A Rail-and-Stile Garden Gate

Simple joinery techniques yield a memorable feature for any garden



by Charles Prowell

My work as a gate builder began in 1982. I landed a commission for a garden gate (with an accompanying arbor) to be built on a public corner lot in Larkspur, California. What marks this date is my departure from the typical, nailed-together, batten-style gates common to most yards with fences. My client wanted something a little dressier than that and was willing to pay for it. So I took the opportunity to make a gate with real rails and stiles, just like a traditional door for a house or a cabinet.

I've built a lot of gates since that one, experimenting with each gate to blend aesthetics and efficiency. The gate illustrated in this article is one of my old standbys: a Craftsman-style gate that goes well with the arbors and trellises that detail many older homes here in northern California (photo facing page).

I built the gate shown in the installation about 10 years ago out of redwood. The one shown in the construction photos, however, is made of western red cedar. Both woods are excellent for gates. But I've been using more and more of the red cedar of late because it costs less. And as cedar gets more expensive, I've turned to fishing through my supplier's inventory for the best stock among the knotty grade. If saving a little money interests you, check out the lesser grades. There are often mostly clear pieces with a few knots that you can work around.

Why I like the lap joint—As is true with other kinds of doors, there are several ways to join a gate's rails and stiles (the horizontal and vertical portions, respectively, of the gate's frame). The options include the traditional mortise-andtenon joint, the floating tenon, the doweled joint, the biscuit joint and the cope-and-stick joint preferred by many production-minded doormakers. Of all of them, I have grown to prefer a joint rarely used in door making: the lap joint. To my way of thinking, it has two big advantages. First, it provides a large mating surface for the glue to get a grip. Given the strength of contemporary glues, this trait is a real plus. And second, the lap joint is reasonably easy to machine (it's the reasonable joint I'm concerned with here, not some schematic puzzle out of a book on Japanese joinery).

This gate is composed of 2x4 stiles, a 2x8 bottom rail and a top rail that started out as a 2x8







Begin a midrail lap joint with a series of crosscuts. Rough out midrail joints with a radial arm saw or a table saw set to cut almost halfway through the stock. Then use a chisel to break free the narrow strips of wood.

Bandsaw lapjoint at the ends. The author uses a bandsaw to rough out the joint at the ends of the rails and stiles. To ensure an accurate, safe cut, Prowell clamps a fence to the bandsaw's table, and snugs the stock against the fence with a featherboard.

Clean up thejoint on a router table.

After removing the bulk of the stock, finetune the joint by milling the lap to exactly half of the thickness of the stock with a straight bit mounted in a router table. The block clamped to the fence keeps the bit from inadvertently nicking the shoulder of the joint.



Or take the router to the work. Running a straight ³/₄in. bit in a router with a custom base, Prowell mills two joints at once. He clamps the stiles together to make sure the alignment doesn't stray. At the outboard end, the router rides on a block the same thickness as the stile.



The middle rail is grooved on both sides. With the ³/₄in. straight bit—this time mounted in the router table—the author plows a groove in the middle rail. With each pass, the bit should take no more than ¹/₄ in. of material. The groove stops short of the end of the rail to prevent a gap in the joint. The finished rail (above right) has two ³/₄in. wide grooves in it. The top one, for the pickets, is ¹/₂ in. deep. The bottom groove, for the panels, is 1 in. deep. The extra depth allows the panels to be inserted after the gate frame has been assembled.



The panels are shaped with a pattern and a router bit. Shallow recesses along the edges of the panels abut one another to create narrow slots with curving ends. Here, a panel edge is cut with a bearingguided router bit. The bit's bearing follows the profile of the pattern, which is tacked to the top of the panel.



Gang-cut the spacers. The pickets in the upper portion of the gate are held apart by spacers made from 1x cedar stock. Here the spacers are crosscut on a table saw. Note how the fence is held back from the stock to prevent the blade from pinching a workpiece against the fence, causing a potential kickback.

before I cut a stepped profile in it. The middle rail is a 2x4. For larger gates I use a 2x10 bottom rail, and I adjust the stile width upward accordingly. To avoid clumsy proportioning, I make sure the width of the stiles falls between onehalf and two-thirds the width of the bottom rail. The planks in the bottom portion of the gate are 1x6s, and the pickets along the top are also 1xs, ripped to 1¼ in. wide.

I leave a ¹/₂-in. gap between a gate and its post on each side for a little expansion room and ease of swing. So the width of a gate equals the distance between the posts minus an inch. The rails are cut to exactly this length, and the stiles are cut to the exact height of the gate.

Once I've got my materials on hand, I start the project by removing the eased edges on the 2x stock with a joiner or a power planer. Squaring the edges ensures a tight fit where the rails meet the stiles. I cut the lap joints for the stiles and rails with a table saw, a band saw and a router (see photos starting on p. 73). I also use a router table to groove the stiles and rails for the pickets and the panels.

Protecting the gate from the weather—I insist on painting or staining a gate, no matter what the species of wood. A good-quality paint or stain will protect the exposed end grain of the wood and help to keep moisture out of nooks and crannies. There are any number of oil-based and water-based products available that promise to enrich the natural color of the wood, but it is my experience, based on a woodworking career that began before child-labor



Glue up starts with one stile and all of the rails. After a dry run to see if the parts fit, the author begins the final assembly by gluing the rails to one of the stiles. At each lap joint, wooden cauls protect the work from the jaws of the C-clamps. Before the clamps are tightened, each joint is adjusted for square by gauging it with a framing square.



Slide in the pickets and the spacers. Pickets and spacers alternate in the grooves in the top and middle rails. They are held by a generous allotment of water-resistant yellow glue swabbed into the grooves. Squeeze-out is removed with a rag. As the pickets accumulate, they are pulled together to eliminate gaps between the pickets and their spacers.

laws, that nothing short of pigment will maintain the color of the wood and prevent graying. Because it is highly absorptive, cedar is good at taking on oil-based, exterior-grade stains. The brand and tint I use most often is Olympic #705 (Olympic Paint & Stain Co., PPG Industries Inc., 1 PPG Place, Pittsburgh, Pa. 15272; 800-426-6306). I give the gate only one coat of stain, and I'm left with a gate that has the coloring of firstgrowth Honduras mahogany. Because this stain also acts as a sealer, a second coat will not penetrate evenly and will leave a gummy residue. Here on the West Coast, a gate needs to be restained about every five years.

Some clients prefer painted gates. If so, it's important to seal a cedar gate with an oil-based primer. The extractives in cedar (and redwood) will bleed through a latex paint. Also, redwood has to be dry if you plan to paint it. Otherwise, it will bleed through even oil-based primers.

Hinging the gate—Almost every gate I make is hung with galvanized, ball-and-pinion strap hinges. They are available in various sizes at hardware stores, they're strong, and they're easy to install. To install the hinges evenly and to avoid one pinion from carrying more weight than the other, it is best first to set the threaded pins into the post. I block the gate in its opening to its final position. Then I set the straps onto the pins and mark the bolt holes for predrilling.

Charles Prowell is a gate builder and furnituremaker in Sebastopol, California. Photos by Charles Miller. The bottom panels go in last. When all of the pickets are installed, the remaining stile is glued to the rails. Now the 1x panels can be slid into place. Their length is equal to the distance between the bottoms of the grooves in the middle and bottom rails, minus $\frac{1}{2}$ in. As a panel is tucked into the 1-in. deep notch in the bottom of the middle rail, its other end clears the bottom rail, allowing the panel to be dropped into the bottom-rail groove.

