

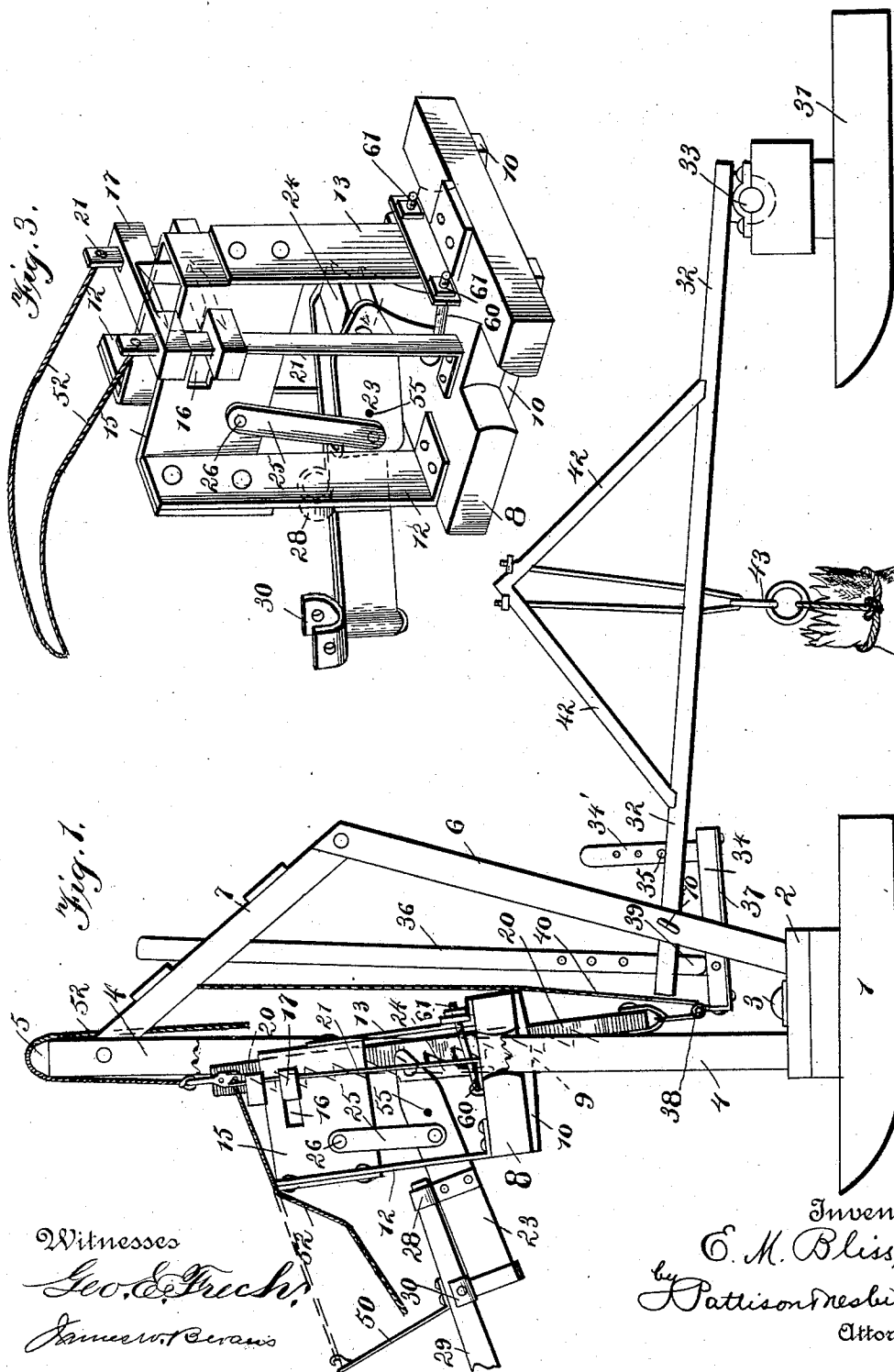
(No Model.)

2 Sheets—Sheet 1.

E. M. BLISS.
STUMP PULLER.

No. 580,759.

Patented Apr. 13, 1897.



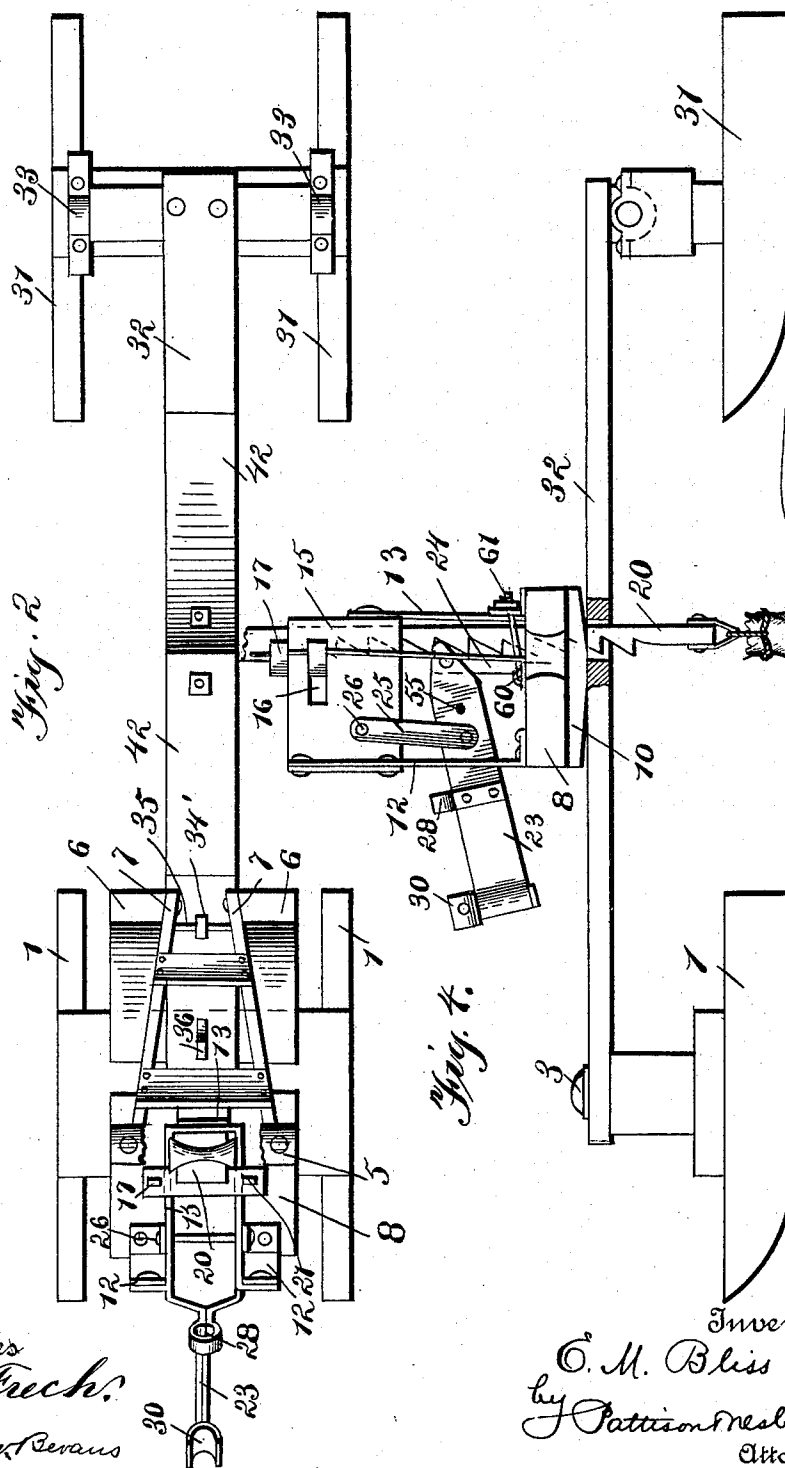
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Witnesses
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UNITED STATES PATENT OFFICE.

EBENEZER M. BLISS, OF TACOMA, WASHINGTON.

STUMP-PULLER.

SPECIFICATION forming part of Letters Patent No. 580,759, dated April 13, 1897.

Application filed August 3, 1896. Serial No. 601,485. (No model.)

To all whom it may concern:

Be it known that I, EBENEZER M. BLISS, of Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Stump-Pullers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in stump-pullers; and it consists in the construction and arrangement of parts which will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a side elevation of a stump-puller embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a detached view of the lifting-lever and pawls with their supporting structure. Fig. 4 is a modified construction whereby the upper work may be dispensed with for light work.

Referring now to the drawings, 1 represents a sled upon which is mounted a base 2, swiveled to the base of the sled through the medium of a central bolt 3.

4 are standards projecting from one side of the base 2 and connected at their upper ends by a cross-piece 5, and 6 are standards at the opposite side of the base 2, extending outward slightly at an inclination and connected at their upper ends to the upper ends of the standards 4 through the medium of the braces 7. These standards and braces form a framework supported by the base 2, upon which the elevating mechanism is supported.

The operating elevating mechanism is supported upon a base or bed 8, arranged upon the standards 4, the said standards having notches 9, and the under side of the bed-plate runners 10, for the purpose to be described hereinafter. Extending upward from the bed 8 are the standards 12 at one side and the central standard 13 at the opposite side. These are connected at their upper ends by an essentially U-shaped iron plate 15, provided with horizontal slots 16, registering with each other, as clearly shown.

A pawl 17 is essentially H-shaped, and the upper portions are cut away at their under

sides at an incline to form notches or teeth adapted to interlock with the notches or teeth upon the ratchet-bar 20. The lower wings or arms of the pawl extend through the slots of the U-shaped plate, and the pawl is normally held in engagement with the ratchet-bar 20 through the medium of the springs 21, having their lower ends secured to the base 8 and extending upward, the said springs being preferably of flat steel, as shown.

A lever having its inner end bifurcated, as shown at 23, carries a double-toothed pawl 24, having teeth corresponding to and intermeshing with the teeth of the ratchet-bar 20, and this lever is fulcrumed upon the links 25, the upper ends of the links being supported by bolts 26 in the U-shaped iron plate and their lower ends pivotally connected to the bifurcated ends of the lever, as clearly shown in the drawings. The outer end of this lever is provided with a socket 28 to receive the inner end of the lever 29 and also a socket 30, in which the lever is connected.

A second sled 31 is provided, upon which one end of a lever 32 is fulcrumed by means of a bolster 33, the opposite end of the lever 32 extending in between the inclined standards, as illustrated. Situated below this end of the lever or timber 32 is a second short lever or timber 34, having one end connected to the timber 32 by means of a standard 34' through the medium of a pin 35.

A lever 36 passes freely through an opening in the free end of the timber 32 and has its lower end pivotally connected to the short lever therebelow, and this short lever or timber has its lower side faced with a heavy sheet-metal strip 37, the inner end of the metal extending upward and provided with a sheave or pulley 38. The lever 36 is provided with a heavy shoulder 39, upon which the adjacent end of the timber 32 rests and is thereby supported by the short timber below.

A rope, cord, or chain 40 has one end connected with the lower end of the ratchet-bar 20, passes around the sheave or pulley of the lower short timber, and its opposite end connected to the brace-bars 7.

A truss 42 is situated intermediate the ends of the timber 32 and a ring 43 connected therewith, the said ring adapted to receive the

rope or chain which is attached to the stump or other load which the machine is intended to operate upon.

In operation the lever is drawn downward, and through the medium of the double-toothed pawl 24 and the manner of supporting the lever through the links the pawl 24 is forced inward against and intermeshes with the teeth of the long rack-bar 20, and it is drawn upward notch at a time and caught by the pawl thereupon, as will be readily understood. The teeth of this pawl are made to exactly register with the teeth of the ratchet-bar 20, so that several of them are engaged thereby, making a hold upon the ratchet-bar more firm and strong. The teeth of the pawl 24, carried by the operating-lever, may be of any desired length and may be very short, if desired, whereby a greater number of teeth will be provided and the arrangement thus made much stronger. When, through the medium of the lever, the ratchet-bar 20 has been elevated, and through the medium of the short timber and the long timber 32 the load raised as high as desired, a rod 70 is passed through the standard 6 below the timber 32, and then the timber 32 lowered to rest thereon. The ratchet-bar 20 is then lowered step by step in a manner to be now described. The lever is provided with an upwardly-projecting spring 50, having a hook at its upper end, as shown, and a rope, wire, or chain made in loop form has its ends connected with the upper ends of the springs which actuate the pawl. By engaging this loop with the hook of the lever-spring a slight downward pull upon the lever will draw outward upon the pawl and permit the teeth of the ratchet to escape by the pawl, and through the medium of the rope 52 the ratchet-bar may be lowered. At the time the lever is drawn downward it is also drawn slightly outward, which will, through the medium of the links or fulcrum upon which it is supported, disengage the double-toothed pawl from the long rack-bar, thus enabling the rack-bar 20 to be lowered. When this has been done, the bar 36 is permitted to pass down through the timber 32, and also the standard of the short timber passes through and the supporting-pin therefor placed in new openings or holes, so that the short timber is suspended at a greater distance below the timber 32, and the machine is now ready to again have the timber 32 elevated and the load continued to be lifted, as will be readily understood. In this way the distance between the timber 32 and the short timber below it, upon which the rack-bar 20 operates, is regulated and the load lifted step by step until the stump is extracted or the object sought accomplished.

When small loads are being operated upon, the lower ends of the links which are connected to the bifurcated ends of the operating-lever can be adjusted outward, the bifurcated end being provided with a series of openings 55 for that purpose, which of course

will increase the movement of the short ratchet-bar and thereby the movement of the long ratchet-bar by moving it two notches at each operation of the operating-lever instead of one.

A yoke 60 is provided at the base 8, and this yoke surrounds the rack-bars, as clearly shown, and is provided with tightening-screws 61. By this means the yoke may be drawn up and the two racks held firmly together and prevent them from slipping and cutting or breaking the teeth, as will be readily understood, when lifting very heavy loads. This yoke serves to bind them firmly and absolutely together, as will be readily understood.

The free end of the timber 32 is prevented from having any side movement by the standard 6, but it is permitted to have a slight endwise movement under the tension caused by the load. In order to prevent any torsional strain upon the ratchet-bar 20, the bed 8 is provided with rockers, as before described, which enables it to tilt and thus to cause the lower end of the ratchet-bar 20 to accommodate itself to the slight endwise movement of the timber 32 and to make always a direct pull upon the bar which will prevent the torsional strain and thereby avoid the breaking of the rack-bar by any undue torsional strain.

For grubbing purposes or pulling light loads the upper structure of the front sled may be detached, as shown in Fig. 4, and the bed 8 placed directly upon the timber 32, as there shown, and the load connected direct to the rack-bar 20. After the stump has been pulled the pin 70 is inserted through the free end of the lever 32 inside of the standard 6, so that as it is drawn the front sled will draw along with it the rear sled to the next point of operation.

From the above description it will be seen that I have produced a machine capable of lifting heavy weights and of being drawn from place to place for ready operation and to be converted from a machine adapted to operate upon heavy loads to one for grubbing and light purposes.

While I have thus shown and described a single lever operating upon the rack-bar 20, it will be readily understood that this rack-bar may be provided with teeth upon opposite sides and a duplication of the levers provided one at each side of the rack-bar. By means of this construction a double operation is provided and a double power also effected.

In order to prevent the breaking of the expensive parts of the machine, the pivotal bolts upon which the operating-lever is hung, or, in other words, the fulcrum, will be made weaker than the timber 32 and the other parts of the machine, so that in case of an overstrain the fulcrum-points will be broken before the expensive parts of the machine are in any way mutilated. This will be found a great advantage, for it often happens that too much strain is put upon machines of this character.

Having thus fully described my invention,

what I claim, and desire to secure by Letters Patent, is—

1. A stump-puller comprising two sleds, one having an upper structure, a lifting mechanism carried by the upper structure, a timber having one end journaled upon one sled and its opposite end moving freely in the upper structure of the other sled, and a connection between the elevating mechanism and the free end of the timber, substantially as described.

2. An elevating mechanism for the purpose described comprising a base or bed plate as 8, an upper structure thereon, a ratchet-bar 15 movable in the upper structure, a horizontally-movable spring-actuated pawl adapted to engage the rack-bar, an operating-lever suspended upon links, and a pawl carried by the

said lever adapted to engage the rack-bar, the parts combined and operating as described. 20

3. In a stump-puller, the combination of the two sleds, one having an upper structure, an elevating mechanism carried by the upper structure, a timber as 32 having one end fulcrumed upon one sled, its opposite end movable in the upper structure, and an under timber, an adjustable connection between the two timbers, and a connection between the elevating mechanism and the lower timber, the parts combined to operate as described. 30

In testimony whereof I affix my signature in presence of two witnesses.

EBENEZER M. BLISS.

Witnesses:

ALTON PICKENS,
GEO. TIBBITS.