

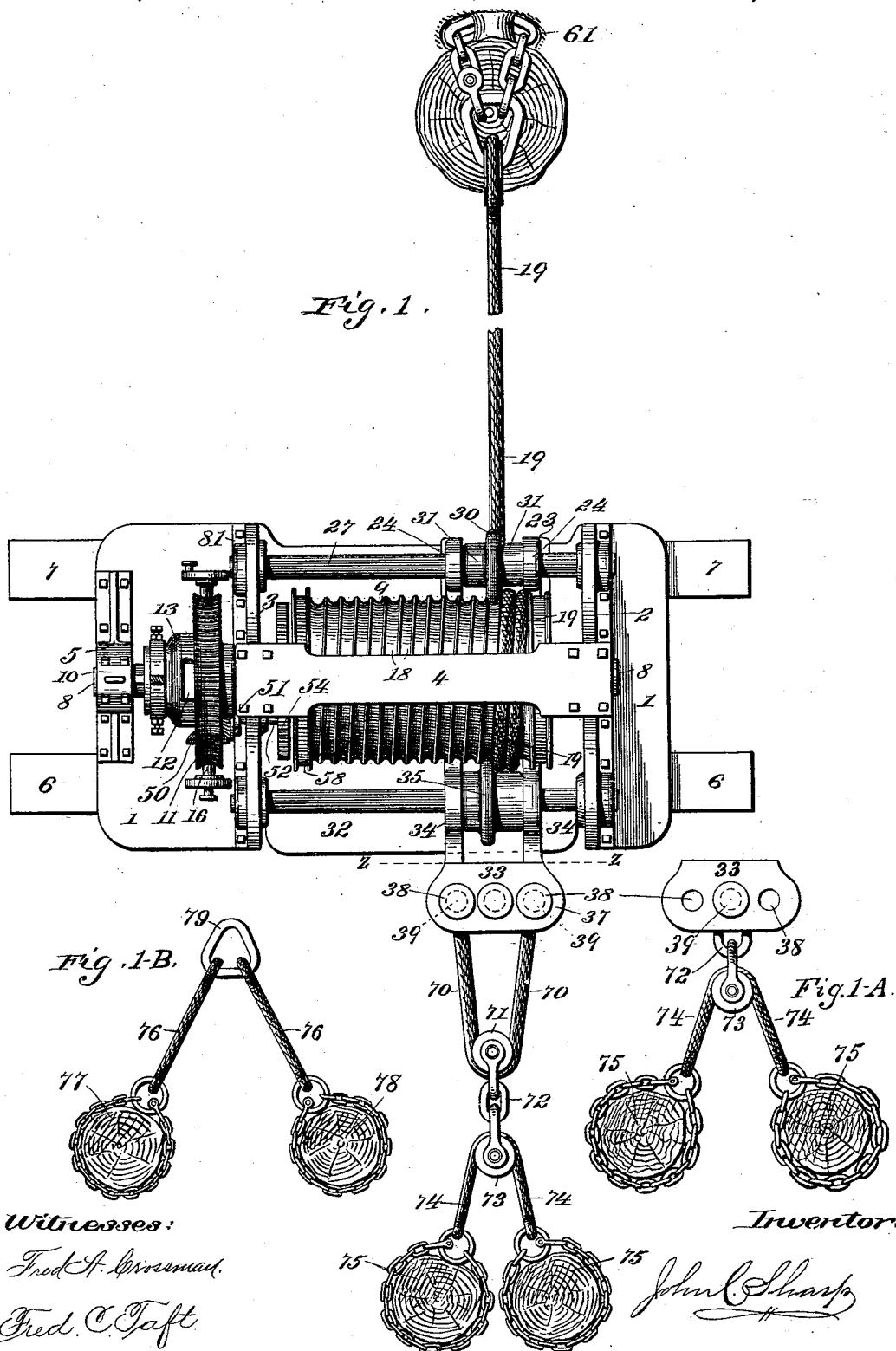
(No Model.)

4 Sheets—Sheet 1.

J. C. SHARP.
STUMP EXTRACTOR.

No. 521,480.

Patented June 19, 1894.



(No Model.)

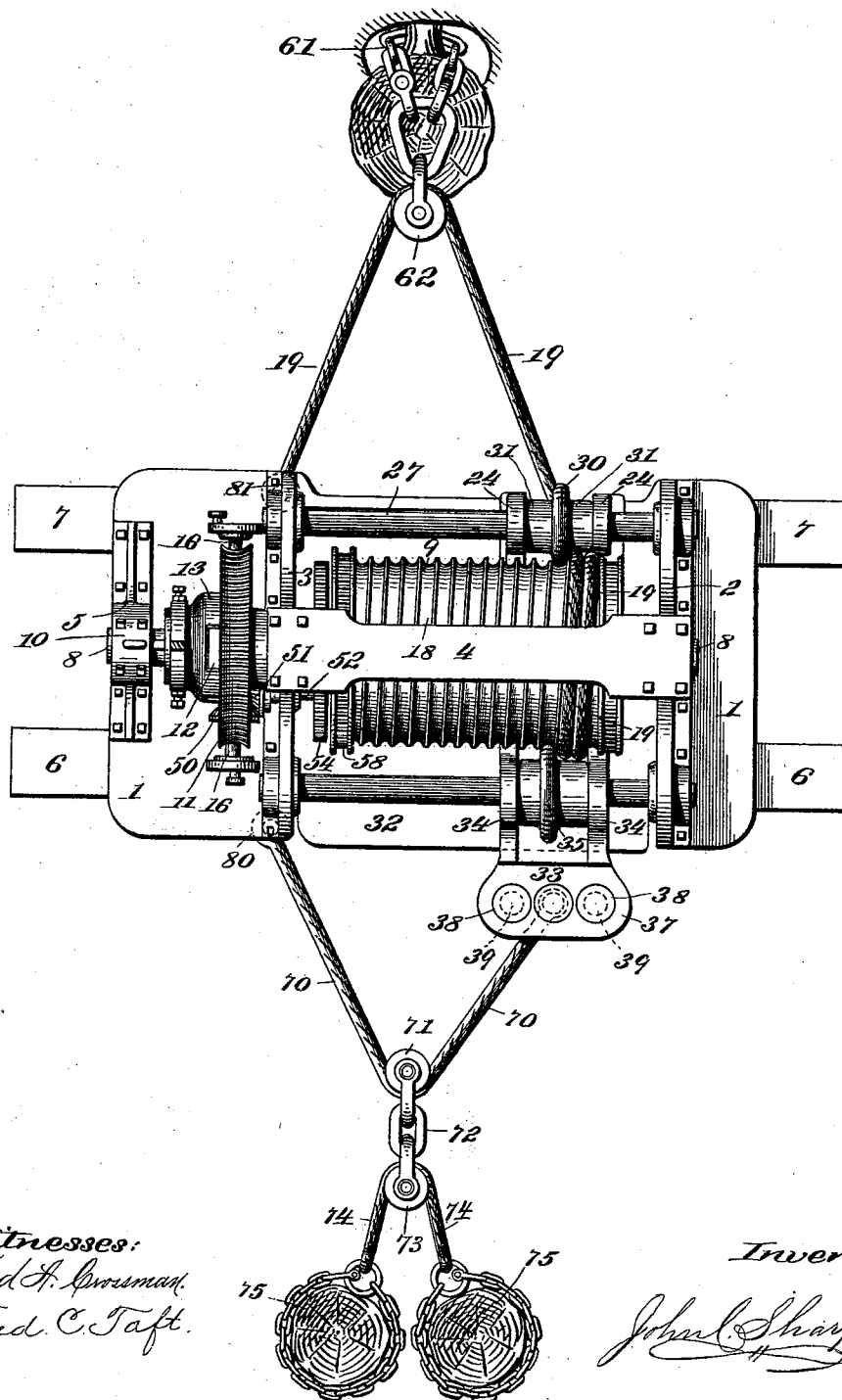
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Fig. 10.



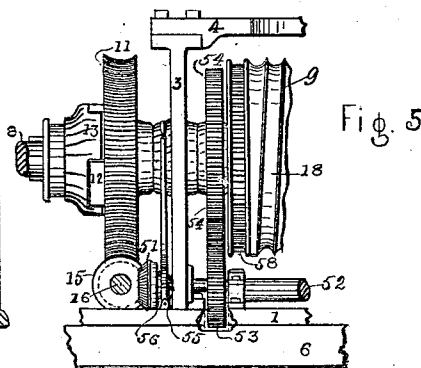
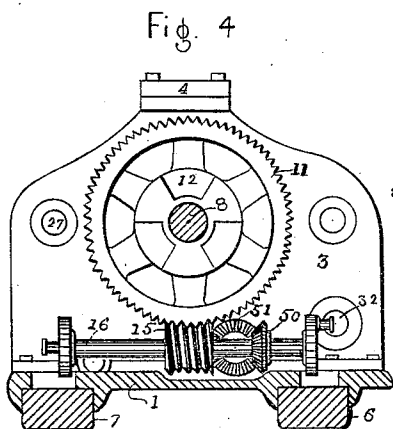
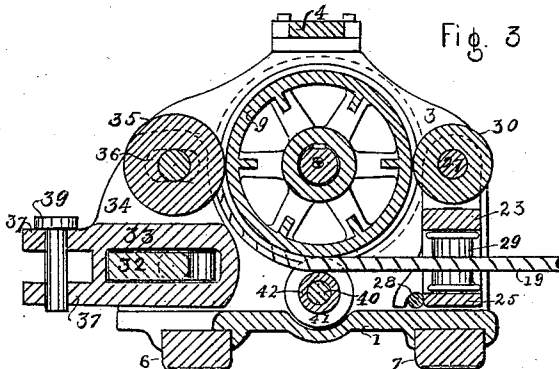
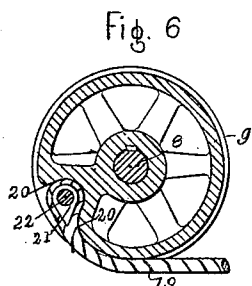
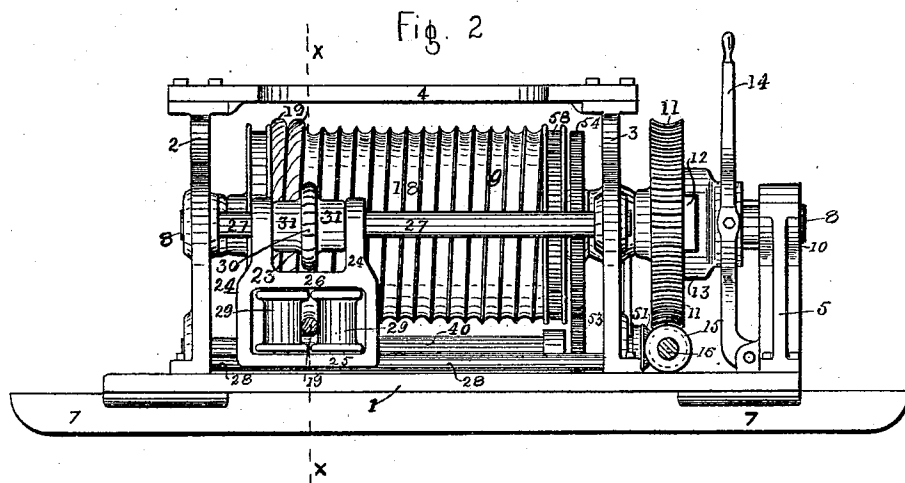
(No Model.)

4 Sheets—Sheet 3.

J. C. SHARP.
STUMP EXTRACTOR.

No. 521,480.

Patented June 19, 1894.



Witnesses
Charles H. House
Silvester J. Jeff

Inventor
John C. Sharp
per F. B. Wright
Attorney

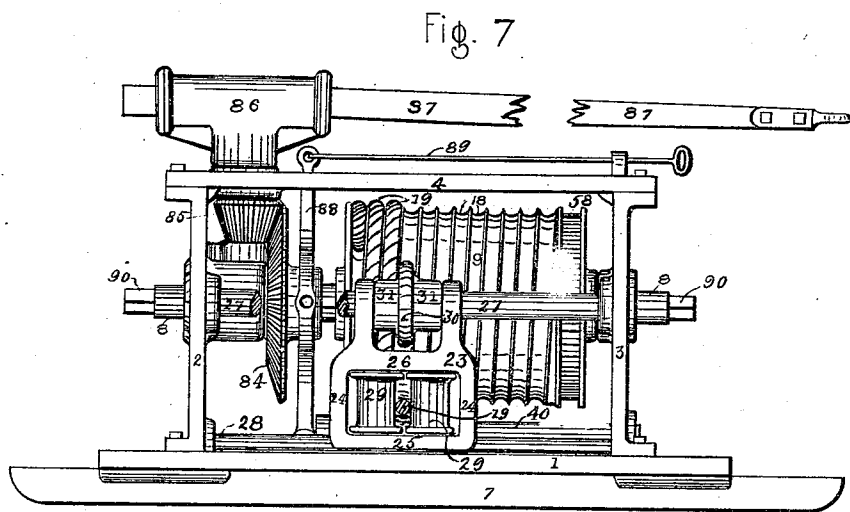
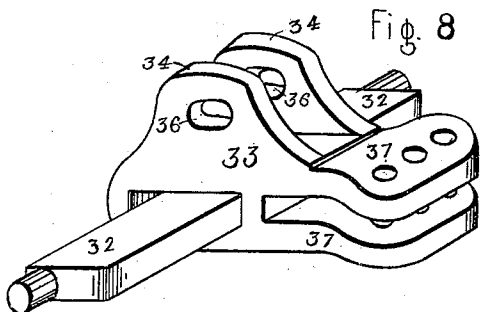
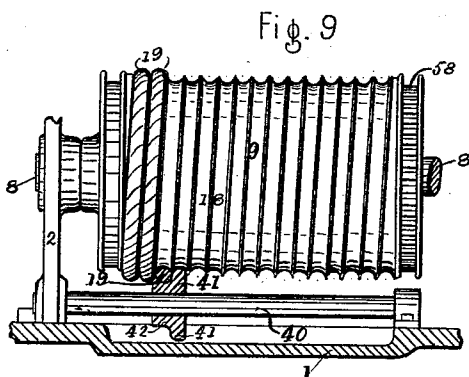
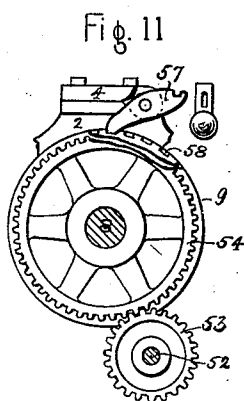
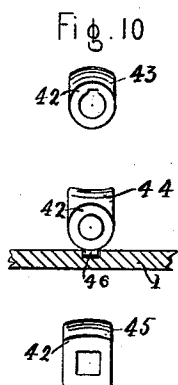
(No Model.)

4 Sheets—Sheet 4.

J. C. SHARP.
STUMP EXTRACTOR.

No. 521,480.

Patented June 19, 1894.



Witnesses
Charles O. Brown
Silvius J. Jaffe

INVENTOR
John C. Sharp.
per *F. B. Knight*
Attorney.

UNITED STATES PATENT OFFICE.

JOHN C. SHARP, OF DELAVAN, WISCONSIN.

STUMP-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 521,480, dated June 19, 1894.

Application filed October 5, 1892. Serial No. 447,969. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. SHARP, a citizen of the United States of America, and a resident of Delavan, Walworth county, Wisconsin, have invented certain new and useful Improvements in Stump-Extractors, of which the following is a specification, reference being had to the accompanying drawings, in which—

10 Figure 1, is a plan view of my machine showing it connected with a stump to be operated upon and also connected with its anchor stumps. Fig. 1^A, is a plan detail view of the anchor rope proper, of the machine, 15 connected with its anchor stumps and also connected with the sliding anchor rope carrier, which is shown detached on line Z, Z, of Fig. 1. In this view (Fig. 1^A), the special anchor rope having been removed, is not shown. 20 Fig. 1^B, is a plan view of the limited swinging anchoring device, showing it detached from the machine, but connected with its anchor stumps. Fig. 1^C, is a plan view of the machine showing its connection with the 25 stump to be operated upon and also its connection with the anchor stumps, the draft rope in this view being provided with a pulley for equalizing the draft, and increasing the power of the machine for pulling larger 30 stumps than could be pulled by the direct-hitch method shown in Fig. 1. Fig. 2, is a front view of the machine with its sliding draft rope guide in position. Fig. 3, is a cross sectional view on line X X of Fig. 2. Fig. 4, 35 is an end view of the machine, showing its gearing, the frame of the machine being partly in section. Fig. 5, is a detailed front view of the fast speed mechanism, looking from the rear of the machine. Fig. 6, is a 40 cross sectional view of the winding drum, and showing in detail the connection of the draft rope. Fig. 7, is a front view of the machine, showing a modification of the gearing for use in small machines to do light work. Fig. 8, 45 is a detail perspective of the sliding anchor rope carrier, and its rocking bar, detached from the frame of the machine. Fig. 9, is a front view of the winding drum, showing a groove-traveler in section at the bottom of the winding drum, the sliding draft rope guide 50 having been removed. Fig. 10, shows three modified forms of groove-travelers. Fig. 11,

is a detail showing pawl and ratchet, for preventing reversal of the winding drum.

My invention relates to stump extractors, 55 and particularly, to the apparatus of the kind described in my application, Serial No. 434,506, filed May 26, 1892.

The invention consists in certain details to be hereinafter described and claimed, whereby the machine is automatically swung into the proper draft line of its work, and whereby the draft rope is guided and held at all times in proper position upon the winding 60 drum. 65

The main frame of my machine may be constructed in any manner or form best suited to the requirements of the case. As shown, it consists of a bedplate 1, side pieces 2 and 3, and a top plate 4, secured together in any 70 suitable manner. The main-frame is preferably supported upon runners 6 and 7, which may be made of wood or other suitable material. The ends and lower sides of the runners may be rounded, and for preventing too 75 great wear, their bottoms may be shod with metal plates. Suitable means are usually provided for the attachment of a team for removal of the machine from place to place.

8, indicates a shaft which passes through 80 bearings in the side pieces 2 and 3, and projecting beyond side piece 3, its end is supported in a bearing in standard 5, which standard is secured to the bedplate. Upon said shaft is keyed a winding drum 9, adapted to 85 rotate therewith. Mounted loosely on the shaft 8, and designed to rotate independently thereof, is a worm-wheel 11, which is provided with one member 12, of a clutch. The other member 13, of said clutch is splined 90 upon the shaft 8, to turn therewith, but capable of sliding thereon when moved by the clutch lever 14, to engage or disengage with the half clutch 12, on the worm-wheel 11, as usual in this style of clutch-coupling. 95 Acting upon the worm-wheel 11, is a worm 15, mounted on a transverse shaft 16, which shaft rotates in bearings on the bedplate of the machine. To the ends of the transverse shaft 16, are mounted band-pulleys, gears, cranks, 100 or any other mechanism for receiving power to operate the machine.

By means of the clutch 12 and 13, the shaft 8, may be disengaged from the power and the

draft rope unwound from the drum, without necessity and trouble of reversing the engines. The winding drum 9, as shown, is spirally grooved, as at 18, on its surface, and the draft rope 19, is wound in such groove as it comes in. The draft rope can be connected with the winding drum in any suitable manner, but, as it is desirable to have the connection with the drum below its face, I preferably provide at one end of the drum a recess 20, Fig. 6, which recess is to receive the eye 21, on the draft rope 19, this eye being securely held in position by a crosspin 22, or other similar device. The bottom of the groove or recess 20, is gradually inclined outwardly to the face of the drum, in order to prevent short and injurious bending of the draft-rope, which is usually made of steel wire. An opening may be left in the end of the drum, to enable the operator to remove the cross pin 22, when desired.

When operating my machine, I securely anchor it to stumps by one of the methods shown, and when thus anchored, the machine must be brought into proper line of draft with the stumps to be pulled, and it is highly desirable that the machine, of itself, and without assistance from the operator should swing into such draft line, and while so doing, it is especially necessary that the draft rope should be guided properly into the spiral groove of the drum, for the reason, that, before the machine has fairly faced the stump to be pulled, the draft rope would come to the drum at such an angle, as, without a proper guide and means of holding or confining it in the spiral groove, would cause it to be improperly wound upon the drum, and also render the draft rope liable to be cut or chafed against the partition between the spiral grooves on the drum, or the corners of the frame. It is for the purpose of accomplishing this, that I provide the sliding draft rope guide 23, and the groove traveler 41. The said sliding draft rope guide 23, is shown more particularly in Figs. 2 and 7, and in this instance, consists of a sliding boxing formed of vertical side pieces 24, 24, a base piece 25, and a transverse partition 26. The upper ends of the side pieces 24, 24, are pierced for the passage of the transverse bar 27, which is supported in bearings in the main frameside pieces 2 and 3. The lower rear portion of each of the side pieces 24, 24 is also adapted, as shown, to slide on a lower transverse bar 28, which bar is supported at its ends in bearings in the side pieces of the main frame. Held between the transverse partition 26, and the base piece 25, are guide-rollers 29, 29, mounted vertically, to rotate in suitable bearings. Between the upper ends of the side pieces, is mounted a groove traveler 30, consisting, as shown, of a wheel having its face made of convex form to fit into the spiral groove of the winding drum 9. It will be readily seen, that, as the drum rotates the groove-traveler 30, will follow along the spiral groove, thus giving the draft rope guide a

sliding motion along the front of the drum. Not only does this groove-traveler 30, move the sliding draft rope guide, but it also prevents the draft rope from leaving its proper groove, the groove traveler being preferably set to always occupy the groove just ahead of the one in which the draft rope is winding. In this instance I have shown the groove-traveler 30, as provided with hubs 31, 31, projecting from each end. These hubs hold the groove-traveler equi-distant between the side-pieces 24, 24, and one of these hubs may also be made to perform the further office of holding the draft rope tightly to the drum to prevent fouling or pinching of the draft rope in winding.

In connection with the sliding draft rope guide and to more completely carry out the purpose of swinging the machine into its proper draft line, and cause it to face its work squarely, at the rear of the machine, I use a sliding anchor rope carrier 33, which slides in the same direction and with like speed and to a like extent as the aforesaid sliding draft rope guide.

Between the side pieces 2 and 3, of the main frame is mounted a bar 32, preferably pivoted to rock in its bearings in the said side pieces, which rocking bar, in this instance, is shown in the drawings as rectangular in section, this form being stronger for the weight of the bar than other forms. Mounted on the bar 32, is the sliding anchor rope carrier 33, the side pieces 34, 34, carry a groove-traveler 35, which, as shown, is similar in form to the groove traveler 30 hereinbefore described. The bearings 36, 36, in side pieces 34, 34, are elongated, so as to give the groove traveler 35, a certain amount of play and permit of the bar 32, being rocked in its bearings, without taking the said groove traveler 35, from its bearing in the spiral groove of the drum, and to also prevent bending of the transverse bar on which the groove-traveler is mounted to slide. This rocking motion of the bar 32, is for the purpose of allowing the outer end or part of the anchor rope to be anchored on a higher or lower plane than that on which the machine rests, and to enable the said bar to adjust or present itself edgewise to the strain, and thereby lessen the liability of breakage, and said rocking motion also prevents injury of the sliding anchor rope carrier by thus rendering it unable to cramp, on the bar 32. Fitting above and below the said rocking bar are flanges or plates 37, 37, which project some distance rearward, and are preferably provided with a series of holes 38, three being shown in this instance. The eyes of the special-anchor rope 70, or connecting link 72 of the anchor rope proper, 74, may be placed between the two plates 37, 37, and secured therein by vertical cross pins 39, passing down through the holes 38, in each of the plates 37, 37. Anti friction rollers may in some cases be used to reduce the friction of the sliding anchor rope carrier at its rear part,

on the bar 32, one roller only being visible in the drawings, in this instance.

Below the winding drum 9, I sometimes provide a bar 40, Fig. 9, having its ends supported in suitable bearings, and mount on the said bar or shaft, a groove traveler 41, which rotates freely and can also slide on the shaft or bar. This groove traveler 41, like the groove travelers 30, and 35, hereinbefore mentioned, has a convex face to fit into the spiral groove of the drum and can be provided with a hub 42, projecting from its side for pressing the rope up against the drum, as shown, and as this groove-traveler always occupies the spiral groove just ahead of the one in which the draft rope is winding, it like the others, prevents the draft rope from leaving its proper groove. I could reverse the position of the said groove traveler on the bar, but in such case, its hub 42, would not be in position to press the rope up against the drum, though the wheel-part of the groove traveler could be made smaller and the bar 40 could be moved up closer to the drum, and by said bar bearing against the draft rope, it could, in a measure, perform the office of the hub 42. This hub 42, on the groove traveler performs the double function of giving an extended bearing on the bar to the wheel-part and by pressing up against the draft rope prevents it from dropping down and out of the spiral groove when the strain on the draft rope is let up, and when thus slackened, the hub and wheel part of the said groove traveler render it impossible for the draft rope to shift from its proper groove into another, the effect of such shifting, would be, to cut or injure the rope on the partition between the grooves, and also in some instances to jam the drum. As a wire draft rope is used, in most cases, and being of a springy nature, it has a great tendency to spring away from the drum when slackened, thus rendering it quite necessary to employ some efficient means, such as the said groove traveler affords, for properly holding the draft rope in place on the drum. In some cases I may use, as a substitute for a groove traveler of this rotating kind, groove travelers of a non-rotating character as shown in Fig. 10.

43, is a groove traveler adapted to slide on a round bar and prevented from rotating by a spline or feather. 44 is the same as 43, except, that its rotation is prevented by a tongue 46, projecting into a groove provided in the bed plate 1. 45, has a square or rectangular opening to fit on a square shaft which would prevent rotation. All these groove travelers 43, 44, and 45 have rounded or convex faces to fit into the spiral groove of the winding drum, and are also provided with rounded hubs 42, projecting from one of their sides, which hubs are to press the draft rope up against the winding drum, for the reasons hereinbefore stated. The wheel form of groove traveler 41, is however preferred, because, it not only affords a rolling and less in-

jurious contact with the groove of the winding drum, but, also affords a rolling and less injurious contact with the draft rope, and the rolling hub also tends to draw the draft rope into its proper groove.

As shown in Figs. 2 and 3, the guide rollers 29, 29, are of such form and so placed as to give the draft-rope 19, considerable play room up and down between them, for the purpose of allowing the draft-rope to enter at any angle to the machine's plane, as for instance, when the draft rope passes over the top of a lifting lever, or when attached to the top of a high stump, or when pulling stumps from either a higher or lower horizontal plane than that on which the machine sets. These guide rollers 29, 29, are necessarily placed a short distance in front of the bottom, or that part of the winding drum where the draft rope first reaches it, and in this space, between the bottom part of the drum and said guide rollers, the draft rope at times becomes slack and would drop out of the groove at the bottom part of the drum regardless of the guide rollers and would be liable to shift to another groove unless prevented by a groove traveler as herein before explained. The said guide rollers not only serve to guide the rope directly toward its proper groove on the drum, but they also afford a rounded and non-injurious bearing for the draft rope to bear against when prying or swinging the machine into its proper draft line, to make the pull, and furthermore they relieve the partition between the grooves of the drum from the lateral strain it would have if the guide rollers were not used.

I do not limit myself to any particular mechanism for driving the shaft 8, but contemplate the use of any such as may be best suited to the case. For more speedily taking up the slack in the draft rope than by the use of the worm and wormwheel driving gear, I may key upon the worm shaft 16, (Figs. 4 and 5) a bevel or miter wheel 50, meshing with another bevel or miter wheel 51, which is loose upon the shaft 52, placed at right angles to the worm shaft 16, and on this shaft 52 is keyed a pinion wheel 53, meshing with a spur wheel 54, of larger size, which spur wheel is either cast to the end of the winding drum or keyed to the shaft 8. The shaft 52, has a half clutch 55, splined thereon and capable of being moved into engagement with the other half clutch 56, fast on the loose gear wheel 51. When this quick speed is used the wormwheel 11, is thrown out of engagement with the shaft 8, the clutch parts 55 and 56 are brought into engagement and the rotation of the worm shaft now operates the winding drum until the slack in the draft rope is all taken up. Then by reversing the throw of the clutches, the worm and wormwheel are once more engaged to rotate the winding drum for making the heavy pull on a stump. For preventing any retrograde motion of the winding drum, if for instance, some part of

the machine should break, or in order to change from the fast to the slow gears or the reverse, I may use the pawl and ratchet device 57 and 58 shown in Fig. 11, or any other suitable means of that character as commonly known.

In Figs. 5 and 11, the winding drum is shown as provided with a ratchet 58, in which engages a pawl 57, pivoted to the frame of the machine, a weight is carried on the outer end of the pawl, which holds it out of engagement when so desired, but when the pawl and ratchet feature is to be used, the weight is removed, and the pawl can then drop into engagement with the ratchet.

In some cases a single anchor stump would be sufficient to securely hold the machine, as for instance when pulling small stumps, and only one stump at a time, but for pulling very large stumps, or several smaller ones at one time, it is necessary to provide a much stronger anchor, which I obtain by connecting the anchor rope 74, with two stumps as shown in Figs. 1, 1^A and 1^C, using a pulley 73, for equalizing the draft on both parts of the doubled anchor rope 74, 74 and by this method the combined strength of both anchor stumps 75, is utilized. The clevis of the pulley 73, Fig. 1^A, can be provided with a link 72, for connecting with the machine or its sliding anchor rope carrier 33, a section of which sliding anchor rope carrier, cut on line Z, Z, of Fig. 1, is shown, and to which the link 72, is connected.

In some cases I use a special anchor rope 70, provided with a special pulley 71 for equalizing the draft on both parts of the double rope, it, however, is really unnecessary to use this special anchor rope 70, except when it is desired to do heavier pulling than can be done by the direct or single power method shown in Fig. 1. A stronger or a doubled power can be obtained, by connecting one end of the draft rope 19, with the winding drum, and after passing the other end through a draft equalizing pulley 62, connecting it to an eye 81, or any suitable strong connection on the frame of the machine, and by now attaching one end of the special anchor rope 70, to the sliding anchor rope carrier 33, passing the other end, through draft equalizing special pulley 71, and connecting it with an eye 80, or any suitable strong connection on the frame of the machine, all as shown in Fig. 1^C. When it is desired to disconnect the special anchor rope 70, from the anchor rope 74, the pin or shaft of the clevis of the special pulley 71, can be withdrawn, the said pulley removed, and its clevis can then be taken out of the link 72.

Sometimes it is desirable to limit the lateral movement of the machine from its anchorage, as for instance, when clearing a road or a railroad, right of way, and to accomplish this purpose I use a limited swinging anchoring device, consisting of two ropes 76, 76, each having one of its ends connected

with one of the stumps 77 and 78, and the other ends connected with a ring or link 79, all as shown in Fig. 1^B. The link 79 can be connected with the sliding anchor rope carrier 33, when this method of anchoring is to be used. The link 79 not being a complete draft equalizer, the combined strength of both of the stumps 78 and 79 is not however obtained as in the use of the anchor rope 74 connected with its anchor stumps.

In Fig. 7, I have shown an arrangement of gearing for use with a small machine. Instead of the worm and wormwheel, I mount on the driving shaft a bevel wheel 84, which normally gears with the bevel gear 85. On the shaft of gear 85, is fitted a head 86, in which is fitted the draft-lever or sweep 87, to which a team may be attached, as usual. The bevel gear wheel 84, is splined upon the driving shaft and is moved into or out of engagement with gear 85, by a lever 88, and rod 89. In Fig. 7, I have shown heads 90, on the ends of the driving shaft, to which may be attached cranks for rotating the drum by hand for taking up slack in the draft rope, when the draft lever is disengaged. Instead of cranks I may use levers, with pawls engaging with ratchets on the ends of the driving shaft, or equivalent mechanism.

While I have shown the preferred form of my machine, I do not wish to be limited thereto, as many modifications might be made without departing from the spirit of my invention.

Having described my invention, what I claim is—

1. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to the drum, of a groove-traveler sliding on a bearing parallel with the face of the drum, and said groove-traveler moved by contact with the spiral groove, and having a rounded hub projecting from its side for holding the draft rope on the drum, all substantially as shown and described.

2. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a groove-traveler, consisting of a wheel having a convex face to fit into the spiral groove of the drum, and said groove-traveler mounted on a bar to slide across the face of the drum by bearing against said spiral groove, all substantially as shown and described, and for the purpose set forth.

3. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to the drum, of a bar parallel with the face of the drum, a groove-traveler mounted on said bar to slide thereon, and said groove-traveler consisting of a wheel having a rounded hub projecting from its side, the face of said wheel being of convex form to project into and fit the spiral groove and moved by contact with said spiral groove, all substantially as shown and described.

4. In a stump extractor, the combination with a spirally grooved winding drum, and mechanism for rotating the same, a draft rope attached to said drum, of a sliding draft rope guide, having a groove traveler, consisting of a wheel bearing against the spiral groove, whereby the sliding draft-rope guide is moved across the face of the drum, all substantially as shown and described.

5. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, of a sliding draft rope guide through which the draft rope passes, a groove-traveler, consisting of a wheel bearing against the spiral groove of the drum, for moving said sliding draft rope guide, and means for allowing a vertical play to the draft rope, all substantially as shown and described, and for the purpose set forth.

6. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding draft rope guide provided with guide rollers, and also having a groove-traveler, consisting of a wheel bearing against the spiral groove of said drum, for moving the said sliding draft rope guide, all substantially as described and shown.

7. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to the drum, of transverse bars and a sliding draft rope guide mounted to slide upon the same, said sliding draft rope guide, consisting of vertical side pieces, a base, a transverse cross piece, guide rollers mounted between the cross and base pieces, and mounted between the upper ends of the side pieces a groove-traveler, consisting of a wheel bearing against the spiral groove of the drum, for moving the sliding draft rope guide, all substantially as described and shown.

8. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding draft rope guide mounted on upper and lower transverse bars, guide rollers mounted in its lower part, and said sliding draft rope guide having two vertical side pieces, through the upper ends of which, the upper transverse bar passes, and a groove-traveler, consisting of a wheel, mounted upon the upper transverse bar between the side pieces and bearing against the spiral groove of the drum for moving the sliding draft rope guide, all as and for the purpose described.

9. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding anchor rope carrier mounted to slide on a bar, and a groove traveler in contact with the spiral groove of the drum for moving said sliding anchor rope carrier, all as and for the purpose described.

10. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding anchor rope carrier, and a groove-traveler consisting of a wheel bearing against the spiral groove of the drum for moving the said sliding anchor rope carrier, all substantially as shown and described.

11. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding anchor rope carrier mounted to slide upon a rocking bar, and a groove-traveler bearing against the spiral groove of the drum for moving said sliding anchor rope carrier, all substantially as shown and described.

12. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding anchor rope carrier mounted to slide upon a rocking bar and a groove-traveler consisting of a wheel bearing against the spiral groove of the drum for moving said sliding anchor rope carrier, all substantially as shown and described.

13. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding draft rope guide, a groove-traveler bearing against the spiral groove of the drum for moving the sliding draft rope guide, a sliding anchor rope carrier, and a groove-traveler bearing against the spiral groove of the drum for moving said sliding anchor rope carrier, all substantially as shown and described.

14. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding draft rope guide, a groove-traveler consisting of a wheel bearing against the spiral groove of said drum for moving the sliding draft rope guide, a sliding anchor rope carrier mounted to slide on a rocking bar, and a groove-traveler consisting of a wheel bearing against the spiral groove of the drum for moving said sliding anchor rope carrier, all substantially as shown and described.

15. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding anchor rope carrier mounted upon a rocking bar, a groove-traveler for moving the said sliding anchor rope carrier, and slotted bearings for said groove traveler whereby the sliding anchor rope carrier may adjust itself to the vertical angle of the anchor rope, all substantially as shown and described.

16. In a stump extractor, the combination with a spirally grooved winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a sliding anchor rope carrier mounted upon a rocking

bar, a groove traveler consisting of a wheel bearing against the spiral groove of the drum for moving said sliding anchor rope carrier, and slotted bearings for said groove traveler whereby the sliding anchor rope carrier may adjust itself to the vertical angle of the draft rope, all substantially as shown and described.

17. The combination, in a stump extractor with mechanism for operating the same, of an anchor rope suitably connected with the rear part of the machine, said anchor rope being doubled back and having its two ends each connected with one of two suitable separate anchors, all for the purpose of securely anchoring the machine and permitting it to swing laterally from such anchorage, substantially as shown and described.

18. The combination, in a stump extractor with mechanism for operating the same, of a draft equalizing pulley suitably connected with the rear part of the machine, and an anchor rope passing about said pulley and each of its ends connected with one of two suitable separate anchors, all for the purpose of securely anchoring the machine and permitting it to swing laterally on the ground into its proper draft line, substantially as described.

19. The combination, in a stump extractor with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, of a draft equalizing pulley suitably connected with the rear part of the machine, and an anchor rope passing about the pulley, said anchor rope having each of its ends connected with one of two suitable separate anchors, all for the purpose of securely anchoring the machine and permitting it to swing laterally on the ground into its proper draft line, substantially as set forth.

20. In a stump extractor, the combination with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, a sliding anchor rope carrier, suitable mechanism for moving the same, of a draft equalizing pulley suitably connected with the machine, an anchor rope passing about said pulley and each of the ends of said anchor rope connected with one of two suitable separate anchors, all for the purpose of securely anchoring the machine and permitting it to swing laterally on the ground into its proper draft line, substantially as described.

21. In a stump extractor, the combination with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, a sliding anchor rope carrier sliding on a bearing in the rear part of the frame of the machine, suitable mechanism for moving said sliding anchor rope carrier, a special anchor rope connected to said sliding anchor rope carrier, of a double equalizing device consisting of two pulleys and connecting clevises and link, the special anchor rope passing through the special pulley and an anchor rope rove through the other of said pulleys and having each of its ends connected with one of two

suitable separate anchors, all substantially as described.

22. In a stump extractor, the combination with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, a sliding draft rope guide and suitable mechanism for moving the same, of an eye or connection on the frame of the machine to which the other end of the draft rope is adapted to be attached, and a draft equalizing device on the draft rope between said frame connection and said sliding draft rope guide, all substantially as shown and described.

23. In a stump extractor, the combination with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, a sliding draft rope guide having guide rollers mounted therein, between which guide rollers the draft rope passes, mechanism for moving said sliding draft rope guide, of an eye or connection on the frame of the machine to which the other end of the draft rope is adapted to be attached, and a draft equalizing pulley on the draft rope between said frame connection and said sliding draft rope guide, all substantially as shown and described.

24. In a stump extractor, the combination with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, a sliding anchor rope carrier, mechanism for moving the same, a special anchor rope having one of its ends attached to said sliding anchor rope carrier and its other end passed through a special draft equalizing pulley and attached to an eye or connection on the rear part of the machine, all substantially as shown and described.

25. In a stump extractor, the combination with a winding drum and mechanism for rotating the same, a draft rope attached to said drum, a sliding draft rope guide, mechanism for moving the same, of an eye or connection on the frame of the machine to which the outer end of the draft rope is adapted to be attached, a draft equalizing pulley on said draft rope between said frame connection and said sliding draft rope guide, a sliding anchor rope carrier, mechanism for moving the same, one end of a special anchor rope attached to said sliding anchor rope carrier and the other end adapted to be connected with an eye or connection on the rear part of the frame of the machine, a special draft equalizing pulley on said special anchor rope between its frame connection and said sliding anchor rope carrier, and said special pulley connected with another pulley having an anchor rope rove through it and each of the ends of said anchor rope adapted to be attached to two suitable separate anchors, all substantially as described.

JOHN C. SHARP.

Witnesses:

J. FRED FITCH,
FRED B. WRIGHT.