2 Sheets—Sheet 1.

W. E. BROCK.

MACHINES FOR MANUFACTURING COMPOUND LUMBER.

No. 192,673. Patented July 3, 1877.

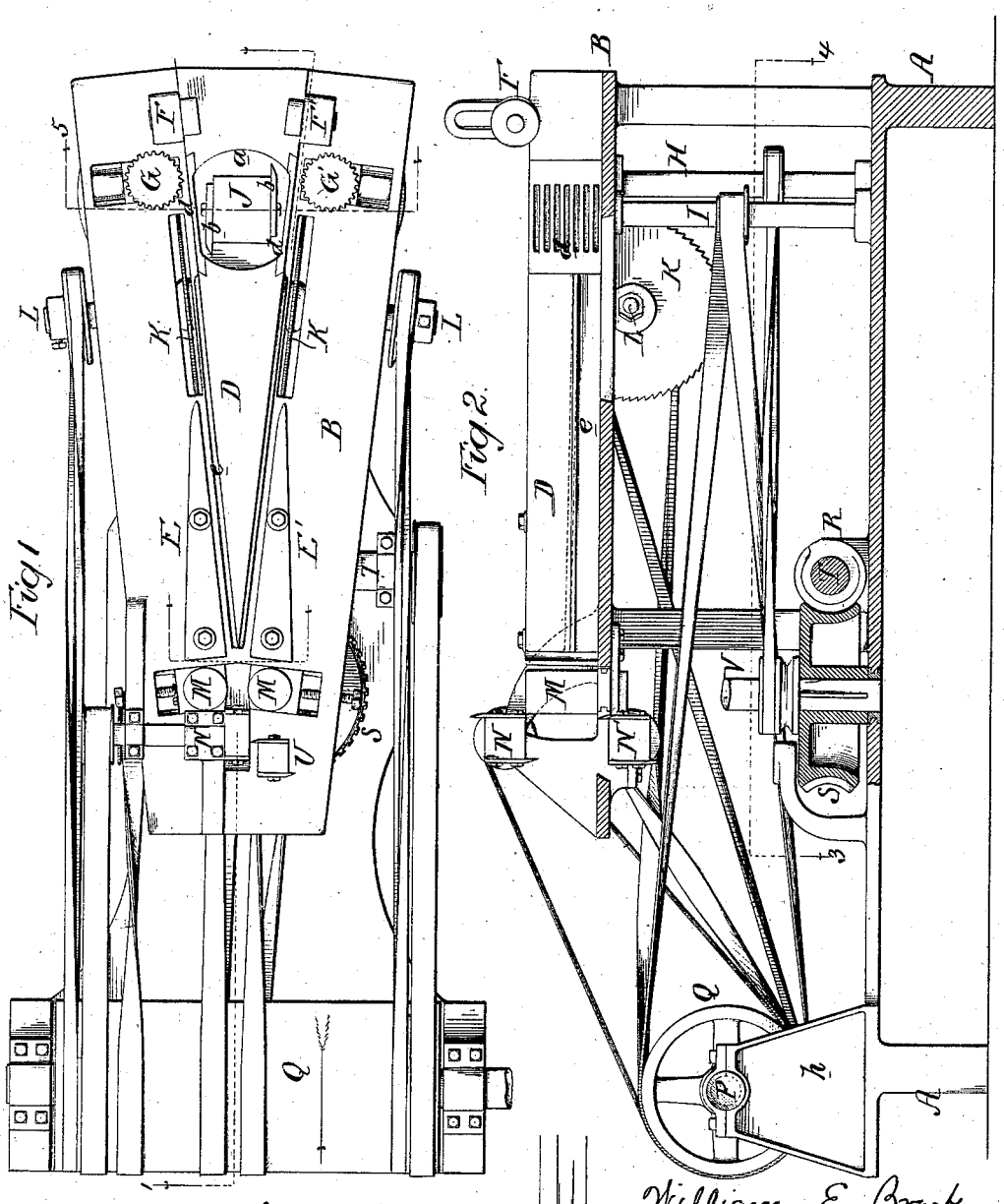


Fig 1

Fig 2.

Witnesses

John K. Rupertus.

Harry Smith

William E. Brock
by his Attorneys
Howson and Howson

2 Sheets—Sheet 2.

W. E. BROCK.

MACHINES FOR MANUFACTURING COMPOUND LUMBER.

No. 192,673. Patented July 3, 1877.

Fig. 3.

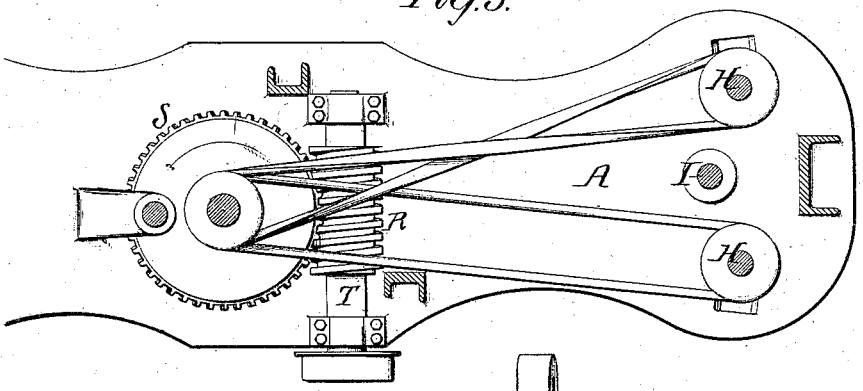


Fig 4

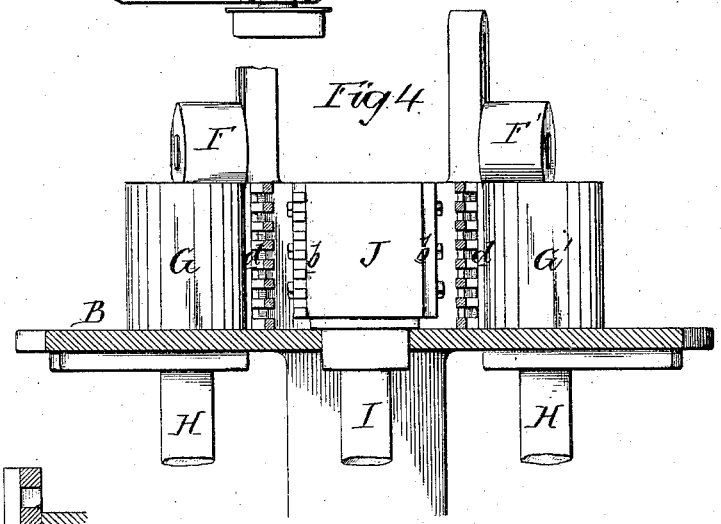


Fig 5

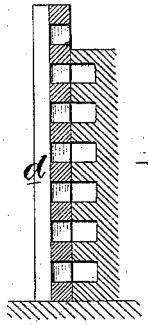


Fig 6

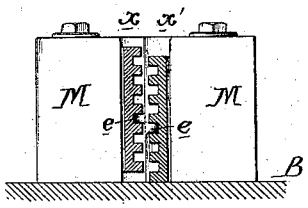
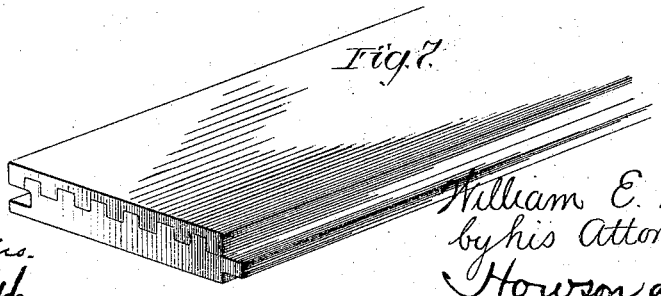


Fig 7.



Witnesses
John K Ruppertus.
Harry Smith

William E. Brock
by his Attorneys
Howson and Sons

UNITED STATES PATENT OFFICE.

WILLIAM E. BROCK, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR MANUFACTURING COMPOUND LUMBER.

Specification forming part of Letters Patent No. **192,673**, dated July 3, 1877; application filed March 7, 1877.

To all whom it may concern:

Be it known that I, WILLIAM E. BROCK, of New York city, New York, have invented certain Improvements in Machines for Manufacturing Compound Lumber, of which the following is a specification:

My invention relates to machinery for manufacturing compound lumber, consisting of boards, the faces of which are longitudinally grooved, so that on forcing the two boards together the ribs of one will enter the grooves of the other, thereby effecting a perfect junction of the two boards, one of which may be of walnut or other comparatively expensive and ornamental wood, the other board being a backing of pine or other cheap wood.

The object of my invention is to rapidly manufacture these compound boards ready for use as flooring, wainscoting, and other purposes.

In the accompanying drawing, Figure 1, Sheet 1, is a plan view of my machine for manufacturing compound lumber; Fig. 2, Sheet 1, a vertical section on the line 1 2; Fig. 3, Sheet 2, a sectional plan on the line 3 4, Fig. 2; Fig. 4, a vertical section drawn to an enlarged scale on the line 5 6, Fig. 1; Fig. 5, an enlarged sectional view of part of the machine; Fig. 6, a view showing the manner of uniting the boards, and Fig. 7 a perspective view of one of the compound boards.

A is the base of the machine, above which a table, B, is supported by suitable posts.

A wedge-shaped block, D, is secured to the top of the table, as are also two blocks, E and E′, these blocks serving as guides for the two boards which have to be united, one board passing through the inclined space between the two guiding-blocks D and E, and the other through the space between the blocks D and E′, so that the boards, which are wide apart from each other at the front end of the machine, converge as they approach the rear, and are united in the manner described hereinafter.

On one side of the block D is a vertically-adjustable pressure-roller, F, for bearing on the edge of one of the boards, and on the opposite side is a similar roller, F′, for bearing on the edge of the other board.

On vertical shafts H, which have their bearings on the base and table, are vertical pressure and feed rollers G and G′, one on each side of the guide-block D, so as to keep the boards in close contact with the same and feed the boards in their proper course.

To a vertical shaft, I, which has its bearings in the base and table of the frame, is secured a rotary cutter, J, contained within a recess, *a*, in the guide-block D′, this cutter being furnished with two knives, *b b*, the edge of each of which has a number of recesses at equal distances apart, so as to separate the edge into a series of independent cutters which make in the face of the board a series of longitudinal parallel grooves, as seen in Figs. 5, 6, and 7.

A grating, *d*, is let into each side of the guide-block D, the board being pressed against the grate by the adjoining feed-roller, and the bars being far enough apart to permit the cutters of each knife to project between them and act on the face of the board. This is an important feature of my invention, as the grates afford such solid bearings for the boards that the longitudinal grooves will be made with a clean cut.

On each side of the guide-block D is a circular saw, K, each saw being secured to an inclined spindle, L, which has its bearings on the under side of the table B, the object of these saws being to sever a strip of the desired thickness from the board, for it must be understood that the latter is generally thicker than the desired strip. After passing the saw the strip passes through the space between the blocks D and E or E′, while the remainder of the board passes to the outside of the latter blocks, and is again passed through the machine until too thin for use.

M M are two vertical pressure-rollers, the space between which is directly opposite the point where the two converging guiding-spaces between the blocks D and E E′ meet. As the two boards *x* and *x′*, each of which has been grooved on one side, approach the pressure-rollers M M, their relative vertical positions are so altered that the ribs between the grooves of one are opposite to the grooves of the other, (see Fig. 6,) and on passing between the rollers the two boards are pressed together, and the ribs of one forced into the grooves

of the other, thereby effecting a perfect junction of the two boards.

The means which I prefer for effecting the alteration in the relative vertical positions of the two boards are shown in Figs. 1, 2, and 6, and consist of two ribs, *e e*, extending from a point adjacent to the cutter J to the point of the block D.

At the rear end—that is, at the end adjacent to the cutter J—the ribs *e* are in line with each other and with one of the cutting-knives of the cutter J; but one or both of the ribs are inclined longitudinally, so that at the point of the block D the bottom of one rib is in line with the top of the other. (See Figs. 2 and 6.)

The alteration in the vertical position of the two boards as they approach the pressure-rollers M M may, however, be made by an inclined bearing for the edge of one of the boards; or, if desired, there may be two rotary cutters, J, one for each board, their knives being relatively so arranged that the ribs of one board will be directly opposite the grooves of the other from the first, in which case the strips *e* may be straight, as there will be no necessity for any vertical alteration of the relative position of the boards as they approach the pressure-rollers M M.

As the compound board passes from between these rollers the upper edge is subjected to the action of the upper rotary cutter N, and the lower edge to that of the lower cutter N′, the cutters being such that a tongue will be formed on one edge of the compound board, and a groove on the other, as shown in Fig. 7; but when compound boards for purposes other than flooring, wainscoting, and equivalent uses are required, plain cutters may be substituted for the cutters N N′, or these cutters may be dispensed with.

The several moving parts of the machine are driven in the following manner:

The driving-shaft P has its bearings on suitable standards *h h*, secured to the base of the machine, and on this shaft is a drum, Q, from which a counter-shaft, T, is driven, this shaft having a worm, R, gearing into a worm-wheel, S, on a vertical shaft, V, from a double pulley on which the shafts H H of the two feed and pressure rollers G G′ are driven by suitable belts.

The inclined shafts L of the circular saws are driven directly by V-shaped belts from the drum Q, as are also the shafts of the rotary cutters.

Another rotary cutter, U, is secured to a vertical shaft driven from the drum Q, this cutter being such that its knives will impart a finished face to one side of the compound board as it passes from between the pressure-rollers M M. One of these rollers is secured to the upper end of the shaft V, and serves to draw the compound board forward after it has passed from the control of the feed and pressure rollers G G′.

It will be observed in Figs. 1 and 2 that the bearings of both rollers M M and of the worm S are rendered adjustable laterally, to suit boards of varying thickness.

It will be seen that all the moving parts of the machine are driven from the drum Q; that the saws and cutters can be driven at the proper rapid speed by direct belts, and that the desired slow rotation of the feed-rollers is attained from the same drum through the intervention of the worm and worm-wheel.

I claim as my invention—

1. The combination, in a machine for making compound lumber, of a rotary cutter for grooving two boards, pressure-rollers for forcing the grooved boards together, and converging guides for directing the boards from the cutters to the rollers, all substantially as set forth.

2. The combination of a rotary cutter having a series of grooving-knives, a grate through which the grooving-knives project, and a pressure-roller for causing a board to bear against the grate, all substantially as described.

3. The combination of the rotary cutter J, the converging guides, pressure and feed rollers G G′, and pressure-rollers F F′.

4. The combination of tonguing and grooving mechanism, substantially as described, with the inclined block D and the blocks E and E′, forming a converging guide, as set forth.

5. The combination of tonguing and grooving mechanism, substantially as set forth, with the inclined guiding-block D, and the circular saws K on opposite sides of said block.

6. The combination of the block D and its inclined ribs *e* with the cutter or cutters J.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. BROCK.

Witnesses:

HENRY HOWSON, Jr.,

HARRY SMITH.