ROCKING CHAIR

This oversized rocker has classic lines and a comfortable leather seat.

BY NEAL BARRETT

There was a time, not so long ago, when rocking chairs could be found in just about every home. There were rockers for the porch or the parlor, rockers for a bedroom or nursery, and sometimes even rockers in the kitchen. Although these chairs may have been used in slightly different ways, they did share one common attraction: that gentle, soothing motion that brought a sense of peace and calm to anyone sitting in the chair. These old rockers were often the favorite seats in the house, and it is surprising how often our modern homes are furnished without one.

The Arts & Crafts-style rocker that we built is a synthesis of several traditional designs. The proportions of the chair are generous, both in seat size and in the massiveness of the chair parts, giving the feeling of a traditional armchair. The upholstered leather seat is soft and inviting, and the deeply contoured back provides comfortable support. While the techniques required to build this chair are beyond those of a beginning woodworker, a serious home craftsperson should not find this project too difficult.

The chair is constructed of 4/4, 5/4 and 8/4 quarter-sawn white oak, which was the most common material used for Arts & Crafts furniture. If you have trouble locating quarter-sawn material, there are mail-order suppliers who will ship lumber anywhere in the country. Two of them are Good Hope Hardwoods Inc., 1627 New London Rd., Landenberg, PA 19350; and Talarico Hardwoods, Rd. No. 3, Box 3268, Mohnton, PA 19540.

1--Glue up the stock for the rockers. Then make a template for the rocker shape and trace its outline onto the rocker blank.

Getting started

Since the rockers are the heart of any rocking chair, they are the logical place to begin. Cut six pieces of 13/16-in.-thick stock, each about 6 in. wide x 38 in. long. Apply glue to the mating faces of the boards, and assemble them into two blanks of three boards each. Clamp the blocks together until the glue sets.

It's important that the finished rockers have identical shapes with a smooth curve. The best way to ensure this is to work from a template. Transfer the rocker shape onto a piece of 1/4-in.-thick plywood or hardboard. Then, carefully cut the template to size with a band saw or sabre saw. Use a rasp or plane to adjust the template until it is perfect, then use it to trace the shape onto each rocker blank

2--Cut the profile of the rocker on a band saw and clamp the rocker in a vise. Smooth the shape with a spokeshave.

Use a band saw to cut the bottom profile of each rocker, staying just to the waste side of the layout line. Clamp the blank between bench dogs, then use a sharp block plane to refine the profile. Cut the top profile of the rockers, then use a spokeshave to smooth the resulting curve.

Legs and rails

Cut blanks for the rear legs from 8/4 stock, then trace the leg profile on each blank and use the band saw to cut the legs.

Remember to stay to the waste side of the layout line. Use a block plane to remove the saw marks and finish shaping the legs. Rip and crosscut the front leg posts to rough length as shown in the plan. Note that all legs will be cut to final length after assembly, because they must be fit to the curve of the rockers.

Lay out the mortise locations in the leg posts. The front and back seat rails are joined to the posts by traditional mortise-and-tenon joints. Since the side rails join the posts at an angle, we used loose tenons to make these joints, simplifying the joint-cutting process and still yielding a strong connection between the parts.

The easiest way to cut the mortises is to use an up-cut spiral bit in the plunge router with an edge guide to register the cuts. Clamp a leg blank between bench dogs and make several passes to cut the mortises to finished depth.

These mortises are 1/16 in. deeper than the corresponding tenons to allow for excess glue at the bottom of the joint.

The mortises that house the loose tenons can retain their rounded ends since it is simple to shape those tenons to match. The mortises for the front and back rails, however, should be cut square at each end to match the normal tenon profile. Use a sharp chisel to make these cuts.

Cut the front and back rails to finished size, then use a dado blade in a table saw to cut the tenons on the rail ends. After making the cheek cuts, readjust the blade height and cut the top and bottom shoulders on the tenons.

Next, cut the 30 degrees chamfer along the top edge of the front seat rail using a table saw or a router with chamfer bit. Then, rip the side rails to width and cut them to length with the appropriate angled cuts.

In order to cut the mortises for the loose tenons in the ends of the side rails, you will have to provide an auxiliary support for the router base. Since the

3--Make a template for the shape of the back legs and trace it onto the leg stock. Cut along the outline with a band saw.

4--Lay out the mortises in the legs and use a plunge router with an edge guide and an up-cut spiral bit to make the cuts.

5--Cut the tenons on the front and back seat rails using a dado blade in a table saw. Smooth the cuts with a sharp chisel.

at least 2 in. thick x 4 in. wide x 16 in. long. Clamp this piece flush to the end of the railto both support the router base and provide a registration surface for the edge guide. Make two or three passes to achieve the finished mortise depth.

Cut two lengths of 3/8-in.-thick stock for the loose tenons. Rip one piece 1 1/2 in. wide and the other 4 in. wide, then use the miter gauge on the table saw to cut the tenons to length. Note that the grain of the tenons must run perpendicular to the joint to provide adequate strength. Clamp each tenon in the bench vise, then use a rasp to shape its top and bottom ends to fit the mortise .

6--Cut the mortises for the loose tenons on the side rails using a router and edge guide. Clamp a block in place for support.

7--Cut the loose tenons to size on the table saw. Then use a rasp to shape the ends of the tenons to fit snugly in the mortises.

Slats and arms

Legs and rails

Cut blanks for the rear legs from 8/4 stock, then trace the leg profile on each blank and use the band saw to cut the legs.

Remember to stay to the waste side of the layout line. Use a block plane to remove the saw marks and finish shaping the legs. Rip and crosscut the front leg posts to rough length as shown in the plan. Note that all legs will be cut to final length after assembly, because they must be fit to the curve of the rockers.

Lay out the mortise locations in the leg posts. The front and back seat rails are joined to the posts by traditional mortise-and-tenon joints. Since the side rails join the posts at an angle, we used loose tenons to make these joints, simplifying the joint-cutting process and still yielding a strong connection between the parts.

8--Clamp the side rails to the bench to route the mortises for the side slats. Support the router with scrap blocks.

The easiest way to cut the mortises is to use an up-cut spiral bit in the plunge router with an edge guide to register the cuts. Clamp a leg blank between bench dogs and make several passes to cut the mortises to finished depth.

These mortises are 1/16 in. deeper than the corresponding tenons to allow for excess glue at the bottom of the joint.

The mortises that house the loose tenons can retain their rounded ends since it is simple to shape those tenons to match. The mortises for the front and back rails, however, should be cut square at each end to match the normal tenon profile. Use a sharp chisel to make these cuts.

Cut the front and back rails to finished size, then use a dado blade in a table saw to cut the tenons on the rail ends. After making the cheek cuts, readjust the blade height and cut the top and bottom shoulders on the tenons.

Next, cut the 30 degrees chamfer along the top edge of the front seat rail using a table saw or a router with chamfer bit. Then, rip the side rails to width and cut them to length with the appropriate angled cuts.

In order to cut the mortises for the loose tenons in the ends of the side rails, you will have to provide an auxiliary support for the router base. Since the rail ends are cut at a 4 degrees angle, you can rip the same angle along the edge of a piece of stock at least 2 in. thick x 4 in. wide x 16 in. long. Clamp this piece flush to the end of the railto both support the router base and provide a registration surface for the edge guide. Make two or three passes to achieve the finished mortise depth.

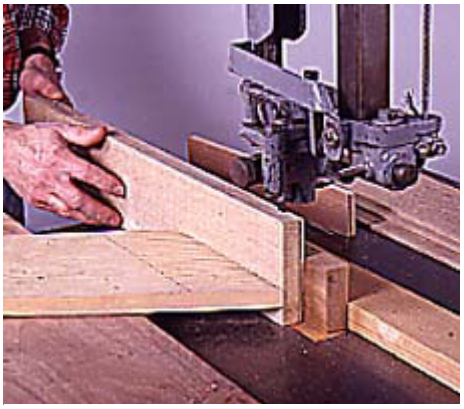
Cut two lengths of 3/8-in.-thick stock for the loose tenons. Rip one piece 1 1/2 in. wide and the other 4 in. wide, then use the miter gauge on the table saw to cut the tenons to length. Note that the grain of the tenons must run perpendicular to the joint to provide adequate strength. Clamp each tenon in the bench vise, then use a rasp to shape its top and bottom ends to fit the mortise .

Slats and arms

Rip and crosscut 5/16-in.-thick stock for both the side and back slats. Then, lay out the mortises for the slats in the side rails. Clamp a rail between bench dogs and use the router to cut the mortises. Be sure to support the router base by clamping two or three boards to the side of the rail. When you cut the end mortises, adjust the support boards so that they extend several inches past the end of the rail Square the ends of the slat mortises with a sharp chisel.

9--Lay out the notch at the back of the arms that fits around the back legs. Using a backsaw, carefully cut out the waste.

10--Assemble each chair side and mark where the leg tenon meets the arm mortise. Cut each leg 1/8 in. longer than the mark.



11--Use a band saw with a rip fence and fingerboard to cut the 1/8-in. oak strips for the outer layers of the back rails.

through tenons on the end of the front leg posts. Cut these tenons 1/4 to 3/8 in. longer than the finished dimension.

Next, cut blanks for the chair arms from 1-in.-thick stock. Make a template for the arm shape from 1/4-in.-thick plywood or hardboard, then trace the shape onto the arm blanks. Use the band saw or sabre saw to cut the arms to shape (except for the notch that fits around the back leg post). Keep in mind that the cut that fits against the front side of the back leg must correspond to the angle of the leg. Clamp the arm in the bench vise and use a hand saw to make the cuts .

Lay out the through mortises in the chair arms, scribing the outlines of the mortise with a sharp knife. Next, drill a 1-in.-dia. hole through the armÂ–centered in the mortiseÂ–to remove most of the waste. Complete the mortise by chopping out the waste with a sharp chisel. Test the fit of the tenon in the mortise, and adjust as required.

Dry assemble a chair side, holding the parts together with clamps. Slip an arm over the appropriate through tenon and mark the tenon at the point that it protrudes through the arm. Disassemble the side and cut the tenon 1/8 in. beyond the mark. Use a sharp chisel to chamfer the end of the tenon 1/8 in. on each side.

Back rails

The back rails of the chair are formed by laminating strips of oak to achieve the necessary curved profile. The outer surfaces of the rails must match the quarter-sawn material of the rest of the chair, so these layers are sawn from a piece of quarter-sawn stock. Rip one piece of 13/16-in.-thick stock 3 3/4 in. wide and one piece 3 in. wide. Then crosscut them both to 24 in. long. Clamp a tall fence to the band saw table to resaw 1/8-in.-thick strips, one from each side of both these boards. When laminating the rails, place the smooth side of these strips toward the center of the rail, to present a better gluing surface.

For the sake of economy, and to make the job easier, we used 1/16-in.-thick white oak veneer for the inner plies of the rails. The combination of two outer layers 1/8 in. thick and seven inner layers 1/16 in. thick yields a perfect 13/16-in.-thick rail. (This veneer is available from a number of mail-order suppliers. We used Certainly Wood, 11753 Big Tree Rd., East Aurora, NY 14052.)

The forms for gluing up the back rails are fabricated by stacking up five layers of 3/4-in.-thick MDF (medium-density fiberboard) or particleboard. You'll need a panel at least 28 in. wide x 64 in. long. When cut, each set of forms should measure 24 in. wide x 12 in. long.

12--Make a trammel base and attach it to the bottom of your router. Use it to cut a pattern for the back rail bending forms.

13--Cut the stock for the bending forms to rough size. Then cut it to finish size using the pattern and a flush trimming bit.

14--Apply glue to the pieces that make up the back rails. Then place them between the bending forms and clamp them tight.

Begin by generating the appropriate curve, using our drawing as a guide. Then, construct a trammel base for the router and install a 13/16-in.-dia. straight bit in the router collet . Measure from the inside edge of the bit to a point 23 in. down the trammel and bore a 3/8- in.-dia. hole. Then place the trammel on the form stock, bore a corresponding hole in the form panel and pin the two together with a short length of 3/8-in. dowel. Make a series of router passes along this arc until you have cut through the stock. Be sure to leave some material uncut at both ends of the arc so that the 13/16-in. space is maintained. When the routing is done, cut the two arc shapes from the form stock. These two pieces will be the first layers of the male and female forms for your rails. Then trace these shapes onto the additional form material and rough-cut the other layers to within 1/4 in. of the finished shape. Add one layer at a time to the form with screws, then use a flush cutting bit in the router to trim it to shape . When all five layers are added to each form, place alignment lines across the forms to keep both sides properly oriented during glue-up. Apply two coats of wax to the inner surfaces of the forms to keep glue from sticking to them.

Use a short-nap roller to spread glue on the mating surfaces of all rail plies. Be sure not to leave any dry spots on the veneer faces. Place the veneer sandwich between the male and female forms and use clamps, both below and above, to squeeze the forms together . Leave the rail clamped for at least 8 hours, then repeat the process for the second rail.

Use a cabinet scraper to smooth the band saw marks left on the faces of both rails. Then plane one edge of each rail flat and square to the face and use the band saw with a fence to rip the rails to width. Scrape or plane the cut edge to remove the saw marks.

The male gluing form can now be modified to act as a jig for sawing the rails to finished length. Cut the form to the finished dimension of the rails, which is 17 7/8 in., making sure to center the arc in the middle of the form. Screw a block to the back side of the form and add a holddown clamp to the top of this block. Then position the form along the table saw miter gauge, so that the end of the form aligns with the near side of the blade, and temporarily screw the form to the miter gauge. Place one of the rails on the form, secure it with the holddown clamp, and cut one end of the rail . Then, reverse the rail in the form, aligning the cut end with the opposite end of the form, and make the second cut.

Finish up the rails by laying out the back slat

15--Use the inner bending form as a jig for cutting the back rails. Attach the form to a backer board and the saw fence.

rest with a sharp chisel. Test fit each slat in its mortise.

Assembly

The back rails are joined to the rear leg posts by double joining plates. The same jig that you used to cut the rails can now be used as a holding jig to cut these plate slots. Fasten a rail in the jig and clamp the whole assembly to the workbench. Use spacer blocks under the plate joiner to properly locate the slots in the ends of the rail. Lay out and cut the matching slots in the rear leg posts.

Use a sharp chisel to cut the 1/8-in. chamfer around the top ends of the rear leg posts. Then, sand all chair parts with 120-grit, then 220-grit sandpaper. Begin assembly by joining the side rails to the slats. It is not necessary to glue the slats in place, but you should clamp the rail-slat assembly together to ease the next steps. Spread glue on the loose tenons and in their respective mortises, then join the side rails to the front and back leg posts. Clamp the assembly together and check for square.

When the glue has set on these side assemblies, join the back rails to the back slats. Again, no glue is needed in these joints. Spread glue in the remaining leg mortises and on the front and back rail tenons. Also spread glue in the joining plate slots and on the plates themselves. Assemble the two sides to the rails, clamp together and check for square.

Bore and counterbore pilot holes for fastening the arms to the back leg posts. Apply glue to the through tenons and arm mortises. Also spread glue along the top edge of the side arm rails. Fasten the arms to the posts with screws. Next, use a plug cutter in the drill press to cut matching plugs. Apply glue and tap the plugs in place to cover the screwheads.

Cut corner blocks to the size and shape specified in the plans. Bore and counterbore pilot holes in the blocks, then apply glue to their ends and screw them in place, flush to the bottom edge of the rails.

Place the chair on its side on a padded table, then position one of the rockers over the ends of the legs and temporarily clamp it in place. Scribe along the inner curve of the rocker to give the desired profile of the leg ends. Cut these legs to shape, then repeat the same process for the opposite chair side. Next, clamp one of the rockers to a pair of the cut legs. Because the curved rockers intersect the legs at an angle, the joint between the two may be slightly open. Use scribers to mark the leg for the necessary adjustment .Invert the chair over the edge of a padded table, then clamp the rockers in place over the leg ends. Mark guide lines along the rockers and legs, then bore the required holes through the rockers and into the leg ends for the connecting dowels. Cut pieces of 1-in.-dia. dowel for these joints, then apply glue to both the holes and the dowels and drive the dowels into place.

16--Lay out the slat mortises in the back rails, then remove the waste using a drill press. Finish the cut with a sharp chisel.

17--Use the bending form to clamp the back rail assemblies to the bench. Then carefully cut plate slots in the rail ends.

18--Assemble the chair pieces and clamp each rocker over the legs. Trace the proper cutting angle onto the legs.

Lay out the two corbel brackets, then use a band saw or sabre saw to cut them to shape. Sand each smooth, then glue and clamp them in place.

Bore holes for the 3/8-in.-dia. pins into the through tenon joints and into the leg-rocker dowel joints, as shown on the plans. Cut lengths of oak dowels for the pins, then apply glue to the holes and drive the pins into place.

Finishing up

We chose to have an upholsterer make up the chair seat cushion in brown leather. You have the option of having a spring seat made or using a foam cushion. If you opt for the spring seat, you will need to provide a cleat on the front and back rails to support the seat frame. Locate these cleats 1 in. down from the top edge of the rails. If you choose to use a foam cushion, you must provide a series of slats to support the seat. Fit the slats (1/2 or 5/8 in. thick), spaced approximately 1 in. apart, over the cleats and screw them in place. In either case, the top of the seat should be about 4 in. above the side rails.

To stain the chair, we used a water-soluble aniline dye. The color we chose is Brown Mahogany No. 57760 from The Woodworkers Store, 21801 Industrial Blvd., Rogers, MN 55374, 800-279-4441. Water-soluble dyes yield excellent color and clarity and are relatively easy to use, but they do raise the grain of the wood after application. To prevent this problem, before staining, wipe the entire chair with a slightly damp sponge and let it dry thoroughly. The surface should become extremely rough to the touch. Lightly sand the chair with 220-grit paper to knock off this rough grain, then dust off the chair before staining.

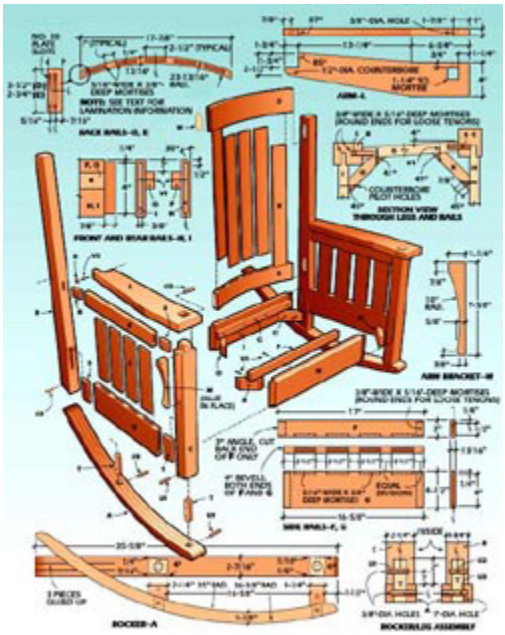
We finished our chair with three coats of Waterlox Transparent, a tung oil varnish. Simply wipe on each coat with a brush or rag, let it set for about 10 minutes and wipe off the excess. After overnight drying, repeat the process. When the final coat is dry, you can burnish the surface with 0000 steel wool and apply a coat of paste wax.

19--Cut the leg ends with a sabre saw, then reclamp the rockers in place. Scribe the legs where necessary to get a tight fit.

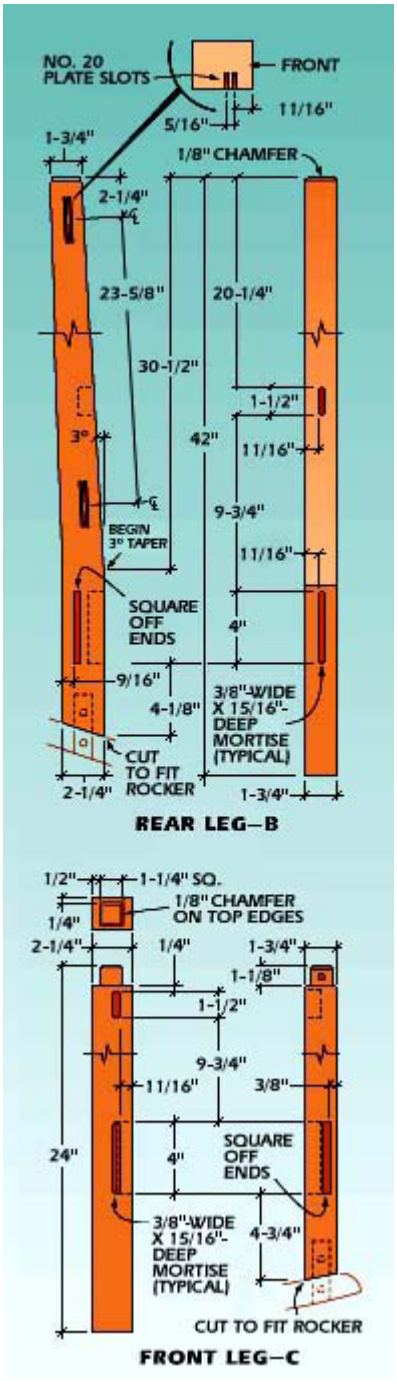
20--Cut the corbel brackets to size and finish sand them. Then glue and clamp them to the outside of the front legs.

MATERIALS LIST–ROCKING CHAIR		
Key	**No.**	**Size and description (use)**
A	**2**	**1 3/8 x 2 7/16 x 35 3/8" oak (rocker)**
B	**2**	**1 3/4 x 2 1/4 x 42" oak (rear leg)**
C	**2**	**1 3/4 x 2 1/4 x 24" oak (front leg)**
D*	**1**	**13/16 x 3 1/2 x 17 7/8" oak (back rail)**
E*	**1**	**13/16 x 2 3/4 x 17 7/8" oak (back rail)**
MATERIALS LIST–ROCKING CHAIR (continued)		

F	**2**	**13/16 x 2 x 17" oak (side rail)**
G	**2**	**13/16 x 4 1/2 x 16 5/8" oak (side rail)**
H	**1**	**13/16 x 4 1/2 x 22 1/4" oak (front rail)**
I	**1**	**13/16 x 4 1/2 x 19 5/8" oak (back rail)**
J	**8**	**5/16 x 2 1/2 x 10" oak (side slat)**
K	**5**	**5/16 x 2 1/2 x 21 1/4" oak (back slat)**
L	**2**	**1 x 4 x 21 3/4" oak (arm)**
M	**2**	**13/16 x 1 1/4 x 7 3/8" oak (corbel)**
N	**2**	**13/16 x 1 3/4 x 4" oak (corner block)**
O	**2**	**13/16 x 1 3/4 x 4" oak (corner block)**
P	**1**	**3/4 x 1 1/4 x 20 1/2" oak (cleat)**
Q	**1**	**3/4 x 1 1/4 x 17 7/8" oak (cleat)**
R	**4**	**3/8 x 1 1/2 x 1 3/4" oak (loose tenon)**
S	**4**	**3/8 x 1 3/4 x 4" oak (loose tenon)**
T	**4**	**1"-dia. x 3 3/8" oak dowel**
U1	**2**	**3/8"-dia. x 1 3/4" oak dowel (pin)**
U2	**4**	**3/8"-dia. x 1 1/2" oak dowel (pin)**
U3	**4**	**3/8"-dia. x 2" oak dowel (pin)**
V1	**16**	**1 1/4" No. 8 Fh screws**
V2	**2**	**1 1/2" No. 8 fh screws**
MATERIALS LIST–ROCKING CHAIR (continued)		
W	**8**	**No. 20 joining plates**
X	**2**	**1/2"-dia. x 1/2" dowel plug**
Misc: Yellow glue, 120- and 220-grit sandpaper, aniline stain, tung oil varnish, 0000 steel wool, paste wax. *Laminated oak veneer		



Rocking Chair Rocker Diagram



Rocking Chair Leg Diagram