

THREE-FACETED BOWL GOUGE HANDLE • SPLIT-TURNED ACCENT SHELVES • WHAT'S IN A NAME?

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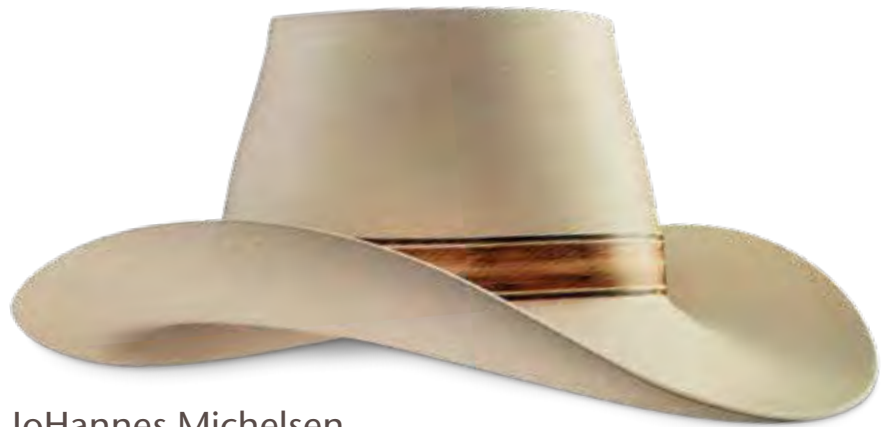


**TURN A
WOOD HAT**

**ARTISTRY IN
WOOD SHOW**

.....
**MAX BROSI
THE STATIC
BECOMES
DYNAMIC**

Turn a Wood Hat



JoHannes Michelsen

Photos by Bryce Boyer.



SYMPOSIUM DEMONSTRATOR IN LOUISVILLE

JoHannes Michelsen will demonstrate wood hat turning at AAW's 2020 Symposium in Louisville, Kentucky, June 4-7. Visit tiny.cc/Louisville2020 for more.



OWN THIS HAT!

JoHannes has donated the hat made in the shooting of this article to AAW's Live Benefit Auction, held during this year's AAW Symposium in Louisville, June 4-7. Visit tiny.cc/2020Auctions for details. Bid in person or remotely online!

The concept for my making wood hats came from reading about turning green wood in Bruce Hoadley's book, *Understanding Wood*. One passage really got my attention; it was about finish-turning a bowl directly from wet wood, what we know as a

once-turned bowl. Hoadley suggests that a "proper" bowl—meaning round—must be twice turned: first roughed, then dried, then re-turned. His implied criticism of oval bowls got my gander up, but it reinforced a key point: turn green wood, get oval product. That's when my

hand went to my head, and I thought, "Wow, I can turn a hat!"

I carried that thought for ten years and, like a seed once planted, the idea grew and I couldn't shake the notion of turning a wood hat. Then, in 1990, came the occasion of the marriage of

Crown and brim profiles

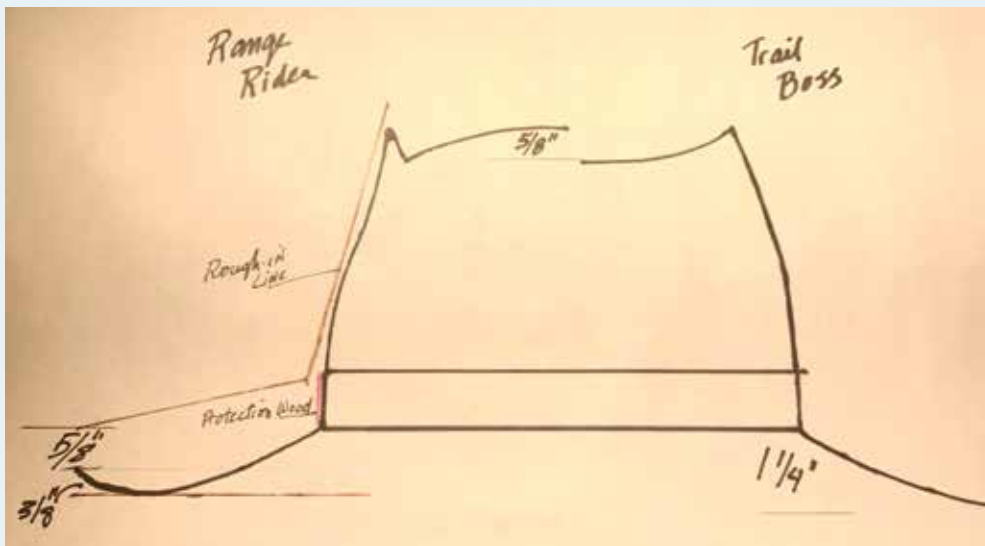
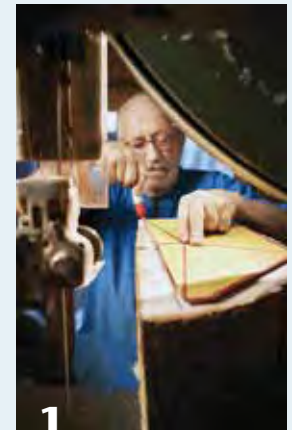


Figure 1. The Range Rider profile illustrated in this article is shown in the left half of this drawing. After determining your desired hat shape, create a full-sized rough template.

Mark rough shape on endgrain



1 Mark the block's endgrain using a sizing/positioning template.

Mark and cut brim diameter



(2-3) Use a large compass to draw the brim diameter, then cut out the blank on the bandsaw.

(4) The author uses a large bandsaw with table tilted to match the tapers already cut along the grain.

Albert and Tina LeCoff (of Philadelphia's The Center for Art in Wood). It was to be a western-style wedding, and attendees were invited to dress accordingly. Again my hand went to my head, and I might as well have heard a deep voice saying, "Turn a hat!" I did turn a hat and have turned many more since then.

Turned wood hats can be custom-fit to anyone's head size. Following are the steps to making a western-style Range Rider (*Figure 1*). In all, I make nine different styles of hats.

Raw materials

I have two sayings about what wood is good for hats: "The wetter, the better" and "Tree today, hat tomorrow." The point is, you want to turn your hat from green wood so it can be shaped to its appropriate oval size and brim profile after turning.

Getting and keeping a good wood supply is paramount. I store wet blocks outside on endgrain, preferably sitting on shavings, not dirt. On top should be something to protect the block from checking, such as another block, wood shavings, or a "cookie-slice" from the end of another block. When prepping blocks for storage, I always leave them extra long—at least 2" (5cm)—so I can cut off the ends in the hopes that any checking or discoloration has not extended to the "good" usable wood.

Start with a blank, as you would a typical bowl turned from green wood.

I use a pattern to help lay out the blank on the endgrain (*Photo 1*), taking care to exclude the pith. I use my bandsaw to cut the blank along the layout lines; it is also possible to use a chainsaw. But before you get to this stage, it's important to select wood with well-balanced grain; avoid having expanded grain on one side and compressed grain on the other, or what I call expansion/compression grain. (*See Balanced Grain sidebar.*)

The pattern I used for this Range Rider example (shown in *Photo b*, *Balanced Grain sidebar*) is 7" tall × 16" wide (18cm × 41cm), with 35-degree tapers on the sides and an extra 1" (25mm) of height on each side. This extra material allows me to adjust the placement of the hat in the blank if needed without losing brim

diameter. Make a pattern for the style of hat you want to turn, and use it to identify which part of the block to use.

You will need a flat on the bark side, so you can lay the block on its top-of-crown and draw a circle indicating the diameter of the brim. Then cut the circle on the bandsaw, making sure to support the sides as needed (*Photos 2, 3*). I then tilt my bandsaw table to 35 degrees and cut the remaining tapers, leaving that extra inch for flexibility (*Photo 4*). If you don't have a large bandsaw, you can get close with some careful chainsaw work.

Mount and turn

I first mount the blank on a screw center held in a chuck, after drilling a pilot hole in the center of the brim ▶

Balanced Grain

When the pith is off center (*Photo a*), the growth rings are spaced unequally. The number of growth rings is the same throughout, but their spacing varies greatly. In the example shown, on one side, the growth rings take up only 8" (20cm) (compressed grain), and on the other side, they take up 12" (30cm) (expanded grain). If you position your blank to include both expansion and compression grain, your hat will move lopsidedly as it dries. Look for evenly spaced grain on both sides of the pith—all expansion or all compression grain is fine (*Photo b*).



(a) A clear example of expansion/compression grain.

(b) This all-expansion-grain layout would work fine for a hat, as it would ensure consistent movement during drying. Note that the pattern's centerline points at the pith.

side of the blank (Photo 5). With the tailstock live center supporting the work, form a chucking tenon on the crown of the hat. Size the tenon to fit your chuck jaws; I use a Oneway Stronghold chuck with #3 jaws, and my tenon was 4¾" (12cm) diameter.

With the blank still mounted on the screw center, tighten your chuck just snug on the tenon and advance the tailstock outfitted with a cone center into the back of the chuck. Turn the lathe on at a very low speed and

confirm that the chuck is running true (Photo 6). If it is not, re-cut the tenon and try the chuck again. When the chuck runs true, snug up the tailstock and tighten the chuck firmly. The goal is to marry the chuck to the blank and keep it that way until all turning, outside and inside the hat, is done and you are ready to finalize the top—all for absolute centering when reversing the workpiece later.

I use a bowl-roughing gouge (*not* a spindle-roughing gouge!) to rough

the hat round, then switch to a more typical ⅝" (16mm) V-flute gouge (Photo 7). I stop short of the brim enough to save a ring of wood from around the base of the crown, using a large carbide-tipped coring tool to cut it free. This extra ring makes for a great mirror frame—a good companion item when selling hats (Photos 8, 9).

A custom fit

Measuring head size for a custom fit is best done with a flexible ruler (Photo 10).

Pre-drill for screw center



Pre-drill the bottom side for mounting on a screw center. Note the extra band of material at the widest part, which allows you to adjust the position of the hat in the block if needed.

Tailstock-mounted chuck



(6) With the blank mounted on a screw chuck, form a tenon at the top of the crown, then mount a chuck on the tenon and ensure it runs true. This ensures centeredness when the hat is reverse-mounted later.

(7) Rough-shape the outside of the crown.

Save a mirror ring



The author opts to part a ring of wood, rather than waste it. The rings make great mirror frames.

You can also do this with a large caliper (which you'll need during turning anyway). Another method is to position the head in a doorway and gently close the door till it contacts the head. Then measure the space between the door and the jamb. You are after two measurements: side to side and front to back, being sure to account for the bump on the back of the head.

Transfer these two main dimensions to paper so you can draw and establish the oval shape of the head. The average of the two main dimensions will give you the diameter of the circle representing the oval head; add to this 1/2" (13mm)—1/4" (6mm) for shrinkage and 1/4" for the wall thickness at the band, 1/8" (3mm) on each side. This extra 1/2", added to the average of the head measurements, will give you

the outside diameter (OD) to size the hat during turning.

The next step is to begin rough-shaping the crown and "sneak up" on the desired OD. Taper the crown, beginning at the top and cutting toward the hatband. Given the size of my tenon for the Stronghold jaws, the OD of the jaws (my starting point) was roughly 6" (15cm). Make sure the taper widens to a diameter larger than the required hat size, so you can gradually arrive at the correct size. Set the caliper to the calculated OD and apply it to the rotating wood—not held straight up as you would in spindle turning, but laid flat, as shown in *Photo 11*.

Where the caliper "falls by," I scratch a line with one jaw of the caliper and then cut with a smaller, sharp gouge

(*Photo 12*). Start above the scratch line and cut a new taper that is less angled and smaller at the start, and gauge it with the caliper until you have snuck up on an accurate diameter for the hatband. Typically, this happens a bit high on the crown (refer to *Figure 1*), which is useful because as you continue toward the brim, you'll have another chance at perfecting the OD if you didn't get it just right higher on the crown.

Turn brim and crown

Now that the crown is turned to the desired OD, you'll know how much brim you have to work with. You will need about 1" of wood thickness in the brim for a Range Rider. Think of the brim in thirds. *Figure 1* shows that ▶

Measure head size



10 Wrap a flexible ruler around the head of the intended wearer, in this case photographer Bryce Boyer, over the bump on the back of the head and around the forehead.

Sneak up on desired OD



11 Use a caliper and gouge to "sneak up" on the pre-determined outside diameter of the hatband.



12 Use a caliper and gouge to "sneak up" on the pre-determined outside diameter of the hatband.

Turn the brim



13



14



15

(13) Turn the first one-third of the underside of the brim, giving it a nice curve.

(14) Match the top side of the first section of brim, using light as a rough guide to thickness.

(15) Complete the curve of the brim up to the hatband. The shadow of the toolrest is a reliable indicator of the curve. Note the extra thickness of "protection wood" at the band, which temporarily protects the final hatband material underneath.

Finish-turn the crown



Complete the turning of the crown, imparting a nice “recurve”—a slight swale and bulge—as the shape widens toward the brim.

Finish-turn underside of brim



With the hat now reverse-mounted, the chuck still holding the crown tenon and threaded onto the spindle, finish-turn the underside of the brim, again using light as a rough guide to thickness.

the first one-third, starting at the outside edge, curves down. Then the next third curves back upward, and the final third rises up to the hatband. Note that the first two-thirds comprise just $\frac{3}{8}$ " (9.5mm) in height, and the last third covers $\frac{5}{8}$ ". This turned brim shape yields a good bent shape later.

I first turn the bottom of the brim, cutting the first third of it $1\frac{1}{4}$ " (32mm) back from and out to the edge, to a consistent curve. I do that with a shear-scraping pull cut, so I'm cutting with the grain (*Photo 13*). Then I thin that section from the top side of the brim, using a push cut downhill, again cutting with the grain. In stages, I bring the first third of the brim to final thickness (*Photo 14*). I try for a fat $\frac{1}{16}$ " (1.6mm) or as much as $\frac{3}{32}$ " (2.4mm) for the outermost $\frac{3}{4}$ " (19mm), and the rest of the brim should be $\frac{1}{16}$ ".

Remove the waste wood that remains on the crown between the established hat size OD and the brim, remembering to leave $\frac{5}{8}$ " of wood so the brim can rise up to the hatband. Leave about $\frac{1}{8}$ " thickness of what I call protection wood on the hatband to protect the crown from an accidental spiraling catch. This can happen if the tip of the gouge contacts the crown as you shape the upper part of the brim. Once you have the transition point established, use pull cuts on the top of the brim to form a nice curve that connects with the first third of the brim. A good way to “see” the entire brim curve is to cast a shadow of the toolrest on it (*Photo 15*). The final thickening of the brim will occur on the underside, after the hat is reverse-mounted. Now go back and remove the protection wood at the hatband (*Photo 16*).

Hat crowns look good at about $4\frac{1}{4}$ " to $5\frac{1}{2}$ " (11cm to 14cm) tall. For the Range Rider, the crown

should have a nice gentle “recurve,” starting at the top with a slight swale and then transitioning into a bulge as it descends to the brim (*Photo 17*). Sneak up on a good line for the crown shape, leaving material for a final cut with a freshly sharpened gouge. As your finish-cut approaches the brim, remember to leave the band $\frac{1}{32}$ " (0.8mm) thicker than the rest of the crown.

Hollow the crown

Remove the hat from the screw center, leaving the chuck attached at the crown, and remount the chuck on the lathe spindle. In this orientation, you can finish-turn the brim and hollow the crown.

With a lamp positioned behind the brim, turn the last two-thirds of it using a push cut, thinning it to translucence. Keep in mind that the brim will allow more light through as you work up toward the crown because as the shape curves upward, there is more and more endgrain exposed (*Photo 18*). Do not take the amount of translucence as a definitive gauge of wood thickness; confirm it with a caliper.

To begin hollowing, I like to core the crown (*Photo 19*), as I use the interior wood to make mini hats. It's free wood and already round! But you can simply turn away that wood if you prefer. Hollow the crown using light as a rough guide, but as with the brim, measure with a caliper to ensure the thickness. Translucence can change as you go, due to a variety of factors, and is not a reliable gauge.

To enter the crown from the brim face, “close” your gouge by rolling its flute fully away from you. The goal is to position the tool's tip absolutely plumb so it cannot skate or run, which can result in disastrous damage to your finished brim. The tri-lobed shape of

my tool handle helps me to know when my flute is closed, and I put the fingers of my left hand in the flute for extra security (*Photo 20*). After turning about halfway into the crown, I find it easier to remove waste from the center with the bowl-roughing gouge.

This is where a large, 18" (46cm) caliper is useful, as it can clear the brim and reach inside the crown (*Photo 21*). The target wall thickness of the crown, above the slightly thicker hatband, should be about $\frac{1}{16}$ ". Note that the Range Rider has a $\frac{5}{8}$ " dome shape at the top (see *Figure 1*), so be sure to reserve material for that as you hollow the crown.

Before I form the tight corner inside the top of the crown, I sharpen my gouge and make a cleanup pass on the inside walls. Glancing a light inside helps me see the quality of my cuts (*Photo 22*). Turning a crisp corner all the way up inside is challenging. I start with the gouge about $\frac{1}{4}$ " from the corner, flute facing up, and push straight in. When both bevels rub, the tool won't go any deeper and I have to remove wood from one side and then the other alternately to advance into the corner. With these cuts, it is critical to close the flute to avoid a catch.

When forming the underside of the dome, you won't be able to rub the bevel with such a narrow opening, but with a light cut, the surface will be reasonably smooth. A J-shaped toolrest helps. I use my left hand as a pivot point and swing the tip of the gouge across the shape (*Photo 23*). Casting a shadow of the toolrest onto the dome will help you see its curve. When you like the shape, a small Termite tool or carbide-tipped cutter does a good job of smoothing the surface. ▶



Core hat crown

The author opts to core a chunk out of the crown prior to shaping the inside.

Hollow crown



Take care when making an entry cut into the crown. A spiraling catch here could ruin your nicely turned brim.



Use a caliper to gauge the wall thickness of the crown.

Finish-turn inside crown



A light glanced up into the crown on the side opposite the translucence reveals tool marks, which the author cleans up with a freshly sharpened gouge.



Shape the underside of the top. A long J-toolrest aids in supporting the tool deep inside the hat.

Sand inside and bottom



24

Compressed air blows water out of the wood, so the wood can be sanded.



25

Sanding

If your wood was nice and wet when you started, it is probably still too wet to sand now. The solution is to blow the water out with compressed air, until almost all the visible wetness is gone (*Photo 24*). The cell water, or bound water, remains in the wood but won't clog your sandpaper. Don't concern yourself with how wet the surface looks on the outside, as you are sanding only the inside at this point.

I use 5" (13cm) sanding disks on a back-up pad that I've modified to make soft and flexible (*Photo 25*). To modify the backing pad, I ground off the rubber, leaving a thin edge that gets into details well. I use 120, 180, 220, and 320 grits at the lathe and finish with 500 after bending the brim. The back-up pad can be attached to extensions, so it can reach into the deep, narrow opening of a hat.

I sand the inside of the hat while it is still in the chuck, reversing the direction of the lathe with each grit. I do this because no matter how sharp your tool is, there are two areas of grain where you are coming off pure endgrain and onto sidegrain, and there will always be some fibers that aren't cut but bent over. It's a kind of micro-tearout. Sanding in reverse bends them back over and they sand away more quickly. With all grits, try to center the sandpaper as well as you can on the pad, as this makes it possible to get into the little corner above the band and the softer corner from band to brim. You can also sand those areas by hand with folded sandpaper.

Finish-turn the top

Now you can remove the hat from the chuck and remount it using a jam chuck or, my preference, shop-made wood jaws to turn away the

Wood Jaws

A set of wood jaws for your chuck is very useful in reverse-mounting a hat for final turning on the top. Most chuck manufacturers offer flat plate jaws, and you'll need a set to attach custom wood jaws.

Start with a board 2½" (6cm) thick, 24" (61cm) long, and 5½" (14cm) wide. At the table saw, rip the four corners off at a 45-degree angle (*Photo a*). Then crosscut the board into four equal lengths. Hold the pieces together to form an octagon—band clamps or rubber bands work well. With the plate jaws mounted on the chuck, close the jaws all the way. Align the joints of the wood with the joints of the jaws so the chuck is centered (*Photo b*).

Since you are screwing into endgrain, use long screws to attach the wood to the jaws. I used 2½"-long screws. Pre-drill and tighten a screw into each of the holes you can see. Then

open the chuck and add screws in all of the remaining holes.

Shape the jaws

With the jaws closed, turn the rough shape inside and out (*Photo c*). Open the jaws to operating range, wide enough so you can turn a big step, at least 8" (20cm) in diameter, to expand into large hats. Turn two more steps for medium and small hats (*Photo d*). Turning multiple steps is useful, as it means having to expand the jaws less from the closed position to mount any hat. As you open the jaws wider, the wood jaws become less round and more like spaced bumps, which show up when burnishing the band.

It is good to give the surface of the jaws a little traction. With the lathe rotating at a very low speed, spray on a light coat of adhesive. Let this dry completely before use.



(a) A 24"-long board with ripped 45-degree bevels.

(b) The bevels align the wood jaws into an octagon. Pre-drill and use long screws to attach the wood to the jaws.

(c, d) Shape your custom wood jaws. Note the lamp rod extending through the lathe spindle and chuck (much farther than it would in actual use).



waste wood from the top. (See *Wood Jaws sidebar*.)

During this process, it is imperative to use a light inside the hat to indicate thickness by translucence. To position a light bulb inside the crown, I made a lamp rod long enough to pass through the lathe's headstock (*Photo 26*). (See *Light Rod sidebar*.)

I do most of the cutting on top with the live center brought up for support (*Photo 27*). You can use the live-center divot left from when you turned the tenon to aid in re-centering the work. Turn away the waste until you see some light coming through (*Photo 28*). My final test for thickness is what I call the "oil-can test": push on the top till it flexes under your thumb. When you have some flex in the top and about the same amount of light shining through as on the sides of the crown, then you can dispense with the tailstock and make some final passes.

You can now sand the entire outside of the hat. It will have dried as you turned the top.

Burnish the band

You can burnish the hatband to give it a distinctive look. I use exotic hardwoods for this, my favorites being ebony, Madagascar ▶

Light Rod

A light rod positions light inside the reverse-mounted hat. The wood's translucence helps in determining wall thickness while turning the top of the crown.

Photo a shows the components: a 3/8"-diameter lamp rod, lock nut, cord, and socket (purchased items), as well as a shopmade wood Morse taper (MT) and centering plug, both bored through with a 7/16" (11mm) bit. The wood MT fits in the spindle on the headstock side, and the centering plug goes in the outboard side. The light rod passes through both wood components (and the lathe's headstock) but does not rotate with the spindle because a pair of locking pliers on the outboard side holds it in place (*Photo b*).

Shopmade parts

To make a #2 Morse taper in wood, start with a blank 4 1/2" long and 3/4" square. A #2 MT is common in many lathes; adjust the dimensions if your lathe has a different MT size. I use an existing metal taper to compare as I turn and to take dimensions. Leave the wood taper about an extra inch long on the wide end. This keeps the lamp parts clear of the chuck but not so far out that the light bulb rubs inside the crown. With the wood MT in your lathe spindle, drill a 7/16" hole all the way through (*Photos c, d*).

Turn the end of the centering plug to 5/8" diameter, as that's the hole size in all modern lathes that accept a rotary adapter for vacuum chucking. Bore a hole through the plug.



(a) Light rod components, all purchased, except for the wood Morse taper and outboard centering plug.



(b) Outboard side: Locking pliers grip the lamp rod next to the wood centering plug, preventing the rod from rotating with the spindle.

(c, d) Turn a wood Morse taper to fit your lathe. Drill all the way through the wood MT.

Reverse-mount, turn top



26



27



28

The hat is reverse-mounted onto expanding shopmade wood jaws to allow access to the top of the crown. With a light bulb inside the crown, the wood is turned to translucence. Note the tailstock is kept in place until the final, light passes.

rosewood, padauk, ziricote, and purpleheart.

Cut burnishing sticks $\frac{1}{16}$ " to $\frac{1}{8}$ " thick and $\frac{3}{4}$ " wide. Sand a bevel on both ends and present this bevel to the wood at a 45-degree angle to the surface of the hatband. Use the toolrest to steady the stick and your thumb to apply pressure. With firm pressure, the exotic wood will literally

melt and deposit molecules of itself on the hat (Photos 29, 30). Once a surface of the stick has been used, it becomes glazed and slick and won't continue to work. Flip it over and use the other side and/or use the other end.

Bending the Hat

Use a bending jig to shape the brim of the hat and to squeeze the

crown into an oval. (See *Bending Jig sidebar*.) The turned wood is thin and wet enough to bend without breaking, and it will hold its new position after it dries.

Before placing the hat in the jig, tape the two endgrain areas of the brim (Photo 31). If the brim is going to crack, it will happen in the middle of the endgrain. The

Bending Jig

A hat-bending jig is a simple fixture. Its purpose is to hold the hat upside down so you can apply pressure to shape the opening to an oval and bend the brim. The jig shown here measures 27" (69cm) tall. The base is 7½" (19cm) wide by 12" (30cm) long, and the legs are 1¼" (32mm) wide, ⅜" (9.5mm) thick. The legs should be of a wood that has some spring like ash or oak.

The padded jaws, measuring 1½" × 6" (38mm × 15cm), are curved to hold the hat at the band. Grind or sand down the corners at the top of the legs, so the hat brim will have clearance to bend freely. A ⅜"-diameter threaded rod extends through the legs and is held in place with a wing nut and notched blocks the same size as the upper padded jaws. A screw in each block acts as a hook for the rubber bands, which extend over the hat and pull the brim into a curve.



Burnish hatband



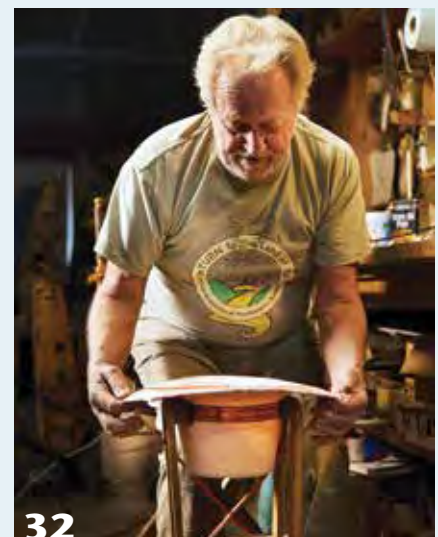
A strip of exotic hardwood is pressed on the spinning hatband, burnishing the wood and mimicking an applied band.



Set in bending jig



Apply tape over the two endgrain portions of the hat to help prevent cracking in these areas.



The hat is set in a bending jig, whose curved jaws squeeze the band into an oval shape. Rubber bands pull the brim into the desired curve.

tape avoids this cracking most of the time. I use a lesser-quality 2-mil plastic packaging tape that will stretch. A higher-quality 4-mil tape won't provide the needed stretch as you apply the tape. If you don't stretch the tape, it will lose its tension and cease to be effective as the wood shrinks.

Put the hat in the bending jig with the sidegrain contacting the curved jaws and the endgrain front to back. You will be bending the hat along the grain, not applying pressure into endgrain. Snug up the wing nut. Once the wing nut contacts the blocks that bend the legs of the jig, I turn it thirteen or fifteen half-turns more. This is not a lot of pressure but is sufficient for ultra-light hats. As the block pressure bends the legs about halfway up the jig, the legs apply spring pressure to the sides of the hatband, bringing it to an oval shape.

Next, apply rubber bands (*Photo 32*). I use a chain of four bands to gradually pull the brim into a curve.

Most of the bending will happen overnight. The next day, if needed, tighten the wing nut ten half-turns more and adjust the rubber bands as needed to make a balanced shape. If one side is resistant, a little heat from a lamp will help. Later that day, I put the hat into a hand-screw clamp, which squeezes the sides farther and allows me to fine-tune the fit. I over-bend the fit $\frac{1}{8}$ " to allow for spring-back. When I reach the desired opening, I put a stop block in the hat crosswise to hold that width (*Photo 33*). The hat needs to be "baked" dry with the stop block and hand-screw clamp in place—I position a desk lamp with an incandescent 100-watt bulb to direct heat into the hat. The baking makes the hat hold its new shape (*Photo 34*).

Final sanding and finishing

I do the final sanding at my drill press after the hat is bent. I use a long extension that allows my soft sanding pad to reach into the hat, but this time with a 6" foam-backed abrasive, 360 and 500 grit, on the 5" pad to get an extra-soft edge that leaves no edge-tracking. Be careful not to sand the burnished hatband, as the coloring will sand away quickly (*Photo 35*).

I typically apply wipe-on polyurethane to my hats. This finish is easily repairable. If you wear a wood hat daily, as I do, after about five or six months, the finish looks a little drab when it gets wet—yes, I wear

them in the rain. The water stops beading up on the finish. A rubout with 1,000-grit abrasive and a fresh wipe of polyurethane gets it looking as good as new. ■

JoHannes Michelsen was born in Denmark and immigrated to the U.S. in 1949. He began learning to turn at age nine. Now living in Vermont, JoHannes teaches wood hat turning all around the world. He is also a designer/inventor of woodturning tools. Contact him at hatman@hannestool.com or visit hannestool.com.

Fine-tune size



33 With the hat in a screw clamp, a stop block defines the final interior width, and heat from a lamp "bakes" it dry in this position.



34



35

Final-sand the hat

Finish-sand the now bent and sized hat using a fine sanding disk mounted in a drill press. If you don't have a drill press, you can mount this setup in a drill chuck on your lathe.