





# UNITED STATES PATENT OFFICE.

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## IMPROVED DITCHING-MACHINE.

Specification forming part of Letters Patent No. 53,737, dated April 3, 1866.

*To all whom it may concern:*

Be it known that I, CONRAD FREESE, of Aurelius, Cayuga county, State of New York, have invented a new and Improved Ditching-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side sectional view of my invention, taken in the line *x x*, Fig. 2; Fig. 2, a plan or top view of the same, taken in the line *y y*, Fig. 1; Fig. 3, a detached side sectional view of the rotary digger or excavator, taken in the line *z z*, Fig. 1.

Similar letters of reference indicate like parts.

This invention consists in the employment or use of a rotary digging-wheel arranged in such a manner that it may be adjusted higher or lower, according to the depth of cut required, and using in connection with said digging-wheel a windlass and sweeps, an annular platform, and rollers, all arranged as hereinafter set forth, whereby the digging-machine is placed under the complete control of the operator and the ditch of the requisite depth dug by the passage of the machine once over the ground.

A represents a horizontal framing, constructed in any suitable manner to support an annular platform, B. This framing and platform are supported by four rollers, C C' C'' C''', two of which, C C', are, one, C, at the front, and the other, C', at the rear, of the machine. These rollers, C C', are placed on shafts D D, which are secured at one end to the under side of the framing A by pivots *a*, the opposite ends being placed in bearings *b* of sufficient length to admit of the rollers being adjusted in a more or less oblique position, to facilitate the turning of the machine when required. The rollers C C' are thus adjusted by having rods E E connected to the free or disengaged ends of the shafts D D, said rods being connected at their inner ends to a lever, F, one below and the other above its fulcrum-pin, so that by actuating said lever the rollers C C' may be moved simultaneously and the shafts D made to assume radii of a circle, in which the machine

is to move in turning. When the machine is propelled or moved along in a right line the rollers C C' are retained in a position parallel with each other, the lever F being held in position by a notched semicircular bar, F, attached to the framing A. The other two rollers, C'' C''', have their shafts fitted in fixed bearings, as it is not necessary that said rollers should be adjustable. I would remark, however, that the framing and platform may be constructed in such a manner that one part, designated by *a*<sup>x</sup>, may yield or give, it being made separately from the other part, and the two parts connected by hinges or a flexible connection, so that the device may conform to the irregularities of surface over which it may pass.

G G represent two uprights or standards attached to the framing A, and each having a rack, *a*, secured to it, and H is a rectangular frame, which is fitted in guides *b* attached to the uprights G G, and is allowed to slide freely up and down.

In this frame H there is fitted a vertical shaft, I, the upper ends of which have sweeps J J attached, and on this shaft I there is keyed a bevel-wheel, K, which gears into a bevel-wheel, L, at one side of a rotary digger, M, the shaft N of which has its bearings in the frame H.

On the shaft N of the rotary digger there is placed loosely a windlass, O, which may be connected with or disconnected from shaft N by means of a clutch arranged in any proper way, the windlass O being moved by means of a lever, P, in order to connect or disconnect it from the shaft. This windlass O has a rope, Q, attached to it, which passes down underneath the annular platform, and, extending forward, is attached to an anchor-stake at a suitable distance in front of the machine.

The rotary digger M is composed of a circular plate, *c*, which is keyed on the shaft N, and an annular plate, *d*, which is concentric with the outer edge of *c*, buckets *e* being secured between *c* and *d*. These buckets have cutters *e'* at their outer ends, and said buckets are of slightly scoop form, with bent inner ends, *f*, which serve to retain the earth until they reach a point over, or nearly over, the shaft N, where the earth is discharged by its



own gravity upon an inclined board or chute, *g*, at one side of the excavation or ditch made by the digger *M*.

At the commencement of the operation the digger is raised above the surface of the earth and retained in such elevated position by a bar, *R*, which is pivoted centrally to frame *H*, and has its ends fitting in the racks *a a* of the uprights *G G*. The animals are then attached to the sweeps *J J* and made to travel around the annular platform *B*, motion being thereby communicated to the digger *M*. The windlass *O* is not connected with the shaft *N* during this preliminary arrangement, and when the digger commences to rotate it is gradually lowered and allowed to excavate the earth, the bar *R* being gradually lowered in the racks *a a*, first one end and then the other, until the digger is at the proper depth. The windlass *O* is then connected with the shaft *N* and the machine gradually propelled forward by the winding up of the windlass-rope, the digger excavating as fast as the machine is moved along.

This machine has been practically tested, and has been found to operate well, performing the work rapidly and in a perfect manner.

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

1. The horizontal framing *A* and annular platform *B*, supported by or mounted upon rollers *C C' C'' C'''*, in combination with a rotary digger, *M*, operated by draft-animals attached to sweeps *J* and walking around the platform *B*, substantially as and for the purpose set forth.

2. The two rollers, *C C'*, arranged or applied to the platform *A*, substantially as shown and described, for the purpose of guiding or turning the machine, as set forth.

3. The placing of the shaft *N* of the rotary digger *M* in a rising-and-falling frame, *H*, arranged in connection with racks *a a* and a pivoted bar, *R*, or their equivalents, for the purpose of adjusting the digger to its work, substantially as described.

4. The construction of the rotary digger *M*, as shown and described, to wit, of the circular plate *c*, annular plate *d*, with the buckets *e* between them, provided with cutters *e'* at their outer ends, and with bent inner ends, *f*.

The above specification of my invention signed by me this 27th day of December, 1865.

CONRAD FREESE.

Witnesses:

M. M. LIVINGSTON,  
ALEX. F. ROBERTS.