2 Sheets—Sheet 1

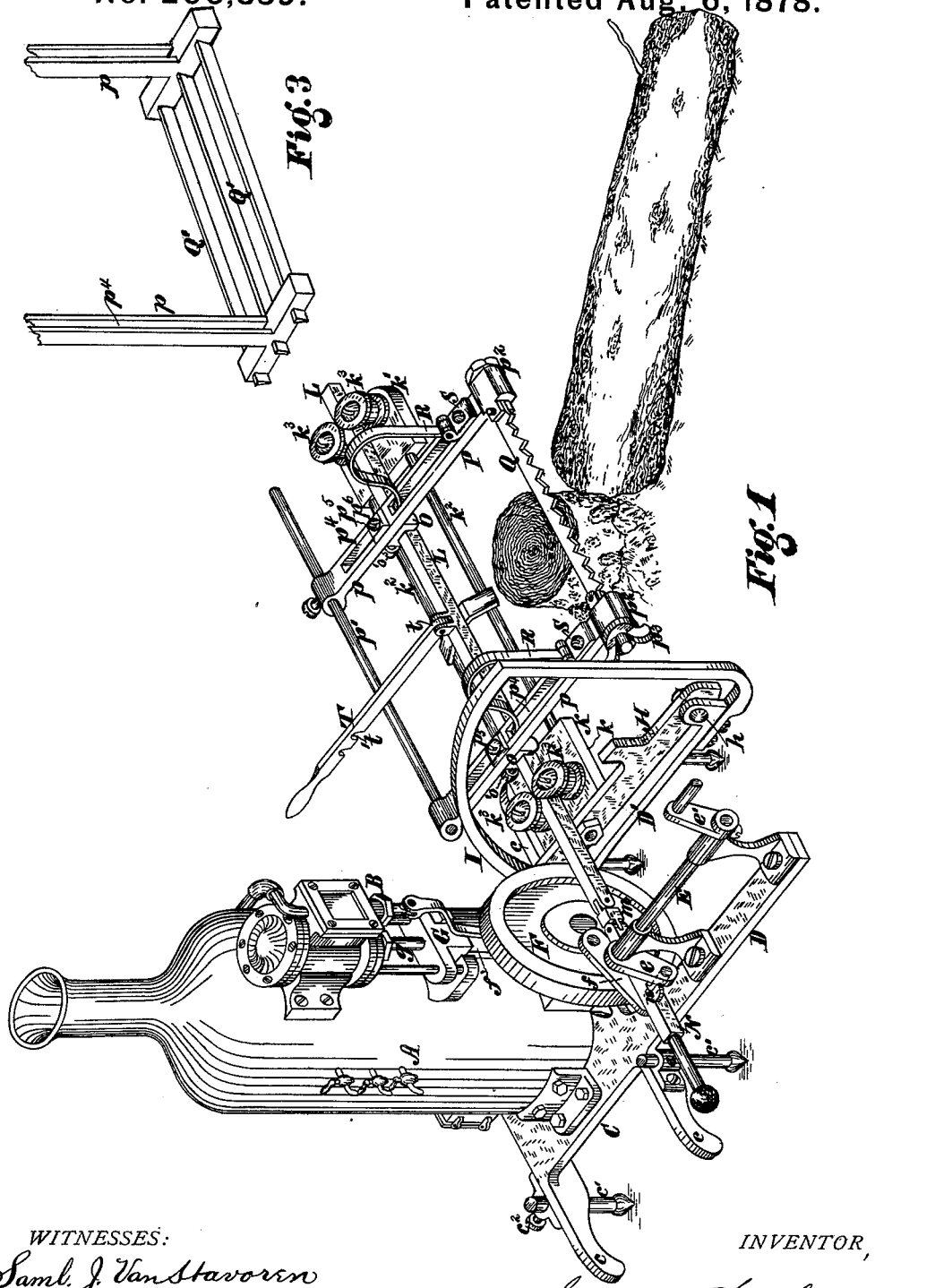
E. SMITH.

Sawing-Machine.

No. 206,839. Patented Aug. 6, 1878.

Fig. 3

Fig. 1



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2 Sheets—Sheet 2.

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Fig. 2

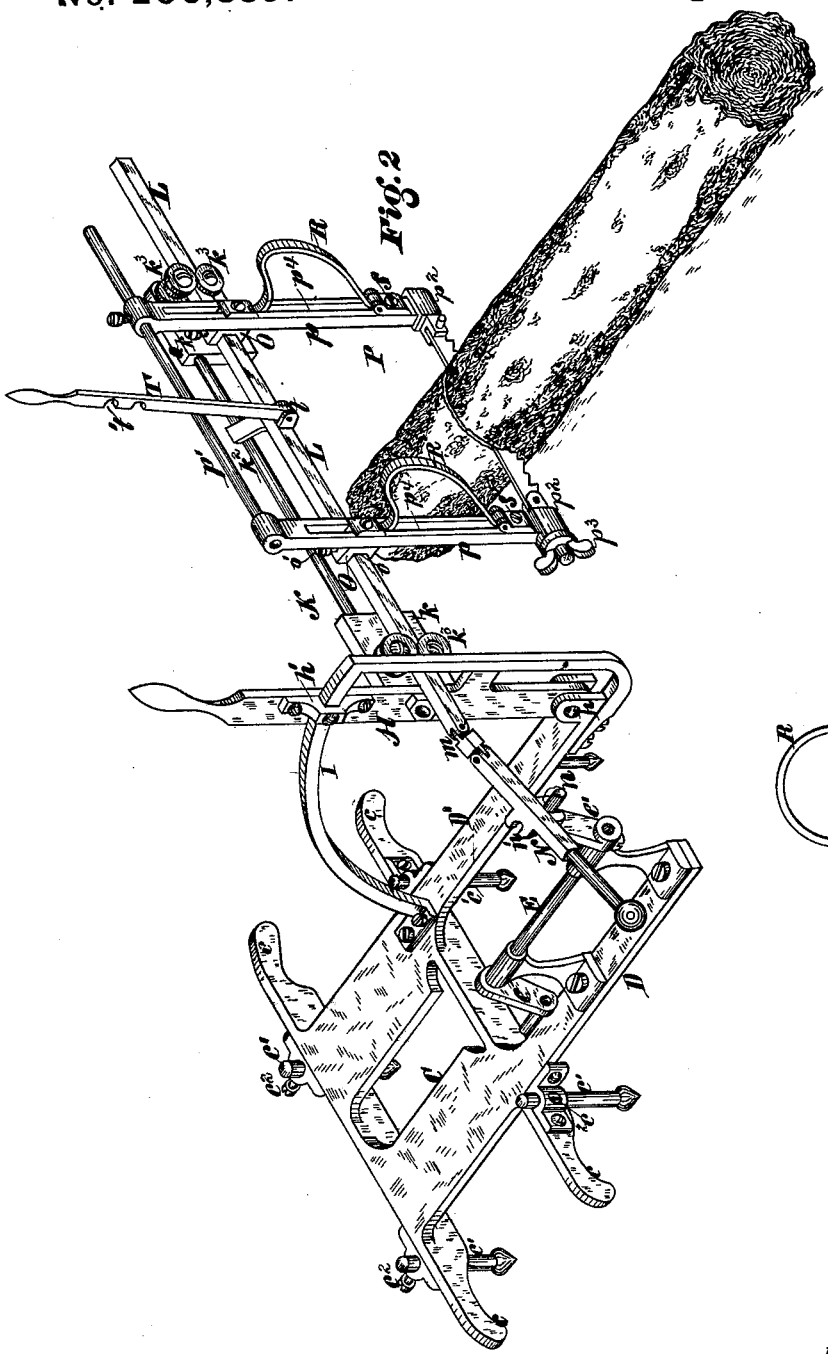
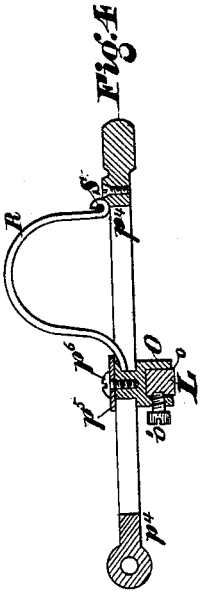


Fig. 4



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UNITED STATES PATENT OFFICE.

EUGENE SMITH, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SAWING-MACHINES.

Specification forming part of Letters Patent No. **206,839**, dated August 6, 1878; application filed June 7, 1878.

To all whom it may concern:

Be it known that I, EUGENE SMITH, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Sawing Down Standing Timber, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a perspective view of my improved apparatus with engine and boiler connections. Fig. 2 is a perspective view of apparatus with boiler and engine detached. Figs. 3 and 4 are detail views.

My invention has for its object to provide a machine for sawing down trees and cutting the felled timber into pieces, and which shall be adapted, also, to sawing marble and other stone blocks into slabs or sections.

My improvements consist in the peculiar construction, combination, and arrangement of parts hereinafter fully described, having reference particularly to the combination, with a portable engine, of a saw-frame adjustable in such a manner as to be moved either horizontally or vertically, so as to produce either a horizontal or a vertical cut, as may be desired.

Referring to the accompanying drawing, A indicates an upright boiler, and B an engine provided with steam therefrom, said boiler and engine being mounted on a frame, C, having handles *c c* and legs c^1 c^1, adjustable in their sockets by means of set-screws c^2 c^2. D D′ are bars or beams projecting from the frame C, and E a rock-shaft supported on D, and having cranks *e′ e*.

F is a balance-wheel, connected, by a pitman, *f*, with the cross-head G, attached to the piston-rod *g*, and, by the pitman *f′*, with the crank *e*, an oscillatory or pendulous motion being thus conveyed to said crank, and a like motion to the crank *e′* on the opposite end of the rock-shaft E.

H is a lever, pivoted at *h* to the outer extremity of the bar or beam D′, and I is a curved arm or quadrant, which passes through a keeper, *h′*, attached to the lever H, and acts as a brace or support for the latter.

K is an arm, secured to the side of the lever H, and projecting laterally therefrom. Said arm is composed, preferably, of end pieces, *k* k^1, and connecting-rods k^2. On the end pieces, *k* k^1, are fastened sheaves or grooved anti-friction rollers k^3.

L is a bar or rail, fitted between the rollers k^3, (which are arranged, as shown, in pairs,) and adapted to slide in the direction of its length. Said bar L has a universal-joint connection, *m*, with a pitman, N, which latter is provided with two boxes or bearings, *n n′*, at right angles to one another, and contrived for the reception of the cranks *e* and *e′*.

O O are blocks, grooved on their rear sides at *o o*, for the reception of the bar L, to which they are fastened by means of set-screws *o′ o′*. P is a frame, composed of the slotted side bars, *p p*, and cross-rod p^1, and Q is a saw, secured in heads p^2 p^2, and provided with screws, &c., p^3, for straining or producing the required tension on said saw.

If desired, two or more blades, Q′ Q′, such as are used in sawing stone, may be employed, as shown in Fig. 3.

The blocks O O project through the slots p^4 in the side bars, *p p*, and are held in position by keeper-plates p^5 and screws p^6, so that said bars may slide upon said blocks, to permit the advance or feed of the saw-frame and the retraction of the latter.

R R are C-shaped springs, having their ends secured respectively, as shown, to the block O O and to knuckle-plates S S, fastened to the side bars, *p p*, the object of said springs being to advance the frame P, when in a horizontal position, as the sawing progresses.

Springs of any other suitable construction may be substituted for those shown, and for vertical sawing no springs are required, as the gravity of the frame is, in such case, sufficient to advance or feed it.

T is a holdback-lever, pivoted at *t* to the bar L, and notched at *t′*, for the reception of the cross-bar p^1, the object of said lever being to retain the frame T in its retracted position when sawing is not proceeding.

The operation is briefly as follows: The machine being transported to the position where

it is required to be used and the engine started, the frame P is brought into a horizontal position by means of the lever H. The box or bearing *n* is then connected with the crank *e*, and the lever T is unshipped. The motion of the engine communicates a reciprocating movement to the saw-frame P, while the springs R R cause said frame to advance, pressing or feeding the blade Q into the tree, which is thus speedily felled. The saw-frame is then retracted and locked by means of the lever T. The frame P is now brought to a vertical position by lifting the lever H, which turns on its pivot *h*, the pitman N moving from over the crank *e* to a position over the crank *e'*, with which latter the box or bearing *n* engages. The lever T is then unshipped and the vertical or downward cut proceeded with.

I have shown and described a steam-engine and boiler; but it is obvious that any other mechanical motor may be substituted therefor. I have also described the machine as being portable, and it is generally designed so to be; but under some circumstances a stationary apparatus may be employed which will fall within the principle of my invention, if the adjustable saw-frame, adapted to cut either vertically or horizontally, be embodied in it.

Further, I have shown the motor and cutting apparatus as mounted upon one and the same frame; but this is not in all circumstances essentially necessary, as separate frames might in some cases be used, and connected by a flexible power-conveyer.

What I claim as my invention is—

1. The combination, with a boiler and engine or equivalent motor, a reciprocating saw adjustable to a vertical and horizontal position, and intermediate mechanism, substantially as described, for communicating motion to the saw from the motor, of a frame, C, supporting said motor and saw, with the intermediate mechanism, and having vertically-adjustable legs c^1, as and for the purpose set forth.

2. In combination with the engine B, the balance-wheel F, rock-shaft E, having double cranks *e e'*, bar L, joint *m*, and pitman N, having boxes or bearings *n n'*, substantially as shown and described.

3. In combination with the pivoted lever H, the lateral arm, K attached thereto, sustaining the sheaves or anti-friction rollers k^3 k^3, and serving to support the bar L and saw-frame P, substantially as shown and described.

4. In combination with the longitudinally-reciprocating bar L, the saw-frame P, attached thereto and arranged to move transversely thereon, substantially as and for the purpose set forth.

5. In combination with the slotted saw-frame P, bar L, blocks O, and saw Q, of the springs R, substantially as shown and described.

6. The holdback-lever T, pivoted at *t* and notched at *t'*, in combination with bar L and saw-frame P, substantially as shown and described.

7. The combination of a motor, B, a double-crank shaft, E, rocked therefrom, lever H, lateral arm K, bar L, joint *m*, pitman N, and saw-frame P, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of June, 1878.

EUGENE SMITH.

Witnesses:

S. J. VAN STAVOREN,

CHAS. F. VAN HORN.