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Patented July 8, 1902.

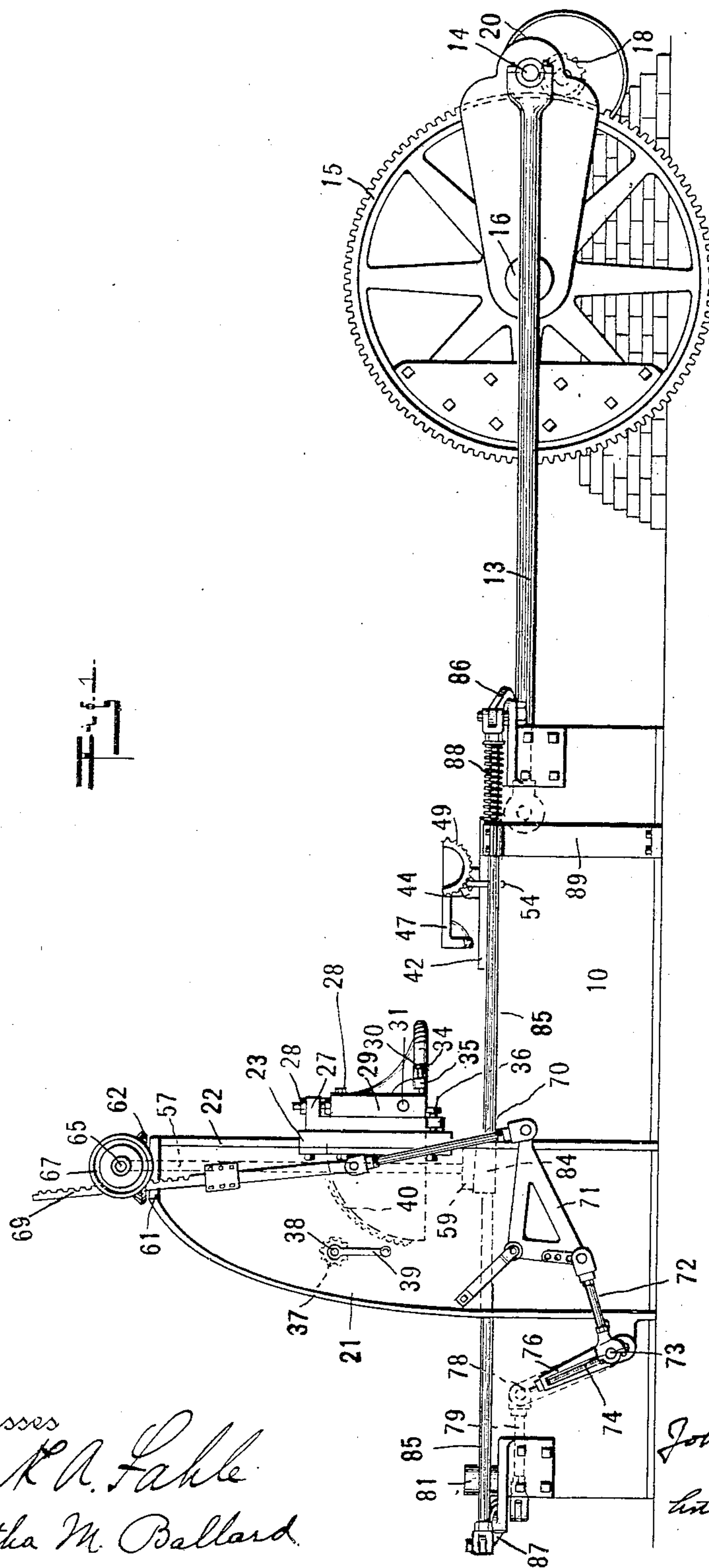
J. N. ROBERTS.

VENEER SLICER.

(Application filed May 13, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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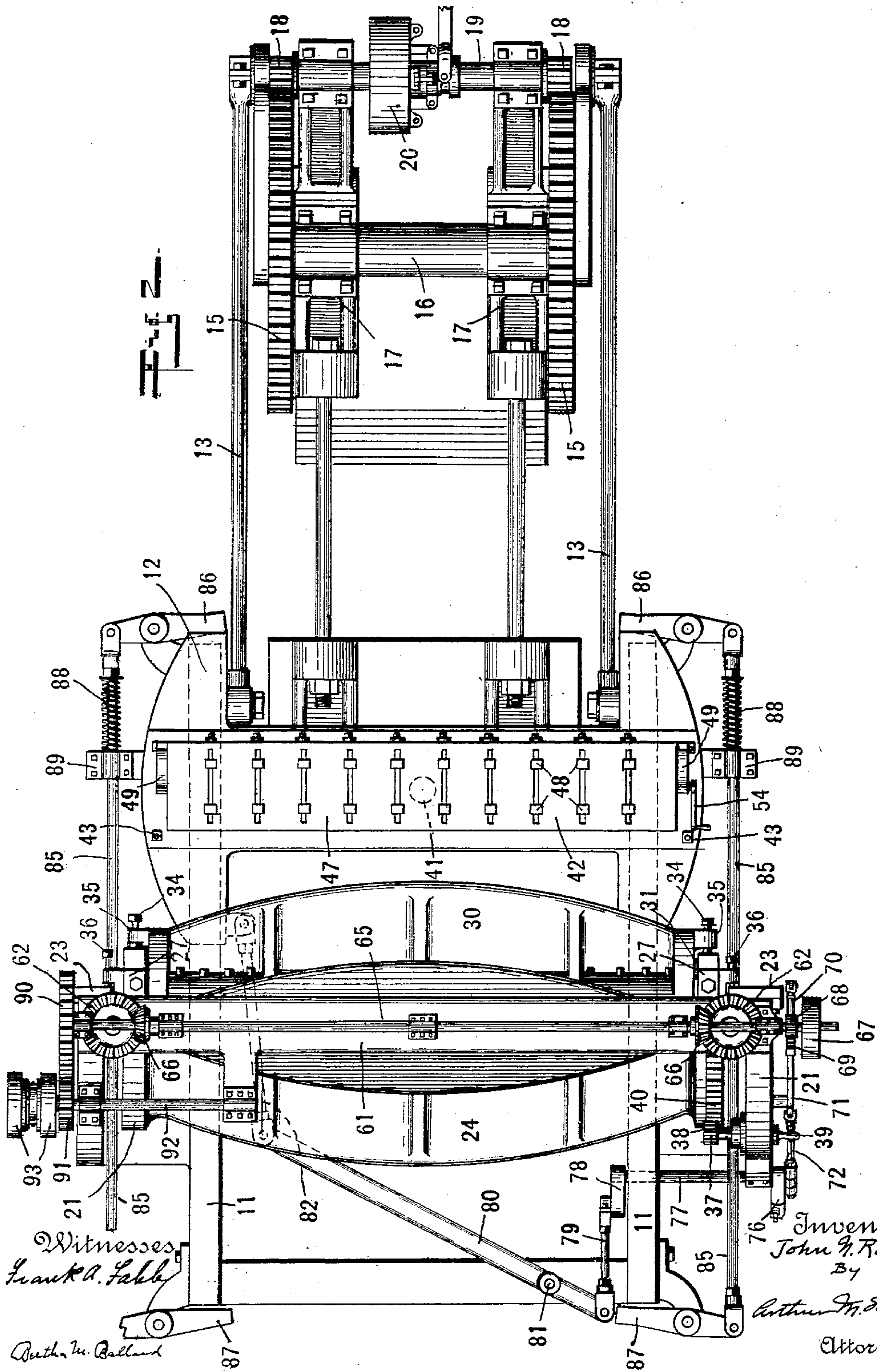
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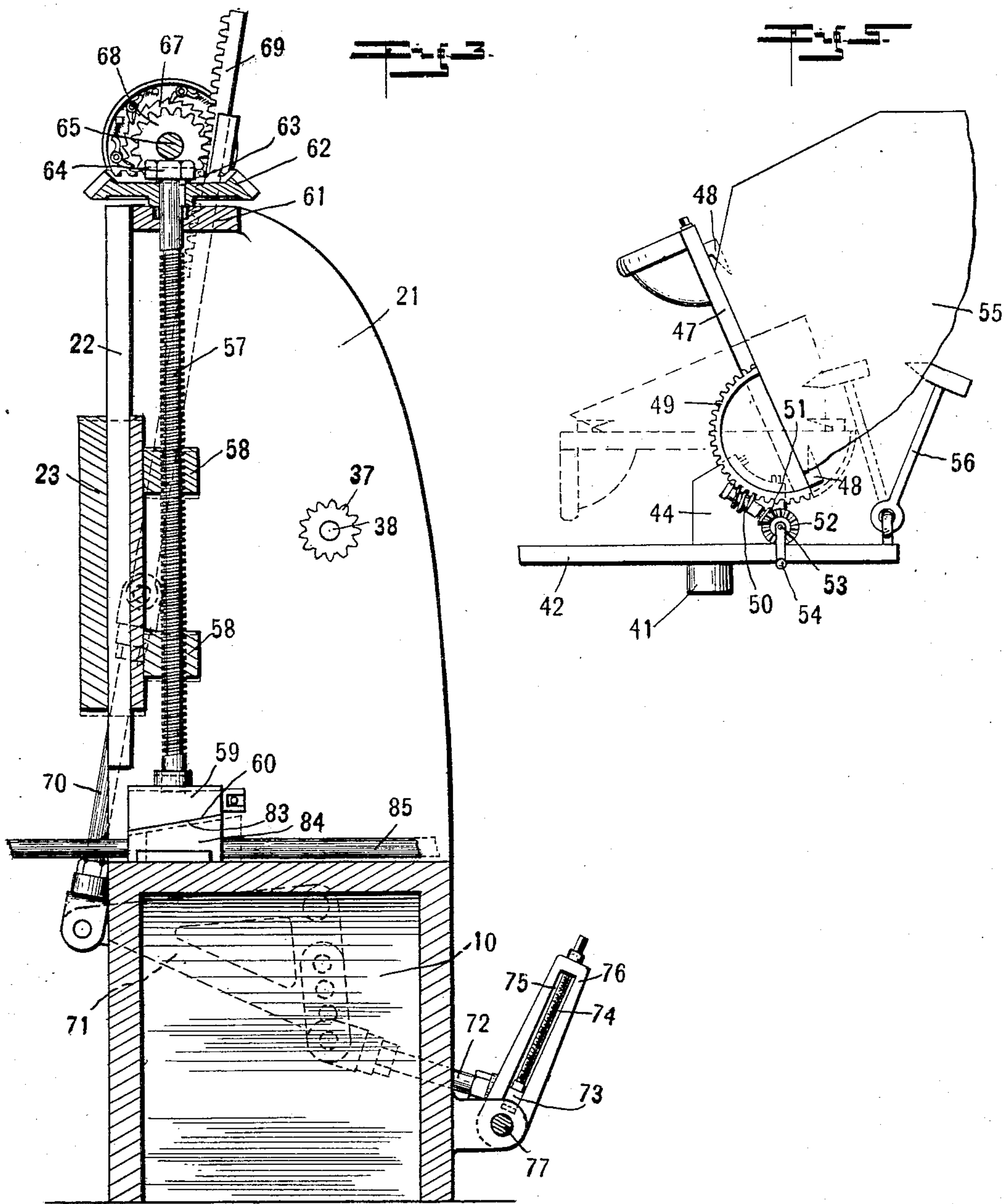
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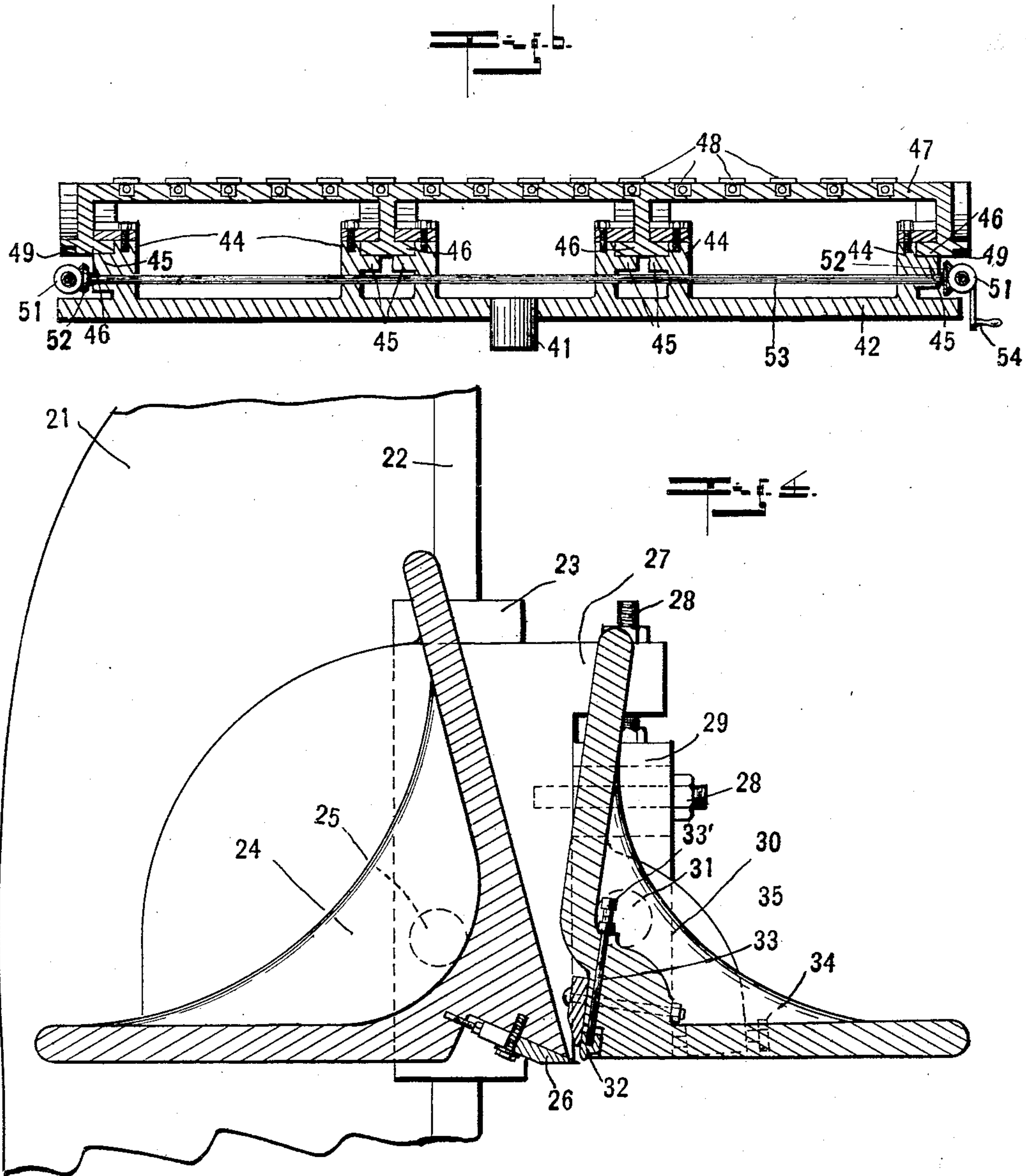
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

JOHN N. ROBERTS, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO LILLY & ROBERTS VENEER COMPANY, OF INDIANAPOLIS, INDIANA, A PARTNERSHIP.

VENEER-SLICER.

SPECIFICATION forming part of Letters Patent No. 704,213, dated July 8, 1902.

Application filed May 13, 1901. Serial No. 59,934. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. ROBERTS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Veneer-Slicer, of which the following is a specification.

My invention relates to an improved machine for making sliced veneers.

10 The objects of my invention are to provide improved means for supporting the flitch in such manner that it may be presented to the knife at any desired angle; to provide means by which said adjustment may be readily
15 made; to provide means for withdrawing the knife from the path of the flitch during its back stroke; to provide means for advancing the knife the cutting distance during the entire or substantially the entire back stroke of
20 the flitch-table and while the knife is withdrawn from the path of the flitch; to provide improved means for supporting the knife and the pressure-bar, whereby they may be rendered readily accessible for adjustment; to
25 so arrange the several parts that there may be no slack take-up in the flitch-holding table after the flitch has been engaged by the knife; to so arrange the pressure-bar arm that its weight will be in direct opposition to the
30 action of the flitch thereon, and to provide such improvements in details of construction as shall be hereinafter pointed out.

The accompanying drawings illustrate my invention.

35 Figure 1 is a side elevation. Fig. 2 is a plan. Fig. 3 is an enlarged section through one of the adjusting-screws. Fig. 4 is an enlarged cross-section of the cutter-head, pressure-bar head, and one of the supports therefor. Fig.
40 5 is an enlarged side elevation of the flitch-holding table. Fig. 6 is a longitudinal section thereof.

In the drawings, 10 indicates a supporting-bed provided with a pair of parallel guide-
45 ways 11, upon which is mounted a reciprocating table 12. Pivoted to table 12 are two pitmen 13, which pitmen are also pivoted upon wrist-pins 14, carried by a pair of driving-gears 15, which are connected by shaft 16,
50 mounted in suitable bearings on a foundation 17, which may or may not be a part of the bed

10. Gears 15 are simultaneously driven by a pair of pinions 18, carried by a shaft 19, provided with a driving-pulley 20, preferably a clutch-pulley.

55 Secured to or forming a part of bed 10, substantially midway thereof, are two standards 21, each provided with a vertical guideway 22, upon which is slidably mounted a head 23. Mounted between heads 23 is a cutter-support-
60 ing arm 24, said arm being suitably braced in the usual manner and provided at each end with a trunnion 25, each of which trunnions is rotatably mounted in the adjacent head 23. Adjustably secured to arm 24 in the usual
65 manner is a knife 26. Formed integral with arm 24 are two forwardly-extending lips 27, one at each end. Mounted upon the forward edge of each lip 27 and vertically adjustable
70 thereon by means of bolts 28 is a block 29. Mounted in front of the cutter-arm 24 is a pressure-bar arm 30, which is provided at each end with a trunnion 31, each rotatably mounted in the adjacent block 29. Adjustably mounted
75 upon the knifecorner of arm 30 is a pressure-bar 32, which may be moved up or down by means of bolts 33 and 34 in the usual well-known manner. The arrangement of the
80 pressure-bar arm 30 is such that the pressure-bar is held above the cutting edge of the knife and the weight of the arm is normal to the line of movement of the reciprocating flitch-carrying table. In the arrangement of the pressure-bars heretofore the weight of the
85 arm has been in the same direction as the pressure exerted by the passage of the flitch, and it is therefore necessary in machines heretofore constructed, where the movement of the flitch is in a vertical or substantially vertical plane, to set the pressure-bar considerably closer to
90 the knife at the middle of the knife than at the ends in order that the spring of the pressure-bar arm may be compensated for. In the arrangement shown in my present machine the weight of the pressure-bar arm is
95 directly opposite the force exerted by the flitch, so that the weight of the arm compensates for the pressure of the flitch, and actual tests on this machine have shown that the pressure-bar may be adjusted uniformly with
100 relation to the knife the entire length thereof and that by such an adjustment the pres-

sure on the veneer will be uniform throughout its length. The distance between the pressure-bar and the knife may be regulated by means of adjusting-screws 34, carried by ears 35 of the pressure-bar arm and engaging blocks 29, the said adjusting-screws also preventing the rotation of the pressure-bar arm upon its trunnions in one direction. A rotation of arm 24 about its trunnions in the direction which would be produced by the flitch is prevented by means of adjusting-screws 36, carried by lips 27 and engaging the heads 23. In order to swing the knife-arm about its trunnions, I journal in one of the standards 21 a pinion 37, carried by a shaft 38, provided with an operating-crank 39. Shaft 38 is axially movable in standard 21 and is normally out of alinement with a segmental gear 40, carried by the adjacent end of knife-arm 24.

Any suitable means carried by the table 12 may be used to hold the flitch in position; but I prefer to employ mechanism by which the flitch may be adjusted about both vertical and horizontal axes in order to vary the angle at which the flitch is presented to the knife.

Pivotally mounted upon the vertical axis 41 upon table 12 is a plate 42, which may be held in any desired angular position upon table 12 by means of suitable clamping-bolts 43. Secured to or formed integral with plate 42 is a series of bearing-standards 44, each provided with a segmental bearing 45, which bearings are adapted to receive segmental tracks 46, carried by the under side of the flitch-platen 47, provided with the usual adjustable flitch-dogs 48. Any suitable means may be used for swinging the platen 47 in the bearings 45—as, for instance, a worm-gear 49, carried by each end of table, and each meshing with a worm 50, to the shaft of which is secured a beveled pinion 51, meshing with a pinion 52, the two pinions 52 being carried by a shaft 53, provided at one or both ends with a crank 54, by which it may be rotated. The flitch 55, which may be a quarter-log, if desired, is secured to the platen 47 by the dogs 48 in the usual manner, and for additional rigidity one or more dogs 56 may be carried by plate 42 in position to be driven into the periphery of the flitch.

The knife-arm is held in vertical adjustment by means of a pair of vertical adjusting-screws 57, each of which passes through nuts 58, carried by the adjacent head 23. The lower end of each screw 57 is rotatably supported in a block or wedge 59, the under face 60 of which is inclined to the axis of screw 57. The upper end of each screw 57 passes through a cross-bar 61, which connects the upper ends of standards 21 and is vertically movable therethrough. Supported upon bar 61, adjacent each screw 57, is a gear 62, through which screw 57 passes and to which the said screw is keyed by a key 63, the arrangement being such, however, as to allow

an axial movement of the screw through the gear. Secured to the upper end of the screw 57 is a head 64, adapted to engage with the upper face of gear 62. Supported in suitable bearings upon cross-bar 61 is a shaft 65, which carries a pair of gears 66, one meshing with each gear 62. Mounted upon one end of shaft 65 is a ratchet-gearing 67, by which the shaft may be driven in one direction only. Forming part of ratchet-gearing 67 is a pinion 68, which rotates freely upon shaft 65 and meshes with a rack 69. Rack 69 is connected by a link 70 to one arm of a bell-crank lever 71, pivoted upon one of the standards 21. Pivoted to one arm of lever 71 at any one of a number of points varying in distance from the center is one end of a link 72, the opposite end of which is pivoted upon a nut 73, which may be adjusted by a screw 74 to any desired position in a slot 75 of lever 76, carried by a horizontal rocker-shaft 77, mounted in bed 10 parallel to shaft 65. Secured to rock-shaft 77 is an operating-arm 78, to which is pivoted one end of a link 79, the opposite end of which is pivoted to a lever 80, pivoted at 81 upon a vertical axis to the bed 10. The opposite end of the lever 80 is connected by a link 82 to the reciprocating table 12, the arrangement being such that the backward stroke of the table 12 will, through the parts described, cause a rotation of shaft 65 and gears 62, so as to cause screws 57 to move heads 23, and consequently the knife, downward a distance equal to the desired thickness of veneer required. Face 60 of each of the wedges 59 rests upon a corresponding face 83 of a horizontally-movable wedge 84, carried by a reciprocating rod or bar 85. Pivoted at the forward end of each guide 11 is a lever 86, the inner end of which is arranged to be engaged by table 12 and the outer end of which is pivotally connected to the adjacent end of the adjacent rod 85. Similarly mounted at the rear end of each guide 11 is a lever 87, the inner end of which is arranged to be engaged by table 12 and the outer end of which is pivotally connected to the adjacent end of the adjacent rod 85. Each wedge 84 is maintained in engagement with the coacting wedge 59 by means of a spring 88, engaging at one end a bearing 89, carried by the bed 10, and at the other end engaging rod 85.

In order to move the knife-arm quickly in either direction, I secure to shaft 66 a gear 90, meshing with a pinion 91, carried by a shaft 92, upon which is mounted reversing-pulleys 93.

The operation is as follows: A flitch 55 is secured to platen 47 in the usual manner by means of the dogs 48. Said flitch may be of any desired angle of cross-section up to a quarter-log or possibly greater, and by turning shaft 52 the platen may be adjusted about a horizontal axis until the free surface of the flitch be thrown into position where the horizontally-arranged knife will cut at the desired

angle to the figure. It is advisable in veneer-slicers that the flitch be presented at a horizontal angle to the knife in order that a shear cut may be obtained and in order that the entire length of the knife may not be in action at one time. The plate 42, therefore, is swung upon its axis 41 to any desired angle to the edge of the knife and clamped upon table 12, this angle depending upon the character of the flitch and the peculiarities of the grain at any particular time, and this angle may be easily changed at any time if it is found that the knife is not cutting smoothly. The rotation of shaft 19 will cause a rotation of shaft 16 and a reciprocation of the table 12. It is to be noticed that in view of the fact that the table 12 slides upon horizontal ways which support the weight of the table there is always a resistance to the rotation of the gears offered by the table, and this action is to be clearly distinguished from the action of the stay-logs or flitch-holding tables which move upon vertical ways. There is always some slight play between a reciprocating table and its driving means, and in a vertical reciprocating table the table drops slightly at the upper end of its stroke and then as soon as the flitch comes into engagement with the knife or slightly thereafter the lost motion must be taken up by the driving means, thus resulting in a slight halt of the flitch-table, and this results in a crease in the veneer. In my present construction, however, there can be no such individual movement of the flitch-holding table, so that there can be no halting of the flitch at any time during the cut. The flitch is carried beneath the knife by the table 12, and a slice of wood is taken off of the face of the flitch. As table 12 moves to the rear it operates through lever 80, the rock-shaft 77, rack 69, and the intermediate connecting parts to operate the ratchet mechanism 67, the pinion 68 thereof rotating freely upon shaft 65 and the shaft remaining stationary. Immediately at the end of the forward stroke of the table 12 said table comes into engagement with the inner ends of levers 87 and suddenly shifts rods 85 so as to drive wedges 84 under wedges 59 and lift screws 57, said screws moving axially through the gears 62, and this movement lifts the knife-arm and pressure-bar arm bodily a distance sufficient to enable the flitch to return beneath the knife without engagement therewith. As table 12 returns said table operates throughout its entire return stroke through lever 80, rock-shaft 77, rack 69, and intermediate parts to rotate the ratchet mechanism 67, so as to rotate shaft 65, and thus cause a rotation of the gears 62 and a consequent rotation of the screws 57, so as to set heads 23 down a distance equal to the required thickness of veneer, the amount of rotation of gear 62 depending upon the point of connection of link 72 and levers 71 and 74. As table 12 reaches the end of its return stroke it comes into en-

gagement with the inner ends of levers 86, so as to swing said levers and suddenly move rods 85 to the rear, so as to withdraw wedges 84 from beneath wedges 59, and thus allow screws 57 to drop through gears 62 until heads 64 come into engagement with said gears, the knife-arm and attached parts being thus dropped into cutting position, said position being the thickness of a veneer-slice lower than its position during the preceding cut. It is to be noticed here that the feed advancement of the knife takes place during the entire return stroke of the flitch-table, so that minute differences in the adjustment of the screws 57 may be produced and so that the advancement of the knife will at all times be uniform for any position of advancement of the operating-levers. The operation as described is repeated until slices have been taken from the flitch, so that the knife is cutting close as possible to the figure-line. The operator then rotates shaft 52, so as to throw platen 47 down through any desired or required angle, and the operation is continued.

In order to enable the operator to conveniently set the knife or pressure-bar or sharpen the knife, shaft 92 is rotated so as to cause a rotation of shaft 65 without a movement of the table 12. The knife-arm is raised until segment 40 is brought up into position to be engaged by pinion 37, when said pinion may be thrown into engagement with the segment and the entire knife-arm, together with the pressure-bar arm, which is pivoted thereto, may be swung about the trunnions 25, the knife being then uppermost, where it may be easily reached for adjustment or sharpening. The pressure-bar arm may also be swung independently upon its trunnions 31.

I claim as my invention—

1. In a veneer-cutting machine, the combination with the cutter thereof, of a flitch-holding table, consisting of a main body, a plate pivotally mounted thereon, means for holding said plate in various positions, a platen pivotally mounted upon said plate on an axis at an angle to the axis of the plate, and means for holding said platen in various positions of adjustment, said platen being adapted to receive a flitch.

2. In a veneer-cutting machine, the combination with the cutter thereof, of a flitch-holding table, consisting of a main body, a plate pivotally mounted upon said body, means for holding said plate in various positions of adjustment, a platen pivotally mounted upon said plate upon an axis at an angle to the axis of the plate, means for holding said platen in various positions of adjustment, and clamping-dogs carried by said platen in position to engage a flitch.

3. In a veneer-slicer, the combination with the knife, of a table, means for moving said table at an angle to and past the edge of the knife, a plate pivoted upon said table on an axis at right angles to the edge of the knife,

means for holding said plate in various positions of adjustment, a flitch-receiving platen pivotally mounted upon said plate upon an axis at right angles to the axis of the plate, 5 and means for holding said platen in various positions of adjustment.

4. In a veneer-slicer, the combination with the knife, of a pressure-bar arm, having a pressure-bar carried thereby and arranged 10 above the edge of the knife, means for adjusting the pressure-bar toward and from the knife, a flitch-carrying table, and means for driving said flitch-carrying table beneath the knife and pressure-bar, whereby the force of 15 the flitch upon the pressure-bar is in opposition to the weight of said bar.

5. In a veneer-slicer, the combination with substantially vertical ways, of a knife-arm supported thereon, one or more substantially 20 vertical adjusting-screws carried by the knife-arm, a wedge carried by each screw, a cooperating wedge mounted adjacent each of said wedges, a flitch-receiving table, means for driving said table beneath the knife, means 25 operated by said table for shifting the cooperating wedges so as to intermittently axially reciprocate the adjusting-screws, and means for intermittently rotating the adjusting-screws so as to advance the knife.

30 6. In a veneer-slicer, the combination with substantially vertical ways, of a knife-arm mounted thereon, one or more substantially vertical adjusting-screws carried by the knife-arm, a wedge carried by each of said screws, 35 a cooperating wedge mounted adjacent each of said wedges, a flitch-carrying table, means for reciprocating said table on a line at an angle to the movement of the knife-arm, means operated by said table for intermittently reciprocating the cooperating wedges 40 so as to intermittently shift the adjusting-screws axially, and intermediate connecting mechanism between said table and adjust-

ing-screws for rotating said adjusting-screws during the return stroke of the table. 45

7. In a veneer-slicer, the combination with a pair of adjustable heads, of a knife-arm pivotally mounted between said heads, and a pressure-bar pivotally mounted upon the knife-arm. 50

8. In a veneer-slicer, the combination with a pair of adjustable heads, of a knife-arm pivoted upon said heads, a pair of blocks adjustably mounted upon said knife-arm, and a pressure-bar pivotally supported upon said 55 blocks.

9. In a veneer-slicer, the combination with a knife, of a flitch-carrying table, means for reciprocating said table adjacent said knife, means for retracting said knife from the path 60 of the flitch before the return of the flitch, means for automatically advancing the knife through the distance of the feed during the major portion of the return movement of said flitch, and for afterward advancing the knife 65 through the distance of its retraction.

10. In a veneer-slicer, the combination with a knife, of a flitch-carrying table, means for reciprocating said table adjacent said knife, means operated by the table for retracting 70 said knife from the path of flitch before the return of the flitch, means operated by the table for advancing the knife during the major portion of the return movement of the table, and means operated by the table for afterward 75 advancing the knife through the distance of retraction.

11. In a veneer-slicer, the combination with a support, of a knife-arm pivoted upon said support, and a pressure-bar pivotally mounted 80 on the knife-arm.

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