Patterns for Calvert Farm Stump Puller

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Sometime in the early 1900's my great grandfather George W. Calvert (1845-1916) made the wooden patterns, figures 1 and 2, and had castings made to build a stump puller for clearing land on the family farm. A picture of the stump puller in use is shown on page 104 of the book "*The Calvert Family of Anne Arundel County, Maryland*" by Edwin T. Calvert. Figure 3 shows that photograph with some of the pattern pieces overlaid.

These patterns are wooden replicas of the metal parts to be cast. Most castings during the early 1900's were sand castings. The dimensions of the patterns are slightly larger than the desired metal parts to allow for the shrinkage of the molten metal as it cools to a solid. The wooden patterns are placed in a core box, sand mixed with a binder (green sand) is packed (rammed) around the patterns, in addition to the patterns, channels (sprue(s)) are formed in the sand to provide a path for the molten metal to be poured into the mold and to allow gasses to escape. The core box is then heated to harden the green sand into a mold. The mold is designed to be opened to remove the patterns before being reassembled and filled with molten metal. (The two halves of the mold are called the cope and drag.) The steps in the process are simple, but practical knowledge is required at each step to successfully produce good useable parts. During this period in industrial history, metallurgy was in its infancy, so the practical knowledge of the foundry man was important as well as that of the patternmaker and the molder.

The Calvert stump puller design is similar to several machines that were available for purchase from the late 1890's through the 1920's. The basic design comes from the capstans used on ships to lift their large anchors. The differences include a large sweep (lever) that is pulled by a horse or team of horses walking in a circle and the machine is portable instead of being fixed to one location as on the ship. The stump puller was attached to a timber base so horses could drag it to the work site. The base also improved stability when the machine was in use. Several patents were granted for these horse powered machines from 1891 to 1907. The stump removing machines are identified by several different names: stump puller, grubber, whim, and winch. Miners used similar machines for moving materials and ore in and out of mines. The machines were originally made of cast iron. Around 1906 steel became available and soon steel became the metal of choice for machines of that period. According to Hercules Manufacturing Company advertisements the steel machines were 60% lighter and 400% stronger.

Before stump pullers became generally available, farmers cleared land for agriculture by cutting the trees down and waiting for the stumps and roots to rot while cultivating crops between the stumps. In some instances the brush from the trees was piled around the stumps and set fire to burn as much of the stump away as possible. Removing the roots and old stumps by manual labor was very difficult and time consuming. With a stump puller and a horse, a few men could clear several acres in a day. The stump puller was anchored to a large stump or a buried log, the cable was pulled out from the drum and attached to stumps within a radius of 100 to 150 feet, the horse or horse team was hitched to the sweep

and as the horse walked around the circle the cable wound onto the drum and pulled the stump out. Small stumps were hooked to the cable directly. For larger stumps the cable was passed through a block (pulley) attached to the stump to be pulled and the end of the cable was fastened to the stump puller. This arrangement doubled the pulling force. The patterns for the Calvert stump puller included patterns for a turning block for double rigging the cable, figure 2. For more pulling force, an additional pulley was attached to the stump puller and the end of the cable was threaded through that pulley and then fastened to the stump. Rigging with two blocks gave three times the pulling force of a direct cable attachment to the stump. The calculated force for a triple rigged puller was equivalent to that of early bulldozers.

Figure 4, a copy of two pages from the Hercules Manufacturing Company catalog from 1911, is annotated to identify features of the Hercules machine and provides a representation of how the machine was connected for stump pulling. The Calvert machine was not as refined as the Hercules but used the same basic machine components and attachment methodology. Both machines used ratchets to maintain cable tension when the horse was not pulling on the sweep, a dog clutch to disengage the sweep to allow the cable to be unwound from the drum without the sweep being moved, and a means of safely connecting the machine to an anchor point (large stump or buried log).

In 1915 the University of Minnesota evaluated clearing land using dynamite alone, using dynamite in conjunction with a stump puller, and using a stump puller alone. The conclusion of the study was that the stump puller alone was superior to the alternate methods because of the speed of clearing and the cleared land was in better condition for agriculture. For stumps that were three to four feet across, using dynamite to break the stumps in pieces prior to pulling was judged to be beneficial.

The unanswered question is why my great grandfather made his own stump puller when several manufacturers were advertising them for sale. The answer may lie in the price of a ready built machine. An advertisement from 1911 for the Hercules No. 3 stump puller listed the price as $445. The least expensive Hercules model started at $245. The Hercules machines were made in Centerville, Iowa and would have required additional cost to ship to Maryland. In 1911 $445 was a considerable sum of money and out of reach for many small acreage farmers.

My great grandfather possessed the wood working and pattern making skills to produce the patterns for the metal parts. He probably learned those skills from his father William T. Calvert (1813-1872). William purchased the farm in 1861 and family oral history identifies his occupation as a wheel wright and pattern maker. George may have been familiar with Baltimore foundries as a result of his father's pattern making work. George purchased the engine for his work boat, the Calvert, from the White & Middleton Gas Engine Company in 1900. According to family lore, the castings for the stump puller were made by the same company prior to 1910. The White & Middleton Gas Engine Company was the predecessor to the Middleton & Meads Company of today (founded 1911). Baltimore was a manufacturing hub at that time and had a number of foundries. By using his knowledge of the foundry process and investing his time in the design, patterns and assembly of the stump puller, George put the cost of a stump puller within reach for the Calvert farm.

Figure 1

Figure 2

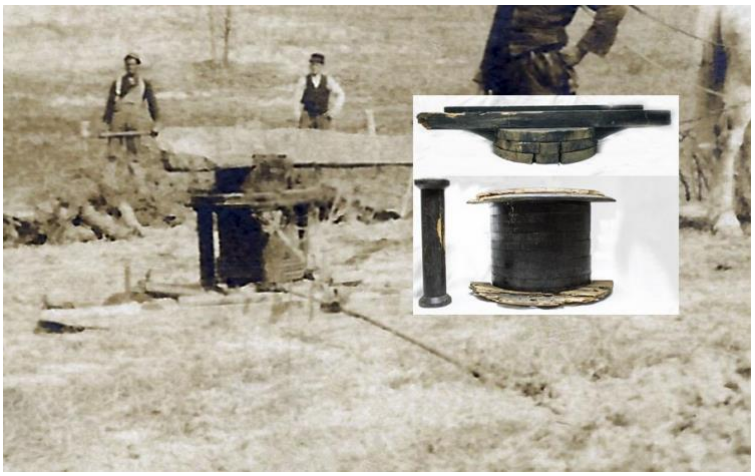


Figure 3

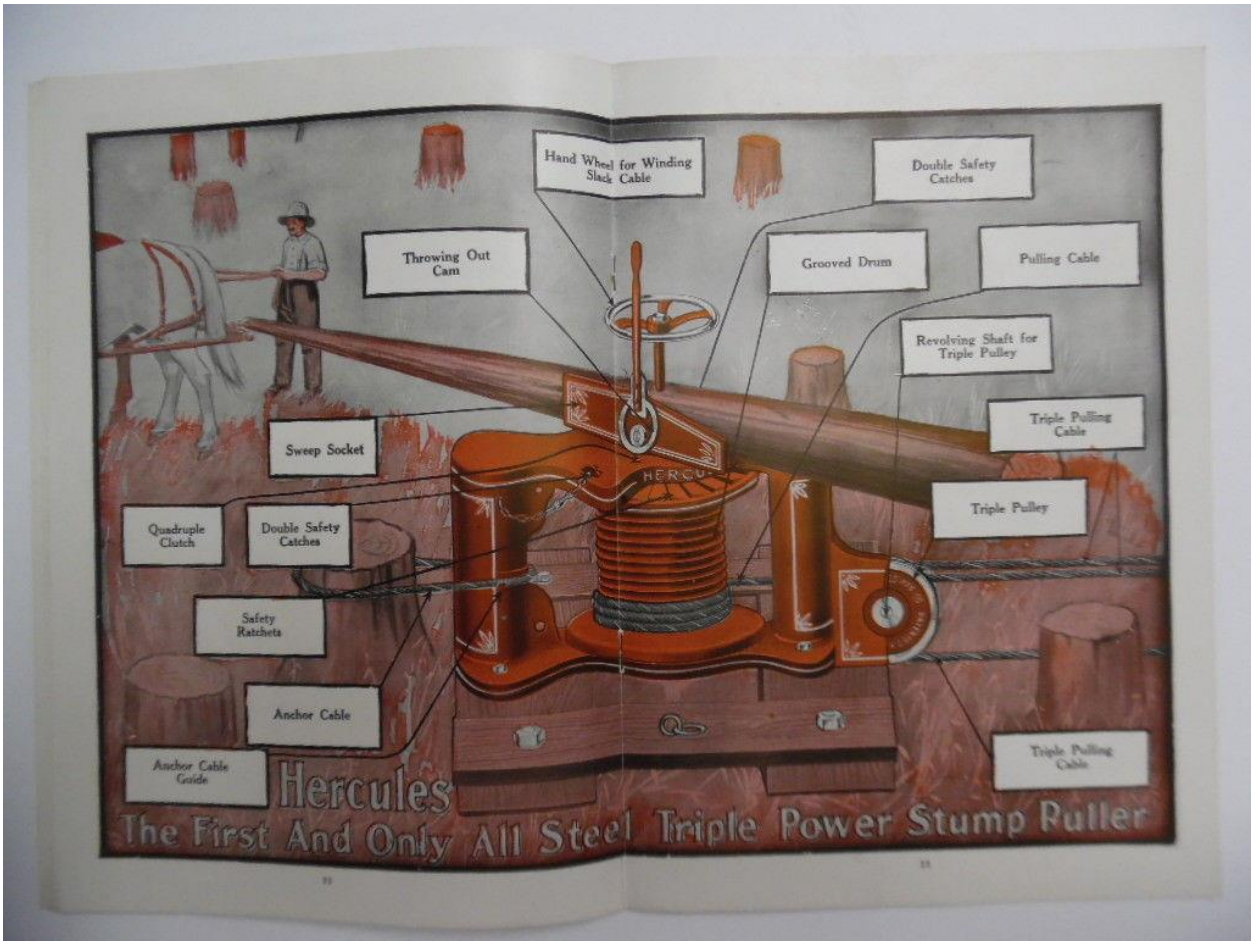


Figure 4

No. 815,586. PATENTED MAR. 20, 1906.

B. A. FULLER & M. BATEMAN.

STUMP PULLER.

APPLICATION FILED OCT. 27, 1905.

Fig. 1.

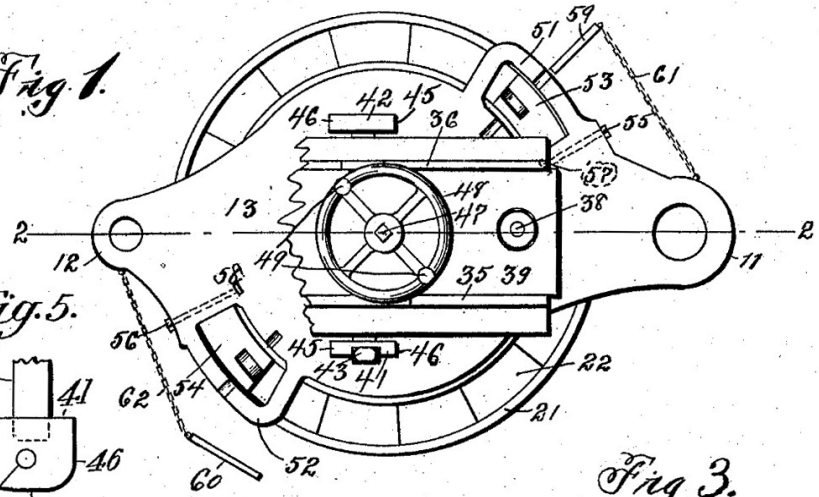


Fig. 5.

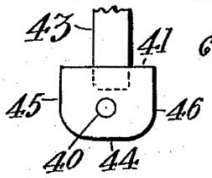


Fig. 3.

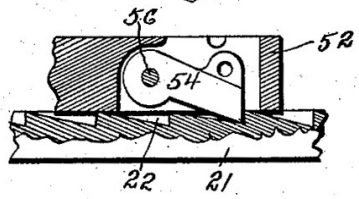


Fig. 2.

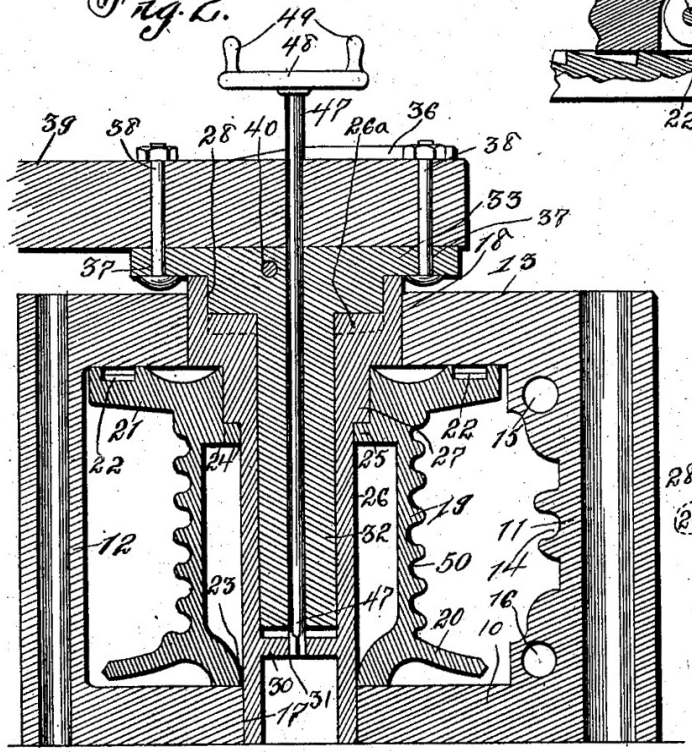
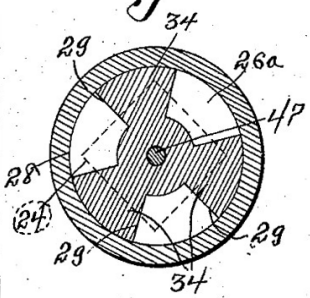


Fig. 4.



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UNITED STATES PATENT OFFICE.

BERNARD A. FULLER AND MILES BATEMAN, OF CENTERVILLE, IOWA.

STUMP-PULLER.

No. 815,586. Specification of Letters Patent. Patented March 20, 1906.

Application filed October 27, 1905. Serial No. 285,227.

To all whom it may concern:

Be it known that we, BERNARD A. FULLER and MILES BATEMAN, citizens of the United States of America, and residents of Centerville, Appanoose county, Iowa, have invented a new and useful Stump-Puller, of which the following is a specification.

The object of this invention is to provide improved means for pulling stumps.

A further object of this invention is to provide an improved windlass.

A further object of this invention is to provide an improved construction for cable and drum windlasses.

A further object of this invention is to provide improved means for taking up the slack of a cable.

A further object of this invention is to provide improved means for clutching the power mechanism to the drum device of a windlass.

A further object of this invention is to provide improved means for unclutching or detaching the power mechanism from the drum device of a windlass.

A further object of this invention is to provide improved means for unclutching a power mechanism from a drum device and improved means for rotating said drum device to take up slack of a cable while said drum device is disengaged from the power mechanism.

A further object of this invention is to provide improved means for disconnecting the drum device from the machine-frame in order that a cable on said drum device may be paid out to reach an object to which strain is to be applied.

Our invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in our claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a plan of the machine, a portion of the sweep being broken away. Fig. 2 is a central vertical section of the machine on the indicated line 2 2 of Fig. 1. Fig. 3 is detail view illustrating one of the ratchet-dogs employed to connect the drum device to the machine-frame and showing the means employed to hold said dog out of engagement with the drum device. Fig. 4 is a detail plan illustrating the triple clutch employed to connect the sweep-post to the drum device. Fig. 5 is a detail view of the means employed to raise and lower the sweep and sweep-post.

In the construction of the machine as shown the numeral 10 designates the base, 11 12 the standards, and 13 the top plate of a frame, which frame preferably is formed in one piece by molding. The standard 11 is formed with a groove 14 at the center of its inner face to maintain a central location of anchoring-cable (not shown) wrapped around said standard. Holes 15 16 are provided at the top and bottom of the standard 11 and are adapted to receive the anchoring-cable at times when it is desired to anchor the frame other than at its center. A circular hole 17 is formed in the base 10, and a circular hole 18 of materially greater diameter is formed in the top plate 13, the centers of said holes being in alinement.

A spool 19 or drum device is mounted in the frame with its lower end resting on the base 10. The spool 19 preferably is formed in one piece by molding and has a lower peripheral flange 20 and an upper peripheral flange 21, the latter flange formed with a ratchet 22 on its upper face. The spool 19 is formed with a circular hole 23 in its lower end and a square hole 24 in its upper end, the centers of said holes coincident with the axis of the spool. A shoulder 25 is formed in the hole 24 in the spool.

A tubular center post 26, generally circular in cross-section, is mounted through the holes 18 and 17 of the frame and is formed with a portion 27 intermediate of its ends square in cross-section and extending through and fitted to the hole 24 in the spool and normally resting on the shoulder 25. By means of the center post 26 the spool 19 is mounted for rotation in the frame, said post being journaled in said frame. The center post 26 is enlarged at its upper end to form a hub 26^a, and said hub is formed with a circular depression 28 in its upper surface and three angular clutch-seats 29, opening upwardly to said depression. The center post 26 also is formed with a flange or plate 30 across near its lower end portion, and a square hole 31 is formed in said flange.

A tubular sweep-post 32 is mounted loosely in the bore of the center post 26 with its lower end above the flange 30. A hub 33 is formed on the upper end portion of the sweep-post 32 and fits within the circular depression 28 of the center-post hub 26^a. Three clutch-lugs 34 are formed on the lower face of the hub 33 and fit to the clutch-seats 29 in the hub 26^a. Sweep-flanges 35 36 are formed on

and extend upward parallel with each other from the hub 33, and holes 37 in said hub receive bolts 38, whereby a sweep 39 is attached thereto. A rock-shaft 40 is journaled in and extends across the hub 33 and is formed with square ends engaging in square holes in cams 41 42. The cam 41 is formed with a handle-socket adapted to receive a handle 43; but the other cam has no such socket. Each cam 41 42 is formed with an end face 44, normally just clearing the top plate 13 of the frame, and side faces 45 46 at right angles to the end face and connected thereto by round corners. The distance between the axis of the rock-shaft 40 and either of the side faces 45 46 surpasses the distance between said axis and the end face by more than the depth of the clutch-seats 29 in order that in an oscillation of the rock-shaft sufficient to bring either face 45 46 in contact with the top plate 13 the hub 33 and sweep-post 32 will be raised to the extent necessary to disengage the clutch-lugs 34 from said seats. Such raising and disengagement of the sweep-post permit rotation of the center post and spool independent of the sweep-post for a purpose and by means hereinafter set forth. The rock-shaft may be oscillated in either direction by manual actuation of the lever 43, according to the convenience of the operator standing on either side of the frame and insures the conjunctive oscillation of the cams 41 42. The side faces 45 46 of the cams are made flat to insure normal retention of the cams in the position assumed thereby when normally actuated. A hole is formed in the sweep 39, and a rod 47 is mounted through said hole and through the bore of the sweep-post and is formed with a square end fitting to the square hole 31 of the flange 30. A wheel 48 is mounted rigidly on the upper end of the rod 47 and is provided with integral upwardly-projecting lugs 49, to which a hand stick or lever (not shown) may be applied in a conventional way to rotate the wheel, rod, center post, and spool when the sweep-post is raised out of engagement with the center post. Such manual rotation of the spool is desirable and advantageous at times in that it permits taking up or paying out cable on or from the drum and avoids the (otherwise) necessity of moving the frame in making a shorter or longer hitch. The spool 19 is formed with a spiral groove 50 in its periphery to receive a draft-cable. (Not shown.) Loops 51 52 are formed on the top plate 13 adjacent the standards 11 12, and ratchet-dogs 53 54 are pivoted therein on bolts 55 56, which bolts extend horizontally through the loop and dogs and are screwed into nuts 57 58, molded in the top plate. The ratchet-dogs 53 54 normally engage the ratchet 22 on the flange 21 at diametrically opposite points and prevent reverse movement of the spool in use. At times when the spool is to be reversely moved to pay out cable therefrom the ratchet-dogs 53 54 are raised out of engagement with the ratchet 22 and are sustained by pins 59 60, removably placed in coinciding notches in the loops 51 52 and the top plate and through holes in the dogs. The pins 59 60 normally are attached to the top plate to prevent misplacing and loss by chains 61 62.

It will be observed that the anchoring end (standard 11) of the frame is made materially stronger than the other end, since it receives the greater strain.

We claim as our invention—

1. In a stump-puller, a frame, a spool therein formed with an angular hole in its upper portion, a tubular center post formed with an angular portion removably mounted in said angular hole whereby said center post is clutched to said spool, a tubular sweep-post clutched to the center post, and means for disengaging the sweep-post from the center post.

2. In a stump-puller, a frame, a spool therein and formed with an angular hole in its upper portion, a center post journaled in the frame and formed with an angular portion removably mounted in said angular hole, whereby the center post is clutched to the spool, and also formed with a clutch-seat in its upper end, a sweep-post formed with a clutch member removably mounted in said clutch-seat, whereby the sweep-post is clutched to the center post, and manually-actuated cam devices for raising the clutch member from the clutch-seat and thereby disengaging the sweep-post from the center post.

3. In a stump-puller, a frame, a spool therein, a tubular center post clutched to said spool, a tubular sweep-post clutched to the center post, and means for disengaging the sweep-post from the center post, which means comprise a rock-shaft in the sweep-post, cams on said rock-shaft adapted to engage said frame and a handle on one of said cams.

4. In a stump-puller, a frame, a spool therein, a tubular center post clutched to said spool, a tubular sweep-post clutched to the center post, and means for disengaging the sweep-post from the center post, which means comprise a rock-shaft in the sweep-post, cams on said rock-shaft formed with flat side faces adapted to engage said frame and a handle on one of said cams.

5. In a stump-puller, a frame, a spool therein, a ratchet-flange on said spool, ratchet-dogs on said frame and adapted to engage said ratchet-flange at diametrically opposite points, pins removably mounted in said frame and adapted to engage and sustain said dogs in elevated positions at times, a tubular center post clutched to said spool, a tubular sweep-post clutched to the center

post, and means for disengaging the sweep-post from the center post.

6. In a stump-puller, a frame, a spool therein, a ratchet-flange on said spool, ratchet-dogs on said frame and adapted to engage said ratchet-flange at diametrically opposite points, pins removably mounted in said frame and adapted to engage and sustain said dogs in elevated positions at times, a tubular center post clutched to said spool, a tubular sweep-post clutched to the center post, means for disengaging the sweep-post from the center post, a rod mounted through said sweep-post, and means for connecting said rod to the center post whereby the center post and spool may be rotated independent of the sweep-post.

7. In a stump-puller, a frame, a spool therein, a ratchet-flange on said spool, ratchet-dogs on said frame and adapted to engage said ratchet-flange at diametrically opposite points, pins removably mounted in said frame and adapted to engage and sustain said dogs in elevated positions at times, a tubular center post clutched to said spool, a tubular sweep-post clutched to the center post, means for disengaging the sweep-post from the center post, a rod mounted through said sweep-post, a manually-operated wheel on said rod, and means for connecting said rod to the center post whereby the center post and spool may be rotated independent of the sweep-post.

8. In a stump-puller, a frame comprising a base, standards and top plate integrally connected, one of said standards formed with a groove at the center of its inner face, a tubular center post journaled in and extending through the central portion of said base and top plates, a spool mounted within said frame and surrounding said center post, clutch connections between said spool and center post, a sweep-post mounted within said center post, clutch connections between said center post and sweep-post, ratchet-and-dog connections between said top plate and spool, and manually-operated cam devices on the sweep-post and adapted to engage said top plate, whereby said sweep-post may be raised and disengaged from the center post.

9. In a stump-puller, a frame comprising a base, standards and top plate integrally connected, one of said standards formed with a groove at the center of its inner face and holes at its ends, a tubular center post journaled in and extending through the central portion of the base and top plates, a spool mounted within said frame and surrounding said center post, said spool formed with an angular cavity, the center post formed with an angular portion fitting said angular cavity, a sweep-post mounted within said center post, said center post formed with a circular cavity and clutch-seats within said cavity, said sweep-post formed with a circular hub fitting said circular cavity and clutch-lugs fitting said clutch-seats, ratchet-and-dog connections between said top plate and spool, and means for raising and lowering said sweep-post in respect of said center post.

10. In a stump-puller, a frame, a tubular center post journaled therein, a drum-spool mounted on and clutched to said center post, ratchet-and-dog connections between said spool and frame, a tubular sweep-post mounted for longitudinal adjustment in and clutched to said center post, manually-actuated cam devices composed of a rock-shaft in said sweep-post, cams on said rock-shaft and a handle on one of said cams, for raising and unclutching said sweep-post, and manually-actuated rotating devices for rotating the center post and spool conjunctively independent of the sweep-post.

11. In a stump-puller, a frame, a tubular center post journaled therein, a drum-spool mounted on and clutched to said center post, suspensible ratchet-and-dog connections between said spool and frame, comprising a ratchet-flange on the spool, dogs pivoted in the frame, and pins adapted to engage with and support said dogs, a tubular sweep-post mounted for longitudinal adjustment in and clutched to said center post, manually-actuated cam devices composed of a rock-shaft in the sweep-post, cams on said rock-shaft, and a handle on one of said cams, for raising and unclutching said sweep-post, and manually-actuated rotating devices for rotating the center post and spool conjunctively in either direction independent of the sweep-post.

Signed by us, at Centerville, Iowa, this 29th day of April, 1905.

BERNARD A. FULLER.
MILES BATEMAN.

Witnesses:
R. M. HICKS,
J. I. ONG.