

No. 724,897.

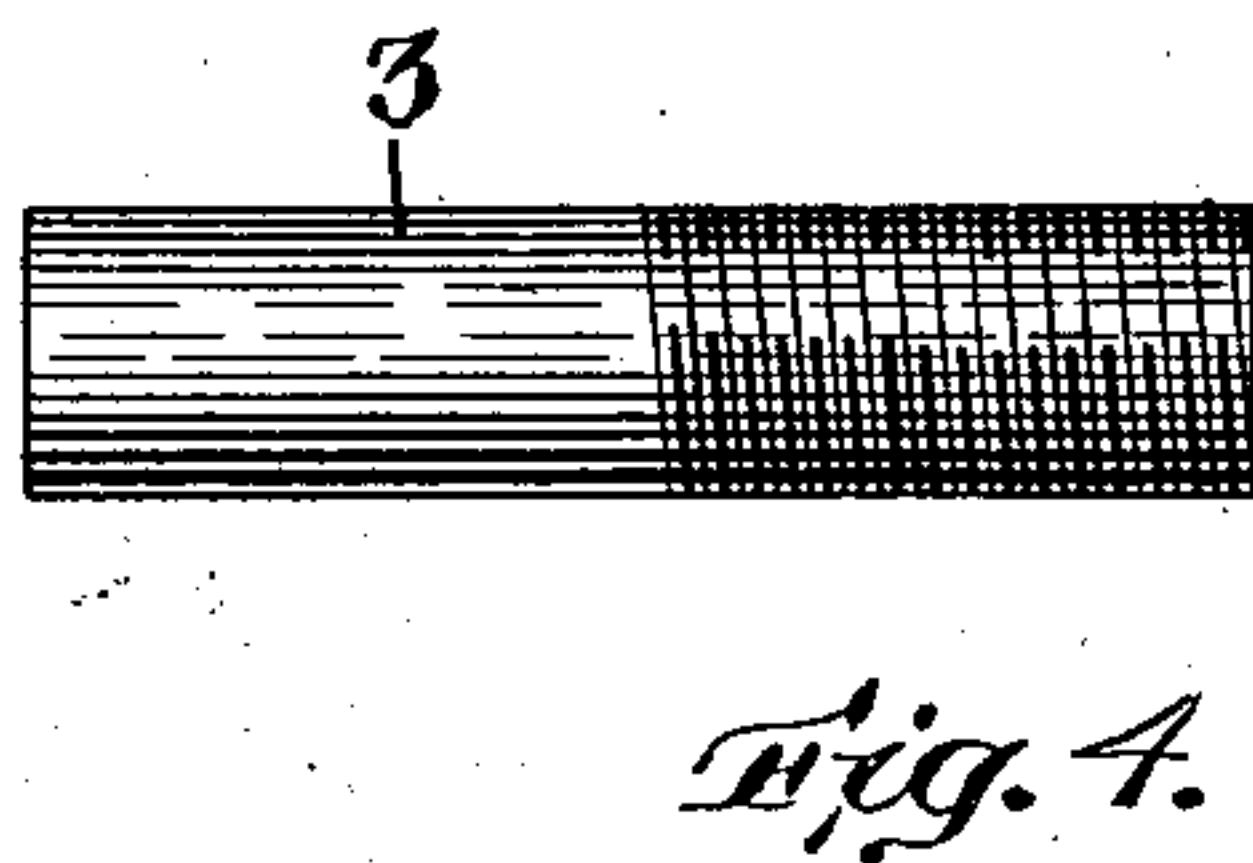
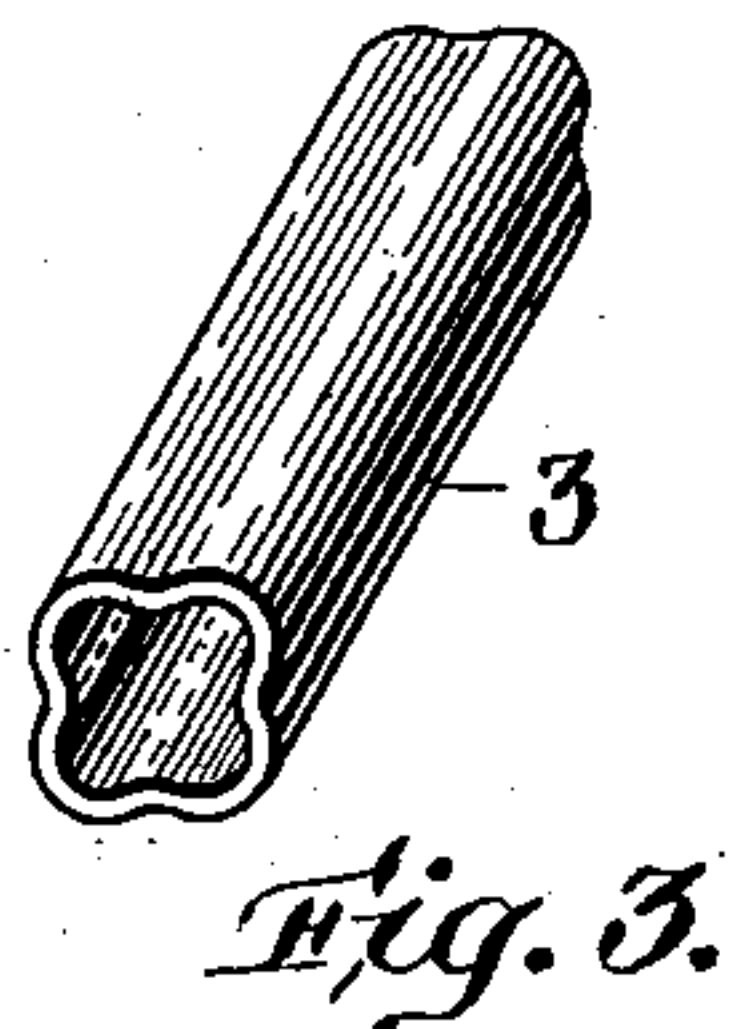
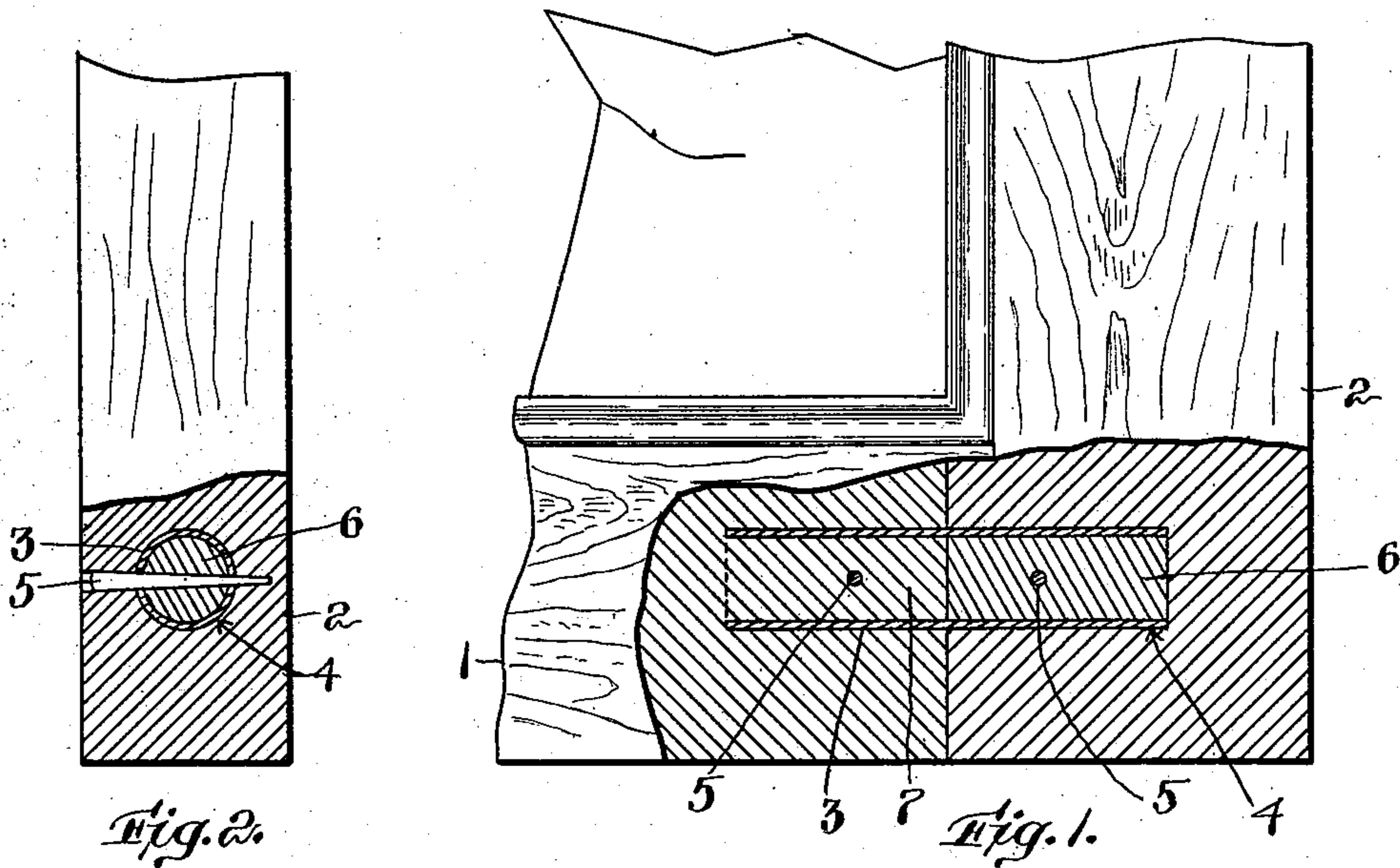
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G. B. LEE.

JOINT FOR CARPENTRY.

APPLICATION FILED APR. 11, 1902. RENEWED FEB. 20, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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JOINT FOR CARPENTRY.

SPECIFICATION forming part of Letters Patent No. 724,897, dated April 7, 1903.

Application filed April 11, 1902. Renewed February 20, 1903. Serial No. 144,328. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. LEE, a citizen of the United States, residing at New London, in the county of New London, State of Connecticut, have invented a certain new and useful Improvement in Joints for Carpentry, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention consists in a novel joint which is particularly adapted to very general and universal use in carpentry, joiner-work, and the like.

One object of the invention is to provide 15 means for enabling woodwork to be effectively jointed in novel and improved manner.

Another object of the invention is to produce a joint which is stronger and more efficient than the usual and well-known mortise-and-tenon joint. 20

Another object of the invention is to render unnecessary the use of the ordinary mortise-and-tenon joint.

I have illustrated my invention in the accompanying drawings with the aid of the representation of the meeting portions of a rail and a stile of a window-sash. This representation, however, is merely for convenience, and it will be understood that the invention is not limited to employment in connection with window-sashes. 30

In the drawings, Figure 1 shows, as aforesaid, the meeting portions of a rail and a stile pertaining to a window-sash, the same being shown partly in section and my invention being shown applied. Fig. 2 shows the same partly in elevation looking at the side of the stile and partly in vertical section on a plane passing through one of the retaining-pins. 35 Fig. 3 is a perspective showing a corrugated dowel-tube. Fig. 4 shows in side elevation a screw-threaded dowel-tube.

Having reference to the drawings, 1 and 2, respectively, designate portions of wood which 45 are joined together with the aid of my invention. In the present instance portion 1 is one rail of a sash and portion 2 is one stile thereof. The parts 1 and 2 having been fitted so as to enable them to be put together, they are 50 united by means of the dowel arrangement, which I will now proceed to describe. An essential feature of this dowel arrangement is

the tube 3. This is embedded partly in one of the portions of wood which are to be united and partly in the other thereof. In making 55 what in general are termed "stile-and-rail joints"—that is to say, in cases in which the grain of the two pieces of wood which are to be joined stands at right angles in the two pieces—a hole is bored transversely into the 60 piece of wood in which the side of the grain is presented to the end of the grain of the other, this hole being intended for the reception of a portion of the length of the tube 3. For instance, in the drawings the hole is bored 65 thus into the stile, as at 4. This hole extends as deeply into the wood of the stile as is expedient in order that a considerable portion of the length of the tube may be received within the hole. The hole having been provided in the stile or the part which in other instances corresponds therewith, the tube is forced into the same. The diameter of the hole is made somewhat less than the external diameter of the tube, so as to require the exercise of some force in order to effect the driving of the tube into place within the hole. 75 The end of the rail or the part that corresponds therewith is now placed in contact with the outer extremity of the projecting portion of 80 the tube which has been applied to the stile and the parts are forced together, so as to cause the portion of the length of the tube which projects at the side of the stile to penetrate the end of the rail, the application of 85 force being continued until the end of the rail has made contact with the side of the stile. As the tube enters the end of the rail, it encircles and incloses a portion or plug integral with the remainder of the rail and corresponding in cross-section with the inside cross-sectional shape of the tube. No portion of the rail is removed for the reception of the tube. In practice I prefer to print, mark, or indent the end of the rail at the 95 place where the tube is to enter the same by means of an edged tool corresponding in contour with the contour of the end of the tube for the purpose of guiding in assembling the work by indicating the point at which the 100 tube is to be caused to enter the rail and for the further purpose of directing the tube as it begins to be driven into the rail. The rail and stile having been forced properly into

the desired relative position, I drive pins 5 5 into the two members of the joint and through the tube, as indicated in the drawings. One of these pins is driven into the stile and through the corresponding end of the tube. 5 The other of the said pins is driven into the rail and through the corresponding end of the tube. These pins act in addition to the frictional engagement of the tube with the 10 rail and stile to lock the parts together, and thus serve most effectively to prevent withdrawal of the tube from either member of the joint or the turning of one portion or member of the joint relatively to the other 15 about the axis of the tube. For the purpose of preventing the portion of the tube which is introduced into the hole that is bored into the stile from being collapsed from any cause I preferably fill that end portion of the tube 20 with a plug, as 6, of wood or other suitable material. Usually after having bored the hole in the stile I drive the tube into the said hole and then enter the plug in the open projecting end of the tube. I then apply the 25 end of the rail to the end of the tube and force the parts together. The plug-like portion 7 of the rail which enters the tube pushes ahead of it the plug 6 aforesaid to the inner portion of the length of the tube and against 30 the end of the bored hole in the stile. The said portion 7 of the rail remains integral with the rest of the rail. When the pins aforesaid are driven crosswise into the stile and rail, respectively, and through the opposite 35 ends of the tube, in passing through the plug 6 and the integral plug-like portion 7 they expand the latter against the tube, tending to expand also the tube, and thereby increasing not only the frictional hold between the 40 outermost surface of the said tube and the surrounding portions of the stile and the rail which are in contact with such surface, but also the frictional hold between portion 7 and the tube. Preferably, in order to increase 45 the tendency of the pins to expand the said plug and plug-like portions, they are formed tapering or wedge shape. In some instances the tube may be formed circular in cross-section, as shown in Fig. 2; but I preferably 50 form the same corrugated lengthwise, as indicated in Fig. 3. The corrugations of the tube serve several purposes. They enable the tube to become compressed somewhat, and thereby reduced slightly in diameter as the tube is being driven into the hole which 55 has been prepared in the stile. They also enable the tube to be subsequently expanded into firmer contact with the surrounding wood forming the boundary or wall of the 60 said hole by the introduction of the plug into the tube or by the action of the pin in being driven through the plug. They also serve to prevent the tube from turning around on its longitudinal axis in its holes or sockets. In 65 some cases for the purpose of increasing the resistance offered by the tube to being withdrawn after having been driven into place I

may form the same with transverse corrugations or the equivalent thereof. Thus, for instance, in Fig. 4 I have shown the tube 70 formed with a screw-thread on the portion thereof which is intended to enter the stile. In this case the tube may be screwed into place in the stile.

In the foregoing I have explained my invention more especially with reference to its use in connection with what are termed "stile-and-rail joints." It will of course be perceived that the invention is not necessarily limited to application to these particular 80 joints, although it has been more especially contrived with reference thereto, at least to joints in which the grain of one of the pieces of wood stands at right angles to the length of the dowel-tube. A plug occupying the 85 entering end of the dowel-tube and integral with the said piece of wood would have but little strength. Consequently I bore the hole which has been referred to into this piece of wood and fill the interior of the tube with a 90 separate plug.

I claim as my invention—

1. In a sash or other jointed wooden structure, in combination, the two pieces of wood placed in apposition with each other, the tube 95 inserted into the meeting portions of the said pieces of wood and having one of its end portions occupied by a separate plug and the other occupied by an integral portion of the corresponding piece of wood, substantially as 100 described.

2. In a sash or other jointed wooden structure, in combination, the two pieces of wood placed in apposition with each other, the tube 105 inserted into the meeting portions of the said pieces of wood and having one of its end portions occupied by a separate plug and the other occupied by an integral portion of the corresponding piece of wood, and the pins applied to the said pieces of wood and the opposite 110 portions of the tube, substantially as described.

3. In a sash or other jointed wooden structure, in combination, the two pieces of wood placed in apposition with each other, and the 115 longitudinally-corrugated tube having one portion of its length embedded in one of the said portions of wood, and the other portion thereof, embedded in the other of said pieces of wood, the said tube having one of its end 120 portions occupied by a separate plug and the other occupied by an integral portion of the corresponding piece of wood, substantially as described.

4. In a sash or other jointed wooden structure, in combination, the two pieces of wood placed in apposition with each other, and the 125 longitudinally-corrugated tube having one portion of its length embedded in one of the said portions of wood and the other portion 130 thereof embedded in the other of said pieces of wood, the said tube having one of its end portions occupied by a separate plug and the other occupied by an integral portion of the

corresponding piece of wood, and the pins driven into the respective pieces of wood and the corresponding portions of the tube and the plugs filling the said portions, substantially as described.

5 5. In a sash or other jointed wooden structure, in combination, the two pieces of wood placed in apposition with each other, the tube inserted into the meeting portions of the said
10 pieces of wood, and a separate plug contained within the interior of the said tube, substantially as described.

6. In a sash or other jointed wooden structure, in combination, the two pieces of wood

placed in apposition with each other, the tube 15 inserted into the meeting portions of the said pieces of wood, the separate plug occupying the interior of the said tube, and the retaining-pins applied to the said pieces of wood and the opposite portions of the tube, sub- 20 stantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE B. LEE.

Witnesses:

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WILLIAM A. COPELAND.