

details of craftsmanship

cabinet construction that's **Built to Last**

Learn the time-tested techniques to frame & panel construction in solid wood.

Wood moves. That's a fact. No matter what you do, it's going to expand and contract with seasonal changes in humidity. So when building cabinets in solid wood, you need to account for wood movement in the design of the project and the joinery you use to build it.

FRAME AND PANEL.

One traditional way to deal with wood movement is to use frame-and-panel construction. Here, a solid-wood panel

is wrapped with a flat, rigid frame. The panel fits in grooves cut in the stiles and rails of the frame. But it isn't glued in place. Instead, the panel is cut a bit narrower than the opening and allowed to "float" in the grooves. This gives the panel a little breathing room to expand and contract without affecting the rest of the assembly. Don't get me wrong, the stiles and rails still do move. But since the parts are narrow, this doesn't amount to much.

RUGGED JOINERY. What this means is that the frame and its joinery are the key to keeping the assembly flat and rigid. The joinery has to have a lot of glue surface to be

strong enough to resist twisting and sagging (in the case of doors).

When deciding on what type of joinery to use, there are a couple of things to think about — the size of the frame and panel and its function. For example, the joinery on the small sides of a cabinet doesn't need to be as strong as the joinery for a large door. Depending on the project, I'll pick one of two joinery techniques — a stub tenon and groove or a mortise and tenon.

STUB TENON & GROOVE

The joint I use on small projects is the stub tenon and groove, as shown in the top drawing on the opposite page. And it's the direction we took when building the coopered door



cabinet. The cabinet sides are supported by the top, bottom, and back so they aren't under a lot of stress. What makes this joint perfect for this situation is that it provides a good amount of glue surface and it's easy to cut on a table saw.

GLUE SURFACE. For the strongest joint, I cut the grooves 1/2" deep. The stub tenons are then cut to fit. This gives you enough long-grain glue surface to create a surprisingly strong, long-lasting joint.

FITTING THE PANEL. There's one other thing to mention here. The stub tenons should fit snugly in the grooves, but the tongues on the panel should fit a little looser. You want the panel to fit tight enough so it doesn't rattle, but yet still move freely with changes in humidity. (To see a few ways to secure the panel and keep it centered, take a look at the box below.)

MORTISE & TENON

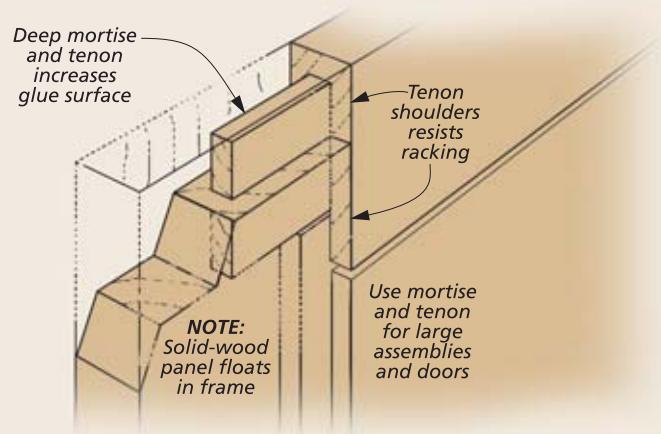
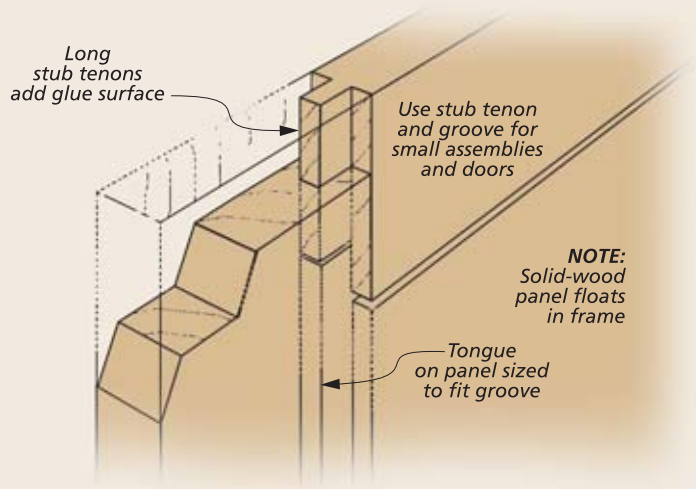
A stub tenon and groove works fine for small panels. But what about larger case sides and doors?

In these situations, the frame-and-panel assemblies may be unsupported (like a door) or be subject to more weight and greater abuse. To handle that, you'll want to beef up the joinery.

That's when I turn to the second joint — a mortise and tenon. This joint has a number of things going for it that makes it ideal for solid-wood construction. If you take a look at the lower drawing at right, you can see what I'm talking about.

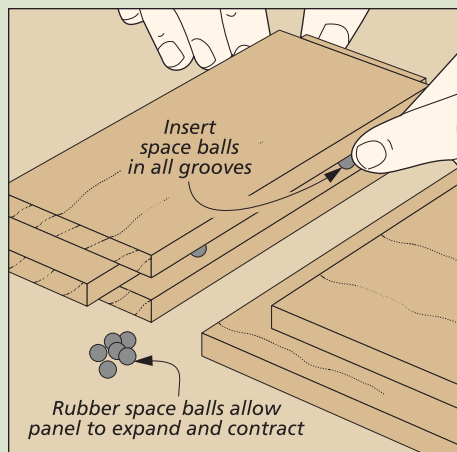
BUILT FOR STRENGTH. Like the stub tenon and groove joint, the panel is captured by grooves in the frame. But instead of relying on the stub tenons and grooves to hold the frame together, a deep mortise is cut on each end of the stiles and a matching tenon is cut on each end of the rails. This gives the frame a large glue surface that makes a big difference in keeping the frame rigid and square.

INTERLOCKING JOINT. A mortise and tenon joint provides a strong physical connection too. The shoulders of the tenon resist racking and twisting perfectly for large doors. And the interlocked parts can't slip apart and are able to support a lot of weight.

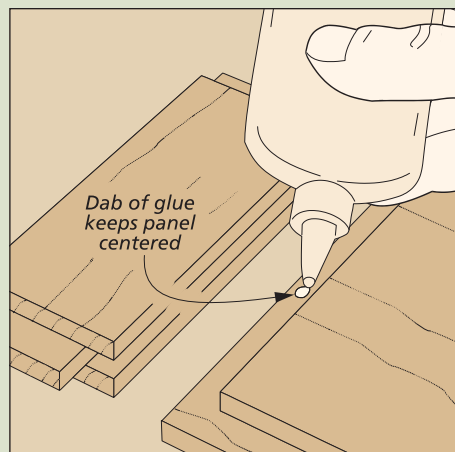


So all it takes are two basic joints and an understanding of how wood moves, to build strong, flat frames that will stay flat for decades to come. **W**

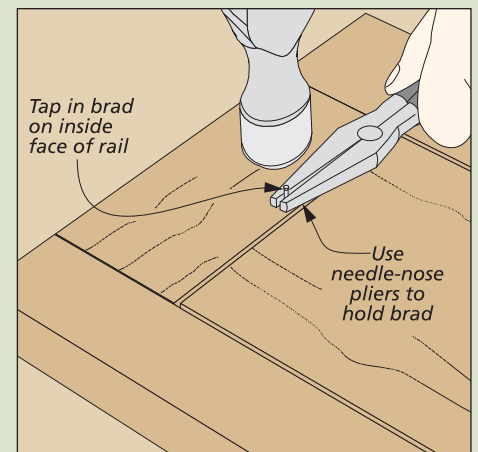
Shop Tip: "Locking in" Loose Panels



Space Balls. Place these soft, rubber balls in the grooves of the panel before assembly. They're firm enough to hold the panel in place, but soft enough to allow movement.



A Dab of Glue. Although you can't glue the entire panel in the frame, a "dab" of glue centered on the top and bottom of the panel will keep it from shifting around.



Wire Brad. Start by gluing the frame together. Then drive a brad through the top rail on the inside (so it won't be visible) to keep the panel centered.