2 Sheets—Sheet 1.

T. ENNETT.

Stump-Extractor.

No. 219,237. Patented Sept. 2, 1879.

Fig. 1.

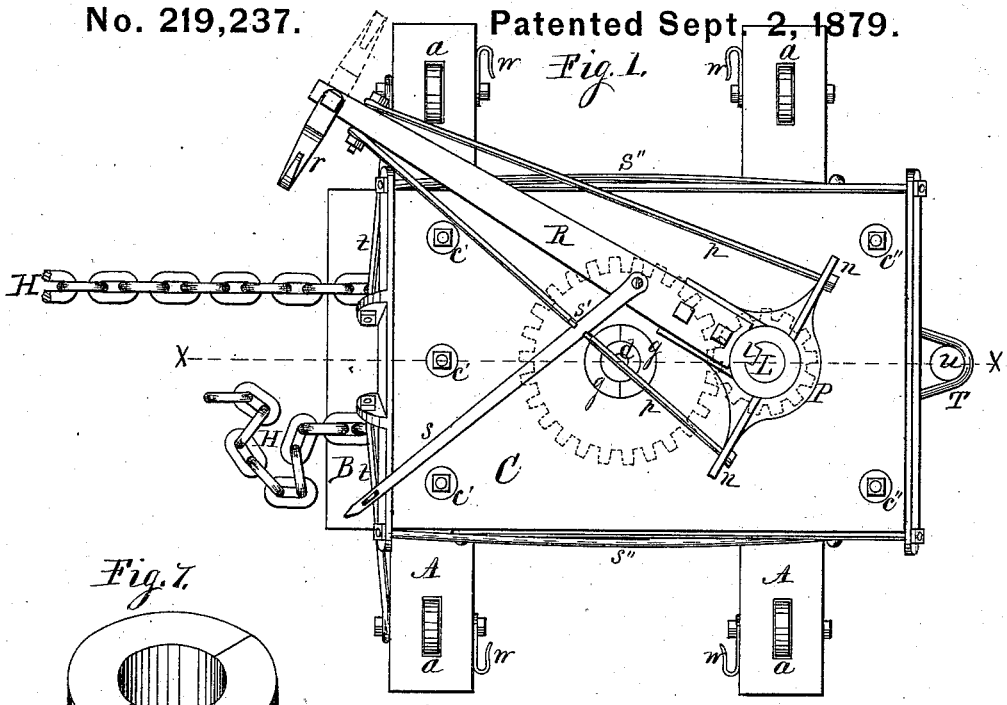


Fig. 7.

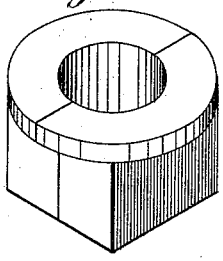
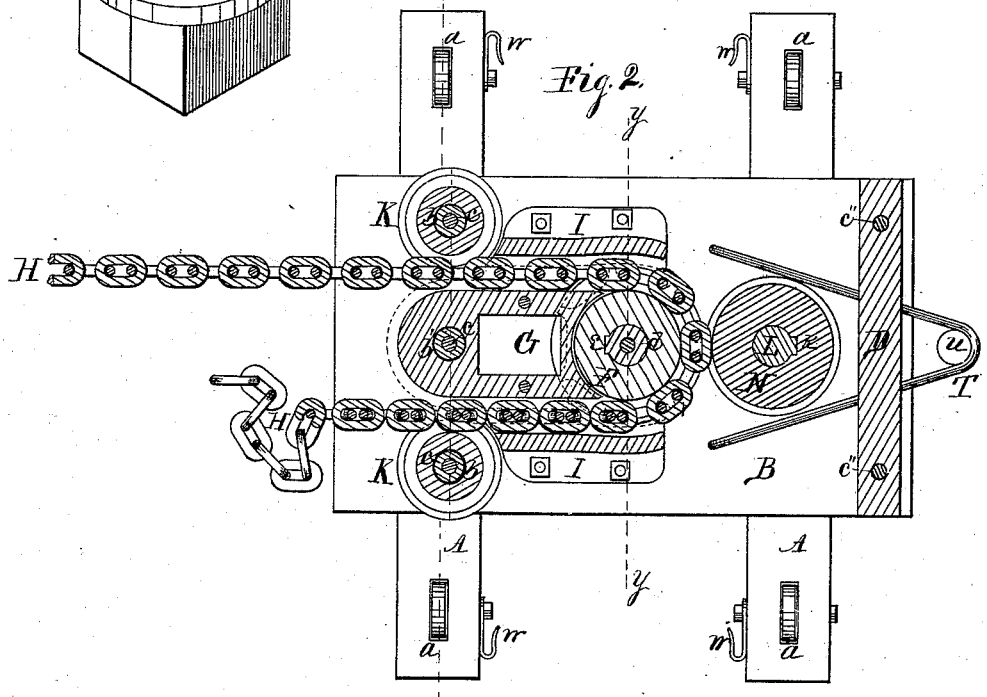


Fig. 2.



Witnesses.
B. Clark White.
A. O. Behel.

Inventor.
Thomas Ennett.
Per Jacob Behel
Atty.

2 Sheets—Sheet 2.

T. ENNETT.

Stump-Extractor.

No. 219,237. Patented Sept. 2, 1879.

Fig. 3.

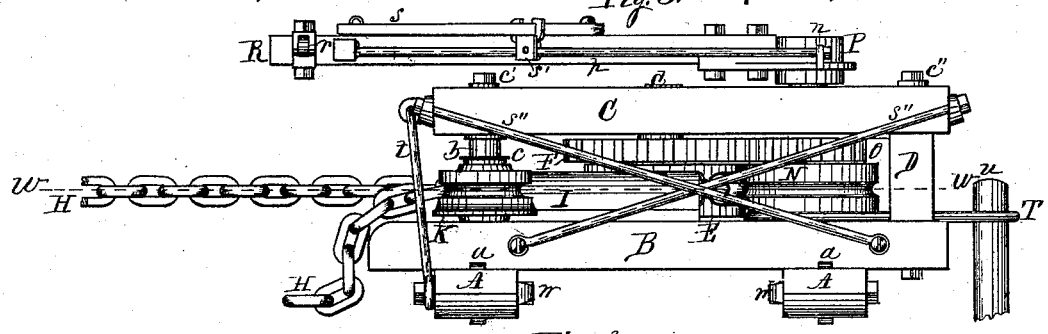


Fig. 4.

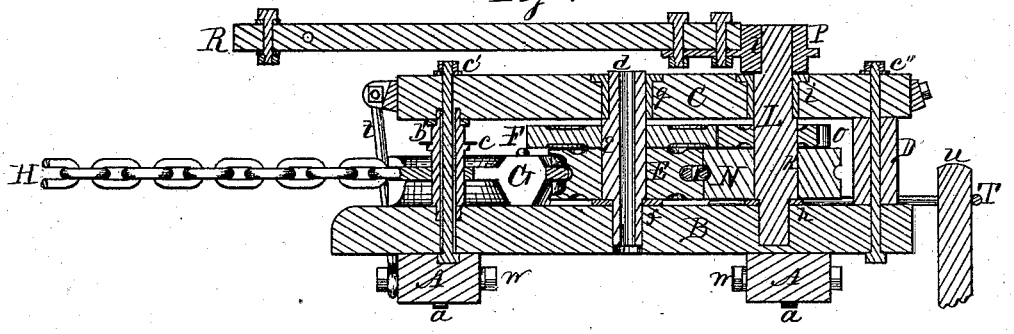


Fig. 5.

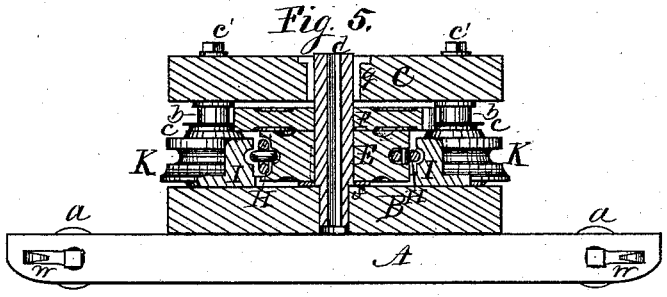
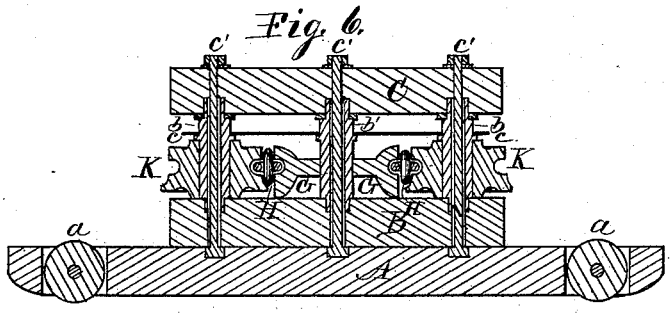


Fig. 6.



Attest.
B. Clark White.
A. O. Behel.

Inventor.
Thomas Ennett.
Per Jacob Behel
Atty.

UNITED STATES PATENT OFFICE.

THOMAS ENNETT, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN STUMP-EXTRACTORS.

Specification forming part of Letters Patent No. **219,237**, dated September 2, 1879; application filed February 24, 1879.

To all whom it may concern:

Be it known that I, THOMAS ENNETT, of the city of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Stump-Extractors, of which the following is a specification.

This invention relates to that class of machines employed to extract stumps and grubs from land, which is especially desirable in the process of clearing wooded lands for agricultural purposes.

The object of this invention is to provide a portable stump-extracting machine capable of all or most of the uses to which a machine of this class is applicable, and in which a cable-chain is carried by a chain-pulley in either direction, as the pulley is turned in either direction, by which either end portion of the chain may be employed, and when one strand of the chain is employed the strand of the free end will be delivered from the pulley in such a manner as to prevent the possibility of its becoming locked or closed in its passage from the machine. These and other improvements, which will be hereinafter more fully explained, constitute the subject of this patent.

In the accompanying drawings, Figure 1 is a plan view of my improved stump-pulling machine, of which Fig. 2 is a horizontal section on dotted line *w*. Fig. 3 is a side elevation. Fig. 4 is a central lengthwise vertical section on dotted line *x*. Fig. 5 is a transverse vertical section on dotted line *y*. Fig. 6 is a transverse section on dotted line *z*. Fig. 7 is an isometrical representation of the divided box.

In the several figures, A represents sills, which are provided with supporting rollers or wheels *a*, near their ends, fitted to revolve on journal-bolts passed transversely through the sills.

B represents a bed-plank, supported near its ends on the central portion of the sills A, to which it is firmly fixed.

C represents a cap-plank, supported above the bed-plank at its rear end on a transverse beam, D, which rests on the bed-plank, and at its forward end on tubular pillars *b* and *b'*, which also rest on the bed-plank.

c represents a transverse bar, fitted to connect the upper portion of the vertical pillars *b* and *b'*. The bed-plank and cap-plank are firmly fixed in this separated position at their forward ends by means of sufficient screw-bolts *c'*, which are passed through the plank and through the tubular pillars, and at their rear ends by similar bolts *c''*, which are passed through the plank and through the transverse beams D. These bolts, by means of sufficient screw-nuts, serve to fix the planks in their relative position firmly, and constitute the main frame of my improved stump-extractor.

E represents a chain-pulley, having its periphery fitted to receive the links of a cable-chain in the manner common in chain-pulleys. Its center is bored and grooved, as in key-seating, to receive the shaft *d*, which, in this instance, is tubular and is formed with a lengthwise rib, *e*, to freely enter the groove in the center bore of the chain-pulley.

F represents a spur-toothed gear-wheel, having its center bored and grooved in the same manner as the chain-pulley, and fitted to receive the same shaft in the same manner. The foot of the shaft *d* is fitted to revolve in a box, *f*, placed about centrally in the upper face of the bed-plank, and its upper end fitted to revolve in a divided removable box, *g*, let into the cap-plank.

In putting these parts in place, the divided box having been removed, the chain-pulley is first placed in position on the bed-plate over the fixed box *f*. The spur-toothed gear-wheel is then placed in position above the chain-pulley. The shaft *d* is then inserted from above and is passed through the cap-plank C, then through the spur-toothed gear-wheel, with the rib *e* entering the groove, and through the chain-pulley in the same manner, and into the fixed box *f*, which is the foot-support of the shaft *d*. The divided box *g* is then inserted in the cap-plank, embracing the upper portion of the shaft *d*, which fixes the wheels in position to revolve with the shaft.

By this construction any or all of these parts may be removed and replaced without disturbing the main frame.

G represents a central chain-guide having its rear end of proper conformation to receive the periphery of the chain-pulley in such a manner as to insure the delivery of the chain from the pulley in its revolutions. Its length-

wise parallel edges are grooved to receive the horizontal projecting portion of the links of one side of the chain. This central chain-guide is placed in close proximity to the forward side of the chain-pulley, with its lengthwise parallel sides parallel to the lengthwise sides of the main frame, to which it is firmly fixed.

H represents a cable-chain of ordinary construction, formed of links adapted to engage the chain-pulley with which it is placed in contact, having its ends passing out of the forward end of the machine, with the inward portion of its links in the grooved edges of the central chain-guide.

I are side guideways, grooved on their inner edges to receive the outward projecting portion of the chain-links. These side guides are fixed to the main frame in such relative position to the center guide-cam as to receive the vertical projecting portions of the links between their adjacent edges, which, in connection with their lateral central grooves, direct the course of the chain in its passage from the chain-pulley to insure its complete delivery from the machine. K are guide-rollers, grooved to receive the cable-chain, and are fitted to revolve immediately in advance of the forward ends of the side guides on the outer pillars, *b*, and serve to direct the entrance of the chain to the grooved guideways; but these rollers may be dispensed with and substantially the same purpose accomplished by extending the side guides forward and curving their ends outward.

With the chain in place, it will be seen that, if the chain-pulley is made to revolve, the chain will be drawn inward from the forward end of the machine through the grooved guideways on one side, and discharged at the forward end of the machine through the guideways on the opposite side of the machine. This same result will be produced if the chain-pulley is revolved in either direction. This enables me to employ alternately both portions of the chain, by which a saving of time is accomplished.

L represents the main driving-shaft, having its lower end fitted to revolve in a box, *h*, fixed in the bed-plank, and its upper portion fitted to revolve in a divided removable box, *i*, let into the cap-plank from its upper side. This shaft is provided with a lengthwise rib, *k*, projecting from its side, and adapted to enter key-seat-like grooves formed in the side of the center openings of the wheels mounted thereon.

N represents a guide-wheel, grooved on its periphery to receive the outward-projecting portions of the chain-links, and is mounted on the driving-shaft L, with the rib *k* engaging the key-seat-like groove in the wheel, and in such relative position to the chain-pulley that its grooved periphery will receive the outward-projecting portions of the chain-links and hold the chain in contact with the pulley.

O represents a spur-toothed pinion mounted on the driving-shaft above the guide-wheel N, with the rib *k* engaging the key-seat-like groove in the wheel, and in such position that its gear-teeth engage the teeth of the large gear-wheel F. These parts can be readily removed and replaced by removing the divided box *i* and then withdrawing the shaft L, which will leave the spur-pinion and guide-wheel free to be removed without disturbing the frame. The portion of the driving-shaft L which extends above the main frame is grooved, as in key-seating, and is designed to receive the spider P, which is formed with an inward-projecting rib, to enter the key-seat groove of the shaft. This spider is formed with a flanged arm, to which the inner end of the sweep-arm R is bolted. This spider is also provided with arms *n*, extending laterally at right angles to the sweep-arm. *p* are brace-rods, which connect with the forward portion of the sweep and with the outer portion of the lateral arms of the spider, at which point their ends are screw-threaded and fitted with screw-nuts, by means of which the brace rods are tightened, producing a trussed sweep capable of use in either direction. *r* is a draft-hook, pivoted to the forward end of the sweep, adapted to receive the whiffletree, to which the team is attached, and is capable of use to move the sweep in either direction, to utilize either or both ends of the cable-chain.

s is a lead-bar, employed to lead the team attached to the machine, and is pivoted to the sweep-arm near its inner end, and extends outward over the brace-rods of the sweep, on which it is supported by means of a clasp, *s'*, having its upper end forked to receive the lead-bar, and is made adjustable lengthwise on the brace-rods, and when adjusted can be fixed in position by means of a clamping-screw passing through its two branches above the brace-rod. It is designed to use a like clasp to that represented at *s'* on the brace on the opposite side of the sweep-arm to support the lead-arm when changed to the opposite side. By means of these adjustable forked clasps the sweep-arm can be adjusted forward or backward to properly lead the team attached to the machine, and it can be changed to lead on either side of the sweep-arm.

s'' are brace-rods placed diagonally in X form on the vertical lengthwise edges of the main frame, and are provided with a screw-thread and screw-nuts, by which they can be tightened, to hold the frame rigid to resist lengthwise strains.

t are brace-rods placed diagonally on the forward vertical end of the main frame, and are provided with a screw-thread and screw-nuts, by which they can be tightened to resist lateral strains.

T represents an anchor-loop fixed to the main frame, and extends beyond its rear end to receive the anchor-post *u*, by which the machine is fixed in position. This anchorage, however, may be varied in the manufacture to meet the requirements of the machine.

It will be seen that in a machine having re-

movable shafts, substantially as herein described, the several wheels mounted thereon may be removed and replaced, or new ones substituted, without disturbing the frame. This feature is also found to be a great convenience in handling the machine, in shipping or in moving it from place to place.

w represents draft-hooks, by which to connect a team to move the machine from place to place when in use, in which instance the carrying-wheels in the outer portion of the sills will serve to reduce the friction. The hooks *w* may also be employed for the purpose of side anchorage when required.

In use, the machine, having been brought into position, is then firmly anchored in place and one end portion of the cable-chain withdraw from the machine, and is connected with the stump, grub, or other substances to be operated upon by any suitable means, such as grappling hooks or chains; or branching grappling chains or hooks may be employed. Power is then applied to the sweep-arm to impart a rotary movement to the chain-pulley in the proper direction by means of its gear-toothed connection therewith, to take in the branch of the chain connected with the object to be operated upon. By this means the power of the machine will be exerted on the object to be moved, and the chain taken in on one side will be paid out or discharged on the opposite side through the grooved guideways, which will insure its complete delivery, and by reversing the movement of the sweep-arm the other end of the cable may be employed in the same manner as above described.

I also construct machines of less power, in which I dispense with the spur-toothed gear-wheels, in which instance the shaft of the chain-pulley extends above the cap-plank, and is fitted to receive the sweep-arm in substantially the same manner as it is applied to the shaft of the spur-pinion.

By this construction I produce a cheap, light, and small machine capable of use as a grubbing-machine, and many other purposes for which like machines are required.

I claim as my invention—

1. The combination, with a chain-carrying wheel, of a chain-delivery guide adapted to deliver the chain from the wheel in its revolutions, substantially as hereinbefore set forth.

2. The combination, with a chain-carrying wheel and delivery-guide, of guideways to insure the delivery of the chain from the machine when carried by a revolving chain-carrying wheel, substantially as and for the purpose hereinbefore set forth.

3. The combination, with a chain-carrying wheel and a central and stationary elongated chain-guide, of the forward guide-rollers, located sufficiently near the stationary chain-guide to be revolved by the movement of the chain, substantially as set forth.

4. The combination, with the spider P and the sweep-arm R attached thereto, of brace-rods *p*, screw-threaded at their rear ends, and adjustably attached to the spider-arms, substantially as set forth.

5. The combination, with the trussed sweep, of a lead-bar pivoted thereto and a clasp for adjustably connecting said bar to the brace-rods *p*, substantially as set forth.

THOMAS ENNETT.

Witnesses:
B. CLARK WHITE,
A. O. BEHEL.