E. A. HILDRETH.

Machine for Splitting Wood.

No. 205,550. Patented July 2, 1878.

Fig. 1.

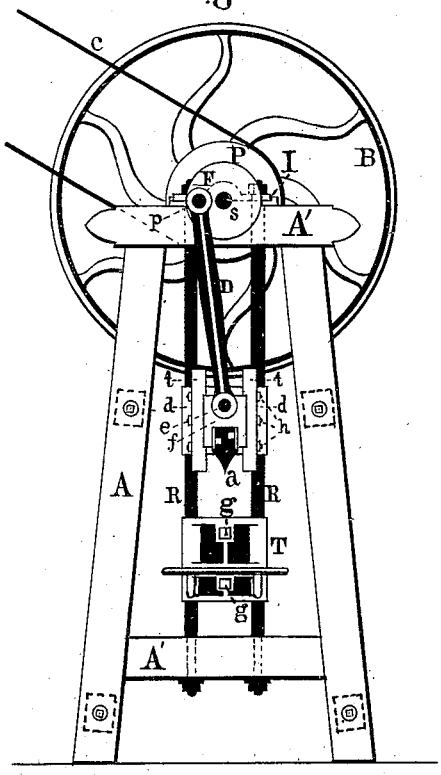


Fig. 2.

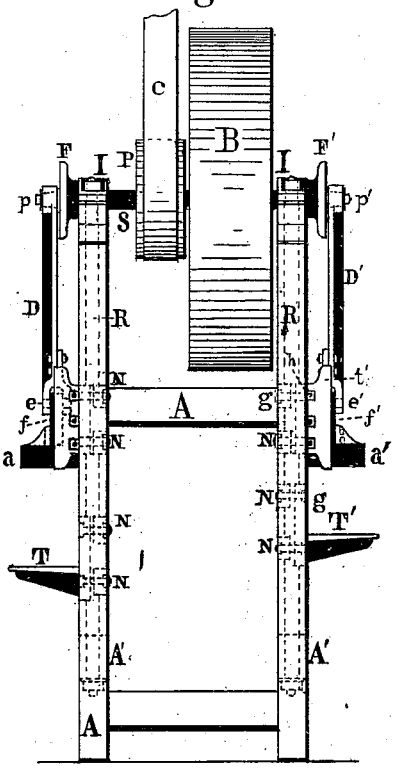


Fig. 3.

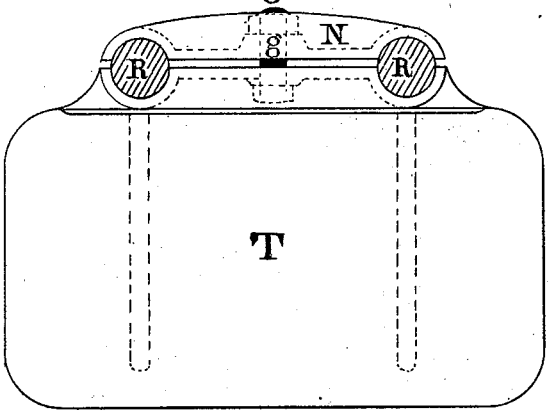


Fig. 4.

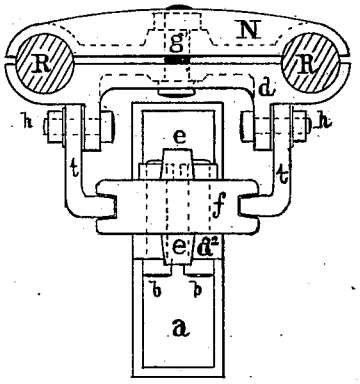
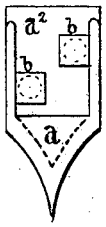


Fig. 5.



Witnesses,
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Inventor.
Edwin A. Hildreth.

2 Sheets—Sheet 2.

E. A. HILDRETH.

Machine for Splitting Wood.

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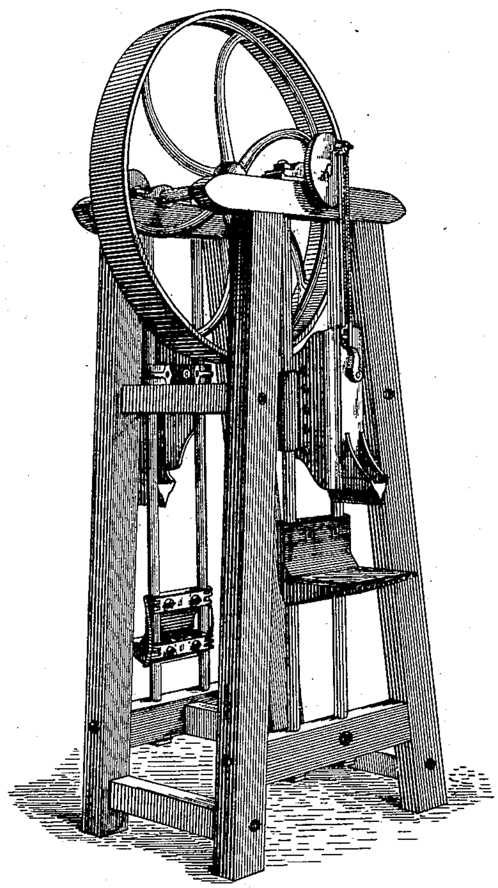
Fig. 6.



Attest:

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Inventor:

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UNITED STATES PATENT OFFICE.

EDWIN A. HILDRETH, OF HARVARD, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR SPLITTING WOOD.

Specification forming part of Letters Patent No. **205,550**, dated July 2, 1878; application filed February 17, 1876.

To all whom it may concern:

Be it known that I, EDWIN A. HILDRETH, of Harvard, in the county of Worcester and State of Massachusetts, have invented a Machine for Splitting Wood, of which the following is a specification:

The object of my invention is to furnish a machine for splitting wood which shall be simple and not expensive in construction, strong enough to resist all the severe strains to which such a machine is necessarily subjected, and which shall be both rapid and efficient in performing its work.

The nature of my invention consists in constructing a very strong, portable, durable, and efficient wood-splitting machine, to be more fully set forth in the following specification and claims.

In the accompanying drawings, Figure 1 represents a front view of my improved splitting-machine. Fig. 2 represents a side view of the same. Fig. 3 is a detail drawing, on an enlarged scale, of the table, showing the method of attaching the same to the frame-rods by means of clamps and bolts. Fig. 4 is a detail drawing on same scale as Fig. 3, showing the splitter-knife and the head-piece to which it is attached, the ways upon which they slide, and the method of securing the same to the frame-rods. Fig. 5 is also a detail drawing of the splitter-knife on same scale as Fig. 3. Fig. 6 is a perspective view of the machine ready for operation.

Like letters represent like parts in all the figures.

A is the main frame of the machine, which is constructed with four legs, cap-pieces A′ on either side or face of the splitter, cross-braces A″ on both sides, and cross-bars A‴ connecting the two sides of the frame. All the parts of the frame are securely fastened together by joint-bolts and tenons. On each cap-piece A′ is placed a box, I, in which the shaft S revolves. The shaft S is provided with a pulley, P, upon which the belt *c* runs to drive the splitting-machine. The shaft S is also provided with a very heavy balance-wheel, B, the inertia of which, when in motion, forces the axes or knives into the wood, and prevents the machine from being stopped by tough, cross-grained, or knotty sticks when they are placed in the machine to be split. On the ends of the shaft S, and outside of the boxes I I, face-plates F F′ are attached, each carrying an eccentric-pin, *p* or *p′*.

The eccentric-pins *p* and *p′* are thimbles cast in iron molds to give them a hard and durable surface. They are bolted into recesses formed in the face-plates F F′ at any required distance from the center of the main shaft, so that by their revolutions they will give the required sweep or vertical motion to the knives or axes *a a′*. The starts *e e* or bearings are also cast in iron molds to give them a true and durable surface.

The pitman D is forked at its lower end to span the head-piece *f*, thereby resting upon both starts *e e*, (see Figs. 4 and 2,) holding both the head-piece and pitman more securely in their proper relative positions. The pitman is also cast with chilled boxes at both ends to fit upon the crank-wrist pin *p* and the bearings *e e*.

Vertical frame-rods R R extend from the cap-piece A′ to the cross-brace A″. These rods are placed on one or both sides of the splitter, according as one or two sets of splitter-knives and tables are desired in the same frame. In the accompanying drawings they are represented as placed on both sides of the frame to give two sets of splitting-knives and tables.

The rods R R pass through the cap-piece A′ and through the box I. They also pass through the cross-brace A″. These rods are provided with a screw-thread at both ends, and are secured beneath the cross-brace A″ and above the box I by large heavy nuts.

Near the central part of the rods R R is placed the bed-piece *d*. (See Figs. 1 and 4.) This bed-piece holds the tracks *t t* in position, and is itself secured to the rods by means of the clamps N N, both clamps and bed-piece being provided with curved slots, which fit onto the rods R R. The bolts *g g* bind the bed-piece *d* and clamps N N firmly onto the rods, and hold the tracks *t t* securely and permanently in place.

The tracks *t t* are bolted to flanges on the bed-piece *d*, so that they can easily be removed and replaced at any time, as shown in Fig. 4.

A thin plate of sheet-iron can be placed be-

tween this flange and the bed of the track-piece, to be removed whenever the tracks or grooves in the head-piece become worn.

The pitman D extends from the eccentric-pin *p* to the bearings *e e* on the head-piece *f*, thereby driving the head-piece and splitter-knife up and down upon the track-pieces *t t* whenever the main shaft revolves. (See Fig. 1.)

The projecting cross-head *a* over the splitting-edge of the knife is formed wide enough to open the wood to such an extent that the two sides of the block shall be thoroughly severed.

The wedge-shaped portion of the knife, which enters and splits the wood, is formed with two concave faces, as shown in Figs. 1 and 5.

The thin edge of the knife enters the wood easily, and opens it without much resistance, while the concave sides of the knife open the wood much more rapidly toward the last part of the stroke, tearing open the wood and effectually splitting the most cross-grained and knotty wood, preventing any of the sticks from clinging to the knife as it is withdrawn.

Were the whole knife made very acute, so as to split the wood easily, the wood would be inclined to cling to the knife when it is withdrawn; and, were the knife made very obtuse to prevent the wood from clinging, it would be much more difficult to make the knife enter the wood.

By forming the knife with concave sides I combine a thin edge which will enter the wood easily with the more obtuse angles of the sides above, which are sure to tear open and separate the pieces of wood, so that they will leave it freely after they have once entered it.

The edge of the knife must be of so acute an angle that it can pare through knots and cross-grained timber.

If in some cases tough knotty wood should not be fully severed by the action of the knife, the sides of the ax above the splitting-edge are so obtuse that the ax will be sure to withdraw without lifting the wood if the ax is plunged into the wood to the required depth.

Were the knife made of such an angle as could be properly forced into the wood, and were the more obtuse-angled sides above the splitting-edge left off, the knife would sometimes stick in a block of tough or knotty wood, and the motion of the knife would at once be given the block—say, eighty to one hundred strokes per minute. Under these circumstances the disengagement of the block from the knife would be attended with danger to the operator, or necessitate the stopping of the machine.

Such difficulty and danger are avoided in my machine by the use of the thin splitting-edge of the knife and by the extended sides above.

The table T, upon which the wood is placed to be split, is provided with a vertical back part, having curved slots formed in its rear surface corresponding to the slots in the clamps N N, by means of which and the bolts *g g* the table is clamped securely onto the rods R R at any desired height.

Whenever it is desired to raise or lower the table T to accommodate various lengths of wood to be split, it is only necessary to loosen the nuts on the two bolts *g g*, raise or lower the table to the desired position, and then tighten the bolts *g g* again, and the table will be held securely in the desired position.

The operation of the machine is very simple. Whenever the main shaft S is put in motion the parts, as above described, cause the head-pieces *f f'* and the knives *a a'* to play up and down between the tracks *t t* and *t' t'*. When the knives are thus in motion the operator places the block of wood to be split upon the table T, and the knife, descending, splits the block in two pieces, the concave faces of the knife opening the block sufficiently to secure the easy withdrawal of the knife, leaving the block of wood upon the table T. Before the next stroke of the knife the operator moves the block of wood sidewise sufficiently to make the next piece to be split off of the required size, and so on across the block. This will split the block into thin pieces extending across the block. The operator holds all these pieces together, and now turns them one-quarter round, then passes them across sidewise under the knife, as before, and the whole block will thus be split into small rectangular blocks, and the operator has the whole bunch in his hands in a convenient form to throw them upon the pile of split wood. When the knife strikes the block of wood it would stop were it not forced forward by the action of the pitman D. The strain through the pitman lifts up the face-plate and main shaft S against the top of the box, straining severely on the rods R R, which hold it in position.

While the ax is being forced into the block the pressure of the wood upon the table T pulls down upon the rods R R, to which the platform T is secured. Thus the upward strain on the box I and the downward strain on the table T both pass into the rods R R and counteract each other.

It will be seen that the frame-rods receive the strains from all the working parts of the splitter, and make a very strong and durable connection between the various parts of the machine.

It is not necessary that more than one set of frame-rods, guides, knives, or tables should be used, unless it is desired to obtain two splitters in the same frame, as each side is complete within itself and entirely independent of the other set of machinery. The rectangular frame-work of the splitter will, however, be the same in either case.

By the arrangement and combination of all the various parts of the splitter, as herein described, each part is very easily and accurately adjusted to its place, and a very rigid, durable, and efficient machine is obtained.

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

1. The combination of the frame-rods extending from the upper to the lower cross-bar, guideways, vertically-sliding cross-head and knife, and the table to rest the wood upon, attached to the frame-rods, substantially as described.

2. The combination of the adjustable tables T with the rods R R, semi-cylindrical recesses in the table formed to fit onto said rods, the clamp N, and bolt *g*, to adjust and hold the table in position, substantially as described.

3. The combination, with the driving-shaft, eccentric-wrist, pitman, and guideways in a wood-splitting machine, of the sliding head *f*, with a wide extended cross-head above the splitting-edge of the knife, said cross-head being formed to open the wood wide while splitting the same for the purpose of fully severing the pieces from each other, substantially as described.

4. The combination, in a wood splitting machine, of the vertically-sliding ax-head *f* with the pitman-arm D, forked at its lower end to receive a bearing, *e e*, on both front and rear of the sliding head, substantially as shown.

5. The combination of the track-pieces *t t*, bolts *h h*, and flanges on the track-bed *d* with a thin removable piece between the track and bed-flange, which can be taken out when it becomes necessary to compensate for the wear of the tracks.

6. The combination of the vertically-sliding head *f*, which carries the splitting-knife, with the tracks *t t*, the driving-pitman D, and the pitman journal or bearing *e*, applied to the sliding-head *f* below the upper extremity of the sliding-head track-grooves, substantially as set forth.

7. The knife-edge support or back-bed *a*, formed hollow and flanged up against the sliding head-block *f*, substantially as described.

8. The combination, in a wood-splitting machine, of the cross-head, having beveled grooves in the sides, with the adjustable tracks *t t* on both sides, beveled to correspond, producing a more perfect fit when the tracks are brought nearer together to compensate for the wear, substantially as shown.

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Witnesses:

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