

Build Your Own

Loose-tenon joinery and applied moldings keep door construction simple and strong

BY PAUL LEVINE

As a cabinetmaker, I build doors all the time. But when it came time to make doors for my house, I cringed. Full-size doors have little in common with their cabinet-size counterparts. They are thicker and heavier, requiring beefy joinery to stand up to the strain of their own weight, not to mention daily use. So after making the first of the 11 doors I needed, I realized that the joinery and assembly methods I was using were not going to fly. I agonized for a few weeks but finally came up with a good plan that didn't require special tools or processes.

A typical interior door is assembled with dowels, which provide lots of surface area for a strong glue bond, but the two-part setup of dowel jigs makes them fussy to work with. My design provides for just as much glue area as a doweled door, but it requires only one cutting operation instead of two. With one dado-blade setup, I can cut grooves to accept the loose tenons as well as the 1/2-in. plywood or medium-density fiberboard (MDF) used for the panels. The frames, panels, and tenons are then glued together. To eliminate fussy alignment work during glue-up, I let the stiles and tenons run long, then trim the door to size with a circular saw and edge guide once the glue has set up.

For about \$50 in materials (not including hardware), I can build thicker-than-average, paint-grade frame-and-panel doors, and I can customize them with my choice of molding. But one of the best things about this setup is the freedom to do what you want.

By substituting mahogany, for instance, for the frame and mahogany crotch veneer on the panels, you get a dramatically different door without really changing the process. □

Paul Levine is a cabinetmaker in Sherman, Conn. Photos by Justin Fink, except where noted.



1 The grooves that hold the panels and tenons all can be cut on a tablesaw with a stacked dado set to 3/8-in. width. By running both sides of each stile and rail against the rip fence, I can cut a perfectly centered groove 1/2 in. wide and 1 in. deep. I like to cut the grooves just a hair wider than the thickness of the panel, then cut the floating tenons to fit snugly.



2 I use a straightedge to make sure the door stays flat as clamps are tightened. I size stiles, rails, and tenons to let the door run long when it's assembled.

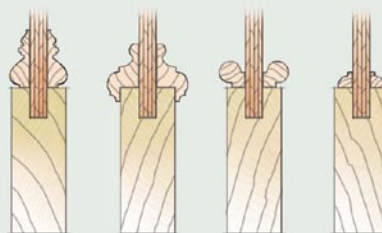


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ONE METHOD, COUNTLESS VARIATIONS

I built traditional paint-grade four-panel doors for my house, but the beauty of this method is that the same techniques can be applied to any design, using any type of wood, to achieve a custom look. Here are a few options.



Molding options

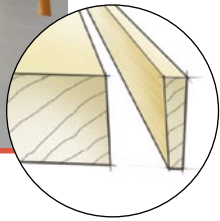


Panel-layout options

Interior Doors



3 After sanding both sides of the door flat with a belt sander (you can also pay a local millwork shop to run the doors through a wide belt sander), I trim the top and bottom of the door, then rip a 3° bevel on the strike-side stile.

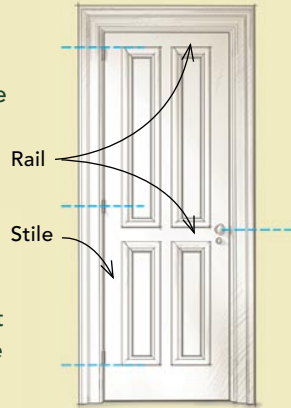


4 Rabbeted panel moldings are available, but stock molding from the local lumberyard or home center can be rabbeted on the tablesaw to fit the frame-and-panel door. Install the panel molding after you've finished routing the mortises for the lockset and hinges, and after you've cut the bevel for the strike side; these doors are too heavy to be riding across the tablesaw on their moldings.



PLAN FOR THE HARDWARE

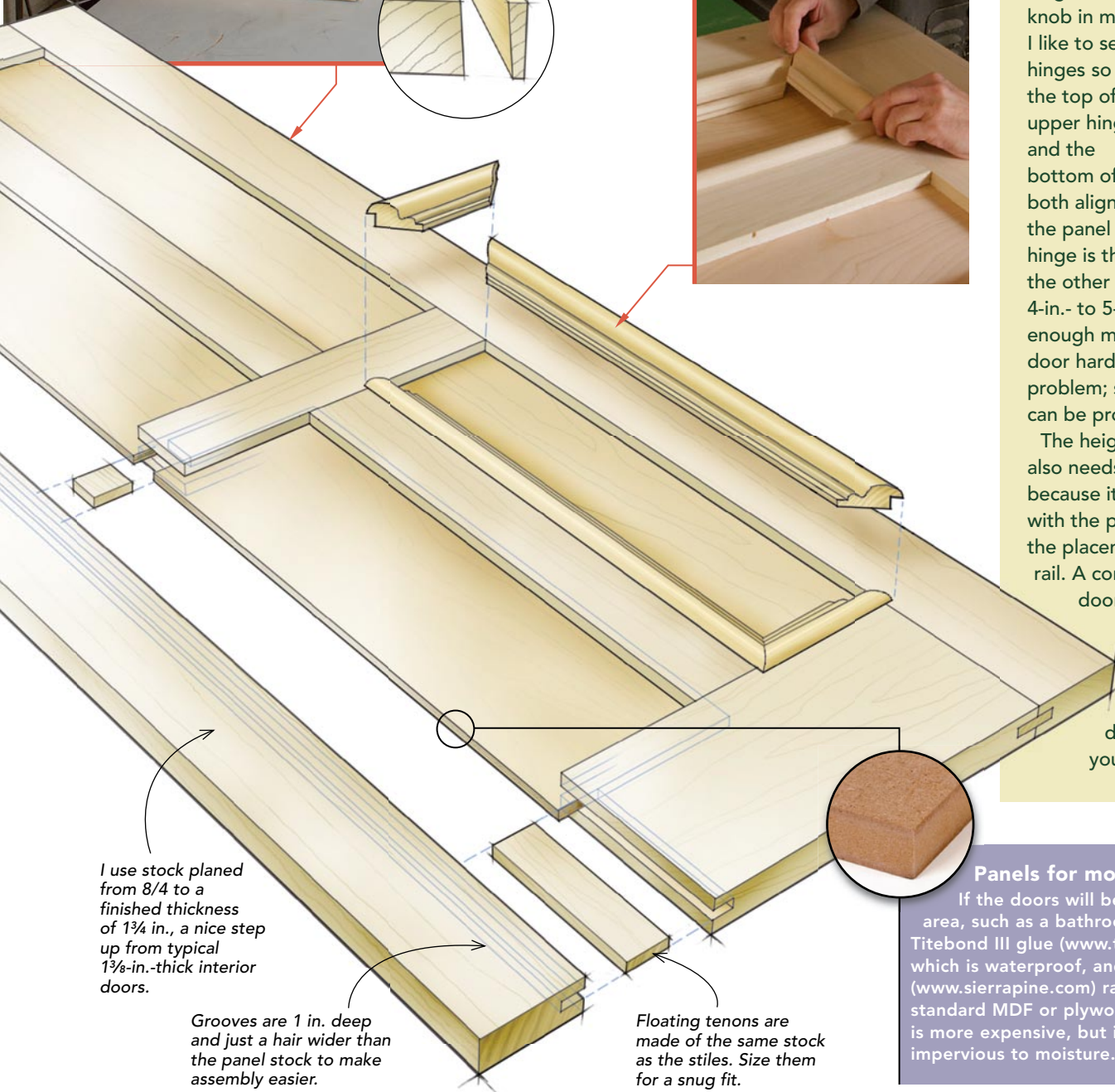
As shown in the drawing below, I size and locate the components of the door with the hinges and knob in mind. I like to set hinges so that the top of the upper hinge and the



bottom of the lower hinge are both aligned with the edges of the panel molding. The middle hinge is then centered between the other two. I've found that a 4-in.- to 5-in.-wide stile has enough meat to carry most door hardware without a problem; stiles smaller than that can be problematic.

The height of the knob also needs to be considered because it could interfere with the panel molding or the placement of the middle rail. A comfortable height for doorknobs is between

36 in. and 39 in. from the floor, but it's usually best to match the existing doors in your house if you're not sure.



I use stock planed from 8/4 to a finished thickness of 1 3/4 in., a nice step up from typical 1 3/8-in.-thick interior doors.

Grooves are 1 in. deep and just a hair wider than the panel stock to make assembly easier.

Floating tenons are made of the same stock as the stiles. Size them for a snug fit.



Panels for moist areas

If the doors will be in a moist area, such as a bathroom, I use Titebond III glue (www.titebond.com), which is waterproof, and Medex (www.sierrapine.com) rather than standard MDF or plywood. Medex is more expensive, but it is almost impervious to moisture.