F. Kettler,

Extracting Tree Stumps.

No. 32,193. Patented Apr. 30, 1861.

Fig. 1.

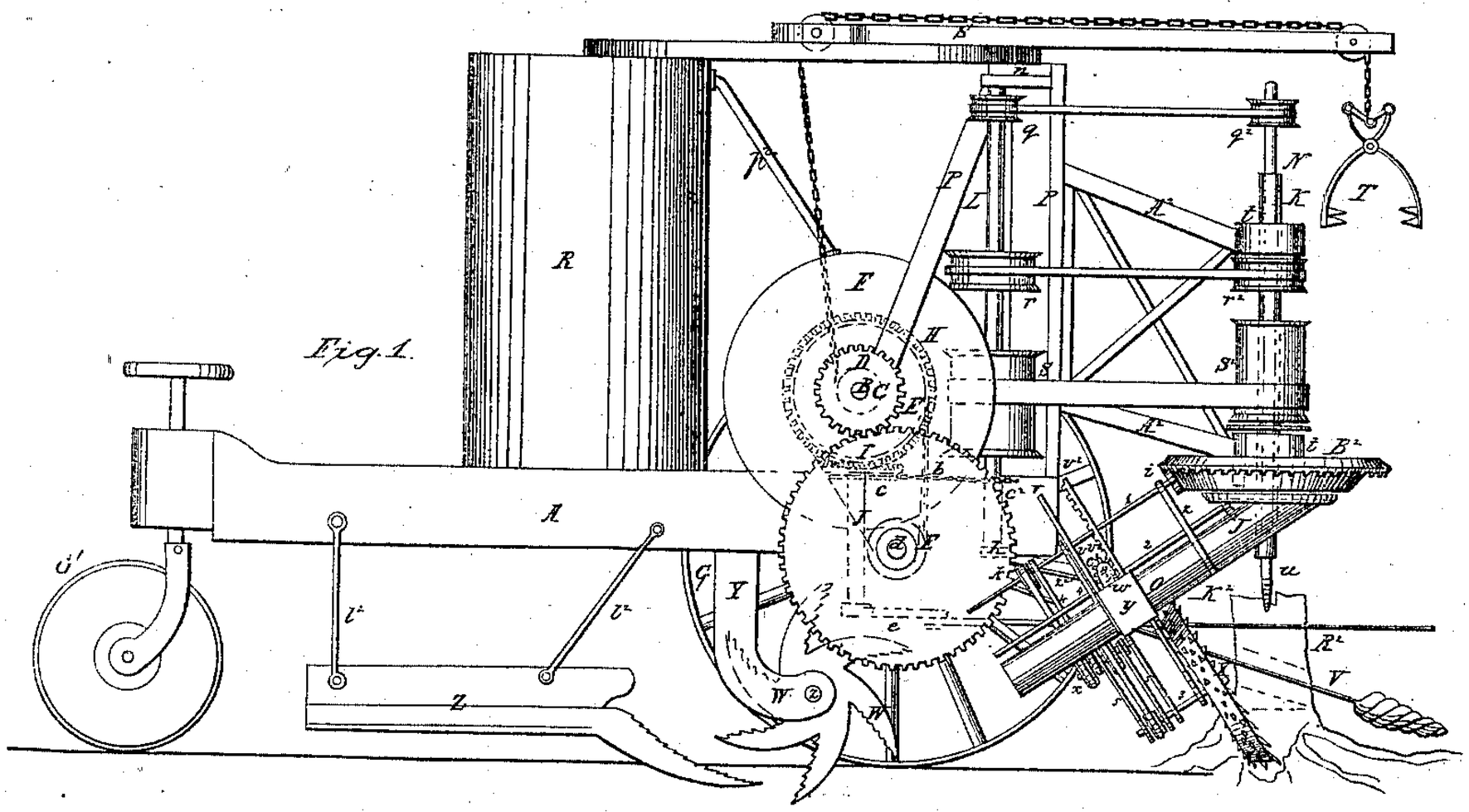

Fig. 3.

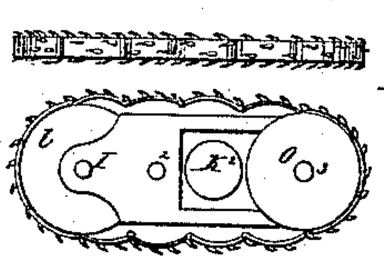

Fig. 5.

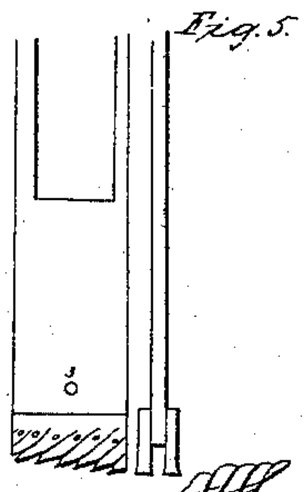

Fig. 2.

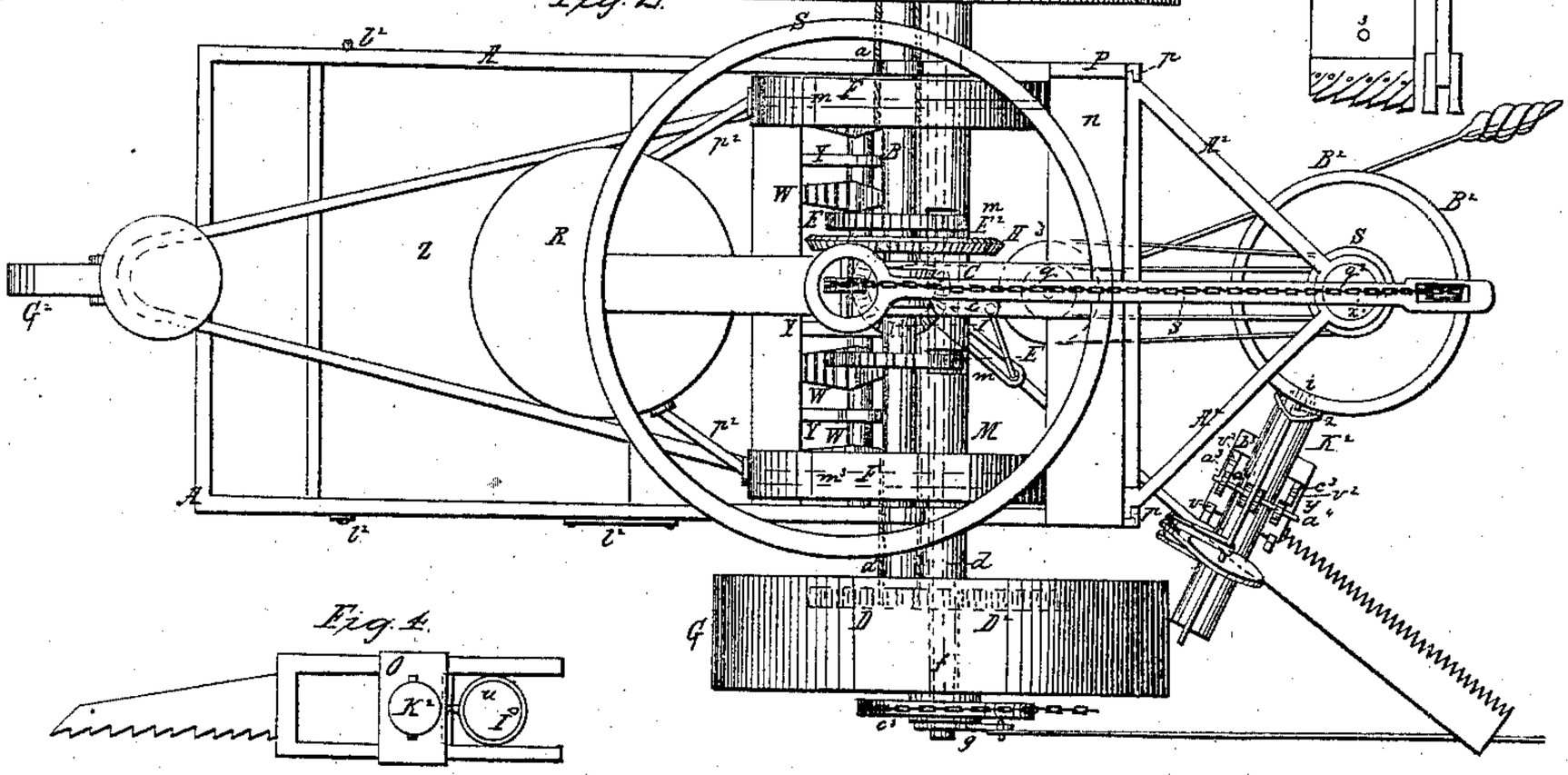

Fig. 4.

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UNITED STATES PATENT OFFICE.

FREDERIC KETTLER, OF MILWAUKEE, WISCONSIN.

STUMP-EXTRACTOR.

Specification of Letters Patent No. 32,193, dated April 30, 1861.

To all whom it may concern:

Be it known that I, FREDERIC KETTLER, of Milwaukee, in the county of Milwaukee, in the State of Wisconsin, have invented new and useful Improvements in Machines for Cutting, Boring, Splitting, and Taking Up Stumps and Roots for the Purpose of Clearing the Land; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a side view of the whole apparatus. Fig. 2 represents a plan or top view of the same. Figs. 3, 4 and 5 represent the cutting tools, hereafter to be described.

Similar characters refer to like parts.

A is the main frame work and P the standards to support the machinery; *p* vertical slide pieces fastened to the standards P.

A^2 is a frame for supporting the boring and splitting or cutting machines. Said frame A^2 is intended to slide up and down in the slide pieces *p* of the standards P so as to regulate the proper position of the machinery which it supports.

R is the boiler, secured firmly to the frame A; F two rotary steam engines which are secured by bolts to the main frame A and standards P.

p^2 are the steam pipes; G, G and G′ the wheels to support and carry the whole apparatus. In Fig. 1 one of the side wheels G is not drawn for the purpose of showing the inner parts of the apparatus better.

B is the main driving shaft, which is double at *a* and *a*′.

a and *a*′ are two hollow shafts, marked with section lines, see Fig. 2; they work freely on the shaft B and in the rotary steam engines F.

D are toothed wheels attached on the outer ends of the hollow shafts *a* and *a*′.

m^3 represents a disk with inserted pistons which work inside the rotary steam engine F, it is marked in red and is fastened on the inner ends of the hollow shafts *a* and *a*′.

The two sets of wheels D and D^2 are in gear, the latter being fastened to the carriage wheels G.

E and E^2 are toothed wheels on the shafts B and *d*, they are worked by means of chains *b*.

The roller C and conical wheel H are fastened by means of a key or setscrew on shaft B so as to put them in or out of work. The conical wheels I and H are in gear. The wheel I, pulley *c* and crank *e* are secured on the vertical shaft J which works inside the frame A. The crank *e* serves to work a saw to cut the stump shorter.

M and *d* is a double shaft. M is the outer or hollow shaft which is fastened to the frame A.

f are two boxes fixed within the shaft M to receive the inner shaft *d*. The shaft M being also stationary and shaft *d* works freely in boxes *f* of shaft M.

The cranks *g*, the wheels E and wheels c^3 are fixed on the shaft *d*. Motion is imparted through the wheels E. Crank *g* works also a saw to shorten stumps.

m are two grooves cut in the hollow shaft M, so as to allow the chains *b* to work freely.

n is a top piece secured on the standards P.

L is a vertical shaft which works in the center between the standards P.

q, *r*, *s* and c^2 are pulleys on the shaft L. The pulleys *c* and c^2 are worked by means of a chain.

N and K is a double shaft; K the outer shaft being hollow and working freely in boxes *t* of the frame A^2. N is the inner shaft with a socket at its lower end.

q^2 is a pulley and *u* a bore; the first being secured on the top of shaft N and the latter fixed in the socket of the lower end.

K^2 is an arm for supporting the cutting and splitting machine. One end of this arm K^2 is secured on the hollow shaft K under an obtuse angle.

s^2 is a loose pulley on the hollow shaft K.

The pulleys *q* and q^2 are worked by a belt. The pulleys *q*, *r* and *s* are larger than the pulleys q^2, r^2 and s^2 so as to increase the speed of the cutting or splitting machines. In case less speed should be required, the pulleys s^2 and roller C may be connected with a belt.

It is understood that the inner shaft N works freely in the hollow shaft K.

B^2 is a double wheel with two sets of teeth, loose on the hollow shaft K. Said wheel B^2 is fastened to the frame A^2 when the boring and cutting or splitting machine is in operation.

R^2 is the stump which is partly cut as is shown in red.

O is a square block with a horizontal hole in the center; it is fastened on the arm K^2

by means of a key or set screw so as to regulate its position with regard to the stumps. Said block O is further provided with four vertical grooves in which forked pieces v and v^2 slide.

w are two nuts for receiving the small shaft a^4, with its wheels a^3, b^3 and c^3. The nuts w are secured to the block O.

v and v^2 are the forked pieces; the latter having teeth so as to be worked up and down by the wheels a^3 and c^3.

y and y^2 are plates that bind the forked pieces together.

z and z^2 are two brackets; the first one being firmly attached on the arm K^2 of the hollow shaft K and the latter to the block O.

1, 2 and 3 are parallel shafts which work in boxes of the brackets z and z^2 and forked pieces v and v^2.

4, 4 and 5, 5 are two sets of parallel rods, movable on the shafts 1 and 3 and connected by a little parallel shaft x.

i is a wheel and k a pulley on the shaft 1 which gives motion to the pulleys of shaft x and the pulley and wheel X on shaft 3. The pulleys are operated by belts

X the splitting machine, see Fig. 1, is a conical wheel in the outer rim of which stonecutters' chisels are screwed. Those stonecutters' chisels project three different ways as is shown in the diagram. The splitting wheel may be replaced by a chain-saw, see Fig. 3, in which case a pulley l is fastened on shaft 1 and another pulley o of the same size on shaft 3. The teeth of the chain-saw are in the same direction as the chisels of the wheel X. The saw in Fig. 4 or planing machine in Fig. 5 may be used instead of the conical wheel X, according to circumstances.

It is obvious that the conical wheel X, the saws in Figs. 3 and 4 and the planing machine in Fig. 5 will cut the stump conically when the arm K^2 makes its revolution around the shaft or bore N.

S is a crane with a catch T, fastened on the top of the boiler R and top piece n. This crane serves to raise or lower the boring and cutting or splitting machines, also for lifting the stumps.

Fig. 4 represents a forked piece to which a saw is attached; this saw is intended to be worked up and down by an eccentric U on shaft 1.

Fig. 5 represents two views of a planing machine for paring or planing away the stumps; this planing machine consists of two rows of chisels fastened on a plate, when in operation it is fastened to the forked piece v^2 and goes on shaft 3.

V is a horizontal bore with a pulley fastened on the end; it is operated with a cross belt from pulley C. This bore V is about four or five inches in diameter and is calculated for splitting and boring the stumps.

The wheels C^3 are provided with a chain for pulling the stumps after being split.

W are curved armpieces to tear and cut the roots; they are hung with pins Z^3 in suspending brackets Y. The arm-pieces W are provided with teeth similar to those of a saw, with the exception that their edges are sharp on both sides. Said arm pieces will revolve as soon as the carriage is in motion.

Z is a box with cutters on one end and serves to clear the land of roots, weeds, &c. This box is suspended by rods l^2 to main frame A; its cutters are constructed in the same manner with teeth as the arm-pieces W, they serve also to cut the roots.

Operation: As soon as steam is admitted to the rotary steam engines or cylinders F, the disk m^3 with its inserted pistons, as described in my claim of Oct. 1860, will revolve and move the wheels D fastened on the same hollow shafts a and a'. The teeth of wheels D will mesh into the teeth of wheels D^2 and cause them to revolve. The wheels D^2 being secured to the carriage wheels G these latter will revolve also in the same time and move the carriage. It is obvious that the carriage is steered by the rotary engines F. The armpieces W will revolve by the motion of the carriage to tear and cut the roots, and throw them in the box Z which latter will clear the land entirely. The shaft B is operated by screwing the hollow shafts a and a' to it. The wheels E, roller C and conical wheel H will then revolve being fastened on shaft B. The teeth of the conical wheel H will mesh into the teeth of the pinion I and move it around. Shaft J, pulley c and crank e will receive rotary motion through the pinion I. The pulley c gives motion to the pulleys q, r, s, c^2 and crank h of shaft L, these latter pulleys working the pulleys q^2, r^2 and s^2 of shafts N and K. As soon as the apparatus is moved on its wheels G, G and G′ to the desired place the wheels D will be put out of gear, so that the apparatus will stand still. The bore N is then applied about two inches deep in the center of the stump so as to give a steady point to the arm K^2 with its cutting tools to revolve around. The pulley q^2 will be then loosened and the double toothed wheel B^2 fastened to the slide frame A^2. The hollow shaft K with its arm K^2 will be revolved by pulley r^2. The wheel i of shaft 1 and wheel j of shaft 2 will revolve around the teeth of the wheel B^2 from the left to the right as soon as the hollow shaft K turns around and will impart motion by means of shafts 1 and 2 to the pulleys of the shafts a^4 x and 3. By this motion the cutter is carried around the base of the stump and the feed thereof being effected by the forked pieces above described, the stump is cut or notched to any desired depth.

Having thus fully described the nature of my invention, what I claim therein as new and desire to secure by Letters Patent is:—

1. The use of the borer V, represented in Figs. 1 and 2, employed for the purpose of splitting the stumps.

2. The splitting or cutting wheel X in Fig. 1, which will cut the stumps conically to any desired depth.

3. The chain-saw in Fig. 3 which is carried around by the rollers or pulleys *l* and *o*, to cut the stumps conically to any desired depth.

4. The planing or paring machine in Fig. 5, which is operated by the forked piece v^2 and shaft 3 which machine is used for the purpose of paring or planing away the stumps conically to any desired depth.

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