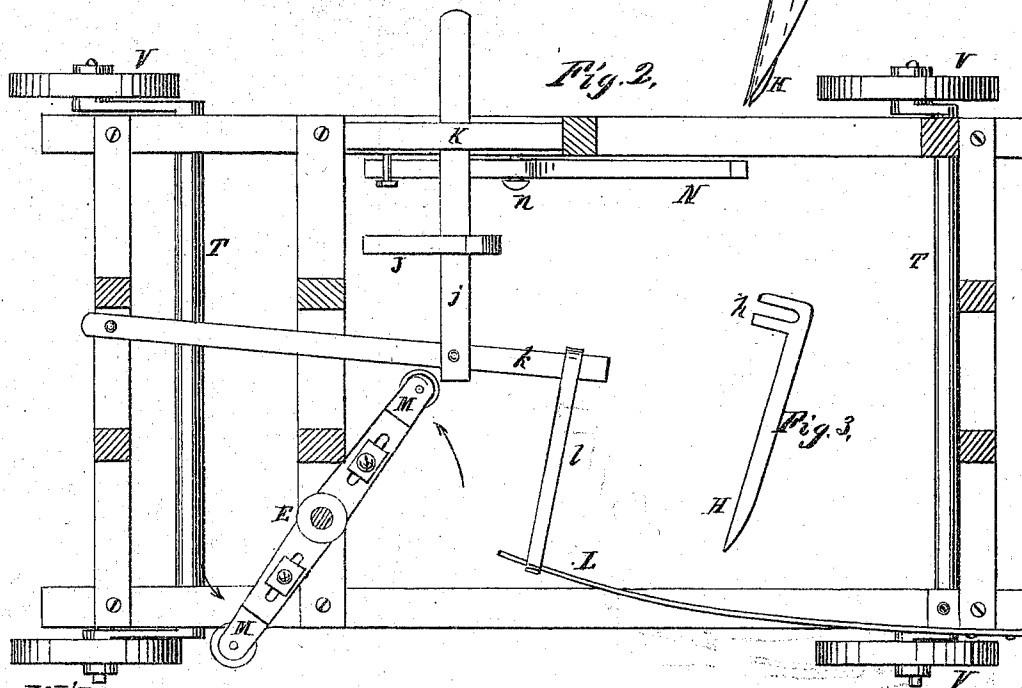
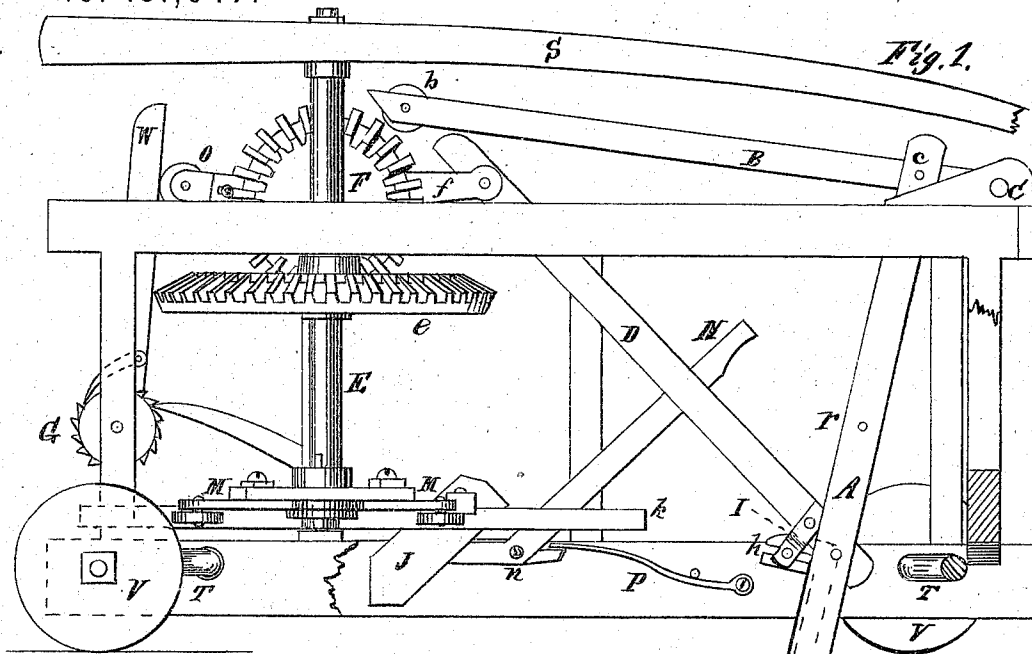


O. FOSTER & O. S. FOSTER.
Improvement in Ditching-Machines.

No. 131,947.

Patented Oct. 8, 1872.



Witnesses:

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UNITED STATES PATENT OFFICE.

ORSON FOSTER AND OSCAR S. FOSTER, OF DURHAMVILLE, NEW YORK.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. **131,947**, dated October 8, 1872.

To all whom it may concern:

Be it known that we, ORSON FOSTER and OSCAR S. FOSTER, of Durhamville, in the county of Oneida and State of New York, have invented an Improvement in Ditching-Machines, of which the following is a specification:

This invention relates to that class of machines used for ditching for drain-tile; and consists in a ditching spade or excavator, a dirt-remover that removes the dirt from the spade, and devices for feeding the machine along, with the mechanism for operating these several devices. The invention consists more particularly in an improved construction and arrangement of the parts for operating the spade, whereby it is made to work freely, and has greater elasticity in yielding to large stones or other obstructions; also, in a movable colter that is thrown out at the edge of the spade at each stroke to loosen stone and hard earth; also, in operating the scraper in its discharging movement by a spring, by which a very sudden and rapid movement is obtained for its discharge, as hereinafter more fully described.

Figure 1 is a sectional side view. Fig. 2 is a horizontal section taken below the driving-gears in Fig. 1, and shows the construction and arrangement of the parts for operating the scraper. Fig. 3 is a detail view.

Similar letters of reference indicate like parts in the several figures.

The machine is operated by the sweep S, and is fed forward as the work progresses by a windlass, G, as ordinarily. E is the driving-shaft, and *e* F the gear-wheels, the vertical gear F making two revolutions to each revolution of the sweep, and said gear having a crank, *f*, that is attached to and drives the spade by a connecting-rod, D. The spade A is suspended by a pivot, *c*, to a horizontal beam, B, one end of which is pivoted to the framework at C, and its other end is provided with an anti-friction roller, *b*, that travels on the upper side of the driving beam or connection D. In the position shown the crank *f* is passing downward, and the spade is reaching back and downward for a cut or stroke. It will be seen that the crank *f* and the spade are near the backward point of reach, and that in this position the spade is lowered considerably as the crank allows the beam B to fall, and that

as the spade is started on its forward stroke it is held down by the weight of the beam B, and is not elevated until the crank has made a half revolution, when the beam B again comes in contact with the connecting-beam D. By these means the spade is held more elevated on its backward stroke, until it is near the end of that stroke, and, as the end *b* of the beam B is always free to rise, the spade can be forced up by any obstruction that it does not overcome. A tooth or colter, H, is placed in the standard of the spade, so as to slide therein, and is made to project from the point of the spade at each digging stroke, and withdrawn as the spade reaches back. This colter, a detail view of which is shown by Fig. 3, has a slotted head, *h*, and makes connection with the beam D by a projection, I, from said beam engaging with its slotted head; and as the beam D changes its angle with relation to A the colter is forced out or withdrawn at the different points of stroke, and by this means the power of the spade to loosen and bring out stone is materially increased, and hard earth is also loosened by it, so that the spade cuts freely. The colter can be forked at its lower end, so as to present two teeth instead of one; but, as such construction tends to weaken the spade, we prefer the single tooth, as shown. J, in Fig. 2, is the scraper; it is attached to a rod or beam, *j*, that has an end-wise movement across the machine, one of its ends sliding in a guide, K, and the other being carried on a swinging rod, *k*, that is pivoted at its forward end to the frame-work. The scraper is returned to its position before the excavator or spade A by arms M that project from the main shaft E, these arms acting alternately upon the swinging rod *k* as the shaft E revolves; and on its discharging stroke the scraper is thrown with a sudden movement by a spring, L, that connects with the rod *k* by a strap, *l*. When the scraper is returned by one of the arms M it is retained by a pawl until the arm has revolved out of the way for its sudden movement. This pawl engages with the rod *j*, and is attached to the short arm of a lever, N, that is pivoted to the framework at *n*, and said pawl is released at the proper time by a pin, *r*, that projects from the spade-standard, coming in contact with the long end of the lever N. P is a spring that

holds this pawl engaged until released, as before described. The machine is mounted on four small wheels, V, as usual, and its height is regulated by crank-axles T T. The windlass G, for feeding the machine forward, is operated by a crank, O, Fig. 1, said crank acting upon a lever, W, that connects with the windlass by a pawl, as shown. This crank O is adjustable in length, to regulate the speed of the machine, as desired, and the arms M M, that return the scraper, are also adjustable in length, as shown.

This machine, digging to a depth of thirty inches, is in practical operation and works well, taking out stone as large as the width of the ditch will permit, and leaving the ditch in a well-finished state.

We claim—

1. The horizontal lever B, pivoted to the frame-work at O, and having a movable bearing, c, for the head of the spade A, in connection with the driving-rod D and crank f, as herein described, and for the purpose specified.

2. The sliding colter H, in combination with the spade A and driving-rod D, as and for the purpose specified.

3. The scraper J, when actuated on its return stroke by the arms M, and thrown out on its discharging stroke by the spring L, substantially as shown, and for the purpose described.

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Witnesses:

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