. 3 is an inverted plan view of the plow, showing in detail the means for guiding the plow point laterally. Fig. 4 is a detail side elevation of the landside attachment used in steering the machine and counteracting the side pressure on the mold-board, and Fig. 5 is a detail perspective view of the plow point, the shift bar and the link connecting the point and bar.

The machine is provided with a main beam or frame 10, which is longitudinally slotted in the center, as shown at 11, and in this slot is hung the plow 12, the plow being hinged at its rear end, as shown at 13, and extending downward and forward, as clearly illustrated in Fig. 3. To the lower end of the plow is hinged the plow point 14, which is adapted to slide in a substantially horizontal manner in the bottom of the ditch, the point being

hung on the pin 15, which is arranged at the lower end of the shift-bar 16, this being fulcrumed near its lower end, as shown at 16^a, and its upper end is held to have a limited lateral movement in a slideway or keeper 17 on the under side of the plow.

Pivoted to the upper end of the shift-bar 16 is one arm of a bell crank 18, which is pivoted, at its elbow, on the under side of the plow 12, and is connected by a rod 19 with a crank shaft 20 extending upward through the plow beam, as shown best in Fig. 3. It will thus be seen that by turning the crank 20, the bell crank may be tilted and the shift bar 16 moved laterally so as to change the angle of the plow point, and in this way the machine may be made to describe a curve.

Fitted to slide in a guide-way 16^b on the under side of the shift bar 16 is a slide 22, to which is pivoted a link 23, this being pivoted also to the plow point 14; and a rod 24 is pivoted to the link 23 and extends upward and backward, being at its upper end pivoted to the lower end of a lever 25, which is fulcrumed on the beam 10, and extends downward through a slot therein, the lever moving opposite a common quadrant 26, which is mounted on the beam 10, and to which the lever may be made fast by means of the usual hand latch and bolt carried by the lever.

It will be observed that by swinging the lever, the rod 24 and link 23 may be actuated, so that the point 14 may be given any desired pitch and may consequently be regulated so as to run the plow deeply into the earth, to run it out of the earth, or to maintain it at a uniform depth.

Hinged to the outer portion of the plow beam, as shown at 27, is a lift bar 28, which extends forward, being bent inward so as to align at its front end with the lower end of the plow, and the front end of the lift bar is provided with a cross shaft 29, carrying pinions 30 which mesh with the curved racks 31 extending upward from the front portion of the plow beam, on opposite sides of the slot 11, and the racks are connected with curved members or guides 32, which lie parallel with the racks and which, by engaging the projecting ends of the shaft 29, guide and brace the same.

Connected with the shaft 29, by means of a

worm gear 33, see Fig. 1, is a shaft 34, which at its free end is hung in an eye 35 on a post 36 which projects upward from the lift bar 28, and the shaft 34 extends to a point where it may be conveniently reached from the rear end of the machine and terminates in a hand wheel 37, by which it may be revolved; and it will be observed that the revolution of the shaft 34 drives the cross shaft 29 which, acting on the racks 31, causes the lift bar 28 to be raised or lowered, thus raising or lowering the plow point, as will appear from the description to follow.

Pivoted on the pin 15 on the plow point are parallel knives 38, which extend upward and are connected together by cross ribs 39 which prevent them from spreading or from buckling inward. The knives have, at their upper ends, a pin 40, which rests on the top of the lift bar 28, so that when the lift bar is raised the knives will be also raised and the plow lifted; and the knives also lie in the slots in the end of the lift bar 28. The knives 38 are just far enough apart to cut the side walls of the ditch and to make the ditch of the desired width, and it will be understood that different riggings may be used having knives dissimilarly spaced, so that a ditch of any width, within reasonable limits, may thus be cut out.

The plow serves to cut the ditch horizontally and to raise loosened earth, and to this end it has at its upper end a mold-board 41 which delivers upon a mold-board 42, carried by the beam 10, and the earth is thus thrown to one side of the ditch into which it may be easily turned when the ditch is to be filled.

Mounted vertically on the rear end of the main beam is a crank shaft 42^a carrying at its lower end, a landside plate 42^b, which is adapted to press against the side of the ditch and counteract the side pressure on the mold-board, and having, at its upper end, a crank handle 42^c, to which is attached a chain 42^d, which is adapted to engage a hook 42^e on the main beam, to hold the crank and landside plate in position.

The main beam 10 has connected to its front end a forwardly-extending draft beam 44, which rests against the end of the beam 10, and which has side braces 45 hinged at their ends, as shown at 43, to the main beam 10 and connected to the draft beam by means of a clevis 46, a rod 47 passing through the lower end of the clevis and beneath the beam 44, and a box 48, which serves as a bearing for the clevis.

The draft beam 44, has at its front ends, a clevis 49, of the usual kind, with which connection is made to draw the machine, and at the rear end of the main beam 10 and the front end of the draft beam 44 are rollers 50, which straddle the ditch and run on the ground, the front rollers 50 being connected by a yoke 51 beneath which, and between the yoke and the beam 44, is a wedge 52, by which the height of the rollers may be regulated.

It will be seen from the foregoing description that the draft beam has the necessary freedom of movement in relation to the main beam 10, that, by means of the mechanism described, the pitch and angle of the plow point may be easily adjusted, that the knives 38 are adapted to cut cleanly the walls of the ditch, that means is provided for throwing out the loosened earth, and consequently that the machine may be drawn like an ordinary plow, and a ditch of the desired dimensions rapidly made.

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

1. In a ditching machine, the combination with a beam, of a hinged plow, means for raising and lowering the plow, a point pivoted to a laterally movable support, and means for swinging the point on its pivot, substantially as described.

2. In a ditching machine, the combination with a beam, of a hinged plow, a point pivoted to a laterally movable support, means for swinging the point on its pivot, knives secured to the pivot of the point and projecting above the beam, and means for raising and lowering the plow and knives, substantially as described.

3. In a ditching machine, the combination with a beam, and a plow carried thereby, of a shift bar pivoted to the under side of the plow to swing horizontally, a point pivoted to the shift bar to swing vertically, and means for operating the shift bar on its pivot, substantially as described.

4. In a ditching machine, the combination with a beam, and a plow carried thereby, of a shift bar pivoted on the plow, a point pivoted on the shift bar, means for operating the shift bar, a link pivoted to the point and having a pivotal and sliding connection with the shift bar, a lever, and a rod connected to the lever and link, substantially as described.

5. In a ditching machine, the combination with a shift bar provided with a guide-way on its under side, of a point pivoted to the shift bar, a slide fitting in the guide-way of the said shift bar, a link pivoted to the slide and point, an operating lever, and a rod connected to the lever and link, substantially as and for the purpose specified.

6. In a ditching machine, the combination with a beam, and a plow hinged thereto, of a pivoted lift bar, knives carried by the plow point and connected at their upper ends with the lift bar, and means for operating the said lift bar, substantially as described.

7. In a ditching machine, the combination with a beam, and a plow carried by the beam, of a crank shaft mounted on the rear end of the beam, a landside plate on the lower end of the crank shaft, a crank handle on the upper end of said shaft, and means for locking the crank in position, substantially as described.

8. A ditching machine, comprising a main

beam, a plow hinged thereto, a shift bar fulcrumed on the under side of the plow, a plow point carried by the shift bar, a lever mechanism for moving the shift bar, a vertically movable lift bar hinged to the top of the machine, means for swinging the lift bar, and parallel knives extending from the lift bar to the plow point, substantially as described.

9. A ditching machine, comprising a longitudinally slotted main beam, a plow hung in the slot and extending downward from the beam, a vertically and laterally moving plow point carried by the plow, a lift bar hinged above the plow, a gear mechanism for adjusting the lift bar vertically, and the parallel knives extending from the lift bar to the plow point, substantially as described.

10. The combination, with the beam, the

swinging plow, the plow point, the swinging lift bar above the plow point, and the knives connected with the plow point and the lift bar, of the rack on the main beam, the shaft on the lift bar geared to the rack, and the screw shaft for turning the shaft on the lift bar, substantially as described.

11. The combination, with the main beam and its ditching mechanism, of the draft beam abutting with the front end of the main beam, braces hinged to the front end of the main beam, and a clevis connection between the braces and the draft beam, substantially as described.

ALFRED C. CARTER.

Witnesses:

THOMAS H. MINERT,

DANIEL A. SHAW.