(No Model.) 4 Sheets—Sheet 1.

J. W. CHAPMAN.

MACHINE FOR CUTTING STAVE OR BARREL VENEER.

No. 435,480. Patented Sept. 2, 1890.

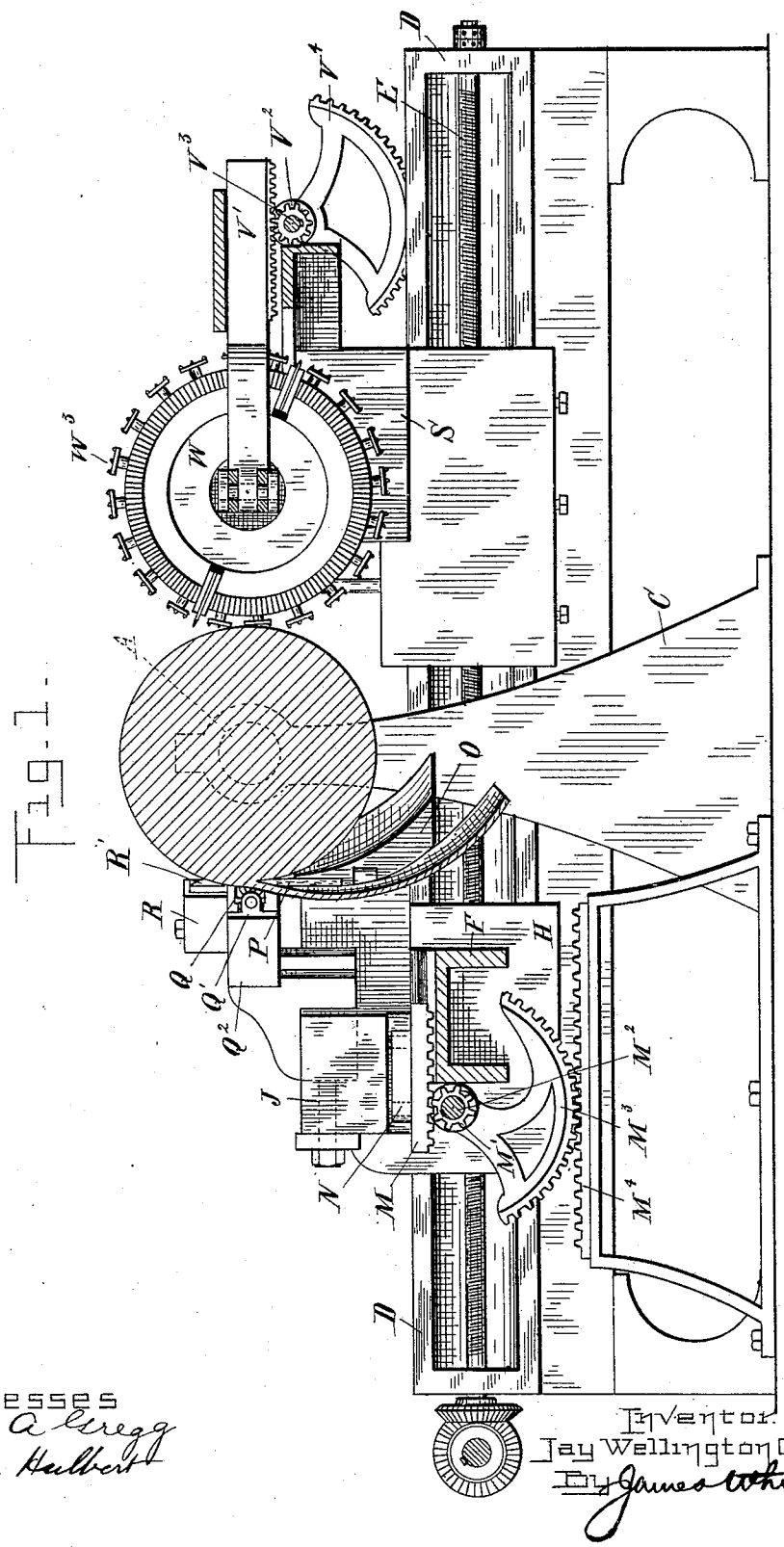

Fig. 1.

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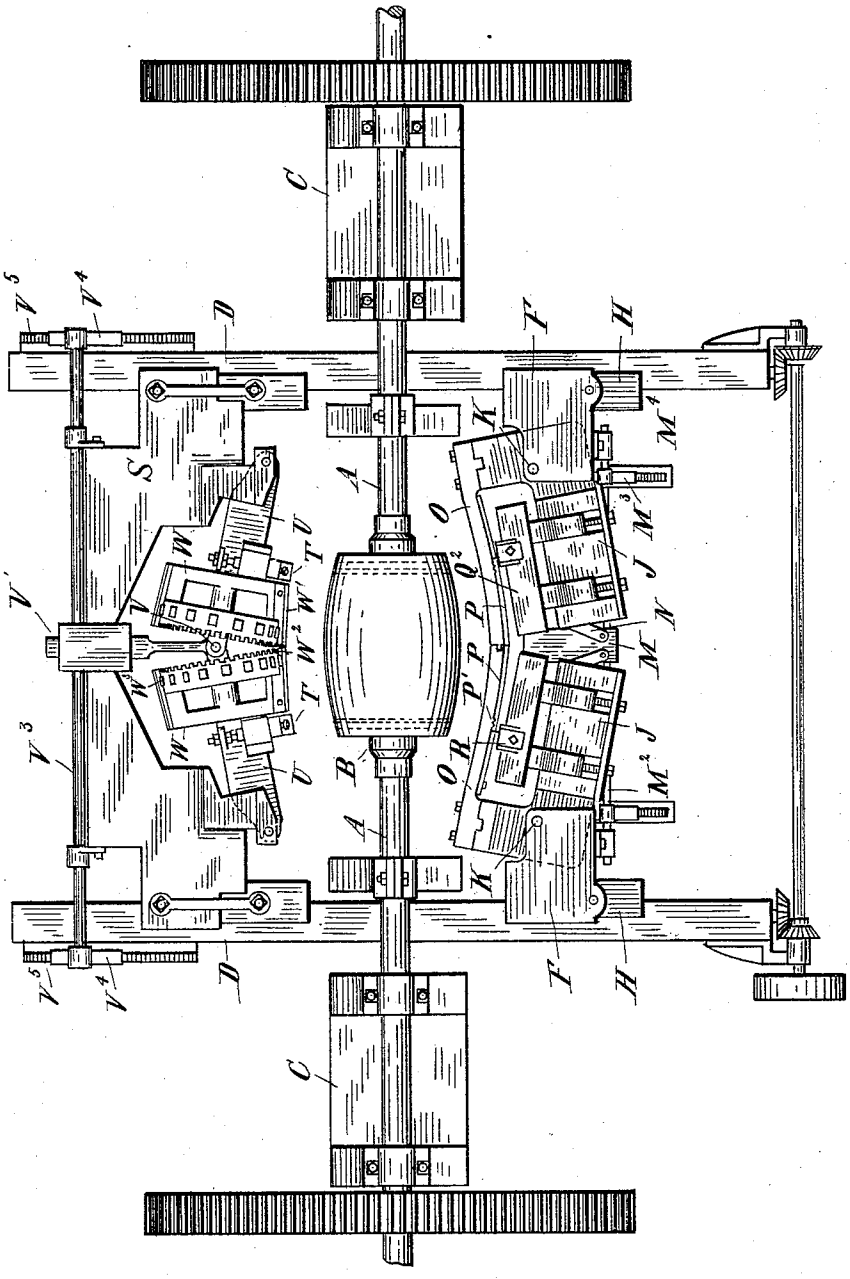
(No Model.) 4 Sheets—Sheet 2.

J. W. CHAPMAN.

MACHINE FOR CUTTING STAVE OR BARREL VENEER.

No. 435,480. Patented Sept. 2, 1890.

Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

J. W. CHAPMAN.

MACHINE FOR CUTTING STAVE OR BARREL VENEER.

No. 435,480. Patented Sept. 2, 1890.

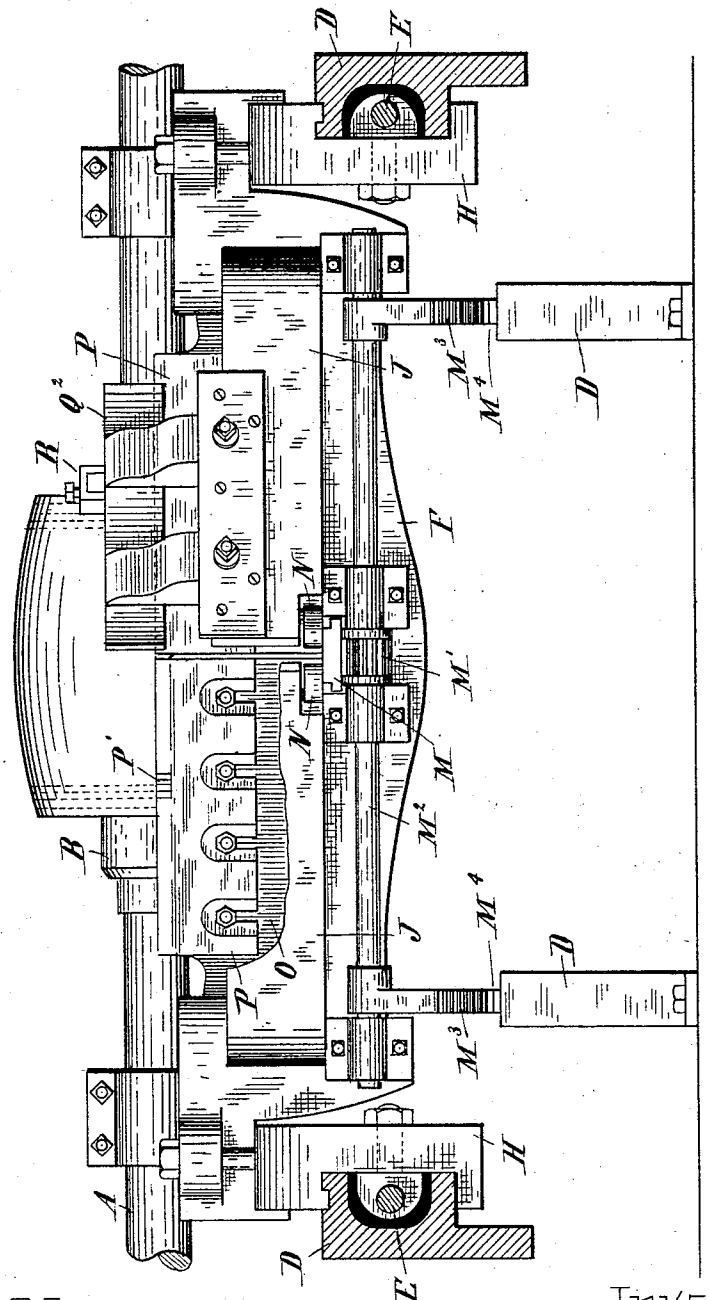

Fig. 1.

Witnesses
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(No Model.) 4 Sheets—Sheet 4.

J. W. CHAPMAN.

MACHINE FOR CUTTING STAVE OR BARREL VENEER.

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Fig. 4.

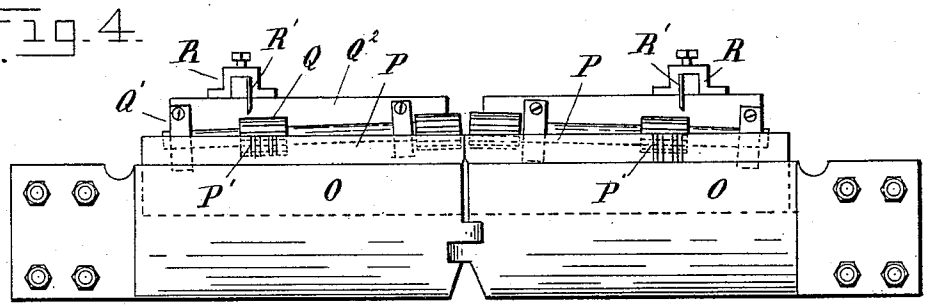


Fig. 5.

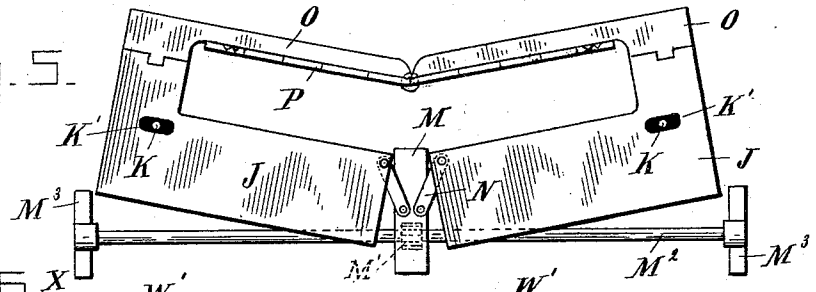


Fig. 6.

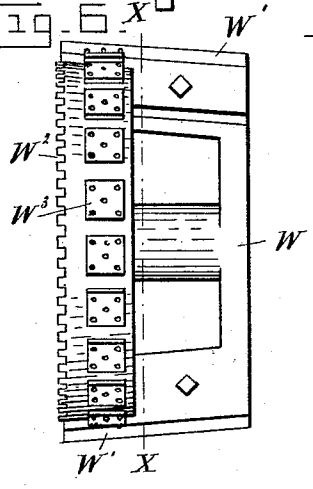


Fig. 7

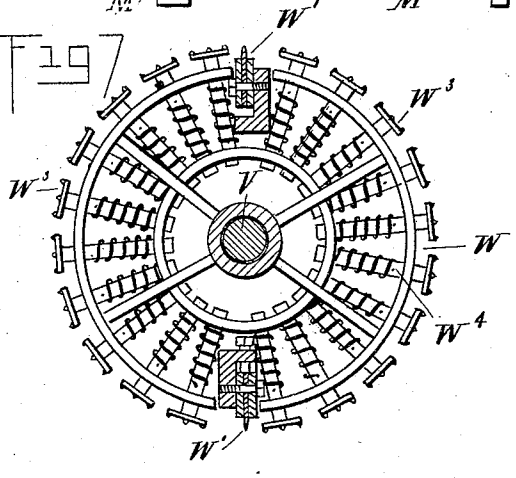


Fig. 8

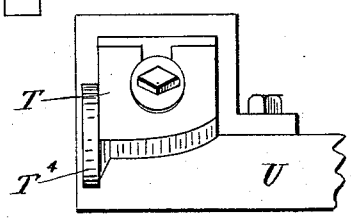
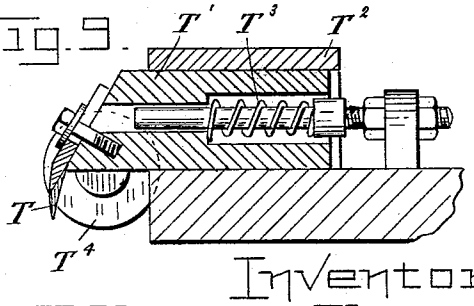


Fig. 9.



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UNITED STATES PATENT OFFICE.

JAY WELLINGTON CHAPMAN, OF DETROIT, MICHIGAN.

MACHINE FOR CUTTING STAVE OR BARREL VENEER.

SPECIFICATION forming part of Letters Patent No. 435,480, dated September 2, 1890.

Application filed January 2, 1890. Serial No. 335,709. (No model.)

To all whom it may concern:

Be it known that I, JAY WELLINGTON CHAPMAN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Machines for Cutting Stave or Barrel Veneer, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in machines for cutting stave or barrel veneer, in which the staves are cut with a curved or angular knife, which cuts the veneer from the log or bolt in barrel form, and in which the curvature of the knife is gradually diminished as the size of the log diminishes, so as to always maintain the same bilge in the log, whereby the veneer cut is all of uniform bilge—that is, when staves are cut off therefrom parallel to the axis of the log and made into barrels of a uniform size the latter will be of uniform bilge.

My invention is intended to form an improvement on the Patent No. 340,745, which is for a stave-veneer-cutting machine operating in the manner above described; and the improvement consists—

First. In the novel construction of the parts whereby the veneer-staves are unfolded or unrolled from the log without materially changing the form which they naturally assume.

Second. In the peculiar construction and operation of straining-rollers arranged in proximity to the cutting-edge of the knife, whereby the veneer on the ends of the log is strained or stretched for the purpose of taking it off the log more readily and imparting a certain quality to it which renders it more valuable for the purpose of making barrels or packages. The process involved in this construction I have described and claimed in a separate application for Letters Patent, Serial No. 335,710, filed January 2, 1890.

Third. In the peculiar means employed for changing the curvature or angle of the knife.

Fourth. In the construction and operation of a revolving divider for measuring and dividing off the veneer in staves of equal size on the log.

Fifth. In the construction, arrangement, and combination of different parts, all as more fully hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a cross-section of my improved machine. Fig. 2 is a plan thereof. Fig. 3 is a front elevation partly in section and having certain portions broken away to show the knife. Fig. 4 is a front elevation of that side of the knife and straining-rollers which bears against the log. Fig. 5 is a diagram plan of the knife-head and its operating mechanism. Fig. 6 is a detail view of one section of the divider-rolls. Fig. 7 is a cross-section of the divider-rolls on line $x\,x$, Fig. 6. Figs. 8 and 9 are details of the planing-knives.

A are the revolving spindles, one or both of which are slidingly secured and provided with chucks B, between which the log is supported in the ordinary manner.

C are the side frames which support the spindle-bearings.

D are the guides with which the carriage slidingly engages, and E are the feed-screws by means of which the knife-carriage is moved to the revolving log.

The knife-carriage is constructed in a novel manner, as follows:

F is a sliding cross-head, which extends transversely between the guides D, and has secured to its free ends the guide-bearings H, which slidingly engage with the guides D, while the feed-screws E engage with screw-threaded nuts on the guide-bearings.

J are two knife-blocks pivotally secured near their outer ends to the cross-head by means of bolts K, which pass through slots K′ in the knife-blocks. The inner end of each of these knife-blocks is secured by means of a link N to a rack M, which slidingly engages in suitable bearings in the center of the cross-head and engages with its cogs into the pinion M′ on the transverse shaft M^2, which is journaled in bearings to the cross-head. Near the outer end of the shaft are secured the segmental gears M^3, which engage with the stationary racks M^4, supported underneath the carriage.

O are two knife-bars, to which the cutting-knives P are detachably secured in any suitable manner. These two knife-bars are hinged together in the center of the machine and may be formed integral with the knife-

blocks, but are preferably firmly secured at their outer ends to the outer ends of the knife-blocks J. These knife-bars have the side toward the log concave and the reverse side convex, the knives being secured to the convex side in sections, each knife-block preferably carrying one-half of the whole knife.

Q are the straining-rollers, having suitable journals Q′ secured on the front side of the transverse supporting-bars Q^2, which are adjustably supported from or toward the log in any suitable manner upon the knife-blocks J. These straining-rollers are preferably so arranged as to have a slight incline or drop toward the ends, so that they bear at the center slightly above the cutting-point of the knife, while at their outer ends they bear against the cut veneer, and by being serrated, fluted, or otherwise configurated upon their faces they have motion imparted to them by frictional contact with the log. The rollers are preferably of the same diameter, or, if anything, the end of the roller which bears against the veneer at the outer ends of the log is larger than the end bearing against the center of the log, and the periphery of the outer ends of the rollers will travel at the same speed or faster than that of the inner ends. Now, as motion is imparted to the roller at its inner end by contact with the barrel-shaped log at the point where the periphery of the latter travels faster than that of the ends of the log, the outer end of the roller bearing on the cut veneer slightly splits or separates the fibers, and at the same time pulls or withdraws the veneer from the log at the same speed as at the center. The object of this straining is to prevent the veneer, which is of bilge form, from being injured by under splitting or tearing in taking it off the log, as it will be easily understood that veneer of this kind is more difficult to take off the log than veneer cut with a straight knife. It will also be observed that the veneer in cutting falls down through the throat at the back of the knife and under the knife-bars of the log, thus allowing it to pass off the log without opening it out materially, and thus preventing it from becoming split or breaking off in sections.

R are knife-holders adjustably secured to the bar Q^2 near the ends of the log and provided with knives R′, which bear against the log to cut off the veneer at a uniform length. The knives are provided at or near their outer ends with angular cutting-edges P′, adapted to cut the usual croze and chamfer, as in barrel-staves. The side frames, with their longitudinal guides, extend to the rear of the log, and another sliding carriage S is supported thereon and actuated by feed-screws in an opposite direction to the knife-carriage—that is, toward the back of the log.

The sliding carriage S has pivotally secured to it the boxes U, in which the outer ends of the shafts V are sleeved. The inner ends of the shafts V are pivotally secured to the sliding rack-bar V′, which slides in longitudinal guide-bearings in the center of the carriage S and engages with a pinion V^2 on the transverse shaft V^3. This shaft is journaled in suitable bearings secured to the carriage, and is provided with segmental gear V^4, which engages in the stationary rack V^5, similar to the rack M^4, above described.

Near the inner ends of each of the shafts V are journaled the divider-rolls W, preferably constructed in the form of a conical spider, to which the knives W′ are adjustably secured. The two rolls are provided at their adjoining ends with intermeshing gears W^2 and with a series of friction-plates W^3, secured to the holders W^4, which engage in radial sockets in the rollers and have a yielding bearing therein. The shafts V are arranged to have a slight play or end motion through the rolls W and boxes U. This allows the inner face of the divider-rolls W to open or close as the rack-bar is drawn from or toward the log.

The boxes U have mounted upon them the planing-knives T, Figs. 8 and 9, which are preferably secured to yielding knife-heads T′, having a guide T^2, and held to its work by the spring T^3. This knife is held in such relation to the log as to plane off the ridges left by the croze and chamfering knives upon the ends of the log. A roller T^4 is secured to one side of the knife-heads T′ and adapted to bear against the log, thus guiding the knife and preventing it from digging into the work.

In practice, the parts being arranged and constructed as described, they are intended to operate as follows: The knife-carrier is advanced by the feed-screws toward the log, as in the ordinary manner of cutting straight-veneer; but, the two faces of the knife forming an oblique angle with each other, they will as the knife-carriage advances upon the log cut the latter upon the ends until it assumes a barrel shape. Then the cutting of the veneer proceeds over the whole face of the log. As the knives always maintain an oblique angle, the veneer is cut with a natural bilge; but it will be seen that by the engagement of the segmental gears M^3 into the racks M^4 the knife-blocks J J will be oscillated upon their pivots in such a manner as to gradually increase or decrease the angle between the two sections of the knives. The object of this is to always maintain in the log the same relative proportions between the diameter at the center and the diameter at the ends—that is, keep the log always of a symmetrical form. This is for the purpose of cutting the veneer with a uniform bilge, as otherwise, if the angle of the knives were fixed, the bilge would be gradually increased as the knives approach the center of the log. In the same manner, as the knife-carriage advances toward the log in front the rear carriage advances against the back of the log, and at the same time the angle between the two shafts V V will change in the same manner as the angle between the

knives, thus causing the dividing-rolls W W to bear against the face of the log and force the knives W′ into the log, whereby the veneer is cut off in sheets or staves of uniform width. The revolving of the divider-rolls being caused by the engagement of the friction-plates into the logs, it will be seen that the slots through which the pivot-pins of the knife-block pass will compensate for the lateral displacement of the knife-blocks by the increasing or decreasing of the angle between the knives. The hinge connecting the two sections of the knife-bar will hold the two parts in proper relative position. The straining-rollers, being secured upon the knife-block, will in the same manner accommodate themselves to the variations in the form of the log and perform their function of straining the veneer by being adjusted in such proximity to the log as to cause the spurs or serrations of the rollers to press into the wood. The outer ends of the rollers are preferably provided with sharp spurs or serrations, whereby they cut at short intervals into the veneer so as to partially separate the fibers and serve to form the dividing lines upon which the veneer can be expanded in the act of securing the heads in the barrel formed of such veneer. The cutting-off knives R′ at or near the end of the log, being carried by the bars R, will always cut the veneer at the proper length, no matter what the curvature of the log.

The whole machine throughout is provided with means of adjustment of the usual kind wherever it may be necessary or desirable, and by making the cross-head detachable and adjustable upon the guide-bearings H can be adjusted independently of the knife-blocks. For grinding the knives, however, it will be seen that by constructing the knives in sections, as shown, they can be more readily repaired or taken off for grinding.

What I claim as my invention is—

1. The combination, in a veneer-cutting machine, of the veneer-cutting knife made in two sections hinged together in the center and secured to oscillating knife-blocks which vary the angle of the two knives, of straining-rollers, one for each section of the knife, substantially as described.

2. The oscillating knife-blocks J, in combination with the knife-bars O, hinged together in the center and secured at their outer ends upon the oscillating knife-blocks and each carrying one section of the veneer-cutting knife, substantially as described.

3. The combination of the oscillating knife-blocks with the knife-bars O, hinged together at the center and secured to or integral with the oscillating knife-blocks, said knife-bars being concave upon the side toward the log and convex upon the reverse side, substantially as described.

4. The combination of the oscillating knife-blocks with the knife-supporting bars O, integral therewith or secured thereto at their outer ends and hinged at the center, and of a throat formed between them adapted for the discharge of the veneer in a downward direction, substantially as described.

5. The combination of the oscillating knife-blocks, the knife-bars O, secured thereto at their outer ends and hinged in the center, the transverse bars Q^2, adjustably supported upon the knife-blocks, and the straining-rollers Q, journaled thereon, all substantially as described.

6. The combination, with a veneer-cutting knife made in sections hinged together and secured to oscillating knife-blocks, of the cross-head upon which the knife-blocks are secured, the slots K′ in the knife-blocks, and the pivot-pins K, all substantially as described.

7. The combination, with a veneer-cutting knife made in two sections pivotally secured together in the center and secured to oscillating knife-blocks, of the sliding cross-head upon which said knife-blocks are supported, the rack-bar M, sliding in bearings in the cross-head, and the links N, connecting said rack-bar with the oscillating knife-blocks, substantially as described.

8. The combination, with a veneer-cutting knife made in two sections hinged together in the center, of oscillating knife-blocks, to which said knife is secured, the sliding cross-head F, upon which they are supported, the rack M, slidingly secured in the center of the cross-head, the links N, the transverse shaft M^2, carrying the pinion M′ engaging the rack, the segmental rack M^3, and the stationary rack-bar M^4, all arranged to operate substantially as described.

9. The combination, with a veneer-cutting knife made in sections hinged together in the center, of the oscillating knife-blocks J, to which the ends of the knife-supporting bars are secured, the cross-head actuated by the feed-screws, the pin pivotally securing the knife-blocks to the cross-head and passing through slots in the knife-blocks, the sliding rack in the center of the cross-head, the pinion engaging therewith, the transverse shaft upon which said pinion is secured, the gear or gears M^3 on said shaft, and the stationary rack or racks M^4 engaging therewith, all substantially as described.

10. The combination, with a veneer-cutting knife constructed in sections hinged together in the center, of the dividing-knives W in rolling contact with each half of the log, and means, substantially as described, for correspondingly changing the angle of the veneer-cutting knives and of the dividing-knives, substantially as described.

11. The combination, with a veneer-cutting knife constructed in sections hinged together in the center and provided with devices for gradually changing the angle of the knives in the process of cutting, substantially as described, of the sliding carriage S, the shafts V, pivotally connected at their inner ends and supported in pivotal boxes upon the carriage

at their outer ends, and the knife-frames W, carrying the knives W′, in rolling contact with the log, substantially as described.

12. The combination of the sliding carriage S, the shafts V, hinged together at their inner ends and supported in pivoted boxes at their outer ends, the frames W, supported on the shafts V, the knives W′, secured in these frames, the friction-bearings on said frames in rolling contact with the log, and the actuating mechanism for changing the angle of the shafts V, substantially as described.

13. The combination, with the veneer-cutting knife constructed in two sections, of a serrated roller for each section of the knife, said roller having an inner portion bearing at or near the center of the log in advance of the cutting-edge of the knife, and an outer portion bearing upon the veneer back of the cutting edge of the knife and adapted to strain said veneer, substantially as described.

14. The combination, with the veneer-cutting knife provided with crozing and chamfering cutting-edges, of the knife T, secured in yielding bearings and provided with the guides T^4, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 21st day of December, 1889.

JAY WELLINGTON CHAPMAN.

Witnesses:
P. M. HULBERT,
JAMES WHITTEMORE.