2 Sheets—Sheet 1.

R. M. WILLIAMSON.

Machine for Making Wooden Boxes.

No. 204,870. **Patented June 11, 1878.**

Fig. 1

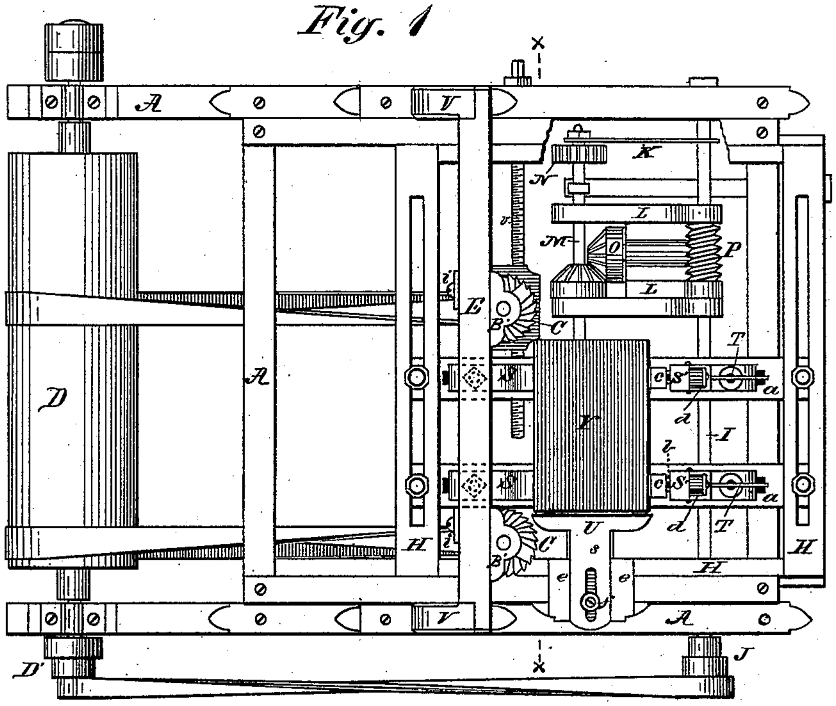

Fig. 2

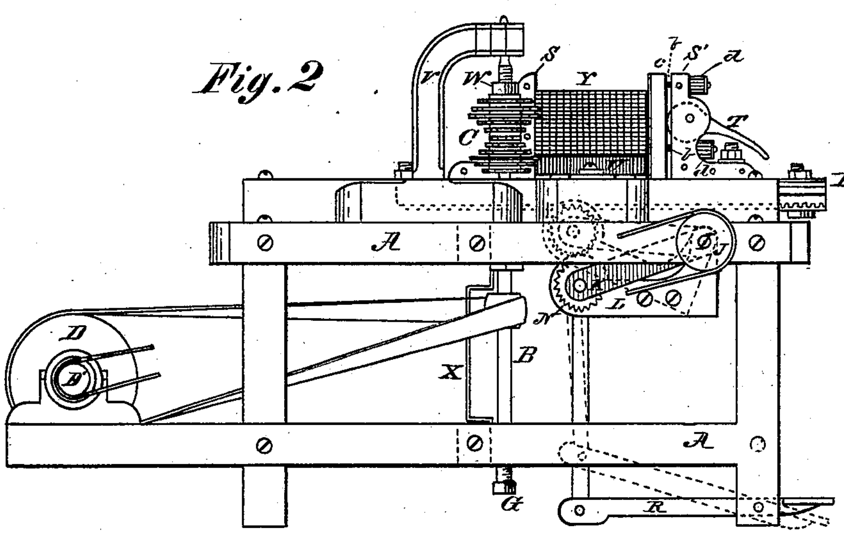

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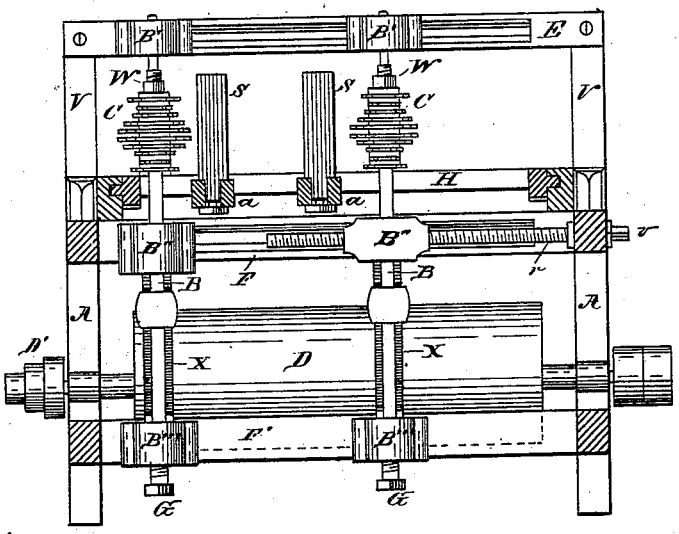
Fig. 3



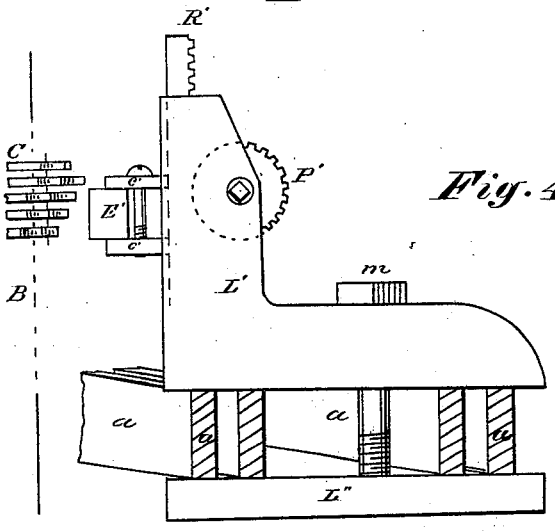


Fig. 4

Fig. 5

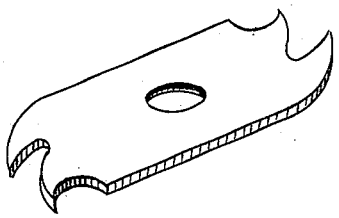
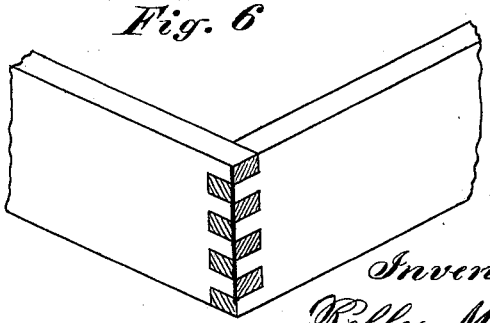


Fig. 6



Witnesses,
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J. Julius Thomas.

Inventor.
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UNITED STATES PATENT OFFICE.

RELLY M. WILLIAMSON, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY STEVENS, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING WOODEN BOXES.

Specification forming part of Letters Patent No. **204,870**, dated June 11, 1878; application filed April 1, 1878.

To all whom it may concern:

Be it known that I, RELLY M. WILLIAMSON, of Chicago, Illinois, have invented certain new and useful Improvements in Box-Machines, of which the following is a full, clear, and accurate description, reference being made to the accompanying drawings, which form a part thereof.

My invention relates to the construction of the cutters in such a machine, to their vertical and adjustable arrangement relative to other parts, to the construction and operation of the feed-table, and to other features hereinafter more fully specified and explained.

Figure 1 is a plan view of the machine, having a portion broken out to show parts otherwise hid. Fig. 2 is an elevation. Fig. 3 is a vertical transverse section through the line *x x*, Fig. 1. Fig. 4 is an elevation of an attachment used in sharpening the cutters. Fig. 5 is a perspective view of a single knife of the cutters, and Fig. 6 is an illustration of the box-corner made by the use of the machine described.

A is a rigid frame, from the upper side rails of which rise the standards V V, curved as shown in Fig. 2, and intended to support the cross-rail E. Directly beneath E is a corresponding cross-rail, F, connecting the opposite top rails of the frame A, and beneath this still a third cross-rail, F′, connecting the lower side rails of the main frame. B′ and B″ are sliding boxes, adapted to be clamped to the cross-rails upon which they are respectively connected, and giving bearing to the arbors or shafts B B, which carry the cutters C C. B‴ B‴ are similar sliding journal-boxes of the same shafts, resting against, but not necessarily clamped to, the cross-rail F, and suspended by the yoke X, Fig. 2, from B″. G G are set-screws, which serve to adjustably support the cutter-shaft.

Both cutter-shafts are movable upon the cross-rails, if desired; but, as it is rarely necessary to move more than one, but one is provided with the adjusting-screw *v*. They are rotated in opposite directions by belts leading from the long horizontal drum D, located at the rear of the machine.

H H is a horizontal frame, fitted to slide backward and forward on suitable ways attached to frame A. The front and rear cross-rails of this frame sustain the longitudinal bars *a a*, which constitute the immediate support of the box-stuff Y to be cut. These supporting-bars are clamped to the cross-rails mentioned in such manner that they may be readily set at any required distance apart, the intention being at all times to set them in close proximity to the several cutters, in order to give broad base and consequent steadiness to the pile of stuff placed thereon to be cut, that the cutters may do smooth and accurate work.

S S and S′ S′ are uprights or brackets arranged on the bars *a a*, and designed to form a clamp to firmly hold the stuff while it is passing through the cutters. Both are adjustable on the bars, and can be set at any desired point or in any desired relation. Thus, if a square box is wanted, S S are set with their faces in the same plane, which plane is perpendicular to the line of movement of the sliding frames or feed-table of which they form part. If it is desired to make a box of more than four sides, one of the brackets S S is set back of the other, so that the plane of their faces will form with the line of movement before mentioned (or the edge of the feed-frame) the angle required in the box proposed.

The brackets S′ S′ are provided with the loose face-blocks *c c*, connected with the brackets by the rods *b b*, passing loosely through them, and provided with the springs *d d*, operating to hold them back against the faces of S′ S′. Pivoted in the brackets are the cam-levers T T, having their eccentric perimeters in bearing upon the backs of the face-blocks *c*, so that by bringing down the arm of the lever the said face-blocks are pressed inward with considerable power, and when the arm is raised they return by the action of springs *d* to their original places.

In operating the machine, the rear brackets are set when required, and the front ones, S′ S′, are set at such distance from the former as will allow any given or convenient number (as 10) of box-sides to be freely set up on edge between them. By means of the cam-levers they are then quickly clamped, ready to pass the cutters, and after being cut are as quickly released. When other than right-angled boxes are made but one end can be cut at a time,

and the other cutter is therefore moved off out of reach of the stuff.

U is a gage, secured by its shank *s* to the frame A. It slides inward or outward between the guides *e e*, and is clamped in any desired position by the screw *f* working in a slot in the shank. Its bearing-face is arranged parallel with the edge of the frame, and it is varied to regulate or determine the depth of the grooves to be made by the adjacent cutters, which depth is obviously the thickness, or a little more than the thickness, of the stuff being used. The same depth of cut will be obtained at the opposite end by moving the cutting-shaft. I is a transverse shaft, journaled in the main frame, and driven through the pulley J by the cone-pulley D′ and connecting-belt. Loosely swung upon the shaft I is the mechanism, composed of the arms K and L and the shaft M, with the connecting bevel-gear wheel *o* and its shaft, with pinion engaging the slow worm P. The shaft M is provided with pinions N N, which, when raised, engage corresponding racks connected with the frame H and feed it forward with regular speed. Hung as described, the feed-shaft M naturally falls by its weight to disengage the rack. It is held in engagement only by the foot-lever R, and in case of any accident to the cutters the feed can be instantly checked by simply removing the foot from the lever. The feed-table is drawn back by hand, as the most expeditious way.

The cutters employed are made up of a series of knives of the general form shown in Fig. 5, alternated with a series of blanks of the same thickness of the knives, and of much smaller diameter. Each knife has two teeth, or more, on each end, and the corresponding teeth of the several knives are arranged above one another in the direction of a spiral. The combined series of knives and blanks or spacers are strung upon the arbor B, and firmly held by the set-nuts W.

In making boxes with sliding covers, one end being lower than the other, the notches in the sides at the low end should begin to correspond with the tenons on said end. To effect this, the cutter at this end is raised by the set-screw G to leave the proper blank space, the top edge of the box-stuff being placed down upon the supports *a a*.

Whenever it is desired to notch and tenon a board or boards longer than will pass between the cutters when set widest apart, one of the cutters is removed and the board is clamped to the feed-table, as in any other case.

The overhanging position of the cross-rail E relative to the standards V V allows the board to be run back past the cutter squarely without encountering any obstruction from the said standards. Thus, while the width of the machine is equal to all ordinary uses, this form of the standards allows stuff of any length to be notched.

In a cutter composed of several parts of knives, as shown, it is desirable, in order to do accurate work, that the teeth should be of equal length, or, in other words, that their edges shall sweep in the same cylinder; wherefore it is frequently necessary to dress them either preparatory or subsequent to filing them. Fig. 4 illustrates a device for this purpose.

L′ L″ is a clamp-bracket, which is placed obliquely upon the bars *a a* of the feed-table. In the face of this bracket is a slide bearing the clamp *c c*, made to hold a squared piece of emery, E′. The slide is operated in any convenient manner. The figure shows a rack-and-pinion movement; but any other may be used.

After setting the bracket upon the feed-table the latter is carefully run back until the emery encounters the revolving cutter, when it is held, and the emery is raised and lowered in contact with the teeth until they are all dressed in perfect line. Such dressing of the teeth furnishes a perfect guide to filing them, and will answer the place of filing to a great extent, avoiding the frequent disturbance of the cutters otherwise necessary.

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

1. The combination with two vertical shafts bearing cutters adapted to be set at varying distance apart, of an expansible feed-table, arranged to pass between the cutters, and adjustable to give support to the box-stuff in proximity to the cutters, substantially as described.

2. The combination with two vertical cutter-shafts adapted to be set at varying distance apart, of an expansible clamp, arranged, in connection with an expansible feed-table, to pass between the cutters, to confine the box-stuff near its ends while being cut, substantially as specified.

3. In combination with the cutters and the feed-table of a box-machine, the brackets S′, provided with the face-blocks *c*, rods *b*, springs *d*, and cam-lever T, substantially as and for the purposes specified.

4. The combination, in a feed mechanism of a box-machine, of a horizontally-sliding table, provided with a rack, and a pinion-shaft, M, swung from a driving-shaft, I, by arms K, severally arranged and together operating substantially as described.

5. The combination shown, Fig. 4, of the tooth-dresser L′, provided with vertically-sliding emery-clamp, with the horizontally-sliding feed-table, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I hereunto sign my name in presence of witnesses.

RELLY M. WILLIAMSON.

Witnesses:
M. E. DAYTON,
JESSE COE, Jr.