greenwood

Make a post-and-rung stool

HOW TO USE RIVEN STOCK, WET/DRY JOINERY, AND NATURAL HICKORY BARK

BY PETER FOLLANSBEE

Making furniture from green wood can be intimidating at first. Never mind riving out the parts from a log, people used to getting stock from the lumberyard often get spooked by the idea of their wood shrinking as it dries. Truth be told, though, you can use this shrinkage to your advantage by making joints that lock together tightly. I learned this building method from Jennie Alexander, my friend and mentor, who used it for her post-and-rung stools and chairs. If done right, this method lets you construct light, strong furniture that will easily stand the test of time. The hickory-bark seat, which only gets nicer with use, is the cherry on top.

Parts are split out from a log, shaved to shape

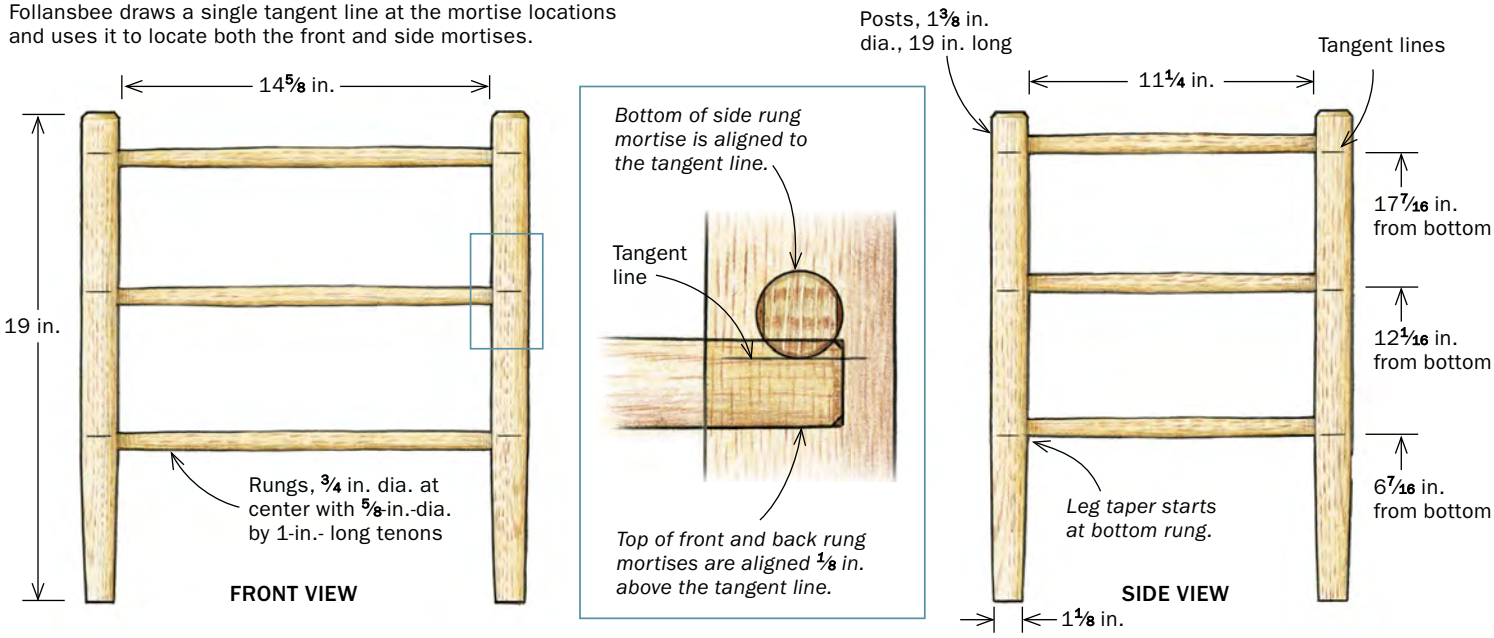
I make these stools—and chairs like them—from straight-grain riven stock. When you rive wood you naturally get continuous grain, which yields the strongest parts and makes shaping them with a drawknife and spokeshave a lot easier. If you want to use sawn lumber instead, be sure to use boards with straight grain.

Using a froe and mallet, I split out parts slightly oversize in thickness, width, and length. I like to use green ring-porous hardwoods, like oak, ash, or hickory, which split the most reliably.

At the shaving horse, shave a face with the drawknife before roughly squaring an adjacent face to it. Then shave the parts square and to

SIMPLE LAYOUT METHOD

Follansbee draws a single tangent line at the mortise locations and uses it to locate both the front and side mortises.



Photos, except where noted: Barry NM Dima; drawings: John Tetreault

Rough out the parts

Rive the blanks. *Using a froe and mallet, split out slightly oversize square blanks that are 2 in. longer than necessary. Use the froe to wedge and lever the parts apart. Large bolts of oak, like the one pictured here, stay green a long time.*

size. Follow the fibers even if they aren't perfectly straight. Because marking gauges don't work well in fibrous green wood, I use a sizing gauge, a scrap of wood with two notches cut in it. One is ¾ in. square for the rungs, the other 1⅜ in. square for the posts. With the posts square, shave them into octagons and let them dry.

Dry posts, super-dry rungs

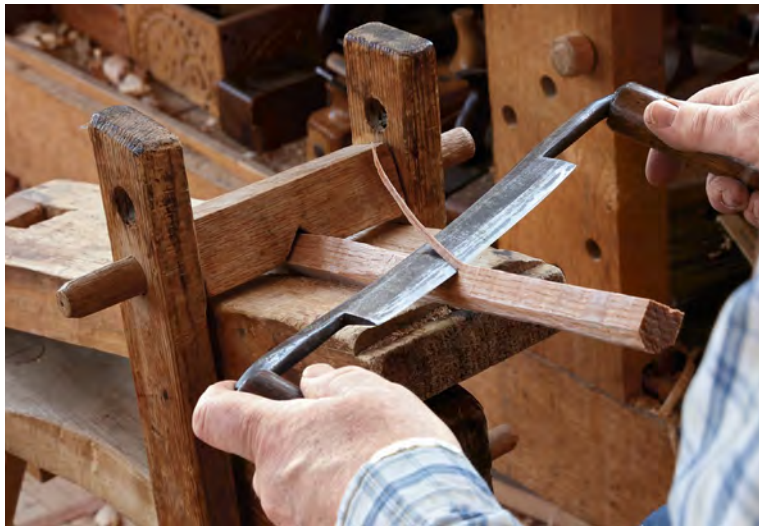
For the wet-dry joint to work, the rungs need to be significantly drier than the posts at the time of assembly. This way, when you drive the rungs into their mortises, the posts will shrink around them, gripping them "till the cows come home," as one old text puts it.

The posts shouldn't be too wet, though. I've heard 12% to 15% moisture content is ideal, but I don't have—and don't want—a moisture meter. I just keep track of how long chair parts have been around and under what conditions they've been stored. To lose enough moisture, the parts need to wait longer in a humid summer than in a dry winter. The posts can take twice as long as the rungs to get dry enough.

Drying the rungs is a two-step process. First, dry them until they hit equilibrium with the environment. Use a scale: When the rungs stop losing weight, they're dry.

Square and size stock with a drawknife at the shaving horse. *Use the stick's fibers as a guide, following them as closely as you can. Be demanding, discarding any blanks with weird wiggles or crook. Take long, sweeping strokes and skew the drawknife.*

Sizing gauge tracks your progress. *The gauge has two square notches cut into it, one for the rung blanks, the other for the post blanks. Follansbee avoids a marking gauge at this step because the scribed line disappears in the wet, fibrous wood and the cutter will follow wiggles in the grain.*



Shave square blanks into octagons. *Usually just two strokes per corner with a skew cut is enough. Do all four corners, then flip the piece end-for-end to finish the section that was pinched under the crossbar. The crossbar of this shaving horse has a V-notch cut in one face, which allows square parts to be held with the corner up.*

Dry and shape the stock

Super-dry the rungs. *For the wet-dry joint to work, the rungs need to be much drier than the posts. After bringing the rungs to equilibrium with the atmosphere, Follansbee uses a shopmade kiln made of insulation board duct-taped together. The heat source is a single 100-watt light bulb. A meat thermometer stuck in the top keeps track of the temperature.*

Round the octagons. *Once the parts are dry, shave the octagons round. Start by bringing them to 16-sided parts, then 32, and so on. Remember to take skewing cuts with the spokeshave.*

Chamfer the ends of the rungs. *These parts get tenons, and the chamfer helps the rungs enter more easily into their mortises without splitting.*

Test holes help size tenons. *Bore test holes with the same bit you'll use for the mortises. The test board needs several holes, because they get reamed out as you test rungs. Rubbing pencil lead in the holes (left) reveals the rungs' high spots (right). Use dry wood for the test board.*

The second step, super-drying them, removes even more moisture. I use a rudimentary kiln for this, being sure to keep the temperature below 140°. Any higher and the wood burns. Again, dry them until they stop losing weight.

Once the rungs are super dry, I trim them to length and often keep them in a plastic bag to prevent them from reabsorbing moisture.

Now shave the parts into cylinders by repeatedly knocking down the corners of the chamfers until the parts are round.

Sizing the tenons

The tenons involve care, since grain orientation is important. Put the growth rings—the tangential plane—parallel to the floor (making the radial plane vertical). Make the tenon tight to the top

Fit the tenons, then flatten the sides. *Skew the spokeshave to keep from tapering the end of the tenons. When the tenons fit all around, shave flats onto the radial faces—the sides (above)—to help prevent the posts from splitting as they shrink around the rungs.*

Photo, top left: Peter Follansbee

Mortise the posts

Lay out the mortises for the short rungs. *After marking the tangent lines, clamp the post horizontal and level. Orient the post's growth rings at 45°. Then use a level and a bird's-mouth jig to pencil a centerline along the post.*

Bore the mortises for the short rungs. *Align the edge of the bit with the tangent line. A bit extender helps Follansbee eyeball square, and a level attached to it keeps him in the right plane. A depth stop on the bit ensures he bores each mortise to the right depth.*

and bottom of the mortise. The radial plane shrinks very little, and the post's length barely at all, so that's where the money is. I use test holes in scrap hardwood to sneak up on this fit.

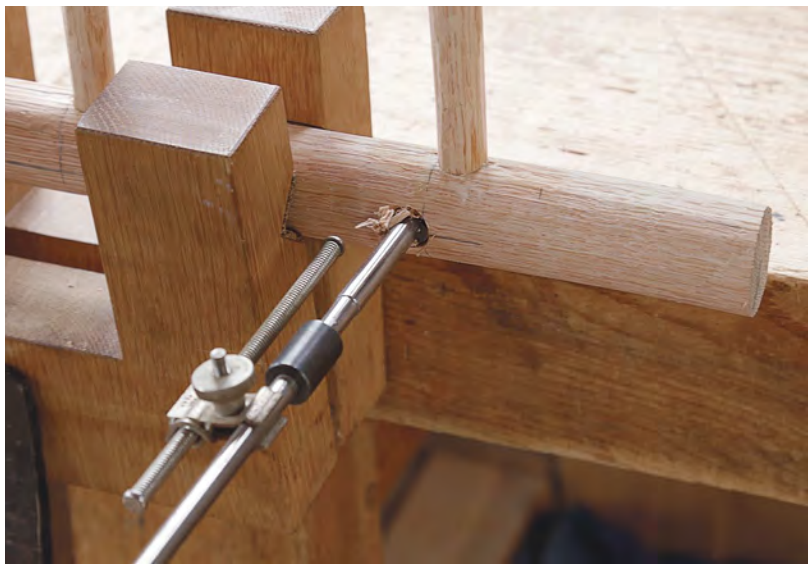
But on the radial faces, shave small flats, making the tenon undersize side-to-side. The post will shrink in thickness as it loses moisture, and if the tenon's sides are too snug, the post could split.

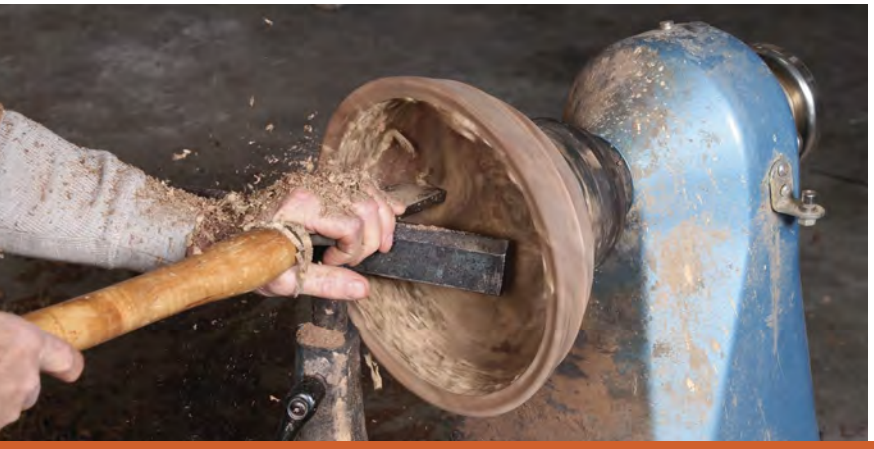
These tenons are unshouldered, so the rungs in each assembly must be the same length and the mortises the same depth. If either's off, your stool can end up catawampus.

When forming the tenons, I often take the rungs out of the plastic bag one at a time to keep them from absorbing ambient moisture.

Glue up the short assembly. *After applying glue to the mortises, pound the rungs into the posts. You'll know the joint's seated when the hammering makes a thudding sound. V-blocks help support the assembly.*

Mortise for long rungs. *Clamp the short assembly so the posts are level and the rungs are plumb (right). From there, draw another level layout line using the same bird's-mouth jig. When boring, overlap the tangent line by ⅛ in. (far right). This strengthens the joint by using the long rung to lock the short rung in place.*





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Assemble the stool

Glue up the frame. *This should come together all at once. After putting the long rungs into one short assembly, hammer on the other side (left). A clamp may be necessary to fully seat the joints (above).*

Trim and chamfer the posts. *Trim the top of the posts to length. Brace the assembly on the floor and use a sharp crosscut saw. Then chamfer the top ends of the posts with a knife. This helps prevent splitting, and makes the tops friendlier to the touch.*

Short rungs are assembled first

When I lay out the mortises, I draw tangent lines instead of centerlines, and wrap them around the post's circumference. Each tangent line locates two mortises. The short rungs get bored just above this line. The mortises for the long rungs, which you'll bore after gluing up the short assemblies, go below the line but overlap it slightly. This lets the long rungs' tenons lock the shorter rungs in place.

To ensure the mortises in each post are in line, clamp the post level and draw a level layout line along its length.

Because the posts are ring-porous wood, they split well along the radial and tangential planes—a boon

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Weave the seat

1. START FRONT TO BACK

The warp sets the foundation for the weaving and runs front to back between the long rungs.

Coils of hickory bark. *While you can gather the bark yourself, it's also available at caning.com. Sixty to 70 ft. is enough for this stool.*

Start by tying a narrow thong to the top rear rung. *To make the knot easier to tie, Follansbee cuts the end of the bark narrower. Soak the bark in water before weaving to keep it pliable.*

Wrap the warp front to back. *Keep the strips spaced closely together and pull them tight without bending the rungs. When one strip runs out, tie on another one, being sure to keep the knots on the bottom.*

when riving and shaping, but a liability when driving in round tenons shaped by hand. So, don't bore the mortises square into these planes. Rather, bore them at a diagonal to these planes so the posts' growth rings bisect the angle of the intersecting rungs. To bore the posts correctly, I clamp them level and attach a line level to my auger bit. Bore square to the post.

When assembling the sides, I add glue. Considering how well the wet/dry joint works without glue, it's like wearing a belt and suspenders, but it doesn't hurt. After banging the parts together, check the interior dimensions to be sure the joints are driven all the way. Before boring the mortises for the long rungs, clamp the short assembly level and plumb and draw another level layout line along the post. After boring these mortises, glue up the rest of the stool.

Before weaving, trim the posts ½ in. above the seat rungs. This leaves enough material so the top joints aren't stressed.

Top it off with a woven bark seat

The inner bark of a young hickory tree is a wonderful material for the stool's seat. You can harvest it yourself in the spring or early summer, or buy it as I typically do. I like strips that are 1 in. wide, so if they come wider I sometimes trim them to width. Also, bark can be irregular, so you may need to thin parts by hand. Before weaving, soak the bark in water for about a half hour.

This stool's herringbone weave consists of the warp and the weft. Start with the warp, which runs front to back. The weft weaves over and under the warp to form the herringbone.

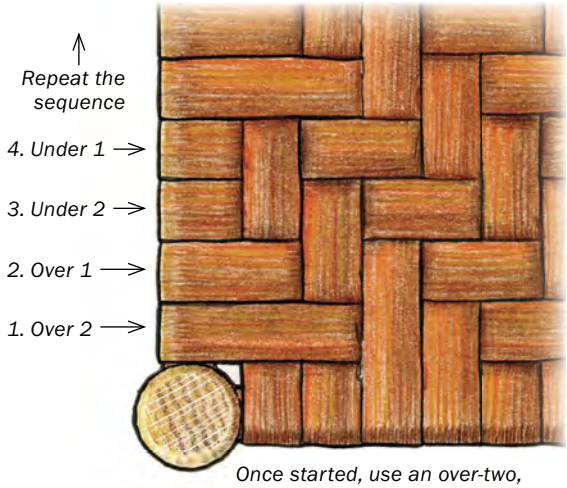
As the seat dries the weave will open up a bit. Come back and shove each row tight again before adding strips to the edges. You'll need to lightly remoisten the seat to do this last bit. These added strips only need to weave through the top and just enough of the underside so they don't come out. □

Peter Follansbee is a woodworker in Kingston, Mass.

2. FINISH SIDE TO SIDE

The herringbone pattern is the result of an easy-to-follow process.

Notch the bark that rounds the post to start the weft. *The weft begins with the last strip used for the warp. A circular cutout lets the bark wrap around the inside of the post cleanly. Keep the strip tight as you pull it across.*



Once started, use an over-two, under-two pattern as you thread the weft through the warp.

Four rows repeat to create the herringbone pattern. *Remember to pull tight as you go and keep the knots on the bottom. For the underside (below), Follansbee simply alternates an over-under pattern.*

Wedged stick helps when things get tight. *The closer you get to completing the seat, the more difficult the weaving becomes. Follansbee uses a wedge to open up the weave and direct the weft. He also uses the wedge's thick end to push the rows of weft into place, which also becomes harder as you weave.*

Double up the last weft row. *To lock the final row in place, Follansbee slightly overlaps the previous row.*