E. BAYLISS.

Stump-Extractors.

No. 134,507. Patented Jan. 7, 1873.

Fig. 1.

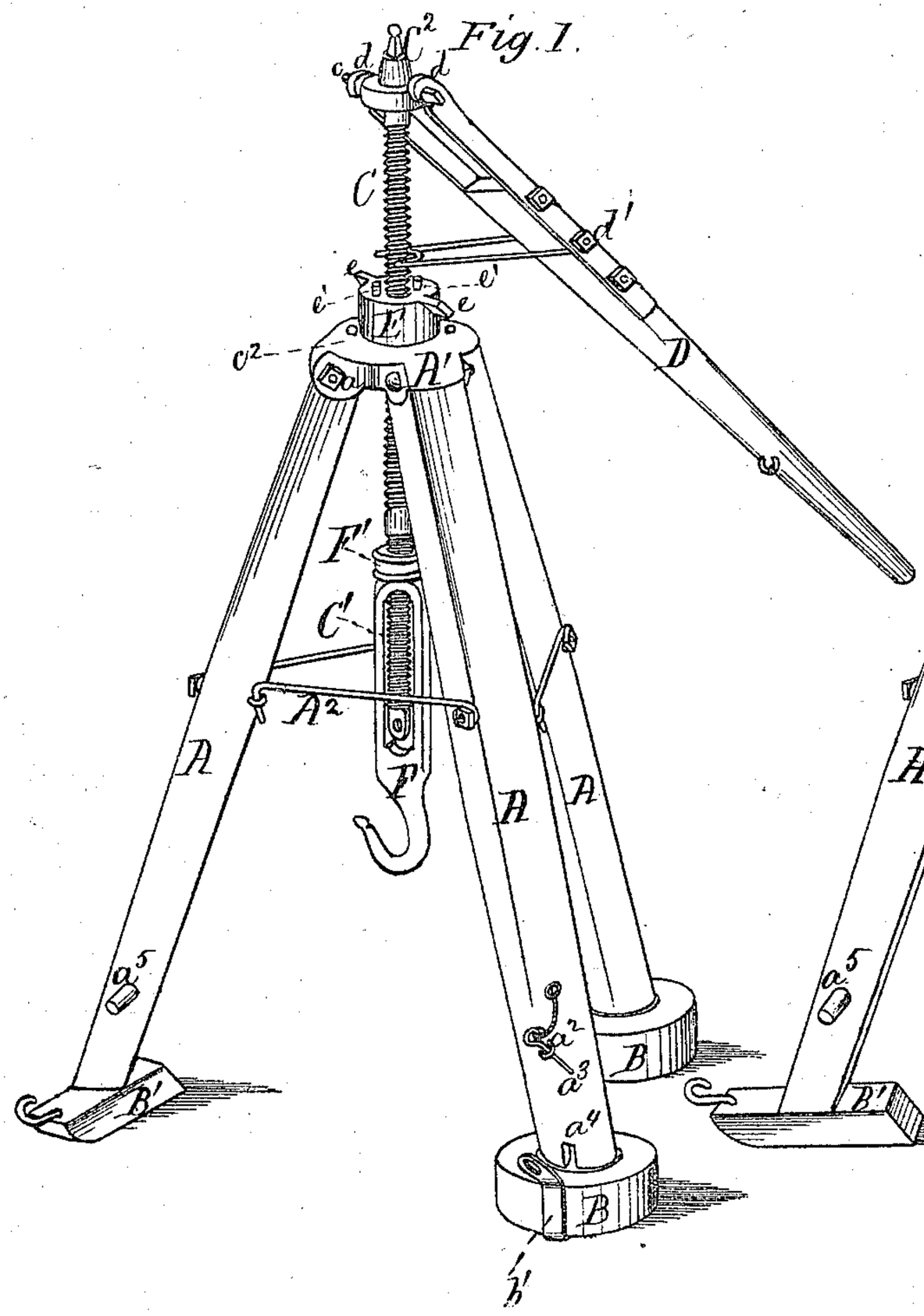


Fig. 2.

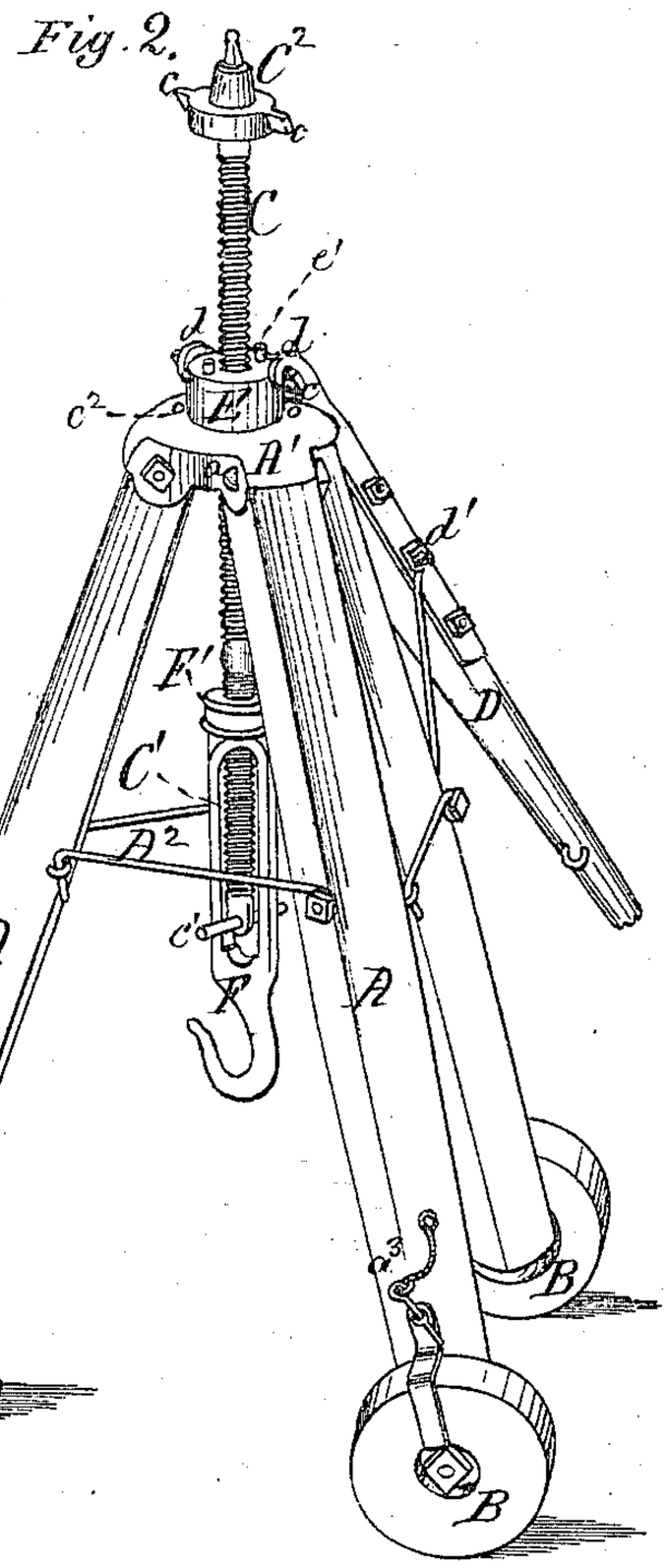


Fig. 3.

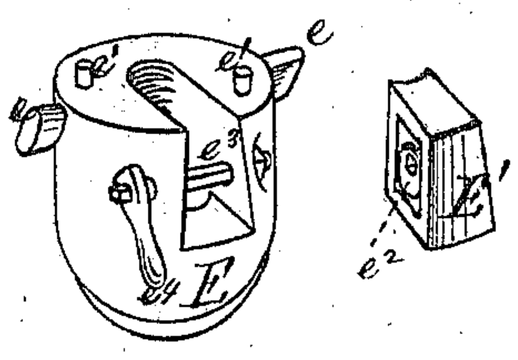
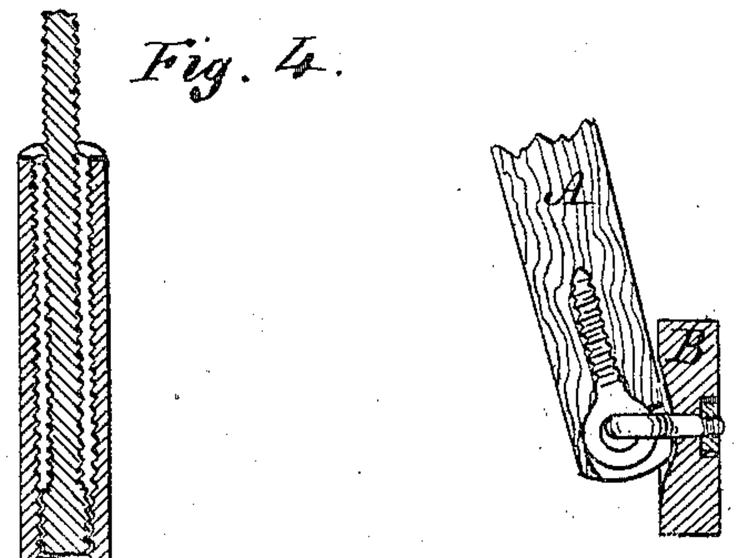


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWIN BAYLISS, OF MASSILLON, OHIO.

IMPROVEMENT IN STUMP-EXTRACTORS.

Specification forming part of Letters Patent No. **134,507**, dated January 7, 1873.

To all whom it may concern:

Be it known that I, EDWIN BAYLISS, of Massillon, county of Stark, State of Ohio, have invented a new and useful Improvement in Stump-Machine, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view of the machine arranged for operation; Fig. 2 represents the machine mounted upon its wheels for transportation; Fig. 3 is a detached view of one of the nuts in which the upper end of the screw works; Fig. 4 represents a modification of the other nut at the lower end of the screw; and Fig. 5 is a sectional view of a portion of the devices.

Similar letters of reference denote corresponding parts in all the figures.

The invention relates more particularly to that class of stump-machines in which the power is obtained from a screw, but some of the features may be applied with equal advantage to any of those machines which are mounted upon vertical or nearly vertical legs. The first part of the invention consists in a novel construction and combination of a screw having a differential thread—that is, a thread of one pitch at one end and a thread of a different pitch at the other end—two nuts in which the screw works, the lower nut being hollow, and a sweep adapted to operate the screw alone or to turn both the screw and the upper nut together, whereby three different rates of speed and power may be attained with the same set of devices. The second part of the invention relates to the construction of the frame or tripod upon which the lifting devices are mounted, whereby the machine is rendered portable, and may be easily moved to and from or about the field.

In the drawing, A are the legs or posts, of any suitable size and length. A^1 is the cap or top plate, made of metal, and provided, upon its under side, with sockets in which the legs are pivoted by pins or bolt *a*. By preference the upper ends of the legs are made round in form, as shown in dotted lines, Fig. 1, in order that they may have a firm bearing on the plate, whether they be spread more or less apart. B B′ are pedestals to support the legs and prevent them from being driven into the ground. Pedestals B are in the form of wheels, provided upon their upper surfaces with semi-spherical recesses or seats, into which the correspondingly-rounded ends of two of the legs fit, the wheels being attached to the legs by means of eyebolts *b* and pins a^1, Fig. 5. B′ is another pedestal, consisting simply of a block of wood or metal, having one end chamfered from the under side, and pivoted centrally to the leg or post. I usually attach a hook to the chamfered end of the block or runner. It will be seen that when it is desired to move the machine I can turn the pedestals B from a horizontal position, as in Fig. 1, to a vertical position, Fig. 2—the eyebolt entering the slot a^4, Fig. 1, the strap *b′* being secured to staples a^2 by pin a^4, by which arrangement the pedestals B are made to serve as wheels, the eyebolts serving as axles, the horse or horses being hitched to the hook or runner B′. Under ordinary circumstances the straps *b′* may be dispensed with, as the eyebolts will be held in place by the slots *a′*; yet I prefer to use said straps, as they serve to relieve the axles from undue strain, and to insure that the parts shall be always kept in a proper working relation. For convenience in lifting the legs to adjust the wheels, or in moving the machine by hand, or for other purposes, I insert pins a^5 in the legs at a suitable height from the ground. A^2 are braces or hooks to prevent the legs from spreading. C C^1 is the screw, and the upper end C is shown with a coarser thread than the lower end C^1. C^2 is a cap having arms *c*, and fitting the squared end of the screw. D is a sweep. Its upper end is forked and formed into hooks *d*, adapted to engage with the arms *c* of cap C^2. D′ is a brace pivoted to sweep D at *d′*. The free end of brace D′ is made to fit screw C C^1, and thus support the sweep at any desired angle. It also serves at times another purpose, which is to operate the nut E, which I will now proceed to describe: This nut is made at its lower end in a semi-spherical form, the cap A′ having a correspondingly-shaped seat in which the nut rests; the object of this construction being to afford a firm bearing for the nut, whatever may be the position of the screw C C^1, as it frequently happens that, owing to the shape of the ground and from other causes, this screw will be much inclined from

a vertical line. *e* are ears or lugs projecting from opposite sides of nut E, and adapted to receive the hooks *d* of sweep D. e^1 are pins rising from the upper face of the nut. Fig. 3 is a detached view of nut E, in which a segment E′ is made movable, and is operated by means of a cam, e^2, mounted on shaft e^3, and actuated by a lever, e^4. The shaft e^3 is supported in bearings in the body of the nut, so that the segment can be moved toward, or withdrawn from, the screw. By this arrangement of devices the grip of the nut upon the screw can be released at the will of the operator, as will be readily understood without further explanation. I usually make the brace D′ of a light iron rod, which may be easily bent into the requisite shape—that is, with the central portion of its free end circular—so as to fit the screw, and also with two eyes or loops (one at each side of the central part) adapted to pass over the pins e^1, on the nut E, thus locking the screw C C^1, sweep D, and nut E, together, so that they all rotate as one piece when the sweep is moved around, as will be hereinafter explained. F F′ is the lower nut. For economy and convenience in construction I usually make this nut in the form shown in Figs. 1 and 2—that is, with a long slot into which the end C′ of the screw enters, the part F′ only having a thread cut in it, the lower end F having a hook attached to or formed upon it. When preferred, however, the construction shown in Fig. 4 may be adopted, when the nut is made tubular with a thread running its entire length, in which case the corresponding section of the screw may be quite short, as shown. In practice, however, I prefer the construction shown in Figs. 1 and 2.

The machine, when in operation, should, of course, be so placed that the screw is directly over the largest root of the stump, with the pedestals as in Fig. 1. The lower nut F F′ should be turned up to the upper end of the thread C^1, and the upper part C screwed down as low as may be convenient into nut E. After the chains or hooks are attached to the root a pin, c^2, should be inserted in the hole at the lower end of the screw, as in Fig. 2, and the sweep should be applied to the nut E, as in the same figure, and carried around in the direction in which the sun moves, (the screw being a right-hand one,) thus elevating the screw until the slack is taken up. If the stump pulls easily this movement of the nut may be continued until it (the stump) is out; but it will ordinarily be found necessary to employ more power. To accomplish this I remove pin c^1, apply the sweep D to cap C^2, resting the free end of brace D′ upon nut E, as in Fig. 1. I then insert the pin c^1 in one of the holes c^2 in cap A^1, as in dotted lines, Fig. 1, so that one of the ears *e* on nut E shall strike the pin, and thus prevent the nut from turning. If, now, the sweep be carried around in a reverse direction—that is, against the sun—the screw will rise in nut E; but as nut F F′ is also held from turning by the chains or hooks, the screw is at the same time backing out from it, so that the actual rise of this lower nut is very slow, and, of course, the amount of power exerted is proportionately great. Thus if the threads C are two inches apart, and those at C^1 an inch and a half apart, the actual rise of the entire screw will be but half an inch at each revolution of the sweep. Suppose that I have continued this last-described movement until the part C has been run up into the nut as far as it will go, and I wish to elevate the stump still higher, but do not need so much power. This I can accomplish as follows: I remove pin c^1 from hole c^2, and drop the free end of brace D′ down until it engages with pins or spurs e^1, as has been explained above, so that the nut E and the screw will both move together, when, reversing the motion of the sweep carrying it with the sun, the screw will be screwed into nut F F′, and, of course, lift said nut and the stump still higher. In order to prepare the machine for pulling another stump, the screw may be lowered by turning it around by hand, or by withdrawing the segment E′ by means of the cam e^2, shaft e^3, and lever e^4.

Many advantages grow out of the employment of this triple-speed machine, as I am enabled to adapt both power and speed to the size of the stump; and, when pulling large stumps, can increase my speed in doing some portions of the work, such as taking up the slack, and in finishing the pulling after the roots are broken. I can also, under ordinary circumstances, save much of the time required in running back the screw, even when the segmental nut is not used, by employing the lower end of the screw to complete the pulling, thus leaving nut F F′ in the position shown in the drawing, so that it is only necessary to run the upper part C^1 down.

I do not, of course, wish to be limited to forming the coarse thread on the upper end of the screw, nor to the precise construction of any of the parts, as many modifications of the devices might be made without departing from the spirit of my invention; and my construction and combination of parts may be advantageously used for other lifting purposes where varying power or speed is required.

The form shown of nut F F′ possesses some advantages over any other of which I have any knowledge, because I can insert the pin c^2 in the hole in the lower end of the screw, whatever may be the position of the screw relative to the nut. So, also, I regard the particular construction and arrangement of the trunnions or arms on both the cap C^2 and the nut E, and of the slots in the hooks *d* of sweep D, as being very advantageous, because, as will be readily seen, said hooks cannot be accidentally displaced when the parts are in the ordinary working position, although by raising the outer end of the sweep it may be easily detached from the arms, as the openings in the hooks are of greater width than the thickness of the arms

or trunnions, but yet are not of sufficient size to admit of the removal of the hooks when they are in a working position. It will be further seen that as the screw rises the position of the brace D′ may be adjusted in such manner as to keep the lower end of the sweep at nearly the same height from the ground, in order that a proper line of draft may be maintained.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a stump-extractor, the combination, with the tripod or supporting-legs, of the circular pedestals adapted, substantially as described, to support the machine when in operation, and also to serve as transporting-wheels, as set forth.

2. In combination with the circular supporting-pedestals, operating as described, the locking-straps *g g*, to assist in maintaining the wheels in proper position when used for transporting the machine, substantially as described.

3. In combination with the differential screw C C^1, the slotted nut F F′ and pin c^2 for locking said nut to the screw, substantially as described.

4. In combination with the cap A^1 and nut E, the pin c^1, or an equivalent locking device, for holding the nut E from turning with the screw C C^1, substantially as described.

5. In a stump-machine, the combination of the differential screw C C^1, the nuts E F F′, and the sweep D, substantially as described.

6. In a stump-machine, the combination of the sweep D and the adjustable braces D′, substantially as described.

7. In combination with the differential screw C C^1 and nut E, the removable sweep D, adapted to be applied to either the screw or the nut E at will, substantially as described.

8. In combination with the differential screw C C^1 and nut E, the sweep D and brace D′, adapted to engage with both the screw and the nut, and to move them both in the same direction at the same time in the lower nut F F′, substantially as described.

9. The nut E provided with the movable section and the cam-shaft, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand.

EDWIN BAYLISS.

Witnesses:

J. H. HUNT,

ANSON PEASE.