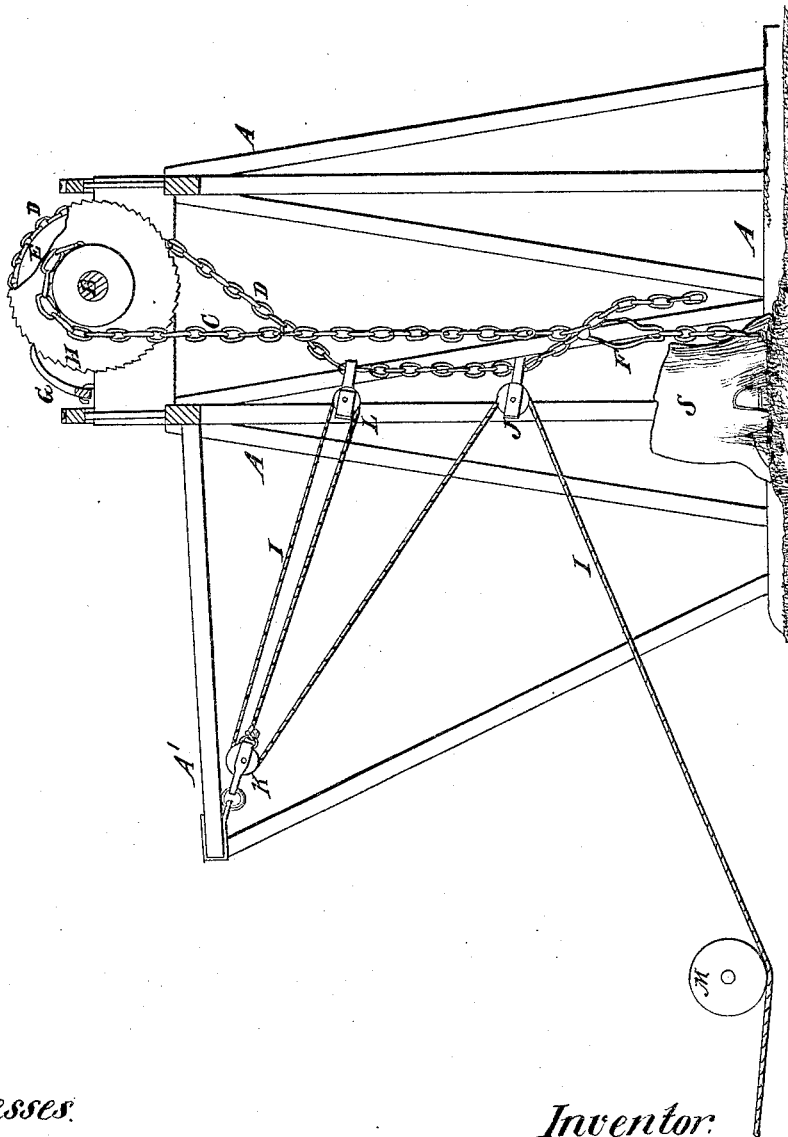


*L. D. Livermore,*  
*Stump Elevator.*  
*No. 51,200. Patented Nov. 28, 1865.*



*Witnesses.*

*C. D. Smith*  
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# UNITED STATES PATENT OFFICE.

LORENZO D. LIVERMORE, OF BEAVER DAM, WISCONSIN.

## IMPROVED STUMP-EXTRACTOR.

Specification forming part of Letters Patent No. 51,200, dated November 28, 1865.

*To all whom it may concern:*

Be it known that I, LORENZO D. LIVERMORE, of Beaver Dam, in the county of Dodge and State of Wisconsin, have invented a new and Improved Stump-Extractor; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawing, which makes a part of this specification, and which represents a sectional elevation of my improved machine.

The subject of my said invention is a machine constructed with a main draft-chain, which is drawn up by the successive deflection of a sway-chain passing around a larger pulley on the shaft on which the draft-chain is wound.

In order to enable others skilled in the art to which my invention appertains to fully understand and use the same, I will proceed to describe its construction and operation.

A A represent various parts of a strong frame, of any suitable construction, for supporting the operating parts of the machine.

B is a shaft journaled in suitable bearings in the frame A.

C is a chain attached at its upper end to the shaft B, or to a small pulley thereon, and adapted at its lower end for attachment to a stump or root.

D is a sway-chain attached at its upper end to a larger pulley, E, on the shaft B, and wound around the said pulley in the opposite direction from the chain C.

The chain D, at its lower end, may either pass through a catch-loop, F, on the chain C, as in the present illustration, or may be attached in any other suitable way to the stump, or to a fixed point, in any manner which will adapt it for readily taking a fresh hold, as will be hereinafter explained.

G is a pawl, hinged to the frame A, and taking into a ratchet-wheel H on the shaft B. A portion of the said ratchet-wheel is in the drawing represented as broken away in order to expose the pulley E.

I is a cord passed around tackle-blocks J, K, L, the first and last of which are hitched to the chain D, while the block K is attached to the projecting part A' of the stationary frame.

The cord I may, if necessary, be passed under a pulley, M, to hold it down in advantageous position for the draft of the team.

S may represent a stump to be drawn.

The operation is as follows: The chain C being attached at its upper end to the shaft B, and at its lower end to the stump S, as before explained, the chain D is drawn through the catch-loop F until both chains are drawn straight and rendered as tight as possible, and is there secured by passing one of its links into the narrow part of the loop F. The pulleys J L are then hooked upon the central part of the chain D, the cord I passed around the pulleys J K L and attached to the pulley K, the team attached to the cord I, and the machine is ready for action. By drawing upon the cord I the chain D is swayed or deflected to the position shown in the drawing, which turns the shaft B with great force, winding the chain C upon it, and thus effectually loosening the stump. The pawl G engaging in the ratchet-wheel H holds all that is gained when the cord I is released. The upper end of the chain C being still held fast, one or both of the blocks J L may be applied thereto and the stump drawn quickly out.

In ordinary cases the stump will be effectually loosened by a single bending or swaying of the chain D, rendering a second hitching of the latter unnecessary; but, if it be necessary the chain D may be a second time drawn tight and secured within the loop F for the application of the power, in the manner before described.

The above machine possesses great superiority in its cheapness, durability, convenience in use, its adaptation to all kinds of work, both large and small, and its completion of the work with one hitching to the stump.

The machine may be used for raising heavy weights and various other analogous uses as well as for the removal of stumps.

From the peculiar nature of the sway-line it will be apparent that a very great force is first exerted to start the stump, and as it yields to this the force decreases with a proportionate increase of motion. The work is thus facilitated to the greatest possible extent.

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

1. The use of the sway line or chain D, operating in the manner substantially as described, to produce an increasing ratio of motion.

2. The described combination of the wheel

and axle E B, sway line or chain D, and draft-chain C, all arranged and operating in the manner and for the purposes set forth.

LORENZO D. LIVERMORE.

Witnesses:

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