(No Model.) 2 Sheets—Sheet 1.

W. SMITH.

STUMP EXTRACTOR.

No. 457,798. Patented Aug. 18, 1891.

Fig. 1.

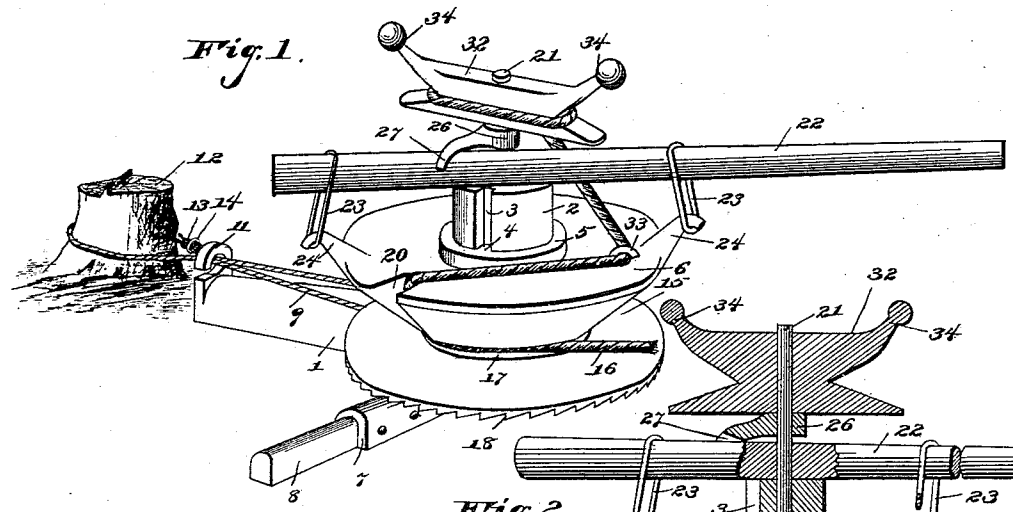


Fig. 2.

Fig. 3.

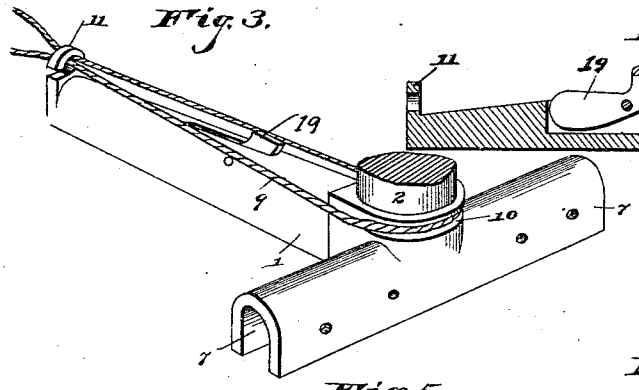


Fig. 4.

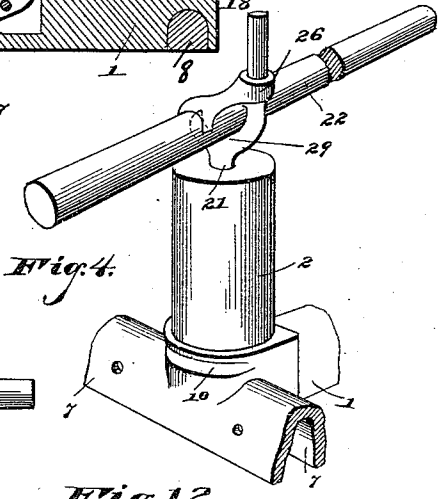


Fig. 5.

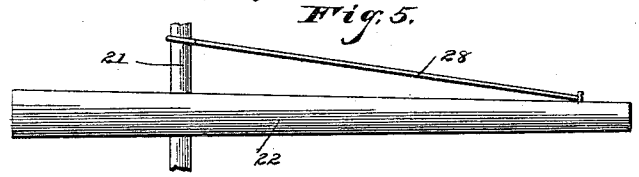


Fig. 6.

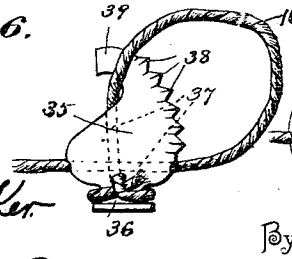
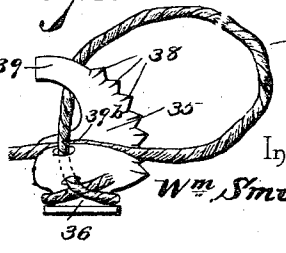


Fig. 7.



Fig. 12.



Witnesses

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(No Model.) 2 Sheets—Sheet 2.

W. SMITH.

STUMP EXTRACTOR.

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Fig. 8.

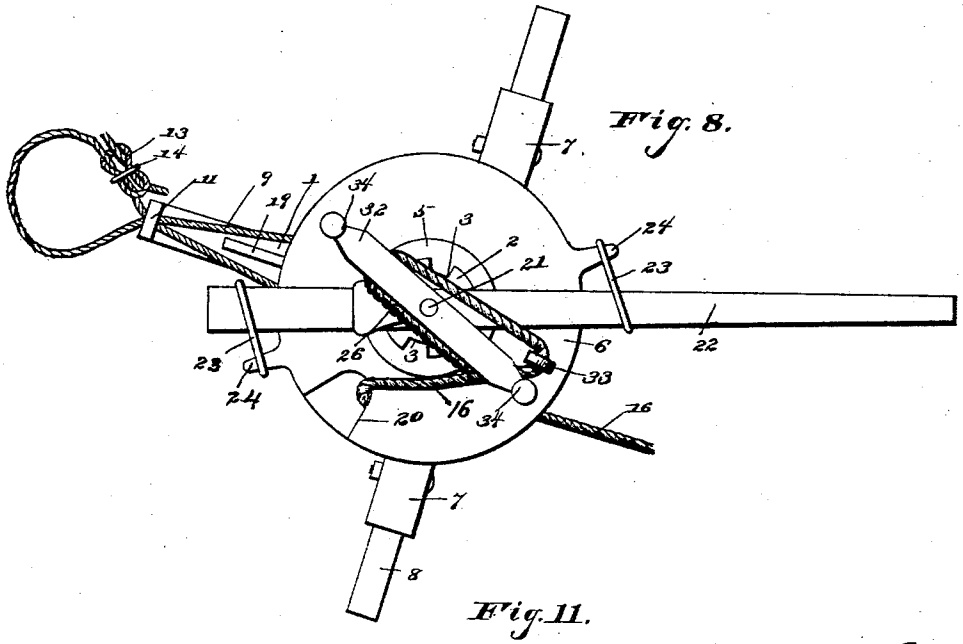


Fig. 11.

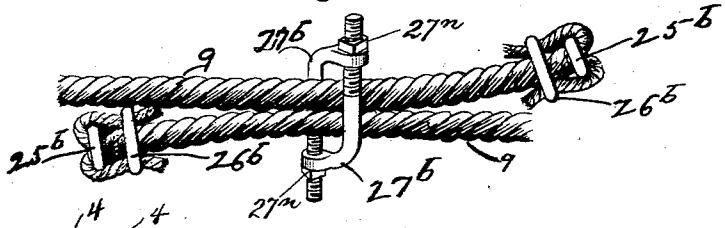


Fig. 9.

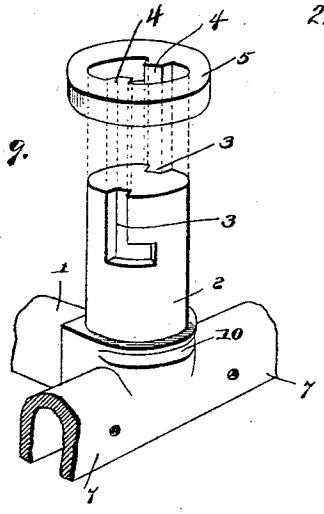
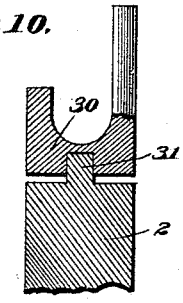


Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM SMITH, OF MYSTIC, IOWA.

STUMP-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 457,798, dated August 18, 1891.

Application filed October 3, 1890. Serial No. 366,942. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SMITH, a citizen of the United States, residing at Mystic, in the county of Appanoose and State of Iowa, have invented a new and useful Stump-Extractor, of which the following is a specification.

This invention relates to grubbing-machines or stump-extractors; and it has for its object to construct a machine of this class which shall possess superior advantages in point of simplicity, durability, and general efficiency.

My present invention relates particularly to the construction of the base and the method of anchoring the same in position for operation.

The invention further consists in an improved construction of the drum or spool and the method of mounting the same upon the base.

The invention further consists in improved means or mechanism for taking up any slack in the rope previous to the commencement of operations.

The invention further consists in means for supporting the sweep or lever in an approximately horizontal position during operation.

The invention further consists in means for connecting the rope with or securing it to the stump which is to be extracted.

The invention finally consists in the improved construction, arrangement, and combination of details, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of a stump-extractor embodying my improvements. Fig. 2 is a longitudinal vertical sectional view of the same. Fig. 3 is a detail view of the base, showing the arrangement of the anchor-rope. Fig. 4 is a perspective view showing the connection of the sweep or lever with the central shaft or post. Fig. 5 is a side elevation illustrating a modification of the sweep or lever. Fig. 6 is a perspective detail view of one of the ties for connecting the operating-rope with the stump to be extracted. Fig. 7 is a perspective view illustrating a modified form of said tie. Fig. 8 is a plan view showing the machine arranged in position for operation. Fig. 9 is a detail view illustrating a modified method of connecting the winding-drum with the base-post. Fig. 10 is a detail view showing a modified construction of the shaft or device for supporting the sweep and supplemental reel. Fig. 11 is a detail view showing a modified manner of connecting the ends of the anchor-rope. Fig. 12 is a detail view showing a modification of the tie for the operating-rope.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the base, which is provided with a vertical post 2, forming the bearing of the winding-drum. The upper end of said post is provided with L-shaped notches or recesses 3 3 to accommodate the studs 4, which are formed upon the inner side of a ring or washer 5.

6 designates the winding-drum, which is mounted upon the post 2 and which is retained in position upon the latter by means of the ring or washer 5, which is adjusted upon the upper end of the said post with its studs 4 engaging the notches 3, said ring being retained by partially turning it so as to cause the studs 4 to engage the lower horizontal portions of the said L-shaped notches. It will thus be seen that the winding-drum is retained securely in position, and that the bore of the winding-drum may be made to fit the post 2 accurately, so as to prevent wabbling.

The base-plate 1 is provided at one end with laterally-extending curved or inverted-U-shaped flanges 7, in which a supporting-bar 8 is seated and suitably bolted or otherwise attached. This device is for the purpose of preventing the machine being tilted or upset during the operation.

The anchor-rope, which is designated by 9, passes along the entire length of the base, which latter is provided with a flange 10 and a hook or loop 11 to retain the said anchor-rope, which latter passes around the stump or stake 12, to which the machine is to be anchored. The ends of the anchor-rope are tied together, as shown at 13, and the looped or knotted portion is encircled by a link 14,

which serves to hold it securely and to prevent its becoming undone, while at the same time it obviates the necessity of a hard knot being formed. Consequently the anchor-rope may readily be undone when it is desired to remove the machine from one place to another.

The anchor-rope is a wire rope, and its ends are secured in the following manner: An iron ring, designated by 25^b, is shrunk upon the rope or cable about four inches from each of its ends. The strands at the ends are then separated and brought back over the ring 25^b, and another ring 26^b is shrunk upon the said ends, which are thus secured in position, forming, practically, a knot which will absolutely prevent the slipping of the ends of the anchor-rope.

Instead of a simple link to secure the loop or knot at the ends of the anchor-rope, I may avail myself of the clamping device shown in detail in Fig. 11 of the drawings, the same being composed of two eyebolts 27^b 27^b, which are bent as shown, the shank of each being passed through the eye of the other and provided with a tightening-nut 27^n. It will be seen that this clamp may be readily fitted and tightened upon the loop or knot which connects the ends of the anchor-rope, thus positively preventing the possibility of the ends slipping or becoming separated under the strain to which the machine is in operation subjected.

The winding-drum 6 is provided with an annular V-shaped groove 15 to accommodate the operating-rope 16. At the bottom of the said groove 15 is formed a groove or recess 17 of sufficient size to accommodate a single coil of the operating-rope. By this construction I avoid squeezing or flattening the innermost coil or operating-rope, which is a very common objection in this class of machines and which quickly results in destroying the rope. At the same time the second coil of rope is enabled to get a firm hold or purchase upon the first coil, which, in a machine constructed in accordance with my present invention, is very important, for reasons which will be presently set forth. The under side of the winding-drum is provided with a circumferential series of teeth or ratchets 18, engaging a dog or pawl 19, which is mounted pivotally in the base. This is for the obvious purpose of preventing the drum from rotating in a reverse direction under the strain of the operating-rope in the event of the operation being temporarily suspended. The dog or pawl 19 may be either weighted or spring-actuated, so as to engage the teeth 18 automatically, and I would have it understood that the said pawl-and-ratchet mechanism may be located at any other convenient point than that herein shown and described.

The winding-drum is provided in its upper portion with a vertical notch or recess 20, through which the end of the operating-rope passes upwardly and is disposed of, as will be presently described.

21 designates a shaft or axle, which rises vertically from the post 2. Suitably mounted upon this shaft or axle is the lever or sweep 22, which is connected by links 23 with horns or projections 24, extending from opposite sides of the winding-drum. The latter, it will be seen, may thus be rotated by means of a lever the outer end of which is provided with whiffletrees for the attachment of the draft.

For the purpose of maintaining the sweep or lever in an approximately horizontal position I may avail myself of a washer 26, mounted upon the shaft 21 above the lever and having a bifurcated extension 27, affording a rest for the short end of the latter. It will thus be seen that when the weight of the long end of the sweep or lever forces the short end of the latter in an upward direction, causing the washer 26 to grip or bite upon the shaft 21, and thus preventing the long end of the sweep from dropping too far, washers, such as 26, may, if desired, be arranged both above and below the lever or sweep 22. These washers may also be dispensed with, and I may in lieu thereof connect the outer end of the sweep with the upper end of the shaft 21 by means of a rod or chain 28, forming a brace, as will be seen in Fig. 5 of the drawings.

In Fig. 4 of the drawings I have also illustrated a modification whereby the shaft 21 is provided at its upper end with a fork 29, in which the lever or sweep is arranged and where it is retained by the washer 26, mounted upon the long arm of said fork.

Another modification has been illustrated in Fig. 10, whereby a forked casting 30 is mounted upon a spindle 31, extending upwardly from the post 2. It will be understood that the operation is practically the same as above described.

Upon the upper end of the shaft 21 or upon the fork at the upper end of the latter or in any suitable position above the sweep or lever is loosely mounted a reel 32, upon which is wound the end of the operating-rope, passing upwardly through the notch 20 in the winding-drum. The latter may also be provided with hooks or guide-cleats 33, one or more, under which the said operating-rope may be passed previous to being wound upon the reel. The latter may be conveniently operated by hand, and for this purpose is preferably provided with handles 34.

35 designates a tying device consisting of a block having a neck or shank 36 and transverse perforations 37, formed approximately at right angles to each other. One side of the tying device is also provided with a series of teeth or serrations 38, and a horn or hook 39 is formed at its upper end.

In practice the operating-rope 16 is passed through the perforations 37 and attached to the shank 36. Said operating-rope is then looped around the stump which is to be extracted, with the teeth or serrations 38 bearing against the side of said stump. It is obvious that the stronger the pull that is ex-

erted upon the operating-rope the more tightly will it be caused to bind upon the stump.

In Fig. 7 I have illustrated a modified form of the said tie, which consists in simply dispensing with the hook or horn 39; but I consider the latter advantageous, inasmuch as it affords a smooth bearing-surface for the operating-rope and prevents the latter from being quickly worn or abraded.

Still another modification of the tying device has been shown in Fig. 12 of the drawings. By this modification I dispense with one of the perforations 37, while the hook or horn 39 is retained. A groove or recess 39^b is formed transversely in the block 35 to accommodate the rope. By this modification the hook or horn 39 serves to connect the end of the rope with the body of the same, which may thus be passed around the tree or stump which is to be extracted and secured in a very easy and convenient manner.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains. The base is first connected with the stump or stake which is to serve as an anchor, and the outer end of the operating-rope is then connected by means of a tying device 35 with the stump which is to be extracted. If there is any slack in the rope after attaching its outer end, such slack may be taken up by winding the superfluous portion of the rope upon the reel 32, which may be readily operated by hand, as already described. After the slack has been taken up the team is started and the reel or drum caused to revolve upon the post 2. The second coil of rope will instantly hug the first or inner coil tightly, so as to absolutely prevent it from slipping, and the rope will immediately be strained taut and the operation of extracting the stump begun. During the operation the superfluous rope is thus kept out of the way upon the reel 32. After a stump has been extracted additional rope may very quickly be supplied, if necessary, by unwinding it from the said reel 32.

In machines of this class it has generally been necessary to attach the end of the operating-rope to the winding-drum. It has therefore been necessary, in order to take up slack, to wind it upon the said drum, which has been slow and tedious. By my invention by the use of the reel 32 much time may be saved, and I also avoid keeping more than two coils of rope upon the winding-drum at any one time, thus avoiding squeezing and flattening the rope, which is very injurious to the latter.

The general construction of my invention is simple, convenient, and inexpensive, and it may be easily operated with satisfactory results.

I have in the foregoing described what I consider to be the preferred form of my improved stump-extractor; but I desire to have it understood that I reserve the right to any changes or modifications in the construction of the same which may be resorted to without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. In a stump extractor, the base having the laterally-extending curved or inverted-**U**-shaped flanges, in combination with the cross-bar seated in and bolted to said flanges, substantially as and for the purpose set forth.

2. In a stump-extractor, the base having the vertical post provided with **L**-shaped notches at its upper end, in combination with the winding-drum and a washer having inwardly-extending studs to engage said **L**-shaped notches, substantially as set forth.

3. In a stump-extractor, the combination, with a winding-drum having a notch or recess, as 20, and a hook, as 33, for the passage of the operating-rope, of an auxiliary drum or reel to receive said rope, substantially as set forth.

4. In a stump-extractor, the winding-drum having a **V**-shaped annular groove, a shallow annular recess at the bottom of the latter, and a vertical notch for the passage of the operating-rope, in combination with a supplemental reel upon which the said operating-rope may be wound, substantially as set forth.

5. In a stump-extractor, the combination of the base having a vertical post, the winding-drum journaled upon the latter, a shaft or axle rising vertically from the center post, a sweep or lever, and a supplemental reel journaled upon the shaft rising from the center post, substantially as set forth.

6. In a stump-extractor, the combination of the base having the vertical center post, the winding-drum journaled upon the latter and having a **V**-shaped annular groove, an annular recess at the bottom of the latter and a vertical notch, a shaft rising from the center post, a sweep journaled upon said shaft and suitably connected with the winding-drum, and the supplemental reel journaled above the sweep and adapted to receive the end of the operating-rope, substantially as set forth.

7. In a stump-extractor, the combination of the base having the vertical center post, the winding-drum journaled upon the latter, the shaft rising from the center post, the sweep mounted upon said shaft, and a washer mounted upon said shaft and having bifurcated extension supporting the sweep, substantially as and for the purpose set forth.

8. In a stump-extractor, the combination of the base having the vertical center post, the winding-drum journaled upon the latter, the shaft rising from the center post, the sweep mounted upon said shaft, a washer mounted upon said shaft and having bifurcated extension supporting the sweep, and a reel mounted upon the shaft above the sweep and adapted to receive the end of the operating-rope, substantially as set forth.

9. The combination of the base having the vertical center post, the winding-drum journaled upon the latter and having laterally-

extending horns or hook-shaped projections, the shaft rising from the center post, the sweep or lever journaled upon said shaft, links connecting the said sweep with the hook-shaped projections of the winding-drum, and the washer having bifurcated extension to support the said sweep in an approximately horizontal position, substantially as set forth.

10. In a stump-extractor, the herein-described tying device, consisting of a block having transverse perforations at an angle to each other and provided with a downwardly-extending neck or shank, said block being provided on one side with teeth or serrations, substantially as and for the purpose set forth.

11. The herein-described anchor-rope, having the rings 25^b and 26^b shrunk upon its ends, in the manner and for the purpose set forth.

12. The combination, with the operating-rope, of a tying device mounted upon the end of said rope and consisting of a block provided with a neck or shank, as 36, and having a hook or horn provided with teeth or serrations, as 38, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM SMITH.

Witnesses:
G. R. SMITH,
LEWIS N. BARTLETT.