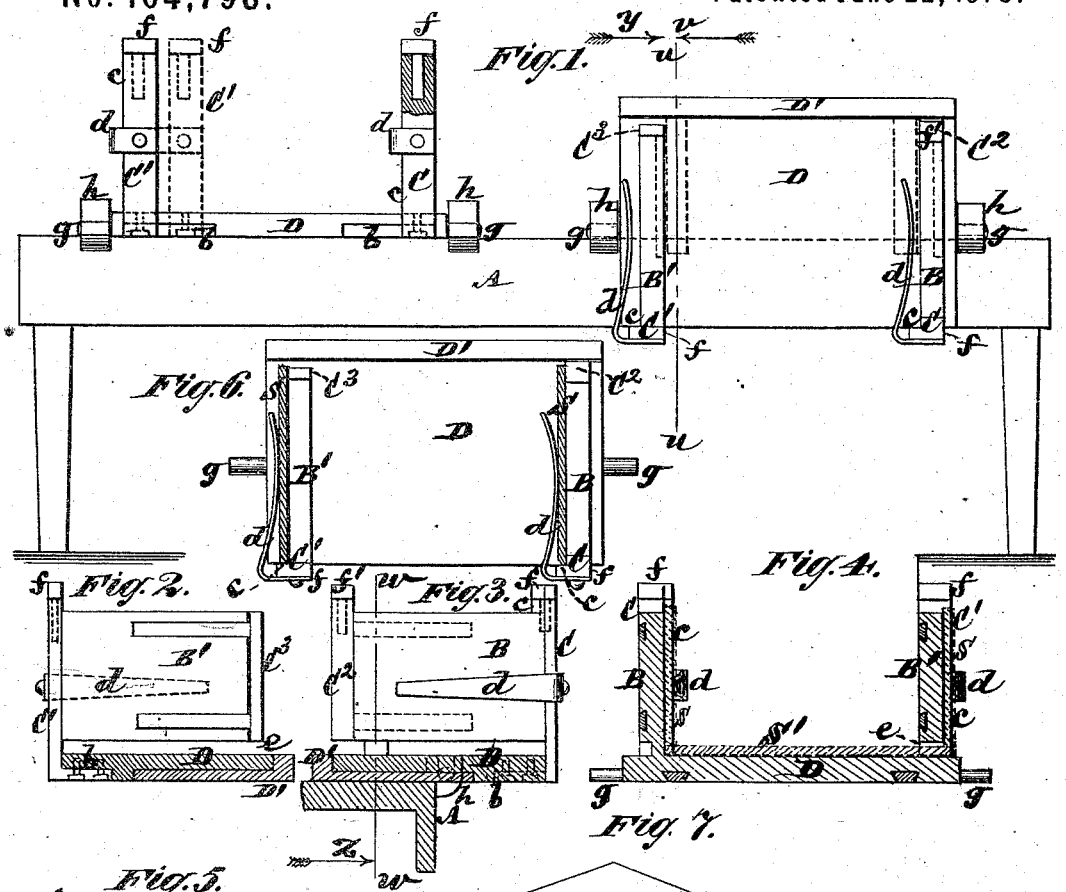
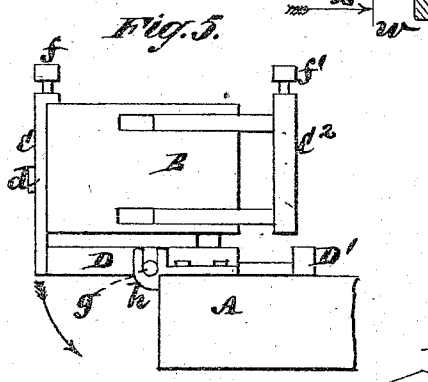
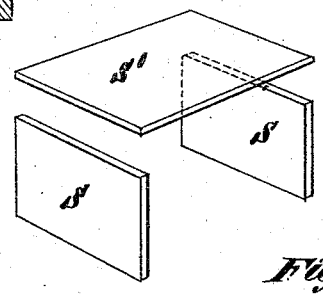
J. W. BOWERS.

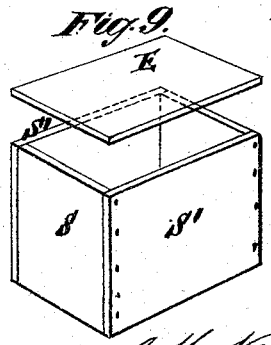
Machine for Making Boxes.

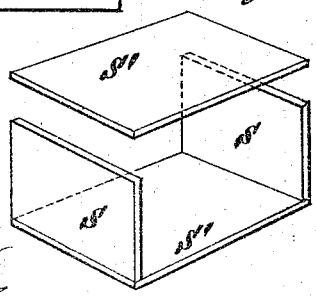
No. 164,798. Patented June 22, 1875.











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UNITED STATES PATENT OFFICE.

JOHN W. BOWERS, OF SOUTH CARVER, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR MAKING BOXES.

Specification forming part of Letters Patent No. **164,798**, dated June 22, 1875; application filed March 17, 1875.

To all whom it may concern:

Be it known that I, JOHN W. BOWERS, of South Carver, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Boxes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms a part of this specification.

This invention relates to means or apparatus for making boxes, the sides or other sectional portions of which are secured by nailing, as in the case of wooden packing-boxes, to which the invention is more particularly designed to be applied, and the description having reference to the drawing will here more particularly be made in connection with the production of such articles.

The invention consists in a bench or stand with attached means for facilitating the nailing of the sides or other sectional portions of the box together, and in various novel constructions and combinations of devices, including sundry adjustable gages, stops, and clamps for placing and holding the several sides or sections of the box while being nailed, and including a tilting or swinging arrangement of box gaging and holding devices, to facilitate the nailing of the bottom of the box.

By this improved apparatus, packing and other boxes may be produced much more expeditiously and accurately than is practicable in the ordinary way of making them.

Figure 1 is a longitudinal elevation of my improved apparatus in duplicate—that is, constructed for making two boxes at a time. Fig. 2 is a vertical transverse section on the line *u u*, looking in direction of the arrow *v*; Fig. 3, a vertical transverse section on the same line *u u*, looking in direction of the arrow *y*; Fig. 4, a longitudinal vertical section, in part, on the line *w w*, looking in the direction of the arrow *z*; Fig. 5, an end elevation; and Fig. 6, a view showing the relative arrangement of the box being made to the gages, stops, and clamps of the apparatus. Figs. 7, 8, and 9 are views in perspective of a box in the course of its manufacture in the apparatus.

Supposing the boxes which it is required to produce are of parallelogrammic shape, then the stuff of which the same are made is first sawed or cut up into lengths and breadths corresponding with the sides, ends, and bottoms of the boxes, and such sides, ends, and bottoms separately and conveniently piled, ready for use.

A is the bench or stand of the apparatus, fitted with two independent box gaging and holding frames or receptacles for making two boxes at a time, inasmuch as a man and a boy will suffice to work both frames more advantageously and economically than they can be worked singly. Both of these frames, of which there may be any number arranged side by side at a suitable distance apart, are of similar construction, and will be more particularly described as follows: B B′ are end wings, connected at their back edges by posts C C¹ to a base, board, or plate, D, along which either or both of said wings may be adjusted—as, for instance, by feet on said posts fitting within recesses *b* in the plate D. This adjustment is to vary the distance apart of the end wings B B′, to adapt the frame to make different lengths of boxes.

Said wings B B′, which occupy a parallel relation with each other, operate as guides, gages, and clamps for the ends S S′ of the box as the same are slid over or on the plate D, up against shoulders or overlapping edges *c c* of the posts C C¹, when the box-gaging frame or receptacle occupies a horizontal position on the bench or stand A. These shoulders *c c* are made, the one on or along the inside of the post C, and the other on or along the outside of the post C¹, relatively to the wings B B′, to provide for the arrest of the ends S S of the box as the same are slid to their places, the one on the inside of the wing C, and the other on the outside of the wing C¹, but both within springs *d d*, attached to the posts C C¹, to hold the box ends S S to their places, as shown in Fig. 6. Thus constructed, the wings B B′ also operate as clamps to hold the work.

One, B′, of the wings is clear open underneath, as shown at *e*, to provide for the passage of the one end of either side S′ alternately of the box beneath it, and the upper edge of said wing is arranged to lie below the level of the upper edge of the box end S as the latter

is slid to its place over the one end of the plate D, on the outside of the wing B′, within its spring *d*, and up against the stop or shoulder *c* of the post C¹. Both posts C C¹ project up above the level of the upper edge of the wing B′, or are provided with blocks, stops, or pieces *f f*, adjustable up or down by any suitable means, for one edge of either box-side S′ alternately to bear up against the adjustment of said stops, providing for different widths of boxes. Furthermore, the wings B B′ and the plate D, on the opposite side of the frame to which are the posts C C¹, are constructed with sliding extension bars or pieces C², C³, and D′, to vary the length of the wings and width of the plate, to suit different depths of boxes being made, and the extension bar or piece C² of the wing B projects above the level of the upper edge of the wing B¹, or is provided with a block, stop, or piece, *f′*, made adjustable up or down by any suitable means, and serving to act as a guide for the one end of either box-side S′ alternately.

When the apparatus is designed to be used for making boxes of only one size, without change at any time, then these several adjusting provisions may be dispensed with; but as by means of such adjustments the same frame or means answer for making boxes of different length, width, and depth, or of varying dimensions in either or any of these directions, it is preferable to construct the parts with reference to such changes.

The wings B B′ being set or gaged to their required distance apart, corresponding with the length of the boxes to be made, and the other parts being set or adjusted to correspond with the requisite depth and width of said boxes, the ends S S are first introduced to their places, as hereinbefore described, and represented in Fig. 6 of the drawing. One of the box-sides, S′, is then placed over or on top of the said ends S S, and is readily or automatically adjusted to a square and even fit with such box ends by means of the upper ends of the post C and opposite end piece or bar C² of the wing B, or of the adjusting-pieces *f f′*, acting as guides to direct it in line with the box ends; also, as stops to arrest said box-side when fully over the upper edges of the box ends. Such box-side S′—say the side represented in Fig. 7—is then nailed down onto the ends S S when the latter are in the position represented in Fig. 6. This makes half the body of the box, as represented in Fig. 8. Such half box-body is then drawn out from the plate D, and from between the wings B B′ and their springs *d d*, the opening *e* beneath the wing B′ admitting of such withdrawal. The half box-body is then reversed or turned upside down, and the side S′ thereof introduced over the plate D, as shown by dotted lines in Fig. 4, and the attached box ends S S inserted as before, the one between the inside of the wing B and its spring *d*, and the other box end between the outside of the wing B′ and its spring *d*, till said box ends are arrested by the shoulders *cc*. The other box-side, S′, is then adjusted to its place over the uncovered box ends and nailed down on the latter, the same guides or surfaces and stops serving to automatically adjust such opposite box-side as answered for the box-side first applied to the ends. This completes the body of the box, less its bottom E, as represented in Fig. 9.

The making of the box-body neither wholly within nor wholly on the outside of the wings B B′, but within the one wing and on the outside of the other wing, subject to retention by the springs *d d*, prevents any cramping of the box or binding of it, which will be found of special advantage, both when entering the box-body and when withdrawing it from the frame in which its parts or sections are nailed together.

To put the bottom E on the box it is proposed to suspend the plate D of such box frame or receptacle by trunnions *g g* in bearings *h h* on the edge of the bench or stand, and after the sides and ends of the box have been nailed together, as described, to swing said box-frame, having the box-body within it, down or over the edge of the bench, in the direction indicated by arrow in Fig. 5, and as shown for the frame at the right hand of Fig. 1, said frame being so balanced on its trunnions as to retain its position, both when disposed horizontally and vertically. The box frame or receptacle having thus been turned into a vertical position, the box-bottom E is slid to its place over the upper or exposed edges of the sides and ends, the one end of the wing B and the one longitudinal edge of the plate D adjacent thereto, or the extension-bars C² D′ of said wing and plate, serving to automatically guide the bottom E, and to arrest it in proper position over the edges of the box sides and ends for nailing the same to said sides and ends. The box frame or receptacle is then turned up into horizontal position again, and the complete box, less its lid or top, removed, as hereinbefore described, for the removal of the half-box.

When using the box-holding frames or receptacles in duplicate, as shown in Fig. 1 of the drawing, a man and a boy are employed to work together, the boy placing the sections or pieces of which the boxes are composed, first by attending to the one frame and then the other, and the man or operator reversely and simultaneously changing his position relatively to the two frames to nail the sections or pieces placed by the boy or assistant. In this way, and by reason of the rapid manner in which the box sections or pieces are adjusted into position, ready for nailing, and by the facility which is afforded for removing the boxes when made, the production of the boxes is greatly facilitated or expedited, and their accuracy and neatness insured.

I claim—

1. The combination, in a box gaging and holding frame, of the wings B B′, having springs *d d*, whereby they form both clamps

and guides on their outside and inside surfaces, respectively, the opening *e* beneath the one wing, the posts or stops C C^1, and the shoulders or projections *c c*, substantially as and for the purposes herein set forth.

2. The combination, with the plate or connecting-piece D, of the wings B B′, forming combined clamps and guides, made adjustable toward or from each other, essentially as described.

3. The combination of the extension-bars C^2 C^3 with the wings B B′, substantially as specified.

4. The adjustable blocks, stops, or pieces *f f′*, in combination with the posts C C^1 and bar C^2, connected with or forming parts of the wings B B′, essentially as described.

5. The extension-bar D′, in combination with the plate D and wings B B′, substantially as specified.

6. The box gaging and clamping or holding frame, constructed substantially as described, and pivoted to a fixed bench, substantially in the manner and for the purpose herein set forth.

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Witnesses:
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