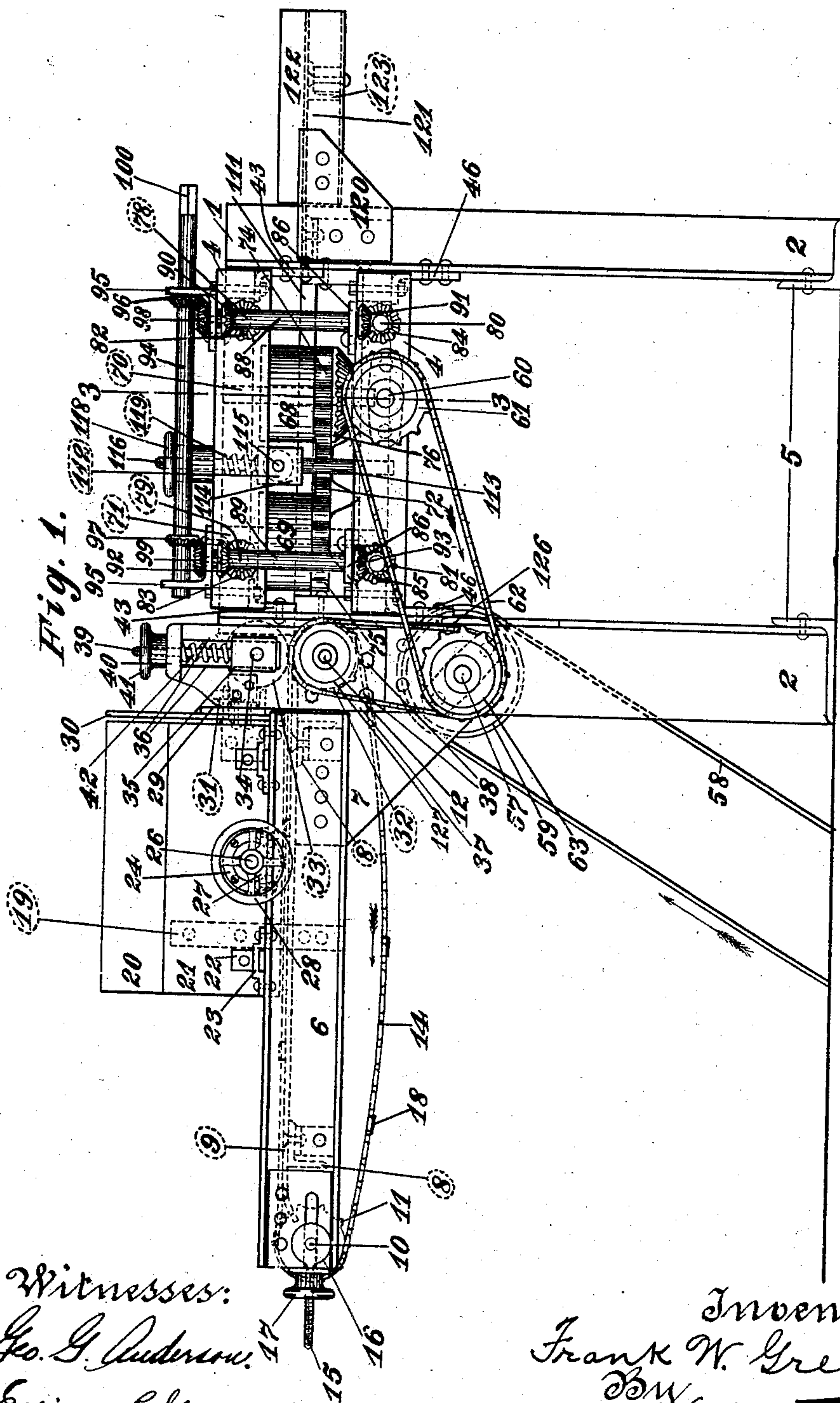


No. 840,315.

PATENTED JAN. 1, 1907.

F. W. GREENE.
WOODWORKING MACHINE.
APPLICATION FILED JUNE 13, 1906.

3 SHEETS—SHEET 1.



Witnesses:
Geo. G. Anderson.
Elliott R. Goldsmith.

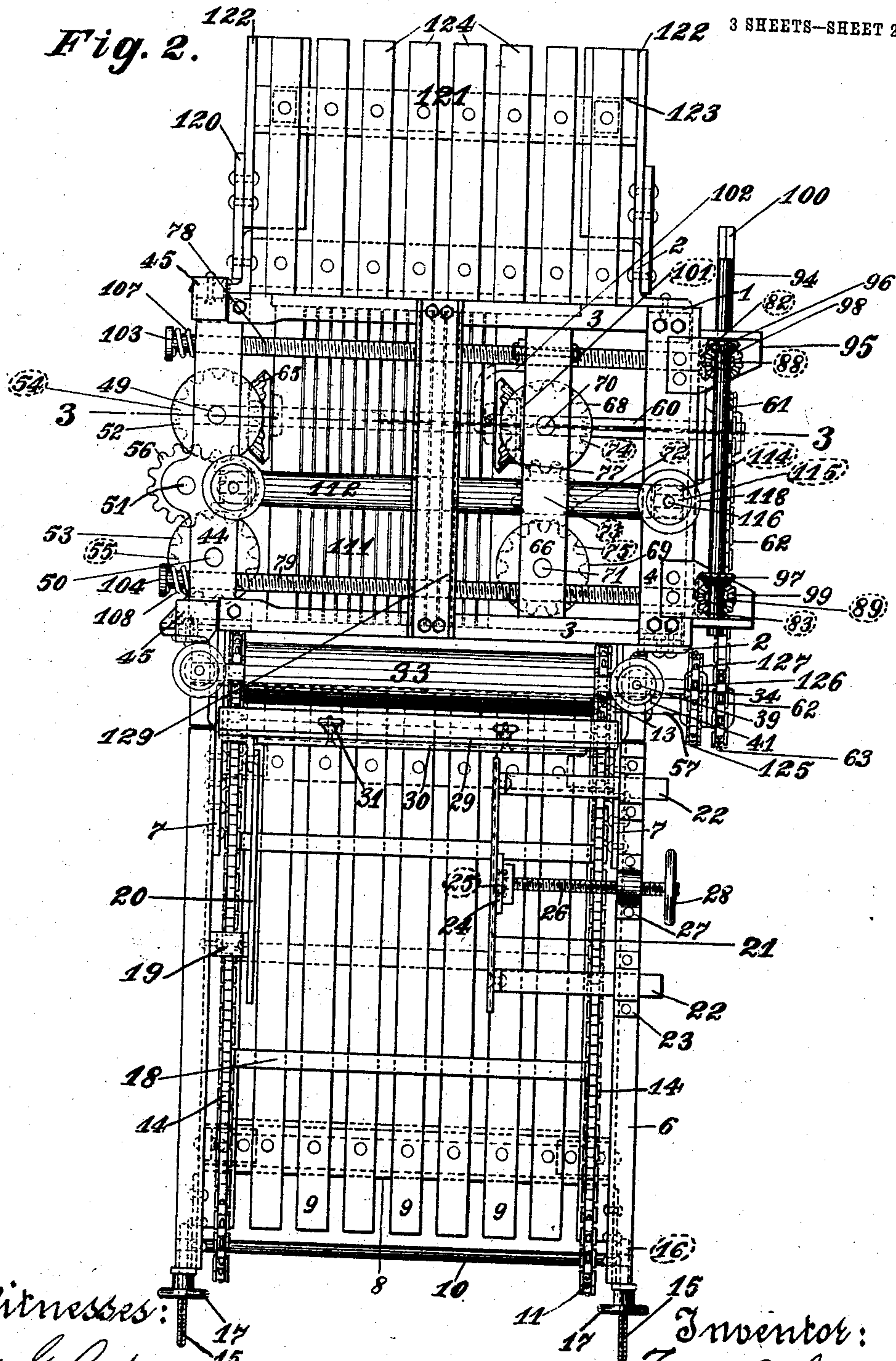
Inventor:
Frank W. Greene,
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3 SHEETS—SHEET 2.



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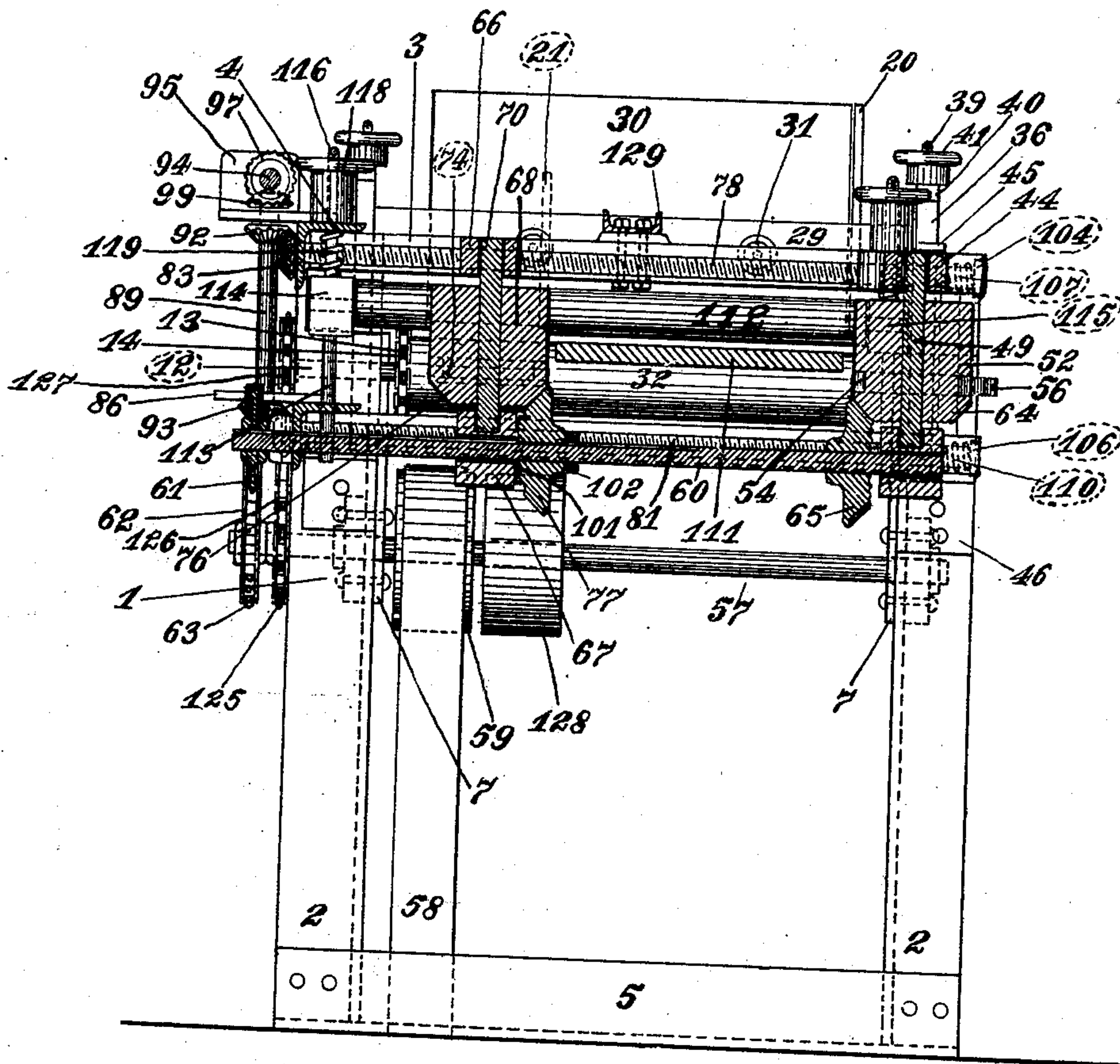
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK W. GREENE, OF SHREVEPORT, LOUISIANA.

WOODWORKING-MACHINE.

No. 840,315.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed June 13, 1906. Serial No. 321,435.

To all whom it may concern:

Be it known that I, FRANK W. GREENE, a citizen of the United States, residing at the city of Shreveport, in the parish of Caddo and State of Louisiana, have invented certain new and useful Improvements in Woodworking-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to apparatus used in woodworking, and particularly to that class of machines in which a plurality of separate boards or pieces of wood are assembled and compacted together into what is known as a
15 "shook," so as to form larger and wider surfaces than could be obtained by the use of a single board or where the use of wide boards would be uneconomical or otherwise undesirable. This machine can also be used for
20 the purpose of assembling and holding separate boards in piles or shooks, a shook consisting of a plurality of boards held together in any desired manner to undergo a single operation. A number of boards thus assembled
25 may be uniformly cut at a single operation by suitable cutters or subjected to some similar process in which it is desirable to work at one time on a pile of boards rather than to handle each piece separately.
30 Among the various manufacturing establishments in which this machine is especially adapted for use might be mentioned box-factories or similar places in which shooks are assembled, one kind of shook frequently
35 handled there consisting of a plurality of separate boards that are uniform in length, but varying in width and sufficient in number and of the proper dimensions to form a side, top, bottom, or end of a box; and another
40 common kind of box-shooks consisting of a plurality of boards arranged with the broad surfaces in engagement and with their edges alining, so that the whole pile may be cut, dovetailed, or subjected to some similar operation
45 at one time; planing-mills, where the individual boards out of which it is desired to form wainscoting or flooring are assembled, so that the flooring or wainscoting can be delivered in sections and the necessity thus
50 avoided of handling each individual board a great number of times in the course of its transportation to the building where it is to be used and while being placed in position therein; furniture factories, and, in fact, any
55 establishment in which it is desired to produce a wide work-surface and yet at the

same time make use of narrower and cheaper boards than could otherwise be utilized or in which a pile of boards can be subjected to some desired operation just as easily as a single board.

In the drawings forming part of this specification, and in which like numbers of reference denote like parts throughout the several views, Figure 1 is a side elevation. Fig. 2 is
65 a top plan view; and Fig. 3 is a section on the line 3 3, Figs. 1 and 2.

The main frame 1 of the machine, consisting of legs 2 (preferably formed of strong angle-irons) and cross-pieces 3 and 4, is held
70 rigidly attached to the floor of the building by angle-irons 5. A pair of arms 6, supported from legs 2 by brackets 7, forms the sides of the rear part or in-feed end of the machine and serves to support the cross-pieces
75 8, to which are secured a plurality of slats 9. Adjacent the outermost end of arms 6 is journaled a shaft 10, on which revolves a pair of sprocket-wheels 11. Keyed to a shaft 12, journaled in the legs 2 of the machine,
80 is a pair of sprocket-wheels 13, and sprocket-chains 14 pass over wheels 11 and 13, being actuated by the latter. A threaded rod 15 is formed with an eye 16 encircling shaft 10, and a threaded nut 17 is screwed on
85 rod 15, said nut bearing against the ends of sides 6, thus to adjust the tension of sprocket-chains 14. Attached to and cross-connecting said chains 14 is a plurality of forwarders
90 or feed-bars 18, which serve to feed the shooks forward to the rollers to be hereinafter described.

Fixed to one side of the machine by angle-iron brackets 19 is a guide-board 20, while on the opposite side is an adjustable
95 guide 21, supported by angle-irons 22, which slide in the openings between straps 23 and the sides 6. A cap 24, fastened to guide-board 21, fits over the head 25 of screw 26, so that as screw 26 is rotated through a threaded
100 bearing in strap 27 by means of wheel 28 guide-board 21 is shifted in either direction desired, and the distance between guide-boards 20 and 21 may thus be varied at will. A slotted bracket 29 supports the front stop-
105 board 30, said stop-board being clamped by bolts 31 to brackets 29, which bolts pass through the slots in said brackets, and thus the stop-board 30 can be readily raised or lowered and its distance above slats 9 regulated
110 accordingly.

Fixed to shaft 12 and revolving therewith

is a roller 32, and immediately thereabove is another roller 33, rotating on a shaft 34, which shaft is journaled in boxes 35. These boxes 35 slide vertically in the slotted guideway 36, 5 formed in the supporting-bracket 37, which is bolted at 38 to leg 2. A threaded rod 39 passes from journal-box 35 through an opening in cap 40, which closes the slotted guideway 36, and a nut 41, screwed on said rod 10 and bearing on said cap, is adapted to raise or lower said rod 39, and accordingly to adjust the position of journal-boxes 35, and with them that of roller 33, which is desirable when the thickness of the lumber being 15 passed through the machine is varied. A helical spring 42, encircling said rod 39, is interposed between journal-boxes 35 and caps 40, so that roller 32 can be raised against the compression of spring 42, as when, for 20 instance, an extra thick board is fed through.

A pair of angle-brackets 43, projecting from legs 2, supports a journal-block 44, which is held from upward movement by a plate 45, projecting from cross-piece 3. Said 25 journal-block is left free to move toward the outside of the machine (the left in Fig. 2 or right in Fig. 3) said movement being spring-controlled by means hereinafter to be described. A similar set of brackets 46 and 30 plates 47 supports a second journal-block 48, positioned vertically underneath block 44. Shafts 49, 50, and 51 are journaled in blocks 44 and 48, and keyed to shafts 49 and 50 are rollers 52 and 53. Immediately beneath 35 rollers 52 and 53 and keyed to their shafts are gear-wheels 54 and 55, both of the same diameter, and on shaft 51 is a gear-wheel 56, meshing with said gears 54 and 55, so that 40 the rotation of roller 52 causes roller 53 to revolve in the same direction and at the same rate of speed.

The main shaft 57 is journaled in the legs 2, and a belt 58, passing over a band-wheel 59, keyed to said shaft and driven by any suitable 45 source of power, (not shown,) communicates motion to said main shaft, which actuates all moving parts. A shaft 60, journaled at one end in journal-block 48 and at the other end in cross-piece 4, has a sprocket 61 50 keyed thereon, over which passes sprocket-chain 62, driven by a sprocket-wheel 63, keyed to main shaft 57. A beveled gear 64 is keyed to shaft 49 underneath gear-wheel 54, and keyed to shaft 60 is a beveled gear 55 65, which meshes with and drives gear 64. Thus by means of chain 62, shaft 60, and beveled gears 64 and 65 the rotation of the main shaft 57 causes rotation of roller 52 and by means of intermediate gear 56 of roller 60 53 also.

Supported in slideways in the cross-pieces 3 of the machine are sliding journal-blocks 66 and 67. Rollers 68 and 69, similar to rollers 52 and 53, are keyed to shafts 70 and 65 71, which are journaled in journal-blocks 66

and 67. An intermediate gear 72, keyed to a shaft 73, journaled in blocks 66 and 67, meshes with gears 74 and 75, and thus communicates the rotation of roller 68 to roller 69. On shaft 70 is a beveled gear 76, meshing 70 with and driven by a beveled gear 77, splined on shaft 60. So, it will be observed, the rotation of rollers 68 and 69 is caused by main shaft 57 in the same manner as is the rotation of rollers 52 and 53, but rollers 68 and 69 75 rotate in a direction opposite to that of the revolution of rollers 52 and 53.

Rods 78 and 79, screw-threaded throughout the greater portion of their length, are journaled at one end in journal-blocks 44 and 80 at the other in cross-piece 4, which rods pass through screw-threaded openings in journal-block 66. Similarly-threaded rods 80 and 81, journaled in journal-block 48 and cross-piece 4, pass through screw-threaded open- 85 ings in journal-block 67. On one end of rods 78, 79, 80, and 81, respectively, are keyed beveled gears 82, 83, 84, and 85. Brackets 86 and 87 support parallel shafts 88 and 89, on which are keyed beveled gears 90, 91, 92, 90 and 93, which respectively mesh with and drive gears 82, 83, 84, and 85. A shaft 94, journaled in brackets 95, has beveled gears 96 and 97 keyed thereon, which gears mesh with and drive beveled gears 98 and 99, keyed to 95 shafts 88 and 89. One end of shaft 94 is squared off at 100 for receiving a detachable crank, (not shown,) whereby said shaft is revolved, and thus the revolution of said shaft 94 is conveyed, by means of shafts 88 100 and 89 and the various beveled gears keyed thereon, to the screw-threaded rods 78, 79, 80, and 81, which are thus caused to rotate in unison. As rods 78, 79, 80, and 81 pass 105 through screw-threaded openings in the journal-blocks 66 and 67, it is obvious that the rotation of said rods will cause said blocks to travel in the slideways provided therefor in cross-pieces 3, and as said blocks travel back and forth rollers 68 and 69 travel 110 accordingly. Thus the distance between rollers 68 and 69 on one side of the machine and rollers 52 and 53 on the other side can be adjusted at will by the mere rotation of shaft 94, and the machine is thus adapted to 115 operate on shooks of different widths.

That part of shaft 60 engaged by gear 77 is squared or splined, so that said gear may have a sliding movement thereon. Shaft 60 passes through an opening in journal-block 120 67, and one side of the hub of gear 77 rests against a boss 101 on said block, while a bracket 102, attached to said block, engages the other side of the hub of said gear. Thus as blocks 66 and 67 are caused to travel by 125 the rotation of rods 78, 79, 80, and 81 gear 77 is caused to slide on shaft 60 in accordance with the movement of said block 67, being pushed in one direction by boss 101 and pulled in the other by bracket 102, so that 130

gear 77 is kept constantly in mesh with gear 76, the same operation that shifts the position of blocks 66 and 67 serving also to determine the position of gear 77. In case of heavy work or long runs on shooks of the same size gear 77 may be keyed to shaft 60 by a set-screw.

Rods 78, 79, 80, and 81 extend through and beyond journal-blocks 44 and 48, caps 103, 104, 105, and 106 being provided at the ends of said rods, and helical springs 107, 108, 109, and 110 are respectively interposed between said caps and journal-blocks 44 and 48. As hereinabove set forth, said journal-blocks are permitted to slide to the left in Fig. 2, and this they must do against the pressure of said springs 107, 108, 109, and 110. This construction accordingly allows rollers 52 and 53 to have a slight horizontal play, which has been found desirable, as it permits the machine to accommodate itself to the slight inequalities and variations in the width of the shooks passing through. When, however, it is desired to make a marked change, as when shooks of entirely different sizes are to be operated upon, the distance between the two sets of rollers 52 and 53 on one side of the machine and 68 and 69 on the other may be adjusted as desired by rotating shaft 94.

In the space between the two sets of rollers is a table 111, which is placed on a level with slats 9. A roller 112 extends transversely across the machine midway between rollers 52 and 53 and 68 and 69 and just above table 111. The purpose of said roller is to prevent the shooks that have been pressed together by rollers 53 and 69 from buckling up; but by means of roller 112 the shooks are held flat, so that they may be properly acted on by rollers 52 and 68. Upright rods 113 support journal-boxes 114, in which the shaft 115 of roller 112 is journaled. Screw-threaded rods 116, attached to journal-boxes 114, pass through openings in bracket 86 on one side of the machine and journal-block 44 on the opposite side. Nuts 118, screwed onto these rods and bearing on bracket 86 and journal-block 44, can be turned thereby to adjust the height of said roller 112 above table 111, while compression-springs 119 encircle rods 116 and bear against journal-boxes 114 and bracket 86 and journal-block 44, thus allowing roller 112 to be raised against the compression of said springs, and thus adjust itself to slight variations in the thickness of the lumber. When the thickness is materially altered, the roll can be raised by turning nuts 118.

Brackets 120, projecting from legs 2, support a table or frame 121, composed of sides or arms 122, cross-bars 123, and slats 124, onto which the finished work falls as it leaves rollers 52 and 68 and from which table it can be removed as fast as may be desired.

On the main shaft 57 is a sprocket-wheel

125, and a sprocket-chain 126, driven thereby, passes over a sprocket-wheel 127, keyed to shaft 12, thereby causing the rotation of said shaft, and in consequence the travel of sprocket-chains 14. When it is desired to stop the machine, belt 58 is shifted to an idler 128, loosely mounted on shaft 57. An I-beam 129 serves to connect top cross-pieces 3, and thus brace the machine.

The operation of the machine is as follows: All parts move in the direction indicated by arrows. Power is applied to the main shaft 57 and rotation is communicated to shafts 12 and 60, and thus sprocket-chain 14 caused to travel and rollers 52, 53, 68, and 69 made to revolve. It is intended to use the machine on some occasions in series with a matching-machine and a machine for applying liquid glue to the tongue and groove of the boards as they leave the matcher. The boards thus prepared will then fall upon the slats 9 and will be forwarded therealong by the cross-bars 18, attached to sprocket-chains 14. The guide-boards 20 and 21 are suitably adjusted to guide the pieces as they pass along slats 9, and stop-board 30 is fixed at the proper height to allow only one shook at a time to pass forward into the bite of the rollers. The boards being thus fed along come into the bite of rollers 32 and 33, which positively feed them forward into the bite of rollers 53 and 69. These rollers, being set at right angles to the path of travel of the boards, compress the shooks together, compact the joints until they are hardly noticeable, and also forward the shook, so that it comes within the bite of rollers 52 and 68, which again press the boards together and then deliver the completed shook on the delivery-table 121.

In lieu of feeding the machine from a matching-machine the guide-boards 20 and 21, together with the stop-board 30, may constitute a hopper into which the shooks may be placed, and then, as the stop-board 30 can be so adjusted that only one shook can pass out at a time, the sprocket-chains 14 and feed-bars 18 will select the bottom shook each time, and after that one has been forwarded to rollers 32 and 33 those above will drop down and the bottom shooks removed, one by one, and so on till the contents of the hopper are exhausted.

The slight variations and inequalities in the width of the shooks will not affect the successful operation of the machine, because the rollers on one side will yield sufficiently against the pressure of the springs 107, 108, 109, and 110 to take care of any such minor irregularities, and where it is desired to use the machine for shooks varying considerably in width rollers 68 and 69 can be quickly and easily shifted in either direction desired by rotation of shaft 94.

The foregoing description has had particular reference to shooks of a single hori-

zontal layer, the individual boards of which are in engagement along their edges; but a slight adjustment of parts enables the machine to be used in handling other varieties of shooks. When, for instance, it is desired to use the machine to assemble a plurality of boards in a pile, so that a number of boards can receive uniform treatment at any one operation, the stop-board 30 is raised sufficiently to allow the desired number of boards to pass through, and rollers 33 and 112 are raised by means of the nuts provided for that purpose. The vertical rollers 52, 53, 68, and 69 then serve to compress together the individual boards of the pile. If the boards are to be fed through on edge, so that their broad surfaces are in engagement, the operation and adjustment would be the same.

Having thus described my said invention, what I claim, and desire to secure by Letters Patent, is—

1. A machine for assembling boards or strips in a common plane to constitute a shook, comprising means for forwarding the boards and presenting the edge of each board to the edge of the one adjacent, and rotary means for pressing the individual boards together.

2. A machine for assembling boards or strips in a common plane to constitute a shook, comprising means for forwarding the boards and presenting the edge of each board to the edge of the one adjacent, and rotary means for pressing the individual boards together, said first-mentioned means operating approximately at right angles to said last-mentioned means.

3. A machine for assembling boards or strips in a common plane to constitute a shook, comprising means for forwarding the boards and presenting the edge of each board to the edge of the one adjacent, and rotary means for pressing the individual boards together, said first-mentioned and said last-mentioned means being driven from the same main shaft.

4. A machine for assembling boards or strips in a common plane to constitute a shook, comprising means for forwarding the boards and presenting the edge of each board to the edge of the one adjacent, and rotary means for pressing the individual boards together, said first-mentioned and said last-mentioned means being driven from the same primary but different secondary sources of power.

5. A machine for assembling boards or strips in a common plane to constitute a shook, comprising sprocket means and horizontal rollers for forwarding the shooks, a table upon which the edge of each board is presented to the edge of the one adjacent, and oppositely-disposed vertical rollers for pressing the individual boards together.

6. A machine for assembling boards or strips in a common plane to constitute a shook, comprising means for forwarding the boards and presenting the edge of each board to the edge of the one adjacent, vertical rollers on each side of the machine to press the individual boards together, means for adjusting said vertical rollers, and means for causing the rotation of said rollers.

7. In a machine for assembling boards or strips in a common plane to constitute a shook, the combination of means for presenting the edge of each board to the edge of the one adjacent, oppositely-disposed pairs of vertical rollers, pairs of upper and lower journal-blocks in which said rollers are mounted, and springs against the pressure of which one pair of said blocks and the rollers mounted therein may travel.

8. In a machine for assembling boards or strips in a common plane to constitute a shook, the combination of means for presenting the edge of each board to the edge of the one adjacent, oppositely-disposed pairs of vertical rollers, pairs of upper and lower journal-blocks in which said rollers are mounted, means for rotating one of each of said pairs of rollers, and means intermediate the rollers of each pair whereby rotation of the first of said rollers causes rotation of the other roller of the same pair, both rollers rotating in the same direction.

9. In combination with a hopper for holding the shooks, means for removing one shook at a time therefrom, rollers adapted to forward said shook, and other rollers adapted to press together the individual pieces of said shook.

10. In combination with sprocket-chains for forwarding the shooks, a pair of rollers into the bite of which the shooks are fed, and other rollers the axes of which are at right angles to the axes of said first-mentioned rollers, said second-mentioned rollers being adapted to press together the individual pieces composing the shooks.

11. In combination with a table on which the shooks are forwarded, rollers at right angles to the plane of said table adapted to press together the individual pieces composing the shooks, and a spring-controlled roller parallel to the plane of said table adapted to keep the shooks flat upon said table.

12. In combination with a hopper composed of a fixed side, a horizontally-sliding side, and a vertically-adjustable front, means for removing one shook at a time from the hopper, forwarding-rollers into the bite of which the shooks come, and other rollers adapted to press together the individual pieces of the shooks.

13. In a machine of the character described, the combination of oppositely-disposed pairs of vertical rollers, pairs of upper and lower journal-blocks in which said rollers

are mounted, means for rotating one of each of said pairs of rollers, and means mounted upon the pair of journal-blocks whereby the rotation of the first of each pair of rollers
5 causes rotation of the other roller in the same pair, both rollers rotating in the same direction.

14. In a machine of the character described, the combination of sprocket means
10 and horizontal rollers for forwarding the shocks, vertical rolls for compacting the

same, a main shaft, a secondary shaft driven thereby for actuating said sprocket means and horizontal rollers, and another secondary shaft driven by said main shaft for actuating said vertical rollers. 15

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

FRANK W. GREENE.

Witnesses:

J. E. THOMAS,

T. S. LEE.