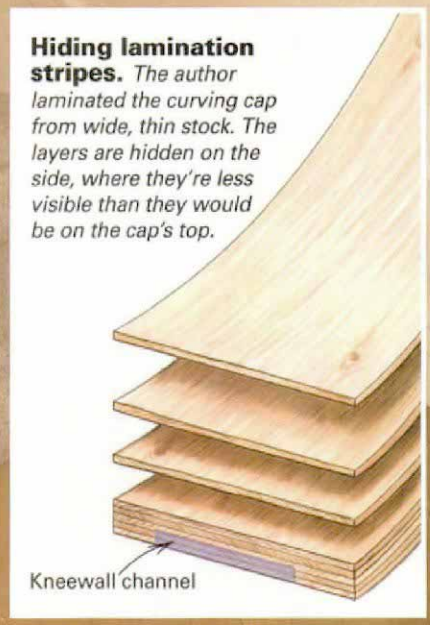
Capping a Curved Stair Wall

Wide horizontal laminations show off the grain of the maple caps

by John Griffin



Hiding lamination stripes. *The author laminated the curving cap from wide, thin stock. The layers are hidden on the side, where they're less visible than they would be on the cap's top.*

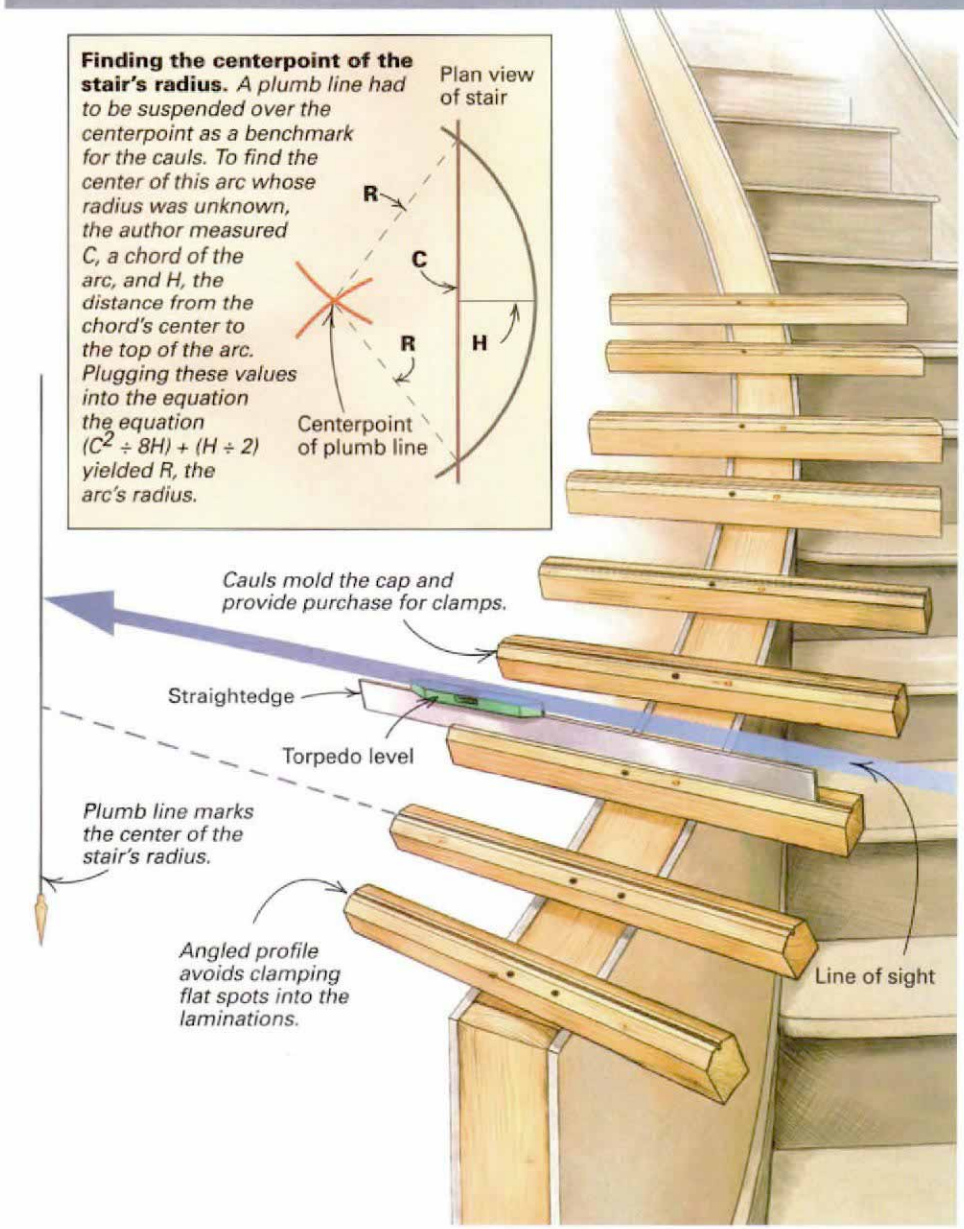
I had contracted the finish stair work on a large spec house in Boulder, Colorado, basing my estimate on the blueprints. When I showed up to start work, though, I realized I had to toss that estimate out the window. The job had apparently gotten much simpler.

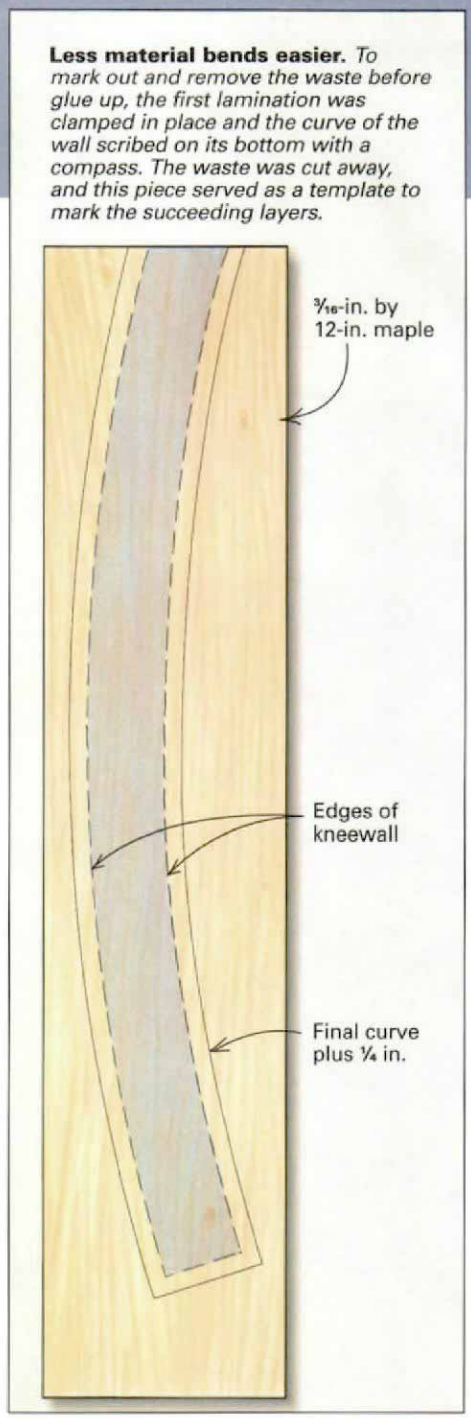
I wouldn't have to build curved stringer stairs with mitered risers and miter-returned treads. The framing contractor had built both curved staircases leading from the foyer to the second floor. And 34-in. high 2x4 kneewalls took the place of the massive round newels and 2-in. pipe rails specified on the prints. Then the builder, Vaughn Paul, asked me to finish the curved kneewalls with maple caps. He wanted the caps to bend around the stair's radius without showing laminations on their tops. The caps were to meet the drywall cleanly—no

Drawings: Paul Perreault. Photo this page: Andy Engel.

Forming a fair curve

Clamping supports, or cauls, are tacked in place at 4½-in. intervals along the wall and shimmed level. Saw kerfs in the cauls hold a straightedge that is rifle-sighted on a string hung plumb above the centerpoint of the stair's radius. The cauls are then screwed fast with 3½-in. screws.





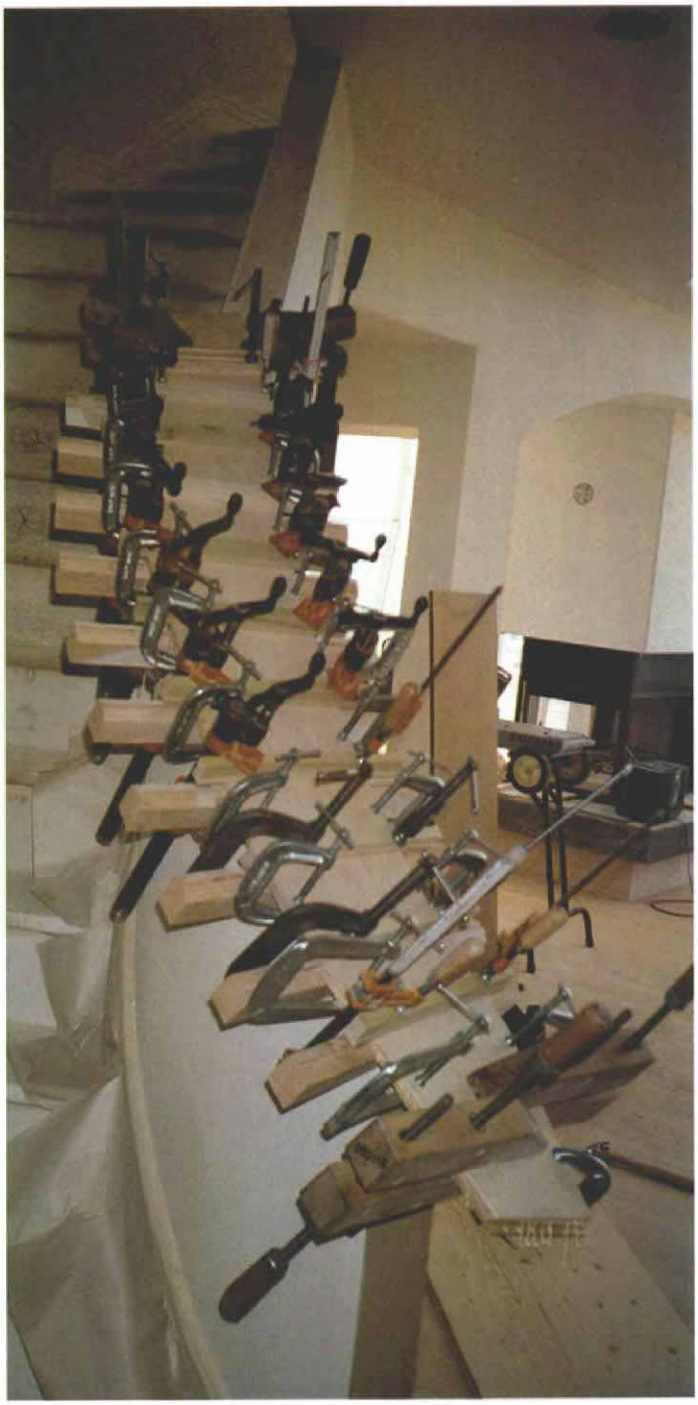
trim. My mind raced. How was I to bend helical twists into 1½-in. thick, 7-in. wide boards without visible laminations or trim?

The cap had to be laminated; there was no other way to bend it. I reasoned that even maple, as hard and dense as it is, flexes if thin enough. If the stock were, say, 3/16 in. thick and 12 in. wide, I might be able to glue and clamp a horizontal lamination into the correct twist, then saw it to the helical shape (drawing p. 75). The laminations would show on the edges, but not on the face.

Gluing two layers at a time—My hardwood supplier resawed some 12-in. boards into 3/16-in. thicknesses for me. But even at 3/16 in. thick, maple is tough. Figuring that less material would be easier to bend, I rough-sawed the curves to within ¼ in. of their finished dimension into the individual laminations (drawing above right). Even so, I could clamp and glue the bend into only two laminations at a time. I used Titebond Supreme (Franklin International; 800-6694583; www.franklini.com), spreading it with cheap, disposable paintbrushes. This special-order glue has a long working time, and it's easier on sanding belts than regular Titebond.

I screwed cauls (drawing above left) on 4½-in. centers to the plywood top plate with 3½-in. drywall screws, and used additional 1x2 cauls on top of the lamination to spread the clamping pressure evenly (photo left, facing page). It took eight days and all my clamps to glue up the two 5-ft. long twisting boards.

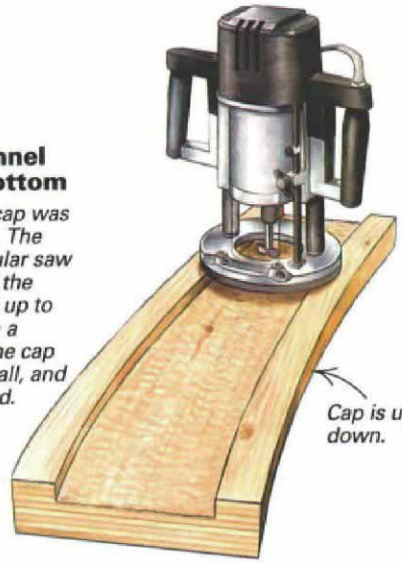
When the final lamination cured, I undamped the caps and unscrewed the cauls. Placing the caps atop the kneewalls, I traced the wall's out-

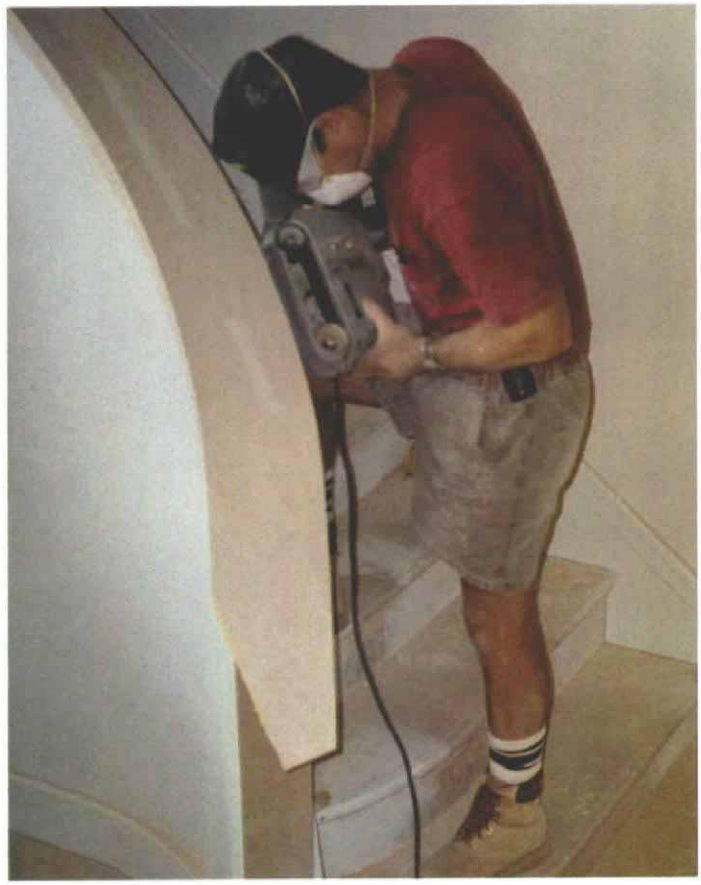


Gluing up. Even after the excess material was cut away, the maple proved to be so tough that only two layers could be glued at a time.

Cutting a channel in the cap's bottom

After glue up, the cap was scribed to the wall. The author used a circular saw to remove most of the waste and cleaned up to the scribe line with a freehand router. The cap slipped over the wall, and no trim was needed.





With the cap temporarily screwed in place, the edges were sanded square and to their final shape.

line on their underside. The finished cap was to project 1¼ in. beyond each side of the wall, so I set my compass to the overhang and scribed the finished width from the wall.

I bandsawed the curves, staying about 1/16 in. outside of the scribed lines to leave room for final sanding and truing. I didn't use a jigsaw because I feared the blade would wander.

Routing the cap to hide the drywall edge— To fit the caps over the top of the kneewall and to hide the drywall edges, I plowed a ½-in. deep, 4½-in. wide channel in their underside. I began by kerfing the caps with a circular saw to remove some of the material. Then, using a ¾-in. straight carbide bit in my router, I finished the channel, carefully cutting to the kneewall pencil lines (drawing above). Freehanding a router on a twisted board isn't easy, but I took my time and was pleased with the results.

After temporarily reinstalling the caps on the wall, I spent a day fairing and squaring their edges with a belt sander (photo above right). I checked the edges frequently with a combination square as I sanded. Finally, I plowed a matching channel in the bottom of the straight sections on the table saw and rounded over all the edges. I butt-joined the straight sections to the curve, reinforcing the joints with #20 biscuits. Construction adhesive and 2½-in. screws hold the cap to the wall, and ⅜-in. face-grain plugs fill the screw holes. □

John Griffin is a finish carpenter who lives in Louisville, Colorado. Photos by the author, except where noted.