No. 706,763. Patented Aug. 12, 1902.

B. A. LANGE.

BOX JOINT.

(Application filed Mar. 6, 1902.)

(No Model.)

Fig. 1.

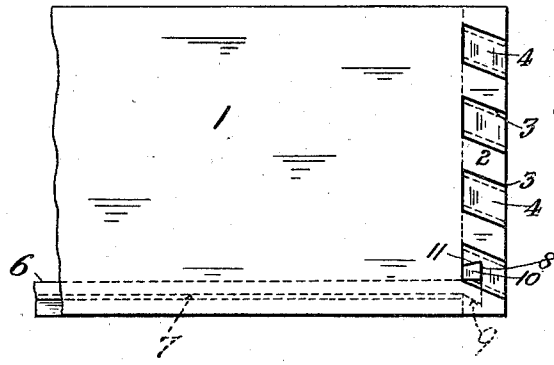


Fig. 2.

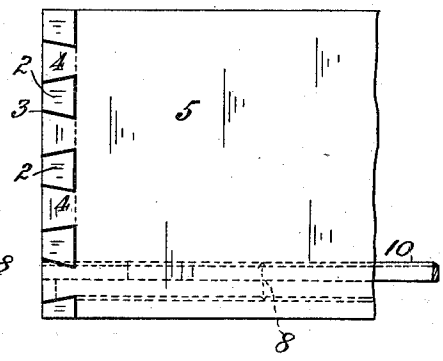


Fig. 3.

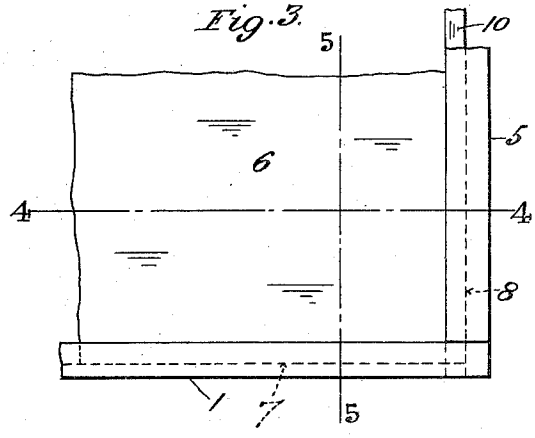


Fig. 4.

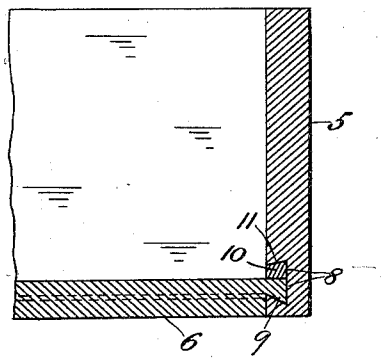
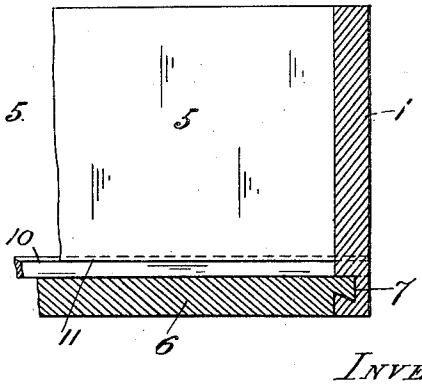


Fig. 5.



WITNESSES:
Maud C. Fletcher,
Carl G. Pressinger

INVENTOR:
Berthold A. Lange,
by Hugh K. Wagner,
His Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BERTHOLD A. LANGE, OF ST. LOUIS, MISSOURI.

BOX-JOINT.

SPECIFICATION forming part of Letters Patent No. 706,763, dated August 12, 1902.

Application filed March 6, 1902. Serial No. 96,939. (No model.)

To all whom it may concern:

Be it known that I, BERTHOLD A. LANGE, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Box-Joints, of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new form of joints for the corners of boxes, and has for its object to provide a tighter and more permanent connection between the sides and ends and also means for staying the bottom.

The features of novelty will be hereinafter described, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation. Fig. 2 is an end view. Fig. 3 is a top plan view. Fig. 4 is a sectional view on the line 4 4, Fig. 3; and Fig. 5 is a sectional view on the line 5 5, Fig. 3.

In the drawings only parts of the side and end pieces are shown, the object being to show the manner of joining same.

1 indicates a portion of one of the sides of a box having at its ends (only one of which is shown) the tenons 2 and mortises 3, in which latter are fitted the tenons 4 on the end piece 5. The bottom 6 dovetails into the groove 7 in the side 1, which holds the side 1 firmly from vertical movement and the bottom 6 from both vertical and horizontal movement.

If it were possible to dovetail both ends, both sides, the bottom, and the top in like manner, there would be no necessity for my present invention. As it is necessary, however, to slide the tenon on the bottom into the groove 7 in the side from the end, it is obviously impossible similarly to slide all the other parts into place in similar dovetail fashion. For instance, the bottom and the two sides being attached together by dovetails, as described, the end piece 5 can be slid into place in similar grooves upon the inside of the side pieces 1, but obviously could not be attached by a dovetail extending across the end of the bottom 6, because the end piece 5 could not be slid into place both vertically and horizontally at the same time. It is desirable, however, to provide a construction in which all the parts shall be firmly and permanently united and kept from sliding out of place. I accomplish this end by providing the end portion 5 and the ends of the side pieces 1 with beveled or slanting tenons and mortises alternating each other and by the provision of a groove in the end portion and a key fitting thereinto.

When the bottom 6 has been pushed into place in the grooves 7 in the sides 1, the beveled tenons 4 on the end piece 5 are placed opposite the beveled mortises 3 on the ends of the side pieces 1 and pushed into place until the tenons fit tightly and neatly into the mortises. The lower part of the end piece 5 is provided with a groove 8, into which fits the tenon 9 on the end of the bottom 6. This groove 8 is shaped in its lower portion to conform to the downwardly-projecting form of said tenon 9, and when a wedge-shaped key 10, as hereinafter described, is used said groove is shaped at its top to conform to said wedge shape, forming the shoulder 11, and said groove is of a width greater than the thickness of the part of the bottom 6 at the narrowest portion of said tenon 9. When the end of the box is slipped into place by the interlocking of the mortises and tenons 2, 3, and 4, as above described, no hindrance thereto exists in the fact that the bottom 6 is already in place, as the tenon 9 at the end of the bottom 6 fits without difficulty into the broad groove 8.

When the parts are in the position already described, a key wedge-shaped in cross-section is pressed into the vacant portion of the broad groove 8 and holds the bottom 6 firmly down, with its tenon 9 firmly pressed into the lower portion of the groove 8, while the upper portion of said groove is occupied by said key 10. It is the function of this key to keep the end piece 5 from downward movement, because that is the only direction in which said end piece 5 can move to liberate its tenons 4 from the clutch of the tenons 2 of the side piece 1. Said downward movement being thus prevented and the end pieces alone being necessarily removed before the box can come apart it is obvious that a box of unusual solidity of construction is thus pro-

vided. Moreover, as the key is wedge-shaped, as clearly seen in Fig. 1 and Fig. 4, it has a special tendency to hold said end piece 5 from downward movement, because the shoulder 11 on the lowest tenon of the end piece 5 bears directly against the wedge-shaped key 10, which shoulder extends clear across the end piece 5 and forms the upper wall of the groove 8.

It is obvious that the direction of the slant of the tenons and mortises on the side pieces and on the end pieces may be changed, so that the downward longitudinal slant will be given to those on the end pieces, while that on those on the side pieces will receive the lateral downward bevel. Such change would simply necessitate the location of the groove 8 in the side pieces instead of the end pieces, the tenons 9 being formed on the sides instead of the ends of the bottoms 6, and the keys 10 would run along the sides 1 instead of across the ends 5.

Square keys instead of wedge-shaped ones may be used, and these if made shorter than the interior measurement of the box may be inserted in the grooves 8 from the inside of the box instead of being pushed into place from the outside, the necessity for any hole or opening through the sides of the box except the described mortises being thus obviated.

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

1. In a box, the combination of side pieces having alternated mortises and tenons at their ends slanting downwardly, end pieces having alternated mortises and tenons at their sides interlocking with those on the side pieces and slanting upwardly, and grooves in said end pieces in which keys or wedges are inserted.

2. In a box, the combination of side and end pieces having interlocking beveled mortises and tenons those on the end pieces being slanted oppositely to those on the sides, transverse grooves in said end pieces, and wedge-shaped keys located in said grooves when the box is assembled.

3. In a box, the combination of side and end pieces having mortises and tenons, tenons on the bottom which fit into grooves in said end pieces, said grooves being wider than the tenons fitting thereinto, and keys fitting into the extra width of said grooves.

4. In a box, the combination of side pieces having downwardly-inclined mortises and tenons, end pieces having transversely upwardly inclined mortises and tenons interlocking therewith, a bottom having a tenon at each end the extremity of which is thicker than its place of union with said bottom piece, a groove in each of said end pieces in the lower part thereof, said groove being deeper at its bottom than at its opening, wedge-shaped keys extending through said grooves, resting on said tenons at each end of the bottom piece, said keys being inserted in place through holes in the tenons of the end pieces registering with mortises in the side pieces after the box is assembled.

In testimony whereof I have hereunto attached my signature, in the presence of two witnesses, this 1st day of March, 1902.

BERTHOLD A. LANGE.

Witnesses:
HUGH K. WAGNER,
MAUD E. LETCHER.