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Craftsman Clock

In this plan you will be getting:

- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.



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Craftsman Clock

Sloping sides, exposed box joints and a deeply overhanging top are all classic elements of Craftsman styling, even though our clock is an invented design. Select some heavily figured quartersawn white oak for your clock to add the crowning touch.

The styling of this clock is loosely based on designs from the Arts & Crafts period. Not a specific reproduction of any particular clock, the final look emerged from some sketches and a little recomposing at the bench.

Our author actually made two versions of this mantel clock: one from leftover teak flooring, and the other from four old bed slats cut from quartersawn white oak. While teak was not a wood typically used during the Arts & Crafts movement, that clock fits right into his Scandinavian style dining room.

Design Issues to Consider First

Clock construction necessarily begins with selecting the clock face and movement first, then sizing the carcass and face frame to fit. Our author hand-painted the face shown here. If you'd rather buy a face, you may need to resize some of part dimensions in the *Material List* to fit the face you buy (see page 81). As far as the clock movement goes, today's quartz movements are an excellent choice. They require little maintenance beyond a yearly battery change. They're also quite accurate, adaptable and inexpensive.

The face frames of this clock are central to its design and construction.

They establish the angle of the case sides, serve as the hinge frame for the doors and display the best qualities of the wood selected. For these reasons the joinery needs to be clean and predictable. If the rails and stiles are not flush and true, the clock's small scale leaves little room for correction.

To join the face frames and doors, we'll use thin loose tenons. The carcass sides have decorative box joints at the top of the case, and shallow hidden dadoes accept the carcass bottom. Basic joinery combines for a beautiful clock case.

Preparing Stock

Begin work by taking all the stock required for the clock down to a consistent 1/2" thickness. Surfaced material bought at the lumberyard may vary by up to 1/16". If you do not have access to a thickness planer, you should keep this in mind.

With the dimensioned stock in hand, decide where to best use the most attractive pieces. Then cut the face frame rails and stiles (pieces 1 through 3) for the front and back frames. They should be cut to exact length at this time, but don't cut the tapers for the stiles just yet. That task is



Two "L"-shaped fixtures can hold the door and face frame components securely for routing the "skinny" face frame mortises.

more easily dealt with after joining.

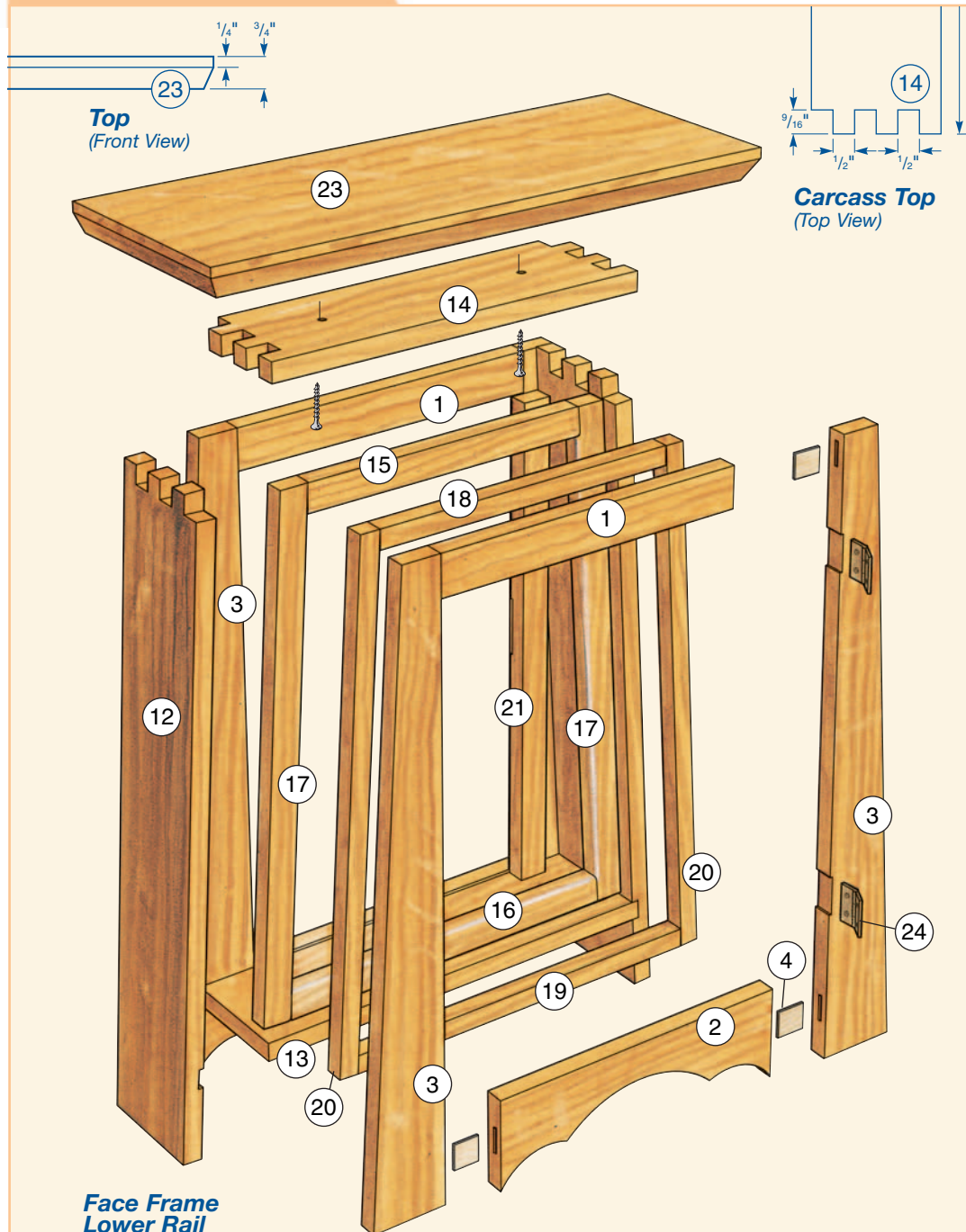
It's a good idea to mark where all the pieces will mate. Use matching numbers at the joints and an arrow that points to the inside plane of the face frame to keep everything clear.

Milling Skinny Mortises

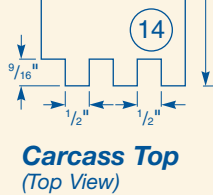
Time to lay out the start and stop marks for the mortises. Because the stock is just 1/2" thick, we'll use 1/8" thick loose tenons (pieces 4). Thin mortises will allow for 3/16" of material on either side of the tenon.

To hold and register the stock

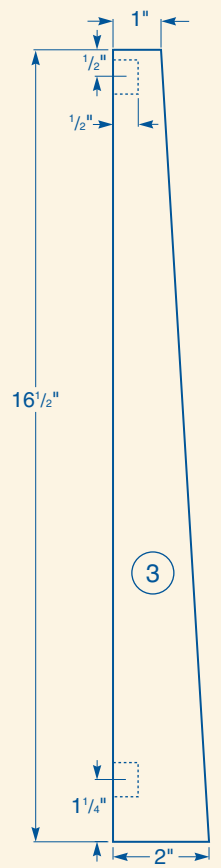
Clock Exploded View



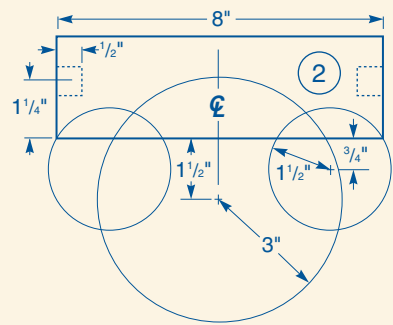
Top
(Front View)



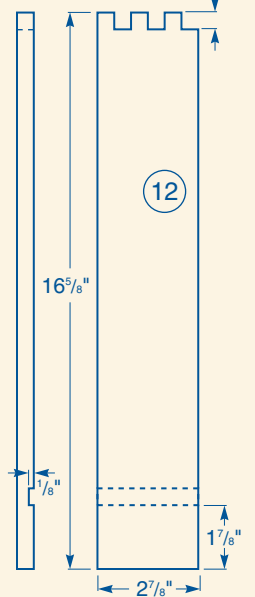
Face Frame Stile
(Front View)



Face Frame Lower Rail
(Top View)

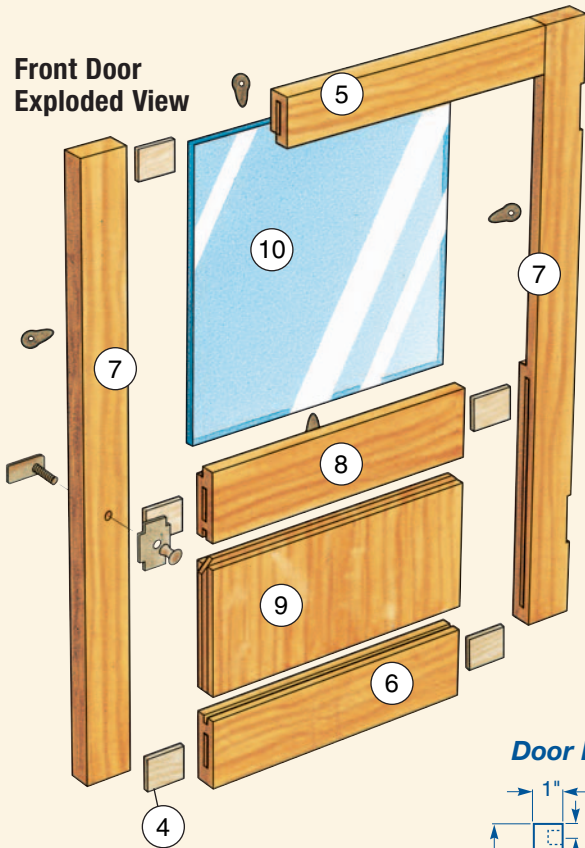


Carcass Side
(Inside View)

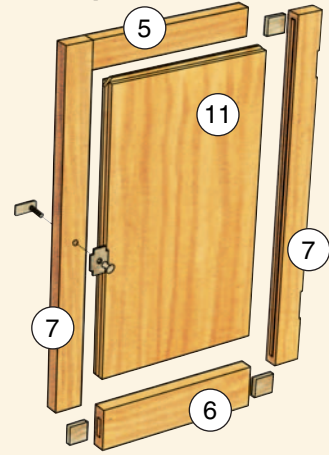


The dado above is plowed at a 4° angle. Be sure you make a left and right side.

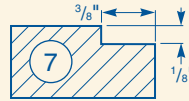
Front Door Exploded View



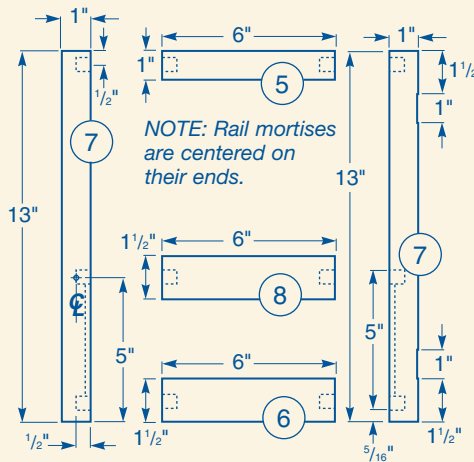
Back Door Exploded View



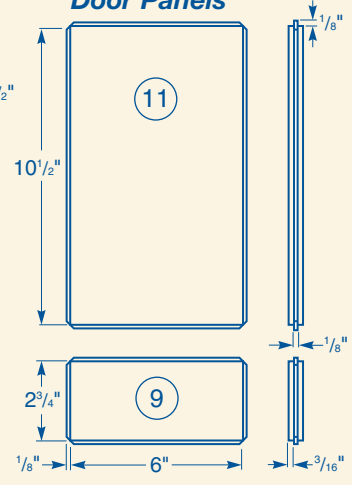
**Rabbet for Glass Panel
(Section View)**



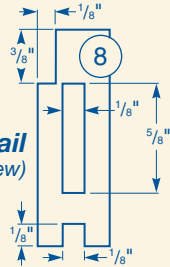
Door Frame Components



Door Panels



**Center Rail
(End View)**



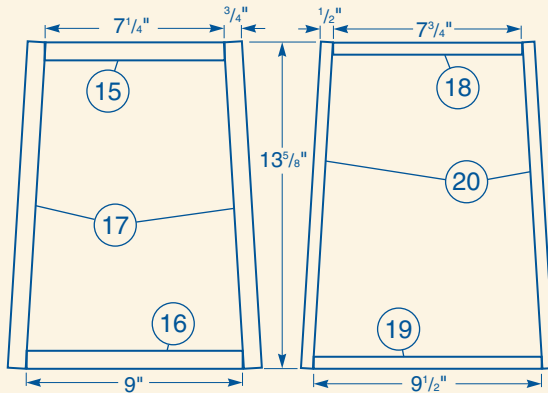
MATERIAL LIST – Carcass/Face Frame

	T x W x L	T x W x L	
1 Face Frame Upper Rails (2)	1/2" x 1" x 8"	8 Front Door Middle Rail (1)	1/2" x 1 1/2" x 6"
2 Face Frame Lower Rails (2)	1/2" x 2 1/2" x 8"	9 Front Door Lower Panel (1)	1/2" x 6 1/4" x 3"
3 Face Frame Stiles (4)	1/2" x 2" x 16 1/2"	10 Front Door Glass Panel* (1)	1/8" x 6 5/8" x 6 5/8"
4 Loose Tenons (18)	1/8" x 5/8" x 1"	11 Rear Door Panel (1)	1/2" x 6 1/4" x 10 3/4"
5 Door Upper Rails (2)	1/2" x 1" x 6"	12 Carcass Sides (2)	1/2" x 2 7/8" x 16 3/8"
6 Door Lower Rails (2)	1/2" x 1 1/2" x 6"	13 Carcass Bottom (1)	1/2" x 2 7/8" x 10 3/4"
7 Door Stiles (4)	1/2" x 1 1/16" x 13"	14 Carcass Top (1)	1/2" x 2 7/8" x 9 7/8"

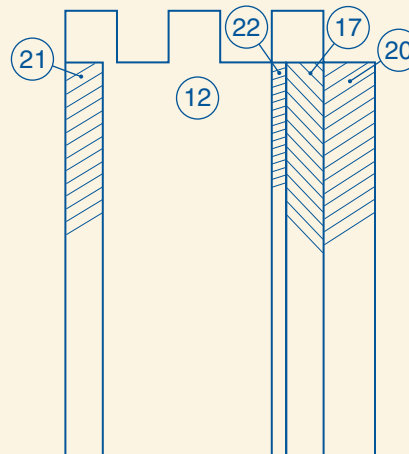
*Purchase after door frame is made.

Technical Drawings

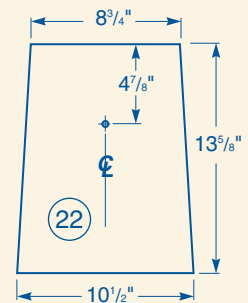
Inner Frame Assemblies



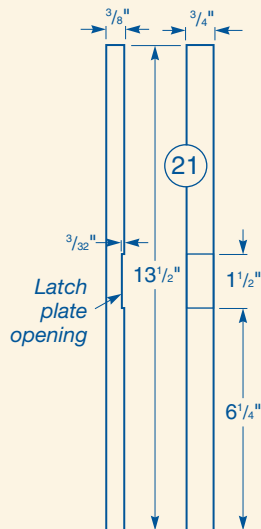
Inner Frame Locations



Clock Face (Front View)



Back Door Stop (Front and Side Views)



MATERIAL LIST – Face Frame/Trim

	T x W x L
15 Clock Face Frame; Top Rail** (1)	3/8" x 3/4" x 7 5/8"
16 Clock Face Frame; Bottom Rail** (1)	3/8" x 3/4" x 9"
17 Clock Face Frame; Stiles** (2)	3/8" x 3/4" x 13 7/8"
18 Inner Trim Frame; Top Rail** (1)	1/2" x 1/2" x 7 7/8"
19 Inner Trim Frame; Bottom Rail** (1)	1/2" x 1/2" x 9 5/8"
20 Inner Trim Frame; Stiles** (2)	3/8" x 1/2" x 13 7/8"
21 Back Door Stop (1)	3/8" x 3/4" x 13 1/2"
22 Clock Face (1)	1/4" x 10 1/2" x 13 5/8"
23 Top (1)	3/4" x 5 1/2" x 14 3/8"
24 Door Hinges (2)	1" x 1" Brass

**Trim to fit inside of carcass.

during routing, make a simple routing jig like the one shown in the *photo* on the previous page. A pair of "L" shaped fixtures will allow room beneath the guide/support member for clamping. Clamp the whole assembly into a bench vise for stability. Be certain to mark one side of the fixture for registration. This is important as it provides a fixed distance from the same edge.

Use a 1/8" up-spiral plunge bit and a gentle feed rate to cut the mortises.

While the bit is not removing much material, the bit itself is somewhat slender and fragile. Plunge the "stop" cut first, followed by the "start" cut, then clean out the material in between, plunging no deeper than 1/8" per pass.

Forming Loose Tenons

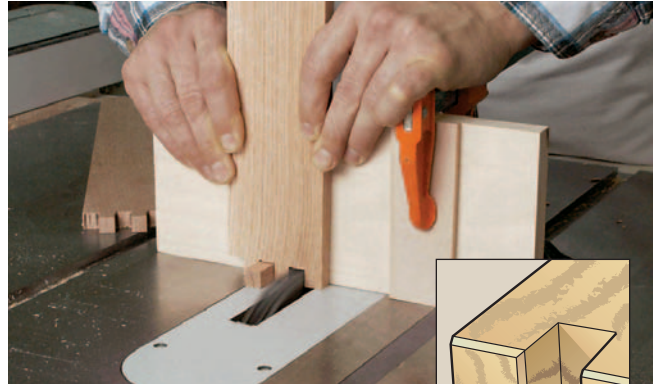
Dimensioning the loose tenons is relatively simple at the table saw. Use stock wide enough that the tenons can be ripped safely and cleanly from the

outside of the blade. The loose tenons should fit into the mortises with no more than finger pressure.

Once the loose tenons are cut to size and the face frames dry-fitted, lay out and cut the front and back door stock (pieces 5 through 11). There are rabbets for the glass panel and grooves for the back door panel to cut and plow. Refer to the *Elevation Drawings* on page 77 for construction details. We used a 1/8" slotting bit with a bearing at



To help form the box joints, attach a simple fence with a registration key to your miter gauge. Always test your cuts on scrap. This setup will generally require some fine-tuning for proper alignment.



The carcass top's box joints stand a bit proud and are slightly chamfered for a decorative touch.

the router table to cut the channel for the door frame panels. Because the panels are flush with the frames, make the cuts as close to the centers of the 1/2" stock as you can. After slotting the pieces with all registration marks facing down on the table, flip the pieces and run them through the slotting bit again to center them. Make the door assem-

blies 1/32" oversize—it's easier to plane them slightly for a snug fit than it is to get lucky with a glue-up that produces a clean and even reveal all around.

Building the Clock Carcass

Like the face frames and the doors, the carcass of the clock (pieces 12 through 14) is made from 1/2"

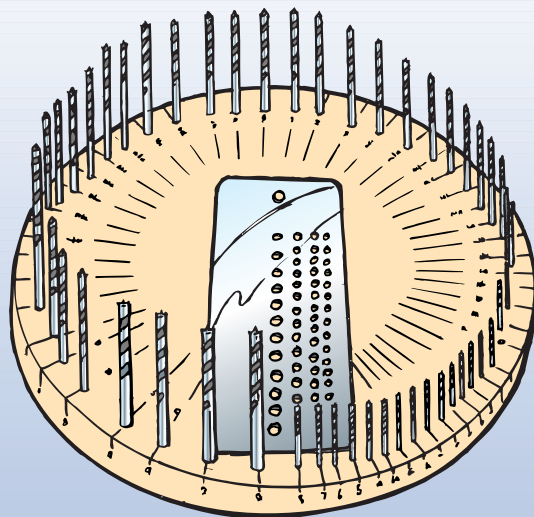
stock. Box joints are used at the top of the case—not so much for strength as for visual detail. Cutting the fingers a bit long on the carcass top allows them to protrude just a hair and to be slightly chamfered.

The bottom of the clock (piece 13) is joined to the sides with an angled dado joint. Remember when cutting

QuickTip

Spin for a Drill Bit

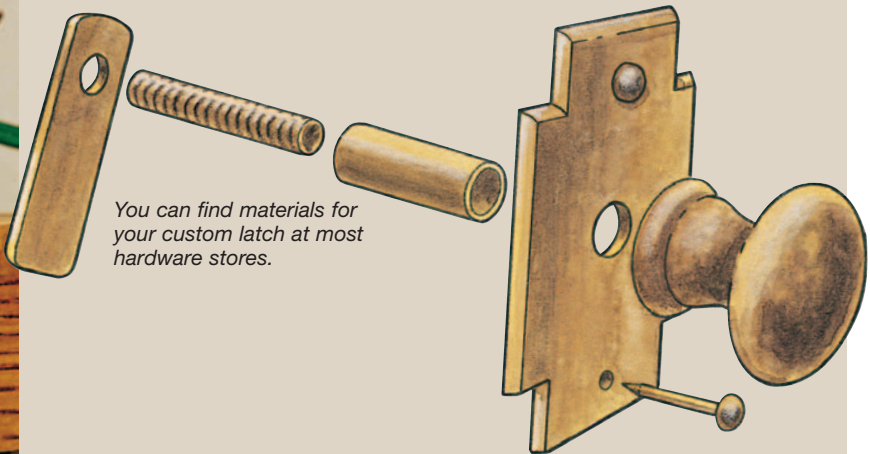
Here's a drill bit holder design that makes it easy to pick out any bit with a spin. Mount a circular piece of plywood to a lazy Susan mechanism. Drill a series of stopped holes around the perimeter of the plywood first to match each bit diameter you own. Mark the plywood on the face and edge as well to indicate sizing. Now it's easy to find the right bit for the job with a spin of the wrist. You might even want to make several of these drill bit holders for each bit type you own—brad point, twist, Forstner, and so forth.



MAKING YOUR OWN KNOB & LATCH



The author made his own hardware for this clock from some common metal supplies. Other pre-made door latches would also work here.



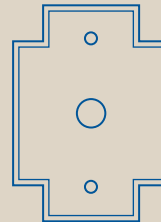
You can find materials for your custom latch at most hardware stores.

Full-size Knob and Latch Elevations

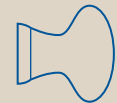
Latch Plate
(Front View)



Base Plate
(Front View)



Knob
(Side View)



Door hardware is a matter of taste. For our author's first (teak) clock, he used a small brass knob treated with steel wool and gun bluing and a small magnet for a catch. This is a good option if you'd rather not make your own knob and latch. For this version of the clock, he wanted a custom fix to the catch situation. With a bit of threaded rod, a knob, a short length of tubing and some scraps of brass, he made a knob-operated catch. The tools required

are common to most home shops. Solder the latch plate to the threaded rod, which screws into the knob. Use the brass tubing as a race so the knob/rod assembly can turn freely. The base plate is a small piece of brass trimmed and drilled for rod access and the mounting brads. Making your own hardware can be fun. But like the clock face, don't let it be an obstacle to building the project.

the dado in each side that the angles measure the same, but they are opposite in orientation.

Before moving on to assembly, mill the two interior frames (pieces 15 through 20) and test-fit them inside the carcass. (Make sure their combined width accommodates the shaft of your clock movement.) The bottom rail of the trim frame (piece 19) also serves as a door stop, but the back door stop (piece 21) stands alone and is glued to the inside of the rear face frame's stile.

Assembling the Parts

With the frames, doors and carcass all cut and jointed, mark the tapers for the sides of the face frames. Cutting them now, after mortising them, lessens the chances for a misstep. Use your band saw to make these cuts, then mount pairs of them together in a bench vise for cleanup and to ensure that the part sizes match. It's a good idea to generally stay a blade width or so off the layout line and plane down to the mark. Once all four stiles are

smooth and identical in angle, glue up the face frames.

After the face frames have cured, there is scrollwork to be done on the bottom rail. Deferring this work until after the face frame is glued provides a little extra support to the bottom edge of the rail where it meets the stiles. The face frames are now ready for sanding.

With the face frames, doors and case glued, the next consideration is the face of the clock (piece 22). Our author used a 1/4"-thick panel of

Masonite that he painted with gesso after cutting it to fit the opening of the case. (Gessoed panels are also available at art supply stores.) Onto this panel he laid out a clock face that he generated on the computer. After darkening the outlines of the numerals and the time rings, he carefully over-painted with gouache and then drilled the center hole for the clock shaft.

Editor's Note: If you'd prefer not to go to the effort of making a custom clock face, you can simply purchase one instead. Several suppliers, including Klockit (www.klockit.com), offer inexpensive Arts & Crafts-style paper clock faces that can be used for this project. However, don't make the mistake of building the entire project before finding a face to fit it. Find and buy the face first, then adjust the *Material List* part dimensions as needed to suit the face you plan to use.

Once the clock face panel is complete it is ready to mount into the clock face frame, which is positioned directly



Painting the clock face's numerals and dial details adds a degree of custom artistry you may want to try. Otherwise, you can buy a printed face and save yourself some effort.

behind the trim frame. Sink four screws through the panel and into the clock frame to mount the panel.

With the face mounted inside the case, the clock is ready to receive the face frames, both front and back. We found that it's much easier to glue one frame to the case at a time. Then mount the top (piece 23) to the case with two screws driven through the inside of the case's top and into the top piece itself.

To hang the doors, our author used 1" x 1" hinges (pieces 24). He didn't like their bright brass look, so he rubbed off the protective finish and then darkened them with some touch-up gun bluing.

Another option is to buy hinges with an antique brass or wrought-iron finish, which will look appropriate here.

Finishing Touches

Sand the entire clock up to 220 grit and then apply a golden high-luster stain. Three coats of medium-luster polyurethane with a light sanding between the coats will seal the deal. Use small glass retainers to secure the glass panel, and mount the quartz movement following the manufacturer's instructions. Now all you need is a suitable mantel and a cup of tea to enjoy watching the hours tick away.

QuickTip

Understanding Moisture Content

The moisture content of wood is measured in terms of weight: the weight of the water versus the weight of the wood. On average, the ideal moisture level for stock you use for furniture and cabinetry should be around 7 to 10%; that is, the moisture in the wood should weigh 7 to 10% of what the wood weighs. Freshly cut green wood can have a moisture level as high as 200%. In that case, the moisture weighs twice what the wood alone weighs. The only way to accurately know how "wet" the wood actually is is to test it with a moisture meter, taking a reading from the center area of the board and in a few inches from an end. Since most of us don't own one of these rather expensive meters, you'll have to trust your lumber supplier. Most suppliers will readily tell you their standards for lumber dryness, and some will test the wood in your presence before you buy.