

How I Make a Rocker

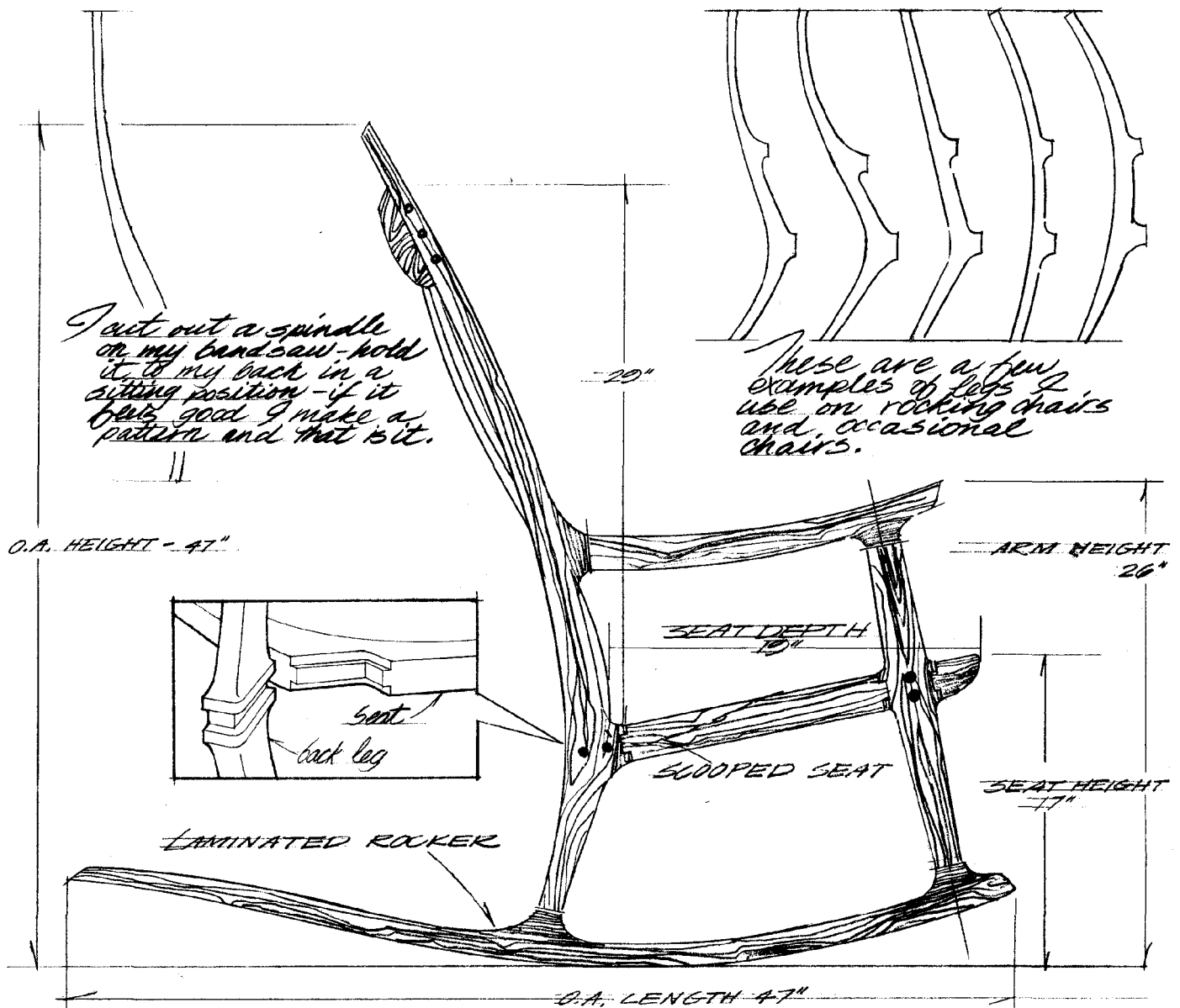
A master craftsman reveals the details

by Sam Maloof

Of the twelve different basic rocker designs I make, the model with solid wood seat and flat spindles is the most popular, and the most imitated. I don't believe in copying, but if knowing the way I work will help other serious woodworkers develop their own ideas, I'm happy to share my methods. I don't have a formula that I follow, nor do I work out mathematically the way my rocker rocks. Each rocking chair differs somewhat in dimension and also somewhat in the density of its parts, so I just work out its balance along the way. I aim for a rocker that doesn't throw you back or tip

you out, and somehow I'm usually right on.

I begin with the seat, cutting from 8/4 stock usually five boards at least 22 in. long and 3 in. to 7 in. wide—enough to add up to a 20-in. width after glue-up. I buy random width and length, common #1 or #2 walnut because its figure is more interesting than that of firsts and seconds. After milling the wood to size, I arrange the boards for the nicest figure match, regardless of whether this happens to be bark-side up or down. I then take the middle board and draw on its long edge the contour of a dished seat, a gentle curve whose maxi-



mum depth leaves $\frac{1}{2}$ in. of thickness about three-quarters of the way back from the front of the seat. I bandsaw this curve, holding the board on edge, then I angle the board through the blade and saw the top of the seat toward the front, to leave a ridge in the middle. I put this middle board back between the two seat boards to which it will be glued, and mark the contour I've just sawn on the edge of each. I bandsaw this contour, and transfer it to the edge of each outer board of the seat. I angle the boards to saw this contour, so that when joined together the five boards form a hollowed-out seat. Before gluing up, I mark and drill for 3-in. long, $\frac{1}{2}$ -in. dia. dowels, staggering them about 2 in. apart for ease of assembly, and for strength.

While the seat blank is in the clamps, I lay out both back legs, nesting them on a roughsawn $\frac{8}{4}$ board about 7 in. wide and 48 in. long. I look for a curve in the grain to match the curve in the legs. I bandsaw the legs before jointing and thickness-planing them, because flattening the wide blank might result in a leg that is too thin. I get both legs to be the same shape with a $2\frac{1}{4}$ -in. long straight cutter on the spindle shaper, using a template. When I've decided which is the right leg and which the left—by how the grain looks from the back and the front—I saw off the bottom of each leg at a 5° angle. Canted to this degree, each leg will join its rocker properly, giving the chair back a nice splay.

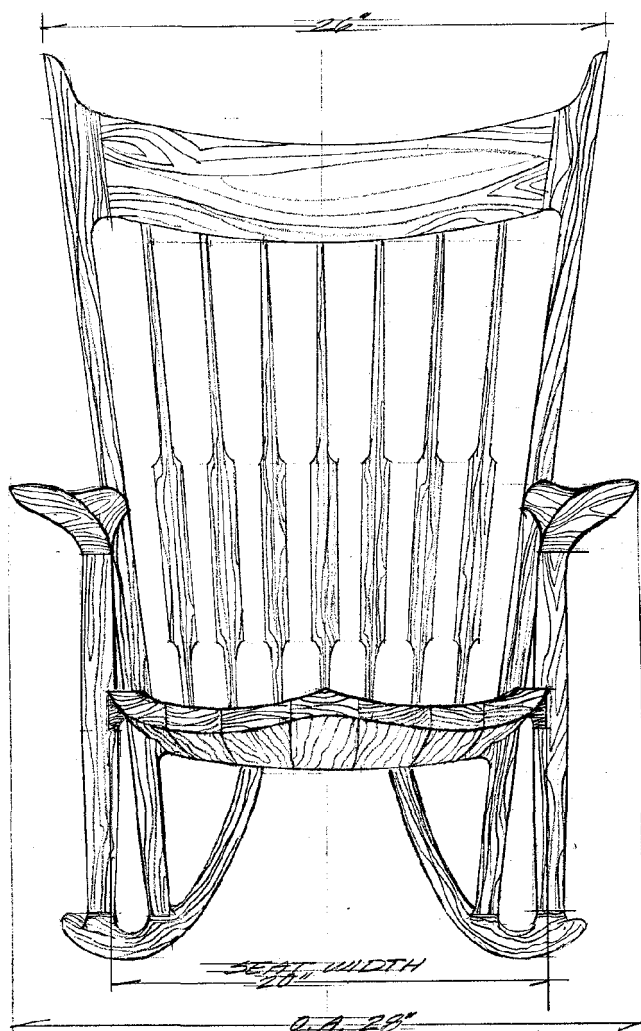
Now I take the clamps off the chair seat and I square up the edges so that the blank is 20 in. wide by 21 in. long. With a 7-in., 16-grit disc on my Milwaukee body grinder, I rough out the bandsawn hollow in the chair seat. I continue shaping and smoothing with 5-in. and then 2-in. discs, up to 150-grit. The top of the seat thus shaped, I cut the notches in the seat to receive the legs. For the back legs, I tablesaw a notch in each rear corner of the seat blank, 3 in. in from the

back and $2\frac{1}{2}$ in. in from the side. For the cuts with the back edge of the seat on the table, I set the miter gauge at 85° , first in one direction, then the other, so that the leg posts will cant outward at their 5° angle. On some chairs I also angle the cuts on the sides, to cant the legs backward or forward, but on the rocker design shown here I make the side cuts at 90° . Now using a router with rabbeting bits—a regular 90° one for the front edges, and custom-made 85° and 95° bits for the side edges—I rabbet the top and bottom edges of these notches, as in the detail of the drawing on the facing page.

The notches for the front legs are less complicated: they're simply dadoed out at 90° and rabbeted, top and bottom, with a regular 90° rabbeting bit. (For a similar joint, see *FWW* #25, p. 54.) Having cut the leg joints in the seat, I bandsaw its outline. Then I round over the underedge of the seat along the back and the two sides, using a 5-in. dia., 2-wing router bit that tapers the seat to about a 1-in. thick-



Maloof's most popular rocker design, in walnut



ness. I leave the area around the joints unshaped, for fairing later. Before fitting the legs, I finish-sand the seat.

With backsaw and chisel I cut the dadoes in the back legs that fit the rabbeted grooves in the seat. I suppose I could jig up and cut these on the tablesaw, but because the back legs are irregularly shaped and because I vary the angles of the back legs in different chair styles, I find the backsaw easier. Next I bandsaw the thickness of the back legs to $1\frac{3}{8}$ in., leaving the full 2-in. thickness in the area of the seat joint and the crest-rail joint, for fairing. With the leg still basically rectangular in section, I drill a $\frac{1}{2}$ -in. hole in the bottom of the leg to receive the dowel that will connect it to the rocker. To shape the edges of the leg, including the corner that will fit the seat joint, I use a $\frac{1}{2}$ -in. roundover bit, but I leave unshaped the area where the arms will attach, and also the outside edges of the leg, because these will be hard-edged. Now I glue the back legs on, clamping across the width of the seat and from back to front.

I make each front leg out of $\frac{3}{4}$ stock, $2\frac{3}{4}$ in. wide and 18 in. long. First I dado it on the tablesaw on three sides to fit the rabbeted notch in the sides of the seat. I then lathe-turn the leg, offsetting the center to the outside of the leg, so that the joint area will be thick enough for fairing into the seat. To complete the leg, I drill a $\frac{1}{2}$ -in. hole at each end for attaching the arm and the rocker. I then round over the corners that will fit the rabbet around the seat notch. Now I glue



With assistant Mike Johnson tracing the curve, Maloof demonstrates how he casts the shape of a rocker on the piece of particleboard that will be its gluing form. Also shown is the glued-up blank, with platforms for smoothing the transitions between legs and rocker, ready for shaping.

the front legs on. When the glue is dry, I secure all the leg joints, front and back, to the seat with 4-in. drywall screws, countersunk and plugged with ebony.

At this stage, the chair looks like a seat board with a leg at each corner: no back, no arms, no rockers. I fair the leg joints now, sanding to 150-grit before attaching the arms, so that I have room to work. Each arm requires a piece of $\frac{3}{4}$ stock, 6 in. wide and 19 in. long, although I usually cradle two arms on a longer piece. I lay out the arm, locating the dowel hole to attach the arm to the front leg, and saw the flat at the end of the arm to abut the flat on the back leg; this latter joint will be screwed from the back and plugged. Then I freehand-bandsaw the arm, shape it using a Surform, attach it, and fair the joints.

I make the back spindles, seven of them for this rocker, from pieces of $\frac{3}{4}$ stock at least 29 in. long. I also use the waste from the back legs, thickened to $1\frac{3}{8}$ in. I lay out the side profile on the face of the board, being careful to avoid areas where the grain will cross the width or the thickness of the spindle, and bandsaw. I also bandsaw and then spindle-sand the contour of the spindles as seen from the front. I used to shape the spindles, but one day I had two shatter on me, and I said phooey, there must be a safer way. They're just too slender to feed into the shaper, and it doesn't take that much longer to bandsaw them. I round over the back edges of each spindle with a $\frac{1}{2}$ -in. roundover bit, and then shape both ends

with a rasp. The end that goes into the seat is $\frac{1}{2}$ in. in diameter; the end that goes into the crest rail is $\frac{3}{8}$ in. These dimensions are all eyeballed. I shape the slender parts by hand with a patternmakers' file, leaving hard edges along the front. Most of the front of the spindles remains flat.

Next I make the crest rail out of 10/4 stock, 7 in. wide and 26 in. long. I cut the ends to the 5° angle that will accommodate the splay of the back leg posts, then bandsaw the curve of the front and back faces. This gives me an accurate thickness in which to lay out the spindle holes. I space the hole centers evenly across the length of the crest rail, and then do the same across the width of the back of the seat, which will evenly splay the spindles. I use a yardstick now, aligned between corresponding hole centers in the crest rail and seat, to set my bevel gauge for positioning my drill-press table. I bore the crest-rail spindle holes on the drill press, but the seat spindle holes by eye. All holes drilled, I bandsaw the bottom edge of the crest rail and shape it with a Surform. I glue the spindles into the seat, fit the crest rail on the spindles and glue the rail in place between the back leg posts. When the glue is dry, I screw from the leg posts into the crest rail, countersinking and plugging the 2½-in. screws. I then fair the joint and finish-sand.

I laminate the rockers, beginning with 6/4 stock, thickening it to 1¾ in. and then sawing it into ½-in. plies. I use a carbide-tipped blade on the tablesaw, and I don't joint the stock between passes—I find the sawn surface smooth enough for laminating. The rocker consists of seven plies about 48 in. long. To make the form for gluing them up, I bend a strip of wood to a shape that looks right, and have a helper trace this curve on a piece of ¾-in. particleboard. I bandsaw three pieces of particleboard along this line and face-glue them into a clamping form. I add seven more short plies to form two platforms for fairing the rocker into the legs. Then I glue up, using white glue. To ensure flatness, I dean up one edge of the rocker blank on my jointer, the other in the thickness planer. I round over the outside corners with a ½-in. bit, except in the area where the legs will connect. The rockers rough-sanded to shape, I put them on the flattest surface in my shop, my tablesaw, and mount the chair on top. The platforms allow for up to 2 in. of adjustment, forward or back, in the placement of the chair. I shift the chair back and forth until the rockers come to rest contacting the ground at about 2 in. in front of the rear legs. I find this looks best, and rocks best. I mount the chair to the rockers with ½-in. dowels, 4 in. long in the back, 3 in. long in the front. Then I fair the joint with a rasp.

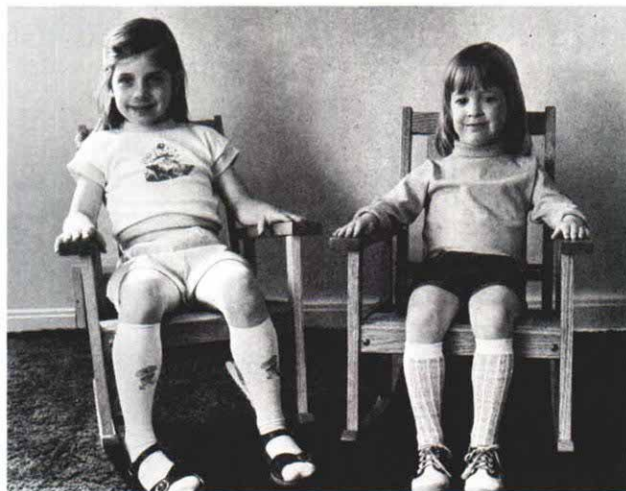
I finish-sand the whole chair to 400-grit and apply three coats (at two-day intervals) of a three-part finish: equal parts of polyurethane varnish, raw tung oil and boiled linseed oil, removing all excess oil after each application. I then apply a final coat of a mixture I mix up on a double boiler: a half-gallon each of tung oil and boiled linseed oil, with a couple of handfuls of beeswax grated in. Do this outdoors and be careful—linseed has a low boiling point. The mixture has a long shelf life (stir before using), and leaves a beautiful sheen when buffed with a soft cloth. □

Sam Maloof has been making furniture for more than 35 years in Alta Loma, Calif. He is author of the book Sam Maloof: Woodworker, published this year by Kodansha International. For more on his work, see FWW #25.

A Child's Rocker

It's small and straightforward

by William Lavin

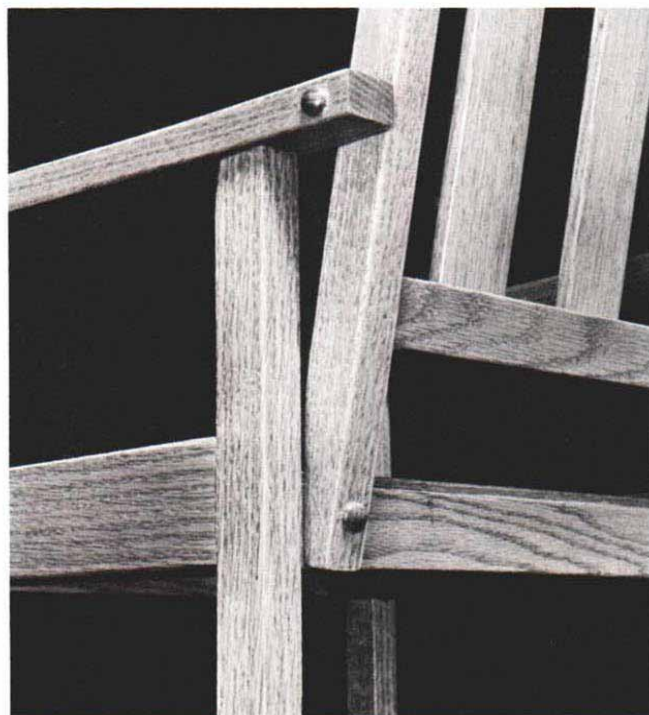
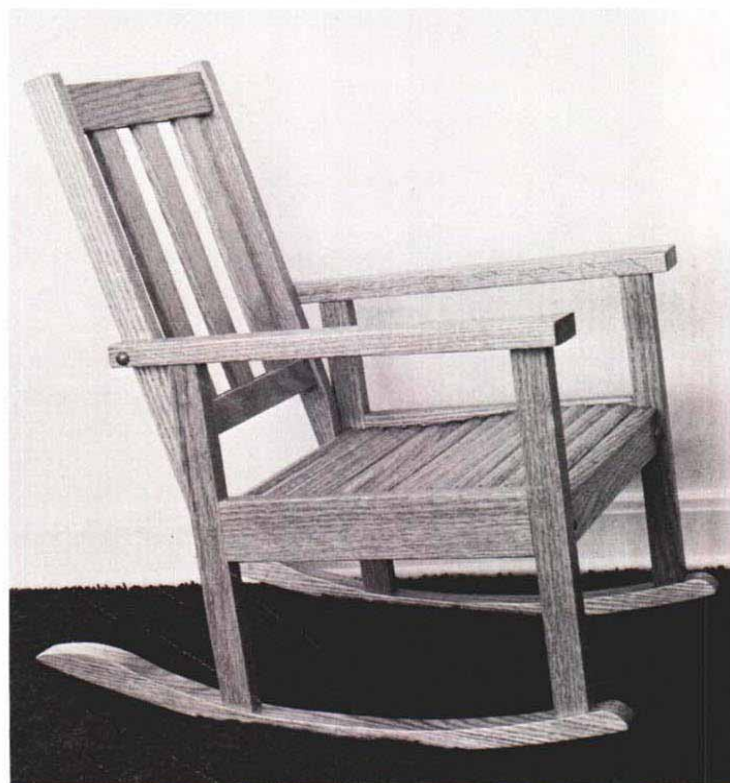
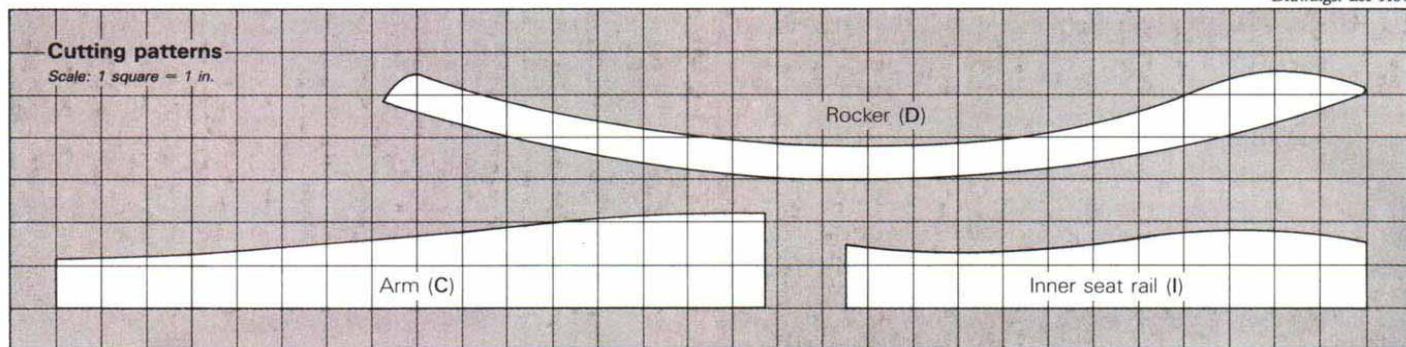


The author's daughters, testing out his project.

Picture an elderly woman knitting, or an old-timer chewing tobacco while playing checkers or whittling, and invariably both are sitting in rocking chairs. The rocking chair stereotypes this age. At the other extreme is the youngster full of unbridled energy that only a rocker can vent. We've all seen it: the elder rocking with gentle, smooth movement in a full-size chair, next to which the child rocks as vigorously as can be in a smaller version. For the average woodworker, a full-size rocker is intimidating to build—too many expectations to fulfill. A child-size chair, however, can inspire freer energies: simple, basic joints and modest proportions demand something reasonable from our abilities.

The idea for this particular chair came from one built more than 50 years ago for my father-in-law by his great uncle, John McCarthy. Originally handcrafted in white oak by a skilled woodworker for an energetic little farm lad, the design yields to simple power tools and a few hand tools. I've toyed with the idea of a short production run, so readily does this design lend itself to a simple router jig for the mortises (compare *FWW* #30, pp. 90-92, and #35, p. 52).

Construction is divided into three subassemblies: the sides, the backrest and the seat. The sides and backrest are joined similarly: horizontals mortised into verticals, except for the arms, which are mortised to receive the tenons on the front posts. Cut this stock, and lay out and cut the joints. Leave the legs a few inches longer than needed so that you can trace the curve of the rocker and then saw the legs later to fit. Note also that for maximum strength the rockers ought to be bandsawn from stock whose grain follows the rocker curve. Dry-assemble, and when everything fits right, take the assemblies apart and sand, finishing up those surfaces that would otherwise be difficult after assembly. All corners should be chamfered. Drill the holes for the screws that will fasten the



Making a rocker for a child brings a formidable furniture project down to size. Detail, above, shows where backrest is screwed to seat frame and arms.

arms to the backrest posts and the backrest posts to the seat. The backrest assembly is completed in a like manner. Glue, clamp and allow to set overnight. When the side assemblies have cured, center the legs on the rockers, drill and fasten with 2-in. screws.

The seat assembly is a butt-glued and screwed frame with the slats tacked on top. The top edge of the inner seat rails is sawn to a contour that dishes the seat. The seat frame is tapered in plan, and I find it helpful to draw the full-size plan view, showing the thickness of the seat rails and front and rear crosspieces. Then I cut the pieces oversize, and place them directly on the view for final cutting (at an angle of 3°) and assembly. The front crosspiece is assembled directly with glue and screws (countersunk and plugged), while the rear crosspiece is fastened only temporarily by a couple of pins—I use large cotter pins, because their rounded ends make them easy to remove. The pins keep the seat rails in position while the slats are attached. At final assembly, screws attaching the backrest to the seat will replace the pins.

The seat slats are ripped from a wide piece of $\frac{3}{4}$ -in. thick stock. I shape the edge first using a Stanley #45 fitted with a Record 12H nosing attachment. Another way would be to

scribe guidelines about $\frac{3}{32}$ in. from the edge and block-plane a rounded edge. And, of course, there's always the router with a roundover bit, although you'd only approximate the nosing drawn. Rip a slat (I actually rip two at once, because I use 30-in. long stock and chop the ripping in half), then shape and rip the next slat. Make a couple of extras in case you make a mistake when cutting to the exact length later. I find it easier to finish each strip before assembly, so that finishing material will not fill in the crevices between the slats.

Cut the finished slat lengths individually, scribing directly from the seat frame, and drill a small hole in each end using a jig to ensure that all the holes will be equidistant and aligned. Fasten the slats with glue and brass nails.

Complete the assembly by first gluing and screwing (from the inside) the seat frame to the side crosspieces. Then attach the backrest, screwing from the backrest posts into the seat frame, and through the arm extensions into the backrest posts. Countersink these screws and plug with buttons for a tactile detail. A durable varnish will finish your heirloom chair. □

William Lavin teaches junior high school industrial arts in Camillus, N.Y. Photos by the author.