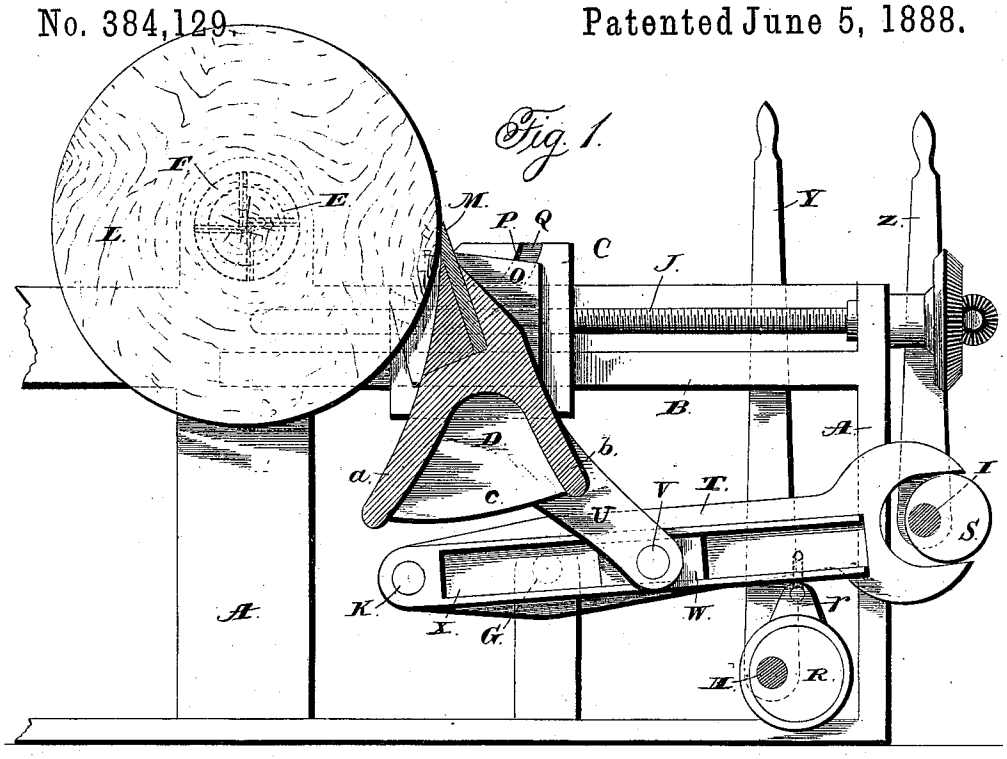
(No Model.) 2 Sheets—Sheet 1.

H. H. COE.

ROTARY CUTTING VENEER MACHINE.

No. 384,129. Patented June 5, 1888.

Fig. 1.



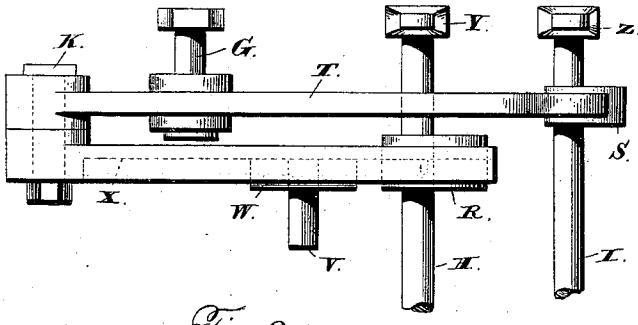
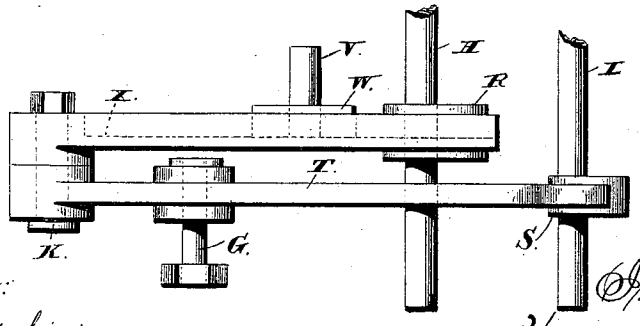


Fig. 2.



Witnesses:
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(No Model.) 2 Sheets—Sheet 2.

H. H. COE.

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Fig. 3.

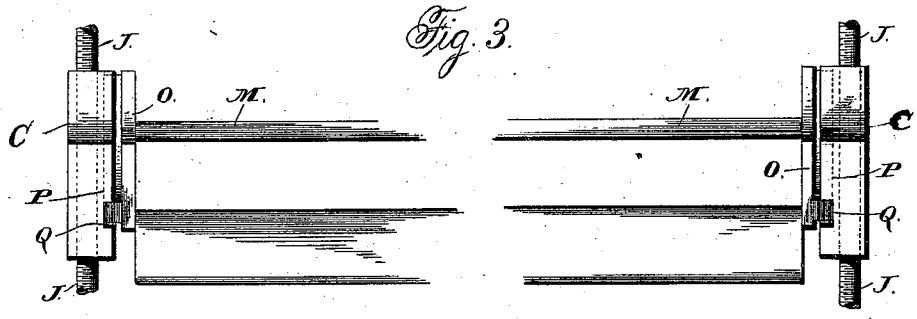


Fig. 4.

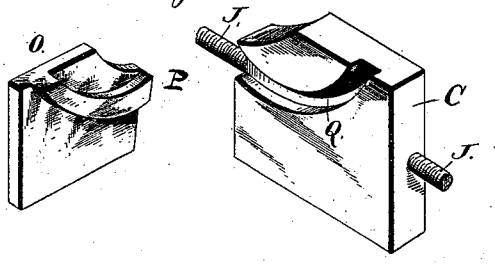
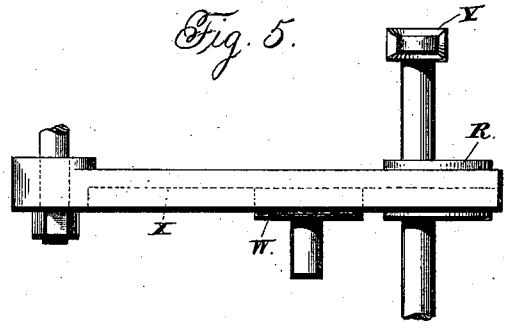


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY H. COE, OF PAINESVILLE, OHIO.

ROTARY-CUTTING VENEER-MACHINE.

SPECIFICATION forming part of Letters Patent No. 384,129, dated June 5, 1888.

Application filed August 19, 1886. Serial No. 211,355. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. COE, a citizen of the United States, residing at Painesville, in the county of Lake and State of Ohio, have invented new and useful Improvements in Rotary-Cutting Veneer-Machines, of which the following is a specification.

My invention relates to machines for producing veneers of wood and thin-cut lumber, in which logs of wood supported on driving-centers carried by rotating spindles are rotated against a knife supported by a bar having its bearings on ways, said bar being automatically moved on said ways toward the log by screws or other device at a speed proportioned to the thickness of veneer or lumber desired to be cut.

The objects of my improvements are, first, to produce a knife-bar of such construction that without inordinate weight it will meet its heaviest labor without spring or vibration; second, to enable the operator of a veneer-machine while his machine is at work to quickly find the easiest smoothest cutting angle of knife toward the log being cut; third, to automatically hold that easiest smoothest cutting angle toward the log being cut while said log is diminishing in size.

Evidently the easiest cutting angle is such an angle that the pressure of the cutting comes directly upon the edge of the knife, dividing the pressure (or friction) equally between the timber of the log on the front and the veneer parted from the log on the back below the edge, though practice may show the smoothest cut in soft timber when more pressure is allowed on the front of the knife. To obtain the easiest cutting angle with a knife having a short bevel requires more "pitch" of knife toward the log than is required by a knife thin on the edge, (*i. e.*, one with a long bevel.) To cut thick lumber, the knife requires more pitch toward the log than is required to cut thin lumber. A knife set to the easiest smoothest cutting angle on a very small log will not cut at all on a very large log, as the arc of the circumference of the log is so much expanded toward a straight line on the large log that the pressure of the log becomes too great against the front of knife below its cutting-edge to permit it to cut. A knife set to the smoothest easiest cutting angle on a very large log, while it will part the lumber from the log, will not do good work on a very small log, as the arc of the circumference of the small log has become so contracted that all pressure has been relieved from the front of the knife and has been changed onto the back of knife, and the lumber made is checked and split and rough on the surface. To most easily make smooth sound lumber from all parts of a log, the pitch of the knife toward the log must continually change from largest to smallest log in proportion as the diameter of log diminishes. I meet these conditions and attain the objects named by mechanisms illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the machine, showing parts in elevation. Fig. 2 is a plan view. Fig. 3 is a detached view of the knife-bar and the connected guide-blocks containing knife-bar bearings. Fig. 4 is a detailed view of one slide-block and an end of the knife-bar, showing the guide-flange thereon; and Fig. 5 is a modification.

Similar letters refer to similar parts in all the views.

I construct the knife-bar D hollow and open on its under side, its diverging walls *a* and *b* giving it a pyramidal form when viewed in section, carrying the knife at its apex. I connect the walls *a* and *b* at suitable intervals of length by partitions, as represented at *c*. This form and construction gives it a depth and breadth of base which without inordinate weight secures sufficient strength and stiffness to resist the heaviest strains without spring or vibration.

I flange both ends of the knife-bar D, as shown at O O, said flanges carrying annular projections on their outer sides, as shown by dotted curves at P. I construct the slide-blocks C separate from the knife-bar D, said slide-blocks being provided with annular grooves (shown at Q) corresponding to and receiving the annular projections on the knife-bar D. Together they form limited bearings curved in the arc of a circle, having their axis of rotation at or near the line of the knife, so that any rotating of the knife-bar does not raise or lower the edge of the knife, nor does such

rotating move the edge of knife backward or forward. I further construct the knife-bar D with projecting arms, as at U, having a suitable leverage relative to the curved bearings P Q. Said arms carry pins V, engaging with the slide-blocks W, which traverse the adjustable guides X as the slide-blocks C, which carry the knife-bar, are actuated forward and back by the feed-screw J.

I construct the adjustable guides X with one of their ends pivotally supported by the pins K, said pins being either connected to a fixed projection on the frame A A A, (not shown in drawings,) or connected to the ends of levers T, as shown, said levers T having their fulcrums at G. The outer ends of said levers T are connected, supported, and actuated by the eccentrics S on the shaft I.

The outer ends of the adjustable guides X are connected with, supported, and actuated by the eccentric R on the shaft H, said eccentric resting in contact with a bearing, *r*, pivoted or depending from a link supported in the lever X. This bearing-block *r* has a rounded lower face adapted to always rest in contact with the eccentric R, for the purpose of giving said lever a steady and gradual change of position as the eccentric is turned and preventing any accidental displacement from said position by always maintaining its contact with the eccentric. The eccentric-shaft H is rotated by the hand-lever Y, and the eccentric-shaft I is rotated by the hand-lever Z.

If the adjustable guides X be set parallel to the ways B, there would be no rotation of the knife-bar D as it is moved back and forth. If the inner ends of the guides X are pivoted to the frame, as shown in Fig. 5, the levers T and their connections G, S, I, and Z are dispensed with, and the guides X are operated solely by the hand-lever Y through the shaft H and eccentric R. By moving the hand-lever Y to the left, the outer ends of the guides X are raised from a parallel to an angle with the ways B. While this produces a change of pitch of knife toward the log and is a great relief to a machine, especially when working logs of great diameter, yet it does not give the operator a complete control of the pitch of the knife, nor does it do the best cutting on small logs, as the automatic change of pitch of knife decreases in ratio as the knife-bar is fed forward; but by introducing the levers T and their connections, as shown, the moving of the hand-lever Y to the left raises the outer ends of the guides X above the parallel line with the ways, while the moving of the lever Z to the left lowers the inner ends of the guides below that parallel line, and thus an equal ratio of change of pitch is automatically produced during the whole forward movement of the knife-bar. By moving the hand-lever Y only, the ratio of automatic change of pitch is increased, but has its greatest effect on the larger diameter of the log. By movement of the hand-lever Z only the ratio of the automatic change of pitch is also increased, but increased in the direction of the smaller diameter of log.

The utility of my invention is presented in the fact that while the knife is firmly clamped to its seat by the clamp-bar N the knife is always at the control of the operator. The friction on the knife is reduced to a minimum. The friction of the "pressure-bar" or "gage-bar" is removed, and the gage-bar—a necessity in most veneer-machines—is nearly dispensed with. The required power to run the machine is much reduced. Smaller driving-centers become adequate. The product of the machine is smooth in surface, even in thickness, and free from checking in all sizes of logs.

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

1. In a rotary-cutting veneer-machine, the combination, with slide-blocks having guides thereon curved in the arc of a circle, of a knife-bar arranged to move on said guides and have its inclination regulated thereby, substantially as set forth.

2. In a rotary-cutting veneer-machine, the combination, with slide-blocks having guides thereon curved in the arc of a circle, of a knife-bar arranged to move on said guides and have its inclination regulated thereby, and a feed-screw for shifting the position of the slide-blocks, substantially as set forth.

3. In a rotary-cutting veneer-machine, the combination, with an adjustable knife-bar, of pivoted guides, the knife-bar having a sliding pivotal connection with said guides, substantially as set forth.

4. In a rotary-cutting veneer-machine, the combination, with an adjustable knife-bar, said bar having arms secured thereto, of pivoted guides, and blocks adapted to slide therein and to which said arms are pivoted, substantially as set forth.

5. In a rotary-cutting veneer-machine, the combination, with an adjustable knife-bar, said bar having arms secured thereto, of pivoted guide-bars or guides, blocks adapted to slide therein and to which said arms are pivoted, and cams for regulating the positions of the guide-bars, substantially as set forth.

6. In a rotary-cutting veneer-machine, the combination, with an adjustable knife-bar, said bar having an arm secured thereto, and slides, each having a curved groove therein, of a feed-screw to actuate the slides, and a pivoted guide-bar having a slide-block mounted therein, said block being pivoted to the arm of the knife-bar, substantially as set forth.

7. In a rotary-cutting veneer-machine, the combination, with an adjustable knife-bar, and pivoted guide-bars with which the knife-bars have a sliding pivotal engagement, of pivoted levers, and cams for regulating the position of said levers and guide-bars, substantially as set forth.

8. The combination, with the knife-bar, and pivoted guide-bars with which the knife-bar has sliding pivotal engagement, of levers piv-

oted on the same axle with the pivoted guide-bars, fulcrums for these levers, and cams for changing both the levers and the guide-bars, substantially as set forth.

9. The combination, in a rotary-cutting veneer-machine, of the adjustable knife-bar D, the annular bearings P Q, the arms U, the slide-blocks W, the adjustable guides X, the eccentrics R, the shaft H, and the hand-lever Y, substantially as described.

10. The combination, in a rotary-cutting veneer-machine, of the adjustable knife-bar D, the annular bearings P Q, the arms U, the slide-blocks W, the adjustable guides X, the eccentrics R, the shaft H, the hand-lever Y, the levers T, the fulcrums G, the eccentrics S, the shaft I, and the hand-lever Z, substantially as described, and for the purposes set forth.

HENRY H. COE.

Witnesses:
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J. B. BURROWS.