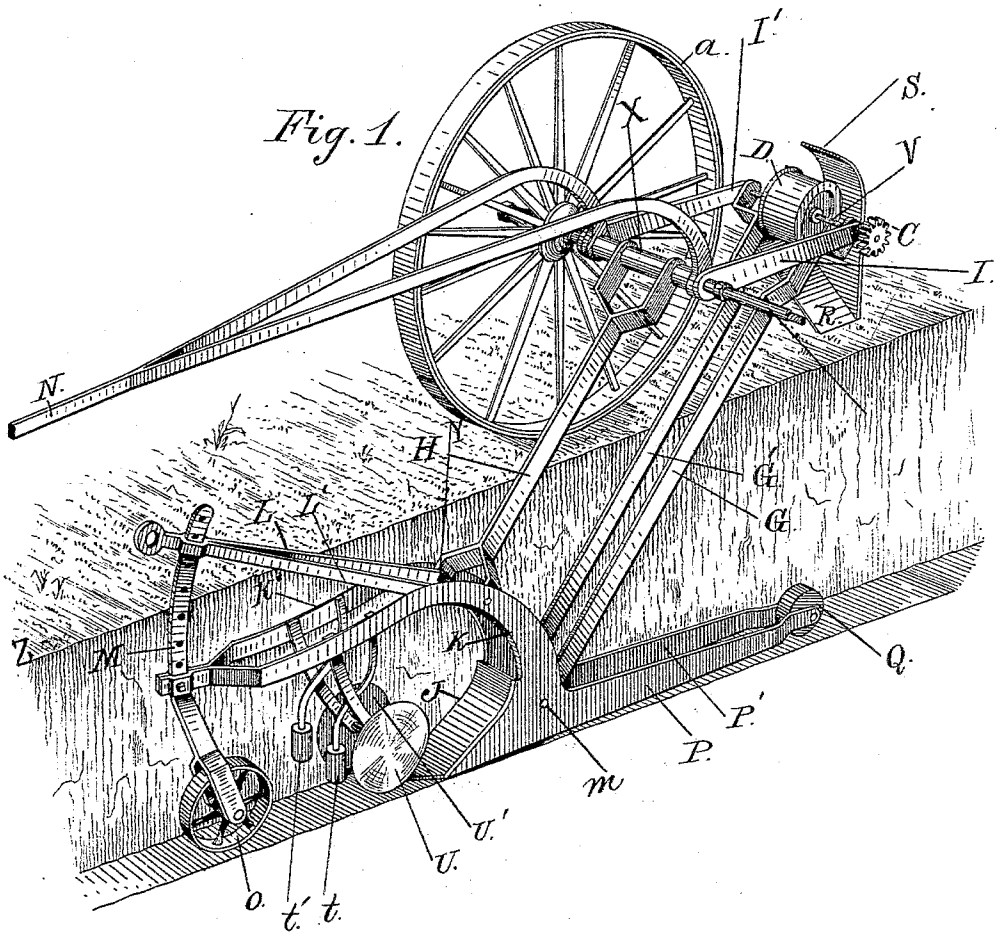
(No Model.) 2 Sheets—Sheet 1.

D. HERSHBERGER.

DITCHING MACHINE.

No. 300,318. Patented June 10, 1884.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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DITCHING MACHINE.

No. 300,318. Patented June 10, 1884.

Fig. 2.

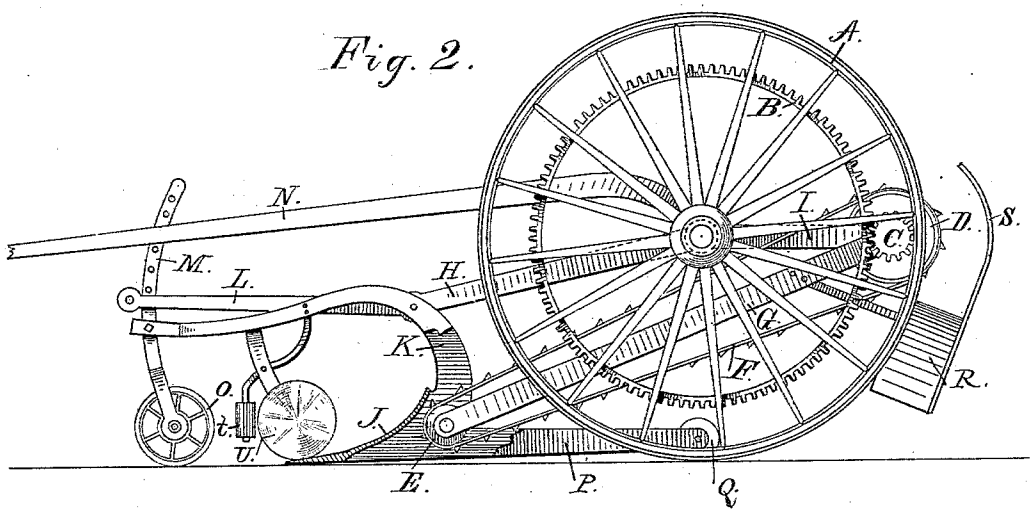
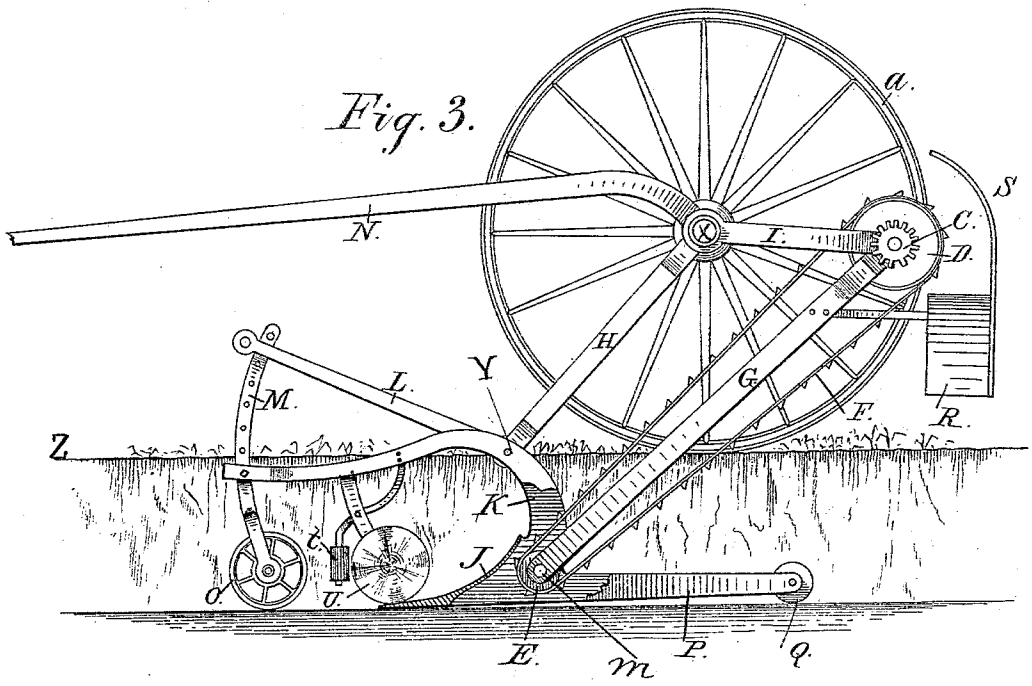


Fig. 3.



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UNITED STATES PATENT OFFICE.

DANIEL HERSHBERGER, OF MILLVILLE, ASSIGNOR TO SAMUEL WATSON, OF STRAUGHN'S, AND JACOB SPENCE AND ADAM SPENCE, BOTH OF JACKSON, INDIANA.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 300,318, dated June 10, 1884.

Application filed November 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HERSHBERGER, a citizen of the United States, residing at Millville, in the county of Henry and State of Indiana, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to ditching-machines; and it consists in the construction and arrangement of parts, as will be hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of my improved machine with one wheel removed, and showing the machine in working position in a ditch. Fig. 2 is a side elevation of my machine, showing the operating parts from the outside. Fig. 3 is a side elevation with one of the wheels removed.

In Fig. 1, *a* is a ground-wheel of ordinary construction, and X is the axle of the same. N is the hound to which the tongue is attached. C is a pinion on the end of a shaft, V. D is a drum, also fixed upon shaft V. G G′ are straight arms hinged upon the shaft or axle V at their upper ends, and hinged upon a cross-shaft, *m*, at their lower ends, and placed parallel with each other. I I′ are straight arms hinged on the axle X at one end, and extending backward to a point even with the periphery of the ground-wheel *a*, or nearly so, where the ends are furnished with holes, which receive and support the axle or shaft V. K K′ represents the curved beam and standard of a plow-shaped excavator, having its mold-board or lifting-surface J made sharp or wedge-shaped. U U′ are rolling cutters attached to the beam by standards. *t t′* are vertical rollers placed in front of the rolling cutters U U,′ revolving on vertical shafts secured to the beam K K′ in a suitable manner. These vertical rollers *t t′* come in contact with the vertical sides of the ditch, acting as guides. M is a vertical standard provided with holes, secured to the front end of the beam K K′, and carrying at its lower end a ground-pulley, O. L L′ are converging arms, constituting a draw-bar, the rear ends of which are secured to the cross-shaft Y, and joined at the front ends to connect with the means used to operate the machine. P P′ are arms extending backward in continuation of the sole or landsides of the plow-shaped excavator, and are provided at the rear end with a ground-roller, Q, which acts as a truck in supporting and carrying the weight of the excavator.

In Fig. 2, A represents a ground-wheel which supports and carries the framing, and B is a cog-wheel smaller in diameter than A, and secured to the spokes of the wheel A, the two wheels having a common center. C is a pinion fitted upon an axle, V, and which is revolved by the cog-wheel B. Attached to the axle V, and revolving on it, is a drum, D, which carries an elevator-chain, F, which extends down and forward to a similar drum, E, which has its journals boxed in the landsides of the plow J. G is a straight arm hinged upon the axle V at its upper end and upon the shaft of the pulley E at its opposite lower end. I is a straight arm hinged on the axle X of the ground-wheel A, and extending backward to a point even with the periphery of the cog-wheel B, where the end is furnished with a hole, which receives and supports the axle V and pulley or pinion C. F is an endless chain elevator or carrier passing over the drums D and E, and constructed in any suitable manner, as may be required. K represents the curved beam and standard of a plow-shaped excavator, having its front or lifting surface, J, where it enters the earth, made sharp or wedge-shaped. Attached to the forward portion of the curved beam K is a vertical standard, to which is attached a rolling cutter, U, which is placed immediately over the point of the mold-board J. A curved arm secured to the beam K behind the standard of the rolling cutter U, and secured by a screw-bolt to said standard, carries a vertical roller, *t*, immediately in front of the rolling cutter U, and which comes in contact with the vertical side of the ditch, acting as a guide, and serving to protect and press evenly the vertical wall of the ditch. Attached to the end of the beam K is a standard, M, which at its lower end carries a ground-wheel, O. The standard M is provided with holes, by means of which the end of the beam may be raised or lowered. L is a draw-bar, secured at the rear end to a cross-shaft, Y, and

arranged at the front end to connect with the means used to operate the machine. N is a tongue-connection secured at the rear end to the axle X, and extending forward far enough to allow room for the team used in operating the machine. H is a straight arm hinged on the axle X at the rear end and upon the shaft Y at the front end. The shaft Y has its end secured in the beam K at the crown of the curve. An arm, P, extends backward in continuation of the sole or bar of the plow-shaped excavator, and is provided at the rear end with a roller, Q, which acts as a truck in supporting and carrying the weight of the plow-shaped excavator and its attachments. In the rear of and directly under the upper end of the endless-chain carrier is placed a delivery-spout, R, upon which the earth loosened and raised by the mold-board J and carried up and backward by the endless-chain carrier F is deposited, and from which it is delivered at the side of the ditch. The spout R is placed at right angles with the plane of the endless-chain carrier, and may be arranged to deliver on either side, or may be made reversible, so as to deliver on the one side, whether the machine is moving one way or the other.

The construction of the arms, as already described, hinged at their ends allows the plow-shaped excavator to be raised or lowered, as the service may require, as shown in Figs. 2 and 3. In the former the excavator is represented as upon the surface of the ground ready to cut and remove the first slice, while in Fig. 3 it is shown below the surface-line Z and in a ditch of its own cutting. The lower end of the endless-chain carrier at E is elevated or depressed along with the plow-shaped excavator, and their relative positions are not changed by such action.

The operation of my machine is as follows: When the machine is moved forward, the front edge of the mold-board J cuts a slice, the thickness of which vertically is governed by a pin or bolt in the standard M, which holds the draw-bar L L′ in such position as is required to govern the cut, the width of the slice being equal to the distance between the rolling cutters U U′ and the same as the lateral width of the mold-board J. The slice of earth thus cut is forced up the inclined face of the mold-board J, and, passing over the upper rear end of the same, it falls upon the endless-chain carrier F, and as the forward motion of the plow puts the wheels A and B in motion the cogs of the wheel B engage the pinion C, by which the drum or pulley D is revolved, operating the endless-chain carrier F, which brings up the earth received from the mold-board J, and from which it falls into or upon the delivery-spout, from whence it is delivered on the side of and without edge of the ditch.

Having thus fully described my improved machine, what I claim as new, and desire to secure by Letters Patent, is—

1. In a ditching-machine, the plow-shaped excavator composed of the beam and standard K K′, the mold-board J, the draw-bar L L′, and arm M, with the wheel O, in combination with the rollers *t t′* and cutters U U′, all constructed and operating in the manner and for the purpose herein described.

2. In a ditching-machine, the combination, with the tongue and hounds N, of the arms G G′, the arm H, and the beam and standard K K′, with the axle X, as herein described.

3. In a ditching-machine, the cog-wheel B, the pinion C, and drum D, the arms G G′, shaft V, and endless-belt carrier F, in combination with the beam and standard K K′, rollers *t t′*, cutters U U′, standard M, and wheel O, substantially as herein set forth and described.

4. In a ditching-machine, the beam and standard K K′, combined with the rollers *t t′*, cutters U U′, and standard M, with wheel O, all in the manner and for the purpose herein set forth and described.

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

DANIEL HERSHBERGER.

Witnesses:
W. T. DENNIS,
FRED. F. ROST.