2 Sheets—Sheet 1.

J. C. BROWN.

LATHE FOR TURNING WOOD.

No. 105,166. Patented July 12, 1870.

Fig. 1

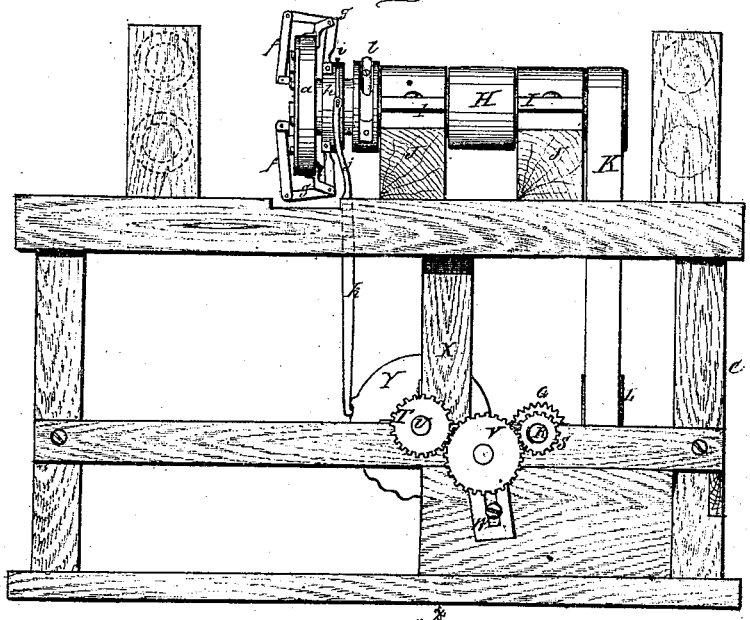


Fig. 2

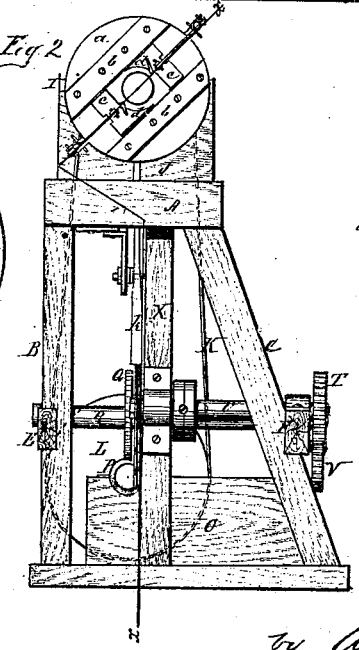


Fig. 3

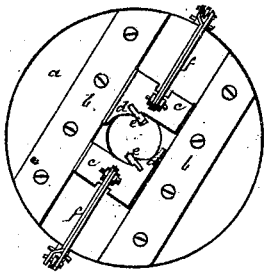
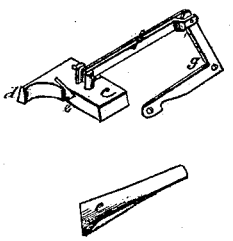


Fig. 4



Witnesses.

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2 Sheets—Sheet 2.

J. C. BROWN.

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Fig. 5.

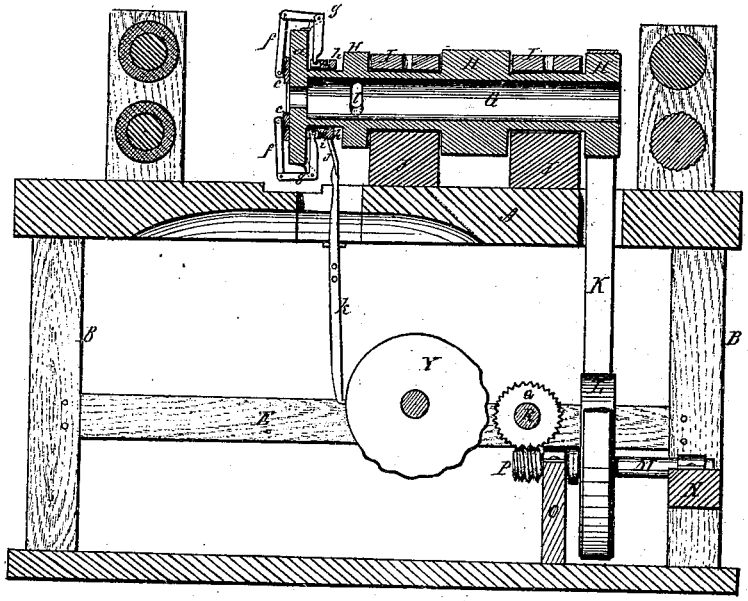
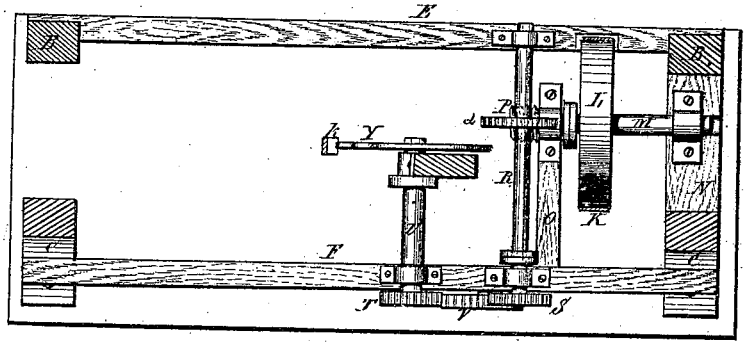


Fig. 6



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JOHN C. BROWN, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 105,166, *dated July* 12, 1870.

IMPROVEMENT IN LATHES FOR TURNING WOOD.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, JOHN C. BROWN, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Machines for Turning Chair-Stuff; and I do hereby declare the following to be a full and correct description of the same, sufficient to enable others skilled in the art and manufacture to which my invention appertains to fully understand and use the same, reference being had to the accompanying drawing which makes part of this specification, and in which—

Figure 1, sheet 1, is a side elevation of my improved machine;

Figure 2, sheet 1, is an end view of the same;

Figure 3, sheet 1, is an enlarged elevation of the cutting disk with the sliding knives;

Figure 4, sheet 1, are detached views of the cutters or planers;

Figure 5, sheet 2, is a longitudinal vertical section in line *x x*, fig. 2; and

Figure 6, sheet 2, is a plan view of the motion transmitting parts of my machine, the table and parts above the same being removed.

Like letters of reference indicate like parts in the several figures.

My invention belongs to that class of machines which turn out the rounds and cross-pieces of chairs, commonly called chair-stuff, which rounds, &c., are formed with beads of different shapes, and whose parts are not equal in thickness throughout their length, but vary according to the pattern given, after which they are cut out. This is accomplished by knives, which slide in ways on the face of a revolving cutter-disk, and which, by sliding inwardly or outwardly while the wood passes horizontally between them, form the beads and irregular shapes, the knives being operated by means of a combination of levers, from a pattern-wheel, which has on its rim a number of raised parts and bosses, answering to the beads and irregular forms to be produced on the chair-stuff, and which acts on a clutch-lever, which clutches the sleeve loosely, on which the ends of the compound levers are secured, which operate the sliding knives so as to slide inwardly or recede outwardly. In this manner any variety of shapes can be produced in chair-stuff, by having a pattern-wheel for each variety of shape desired to produce, and, as this pattern-wheel is so arranged at the end of its shaft that it can be easily removed and another substituted for it on the shaft, a change of pattern is effected in a few minutes. It may even be done while the machine is in motion; and

The nature of my invention consists in the arrangement of the pattern-wheel, levers, collars, cutter-blocks, and disk, as hereinafter described and claimed.

A in the drawing represents the table of the machine, resting on supports B B C C, the latter of which extend down, and outwardly inclined, to gain room for the shafts of the moving wheels.

At a suitable distance below the table, parallel with it and each other, are beams E F, respectively connecting the supports B B and C C to each other.

A hollow cylinder, G, having shoulders H turned on its outside, revolves in suitable bearings I on blocks J, which latter are firmly secured on table A, and thus elevate the cylinder G a sufficient distance above the table to allow it to revolve with its working parts clear of the same.

The rear shoulder H is connected by a belt, K, to a large belt-wheel, L, on a short shaft, M, which has its bearings on a cross-piece, N, connecting the rear supports B C, and a standard-piece, O, secured in suitable manner to the frame.

To the shaft M the motion is imparted from a steam or other suitable power.

On the shaft M, just outside the bearing on piece O, is formed a worm-wheel, P, meshing into the teeth of gear-wheel Q, on shaft R, which latter extends at right angles to shaft M, from beam E to beam F, on which it has suitable bearings.

At the outside of its bearing on beam F the shaft R carries a cog-wheel, S, transmitting motion to a cog-wheel, T, on a shaft, U, by means of an intermediate larger gear-wheel, V. This gear-wheel V moves on a short pivot or shaft, on a sliding-frame, W, from which it can be readily detached, and a larger or smaller wheel substituted for it, to accelerate or diminish the speed of cog-wheel T, the sliding frame W accommodating any sized intermediate wheel (the diameter of which is not less than the distance between the cog-wheels) to the cog-wheels S T.

The shaft U has its bearings on beam F, and on a standard, X, extending from the table to the floor, and thus forming an additional support for table A.

On the outside of standard X shaft U carries a pattern-wheel, Y, so arranged on the shaft as to be easily removed and exchanged for another one.

The cylinder G, at its forward end, is provided with a disk, *a*, being of a considerably larger diameter than the cylinder, but concentric with the same.

On the face of this disk *a* are two ways, *b b*, between which slide blocks *c*, the edges of which, as well as the contiguous ones of the ways, are beveled in such a manner that the blocks are held by the edges of the ways without being in the slightest degree obstructed in their free sliding to and fro.

The ways *b* are, of course, situated at equal distances from the center of the disk *a*.

The blocks *c* slide over an opening in the center of disk *a*, which opening communicates with the hollow

of cylinder G, and is concentric with but smaller than the same.

The blocks *c* are shaped peculiarly, as shown in fig. 4, having an inwardly-curved, but on the outside straight, projection, *d*, at one end, at the commencement of the inner curve of which is a slot, in which a knife, *e*, shown distinctly and separately in fig. 4, is secured. This knife is bent as shown, with a slight curve at the bend.

On each block *c* is a short standard, to which is pivoted a lever, *f*, the other end of which is pivoted to one arm of a bell-crank lever, *g*, having its pivot on a short standard extending diagonally from and attached to the rear of disk *a*.

The other arm of the lever *g* is pivoted to a short standard on a sleeve, *h*, which freely slides on that portion of cylinder G between disk *a* and the first shoulder H on the cylinder.

In the circumference of sleeve *h*, in rear of the standards to which levers *g* are attached, is formed a groove, in which plays loosely a ring, *i*, having at opposite sides little pivots or trunnions, which fit into eyes in the ends of the forked part *j* of lever *k*, which latter is pivoted to a hanger secured on the underside of table A, and, with the rearward projection at its lower end, comes in close contact with the pattern-wheel Y, which latter operates the lever *k*, and through it and the intermediate levers the knife-blocks *c*, on the face of disk *a*.

The band or ring *i* moves loosely in its groove in sleeve *h*, but still sufficiently fills the space of the groove to operate the sleeve *h* forward and backward on cylinder G, in obedience to the slightest movement of lever *k*, and it is open on top, so as to readily yield to any expansion or contraction of the sleeve *h*.

The first or foremost shoulder H is, from opposite sides, toward the center, so planed or otherwise cut out as to leave virtually two disks, with two blocks at opposite sides to connect them.

To the corresponding faces of these blocks, at opposite sides, are secured planing knives *l*, which project into the hollow cylinder G a sufficient distance to cut the square timber round, and of the size of the largest bead to be produced, the opening in the disk *a* being, of course, of sufficient size to allow the thus rounded timber to freely pass through it to be further operated upon by the knives *e*.

The pattern-wheel Y has on its rim the exact pattern of the beads cut on the stuff, and of all the irregularities and deviations from a straight line, by means of raised parts on the rim. Thus, when one of the raised parts or bosses begins to press against the projection at the lower end of lever *k*, the forked part of the latter forces the sleeve *h* rearward, carrying with it the one arm of bell-crank lever *g* attached to it, while the other arm of the same depresses the knife-block *c*, through lever *f*, bringing the knives nearer the center, and lessening the space between them.

In this manner the knives are made to cut deeper into the timber which is slowly passing through between them.

As the center of the boss on the rim of wheel Y has passed the projection on lever *k*, the latter follows the receding curve of the boss, as the centrifugal force of the rapidly revolving knives and the resistance of the wood to the knives operate on the several levers in an equal manner, as the boss on wheel Y, and thus the sleeve *h* moves outwardly again, operated by the blocks *c* through levers *f g*. Thus, any irregularity, even the slightest, and deviation from the straight line of circumference on the rim of the wheel Y, is immediately and completely reproduced on the timber or stuff being cut, with this difference, that whatever is a boss or elevation on the pattern-wheel will be a similar depression on the stuff operated upon, and *vice versa*.

The operation of the machine is as follows:

Motion being imparted to the shaft M, a rapid revolving motion is imparted to cylinder G through belt K, while a very much slower revolving motion is transmitted to the pattern-wheel Y through worm P and gear-wheels Q, T, V, and S.

The speed of revolution of the pattern-wheel Y, its complete revolution, in fact, must be in exact proportion to that of the cylinder G, for, as there is always only one pattern on the wheel Y, its complete revolution must be accomplished exactly at the moment the last necessary cut has finished one round or other piece of chair-stuff, so as to begin its new revolution when the cutting of another piece of chair-stuff is begun.

As pieces of greater or lesser length are to be cut, the pattern-wheel must revolve slower or faster, for each pattern must cover the entire circumference of the pattern-wheel, and for stuff the pattern has to be spread considerably to reach around the entire circumference of wheel Y, and the latter has to move considerably faster than if a larger pattern was formed on wheel Y, in order to finish its complete revolution not later than at the moment when one length of chair-stuff has been finished.

This difference in motion is regulated by the intermediate cog-wheel V, which can be changed for either a larger or a smaller one, so as to increase or decrease the rapidity of motion of pattern-wheel Y, according to the length of the chair-stuff to be cut.

The square timber is fed between rollers, which I have shown in the drawing, to facilitate in understanding the operation, but which are perfectly common and well known, and which I do not in any manner claim.

The timber is advanced into and in the cylinder G, which is rapidly revolving, when as it comes within reach of the planers *l*, it is operated upon by the same, rounding it off to a size that it will easily pass through the central opening of disk *a*, through which it passes to be operated upon by the sliding knives, which approach and recede in exact imitation of the irregularities on the pattern-wheel, and, as the motion of the several levers and the sleeve is a very short one for each, no great force is required to operate the knives, the motion and cutting of which latter must consequently be perfectly true and easy.

In this manner chair-stuff of any length and pattern can be automatically produced at one-half the cost and one-half the labor and time than it can now be done by any known method.

I am well aware of the patents granted to Frank Douglas, October 12, 1869, and to G. W. Walton and H. Edgarton, July 7, 1857, as well as of the rejected application of John P. Sherwood, of 1857; and these devices I do not claim; but

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

The arrangement of the pattern-wheel Y, lever *k*, collar *h*, bell-crank levers *g g*, links *f f*, cutter-blocks *c c*, and disk *a*, when constructed and operating in the manner and for the purpose specified.

J. C. BROWN.

Witnesses:
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R. H. BALL.