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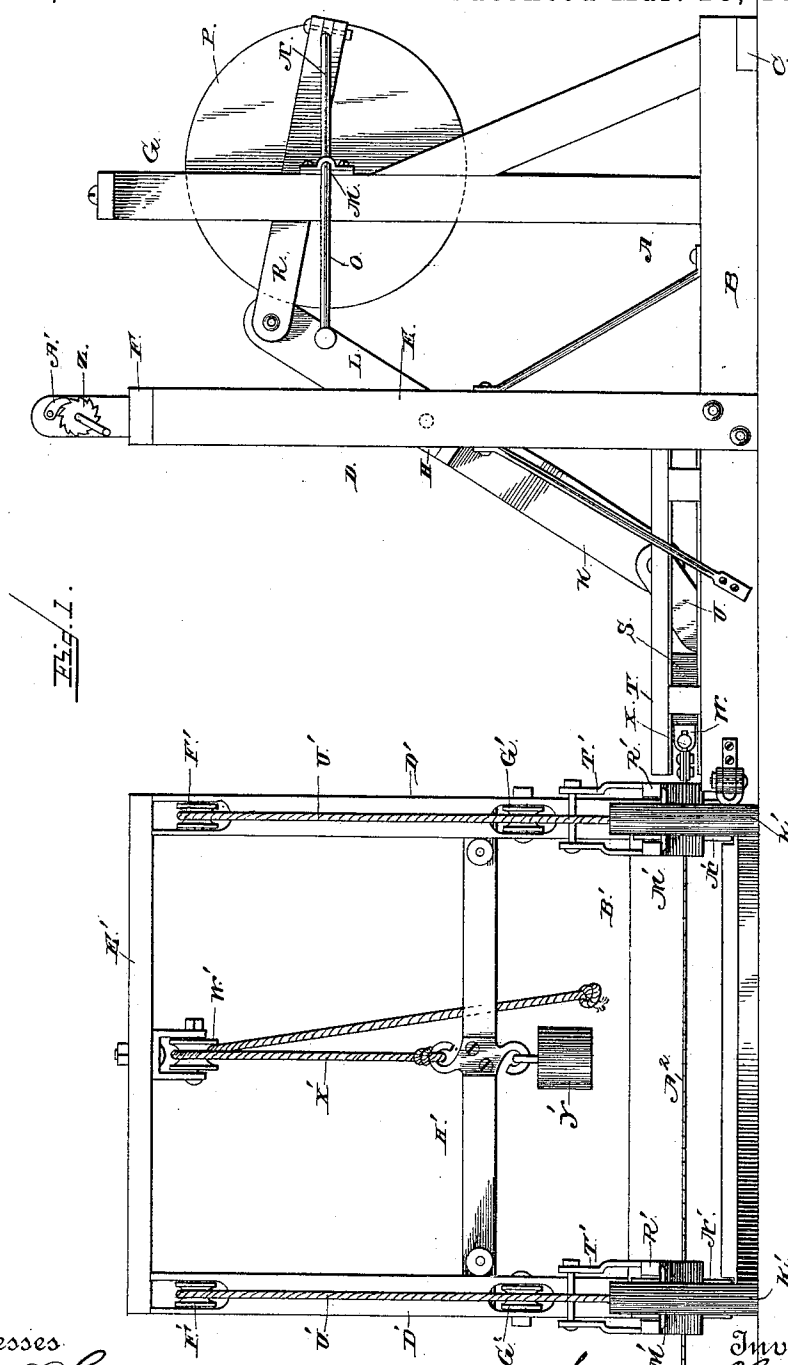
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S. HERSHEY.

DRAG SAW.

No. 360,018.

Patented Mar. 29, 1887.



Witnesses

M. E. Fowler
E. L. Siggers

Inventor

Samuel Hershey

By his Attorneys

C. A. Snowdon

(No Model.)

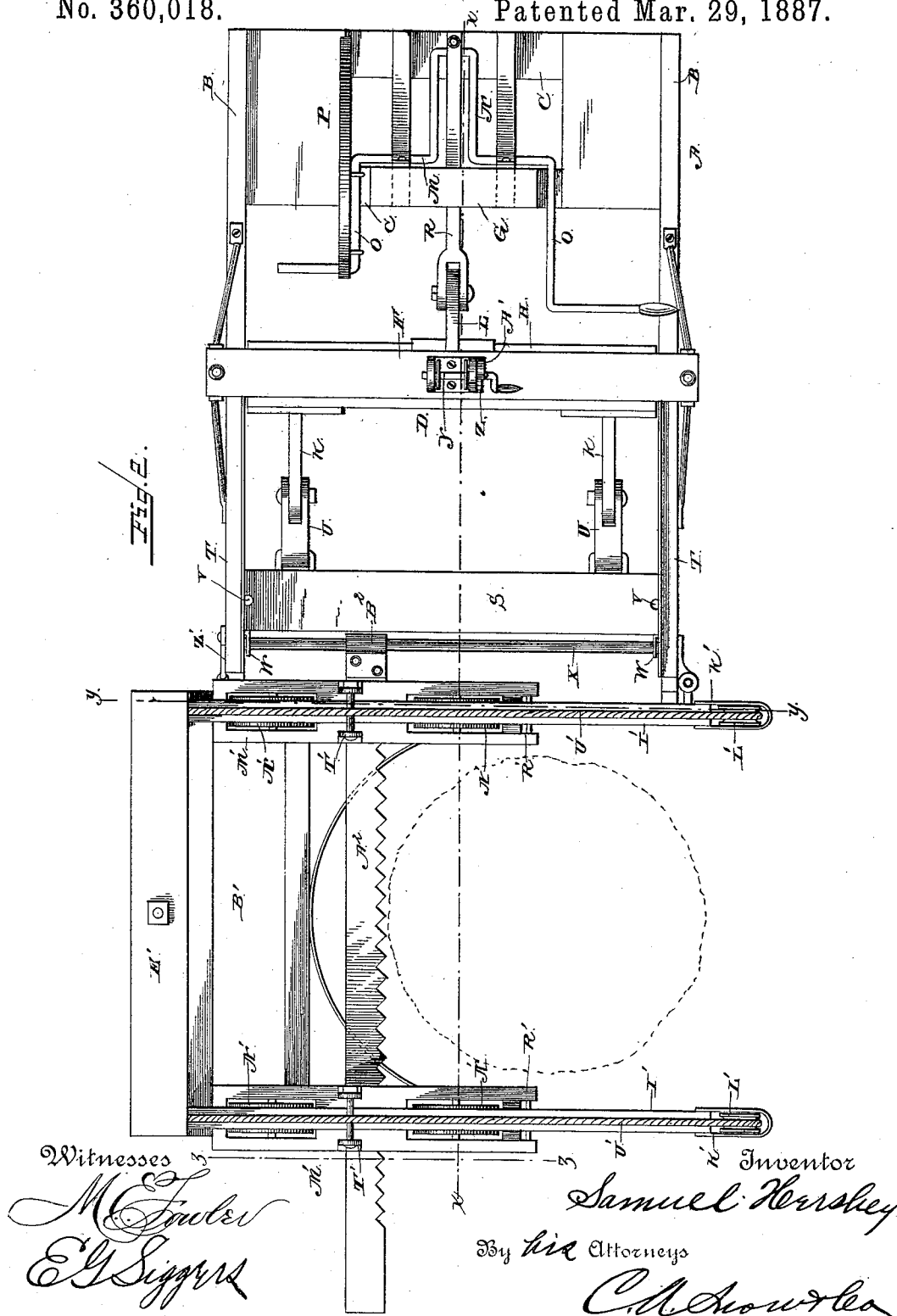
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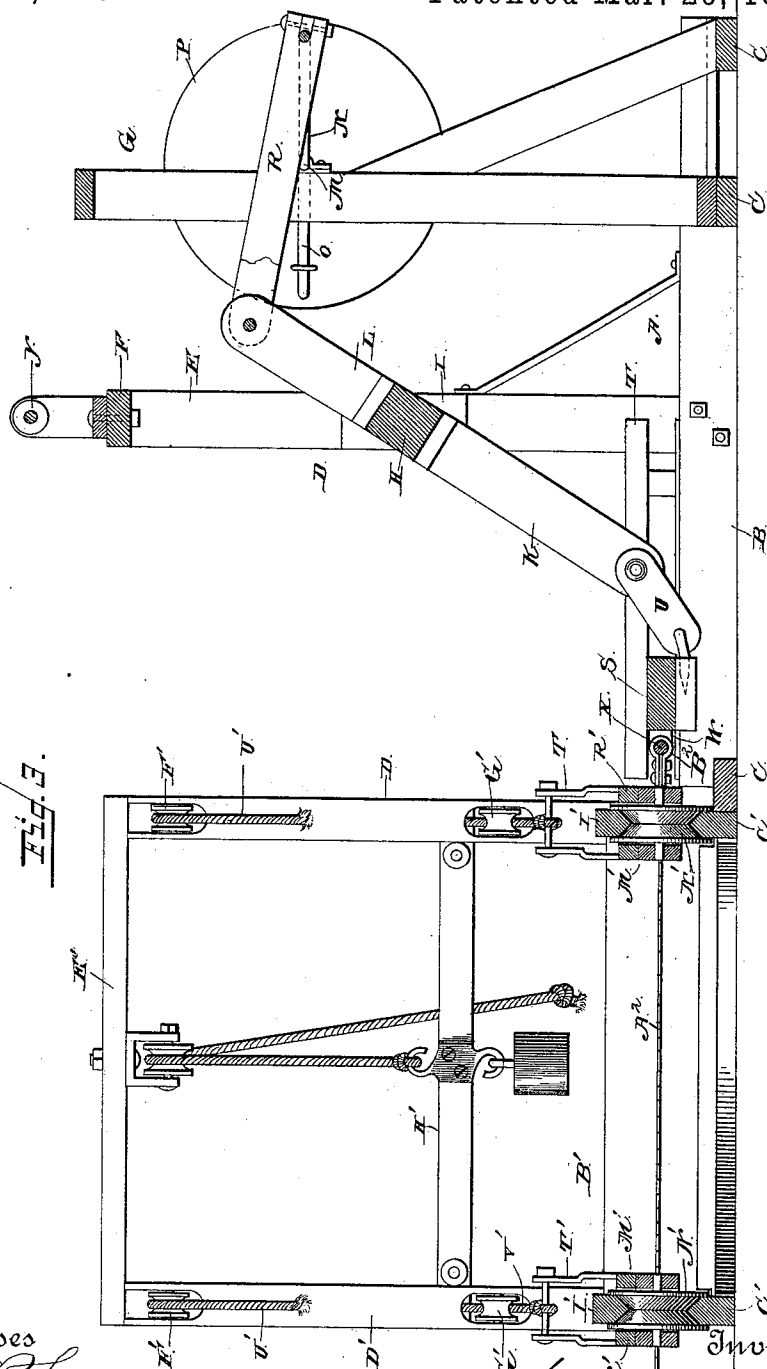
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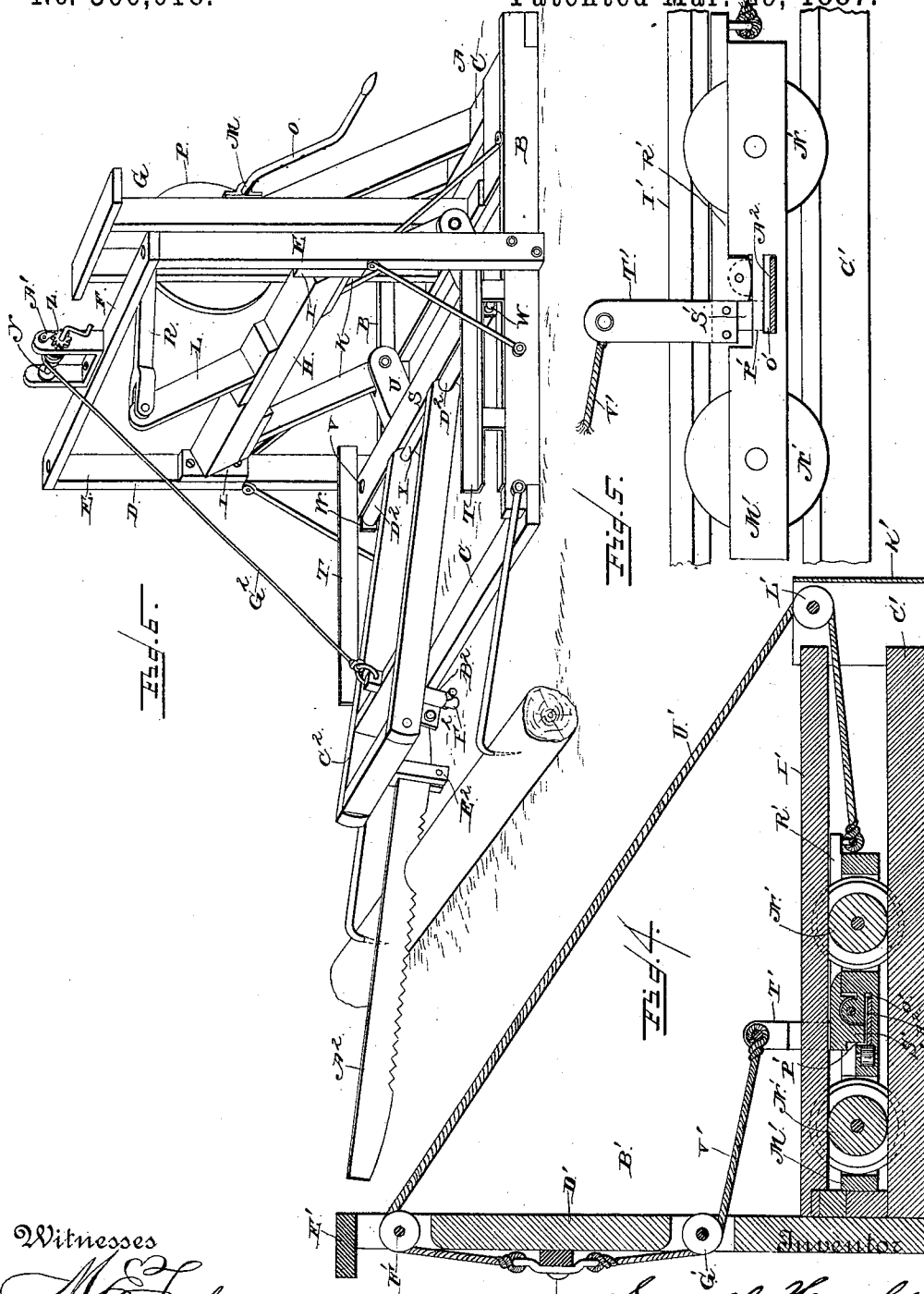
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UNITED STATES PATENT OFFICE.

SAMUEL HERSHEY, OF ALLENDALE, ILLINOIS.

DRAG-SAW.

SPECIFICATION forming part of Letters Patent No. 360,018, dated March 29, 1887.

Application filed November 3, 1886. Serial No. 217,903. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HERSHEY, a citizen of the United States, residing at Allendale, in the county of Wabash and State of Illinois, have invented a new and useful Improvement in Sawing-Machines, of which the following is a specification.

My invention relates to an improvement in sawing-machines for felling trees and cutting up saw-logs; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a sawing-machine embodying my improvements when arranged for felling a tree. Fig. 2 is a top plan view of the same. Fig. 3 is a longitudinal sectional view of the same, taken on the line *xx* of Fig. 2. Fig. 4 is a transverse sectional view taken on the line *yy* of Fig. 2. Fig. 5 is a detail section taken on the line *zz* of Fig. 2. Fig. 6 is a perspective view of my sawing-machine when adapted for use in sawing up logs.

A represents a rectangular frame, comprising the longitudinal sills B and the cross-bars C. From the center of the frame rises a vertical frame, D, comprising the standards E and the cross-bar F, connecting the upper ends of the standards.

G represents a vertical open frame, which is arranged in rear of the frame B and in the center of the frame A. A rock-shaft, H, has its ends journaled in blocks I, which are attached to the inner opposing sides of the standards E. From the lower side of the said rock-shaft, near the ends thereof, depend arms K, and from the upper side of the rock-shaft, at its center, projects an arm, L.

M represents a shaft, which is journaled in bearing-blocks secured on the rear side of the frame G at a suitable height from the ground-frame A. The said shaft M is provided at its center with a crank, N, and at opposite ends with oppositely-extending cranks O. A fly-wheel, P, is also attached to the shaft M.

R represents a pitman, which has one end attached to the crank N. The front end of the said pitman is connected to the upper end of the arm L.

From the foregoing it will be understood that the shaft H may be rocked, so as to oscil-

late or swing the arms K, by rotating the shaft M.

S represents a cross-head, which works in longitudinal guideways T, that are secured on the upper sides of the sills B at the front ends thereof. This cross-head is connected to the lower ends of the oscillating arms K by means of links U. In the ends of the cross-head are made vertical openings V, to receive oil or grease for lubricating the guideways T. From the front side of the cross-head, at the ends thereof, project lugs or ears W, and X represents a cross-rod which has its ends attached to the said lugs or ears. On the upper side of the frame D is a winch, Y, having a ratchet-wheel, Z, and a pawl or detent, A', to engage the said ratchet-wheel and prevent retrograde rotation of the winch.

B' represents a rectangular frame, which is open at one end. The side sills, C', of the said frame have their upper sides beveled or inclined, as shown, so that sawdust will not lodge upon them. From the closed end of the frame B' rise a pair of vertical standards, D', which are connected at their upper ends by a cross-bar, E'. Pulleys F' are journaled near the upper ends of the said standards, and pulleys G' are journaled near the lower ends thereof.

H' represents a frame, which is provided at its ends with anti-friction rollers that bear upon the opposing inner edges of the standards D' and guide the said frame H' vertically between the said standards. At a suitable height above the sills C', and in a vertical line with the same, are bars I'. Vertical knees K' connect the outer ends of the sills C' and the bars I', and in the upper ends of the said knees are journaled pulleys L'.

M' represents carriages, which are provided with flanged wheels N', that bear upon the upper sides of the sills C' and under the lower sides of the guide-bars I'. In the centers of the said carriages are made horizontal transverse openings O'. Vertical openings P' are made in the upper sides of the carriages at the rear ends of the openings O', and communicating with the same.

R' represents clamping-arms, which are pivoted on the upper sides of the carriages, near the centers thereof, and extend forwardly thereon, and from the rear ends of the said

arms depend shoulders S', which extend downwardly through the openings P' in the carriages.

T' represents vertical arms, which extend upwardly from the rear ends of the clamping-arms R'.

U' represents ropes or chains, which have one end attached to the front ends of the clamping-arms, pass over the pulleys L' and over the pulleys F', and have their rear depending ends attached to the upper side of the vertically-movable frame H'.

V' represents ropes or chains, which have their front ends attached to the upper ends of the vertical arms T', pass under the pulleys G', and have their rear ends attached to the under side of the vertically-movable frame H'.

W' represents a pulley, which is suspended from the center of the bar E'. A rope or chain, X', is attached to the center of the frame H' and passes over the pulley W'.

Y' represents a weight, which is suspended from the vertically-movable frame H'. This weight normally lowers the said frame, and thereby draws upon the rear ends of the ropes or chains U', and causes the latter to draw the carriages forward on the sills. By drawing downwardly upon the rope X', so as to raise the frame H' and the weight, the carriages are moved rearwardly on the sills by the chains or ropes V'.

The frame B' is used when a tree is to be felled or sawed down, and the said frame is placed around the tree which is to be felled, and has one side attached to the front end of the frame A' by means of suitable hooks, Z'.

A² represents a horizontal crosscut-saw, which passes through the transverse openings O' in the carriages M' and bears against friction-rollers in the rear sides of the said openings. The said carriages are previously moved rearwardly in the frame B', so that the toothed edge of the saw will bear against one side of the tree which is to be felled. It will be observed that the saw is thus supported in a horizontal position and at a very slight distance above the ground, so that the tree will be sawed or cut nearly on a level with the ground, and the stump will thus form only an inconsiderable obstruction, which will not seriously impede a mowing-machine or seeder.

One end of the saw A² is attached to a collar, B², which is adapted to slide upon the cross-rod X. The function of the weight which is attached to the vertically-movable frame H' is to draw the said frame downwardly, so as to press the toothed edge of the saw against one side of the tree, and thus cause the saw to cut rapidly when it is reciprocated. Two men grasp the cranks O and rotate the shaft N, thereby reciprocating the cross-head S, and consequently operating the saw. The constant pressure exerted by the weight on the carriages which guide the saw keeps the latter always at work in the kerf, and as the saw moves forwardly through the tree wedges are driven into the kerf in rear of the saw from

time to time, so as to cause the tree, when the saw has passed entirely through it, to be thrown forwardly through the open end of the frame B', and thus do no injury to the sawing-machine.

Whenever it is desired to withdraw the saw A² from the kerf, this may be accomplished by drawing downwardly upon the rope X', so as to raise the weight and the frame H'. This causes the ropes or chains V' to draw rearwardly upon the upper ends of the vertical arms T', and thus raise the front ends of the clamping-arms R', so that the depending shoulders S' of the said clamping-arms will be forced downwardly through the openings P' in the carriages and clamp firmly onto the saw and withdraw the latter from the kerf as the carriages move rearwardly. By thus clamping the saw to the carriages before the latter are moved rearwardly, the saw-teeth are prevented from striking against the front sides of the openings O' and becoming dulled or broken.

When it is desired to saw up a tree into stove-wood after it has been felled, the frame B', with its attachments, is detached from the machine or frame A, and the horizontal saw A² is detached, with its collar, from the cross-rod X. A rectangular saw-frame is then pivoted upon the cross-rod X, and is prevented from moving laterally thereon by sleeves D², which fit on the cross-rod X between the ears W and the rear end of the saw-frame. From the outer end of the saw-frame depends a vertical guide, E², and a vertical spindle, F², also depends from the saw-frame at a suitable distance in rear of the said guide. The collar B², previously described, is then attached to the vertical spindle F², thereby supporting the saw in a vertical position with its toothed edge on the under side, and the said saw is guided in the guide E². The weight of the saw and of its frame keeps the toothed edge of the saw bearing firmly on the upper side of the log to be cut, and by rotating the shaft M the saw will be operated so as to cut the log, as will be readily understood. In order to raise the saw out of the kerf, I connect the outer end of the saw-frame to the winch Y by a rope, G². When the saw-frame is raised, so as to elevate the saw, the frame and the saw are maintained in their elevated position by the pawl A', which engages the ratchet-wheel Z of the winch.

A sawing-machine thus constructed is adapted both for felling trees and cutting them up into fire-wood after they are felled, so as to enable land to be cleared for tillage in a very short time and with the least possible expenditure of labor.

Heretofore it has been the practice in the northwest to fell trees and roll the logs into heaps and destroy them by burning, as the logs are so large that they cannot easily be converted into stove-wood, and thus millions of cords of valuable fuel are annually wasted. My sawing-machine, as before set forth, is adapted not only to fell the trees, but also to rapidly saw the logs into short lengths, that

may be easily split and converted into stove-wood, thus effecting an economy of the wood which is more than sufficient to pay the cost of clearing the land.

5 Slight changes in the form, construction, and proportion of parts can be made without departing from the spirit of the invention.

Having thus described my invention, I claim—

10 1. In a sawing-machine, the combination of the stationary frames, one having the guides and the other the fixed tracks or ways, arranged in a plane transversely of the guides, the reciprocating cross-head working in the
15 guides and carrying a fixed rod, X, the carriages having the transverse aligned openings O' and mounted on suitable rollers traveling on the tracks, a weighted sliding frame arranged in rear of the carriages and having an
20 intermediate connection therewith to normally draw the same in one direction, and a saw working in the aligned openings in the carriages and having a connection with the rod X, to be reciprocated thereby, and movable
25 longitudinally thereon, substantially as described, for the purpose set forth.

2. In a sawing-machine, the combination of a stationary frame, B, provided with an open side, the movable carriages having the transverse aligned guide-openings, a vertically-movable weighted frame arranged in rear of the carriages and connected by an intermediate rope with the carriages to normally draw the same toward the open side of the frame, a reciprocating cross-head, and a saw working in the aligned openings in the carriages and having an intermediate connection with the cross-head to permit it to be moved longitudinally of the same, substantially as described.

30 3. The combination, in a sawing-machine, of the movable carriages for guiding the saw, and the clamping-arms R', pivoted to the said carriages and having the shoulders S' and the arms or levers T', and the chains or ropes V', attached to the said arms or levers, whereby,
45 when the said ropes or chains are drawn backwardly to move the carriages rearwardly, the clamping-arms are tilted so as to force their shoulders S' upon the saw to clamp the same to the carriages, for the purpose set forth, substantially as described.

4. In a sawing-machine, the combination of the movable carriage, the laterally and endwise movable saw working therein, a clamping device carried by the carriage for holding the saw against movement during the retrograde movement of the carriage, and a movable weighted frame having an intermediate connection with the clamping device to operate the same, as and for the purpose described.

5. In a sawing-machine, the combination of the frame B', the guide-carriages for the saw movable on the said frame and having the pivoted arms R', provided with the depending shoulders S' and the vertical arms T', the vertical standards D' at one end of the frame, the pulleys F' and G', journaled, respectively, at the upper and lower ends of the said standards, the cross-bar E', connecting the upper ends of the standards, the vertically-movable weighted frame H', the ropes or chains U', attached to the said frame, passed over the pulleys F' and over pulleys L' at the front end of the frame, and attached to the arms R', and the ropes or chains V', attached to the arms T', passed under the pulleys G', and connected to the vertically-movable frame H', and the rope and tackle for raising the said frame, for the purpose set forth, substantially as described.

6. In a sawing-machine, the combination of a stationary frame, A, having the guideways T in the opposing sides thereof, the vertical frames D G, fixed to the frame A, a rock-shaft journaled in the frame D and having the depending arms K on its lower side and the upwardly-extending arm L on its upper side, a crank-shaft journaled in the frame G and carrying a fly-wheel, a pitman, R, intermediate of the crank-shaft and the arm L of the rock-shaft, a reciprocating cross-head working in the guideways and having the links U, connected with the depending arms of the rock-shaft, to be operated thereby, and means for connecting the cross-head with the saw, as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

SAMUEL HERSHEY.

Witnesses:

JOHN E. ROSENBERG,
THEODORE McCLAIN.