



Two Projects Customize a Kitchen

A spice shelf and a decorative steam-bent dish rack improve the looks and the utility of any kitchen

by Rex Alexander

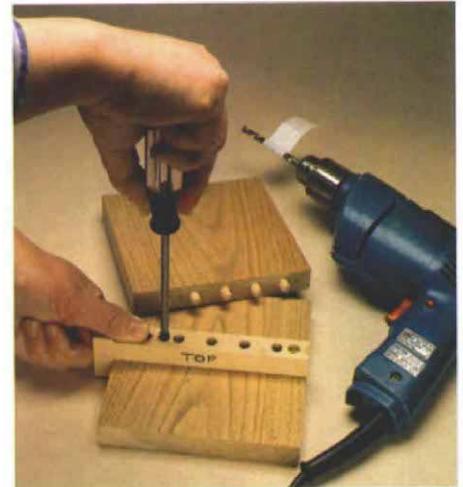
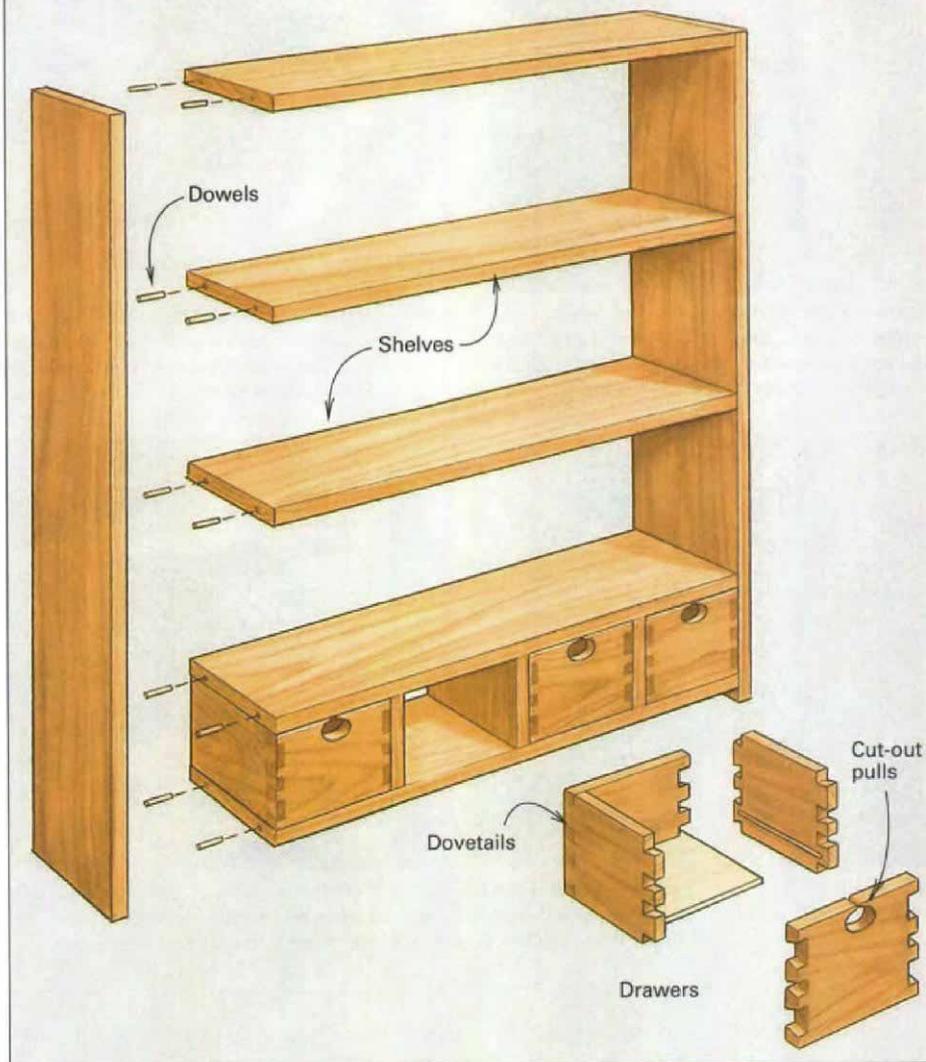
Don't take this the wrong way, but odds are good that your kitchen could use a little spicing up. I'm not talking about anything major like a complete overhaul, or anything as minor as a new set of knobs and pulls. No, I'm thinking of something in the middle. Something that takes a moderate amount of work but that yields a clear improvement both in looks and in function.

As a custom cabinetmaker, I see a lot of kitchens, and most have become monotonous runs of cabinet doors and drawer fronts in order to squeeze out all available space. I grapple with such issues in almost every kitchen I design and build, so I came up with a couple of useful fixtures that would perform a task, add a little bit of dimension to the kitchen and be fun to look at.



Open shelves with dovetailed spice-box drawers

This shelf unit is as simple and useful as it looks. The shelves and drawer divisions are doweled together, the drawers are dovetailed, and the whole works beautifully over a range or cooktop.



An easy jig aligns dowel holes perfectly. After screwing this simple jig to the end of the shelf and drilling the dowel holes, the author registers the jig to a mark on the side piece and drills again, producing the perfectly aligned dowel holes.

The joint I use to connect the shelves to the sides depends on where the shelf will be installed. For example, if the unit will sit alone, I dovetail the four corners of the carcass and dowel the shelves and vertical divisions for the drawers. If cabinetry will flank the unit, I simply drill holes with a countersink bit and screw it together with drywall screws. Should price be a factor and the sides be exposed, I drill, countersink, screw and then plug the holes.

Regardless of construction technique, building this shelf unit with spice drawers is a simple way to enliven a kitchen.

A simple doweling jig makes construction easy—If I'm going to dowel the sides, I first size the wood for the shelf unit and either hand-

Thanks to downdraft range vents and whole-house ventilation systems, range hoods can be eliminated from a lot of kitchens. So to take advantage of that space wherever possible, I eliminate the range hood from my designs to give the kitchen a more open look.

In place of the range hood, I designed a shallow, open shelf unit to display plates or useful cooking items (top photo, facing page; drawing above). Somewhere within the unit I install small dovetailed drawers that not only show a high degree of craftsmanship but also hold spices, recipes, teas or anything else that needs to be convenient to the stove. The shelves are open and decorative, so I build them of solid wood.

I install this unit over 30-in. ranges, which means the width of the unit is 30 in. The height of the unit can vary, rising above or falling below the horizontal lines of the upper cabinetry, or blending with the cabinetry through the use of custom molding. Ordinarily, I use two shelves and make the four equally spaced spice drawers $3\frac{3}{4}$ in. high by $6\frac{5}{16}$ in. wide. I keep the maximum depth of the unit a shallow 6 in. so that the drawers and the shelving don't interfere with the operation of the cooktop.

plane, scrape or sand each piece, depending on the species of wood I'm using. Next I make a doweling jig on the drill press. The jig for this unit is a piece of wood that's 6 in. long by $\frac{3}{4}$ in. square (the same size as the end of the shelf), with a $1\frac{1}{2}$ in. long piece of the same dimension screwed at a right angle to the end so that it can swivel. I space dowel holes in the long section of the jig every 1 in. and screw it to the workpiece through two countersunk holes (photo above).

To drill the dowel holes, I place the jig flush with the end of the shelf. After drilling the dowel holes into the shelf end grain, I unscrew the jig and swivel the end of it. I then set the jig against marks I've drawn on the side piece to show where the dowels will be drilled. I screw the jig to the piece, set my depth guide and drill. I use the same jig and the same procedure for the short drawer partitions. I use 2-in. long, $\frac{5}{16}$ in. dia. fluted dowels to attach the shelves.

If I want the shelf also to be able to hold plates or saucers, I chuck a core $\frac{1}{2}$ in. box bit in my router before gluing up and cut a plate groove in the shelving 1 in. from the back edge. Using a smaller-diameter dowel to

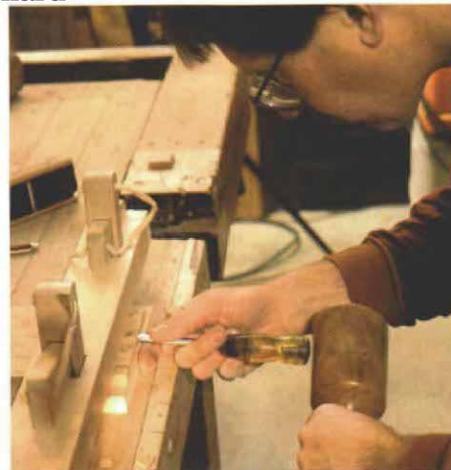
Cutting dovetails is finicky but not hard



Start sawing at an angle. Using an English backsaw, the author cuts down the pencil mark at an angle so that he can align the bevel and end-grain cuts.



A sharp chisel takes out the waste. The author registers the flat side of a sharp chisel against a wooden clamp perpendicular to the workpiece; waste wood is between dovetails.



Only a little at a time. After chiseling down into the waste, the author peels away the waste gradually, a few thin chips at a time before he begins cutting down again.



Trace the tails to mark the pins. The author carefully lines up the new dovetails with the end grain of the opposing workpiece and transfers the marks for the pins.



Tap the two pieces together. If they were cut with care, the dovetails and pins should wedge tightly together under mild pressure. Here, the author taps the drawer side in place using a smooth-faced hammer.

spread the glue, I next insert the dowels in the longer holes and glue and clamp up the shorter divisions for the spice drawers. I attach the drawer section and the rest of the shelving to one side and follow by gluing and clamping the other side.

The fun is in the dovetailing—I look for just the right piece of wood to use for the drawer fronts. When the drawers are in their proper positions, it's quite dramatic if the fronts are cut from one plank and the grain runs continuously from one to the next. After I select the wood for the sides and for the bottoms of the drawers, I surface the sides to $\frac{1}{2}$ in. and the bottoms to $\frac{1}{4}$ in. Finally, I cut the dovetails for front and back.

Dovetailed drawers add a rich, handmade look to any kitchen, and creative layout of tails and pins can take the effect even further. For this shelf unit, I try to keep each drawer symmetrical, and as a rule, I never go over 12° for the angle of the tails. I've used a lot of different varieties of saws to cut dovetails, but the two that I now use exclusively are an English, 20-tooth-per-in. backsaw for hardwoods and a 21-tooth Japanese dovetail saw for softer woods.

To lay out the tails, I lightly mark the depth of the cut on each side of the piece using a cutting gauge. After establishing my 12° angle on a sliding bevel, I mark the angle of the tails and then square the marks across the

end grain. I clamp the piece in a bench vise and cut the tails to the mark (photo above left). After these cuts, I clamp a squared 2x block onto the piece flush with the depth mark at the bottom of the tails. It's important that the 2x has a piece of fine-grit, self-adhesive sandpaper covering the bottom to prevent slippage. Then I chisel halfway through between each tail (photo above center). To avoid tearout, I flip the piece over and repeat the process from the otherside (photo above right).

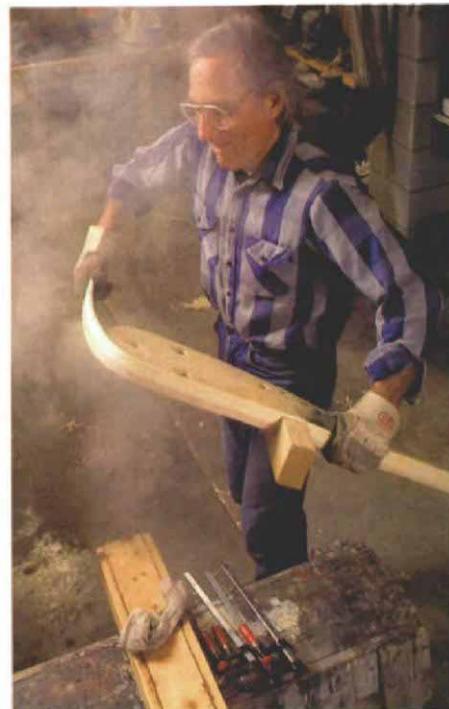
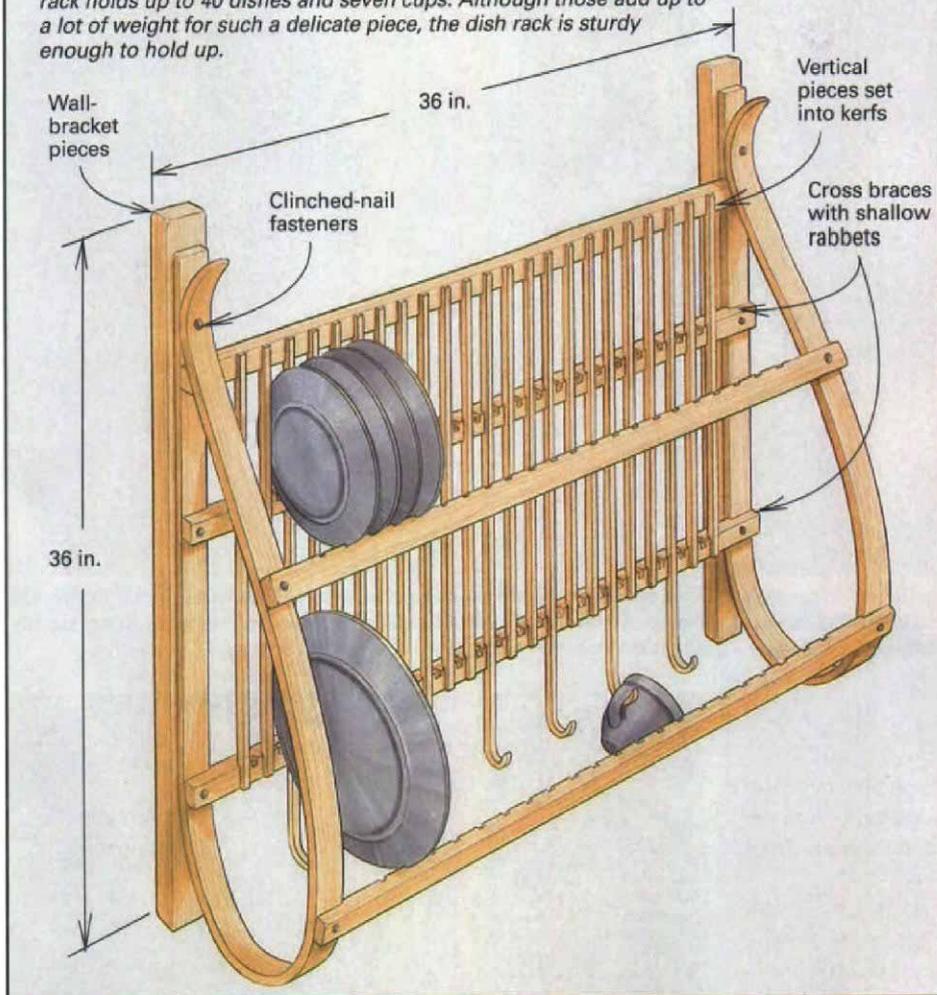
After the tails are cut, I saw along the depth mark to the dovetails at each end, then pare it clean with a sharp chisel. That takes care of the waste at the ends and leaves a row of clean dovetails. Then I lay the freshly cut dovetails over the end grain of the piece that will yield the pins. I trace around the dovetails with a 5mm mechanical pencil (photo bottom left) to transfer the angles. Finally, it's a simple matter of aligning a square with the pencil marks to mark the sides of the pins.

Cutting and chopping out pins are done the same way as tails. I then take a sliver off the inside edge of each tail using a thin, sharp knife to ensure a smooth, tight fit. Finally, I tap the two pieces together (photo bottom right).

If a hole is to be cut out of the drawer front for a pull, now's the time. I've had luck cutting out this pull with a Forstner bit in the drill press and a $\frac{1}{8}$ -in. blade on a bandsaw. Before assembly, I cut rabbets in each drawer side to accept the $\frac{1}{4}$ -in. bottom.

A steam-bent dish rack inspired by the toboggan

Plenty of curves and storage space combine in this dish rack. Made of thin strips of white ash, this steam-bent dish rack holds up to 40 dishes and seven cups. Although those add up to a lot of weight for such a delicate piece, the dish rack is sturdy enough to hold up.



Soft as leather after 20 minutes of steaming. This strip of white ash bends easily after steaming, but it needs to be quickly shaped around the form before it loses its pliability.

One day as local craftsman Tim Joseph worked in his shop steam-bending white ash for the toboggans he makes, I approached him about designing and building a dish rack for me. A few days later, we sat down at his kitchen table, and he began doodling a rough sketch for a rack that would hold small and large plates and a row of cups (drawing above).

Toboggan building must have been at work on his imagination because the dish rack (bottom photo, p. 64) began to take on the shape of one of his small sleds. After a discussion of structural engineering and dimensions, I developed a scale drawing, and Tim built it. Tim has made only one more dish rack since then, but we're planning on building another for my own kitchen.

Choosing the right wood takes some thought—The weight of 40 dishes and seven cups can be substantial, so the choice of wood and the cut of the wood are important. For this design, the wood had to be steam-bent the same way Tim makes his toboggans. Oak, ash, birch and walnut all bend well. But Tim had already quartersawn and air-dried a log of white-ash pieces for his toboggans, so he had plenty of wood left for a dish rack.

Quartersawn or straight-grain cuts (wood that is cut perpendicular to the annual rings) is best for steam-bending. But even with quartersawn

wood, you have to inspect the pieces carefully because small wormholes, knots or other imperfections can cause cracks or breaks.

Air-dried wood is more elastic and bends more easily than kiln-dried wood, so it's a better bet for steam-bending. But if you have to use kiln-dried wood, soak the pieces in water several hours before steaming and bending.

Tim made a basic steam box for steaming the ash. To form the long, narrow box, he nailed four 1x4s together, closing off one end with a 3½-in. by 5-in. square piece of 1x. He also tacked a small piece across the other end, leaving just enough of an opening to slide in the wood. For steam, he puts a few quarts of water in a large pressure cooker and sets it on a small butane burner. A plastic hose connects the box to the pressure cooker. After he slides the ash into the box, he closes it off by wrapping a wet cloth around the open end.

Frames are bent around a form—Tim made several forms to shape the teardrop main frames and the cup hooks. The main frames were sized to hold the weight of a row of plates as large as 11 in. dia. and several smaller plates down to 6¾ in. dia.

Tim cut the form for the teardrop-shaped frames from a 2x12. He cut holes in the face of the form so that a clamp can gain purchase to hold the main frame while it dries on the form.

To prevent splintering of wood, Tim chamfers and lightly sands the edges of an 1½-in. by 1½-in. by 7-ft. piece and then puts it into the steam box. Once the wood is pliable, usually after 10 minutes to 20 minutes of steaming, he removes it and very quickly bends (photo above) and clamps the



Clamp it quickly. Once the wood is bent around the form, it should be clamped in a hurry to avoid splitting the wood. The clamping is best done as a two-man job: One holds the workpiece and the other clamps.

main frame around the form (photo above). After two or three hours, he removes the frame from the form and ties the ends together. Until the wood is completely dry, tying helps maintain the teardrop shape and frees the form for bending the other frame piece.

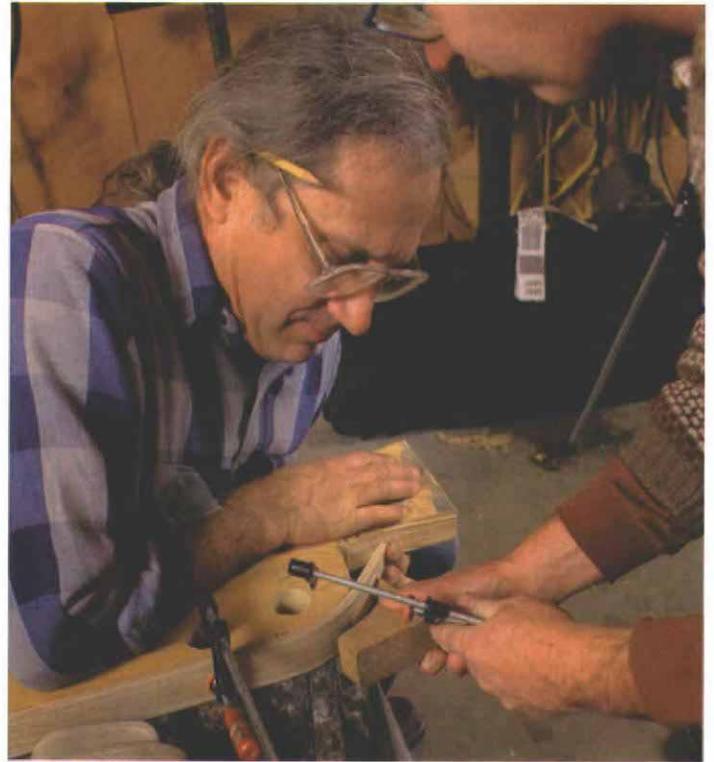
The top ends of the main frame also have a slight bend to them, and these ends have to be steam-bent. Tim has another form to create that slight curve at the end. He steams just the last 12 in. near the tip of the main-frame piece. Again, he quickly clamps the main frame to the form, fitting a smaller piece that follows the shape of the form over the end to reinforce the curve (photo top right). Because the bend is so sharp and because the piece is so small, the tip of the piece will spring back slightly once the clamp is removed.

The cup hooks are slender pieces— $\frac{3}{8}$ in. square by $27\frac{1}{2}$ in. long—which makes it difficult to bend them without breaking them. So to prevent splits or breaks, Tim runs the end to be curved through a bandsaw to split the last 6 in., which then will be steamed, bent and later glued together.

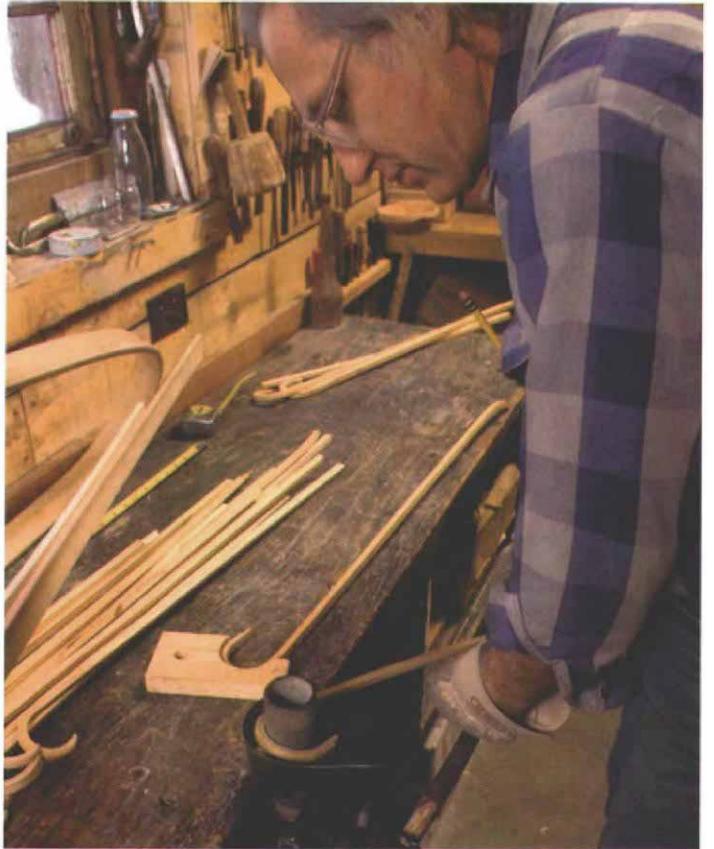
A pipe-and-steel form bends the cup hooks—Tim uses three different forms to shape the hook. First he screws a 2-in. stainless-steel strap to a piece of $1\frac{1}{2}$ in. galvanized pipe (bottom photo) to make a sort of T-shape. The hooked end of the workpiece fits under the steel strap and is held between the screws that hold the strap to the piece of pipe.

So just before the slender hooked piece is pulled from the steam box, Tim mounts the galvanized pipe in a bench vise and heats both pipe and strap with a propane torch to slow the release of heat from the workpiece. He pulls the pliable piece from the steam box and, wearing heavy gloves, quickly slips the piece under the steel strap and through the two screws that hold the strap to the pipe.

Then Tim bends the end of the piece around the pipe and tightens the bench vise to hold it in place. Once the piece is bent, he cuts a C-shape out



The second curve is a separate operation. After the large curve is clamped and dried, the other end is steamed and bent to create the slight reverse curve at the top of the main frame.



This clamp shapes the cap hooks. After steaming, the slender cup hook is bent around a $1\frac{1}{2}$ in. galvanized pipe and held in place by a 2-in. stainless-steel strap that's screwed to the pipe. The pipe and the strap are heated ahead of time with a torch so that the workpiece won't lose its heat too quickly.

of a piece of 1x and inserts the hooked piece into it. The C-shape works like a clamp to hold the hook tightly until it dries.

Later, when the hook is dry, Tim makes a form that fits the inside of the hook. He waxes both forms to prevent sticking, then glues the sawn ends of the hook back together and clamps the piece into place (top photo). Once the glue is cured, he removes the piece, and scrapes and sands it to get a smooth finish. For an added touch, he carves the tip to a dull point.

Preparing the other parts—Twenty-one other vertical parts are needed, including fourteen $\frac{3}{8}$ -in. by $\frac{3}{8}$ -in. by 22-in. vertical dividers and seven $\frac{3}{8}$ -in. by $\frac{3}{8}$ -in. by 27 $\frac{1}{2}$ -in. cup hooks that will hold the plates.

Also, three cross braces— $\frac{3}{4}$ in. by 1 in. by 35 $\frac{1}{2}$ in.—fit across the back of the main frame. And two cross braces— $\frac{7}{8}$ in. by 1 $\frac{1}{4}$ in. by 35 $\frac{1}{2}$ in.—fit across the front of the main frame. These front pieces are kerfed every 1 $\frac{1}{8}$ in. with a $\frac{1}{4}$ -in. dado blade. Tim cuts these pieces using a radial arm saw. The kerf follows the shape of the dado blade, making a natural, rounded resting place for the plates (bottom photo).

Using a sharp chisel, Tim lightly chamfers all of the openings, then lightly sands. This work allows the plates to nestle, and it keeps the edges free from chipping.

The three rear cross braces have the same $\frac{1}{4}$ -in. kerf and chamfer as the front braces. Also, all three will need dadoed slots $\frac{3}{2}$ in. by $\frac{3}{8}$ in., spaced every 1 in. to house vertical dividers and occasional cup-hook pieces. All five cross braces now will have rabbets cut into each end $\frac{1}{8}$ in. deep and 1 $\frac{5}{8}$ in. across so that they fit neatly over the main frames.

The two remaining parts of the dish rack are $\frac{7}{8}$ -in. by 2 $\frac{5}{8}$ -in. by 35-in. strips that create a flat surface for attaching the frame to the wall. All of the parts of the dish rack need to be scraped and lightly sanded before they are assembled.

Assembling and finishing the dish rack—After laying the assembled pieces on a flat surface, we dry-fit all of the parts. Using the different-size plates that will perch in the rack, Tim and I establish the location of the front and rear cross braces.

When we built the first dish rack, we both felt that a clinched nail with a decorative head would hold the front cross braces to the frame better than screws and would add to the visual appeal of the rack. We used nails from the Tremont Nail Company (800-842-0560), which makes some interesting and traditional cut nails using old patterns. Tim ended up using an 8d clinch nail with a rose head after first drilling a hole slightly smaller than the nail through the cross brace and main frame.

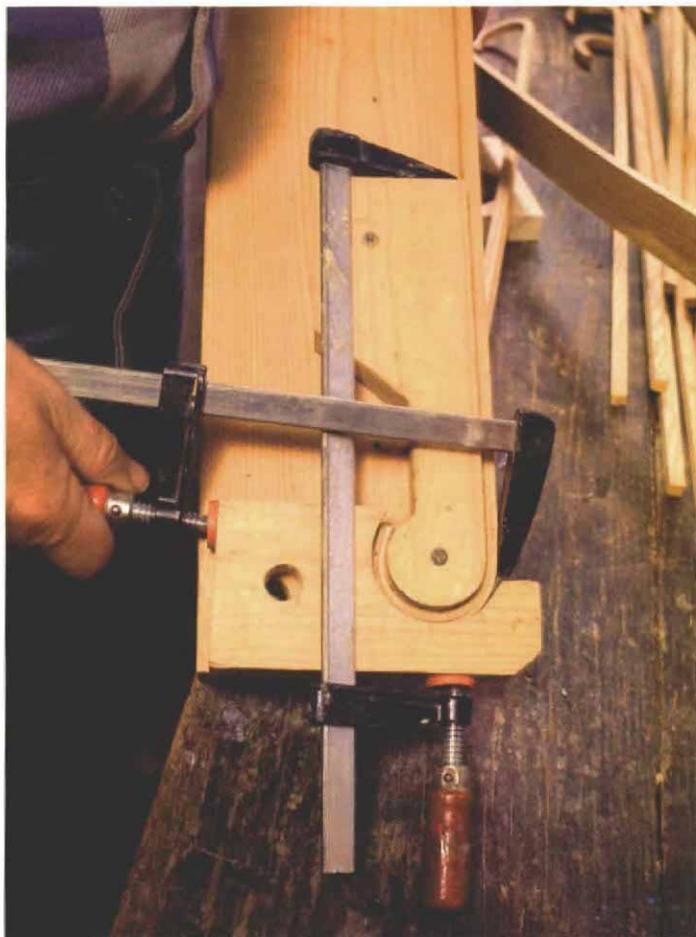
After applying glue to the cross brace, Tim nails through the predrilled hole, takes a pair of pliers and hooks the end of the nail. This hook will act as an added fastener once the nail is clinched. He then sets the piece on a hard surface and clinches the nail with a hammer.

Tim spring-clamps the main frame to the wall-bracket pieces and predrills a hole for a nail through both frame members and wall brackets close to the tip. He squirts a little glue between the frame members and nails and clinches together the main frames at the top of the wall bracket.

Laying the assembled frame flat on a bench, he spot-glues the slender cup hooks and other verticals to their dadoed homes. After the glue cures, Tim removes any exposed glue with a chisel or scraper and lightly sands any rough surface.

Using a rag, Tim applies three thinned coats of polyurethane. Then he lightly sands with 400-grit wet/dry sandpaper between coats. After I install the dish rack, I put a thin coat of beeswax over the surface and rub it off for a dull sheen. □

Rex Alexander is a custom woodworker who specializes in cabinets and staircases. He lives in Brethren, Michigan. Photos by Steve Culpepper except where noted.



The sawn hooks have to be glued. To bend the tight curve in the cup hooks, a 6-in. long bandsaw kerf was made in the end of each piece. The jig shown above was used to glue the kerfed ends back together.



Finally, the cross braces are sized and kerfed. Shown here are the three stages of the cross braces used on the dish rack. These pieces will go on the back of the rack. The dadoed slots between the curved kerfs hold the vertical dividers and the cup hooks.