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I. J. B. DEMERS

2,247,330

JOINT FOR COMBINATION WOOD AND METAL STRUCTURES

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Fig. 1

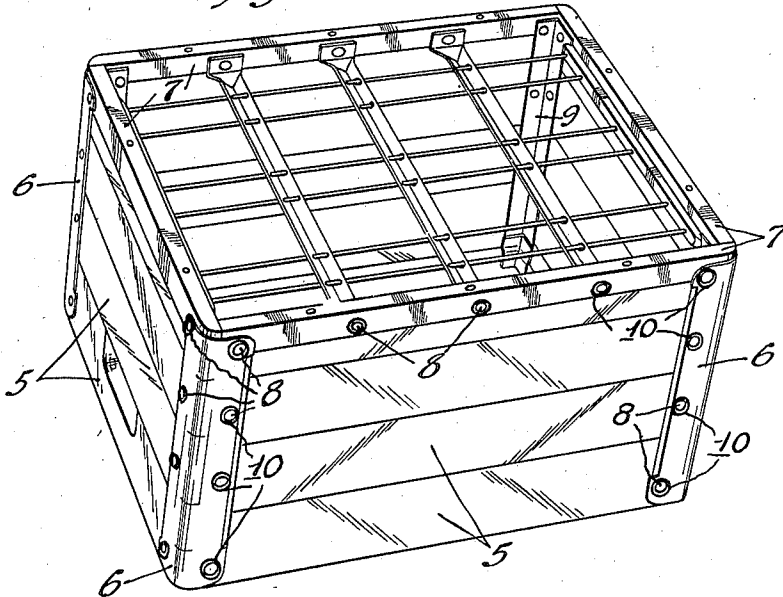


Fig. 3

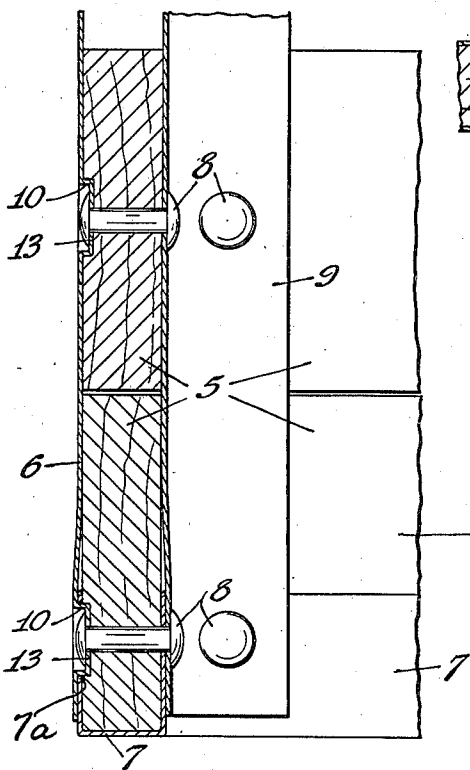


Fig. 2

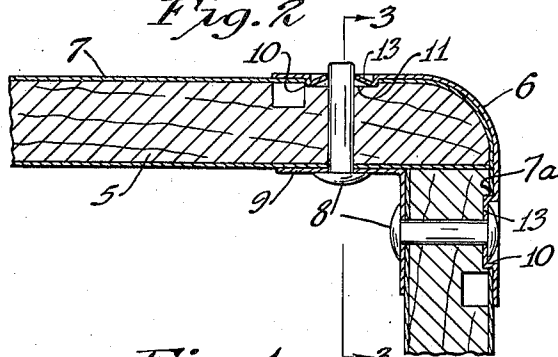
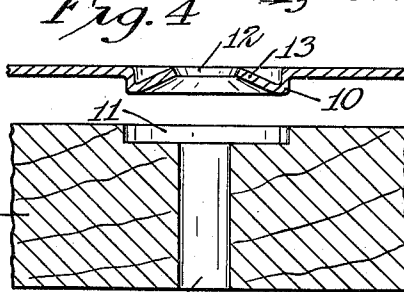


Fig. 4



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JOINT FOR COMBINATION WOOD AND METAL STRUCTURES

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5 Claims. (Cl. 20—92)

It is an object of this invention to provide novel means for strengthening the joints and facilitating the construction of combination wood and metal structures.

A further object is to provide for joints of this class button-like projections or offsets on the metal members which fit into wide recesses or counter-sinks formed in the wood members surrounding the bolt or rivet holes, the projecting offsets being so constructed as to expand and fit tightly in the counter-sinks when the fastenings are made as by forming the rivet heads or tightening the nuts on the bolts.

Other objects will appear and be more fully pointed out in the following specification and claims.

In the accompanying drawing:

Figure 1 is a perspective view showing my invention as applied to a bottle crate, the crate being shown in inverted position;

Fig. 2 is a fragmentary horizontal section through a corner of the crate and along the axes of the lowest row of rivets, one of the latter and the adjoining offset being shown in their normal positions before the rivet head is formed;

Fig. 3 is a vertical section through the lower portion of the crate, taken on the line 3—3 of Fig. 2 and with all joints fastened, and

Fig. 4 is an enlarged detail showing one of the wood members and one of the metal members in alignment for making the joint but separated.

The principal members of the illustrated crate comprise wood slats 5, forming the side and end walls, and metal reinforcing members including outside corner angle bars 6, inside corner angle bars 9 and channel shaped bottom rails 7. Rivets 8 are employed to fasten the several metal members to the wood members and to each other.

The angle bars 6 are formed with button-like offsets 10 adapted to project into shallow but wide annular recesses or counter-sinks 11 (Figs. 2 and 4) formed in the underlying wood members around the holes for the rivets 8. The offsets 10 fit loosely in the recesses 11 when the members are assembled. Each of the offsets 10 has a central opening 12 for a rivet or bolt and surrounding this opening is a normally conical portion 13 adapted to be sprung to a flat position when the rivet or bolt is tightened, as indicated in Fig. 3.

Where the metal members overlap so that one thickness is interposed between the wood and another thickness of metal, holes 7a are cut in the underlying member 7 to receive and fit the offsets 10, as indicated in Figs. 2 and 3. Where this

is done the offsets 10 may be extended into the counter-sinks 11 or the latter may be eliminated so that the offsets merely bear against the outer surface of the wood members in the holes 7a.

In assembling the wood and metal members in a suitable jig, the offsets 10 slip into the counter-sinks 11 readily to hold the several members in proper relative positions until the rivets can be inserted and fastened.

When ready for the final fastening operation, the ends of the rivets project somewhat from the outer face of the offsets 10, as illustrated by one of the rivets shown in Fig. 2. During the formation of the heads on the rivets the upsetting operation causes the conical portions 11 of the offsets 10 to be flattened and this forces the offsets to expand radially from the rivets so that the offsets fit relatively snugly in the recesses 11. The effect of this is to make a tighter and stronger joint and to retain the rivets under tension when the wood members swell and shrink. As is well known, the wood members of bottle crates, for example, are subjected to washing and sterilizing so frequently that the wood, due to its swelling and shrinking, works loose from the rivets and other metal members with the result that the members of ordinary bottle crates rattle and become progressively looser. Joints made according to the present invention remain tight for longer periods of time and are stronger.

While I have illustrated my improved joints as employed in a bottle crate it will be understood that the invention has like advantages in other combination wood and metal structures.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. The combination, in a wood and metal structure, of a wood member formed with a substantially cylindrical counter-sink, a sheet metal member extending upon the outer surface of said wood member and formed with an offset normally fitting loosely in said counter-sink and adapted to be expanded radially to fit snugly therein and a fastening member connecting said members together and having a head engaging said offset for confining and expanding the same radially in said counter-sink.

2. The combination, in a wood and metal structure, of a wood member formed with a wide substantially cylindrical counter-sink to receive a rivet or the like, a sheet metal member formed with a cylindrical offset to fit in said counter-sink and a fastening member connecting said wood and metal members together and having a head engaging said offset, the diameters of said coun-

ter-sink and offset being substantially greater than that of said head.

3. The combination, in a joint for overlapping wood and metal members, of a wood member formed with a counter-sink, a cylindrical offset 5 formed in said metal member to fit in said counter-sink, said offset having a central opening to receive a fastening member, a resilient, normally reentrant and substantially conical portion of said offset surrounding said opening and normally spaced from said wood member in said 10 counter-sink and a fastening member in said opening and having a head confining said conical portion under compression in said counter-sink and expanding said counter-sink radially to fit 15 snugly therein.

4. The combination, in a joint for overlapping wood and metal members, of a wood member, a button-like offset formed in said metal member, 20 said offset having a central opening and said wood member being perforated in alignment with said opening to receive a connecting member, a

resilient, substantially conical reentrant portion of said offset surrounding said opening and normally spaced from the wood member and a connecting member extending through said opening and perforation and confining said conical portion under compression.

5. The combination, in a joint for overlapping wood and metal members, of a wood member, a button-like offset formed in said metal member and engaging said wood member, said offset having a central opening and said wood member being perforated in alignment with said opening to receive a rivet, a resilient, normally reentrant substantially conical portion of said offset surrounding said opening and normally in spaced relation to the wood member and a rivet in said opening and perforation and confining said conical portion under compression and in substantially flattened position against said good member.

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