

(No Model.)

J. W. MAXWELL.

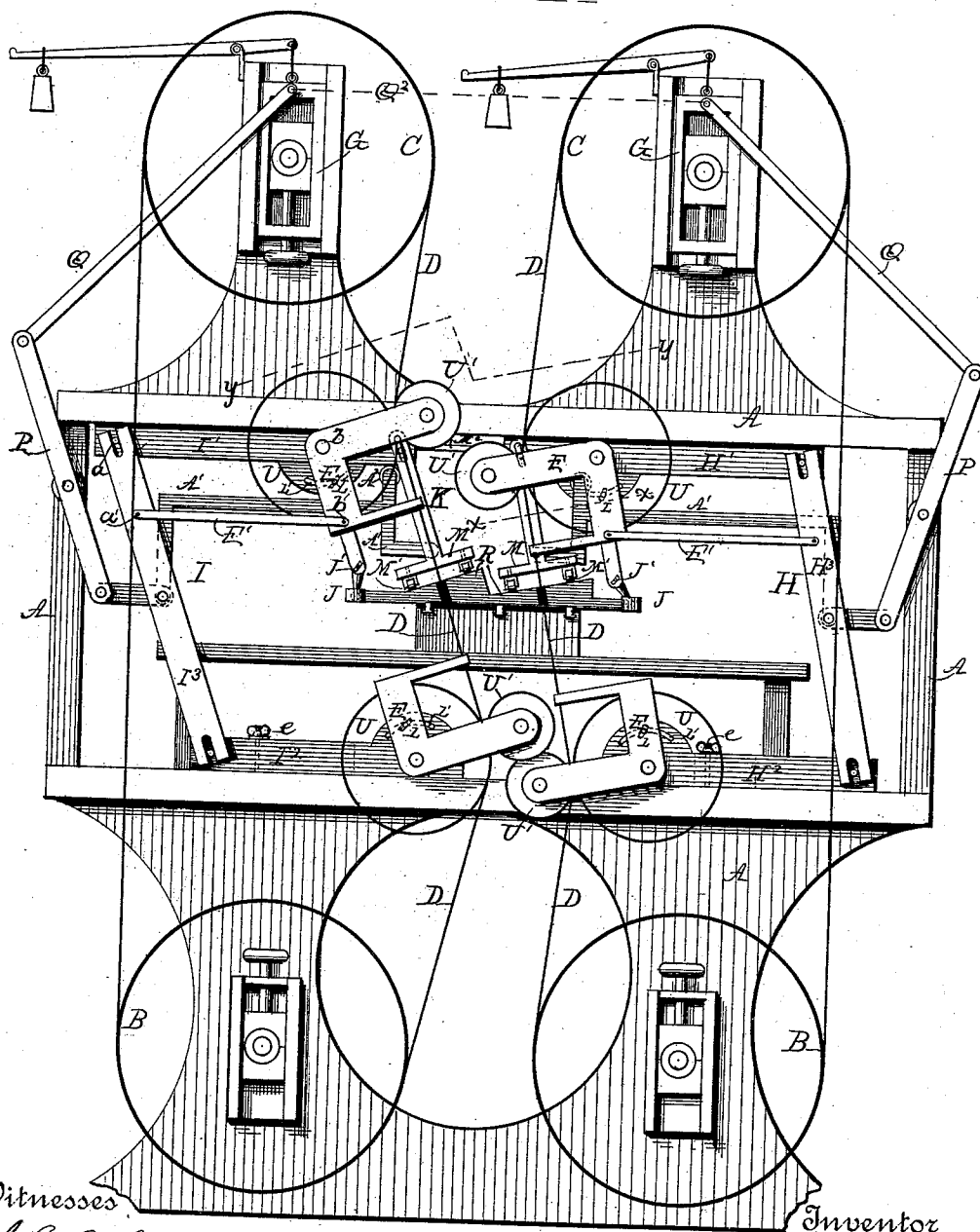
2 Sheets—Sheet 1.

BAND SAW MILL.

No. 357,681.

Patented Feb. 15, 1887.

Fig 1.



Witnesses

L. E. Stevens

P. C. Stevens

Inventor

Joseph Wiley Maxwell.

By his Attorney W. K. Stevens.

(No Model.)

J. W. MAXWELL.

2 Sheets—Sheet 2.

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Fig 2.

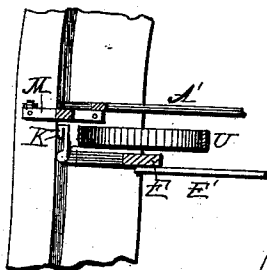


Fig 3.

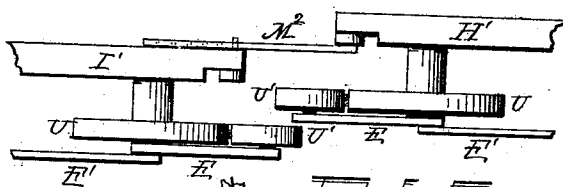


Fig 5.

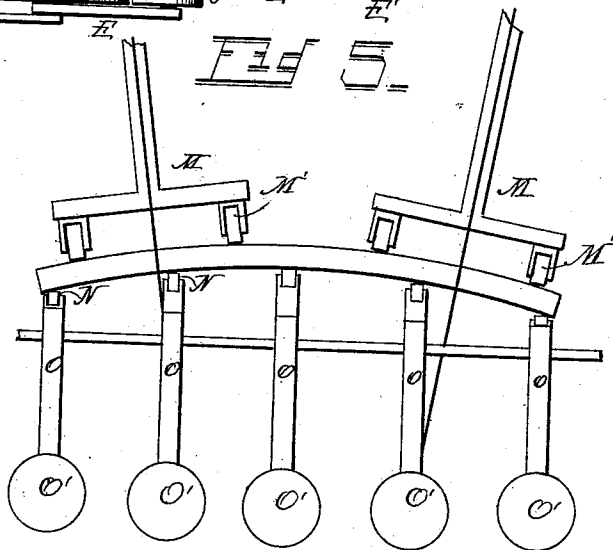


Fig 4.

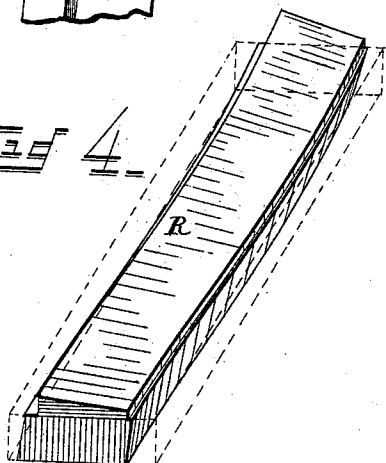


Fig 6.

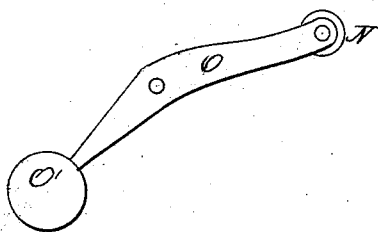
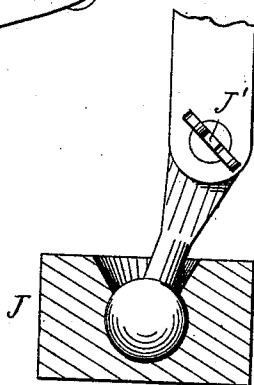


Fig 7.



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH WILEY MAXWELL, OF LOUISVILLE, KENTUCKY.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 357,681, dated February 15, 1887.

Application filed June 10, 1886. Serial No. 204,789. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WILEY MAXWELL, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Band-Saw Mills; 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 appertains to make and use the same.

This invention relates to band-saw mills, and particularly to that class of band-saw mills which are designed to cut lumber into shapes corresponding with a profile-pattern by the automatic action of the pattern on parts of the mill on the principle shown in other applications of my own for patents now before the Patent Office.

The object of this invention is, first, to provide means whereby one or more saw-blades may be deflected from a vertical path to fixed or variable inclinations for the purpose of sawing bevels and twisted or warped surfaces, such as those required in the side timbers of ships; and, second, to provide means particularly required to adapt two separate band-saws to act at once upon the same work on the principle shown in other applications above referred to.

To this end my invention consists in the construction and combination of parts forming a band-saw mill, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a band-saw mill, showing the principal features of this invention. Fig. 2 is a sectional view of a portion thereof, taken at the line *x x*. Fig. 3 is a view of a portion thereof, at the line *y y*, without the frame A. Fig. 4 is a detail view in perspective of a warped surface after having been sawed. Figs. 5 and 6 show means for guiding a plank which has been warped by the weather, so that work may be sawed therefrom, whose edges each bear a fixed angle with the surface throughout. Fig. 7 is a detailed sectional view of a profile-following roller.

A represents the frame of the saw-mill or sawing-machine. B B represent two lower pulleys journaled in any usual way therein.

C C represent two upper pulleys journaled in bearings G, fitted to slide vertically in the frame A.

D D are band-saws mounted on the pulleys B and C.

H and I are sashes fitted to slide transversely in cross-bars of the main frame, to carry rollers U to bear against the inner faces of the saw-blades to give direction thereto. In the present invention the sash H is made up of an upper slide-beam, H', and a lower slide-beam, H'', connected by a vertical beam, H³, loosely pivoted at its ends thereto and pivoted midway to a lever, P, which is pivoted to the main frame. The sash I is similarly made up of two reciprocally-sliding beams, I' and I'', connected by a vertical beam, I³, loosely pivoted at its ends thereto, and pivoted midway to a lever, P, which is pivoted to the frame A. By this means either saw may be moved in a vertical plane outward from its normal plane, or it may be inclined by setting either roller U forward of the other. To adapt the saw-guides K, which I have specifically described and claimed in other applications above referred to, to automatically follow the tangent plane of the two rollers U in this invention, I have hung them to the sliding beams I' I'' and H' H'', concentrically with the respective rollers U, by means of hangers E, and I have connected the said hangers with the vertical beams I³ and H³ by means of parallel rods E'. This device works on the well-known principle of the parallel ruler. The two pins *a a'* in the beam I³ and the two pivotal points *b b'* in the hanger should be in parallel planes, and the pivots *a b*, compared with the pivots *a' b'*, should be in a plane parallel therewith. The distance from the pivot *b'* to the adjacent guide K should be equal to the radius of the adjacent roller U, to keep the guide K tangent to the roller.

In order that the saw may not leave one roller U when a straight line drawn tangent to the adjacent saw-pulley and the other roller U would not touch the one roller first named, I have journaled an auxiliary roller, U', upon each of the hangers E, tangent to the outer face of the saw at its point of contact with the roller U. The centers of the two rollers and the pin *b'* are in lines forming a permanent right angle—angle *b' U U'*—ninety degrees.

In order that work may be sawed at once by the two saws narrower than the diameter of the roller U', I have hung one saw, with all of its accessories, a little to the rear of the other saw.

I am aware that two saws hung in different planes, one behind the other, is not a new principle; but I am not aware that two sets of saw-guiding rollers have before been hung to reciprocate in parallel planes one behind the other.

In order that the roller J may follow the profile of a pattern and communicate a take-up motion to the upper saw-pulley, as described in other applications, I connect the lower ends of levers P with the middle of the beams I² H², and I connect the rods Q directly with the bearings G without the interposition of a pitman, because if a pitman were used in connection with a rod on one side only the pitman would swing instead of communicating the motion of the rod to the bearing. If two pitmen were provided, one to each bearing G, and the free ends of the two pitmen connected by a rod at the dotted line Q², it would be an equivalent to the pitman claimed in another application.

L represents binding-screws in the hangers E, engaging segmental slots L' in the beams H' H² and I' I², whereby the sashes and hangers may be fixed to guide the saws permanently at any required angle of inclination. The roller J is provided with a ball-and-socket bearing, as shown in Fig. 7, whereby it may accommodate itself to a winding-surfaced profile. The shaft of the roller J is jointed and provided with a binding-screw at J', whereby it may be bent and rigidly fixed at the most convenient angle to enable the roller to follow the pattern.

M is a T-shaped guide centrally pivoted to an arm, A', which is pivoted to the beam I² at its center. Said arm A' is bent to give as much free space as possible over the table, and is provided with an anti-friction roller, A², to roll against the beam I' to maintain the T-guide in position upon the pattern, and yet permit the beam I' to traverse independently of the arm A'. The said T-shaped guide has rollers M' journaled on its side arms to follow winding or warped surfaced patterns or lumber. Its upper arm is loosely pivoted to the beam I', and in case the work to be sawed is parallel-sided the two sashes may be connected by an adjustable rod, M², whereby the incline of one sash will be communicated to the other.

Each sash may be provided with a separate T-shaped guide to independently control its saw, as in Fig. 5, where a warped plank is shown being cut at both edges at right angles to the general plane traveled by the rollers of the T-shaped guides.

N represents a series of rollers each journaled upon a separate elbow-lever, O. These

levers are pivoted at their angles to the main frame beneath the path of the work and are separately weighted at O', whereby they press the work up against the rollers of the T-shaped guides, each roller N following its own narrow path on the under face of the lumber, however badly warped it may be.

It will be seen that the T-shaped guide effects only the inclination of the saw, while the guide-roller J, moving the sash bodily, directs the profile to be sawed.

Fig. 4 represents a plank four or six inches thick with its edges cut into warped or winding surfaces to fit into the bow of a ship. On the top of this plank, which is shown in full, as it was before cutting, in dotted lines, a guide-pattern, R, is represented, on which one or both the T-shaped guides may travel to direct the saws in cutting the edges.

The guide K is slotted vertically to receive the saw and is pivoted in the hangers, the pivot being in front of the saw-blade or concentric with it.

For some purposes it may be desirable to disconnect the beam I² from the beams I' and I², and to secure each of the latter independently of the other to the frame A by means of binding-screws *c*. If one of the sliding beams—I², for instance—were rigidly fixed to the frame A, the other beam, I', might still perform many of the functions due to this combination. As a modification the roller J may be mounted on the arm A', whereby the sash would be traversed correspondingly to the profile of the pattern. The inclining of the saw might also be accomplished by a profile-shaped flange standing upon the pattern, to be engaged by a slot in the guide M, the T-arms and rollers being dispensed with.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a frame, A, a band-saw, D, mounted thereon, two beams, I' I², fitted to slide transversely in the frame, rollers U, journaled upon the said beams to roll against a face of the saw-blade, and a beam, I³, loosely pivoted at its ends to the beams I' and I² and pivoted centrally, substantially as shown and described.

2. The combination of a frame, A, a bearing, G, fitted to slide vertically therein, a pulley, C, journaled in the said bearing, a band-saw, D, mounted on the pulley C and a lower pulley, two beams, I' I², fitted to slide transversely in the main frame, rollers U, journaled on the said beams to roll against a face of the band-saw, a beam, I³, loosely pivoted at its ends to the beams I' and I², a lever, P, pivoted to the main frame and connected at one end with the middle of the beam I³, and connected at the other end with the bearing G by means of a rod, Q, substantially as shown and described.

3. The combination of a saw-mill frame, two band-saws, each mounted on a pair of pulleys, and each pair of pulleys journaled on

a pair of shafts independently of the other, two pairs of beams fitted to slide transversely in the frame, a roller journaled on each sliding beam, two of the said rollers fitted to roll against the inner face of each saw, and means for traversing the beams while the saws are at work, substantially as shown and described, whereby the adjacent portions of the two saws may be caused to approach each other and recede while at work, as specified.

4. The combination of a band-saw, D, one or more rollers, U, journaled to roll against a side of the saw, a hanger, E, hung to swing concentrically with each roller, a saw-guide, K, attached to the hanger in a line tangent to the roller, and means for securing the hanger in position, substantially as shown and described.

5. The combination of the roller U, journaled on a frame provided with a segmental slot, L', the hanger E, hung concentrically with the said roller and provided with a binding-screw, L, fitted to engage the said slot, and a saw-guide, K, attached to the hanger in a line tangent to the said roller, substantially as shown and described.

6. The combination of a saw-frame, A, a band-saw mounted thereon, a beam, I', fitted to slide transversely therein, a roller, U, journaled on the said beam, a hanger, E, hung concentrically with the said roller, a saw-guide, K, secured to the hanger, a beam, I³, pivoted at one end to the beam I', and pivoted at the other end in a fixed relation to the saw, and a rod, E', pivoted at one end to the hanger E and at the other end to the beam I³, on the principle of the parallel ruler, substantially as shown and described.

7. The combination of the band-saw D, a roller, U, journaled on a portion fitted to slide transversely to the saw, a hanger, E, journaled concentric with the said roller, a roller, U', journaled to the hanger on the opposite side of the saw to the roller U, and means for securing the hanger at the required angle, substantially as shown and described.

8. The combination of the band-saw D, mounted on a frame, a portion, I', fitted to slide transversely in the frame, a roller, U, journaled on the sliding portion, a hanger, E, hung upon the sliding portion concentric with the said roller, another roller, U', journaled upon the hanger on the opposite side of the saw to the roller U, a beam, I³, pivoted to the portion I' at one end, and pivoted at the other end in a fixed relation to the saw, and the rod E', connecting the beam I³ and the hanger E, substantially as shown and described.

9. The combination of a band-saw, D, mounted on a frame, parallel beams I' and I², fitted to slide transversely in the frame, rollers U, journaled upon the beams I' and I², hangers E, hung to the said beams concentric with the said rollers, a beam, I³, loosely pivoted to the beams I' and I², parallel rods E',

connecting the hangers E with the beam I³, and two saw-guides, K, attached to the two hangers in a line tangent to both rollers U, substantially as shown and described.

10. The combination of the hanger E, provided with saw-guides and means for setting them at different angles, and the roller J, connected with one of the said hangers by a ball-and-socket bearing, substantially as shown and described.

11. The combination of the hanger E, provided with a saw-guide and means for being set at different angles, and the roller J, journaled on a jointed shaft provided with a binding-screw, the said shaft being attached to one of the said hangers, substantially as shown and described.

12. The combination of a saw-frame, a band-saw mounted on pulleys, one of which is journaled in a bearing fitted to slide vertically in the said frame, a pair of rollers journaled in bars which are fitted to slide transversely in the said frame and are jointed together, on the parallel-ruler principle, a lever pivoted to the frame and connected at one end with the said sliding bars and at the other end with the said pulley-bearing, substantially as shown and described.

13. The combination of two band-saws mounted side by side on pulleys, one in a vertical plane to the rear of the other, beams connected on the parallel-ruler principle and fitted to slide transversely in the frame, a roller journaled upon each sliding beam tangent to a saw, a hanger hung upon each sliding beam concentric with each of the said rollers, and an auxiliary roller journaled upon each hanger on the opposite side of the saw to the first-named rollers, substantially as shown and described.

14. The combination of the band-saw rollers U, journaled on beams fitted to slide independently of each other and connected together, on the parallel-ruler principle, and the T-shaped guide M, having pivotal and sliding connections at two points with one of the said sliding beams, substantially as shown and described, whereby the rocking of the said guide will cause a relative sliding motion in the said beams, as specified.

15. The combination, with a saw-guide and sliding support therefor, of a T-shaped guide arranged to have its arms bear against a pattern at each side of the path of the saw and having sliding connections at the end of its body, with the said support for the saw-guide and pivotal connection to an independent support at a point between the said sliding connection and the cross-arms, substantially as shown and described.

16. The combination of two band-saws mounted side by side in nearly the same plane, a guide for each saw mounted upon beams jointed together, on the parallel-ruler principle, and fitted to slide transversely to the machine,

and a link or rod, M², connecting the two
jointed guides, substantially as shown and de-
scribed, whereby two saws may be guided to
saw parallel with each other at various incli-
5 nations, as specified.

17. The combination of the T-shaped guide
M, connected with saw-inclining guides of a
sawing-machine above the plane of the work,
and a series of weighted levers, O, pivoted to
10 the machine beneath the path of the work and
provided with rollers N, substantially as shown
and described.

18. The combination of the jointed sash I,

the arm A', pivoted to the beam I³ thereof
and provided with a roller, A², adapted to roll 15
against the beam I', and the T-shaped guide
M, pivoted centrally to the arm A' and hav-
ing a pivotal and sliding connection therewith,
and the beam I', substantially as shown and de-
scribed. 20

In testimony whereof I affix my signature
in presence of two witnesses.

JOSEPH WILEY MAXWELL.

Witnesses:

HENRY W. MEYER,
M. P. HEATT.