A. Broughton,

Stump Elevator.

No. 28,806. Patented June 19, 1860.

Fig: 1.

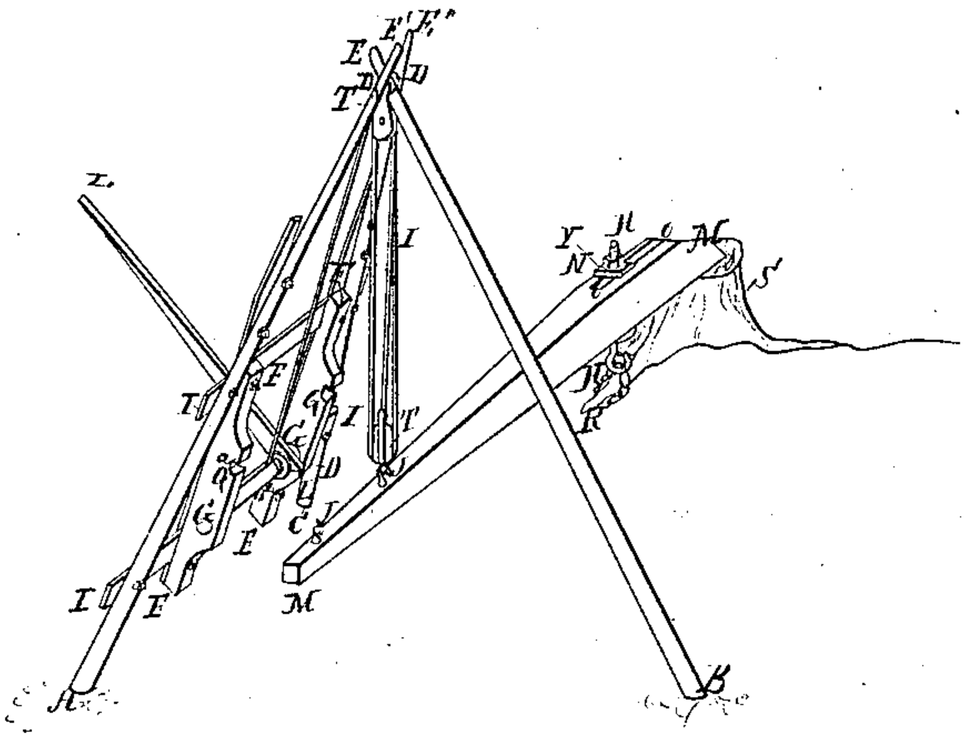


Fig: 2.

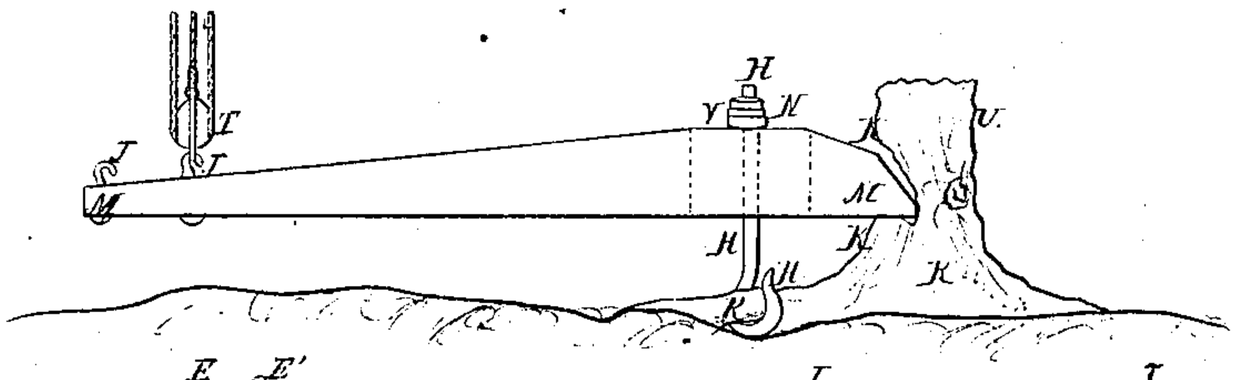


Fig: 3.

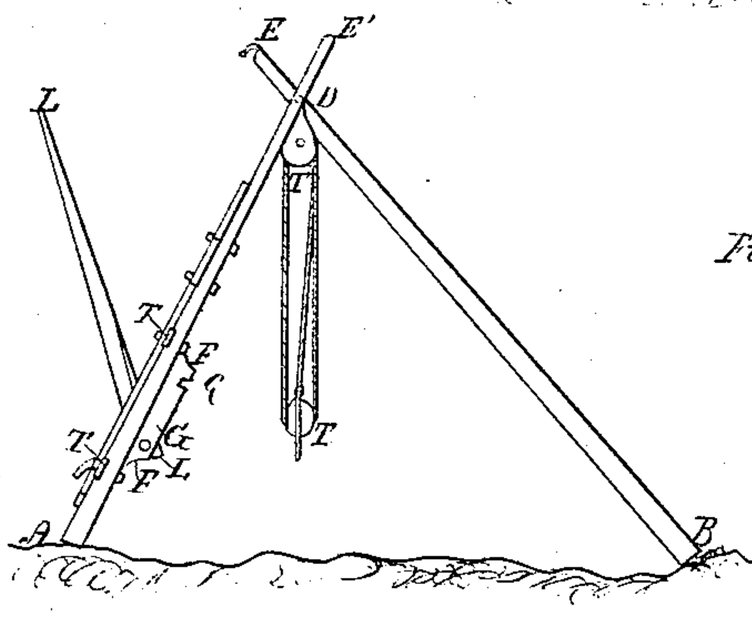


Fig: 4.

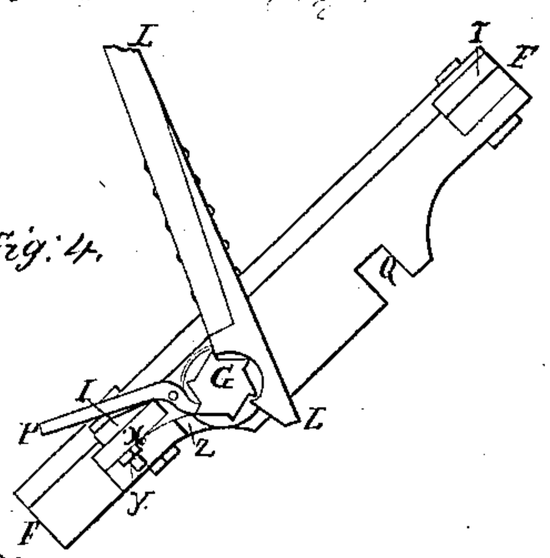


Fig: 5.

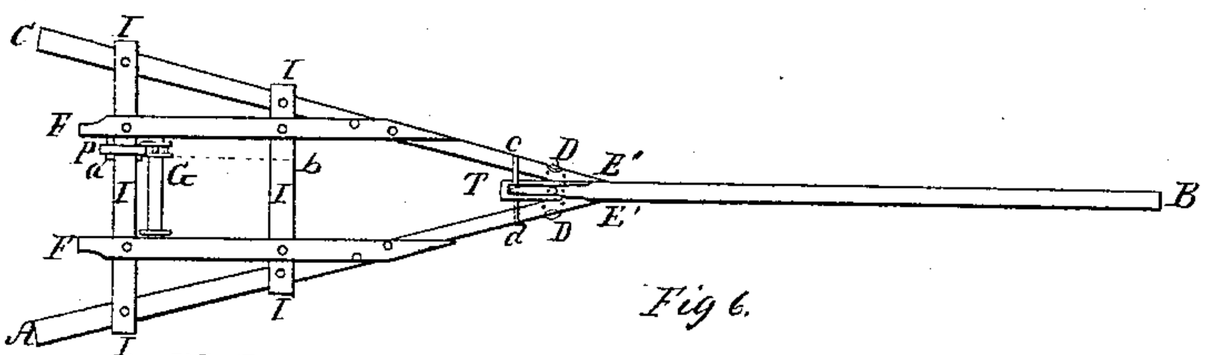
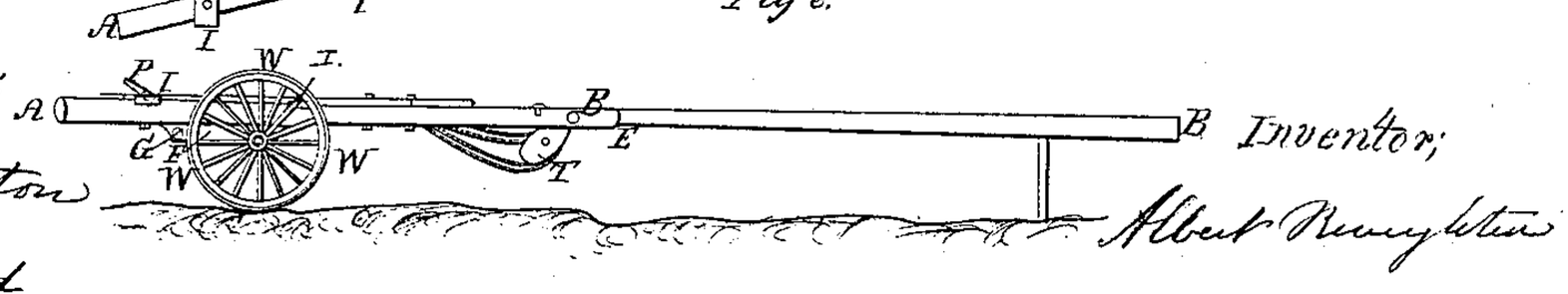


Fig 6.



Witnesses;

John Hutton

F. F. Read

Inventor;

Albert Broughton

UNITED STATES PATENT OFFICE.

ALBERT BROUGHTON, OF MALONE, NEW YORK, ASSIGNOR TO HIMSELF AND ALEX LINDSAY, OF SAME PLACE.

STUMP-EXTRACTOR.

Specification of Letters Patent No. 28,806, dated June 19, 1860.

To all whom it may concern:

Be it known that I, ALBERT BROUGHTON, of Malone, in the county of Franklin and State of New York, have invented a new and useful Machine for Pulling Trees and Stumps, to be Called "Broughton's Portable Stump-Puller;" and I do hereby declare that the following is a clear, full, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, which make a part of this specification, and in which—

Figure 1 is a perspective view of the whole machine prepared for use and attached to a stump; Fig. 2, a side elevation of the main lever prepared for use and attached to a tree; Fig. 3, a side elevation of the hoisting gin; Fig. 4, a section along the line *a*—*b* of Fig. 5 showing the construction of the ratchet and pawl and the hand lever by which they are moved; Fig. 5, a plan of the hoisting gin stretched out in a horizontal position and prepared for mounting on wheels; and Fig. 6, a side elevation of the hoisting gin, mounted on wheels and converted into a carriage or cart for the transportation of the whole machine.

The nature of my invention consists in the attachment together and combination of the hoisting gin tackle blocks and main lever in such manner and proportions as when attached to a stump or tree to exert a direct upward force upon the roots.

To enable others to make and use my invention I will proceed to describe its construction and operation.

I. The construction.

The machine essentially consists of the hoisting gin (A B C D E Figs. 1, 3 and 5) the main lever (M M Figs. 1 and 2) and the wheels (W W W Fig. 6) and their appurtenances.

1st. The hoisting gin (A B C D E Figs. 1 and 3) is made like the ordinary hoisting gin in all respects except the following, viz:—(1) The pawl and ratchet; the ratchet and windlass G G (Figs. 1 and 4) are set into the blocks F F and F F; and the pawl P plays on the block K (Fig. 4) which is fastened to the cross-bar I by the bolt Y (Fig. 4) and the spring Z serves to keep the pawl P pressed closely against the ratchet G. (2) The hand lever (L L Fig. 4) has an upper end or handle which is made of wood; to this the lower end which is made of iron 2 inches in thickness is bolted in the manner shown in Fig. 4 and this iron plate is hollowed or cut out in the manner shown in the same figure so that when the lower point or hook of the lever is caught on one tooth of the ratchet the upper part of this semicircle in the iron may press against the second tooth back from this first one: This lever may with perfect ease be attached or detached to or from the ratchet at pleasure. (3) The blocks F F and F F are made projecting out from the frame work of the hoisting gin and in their upper part at Q Q (Figs. 1, 3 and 4) a notch or slot is cut which is intended to receive the axle of a pair of wheels to be attached to the gin when it is to be removed. (4) The longer leg E B of the hoisting gin has at its upper end an iron hook (*e* Figs. 3 and 5) which when the gin is placed in a horizontal position as in Figs. 5 and 6 catches against and rests upon the bar *c*—*d* which is placed across the other two legs C E and A E at the points shown in Figs. 5 and 6, and thus serves to sustain the forward part of the gin (or cart as it becomes) when mounted upon wheels as in Fig. 6.

2nd. The main lever (M M Figs. 1 and 2) consists of a single strong beam of timber about 15 feet in length about 8 inches square at the smaller end and about 12 by 18 inches in size at the largest place which is situated at a distance of from 2 to 4 feet from the larger end; in this largest part of the beam a slot or mortice (O, O, Fig. 1) about 3 feet long and 2 inches wide is cut running lengthwise of the beam and extending downward entirely through it; through this slot is passed an iron rod (H H H Figs. 1 and 2) 2 inches in diameter; the lower end of this terminates in a hook and on its upper end is cut a screw on which works the nut N and the washer V, the lower surface of which is made slightly convex, as shown in Fig. 2; on the upper side of the smaller end at convenient distances are placed the iron hooks J, J, to which the tackle block T is to be attached; and the larger end of the lever is cut away in the form shown in Figs. 1 and 2.

3rd. The wheels (W W W Fig. 6) are ordinary wagon wheels of medium size, turning on an axle tree of square timber of

the same size as the notches Q Q in the blocks F F and F F and furnished with two large iron bolts placed at a distance apart corresponding with the distance apart of the blocks F F and F F, through which blocks holes are bored at Q Q of sufficient size to allow these projecting bolts to pass freely; and the gin being let down onto these wheels the axle fitting into the notches Q Q and the bolts passing through the corresponding holes the gin is changed into a cart like vehicle for the conveyance of itself and the rest of the machine and its apparatus.

II. The operation.

1st. To move the machine to the field where it is to be used the hoisting gin must first be mounted on the wheels and this, the gin being in the upright position shown in Fig. 3, may be easily done by a single person by setting the wheels and axle immediately beneath the gin, the axle parallel to the plane of and a short distance in front of the two shorter legs, and then carrying the loose or single leg outward (keeping the end pressed to the ground to retard the downward motion) and thus lowering the gin gradually down until it rests upon the axle the latter entering the slots Q Q and the bolts above mentioned passing up through the holes in the blocks; then, the levers and the rest of the machine and its apparatus being loaded onto the frame work of the gin and so adjusted as to nearly balance the whole upon the axle, the frame work of the gin is converted into the body and the longer leg into the tongue of a cart or carriage and by attaching any convenient power to this tongue the machine may be drawn to the desired location; or if desirable the power may be attached directly to the body of the gin and the tongue turned back or taken out.

2nd. To set up the hoisting gin, the cart is to be placed opposite to and about ten feet from the stump or tree to be pulled, and the levers and the rest of the load moved to the hind end of the cart; when their weight will tip that end down to the ground and the forward end of the body and the hind end of the tongue up so that a single man by lifting at first at the points D D, and then pushing upward on the tongue may easily raise the body to the upright position of the gin in Figs. 1 and 3 meanwhile the wheels (being but loosely attached to the gin) will remain upon the ground and may then be removed.

3rd. To pull a stump the first step, after the placing of the gin, is to dig around and under a root of proper size and strength at a distance of from 2 to 4 feet from the body of the stump and then to pass a short chain around under it as shown in Fig. 1 at R; next, to place the larger end of the main lever upon the top of the stump and the smaller end under the center of the hoisting gin as shown in Fig. 1; then, to pass the rod H H through the slot O O and to hook the lower end firmly into the chain above described; next, to place the washer V on the rod, above the lever, and to screw the nut N tightly down. This being done the lower tackle block T must be attached to one of the hooks J J; and then the machine is ready for use, and is to be worked by applying the hand lever L L to the ratchet G and so turning the windlass until by the upward force exerted by the tackle block T upon the main lever M M and by the main lever (by means of the rod and hook, H H H) upon the root R, until the stump is either entirely extracted from the ground or so nearly so that it may be easily removed by hand. In most cases the chain above described may be dispensed with and the hook H H used in its stead as in Fig. 2 and generally this is the more convenient method.

4th. In grubbing as for railroad and other purposes it becomes desirable to remove trees bodily trunk branches and all. In such cases this machine may be used for that purpose by merely cutting a notch in the body of the tree (as is shown in Fig. 2 by the line K K K) and attaching the main lever and rod and hook in the same manner as above and operating as in the case of a stump until the tree is raised so that its weight will assist its fall which will always be in a direction away from the machine and not toward it, as in other machines.

5th. Fruit or shade trees of almost any size may be pulled, for transplanting, by this machine without injury to the roots by simply passing the chain under the roots close up to the trunk and then placing a block a little beyond the tree, to be used as an artificial fulcrum for the main lever M M, and operating as before.

6th. To move the machine any short distance, as from one stump to another, it is only necessary for the operator to place his shoulder to and alternately lift and carry each of the legs of the gin forward or backward, right or left as the case requires, a short distance in the direction in which it is desired to move the machine and to continue this operation until the proper location is reached; and when the work is completed the gin may be let down onto the wheels in the manner already stated the machinery and implements packed upon it and the whole drawn away at the pleasure of the operator.

It will be observed on inspecting the model that the arrangement and proportions of the main lever, tackle blocks, windlass,

and hand lever are such that a downward force of one pound on the outer end of the hand lever will exert an upward force on the rod and hook H H H of from 600 to 800 lbs.; and consequently in the working of the machine, a man exerting on the hand lever a downward force of 200 lbs. will produce an upward force on the root varying from 60 to 80 tons in amount.

By actual experiment and practice in pulling stumps with my machine I have proved beyond doubt the following facts: 1st, that my machine requires but little iron or metal work or chain and may be constructed at an expense of about thirty dollars only; 2nd, that a single man may set it up take it down and move it around with but little difficulty; 3rd, that with it a single man of ordinary strength can pull up any ordinary stump, while 2 or 3 men can with advantage be employed in its use, and 3 men can exert all the power which can ever be wanted to pull any stump or tree; and 4th, that by the use of the main lever M M I virtually produce the same effect which would be produced if nature had provided the stump or tree with a root of the same length and strength as the lever and as if the tackle block had been attached to and the upward force exerted upon this root at the same distance from the trunk as the hooks J J; and that this main lever is in effect merely such an artificial root. From these facts and from careful comparison of my machine and its working with the other machines for that purpose now in common use I deduce and assert for my machine the following advantages above all others: (1) its superior and perfect portableness; (2) its greater facility and effectiveness of operation; (3) its adaptation to different kinds of work; it pulling large trees for transplantation and grubbing as well as stumps for clearing land; (4) that the hoisting gin is so made that it may be used for other purposes besides stump pulling, as in raising stones or other heavy bodies or in loading wagons or trucks, thus adding to the real usefulness of the machine; (5) that the direction given to the operation of the power of the machine being such as to pull the stump or roots directly upward out of the ground is much preferable in point of economy of power to the horizontal twisting or rotary motion of most if not all other stump machines; and (6) that as a whole it is cheaper of construction, easier of transportation, less expensive and difficult of operation, more powerful and efficient in action and in all respects superior to any stump machine in existence or use.

It will be seen from the foregoing description and the accompanying drawings that I have made various minor improvements in several of the different parts of my machine still I do not claim these or any of the separate fixtures or portions of the machine as my invention but on the contrary I disclaim each and every one of these parts taken separately each by itself alone, but

What I do claim and desire to secure by Letters Patent is—

1. The mode of converting the hoisting gin into a cart or vehicle for the transportation of the machine and its apparatus, as shown in Fig. 6.

2. The arrangement connecting together and combination of the hoisting gin and main lever in the manner shown in Figs. 1 and 2 for the purposes above stated.

3. The method of attaching the main lever to the roots of the tree or stump as shown in Figs. 1 and 2 and above described together with the use of the main lever, as arranged, for the purposes herein stated.

4. The arrangement connecting together and the combination of all the several parts of the machine, substantially in the manner shown in the annexed drawings and above described, for the purposes and uses in this specification above stated and set forth.

ALBERT BROUGHTON.

Witnesses:

JOHN HUTTON,

F. F. WEAD.