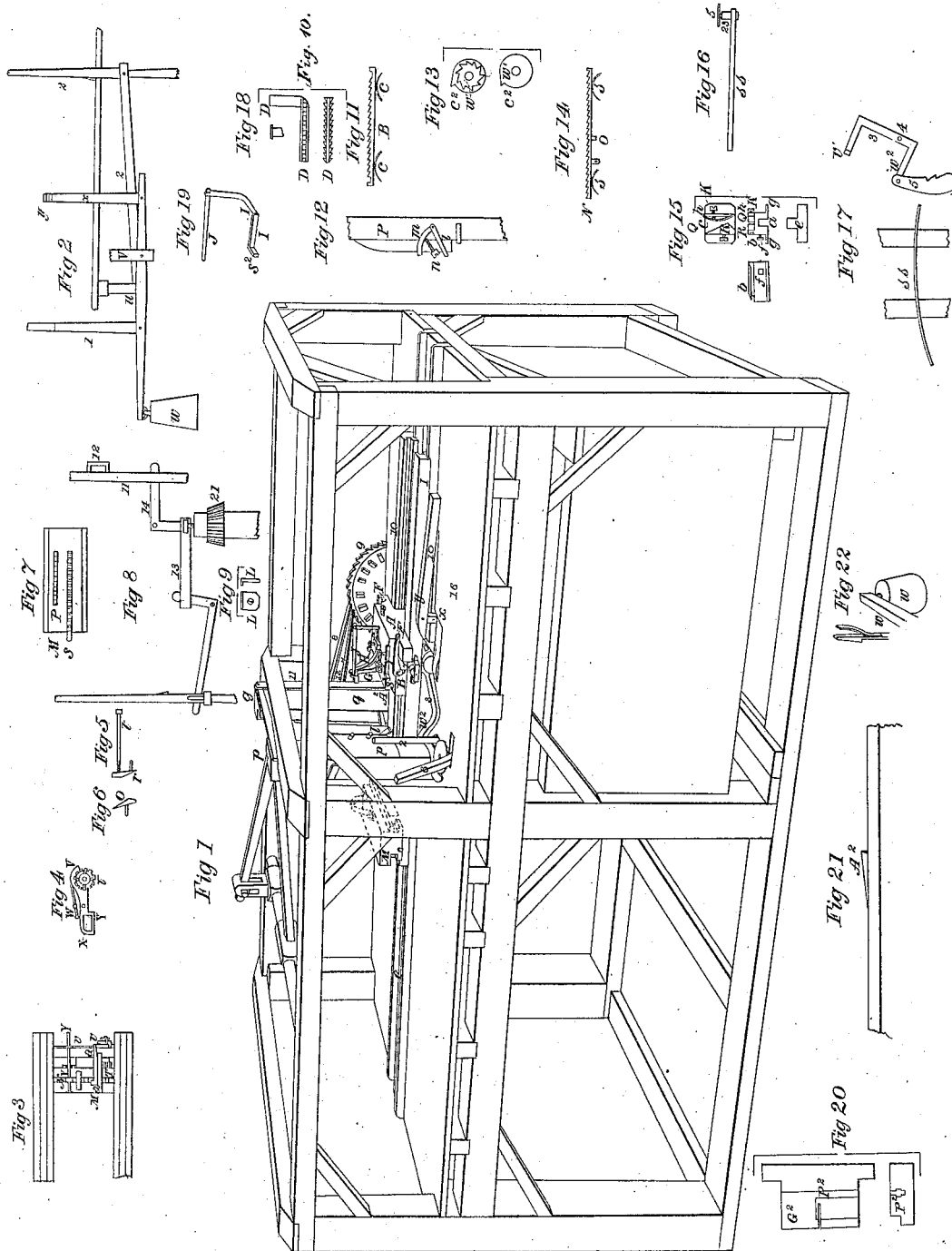


*Moody & Morrill,  
Reciprocating Saw Mill,*

*No. 1,186,*

*Patented Feb. 8, 1840.*



# UNITED STATES PATENT OFFICE.

SAM. MORRILL AND EDWIN MOODY, OF ANDOVER, NEW HAMPSHIRE.

## SELF-TENDING SAWMILL.

Specification of Letters Patent No. 1,486, dated February 8, 1840.

*To all whom it may concern:*

Be it known that we, SAMUEL MORRILL and EDWIN MOODY, of Andover, Merrimack county, State of New Hampshire, have invented a new and useful Improvement in Machines for Sawing Logs into Boards, which improvement is called "the Self-Tending Sawmill," which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

The nature of this invention and improvement consists in a certain new and useful combination and arrangement of parts of machinery by which the sawmill tends itself (after the log is dogged) without requiring the presence of any person—or to be more particular the action of the machinery saws a board, then hoists the small gate which runs back the carriage, takes out the dog at the head block, sets off the log to the thickness of the board required, replaces the dog, shuts the small gate, unmeshes the gear which ran back the carriage and puts on the hands which prepares the mill for sawing a second board.

To enable others skilled in the art to which this invention appertains to make and use the same we will proceed to describe the construction and operation of said invention in a more particular manner.

Figure 1 is a prospective view of the machine; Fig. 2, apparatus for hoisting the small gate, Fig. 3, under side of the immovable part of the tail block—represented in a reversed position; Fig. 4, notched wheel and dog on the back of the tail block; Fig. 5, the movable inclined plane and screw on the fender post *g* next the rag wheel for setting off the end of the log at the head block,—as the carriage runs back; Fig. 6, permanent inclined plane on the side of the opposite fender post *p* for pushing back the driving bar which runs through the head block to its original position as the carriage advances; Fig. 7, under side of the movable part of the tail block—inverted position; Fig. 8, knee, pole, and loop for taking off and putting on the hands—also part of the apparatus for meshing and unmeshing the running back gear and the main gate pole; Fig. 9, top and side view of the right angled plate on the under side of the head block which strikes the knee that moves the gate poles for shutting the gates and for moving the index—represented in a reverse posi-

tion;—Fig. 10, top and side of the notched knee that sets the log at the head block—represented in a reversed position;—Fig. 11, driving bar and springs in the head block for moving the right angled arm; Fig. 12, inclined plane and curved bar on the side of the fender post for taking out the dog from the log; view taken from the opposite side of the machine, near rag wheel. Fig. 13, top and bottom of the index plate for shutting the main gate; Fig. 14, driving bar and springs in the tail block; Fig. 15 top and end view of the movable gage block and adjustable cam for moving the tail block—also the groove in the side thereof; Fig. 16, spring for replacing the hand and knee which shut the gates; Fig. 17, top view of the said knee hand and spring; Fig. 18, the dog which holds the right angled arm in the head block and prevents said arm from moving back until the log is cut up. It passes through the top of the head block; Fig. 19, crank shaft and rod placed in the head block for dogging and undogging the log; Fig. 20, horizontal and vertical section of the head block showing the perforations for the arm and bars; Fig. 21, section of the carriage 10 showing the projection for knocking off the spring catch 1 which holds up the weight *w*; Fig. 22, spring catch and weight.

Similar letters refer to similar parts in the figures.

The frame, carriage, fender posts, saw gate, rag wheel, hands, gates and gate poles, water wheels, gearing and ungearing apparatus are made in the usual, or the most approved plan; also the head and tail blocks and the dogs, except in the particulars hereafter described.

First, of the head block A, Fig. 1: This is made as follows: The block A is made in the usual manner, except that it is perforated longitudinally through by a perforation *P*<sup>2</sup> for the introduction and movement therein of a right angled arm D, Fig. 10, and a notched bar B, Fig. 11, for moving said arm and also perforated with a transverse groove *G*<sup>2</sup> at right angles to the last mentioned groove, extending nearly half the length and breadth of the block for the reception and movement therein of the plain part of the right angled arm D. The notched bar is represented at B, Figs. 1 and 11, and has two springs C C under it to keep the notches of the bar in gear with the

notches of the arm and to contract and suffer the bar to recede from the arm when required to be drawn back.

The arm which rests against and moves the log is represented at D, D', Fig. 10, one branch of which D' is notched on the upper side as well as the under side for reversing as the mill sets off from one side or the other, the side which is uppermost receiving a dog E, Fig. 18 passing through the top of the head block, and which holds the arm from moving back while the lower side is in gear with the bar B. The other branch of the arm is made plain.

At each end of the block is a lever F, Fig. 1, for bearing down the bar B and unmeshing it from the arm D so as to allow the arm D to be drawn back.

The dog G, Fig. 1, for holding the log is made in the usual manner, except that the half bail extends to the end of the block and there enters and turns in an eye in a vertical plate fastened on the end of the block. This dog is driven into the log for securing it by a strong spring H which is fastened at one end to the top of the block. The other end is loose and bears against the dog.

The dog is drawn from the log by means of a crank shaft I, Figs. 1 and 19, and rod J which also contracts the spring H. The horizontal part of the crank shaft I turns in a horizontal opening in the head block. The arm I, projects beyond the end of the block and is held up by a button K (attached to the top of the block) while rolling on the log.

The connecting rod J is attached to the corner of the bail and to a vertical part of the crank shaft.

To the under side of the head block is fastened a horizontal plate L bent downward at right angles, Fig. 9, which strikes against a projection *v'* on the knee 3 for shutting the gates, moving the hand, &c., as hereafter described. See Fig. 17 for projection *v'*.

The tail block M, Figs. 1, 3, 7, is made and slides in the usual manner of slide tail blocks except in the following particulars. It is moved by a notched bar N, Fig. 14, on a similar principle to that in the head block.

The bar, however, meshes into a notched plate P, Fig. 7, fastened to the under side of the sliding part of the tail block M. An arm *o*, Fig. 14, projects down from the under side of said bar, which, as the carriage moves back, strikes against an adjustable cam Q, Fig. 15, of a gage stock fastened to the middle rail E which causes the bar to move the sliding part of the tail block and log toward the saw the thickness of the board required to be sawed. The same arm *o* strikes against a stationary cam R upon the same stock, Fig. 15, on the return of the carriage which moves the bar N back to its former position. Near the center of the movable part of the tail block is a rack S, Fig. 7,

and on the fixed part a pinion T, Fig. 3, for holding the tail block firmly while the log thereon is being sawed. On the axle of the pinion (outside the block) is a notched wheel U, Figs. 3 and 4, in whose notches a dog V engages, which is pressed down by a spring W, in the arm of which dog is a rectangular mortise X to admit a lever Y, Fig. 3, whose fulcrum is attached to the under side of the block and whose point of connection is to the under side of the notched bar N at Y and is used for drawing the notched bar N down and disengaging the same from the notched plate P of the movable part of the tail block, the springs *s s* under the notched bar being contracted at the same time. There is another lever *a* attached to the under side of the block for raising the dog V from the notched wheel U whose fulcrum is in the under side of the tail block and whose opposite end is turned at right angles and brought to a sharp edge so as to pass into and along a groove *b*, Fig. 15, in a movable gage stock, hereafter described, for lifting said dog from the notched wheel U so as to allow the pinion T to turn and the tail block M to move.

The movable gage stock, Fig. 15, is a rectangular piece of metal *c* with a rectangular groove *d* in the center of the same underneath to permit it to fit upon and be fastened to a short rail or rib *e* between and parallel to the two side rails on which the carriage travels. The fastening is effected simply by a horizontal screw *f* passing through one side of the stock and bearing against the side of the rail *e*. The stock has flanges *g g* which rest upon the floor of the mill at the sides of the center rail. On the top of this stock are raised projections R and *h* one on each side. One is merely a vertical plate *h* tapered at each end to which is attached by a joint an adjustable cam Q, straight at one end and curved at the other, the curved end being toward the tail end of mill and adjustable at pleasure by means of a horizontal screw K for thick or thin boards, the inclination of which cam being increased when a thick board is required to be sawed and decreased when a thin one is desired, by said screw. The other raised projection R is of a triangular shape and has on its longest side on the outside a groove *b* made flaring at one end for the purpose above mentioned; that is to say, to admit the point of the lever *a*, Fig. 3, for raising the dog from the notched wheel. This movable stock C may be shifted in its position back or forth on the rail *e* to accommodate itself to logs of various lengths.

On the inside of one of the fender posts *p* is a hinged bar *l*, Figs. 1 and 12, of iron projecting out from the fender post against which a projection S<sup>2</sup> on the end of the arm of the crank I, Figs. 1 and 19, strikes and moves up over the same for drawing the dog

G, Fig. 1, from the logs; said hinged bar  $l$  is hinged to a curved arm  $m$ , Fig. 12, let into the fender post  $p$ , Fig. 1, and adjustable by a screw  $n$ , Fig. 12, for changing the inclination of the hinged bar for moving the half bale dog more or less.

On the same fender post is an inclined plane O, Fig. 6, for pushing back the driving bar B, Fig. 1, as the carriage advances toward the saw, the projection  $S^2$  passing under the bar  $l$  and lifting it in this forward movement of the carriage; it drops to its former position as soon as the projection  $S$  leaves it.

On the opposite fender post  $q$ , Fig. 1, there is another inclined plane  $r$  Figs. 1, 5, adjustable by a screw  $t$  for setting the log for the cut of a board as the carriage runs back by the end of the notched bar B of the head block striking against the same.

Under the floor of the mill there is a horizontal lever  $u$ , Fig. 2, whose fulcrum is in a hanging post  $v$  projecting down from the floor to one end of which lever is suspended a weight  $w$  for hoisting the small gate and near the other end there is hinged a vertical bar  $x$  the upper end of which is hinged to a movable inclined plane  $y$ , Figs. 1 and 2, over which a roller  $z$ , Fig. 1, attached to the side of the carriage moves as the carriage is run back—presses down said inclined plane  $y$ —moves the post  $x$  and the lever  $u$  and raises the weight  $w$  which is held up by a spring catch 1 that hooks to the floor on the other side of the carriage—thus relieving the apparatus hereafter to be described to which the small gate is suspended from the influence of the weight and leaving it at liberty to fall when required to be closed. The vertical pole 2 of the said gate is hooked up to the floor of the mill and is unhooked by means of a knee 3 fastened to the floor and partly under the carriage Figs. 1 and 17 moving on a pin 4 as its fulcrum and operated or moved by the right angled plate L under the carriage striking against a projection  $v'$  on said knee which at the same time moves a hand 5 Fig. 17 which takes hold of the notches on the under side of an index plate  $w'$  Figs. 1 and 13 and moves it around one point at every cut of a board and when it is moved around to the last point a cam  $C^2$  on the periphery of the index plate strikes against the main gate pole 6, hooked to the floor, pushes it off which falls by its own gravity and closes the main gate and thus stops the mill. The pole is attached to the gate and hooked to the floor in the usual manner.

The hand 5 is thrown back by a spring  $S S$ , Figs. 16 and 17 underneath the floor which bears against a pin  $x^3$  attached to the catch 5. When the small gate pole drops the running back gearing is thrown out of gear in the usual manner and the hands 7, 8 drop into gear with the rag wheel 9. When the

small gate pole 2 is raised to let the water on the small wheel for running back the carriage 10 the hands 7, 8 are raised from the rag wheel at the same time and this is effected in a new mode which is as follows—In front of the fender post there is a vertical bar 11 Figs. 1 and 8 in which there is an iron loop  $N^{12}$ , which embraces the hands—the lower one 7 resting on the lower side of said loop and the upper hand 8 resting on top of the lower one—which bar  $N^{11}$ , is connected with the ordinary knee and lever for meshing the running back gear of the common saw mill as represented in Fig. 8 in such a manner by an additional knee 14 as that when the meshing of the gearing takes place for running back the carriage said vertical bar 11 is raised by said connection which raises the lower hand 7 and with it the upper one 8 resting thereon from the rag wheel 9 which stops the advance of the carriage, and which will always prove effective without the liability of the forward or upper hand catching or hanging in the notches, and thus destroying this part of the saw mill.

Operation: The carriage 10 being run back, the log dogged on the head and tail blocks, the hands 7, 8 in gear with the rag wheel 9, the pole 6 of the main gate is raised and hooked to the floor 16 of the saw mill. This lets on the water and sets the mill in motion, which continues until the log is sawed up when the pole 6 is pushed off from the floor, falls and closes the main gate which stops the mill and this is effected every time the cam ( $c^2$ ) of the index wheel, Fig. 13, comes in contact with the pole 6, which takes place at every revolution of the index, which is effected in a longer or shorter time according to the size of the log and the number which is brought next the pole and to which the machine is set. The index is turned by means of the hand 5 which is moved horizontally over the floor by the knee 3, by the plate L on the carriage striking the projection  $v'$  on said knee which knee also moves the pole 2 of the small gate by means of the part  $w^2$  striking it and causes it to fall and close the small gate. When the carriage has advanced as far as it is intended to go a projection pin, or stud  $A^2$ , Figs. 1 and 21, on the side of the carriage strikes the hook, knocks it from the floor, which causes the weight  $w$  to fall and this raises the other end of the lever from that on which the weight is suspended, which strikes a horizontal lever 20 to which the gate pole 2 is attached, which opens the small gate and lets on the water to the small wheel and at the same time puts into gear the pinion 21 of the running back gear in the usual manner, which causes the carriage to run back for a new cut and as it runs back the dog is set for a new cut without the

aid of any person, by means of the projection S on the arm of the crank I passing up over the hinged bar 7 which causes the crank I to move around and  
 5 draw back the dog from the log and being thus liberated from the log, which is then moved forward by means of the bar B striking against the end of the inclined plane *r*, Fig. 5, on the fender post *g*, which  
 10 pushes in said bar, and this being geared with the notched arm against the plain part of which D the log rests it moves said log or sets it toward the saw the thickness of the board required to be cut, which is deter-  
 15 mined by the set of the inclined plane *r*, regulated for any thickness by the set screw *t*, Fig. 5. At the same time or a little sooner the tail block is moved for setting the other end of the log, which is effected by the arm  
 20 O of the bar N striking against the adjustable cam Q which moves said bar and with it the movable part of the tail block, being both in gear by the notches on the bar and those on the plate of the tail block. At the same  
 25 time the lever *a* enters the groove *b* which moves the lever and raises the dog V from the notched wheel U which suffers the pinion and rack to move which are merely designed to hold the block. The lever *a* on  
 30 leaving the groove moves back again, which suffers the dog again to fall into the notches of the wheel U, which holds the pinion from moving any way. The lever *a* then passes  
 35 back over the top of the stock without impediment. The plate L then again strikes the projection V' on the knee 3, unhooks the pole 2 and closes the small gate as before, and at the same time gears the hands with the rag wheel and ungears the running back  
 40 gear and the carriage advances as before for a new cut. The levers F are by hand used for bearing down the bar so as to disengage it from the right angled arm that said cam may be moved back in putting in another  
 45 log.

The hands are ungeared at the same time that the running back gear is put into gear when the small gate is raised by the connection of levers, knees, and bars, before described. The knee 14 is for raising the bar 50 11 which raises the hands.

What we claim as our invention and which we desire to secure by Letters Patent consists—

1. The combination and arrangement of 55 the notched bar B and notched arm D with the inclined planes *r* and *o* attached to the fender posts as herein described, the inclined plane *r* being provided with a set screw *t* to adjust it to any thickness of board required 60 as before described.

2. The combination and arrangement of the dog G, crank I, arms J, and spring H with the hinged inclined plane *b* for drawing back and driving forward the dog G of 65 the head block A as described.

3. The construction of the movable stock C and adjustable cam Q in combination with the center rail *e* to which it is secured and the notched bar N and notched plate P 70 for moving the tail block M, also the arrangement of the lever *a* moving in the groove *b* of the stock C for raising the dog V from the notched wheel U as described.

4. The combination of the index 13 and 75 hand 5 with the knee 3 for shutting the main gate to stop the mill at any required time as described.

5. The mode of raising the hands from the rag wheel by means of the combination of 80 the vertical bar 11, loop 12, and knee 14 with the ordinary apparatus for meshing and unmeshing the gear for running back as described.

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Witnesses:

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