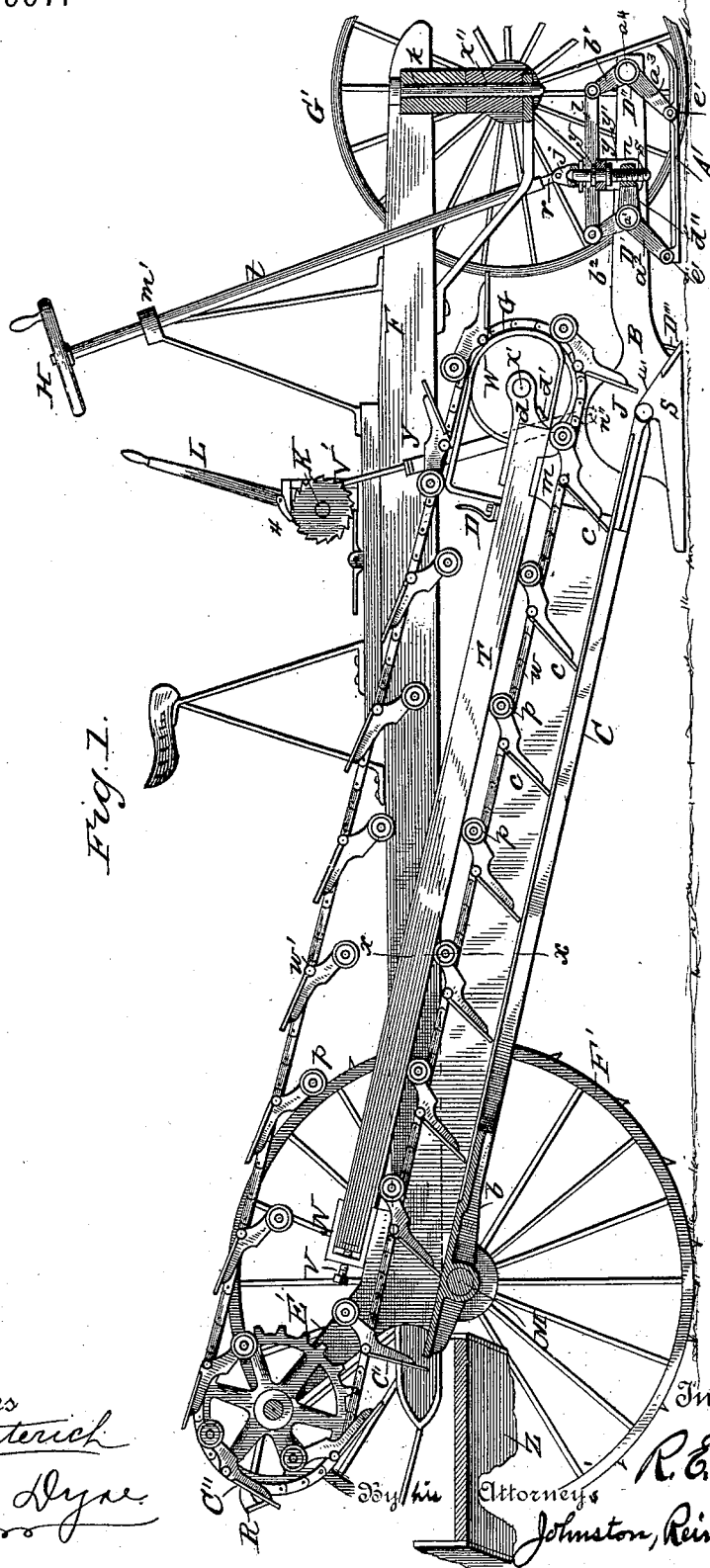


2 Sheets—Sheet 1.

No. 397,997.

Patented Feb. 19, 1889.



2 Witnesses
Fred J. Dieterich
Mrs. E. Byrne

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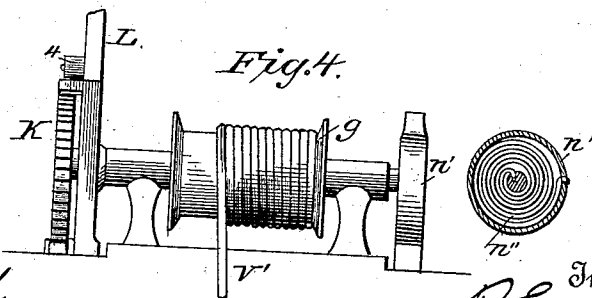
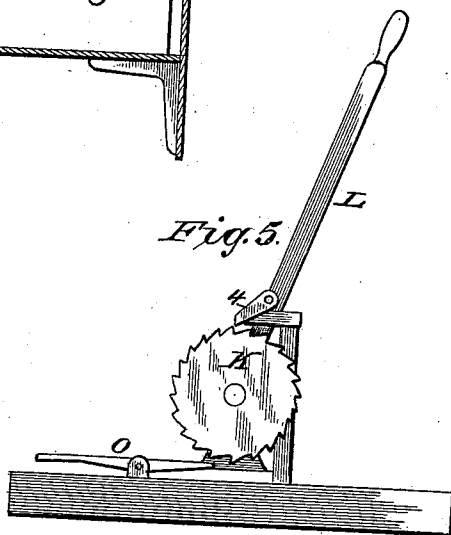
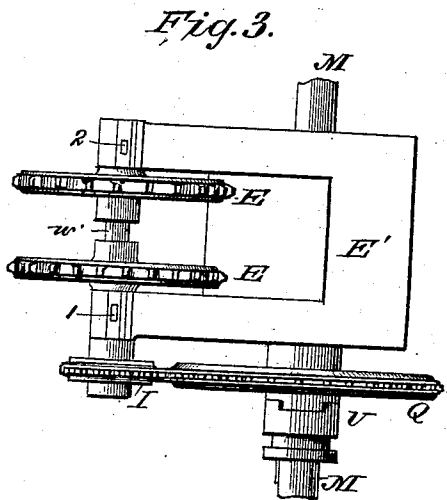
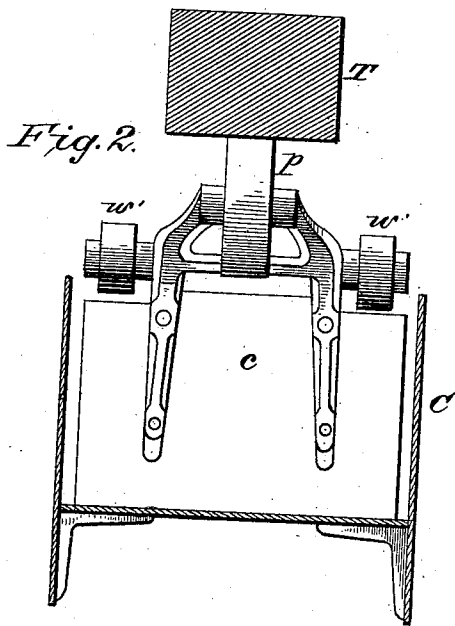
(No Model.)

2 Sheets—Sheet 2.

R. E. NEVIN.
TILE DITCHING MACHINE.

No. 397,997.

Patented Feb. 19, 1889.



Witnesses,
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UNITED STATES PATENT OFFICE.

ROBERT EMMET NEVIN, OF ENON VALLEY, PENNSYLVANIA.

TILE-DITCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 397,997, dated February 19, 1889.

Application filed September 30, 1886. Serial No. 214,953. (No model.)

To all whom it may concern:

Be it known that I, ROBERT EMMET NEVIN, a citizen of the United States, residing at Enon Valley, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Tile-Ditching 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 appertains to make and use the same.

My invention relates to that class of ditching-machines which are provided with a plow for cutting a ditch and an elevator for carrying off the earth loosened by the plow; and it consists in the constructions hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a vertical longitudinal section of my improved ditching-machine. Fig. 2 is a vertical transverse section on the line xx of Fig. 1, on an enlarged scale, and represents a cross-section of the beam or timber T and trough C and a rear face view of the elevators c . Fig. 3 is a top view or plan of the sprocket-wheels, their shafts, and frame. Fig. 4 is a front elevation of the drum carrying the wire cable attached to the plow-beam for elevating and lowering the plow through the medium of a lever, ratchet-wheel, and pawl; and Fig. 5 is a side elevation of the ratchet-wheel, pawl, and lever for operating said drum.

Reference being had to the drawings and the letters marked thereon, F' F' represent the rear wheels of the machine, provided with projections on the face or tread of the rim or tire. The wheels are secured to the shaft M and revolve therewith, and furnish the motive power for operating the elevators. On the shaft M is also arranged a sprocket-wheel, Q , and a clutch, U , for engaging and disengaging the train of gearing with the shaft.

The clutch is operated in the usual manner by means of a lever. (Not shown.) The wheel Q is provided with an endless chain belt, which passes over the wheel I for operating it, and thereby transmitting power to the

sprocket-wheels E E , supported on shaft w' , which is mounted in journals 1 2 on the frame E' , which is journaled upon shaft M .

Upon the upper front end of the frame E' is formed or secured a socket or sleeve, N , which is provided with an adjusting-screw, V . The rear end of the beam or timber T is supported in the sleeve N , and its forward end is secured to the bearing d , supported by the shaft x' of the chain-carrying wheels W W .

To the front end of the beam T is bolted a curved track, G , the front end of which is secured to the bearing d at d' , and at the rear end of said track is secured a projecting tripping-spring, D . The beam T is supported at its front end at m by the trough C , which is hinged at its rear end on shaft or axle M by the part b of the frame E' . The endless chains or belts w w , to which the elevators c are secured by their trunnions w' , pass over the sprocket-wheels E E and carrying-wheels W W . The elevators c travel in and through the trough C . Projecting rearwardly from the frame E' is a spring-scraper, R , for cleaning the faces of the elevators c , and for turning them into the position shown at C'' in case they do not assume that position after leaving the rear end of the trough.

The frame F consists of two pieces of timber, which converge toward the front end of the machine, and between which, at the front end, is the king-bolt k of the swivel x'' , which is provided with laterally-extending trunnions, (not shown,) which form the axles for the front wheels, G' , (only one of which is shown.) To the upper surface of the frame, F is attached a support, m' , for the tube t , through which passes a rod, r , provided with a hand-wheel, H , for revolving said rod.

To the lower end of the rod r is attached a swivel, j , for turning the screw s in the nut n in the arm d'' of the bifurcated bell-crank lever D' . This lever consists of the horizontal arm d'' and the angular arms a^2 and b^2 , and is pivoted at a' to the plow-beam B , which is also pivoted at a^4 another bell-crank lever, D'' , having arms a^3 and b'' . The arms b' and b'' of the bell-crank levers D' and D''

are connected by a pivoted link, l , and the arms a^2 and a^3 are connected to the sled A' by pivoted joints $e' e'$. The screw s is provided with collars $y y$, between which project the arms of a bracket, y' , secured to the beam B of the plow for holding the screw in position with relation to said beam B. This arrangement of the rod r , screw s , and bell-crank levers D' and D'' is used for the purpose of elevating and lowering the sled A' , and thereby determining the depth of the channel to be cut by the cutter D''' of the plow S, which is pivoted to the trough C at J.

Instead of the sled A' , a caster-wheel (not shown) may be used for producing the same effect.

The plow S and the forward end of the trough C are raised and lowered by means of a link, Y, attached to the plow-beam at n'' , and to the upper end of said link is attached a wire cable, V' , which is wound around a drum, g , (clearly shown in Fig. 4,) which drum is operated by lever L, pawl $\downarrow$, and ratchet-wheel K, and is held against turning back or unwinding by a foot-lever, O.

In the case n' is arranged a coil-spring, n'' , one end of which is attached to the shaft which supports the drum g , and the other end is secured to the case n' , for the purpose of keeping the wire cable V taut. The rollers p on the shaft or axle of the elevators c on their return travel over the track G and under the beam T, which holds the elevators to their work in the trough C. The tension of the endless chains $w w$ is regulated by the screw V in the sleeve or socket N, which moves the beam T and the carrying-wheels W W.

The rear end of the machine is provided with a side chute, Z, for carrying off the earth delivered upon it by the elevators c as they pass from the rear end of the trough C.

From the foregoing description and the drawings the skillful mechanic will be enabled to construct my improved machine, the operation of which is as follows: The plow S being lowered to the ground through the medium of lever L, pawl $\downarrow$, ratchet-wheel K, drum g , and cable V' , the sled A is then adjusted for giving the desired depth of cut to share D''' by turning the hand-wheel H, which will operate the rod r and screw s , thereby moving the arm d'' , which, through the medium of bell-crank levers $D' D''$ and the pivoted link l , will raise or lower the sled at the will of the operator. In its forward movement the machine causes the point of the share D''' to enter the ground and plow it up. The loosened earth passes up the incline w' of the plow S, and is caught by the elevators c and carried into, along, and through the trough C and deposited on the chute Z, which conducts it away from the machine.

Having thus fully described my invention, what I claim is—

1. In a ditching-machine, the combination of a vertically-adjustable plow, a vertically-adjustable sled pivotally secured to the beam of the plow and supported by means of bell-crank levers, mechanism for adjusting the plow and the sled, a trough pivotally secured to the plow at its front end and to the rear axle of the machine, and an endless belt provided with swinging buckets, substantially as described.

2. In a ditching-machine, the combination of a plow, a trough, a longitudinally-adjustable beam above and parallel with the trough, and an endless belt having elevators attached thereto provided with friction-rollers which engage with the under side of said beam while passing through the trough, substantially as described.

3. In a ditching-machine, the combination of a plow, a trough, an endless belt having buckets provided with pintles on their sides and an arm supporting a friction-roller, and a beam above and parallel with the trough, against which the rollers bear to hold the buckets in working position in the trough, substantially as described.

4. In a ditching-machine, the combination of a plow, a trough, an endless belt provided with buckets, a beam separate from the trough and seated at one end on a frame, and having a shaft supporting the front wheels over which the belt passes connected to the other end, and means for adjusting the beam longitudinally, substantially as described.

5. In a ditching-machine, the combination of a plow, a trough, an endless elevator, a beam above, parallel with, and supported by the trough at its front end and supporting the front wheels over which the elevator travels, a socket on the rear frame to receive one end of the beam, and an adjusting-screw for moving said beam longitudinally, substantially as described.

6. In a ditching-machine, the combination of a plow, a trough, an endless belt provided with pivoted buckets, a scraper supported by the rear frame, extending across the path of the buckets, and constructed to clean their working-surfaces and turn them in the plane of the belt as they cross the rear supporting-wheels, substantially as described.

7. In a ditching-machine, the combination of a plow, a trough, an endless chain elevator, a beam above the trough and supporting a track at its front end, and front and rear chain-supporting wheels, substantially as described.

8. In a ditching-machine, the combination of a plow, a trough, an endless chain elevator, a beam above the trough and supporting a track at its front end, and an arm for turning the elevator-blades into position for crossing said track, substantially as described.

9. In a ditching-machine, the combination of a plow, a sled or wheel secured to the beam

thereof, rocking levers connected by a link, a screw, and an operating-rod for adjusting said sled, substantially as described.

10. In a ditching-machine, the combination
5 of a plow, a sled attached to the front end thereof, rocking levers pivotally connected to the sled and to a link, an adjusting-screw, a swivel connected to one end of said screw,

and a rod surmounted by an operating medium, substantially as described.

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

ROBERT EMMET NEVIN.

Witnesses:

ED. WHITNEY,
PHEBE L. HERR.

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