

Cross-Grain Constructions

Four clever ways around problems

by Jim Cummins

Wood swells and shrinks in width and thickness as it absorbs and loses water according to the changing relative humidity of the air around it. But humidity hardly affects length at all. Therefore, any furniture construction that restricts wood movement by fastening one piece of wood cross-grain to another courts problems. Many old pieces built this way have cracked or warped because they couldn't withstand the drastic moisture changes caused by central heating. Contemporary builders can avoid cross-grain problems by using plywood and particleboard. Because of their balanced internal structure, both are very stable and may be glued "cross-grain" with impunity. Yet plywood and particleboard are not the most pleasant materials to work with, and they result in a contemporary look that's not always what a woodworker wants.

Modern solid-wood furniture usually leans toward the old designs and the old construction methods, making it prone to all the old problems. Yet ways have evolved to allow cross-grain movement while still using traditional design elements such as drawer runners and applied moldings. Typically, one piece is allowed to slip along the unmoving long-grain piece by means of sliding dovetails, screws fastened through slots rather than tight holes, or other devices (such as the buttons that hold tabletops to aprons) that allow movement without compromising strength.

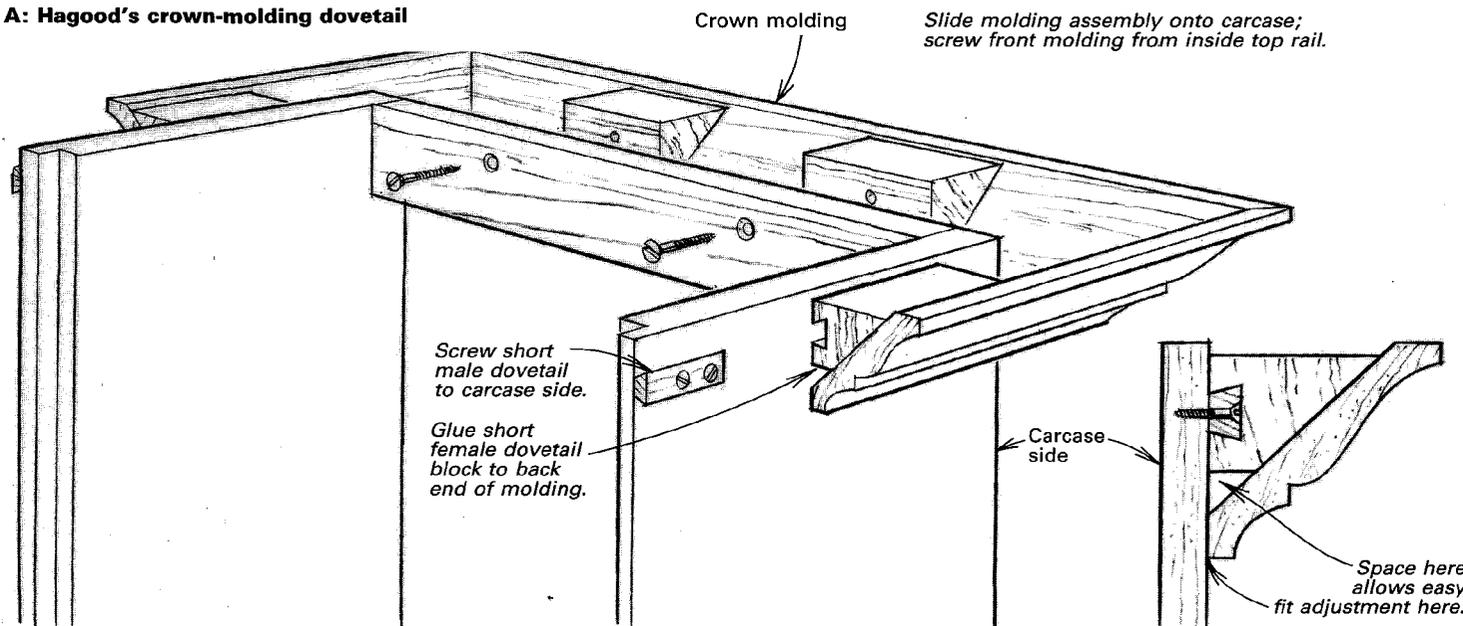
Many of these solutions are very familiar because they have

appeared in construction drawings for project after project. Here are a few less obvious ideas and embellishments that have recently come to our attention:

Tom Hagood of Birmingham, Ala., came up with a way to attach crown moldings, as shown in drawing A. The advantages are that it's relatively easy to make the joint using a router and dovetail bit, the applied dovetail piece replaces the screws-in-slots that would otherwise be visible inside the case and the molding may be easily removed if the piece has to be moved through doorways. Crown moldings typically leave a gap at the top between the molding and the case. This may be filled in with another strip of wood, but the usual treatment is to apply a solid top, with molded edges, that overhangs on front and sides, complementing the molding profile.

Walter Owens of Bloomington, Ind., routs full-width sliding dovetails to fasten drawer frames into carcasses, as shown in drawing B. The inherent problem with sliding dovetails is that friction increases as the joint is assembled, often to the point where things jam. There's further risk of breakage when attempts are made to disassemble the parts so the joint can be adjusted. In the old days, sliding dovetail joints were usually tapered: Assembly was easy until the joint finally wedged itself tight, hopefully at just the right position. Skilled use of specialized hand tools is required to fit one of these joints correctly. Owens' method solves the problem neatly by adapting a router jig to make a

A: Hagood's crown-molding dovetail



B: Owens's sliding dovetail

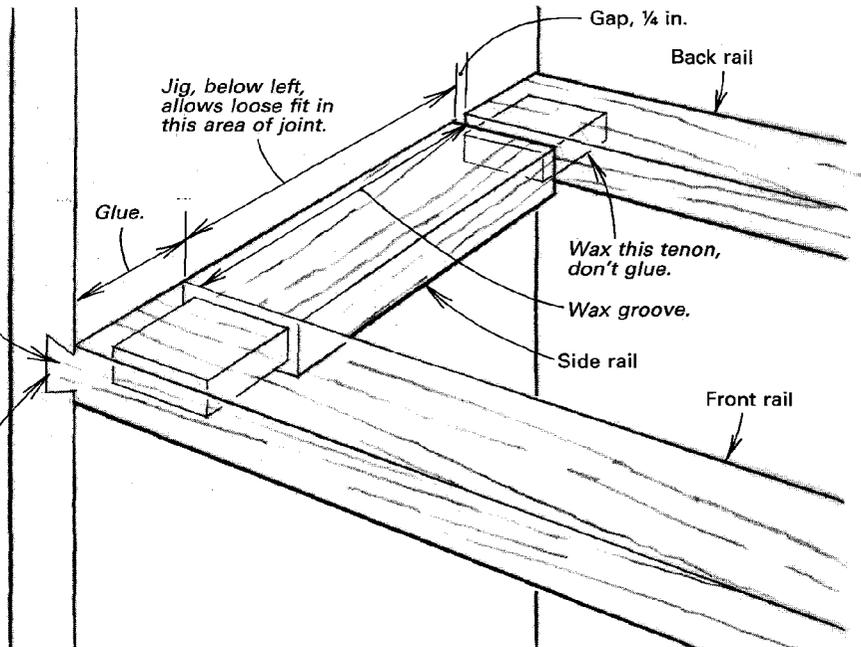
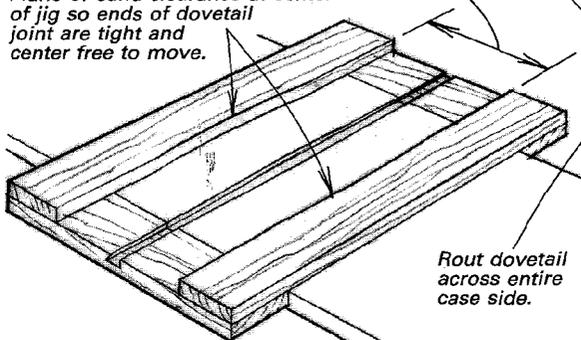
For assembly, first glue back rail in carcase; glue side rails to front rail out of carcase. Next wax middle of groove and slide side pieces into carcase, applying glue to front-rail dovetails just before it slides into place.

Cut male dovetail on router table with front and back rails dry-fitted to side rails.

Dovetail jig

Space jig rails for desired dovetail width.

Plane or sand clearance at center of jig so ends of dovetail joint are tight and center free to move.



dovetail that's tight at the ends, where the fit shows, and looser in the center, where movement is desired.

Norman Vandal of Roxbury, Vt., a contributing editor at *Fine Woodworking*, has come up with a trick of his own (drawing C). It requires a picture-frame-hanger bit (also known as a hang-slot bit) to rout a T-shape slot along the length of the drawer glide. This bit is normally used to plunge a hole in the back of a frame, and then to undercut it so that the frame may trap a nail head or screw head protruding the correct distance from the wall. (Hang-slot bits are available from most woodworking-supply companies.) Advantages are that the drawer guide rides in a simple dado rather than requiring a dovetail; the fit may be adjusted during assembly by adjusting the height of the screw heads, and after assembly, nothing shows.

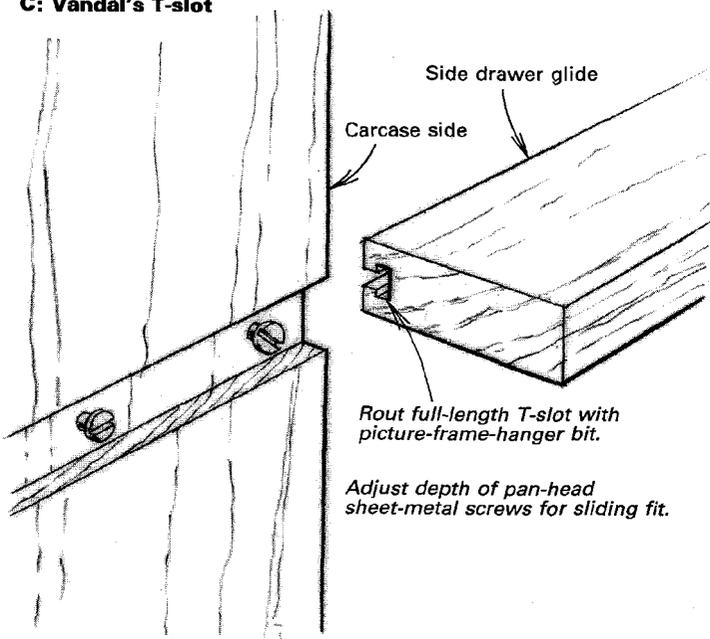
Our final cross-grain tip, at least for now, comes from Warren May of Berea, Ky., who is partial to a casework style he calls

"Kentucky." He wrote about constructing a quilt cabinet in this style and illustrated his router methods for straightforward joinery and assembly in *FWW* #57. In addition, May has devised a way to hold small applied moldings to case parts (drawing D). The miters at the front are glued tight, as is the front of the molding to the case. The back of the molding is secured with screws in slots from beneath or above, and these are hidden by other case members. May notes that this approach can work for attaching tiny transitional moldings as well.

These ideas prove that the visual appeal of traditional furniture designs doesn't have to be compromised simply because we choose to live in dry hotboxes all winter. No doubt more of these clever, slippery solutions are even now forming in the minds of creative woodworkers who want the best of both worlds. □

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C: Vandal's T-slot



D: May's molding trick

