April 8, 1930. J. VAALER 1,753,487

JOINT CONSTRUCTION

Filed Oct. 13, 1926

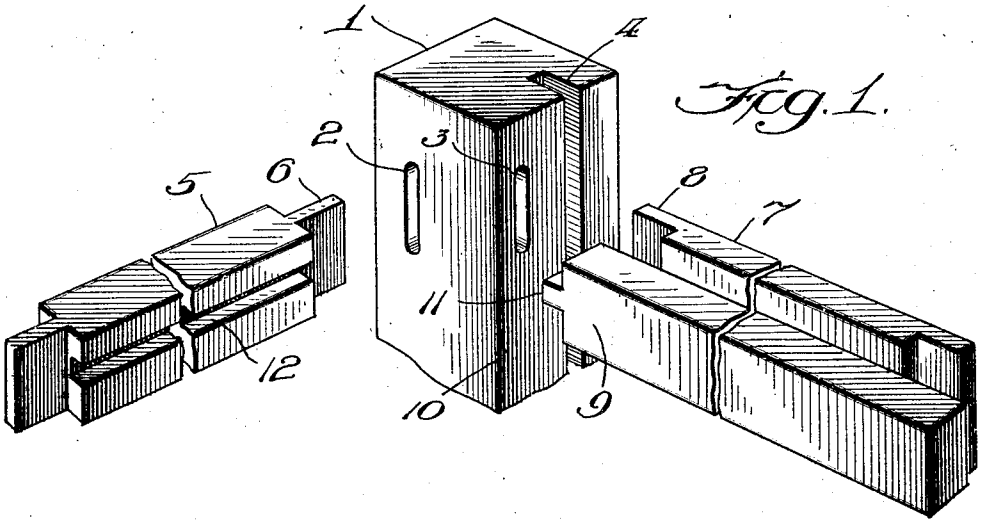


Fig. 1.

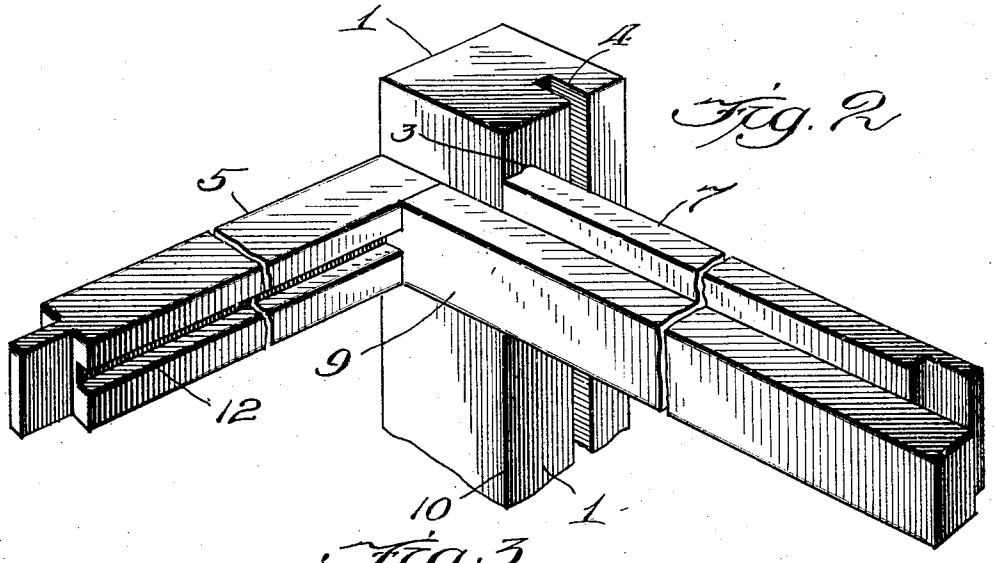


Fig. 2

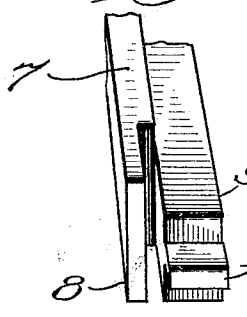


Fig. 3

Inventor:
Jens Vaaler
By Wallace R. Lane
Atty

Patented Apr. 8, 1930

1,753,487

UNITED STATES PATENT OFFICE

JENS VAALER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CLEMETSEN COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

JOINT CONSTRUCTION

Application filed October 13, 1926. Serial No. 141,248.

This invention relates to joint constructions which may be utilized in furniture manufacture or in other fields where an interlocking joint of this type may be useful.

Ordinary mortise and tenon joints of the type having perfectly fitted mortises and tenons, with parallel surfaces in snug contact, are too expensive and not suited to large scale production methods. Furthermore, such a joint when made of wood is not capable of preventing slight relative movement of the cooperating members, due to the compressibility of the wood fibres. Under the influence of time and varying humidity such a joint gradually loosens and its effectiveness is seriously diminished.

If the mortise and tenon are tapered to provide a wedging fit the continued pressure exerted perpendicularly to the surfaces soon causes the mortised member to split, or the joint is rendered less effective as the drying tenon shrinks away from the mortise at the points where effective pressure had existed. Of course, accurately tapered joints in the wood working art are too expensive for practical use.

My invention provides a joint in which the square-cornered edges of the tenon engage the round-corners of the mortise firmly at all points from the open end to the bottom of the mortise, regardless of the slight variations of dimensions that may occur in quantity production. The strains thus imposed on the mortised member are exerted largely diagonally across the grain of the wood, thus eliminating entirely the danger of splitting and insuring a resilient grip that will be maintained as the wood is affected by time and humidity.

I furthermore utilize this principle in an interlocking joint construction which is peculiarly adapted to derive the maximum benefit from the principle, in that with some aid from glue and without the aid of pins, nails or screws initial relative movement of the cooperating members is rendered practically impossible.

One of the objects of this invention is to provide a joint construction comprising interlocking members which will afford each other vertical and lateral support.

Another object of this invention is to provide a joint construction having round-cornered mortises and square-cornered tenons to effect a wedging engagement when the tenons are driven into the mortises.

Another object of this invention is to provide a joint construction having round-cornered mortises and square-cornered tenons so dimensioned that when the tenon is forcibly driven into the mortise each square-cornered edge of the tenon exerts pressure in a fan-shaped arrangement of the lines of force radiating out from the edge.

Another object is to provide a new mortise and tenon joint construction in which the pressure between the two cooperating members is exerted in part obliquely to the grain of the wood and is exerted more constantly and effectively than is the case in ordinary joint constructions.

Another object of this invention is to provide a joint construction having more surfaces on which to apply glue than have hitherto been provided in furniture joints, there being also less surface area transversely intersecting the grain of the wood and more surface area paralleling the grain.

My invention further resides in the combination, construction and arrangement of parts shown in the accompanying drawing, and while I have shown therein a preferred embodiment I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Further objects, advantages and capabilities will later more fully appear and are inherently possessed by my invention.

Referring now to the drawing, in which is illustrated one embodiment of my invention—

Fig 1 is a disassembled view in perspective;

Fig. 2 is an assembled view of the parts shown in Fig. 1;

Fig. 3 is a perspective showing the end of one of the horizontal members.

Referring now in greater detail to the drawing, 1 is a member which may be a verti-

cal post, such as is found in desks, having round-cornered mortises 2 and 3. A recess 4 may be provided when this post is used in a desk for the reception of the panel which may cover the end of the desk.

When this joint construction is used in a desk, the element 5 will extend longitudinally with its square-cornered tenon 6 forcibly driven into the round-cornered mortise 2.

A horizontally extending member 7 is provided with a square-cornered tenon 8 which is forcibly driven into the round-cornered mortise 3 of the post.

A projection 9 on the member 7 extends past the corner 10 along the face of the post and carries a reduced portion or projection 11 which is adapted to fit into the recess 12 on the element 5.

As is shown in the assembled view in Fig. 2, the projection 11 seated in the recess 12 causes the element 5 and the member 7 to afford each other vertical support independently of the post 1 and to cooperate with the mortises and tenons to effect an interlocking and extremely rigid joint.

The rigidity of this joint construction is further promoted by the design of the mortises and tenons. It can be readily understood that when a square-cornered tenon of suitable dimensions is driven into one of these round-cornered mortises the ends of the mortise are distorted to more nearly conform with the outline of the tenon and likewise the tenon becomes distorted to conform to the outline of the mortise. In this manner the tenon becomes snugly wedged into the mortise and does not need to rely so much upon the glue for preservation of a firm joint.

It will be observed that my invention provides a greater number of surfaces than has hitherto been provided in furniture joints on which glue may be applied. There is also a minimum of surface area which transversely intersects the grain of the wood, resulting thereby in a minimum number of glued surfaces which are less suited to be held together by glue.

Another advantage arising in this type of joint construction is that the interlocking effect is produced without the use of nails, screws, or a pin, the forces which hold the parts together acting directly upon the surfaces of the principal members themselves. The large amount of friction between the square-cornered tenons and the round-cornered mortises tends to hold the members rigid and immovable, which friction is therefore an aid to the glue. It is of course, an advantage to prevent any initial movement of the glued members without entirely relying upon the glue to prevent that initial movement. This manner of wedging the members therefore takes some of the strain off the glue, and on the other hand the glue tends to relieve some of the strain in the corners of the mortises.

As seen in Fig. 2, the inner vertical face of the projection 9 (of member 7) fits tightly in engagement with the adjacent face of the post 1. These faces being with the grain afford excellent surfaces for the application of glue, which in conjunction with the arrangement of the mortises and tenons gives exceedingly great rigidity to the finished product.

Having shown and described my invention, I claim:—

1. A joint construction comprising a post having mortises in two adjacent faces, an element having a tenon adapted to fit into one of said mortises, said element having a recess, and a member having a tenon adapted to fit into the other of said mortises, said member having a projection adapted to seat in said recess, said projection having a face in engagement with the adjacent face of the post.

2. A joint construction comprising a post having mortises in two adjacent faces, an element having a tenon adapted to fit into one of said mortises, said element having a recess, a member having a tenon adapted to fit into the other of said mortises, and a projection on said member extending along and in engagement with a face of said post toward said recess and having a reduced portion adapted to fit into said recess.

3. A joint construction comprising a post having mortises in two adjacent faces, an element having a tenon adapted to fit into one of said mortises, said element having a recess, and a member having a tenon adapted to fit into the other of said mortises, said member having a projection adapted to seat in said recess, one of said mortises having a rounded corner, and the corresponding tenon having a square corner for effecting a wedging fit when the tenon is driven into the mortise.

4. A joint construction comprising a post having a plurality of recesses, a recessed element having a projection fitted into one of the recesses of said post, and a member having a projection fitted into the recess of said element and having another projection fitted into a recess of said post.

5. A joint construction comprising a vertical post interlocked with two horizontal members which are disposed at an angle to each other, the post having a round-cornered mortise in each of two faces, one of said members having a recess and having a square-cornered tenon fitted into one of said mortises, and the other of said members having a square-cornered tenon fitted into the other mortise and having a projection fitted into the recess in the first said member.

6. A joint construction comprising a vertical post having a round-cornered mortise in each of two adjacent faces, a horizontal element having a square-cornered tenon fitted

into one of said mortises, a horizontal member at an angle to said element having a square-cornered tenon fitted into the other of said mortises and means for directly connecting said element and said member whereby each affords vertical support to the other.

7. A wooden joint construction comprising a wooden member having narrow elongated mortises in two adjacent faces, the length of each mortise extending parallel to the grain of the member, a second wooden member having a tenon adapted to be fitted into one of said mortises and having a recess, the depth of said tenon and the length of said recess extending parallel to the grain, a third wooden member having a tenon adapted to be fitted into the other said mortise and having a projection extending along and in light engagement with the face of the first member toward the first said mortise, and a reduced portion on said projection adapted to extend into the recess on the said second member, the projections and tenon on the third member extending parallel to the grain of the wood.

8. In a wooden joint construction, three interlocking members, each extending at right angles to the other two, the first member having recesses retaining projections from the other two members, and one of the said two members having a recess retaining a projection from the other of the said two members, the major portion of the contacting surfaces comprising cooperating surfaces the grain on each of which extends perpendicular to the grain in the other and in a parallel plane.

9. A joint construction comprising a vertical post having a mortise in each of two adjacent faces, the mortises extending with the grain of the post and being considerably greater in length than in width, and provided with rounded corners, a horizontal member having a rectangular cornered tenon adapted to fit into one of said mortises, a second horizontal member at an angle to said first member having a rectangular cornered tenon adapted to tightly fit in the other of said mortises, and means for directly connecting said two members together whereby each affords vertical support to the other.

In witness whereof, I hereunto subscribe my name to this specification.

JENS VAALER.

CERTIFICATE OF CORRECTION.

Patent No. 1,753,487. Granted April 8, 1930, to

JENS VAALER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 18, claim 7, for the word "light" read "tight"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of June, A. D. 1930.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.