

Joining rails and fittings



STEP BY STEP

Thirty years ago, in a fit consisting of equal parts hubris and innocence, I let a builder convince me to install his stair rails. I was newly self-employed and saw installing railings as an opportunity to expand my offerings, even though I knew next to nothing about them. While I lost my shirt on that job, these step-by-step instructions will help you keep yours on.

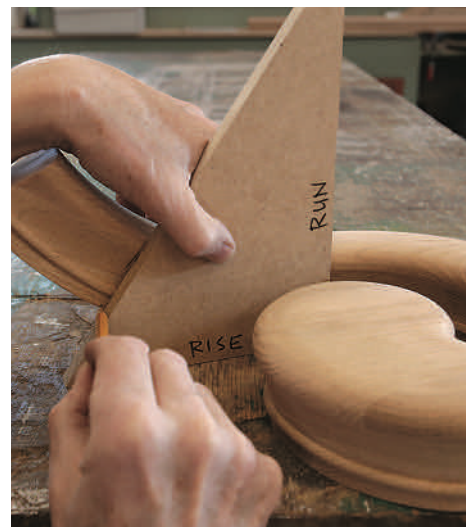
For me, one of the more intimidating parts of the installation was cutting and attaching easings, volutes, and goosenecks to straight rails. These parts are expensive, which makes cutting the correct angle even more stressful—and then you still have to fasten the fittings and rails together both invisibly and stoutly. The fittings come with instructions, but they don't tell the whole story.

The key thing to remember is that fittings have to be cut at the

Continued on page 92



1 Locate the cut. Set the pitch block with the run side on a flat surface, place the fitting on the same surface, and mark the point where the two intersect. (To mark an up-easing or gooseneck, rest the pitch block on its rise side.)



2 Mark the cut. Keep the fitting on the flat surface, then flip the pitch block to its rise side and use it to mark a cutline. (To mark an up-easing or gooseneck, rest the pitch block on its run side.)



3 Make the cut. Make an auxiliary fence by clamping a piece of plywood or MDF to a miter saw, and make the initial cut through it. Then, hold the fitting so its bottom fully contacts the auxiliary fence, line up the mark with the kerf in the fence, and cut to the line.

STEP BY STEP

4 Make a template. To locate the bolt holes, slice a thin piece from the rail you're using. Drill a $\frac{1}{8}$ -in. hole in its center, $\frac{15}{16}$ in. up from the bottom.



5 Locate the holes. Use opposite sides of the template to mark the fitting and the rail. This way, if the hole in the template is off-center, the holes in each piece will still align.



6 Drill pilot holes. Drill $\frac{1}{8}$ -in.-dia. pilot holes in both the fitting and the rail, eyeballed square to the ends. The pilot hole will minimize the chance of the grain throwing off the larger bits to follow.



To see a step-by-step video of this process, visit FineHomebuilding.com/magazine.

7 Enlarge the holes. Drill a $\frac{1}{4}$ -in. hole in each piece, square to the ends. This creates the hole for the lag end of the hanger bolt in the fitting. For the rail, enlarge the hole with a $\frac{3}{8}$ -in. bit, providing a little wiggle room for the machine-threaded end.



8 Drill the access hole. Use a sharp spade bit to drill a 1-in. access hole about $1\frac{1}{2}$ in. deep, centered side to side and $1\frac{3}{8}$ in. from the end of the rail. Mark the bit with tape so as not to drill through the top of the rail.



Continued from page 88

point where their curves are tangent to the line of the rail, and each cut has to be square to the rail. A pitch block—a right triangle with one leg the height of the stair’s rise and one leg the length of its run—is used to lay out the cut. Pitch blocks are similar to the cutout resulting from notching the stair stringers, but don’t be tempted to use those cutouts because they’ll be smaller than the stair’s actual dimensions by the thickness of the saw’s kerf. Once the parts are cut, they can be joined with a hidden $\frac{5}{16}$ -in. rail bolt, also called a hanger bolt and usually included with the fitting.

There are two main types of rail fittings. Starting volutes and easings are fittings used to transition from the bottom newel post to the stair rail. Up-easings and goosenecks are the second type, used to transition from a stair rail to a vertical section of rail at a landing. Shown here is a starting volute. The installation steps are the same for both types of fittings, except the orientation of the pitch block used to mark the pieces is reversed between the two.

Senior editor Andy Engel is the author of *Building Stairs (For Pros, by Pros)* from The Taunton Press. Photos by Rodney Diaz.

STEP BY STEP



9 **Make way for the washer and nut.** Chisel a flat spot inside the access hole that’s large enough to accommodate a $\frac{5}{16}$ -in. flat washer, being careful not to damage the rim of the hole. A sharp $\frac{3}{8}$ -in. chisel works well.



10 **Insert the bolt.** Eye the edge of a pair of locking pliers so they’re even with the end of the rail. Align the bolt to leave room in the access hole to slip a wrench past, then clamp it tightly. Lube the treads with wax and turn the lag end into the volute. When the edge of the pliers hits the endgrain of the volute, the bolt will be at the right depth.



11 **Connect the parts.** Coat the ends of the rail and the fitting with glue, put the bolt into the rail, and place a washer and nut on the end. Keeping the beads on the rail and fitting aligned, tighten the nut with a $\frac{1}{2}$ -in. wrench.



12 **Plug the hole.** Glue in the 1-in. plug included with the rail bolt, being sure to line up the grain direction. Leaving the plug a little proud makes it easier to flush the two up in the next step.



13 **Fair the joint.** Rails and fittings are made on separate machines and rarely match perfectly. If you’re lucky, sanding will be enough to fair the joint, but most cases require a combination of chisels and files, with sanding as the final step.