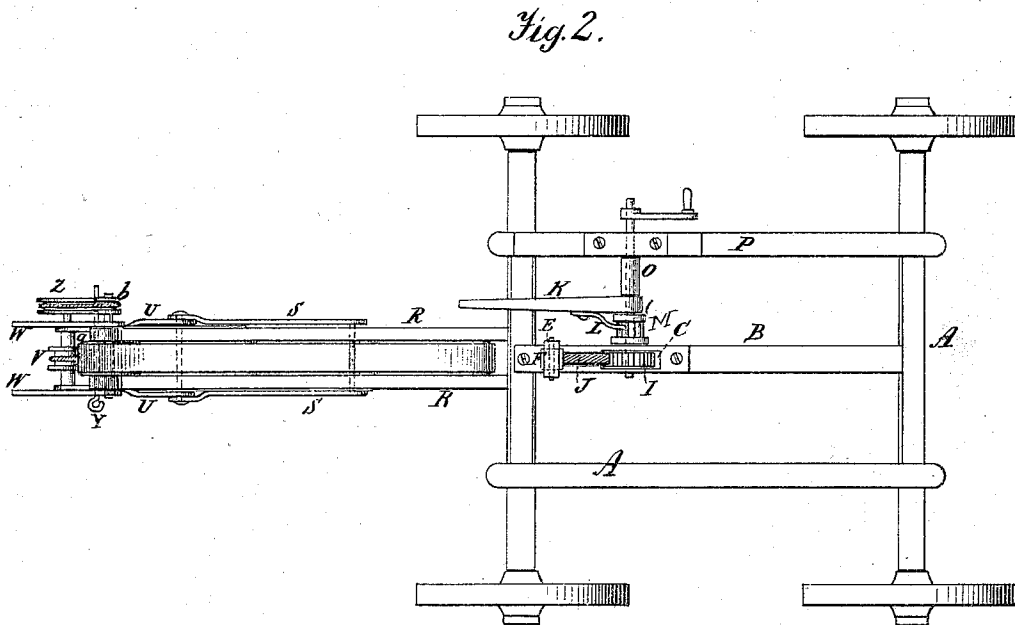
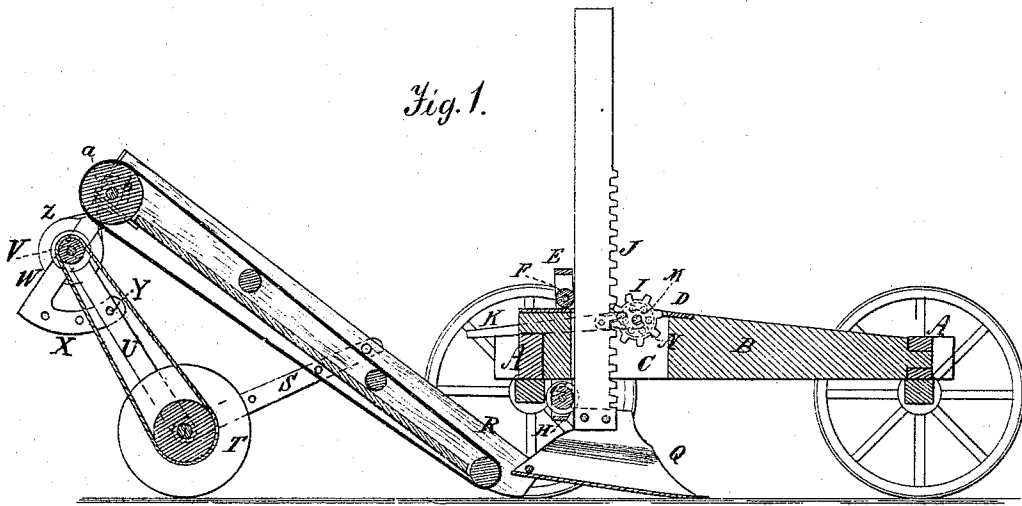


J. W. HUMPHREYS.

Ditching-Machines.

No. 134,991.

Patented Jan. 21, 1873.



Witnesses.
A. Ruppert.
C. S. Cheney

Inventor.
James William Humphreys.
By his attorney
Theodore Munger.

UNITED STATES PATENT OFFICE.

JAMES W. HUMPHREYS, OF LA FAYETTE, INDIANA.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. 134,991, dated January 21, 1873.

To all whom it may concern:

Be it known that I, JAMES WILLIAM HUMPHREYS, of La Fayette, in the county of Tippecanoe and State of Indiana, have invented a new and useful Improvement in Ditching-Machines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a longitudinal vertical sectional view, and Fig. 2 is a plan view of the machine.

This invention relates to an improvement in ditching-machines; and consists in the combination of a pair of metallic arms pivoted at one end to the sides of the chute and at the other to the journals of a large sheave-wheel; an intermediate pair of arms provided with key-holes, secured at one end to the journals of the large sheave-wheel and at the other to the journals of a small sheave having its bearings in another pair of arms pivoted at one end to the sides of the chute near its top, the lower ends of said last-named arms terminating in segmental curves provided with key-holes arranged to connect the segmental curves to the intermediate pair of arms by a key; the object of this part of the invention being to elevate or depress the chute to any desired angle, and to hold it when it has been so elevated or depressed.

In the drawing, A is a frame mounted upon four wheels. B is a beam having the slat C faced by the metal plate D. E is a loop which forms the bearing for the friction-roller F. G is a sheave which acts as a guide and friction roller, and is supported in the hanger H secured to the under side of the beam B. I is a spur-wheel, the teeth of which mesh with the teeth of the rack J. K is a reciprocating lever provided with a pawl, L. M is a ratchet-wheel. A shaft, N, prepared to receive a crank, forms the axes of I and M and the fulcrum for the lever K. A spool, O, between the lever K and the beam P, holds the lever K to its place. Q is the cutter, which is secured to the bottom of the rack J and to the front of the chute R. S S are metallic arms pivoted to the sides of the chute R and to the journals of the sheave-wheel T. U U are metallic arms provided with key-holes pivoted to the journals of the sheave-wheel T and sheave V. W W are metallic

arms pivoted to the sides of the chute R near its upper end, terminating in segmental curves X X provided with key-holes. Y is a key used to connect the arms X X with the arms U U. Z is a sheave fixed on the end of the journal of the sheave V. a is a belt-wheel, which has its bearings in and revolves between the sides of the chute R. A small sheave, b, is fixed upon the end of the journal of the belt-wheel a outside of the chute R. The chute R is provided with internal friction-rollers, which, together with the belt-wheel a, carry an endless apron by which the dirt is conveyed up the chute.

The machine operates as follows: The rack J may be raised or lowered by turning a crank on the end of the shaft N when the pawl L is detached from the ratchet, or by the lever K when the pawl is connected with the ratchet. When the rack J has been raised or lowered to the position desired—the pawl L being connected with the ratchet M—the lever K is rested upon the back of the frame A, detaining the rack at said position. The friction-rollers F and G facilitate the operation of moving the rack J. The journals of the sheave V are placed about the longitudinal center of the arms W W. The segmental curves X X are keyed to the arms U U. The journals of the sheaves b and Z are in the arms W W, and the distance between them always remains the same. The sheave-wheel T transmits motion, by a belt, to the sheave V, which is fixed on the same axis with the sheave Z; motion is thereby given to the sheave Z, whence, through a crossed band, reverse motion is transmitted to the sheave b and the belt-wheel a fixed upon the same axis. Moving the segmental curves X X toward the front of the machine throws the arms U U and W W nearer to a line and increases the angle of the chute. Moving the curves X X to the rear throws the same arms further from a line and decreases the angle of the chute R. As the ditch deepens the rack J is lowered, thereby lowering the cutter Q. The sheave-wheel T runs upon the bottom of the ditch. The dirt may be deposited at the side of the ditch by attaching a receiver and side chute at the rear end of the chute R.

Having thus described my improvement, what I claim as new and useful, and desire to secure by Letters Patent, is—

In combination, the arms S S pivoted to the chute R and to the journals of the sheave-wheel T, the intermediate arms U U provided with key-holes secured to the journals of the sheave-wheel T, and the sheave V, the latter having its bearings in the arms W W pivoted to the chute R and terminating in the curves X X, all in the manner and for the purposes hereinbefore set forth.

In testimony that I claim the foregoing improvement in Ditching-Machines, as above described, I have hereunto set my hand and seal this 2d day of August, 1872.

JAMES WILLIAM HUMPHREYS. [L. s.]

Witnesses:

C. W. COTTON,
RICHARD HARRIS.