WOODTURNING FUNDAMENTALS

American Association of Woodturners
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AAW AMERICAN ASSOCIATION OF WOODTURNERS
WE ARE TEACHING THE WORLD TO TURN

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American Association of Woodturners

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A NOTE ABOUT SAFETY

An accident at the lathe can happen with blinding speed, while respiratory and other problems can build over years.

Take appropriate precautions when you turn. Safety guidelines are published online at tiny.cc/turnsafe. Following them will help you continue to enjoy woodturning.

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The AAW strives to cultivate an organization built on mentorship, encouragement, tolerance, and mutual respect, thereby engendering a welcoming environment for all. For more, tiny.cc/AAWDiversity.

Cover: *Rick Rich makes a shearing cut with a skew chisel to size blanks for a Panache pen kit. The full article begins on page 12.*

Welcome

For those who live hours (3-1/2, for me) from the nearest AAW club, the annual Symposium always provides a great immersion into the supportive, collegial community of woodturning. This year's event in Chattanooga brought us face-to-face again after a two-year hiatus—a welcome return to near-normal. As always, the rotations were packed with engaging demonstrators and inspiring topics. So even if you are lucky enough to have a nearby club or fellow turners with whom to exchange ideas, the Symposium event is not-to-be-missed. Start making plans to join us in Louisville in 2023!

Building on the idea of live demonstrations, contributor Kevin Felderhoff shares his technique for turning acorns with threaded tops (**p. 20**). With Felderhoff's standardized system, lids and bottoms of these diminutive boxes are interchangeable so you can mix-and-match and investigate contrasting wood grain and tones. Felderhoff has produced a comprehensive two-part video to accompany his article, so be sure to check out the included links.

The Pro Tips column this issue is a bonanza of turning-specific shop jig ideas from Ernie Newman (**p. 34**). Jigs are a great way to expand the abilities of our equipment to make repetitive tasks easier or complete a project that might otherwise be impossible with off-the-shelf tooling options. Newman's decades of turning, teaching, and learning from others snaps into focus in this packed column.

Kit Corner columnist Rick Rich brings us another pair of excellent articles, this time on the topic of turned pens (**p. 6**). With an overwhelming number of kit options on the market, Rich explores the differences between kits of varying price points. What do you get for your hard-earned dollars? Are more expensive kits correspondingly more complex to turn? Filling a need that will surely arise from your own pen-turning efforts, Rich also gives a simple approach to turning a desktop pen and pencil holder (**p. 12**).

We also have an interesting take on bottle stoppers (**p. 15**), a versatile stand for displaying your turnings (**p. 25**), and a quick-change tool handle (**p. 30**).

Enjoy this latest batch of contributions!

—Don McIvor, Editor

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KIT corner

EVALUATING PEN KITS

BY RICK RICH

For this issue, I set out to step through the making of a Panache pen kit. I have never made one and the design is interesting. It occurred to me to compare making the Panache pen with the ease of making a Slimline pen; I have made hundreds of those. While browsing supply catalogs and websites and noting the overwhelming number of pen kit options, I have often wondered if some of the expensive kits are worth their cost—what do you gain by paying top dollar for a kit? For comparison, I seized the opportunity to investigate the most expensive fountain pen kit I could find in my catalogs. I ordered quickly, before I could change my mind. In this article I will make all three kits: a simple chrome Slimline, a 10k gold rollerball Panache, and a distinguished Statesman fountain pen in rhodium finish with 22k gold accents (**Photo 1**).

Gather materials

Start with a pen kit of your choice. The author chose three models for comparison purposes.

While making each kit, I kept track of the time it took me to take each one from blanks on the mandrel to complete assembly. I also wanted to see for myself the simplicity, or perhaps complexity, of turning (the easier part) and assembling (the harder part) the expensive kits, especially the fountain pen. For the vast price difference, I wondered what the writing quality would be? I knew how the inexpensive ball point Slimline writes, but what about the moderately priced rollerball and the exquisite fountain pen?

Pen blanks

I used seasoned, figured bigleaf maple for all three pens. I did so by raiding the firewood shed where I set aside promising pieces that show rippling or other interesting figure (**Photo 2**). I used my bandsaw to mill pen blanks from the piece, coated the ends with wax, and stacked them on a shelf to acclimate to my shop. When I started this project a few months later, they were bone dry and crack free.

Prepping the blanks

Before turning the kits, I wanted to ensure fairness for timing only the turning and assembly steps. To accomplish this, I drilled and glued the tubes in all the pen blanks first. I use my chuck fitted with extended pin jaws to drill pen blanks. I size each blank by placing one of the brass tubes on the blank and marking off an extra 1/8" (mm) at each end of the tube. Keeping the blanks oriented so that the grain runs uninterrupted through the cap and body is critical for a visually appealing outcome. I draw a line between the tubes to keep track of the proper grain orientation.

All those accessories

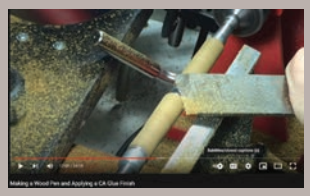
Pen turning seems to require an inordinate number of accessories, a situation made worse by the absence of industry standards and inherent size differences between pen styles. Before ordering a kit, it's essential to verify that you have the correct mandrels, bearings, and other odds-and-ends specified (but not included) in the kit.

I checked to see if I had the proper pen mill pilot shafts to fit the four different tube sizes on the Panache and Statesman pens—I didn't. I had two shaft sleeves from a Majestic Jr. pen kit that I completed years ago and found they fit the Panache tubes. Excellent. I had nothing for the Statesman. Having not ordered this accessory with the kit, the workaround was to turn those pilot shaft sleeves myself. Using a 7mm tube and blank on the mandrel, I measured the inside diameter of each Statesman tube with a caliper and then

RESOURCE INFORMATION

If you're interested in pursuing pen turning, you may wish to start with a few of the numerous books (check the library) on the topic and a few hours on YouTube (one suggested video from SP Wood Art is linked below). You should also visit Kurt Hertzog's article, "10 Steps to Better Pens," linked below.

tiny.cc/SPWood



tiny.cc/BetterPens

Choose wood

Pre-cut blanks are readily available for purchase but using your own wood creates additional meaning for the piece. The author selected a piece of big leaf maple from his firewood pile. The ragged split indicates interlocked grain and the promise of curly figure.

Improvise, organize

While many mandrels can accommodate a variety of pen kits, pen mills (or barrel trimmers) are specific to certain tube sizes. Lacking the correct pen mill (or barrel trimmer), the author transferred dimensions from the pen tubes to the blanks using a caliper. While not as convenient, the results are just as precise.

transfered the measurement to the blank with a parting tool (**Photo 3**). A few iterations of taking the blank off the mandrel and checking the fit of the tube paid off with tight fitting pilot shaft sleeves (**Photos 4, 5**).

I also discovered that the pen mill cutter head I have isn't large enough for the Panache, and this led to more problem solving. I didn't expect these little surprises but solving them on the fly is part of what makes turning such an enjoyable hobby.

Some degree of organization is critical when turning pens. Blanks for the three kits are grouped by kit (they aren't interchangeable), with each set marked to help keep track of grain alignment.

Slimline pen

With the lathe configured for drilling blanks, I set the timer and started on the Slimline pen kit (**Photo 6**). Slimlines are such basic pens that it's hard to mess them up and they proceed quickly. Eighteen leisurely minutes later and my Slimline pen was complete and glossy from several coats of friction polish (**Photo 7**).

Slimline pen

Slimline pens are quick and simple because they have a uniform, consistent shape along their length. It's a great starter kit for budding pen turners, and the author finished this one in 18 minutes.

Panache pen

I started the timer for the Panache pen kit and put the bushings on the blanks. Three of them. The fourth bushing did not sit flush on the large end. That's the location for the large end cap that the pen sits on. It's larger than 3/4", the diameter of my pen mill cutter head (**Photo 8**). I don't have a disk sander and I certainly wasn't going to try to hand-sand it flat or concoct some dangerous trick with a power tool. I do have a scary-sharp 1/2" paring chisel, and that allowed me to carefully trim the end grain (**Photo 9**)—both hands behind the blade, always.

A minute later and the Panache blanks were mounted on the pen mandrel. I usually rough pen blanks round with my spindle roughing gouge (SRG) and then move to the skew for a clean finish (**Photo 10**). This pen was straightforward; it has a gentle concave side that sweeps towards the middle. I sanded the Panache to 600 grit before applying about five coats of friction polish (**Photo 11**).

Assembly of the kit is as easy as following the steps in the instructions. I was careful to identify the correct ends for the end caps to maintain the proper grain orientation. I managed to keep the ends oriented but did not pay enough attention to getting the grain alignment correct when pressing in the nib coupler. Truth is, I paid no attention at all, as I was so pleased with myself for keeping the ends oriented. My inattention to this detail shows when the pen cap is on; the grain doesn't line up (**Photo 12**). The Panache pen took me forty-three unhurried minutes to complete.

Panache pen

A larger-than-normal bushing on the Panache pen sent the author looking for a solution to trim the blank end perfectly perpendicular to the axis of the barrel (usually accomplished with a barrel trimmer). The solution was a razor-sharp chisel, a vise, and a steady hand.

A skew chisel almost always leaves a better surface than a spindle gouge, needing only a quick run through the abrasives stack to bring the pen to finish-ready.

With panache

The finished and assembled Panache pen kit.

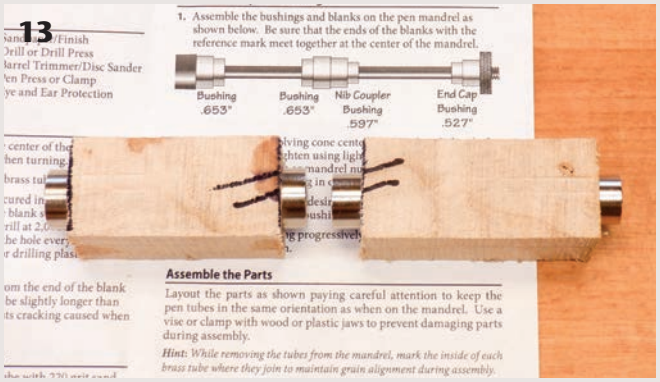
Statesman pen

I added the orientation and grain line lesson to my mental kit as I began turning the Statesman. I really didn't want to mess up this extravagant kit. The kit uses three bushing sizes and the two smaller ones are superficially similar, so I set up the bushings in the blank using the diagram to ensure they were correct (**Photo 13**). As is my normal practice, I roughed the blanks using the SRG and then to the skew for final shaping (**Photo 14**). I decided that I wanted a very slight rounding of the blanks between the bushings to give the pen a subtly fuller appearance, but not so rounded that it was clearly noticeable (**Photo 15**).

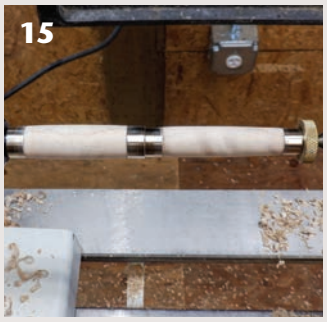
As with the previous two kits, I sanded and then finished the Statesman with friction polish, but I gave the pen about eight coats. I marked the grain orientation. In the assembly instructions I saw the clearly printed helpful hint to mark the inside of the brass tubes (**Photo 16**). I took my time on this one and it showed in the eventual forty-eight minutes required to complete the kit. It would do no good to hurry and accidently press the cap end where the coupler should go!

Here is how I got the grain lined up. Before pressing on the last piece—the center band coupler—I pushed the large end barrel over the coupler as far as I could using only moderate finger pressure. I then screwed on the coupler and twisted the barrel to bring the grain into alignment (**Photo 17**). I then unscrewed the barrel and coupler and then pressed the assembly together tightly. The grain lined up perfectly. I breathed a sigh of relief!

A Statesman fountain pen



Verify bushing orientation before starting, especially in a kit of this style with three subtly different bushing sizes.



Use a spindle roughing gouge to knock the corners off the blanks and quickly brings them to round before switching to a skew chisel for refined cuts. Despite the diminutive size of the turning, artistic expression is still possible; note the understated but elegant curves.

More details

Marking the interior of the pen tubes to track grain orientation is also helpful; unlike the outside, your marks won't get turned away.

Tolerances are tight and you want to avoid having to pull pieces apart because you put them in the wrong place; lay out and double check the sequence of components before assembly.

Writing experience

Catalog descriptions for pen kits rarely—if ever—mention the writing experience you can expect with your completed project. The writing quality was something I wished to explore with these completed pens (**Photo 18**). I used the Slimline as the familiar base standard ballpoint pen. The writing experience is what you'd expect from most every other office pen purchased by the millions all over the world.

The rollerball cartridge in the Panache pen is a considerably better writing experience than the Slimline. The ink flows agreeably onto the paper.

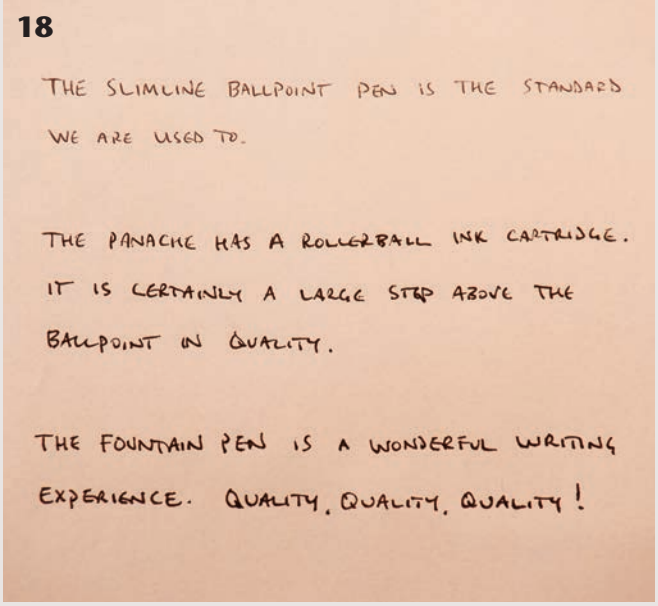
The Statesman is touted as "featuring a top-quality German-made nib with genuine iridium point for smooth writing and dependable ink flow." This is not just a sales pitch; the writing experience is exactly that. Top quality and a very uniform ink flow. Even though I felt the need to slow down, the ink flowed as quickly as I could write. Somewhat neatly write, that is.

At the top of the article, I posed the question: what do you gain by paying top dollar for a kit? The durability of the finish on the components should be more robust and the writing experience should improve as well. The latter variable may be most relevant to fountain pens, where nibs and the ink feed dictate the writing experience and may not be upgradeable or interchangeable with aftermarket parts. Expect your rollerball or ball point kit to come with a serviceable but low-quality ink insert. For only a few dollars at an office supply store you can purchase a high-quality insert (look for established and respected brands like Cross, Shaefer, and others) and significantly improve the writing experience.

All three pens were fun to make. If I ever purchase another full-size fountain pen, this experience will be helpful in assembling it correctly. As far as the Panache, I'm glad I tried it because it ended up being a surprisingly good pen. I'm not sure what the fix is for the larger-than 3/4" bushing size because the 3/4" pen mill cutter heads are the largest regular pen mills in my catalogs. There is a newer style of carbide insert trimmers, but they are considerably more expensive. If I made the Panache kits in the dozens, I would get such a trimmer. As a disclaimer, I did not check the websites of my favorite woodturning supply merchants to see what else they have for pen mills and trimmers, just the catalogs and magazines that I enjoy browsing through with a cup of coffee. ■

But will it write?

18



Aesthetics are great, but in the end, you need a tool that works. All three kits come with what approximates a medium nib. The ballpoint and rollerball tips offer the same writing experience you'd expect from any common pen of these sorts—but with eye-catching appointments. The fountain pen looks and writes in a class of its own.

Rick Rich is a woodturner from Washington State. He is a member of the American Association of Woodturners (AAW), the Cascade Woodturners Association in Portland, Oregon and a founding member of the Southwest Washington Woodturners in Vancouver, Washington.

PEN & PENCIL HOLDER

BY RICK RICH

Every desk deserves a turned pen and pencil holder, especially if it contains a turned pen or pencil! This simple and quick project uses a relatively small blank of wood and a few turning accessories that you may already have. I like to use a series of five Forstner-style bits, graduated in 1/4" (6mm) increments from 1" – 2" (25mm – 50mm) to hollow the blank. You might be able to get away with only the 2" bit, but drilling the interior all at once with a bit that large puts a lot of torque on the blank; you'll end up with less stress and a cleaner finish cut using whatever graduated selection you can gather.

You will also need a 6" (15cm) drill bit extender, a drill chuck with a morse taper to match your tailstock, and a four-jaw chuck. Forstner-style bits work most efficiently and leave the best cut surface when they are sharp. I recommend touching up your bits before you start the project by honing the cutting edge with a small diamond sharpener.

Stock needs

For the blank, I used a leftover chunk of big leaf maple. You'll need a blank roughly 5" – 6" (13cm – 15cm) in length and 2-3/4" (10cm) square to end up with a 2-5/8" (7cm) diameter × 5" tall holder. The inside is hollowed to 2"-diameter—based on the Forstner bit size—and it will be drilled 4-1/2" (11cm) deep to hold pens, pencils, and other items such as scissors. This is deep enough that even scissors are not in danger of falling out and with a 2-5/8" base, it won't be tippy.

Rough the outside

Locate the centers on the ends and mount the blank between centers. I like to set my toolrest slightly above center for spindle turning. Check that the blank clears your toolrest, get your freshly sharpened spindle roughing gouge, turn on the lathe and take down the corners nice and easy (**Photo 1**).

Turn a tenon

Once the blank is round, turn a tenon on the bottom to fit your chuck jaws. I turn this with a peeling cut using a skew, but it can be done with a parting tool, beading/parting tool, or a square scraper (**Photo 2**). The object is to create a tenon with sides to match the internal profile of your jaws and a squared shoulder where the top of the jaws will seat.

When the blank is round and the tenon is turned, remove the blank from centers and install the chuck onto the lathe. As the blank is mounted into the chuck jaws, use the revolving center to apply light pressure from the tailstock end. This helps ensure a good seating of the tenon shoulders against the chuck jaws, then tighten the chuck. Rotate the blank—it should not wobble. If there is a little, true it up.

Shape the outside

Set an outside caliper (with rounded ends for safety) on a ruler and adjust the tips 2-5/8" apart (**Photo 3**). Use the caliper and parting tool to make several sizing parts so the outside of the holder will be a pleasing, straight cylinder (**Photo 4**). When doing so, hold the caliper tips lightly against the wood from the back, gently pressing in as the parting tool is removing material. When the diameter is reached, the caliper will neatly slip over the groove made by the parting tool.

Prepare your blank for chucking

Mount your blank between centers and bring it to round with a spindle roughing gouge.

Using a skew, parting tool, or a square scraper, make a peeling cut to create a tenon to fit your four-jaw chuck.

Turn the outside

Set a caliper to your final dimension. If you're not confident about your turning skills, add a fraction of an inch to your diameter to give yourself room for correcting tearout or tooling problems.

With the blank mounted in your four-jaw chuck, transfer your external measurement using your caliper and a parting tool to several locations along the length of the blank.

Use a skew and paring cuts (if necessary), finishing with light passes and shearing cuts to reduce your cylinder to the marked dimensions.

Now it is as easy as connecting the grooves. If there isn't much material to remove, use the skew (**Photo 5**). If there is more than 1/8", I would suggest using the spindle roughing gouge to remove the bulk of the waste material and then switch to the skew for the final finishing cuts. Finally, put a light chamfer on each end with the skew or spindle gouge to eliminate sharp edges. Now, sand to your desired grit and apply the finish of your choice. It's friction polish for me because I like the instant results it gives (**Photo 6**).

Drill the center

When I use a drill bit extension, it seems to add vibration and chatter to the bit, which is why I like to drill out as much as I can without an extension (**Photo 7**). I drill in two stages. The first stage is to drill halfway or just a tad deeper without the extension and then use the extension for the deeper half. Start with a 1" (25mm) bit and drill to depth. Move to a 1-1/4" bit and repeat. Do this until you finish with a 2" bit.

A very important note on safety when using a drill chuck with a Morse taper; always keep back pressure towards the tailstock. The drill chuck can come out of the quill, especially when retracting the bit. Another drilling tip—use a slow speed. My drilling speed is in the 600 – 700 rpm range, sometimes even slower.

Once the drilling is complete, don't bother to sand the inside unless it really bothers you. A sharp Forstner-style bit leaves a clean hole. If you do want to sand the inside, I recommend using a piece of sandpaper attached to a scrap piece of wood. Putting your fingers inside a narrow form like this one is dangerous—so please don't attempt it.

Part-off

Part the holder off the waste portion. When parting, move the tip of the tool through an arc towards the axis of rotation and take small bites. If the wood smokes, you need to create some relief cuts on the sides to widen the cut. Take your time and let the project fall gently into your waiting hand as it separates.

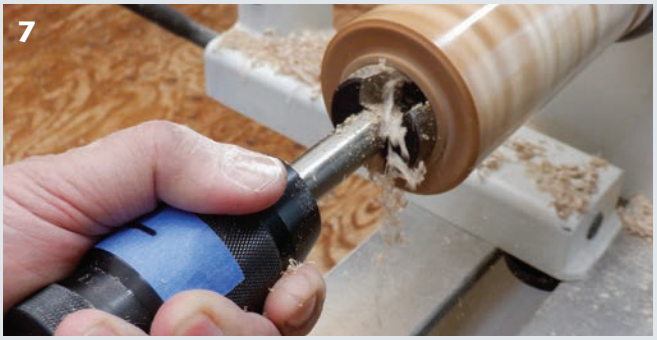
There will likely be a small nub of wood in the center. It's easily removed with a spindle gouge by taking light cuts towards and around the center (**Photo 8**). I don't bother sanding the bottom either, but you certainly may if you'd like! ■

Rick Rich is a woodturner from Washington State. He is a member of the American Association of Woodturners (AAW), the Cascade Woodturners Association in Portland, Oregon and a founding member of the Southwest Washington Woodturners in Vancouver, Washington.

Finish the exterior

Sand to completion and apply a finish to the exterior.

Hollow the center



Using your Forstner-style bit (or bits), bore out the interior of the holder. Be sure to leave enough material in the bottom for parting.

Part-off

Use a parting tool to remove the holder from the lathe. Clean-up the nub with a sharp gouge or knife.

OFF-AXIS TOP HAT BOTTLE STOPPER

BY DAVE BLEIL

I am always looking at objects with an eye for turning them. The stoppers I once made for friends and family seemed to be too much like the ones everyone else had been making; I wanted something different. Reading a Dr. Suess book to one of my grandsons is a likely candidate for the origin of this idea—think *The Cat in the Hat*. Because the project requires little wood, it didn't take me long to try to make one. My wife's "Oh, that's different" reaction added encouragement—confirmed by the people that received them as gifts.

Figure in the wood adds to the attractiveness, so I immediately looked for pieces that had unusual grain or a distinctive feature such as spalted patterns in maple or a cherry burl. I am sure you have pieces of wood that look very distinctive in your stash that are cut-offs left over from another project that can be put to good use. Grab one of those pieces and have some fun making an off-axis-turned top hat stopper!

The finished hat has a brim of about 1-3/4" – 1-7/8" (44mm – 48mm); the smallest part of the hat band is slightly less than 1" (25mm) in diameter. The height varies from 1-3/4" – 2" (5cm) depending on the brim diameter. I personally like the taller ones.

Even though this is a small item, there are opportunities for embellishment. In my area there are three school districts that have red and black as school colors, so I have made some stoppers incorporating these colors. The middle two stoppers in the opening image are dyed laminated birch; the two on the ends are spalted maple and English walnut. I question whether this stand-out design needs to be colored, but the connection with the school colors makes these items popular.

Here is how I approach turning my off-axis stoppers. I recommend reading this description in its entirety before starting.

Stock up

Metal stoppers are available from many suppliers of woodturning accessories and kits. I use the flat-bottom stoppers from Niles Bottle Stoppers so that they can be displayed on a shelf when they aren't doing their job in a bottle. I want a high-quality stopper that will add to the decorative aspect and last forever.

Using a bandsaw or table saw, cut your stock to about 2"- square and 3" (8cm) long; the length can be as little as 2-3/4" (7cm), but 3" gives you room to maneuver your tools. A 6"- (15cm-) long piece will easily give you two top hats. I usually find several pieces of different species or interesting grain patterns and prepare them for the lathe. I am not a production turner but have given at least fifty of these stoppers as gifts.

Rough turn

With a small blank that will be secured with the tailstock, I do not bother to round the end that I place in my chuck jaws (**Photo 1**). If you would like the added security of a tenon, round the entire blank between centers using a spindle roughing gouge and then use a parting tool to cut a tenon on the end of the blank to fit your chuck jaws. Whichever end you choose to place in the chuck will be oriented at the top of the hat, so consider how you want grain or color to figure into your design. At the least, round the section of the wood you will turn into a stopper to about 2"-diameter.

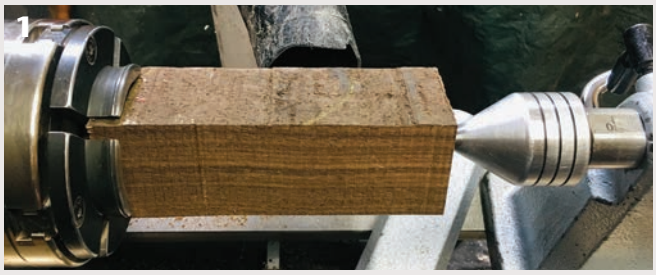
Make a shearing cut across the end grain with a freshly sharpened tool. A properly presented skew chisel will leave the best surface—with the long point down, cut through an arc to the center, riding the bevel through the cut. A spindle gouge presented on its side (flute away from the stock) and cutting through an arc will also leave a satisfactory surface. Whatever your tool choice, you will want to slightly undercut the area where the base of the stopper will contact the wood. The resulting concave surface reduces the chance of a gap showing between the wood and the metal stopper.

Fit the stopper

Drill a 23/64" (9mm) hole to a depth slightly greater than the threaded tenon on the wine stopper (**Photo 2**). Although a 3/8" (9.5mm) bit is only fractionally larger, avoid the temptation. I learned by experience that a 3/8" bit is too large.

Thread the stopper into the hole by hand (**Photo 3**). You are forcing the stopper to cut its own female threads, and you will need to repeatedly turn the stopper in until you meet resistance, then back it out, and blow out the hole until you get a secure, seated fit (**Photo 4**).

Blank preparation



Mount your blank in the chuck jaws and bring up the tailstock for support.

Affix the stopper

Drill the bottom of the hat blank to receive the threaded stud on top of the stopper.

Turn the stopper in by hand, forcing the stud to cut its own threads as you proceed. The stopper should seat against the bottom of the blank without a visible gap.

Shape and decorate

Using the tailstock for support, shape the hat, focusing on creating a brim and a form that tapers down to location for the hat band.

Add a hat band using a permanent marker. Don't use a worn pen, which may leave a ragged line.

Part-off the hat at about 2"—longer if you're aiming for a stovepipe look.

Shape the hat

Remove the metal stopper and bring up your live center on the tailstock to support the piece. Shape the bottom part of the hat that includes the brim (**Photo 5**). I use a small round-nose scraper to establish a crude shape before switching to a spindle gouge to refine the form. I like to turn a slight taper from the top of the hat to the brim.

Sand

Small objects like these stoppers invite close inspection, so a good finish is essential. Sand the bottom, brim, and side through your grits, finishing with 400- or 600-grit abrasive.

Add a band

The hat band is about 3/8" wide. I use a black ultra-fine permanent marker to define the top and bottom of the band, then a chisel-point permanent marker to color the interior (**Photo 6**). Using at a relatively new marker makes the process neater and easier. I have tried many colors for the hat band but have always been dissatisfied with any choice other than black.

Part-off

Using a parting tool, part-off your hat at a length of about 2" (**Photo 7**). You can go for a little more length if you're aiming for more of a stovepipe hat look.

Make a friction drive

Use a dowel to make a shopmade friction drive for your hat. Taper the end to fit securely in the hole in the base of the hat blank.

Drive your hat

Make a friction drive by mounting a small piece of hardwood or a dowel in your chuck—a piece slightly larger than 3/8" in diameter will work (**Photo 8**). Note that a piece of stock this small won't fit in the jaws but can be securely held by the center of the jaws and extend back towards the headstock spindle. Turn the end to a taper of about 23/64" (9mm) at the tip.

Mount the hat back on the lathe by inserting the friction drive into the hole for the metal stopper.

Off-axis turning

Examine the top portion of the hat. Consider whether there is a feature or some grain figure in the wood you want to retain and emphasize. You will have to position the blank on the friction drive to retain that feature and remove waste wood from the opposite side (**Photo 9**). Just keep in mind that moving a section of the wood away from the axis of rotation will place it in the path of the gouge to be cut; placing a section of the wood closer to the axis of rotation means it is more likely to remain in the finished piece. Alternatively, your intuition may tell you that removing wood on one side may reveal better grain figure, so you may want to sheer off that side.

Having identified the off-axis location for your new center, bring up the tailstock and position the live center against the new axis of rotation—this will involve angling the hat on the tip of the friction drive (**Photo 10**). Tighten the tailstock. Rotate the blank by hand to make sure it clears the toolrest. Lower your faceshield into position, stand out of the line of fire, and start the lathe at a slow rpm. Slowly increase the lathe speed. Stop the lathe and try to move the piece with your hand; other than rotating with the drive spindle, it should not budge.

Once you are satisfied that everything is secure, use a freshly sharpened 1/2" (13mm) bowl gouge or a spindle gouge to shape the top (**Photo 11**). Stop the lathe frequently to confirm that you are not cutting into the hat band. Take light cuts starting from the top of the hat and cutting towards the brim. You can see the piece taking shape by watching the ghost image as the nonuniform piece rotates through space.

The blank may loosen as it pushes against the compression chuck, so occasionally tighten it by applying more pressure from the tailstock's live center. Stop the lathe often and adjust your toolrest to get your tool supported and as close to the turning as possible. This will give you more tool control.

You should also frequently check to make sure you're not cutting into the hat band. If you do hit the band, after hand sanding the new surface, use some clear tape to line up the two remaining ends and fill in the band with your marker.

More sanding

You will want a smooth finish to show off the features in the wood. With the lathe off, hand sand the newly cut wood, sanding with the grain direction. As with the previous sanding effort, work through 400- or 600-grit abrasive. Lightly sand the ridge connecting the two adjacent faces.

Mount on the off-axis

Mark the location for remounting your blank off-axis. Moving a section of the blank away from the axis of rotation means it is more likely to be removed during turning.

Angle the blank on the friction drive and secure it in place using the tailstock in the off-axis location. Snug the tailstock, but don't overtighten it and split the blank or break the friction drive.

Turn the off-axis

Shape the sweep of the hat, taking light cuts from the perimeter of the "ghost" edge as the off-axis blank rotates through space.

Shape the hat top

With the tailstock still in place, make a series of light sheering cuts across the top of the hat (**Photo 12**). While there is still a nub connecting the tailstock to the hat, sand the top of the hat.

Remove the hat from the chuck and use a knife or chisel to remove the nub. Finish the surface with abrasive, blending the spot where the nub was removed with the surrounding surface (**Photo 13**). If the top of the hat is flat, I have found that placing a sheet of abrasive on a flat surface and rubbing the top of the hat across it is an efficient way to finish this surface.

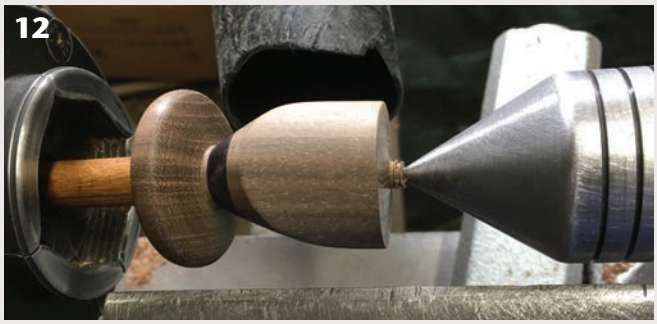
Apply finish

If you're worried the brim might break if the stopper is dropped (I have never had this happen), you could put a little thin CA glue across the bottom side of the brim. I use multiple layers of wipe-on poly, but there are many options—feel free to use your finish of choice. On the down side, wipe-on poly will yellow if left in sunlight such as on a windowsill.

Give your friends and family something they couldn't possibly have—these stoppers make memorable gifts (**Photos 14 - 16**). I include a gift or business card on which I write "STOP your WINEing," along with the type of wood. ■

Dave Bleil became interested in turning while in high school and subsequently used his uncle's Shopsmith while in college. Dave joined the Pennsylvania Guild of Craftsmen where local turners, including Ted Rasmussen, encouraged his turning. These days, most of his turnings go to family and friends as gifts.

Refine the shape



Refine the top of the hat with a series of shearing cuts, made either with the long tip of a skew chisel or a spindle gouge presented on its side.

Remove the nub from the top of the hat with a chisel or carving knife, sanding the area to blend the surfaces.

Combine function and whimsey

Finished stoppers, including a rakish pair that look like they are weathering high wind. The Santa-themed stopper is by Mike Peace.

THREADED ACORNS MADE EASY

CERAMIC VESSEL BY JANET LEAZENBY

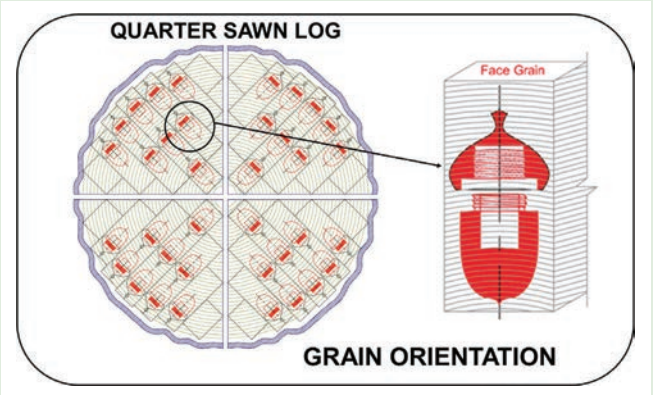
BY KEVIN FELDERHOFF

A wooden acorn is one of my favorite turning projects. My approach uses threaded lids, and the process I use is an easy introduction to threading wood. If completing this project encourages you to explore threading, hand-chasing is the more challenging version of this process, which makes use of an off-the-shelf tap and die. Being able to add a threaded lid will impress your fellow woodturners and friends. As an added benefit, my process creates interchangeable components, allowing you to mix-and-match tops and bottoms.

Stock selection

Choosing the right piece of wood with respect to grain orientation is the critical element of this project (**Figure 1**). In addition to orientation, tight wood grain will take threads better, giving you crisp, clean threads for a better fit and smoother function. You'll want want to tap and cut your threads into facegrain rather than endgrain; the threads will be stronger in that orientation.

Grain orientation is critical



You'll want to turn these forms in facegrain orientation, which may seem odd as their length and chucking method would make you think "spindle." However, the suggested orientation creates the strongest threads.

I primarily use local woods including maple, walnut, mesquite, and cherry. Choosing different species of wood for the top and bottom creates a more visually dramatic acorn. Also, I have found that kiln-dried wood with zero percent moisture content is necessary for stability. Even with very low moisture content, the threads can bind in the different seasons. We will address this later in the article to ensure your threads will work correctly in all seasons.

You'll need two blanks for each acorn. The piece for the acorn cap (the box top) will be a 2-1/2" (6cm) cube. The blank for the bottom will be 2"- (5cm-) square and 3"- (8cm-) long.

Rough the cap

Place the 2-1/2" cube of wood in the chuck in facegrain orientation (i.e., with the facegrain oriented towards the tailstock). Use a 1/2" bowl gouge to turn the blank down to 2-1/4" (6cm) diameter. The chuck jaws will prevent you from rounding the entire length, but that's okay—turn the portion of the blank you can access.

With a 1-3/4"- (44mm-) diameter Forstner-style bit mounted in a drill chuck, drill a 1/4"- (36mm-) deep recess in the end (**Photo 1**). Switch to a 1-1/8" (29mm) bit to drill a 1"- (25mm-) deep hole in the blank (**Photo 2**).

Tap the cap

I use a Beall 1-1/4" (32mm) x 8 TPI spindle tap to cut the internal threads in the cap (**Photo 3**). Before you start cutting threads, turn a small chamfer with a small skew or scraper on the top of the 1-1/8" hole to allow the tap to get a good start. Apply a little mineral oil to the wood prior to tapping; this will help reduce friction and soften the wood fibers. Bring the tailstock up with light pressure to keep the tap straight. Use a box end or adjustable wrench to turn the tap as you continue to apply even pressure with the tailstock quill. Tap the hole until you reach the bottom, then back the tap out by hand (**Photo 4**).

Shape the top

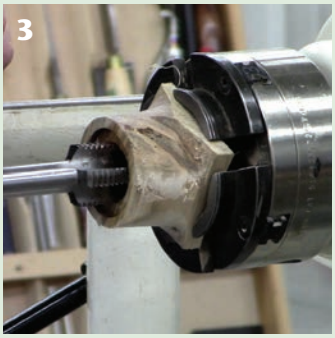
After threading the top, I use a small bowl gouge to start shaping the outside of the acorn cap up to the face of the chuck jaws (**Photo 5**). Take care to avoid contacting the jaws or turning into the hollowed interior—you should have plenty of material to work with to avoid those mistakes. The maximum diameter of the top will be about 2-1/4"; this will give it a pleasing shape.

After shaping, sand the acorn cap up to the chuck jaws. Remove the top from the chuck for now—it will be reverse-chucked later to complete the form.

Prep the cap

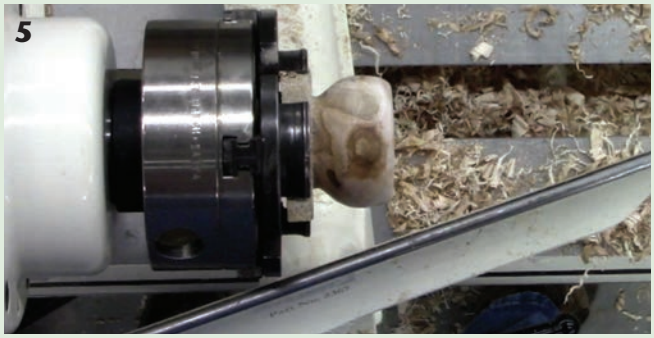
Bring the cap blank to round and use a drill chuck to drill stepped holes in the bottom.

Thread the cap



Tap internal threads using a commercially available tap and pressure from your tailstock.

Start shaping the cap



Use a spindle gouge to shape as much of the exterior of the cap as you can easily reach.

Thread the bottom

Mount the 2" x 2" x 3" quarter sawn blank for the bottom in your chuck with the facegrain out and round it to 1-3/4" diameter using a 1/2" bowl gouge. Use a 1-3/8"- (35mm-) diameter hole saw to make a 1/2"- (13mm-) deep, 1.2"-diameter tenon on the end (**Photo 6**) (see sidebar).

Square up the shoulder from the hole saw with a parting tool to a 1/2"- (13mm-) wide and add a chamfer with a skew or scraper to the smaller 1.2" diameter. The chamfer will help the 1-1/4" x 8 TPI thread die to get a good start. Apply a little mineral oil on the wood prior to cutting the threads.

Bring the tailstock up and maintain light pressure on the die to keep it straight while cutting threads. Be cautious with the pressure and if you feel a lot of resistance, back the die out to break the chip and continue tapping until the die bottoms-out on the shoulder. A small shopmade handle makes the die easier to hold and control (**Photo 7**).

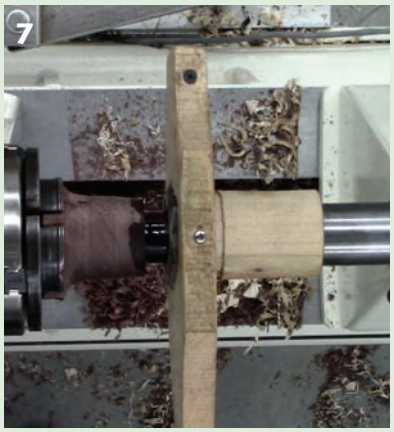
Undercut the last thread with a 1/8" (3mm) parting tool and cut the threads to about 3/8" (10mm) in length (**Photo 8**). Test fit the top and bottom and make sure the two shoulders are resting against each other. If there is some resistance and the two shoulders are not resting together, you will need to identify and correct the issue. Typically, either the undercut below the bottom of the threads is not deep enough or the threads on the bottom are too long. Make small adjustments until the two shoulders rest against each other and there is no resistance when screwing on the cap.

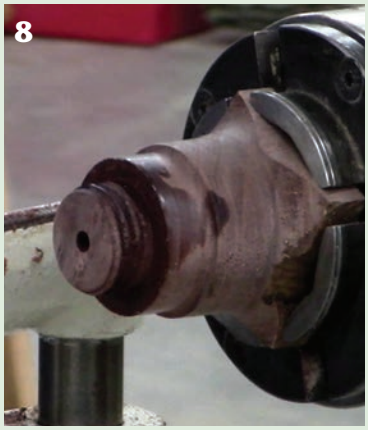
Modified Hole Saw

Your hole saw will need to cut a precise 1.2"- (30mm-) diameter hole. I have found that some hole saws have so much set to their teeth that the kerf removes too much material. Make a test cut or two with your hole saw using scrap material and measure the interior diameter. If the hole saw is removing too much material, use a Dremel-style tool with a small grinding-stone bit to remove some of the set from the interior teeth. Alternate removing a little metal followed by a test cut until you sneak up on the desired diameter.

Thread the bottom

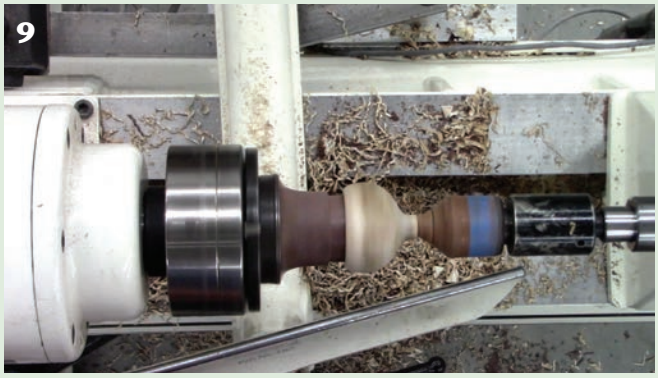
After bringing the bottom to round, use a hole saw to create a spigot on the end. Shape a perpendicular shoulder at the base of the spigot.





Cut a slight chamfer on the end of the spigot and use a die to cut threads on the spigot. You'll also need to undercut the last thread with a narrow parting tool.

Finish shaping the cap



Thread the cap onto the bottom and finish shaping it. Use the tailstock for support up until the last cuts on the tip. A shopmade cap on the live center prevents marring the top of the acorn.

Top of the cap

When you have a good fit, leave the top screwed to the bottom and bring the tailstock up for support, then shape the top of the acorn (**Photo 9**). Remove the tailstock back to finish the top part of the acorn, being careful to take light cuts (**Photo 10**). Sand the top.

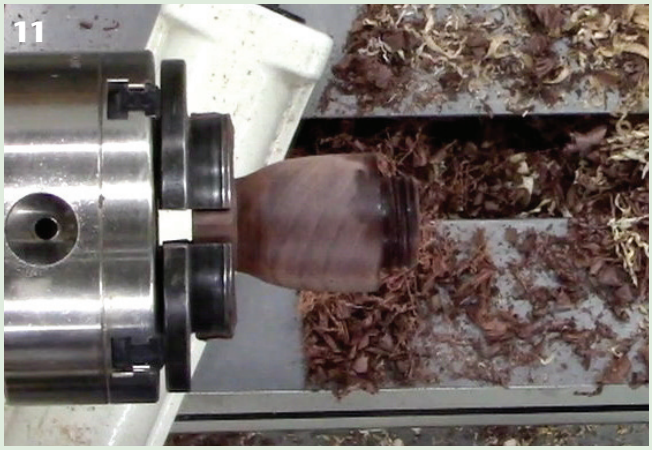
As an added design element, consider carving, scalloping, or otherwise texturing the top. This will give your box an extra bit of character.

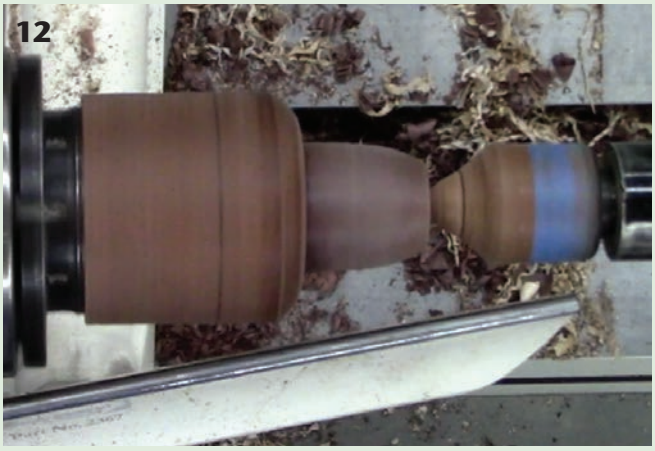
Complete the bottom

Set the top aside and drill a 7/8"- (22mm-) diameter hole about 1-1/4" (32mm) deep in the bottom. Shape the exterior of the acorn box to the jaws of the chuck and then sand the sides and top of the form (**Photo 11**).

Remove the acorn bottom from the chuck and mount a threaded chuck in its place (see sidebar). Screw the bottom of the acorn onto a shopmade threaded chuck (see sidebar). threaded chuck (**Photo 12**). Bring the tailstock up for support and shape the bottom of the acorn box with a small spindle gouge. Move the tailstock away to finish shaping the bottom, being careful not to remove too much wood at one time. After shaping, sand the bottom.

Finish the bottom





Remove the cap and shape as much of the exterior of the acorn as you can reach. You will need to reverse chuck it (see sidebar) to finish shaping and sanding the tip.

Threaded Chuck

You will need to make a threaded chuck using your 1-1/4" x 8 TPI tap. Using standard threads and consistently sized components will make your lids interchangeable, and you will have a universal chuck for future acorn boxes.

Use a blank that is a little wider than your acorn bottom. Bring it to round and round-off the outside corner to remove any sharp edge from the equation and give you better access to your acorn. Drill and tap the end. My chuck is tapped on both ends so that I can thread it directly on the lathe spindle.

Managing Moisture Content

With seasonal moisture fluctuation, your acorn may shrink or swell, and your threads may not work as smoothly as they once did. This situation can be corrected by placing the acorns in a toaster oven for two hours at 175°F (80°C) after turning is complete. With blanks this small, the temperature will bring your moisture content down to 0%. Remove the acorns from the oven and re-chase the threads. This will remove a small amount of wood and loosen the fit. This step will allow your threads to be loose enough to work smoothly throughout the seasons.

Finishing

Like many turning projects, finishing options with these small boxes are quite flexible (**Photos 13 – 14**). I like to use mineral oil and wax on the inside of the acorn so the threads are lubricated but not clogged with, for example, varnish. For the outside, wax, oil finish, spray finish or friction polish would be fine. I do like to complete my finishing routine with the Beall Buffing System. ■

Kevin Felderhoff is a member of the Carolina Mountain Woodturners and the Golden Triangle Woodturners. Kevin can be reached through his website at www.kevinfelderhoff.com.

Completed acorn

The undercut top neatly disguises the threads in the completed acorn.

RESOURCES

To see the author's companion instructional video, visit one of the links at right.

tiny.cc/Acorns1

tiny.cc/Acorns2

ADJUSTABLE DISPLAY STAND

BY GARY MILLER

Whenever I make a new platter or shallow bowl that is particularly showy, it seems that none of my display stands are sized correctly for the new turning. Frustrating; I have to make a new one that will best display the new project. I have made a variety of stands over the years, many of them copies of creative ideas that other turners have devised. I have found that even those can be problematic because they lack adequate adjustability or just look a bit clunky in contrast to the turned piece I want to display. I set out to design and build a stand that would be versatile, unobtrusive, light but strong, and easily stored—my wife regularly changes the décor in our home.

Although my design is adjustable, it does have limitations. My stand, although simple in concept, is a bit more finicky to make than others I have made. It will handle anything from 6" – 12" (15cm – 30cm) in diameter and 3/4" (19mm) to a little more than 3" (5cm) deep. The opening photo shows an 8" × 3-1/4" (20cm × 10cm) eastern aromatic cedar bowl.

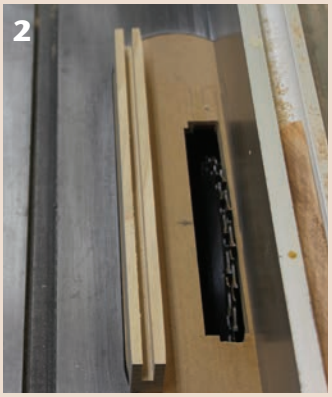
Size the components

I start with a 3/4" × 1-3/4" × 12" (19mm × 44mm × 30cm) piece of hardwood; I used poplar for this article. Using my table saw, I rip a strip slightly thicker than 1/4" (6mm) and 12" long. I rip the remaining piece of hardwood to 1-1/4" (32mm) in width (**Photo 1**).

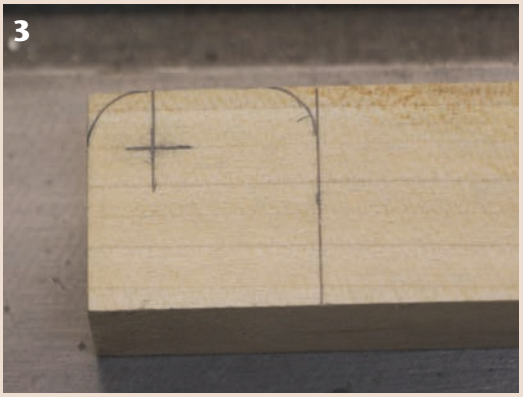
Dimension your stock

Start with hardwood stock and a ripping cut at the table saw.

Dimension your stock



Use a 1/4" dado stack to cut a 5/8"-deep dado centered on the 3/4" edge of the larger piece of stock.



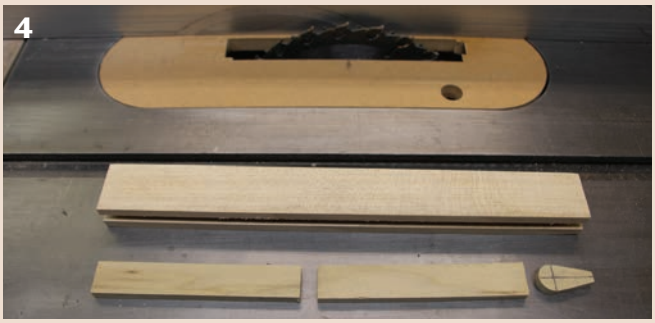
With a standard blade back on the saw, crosscut a 1-1/4" length for the body of the base.

I disconnect the power supply to my saw before installing a 1/4" dado stack and dado insert. I cut a 5/8"- (16mm-) deep dado centered on the 3/4" edge (**Photo 2**). Then I crosscut a 1-1/4" length from that piece for the body of the base (**Photo 3**).

From the 1/4" strip I cut two 4-1/2"- (11cm-) long pieces for the legs and a 1-1/4"- long piece for the pivot using my compound mitre saw (**Photo 4**).

Lightly sand all the components. The pivot should be snug but moveable within the dado.

Cut legs and pivot



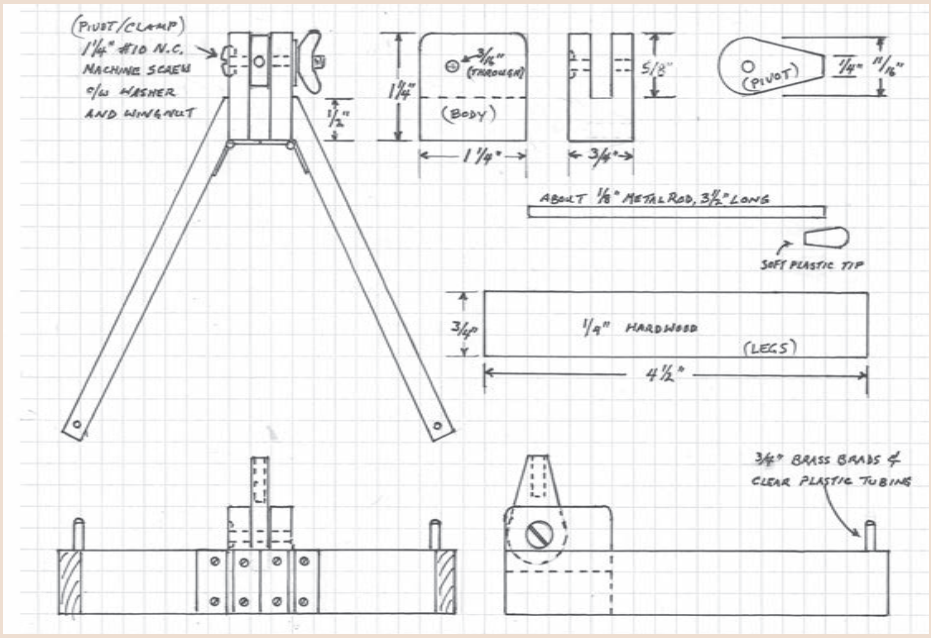
Cut two 4-1/2"- (11cm-) long pieces from the 1/4" strip for the legs and a 1-1/4"- long piece for the pivot using mitre saw or handsaw.

Make the pivot

The pivot will need a short metal rod about 3" long and about 1/8" (3mm) in diameter which will provide support to the display object. I used a piece of 11/64" (4mm) diameter aluminum rod.

Lay out the dimensions shown in **Figure 1** on the 1/4" x 1-1/4" hardwood stock and mark locations for drilling. The pivot is a simple shape that uses most of the dimensional size of the stock, so I do all the shaping with my 12" disk sander rather than cutting and sanding to shape.

Figure 1



Mark the drilling locations on the side and at the 1/4" end of the piece. Drill a 3/16" (4mm) hole through the side for the pivot and clamping machine screw and a hole to match your metal rod about 5/8"-deep in the end (**Photos 5, 6**). I have a small vice mounted on a cross-slide for my drill press to hold small objects to drill safely.

The Body

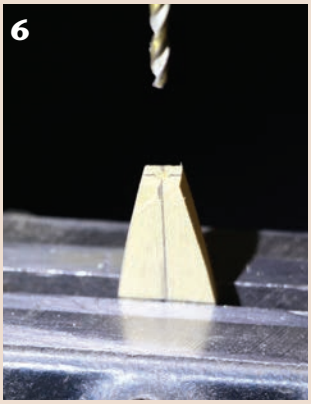
Lay out the rounded corners and location of the hole. Trim the body to shape and drill a 3/16"-diameter hole through the side. Bore a 3/8"-diameter, 1/16"- (9mm × 2mm) deep countersink on the left (viewing from the front) to accommodate the head of the pivot machine screw (**Photo 7**).

The legs

Lay out the bevels and drilling locations noting that the two legs are mirror images of each other—you don't want to end up with two left legs. Cut the bevels (again, I used my disk sander) and drill 3/64" (1mm) holes, 3/8"-deep near the tips (**Photo 8**).

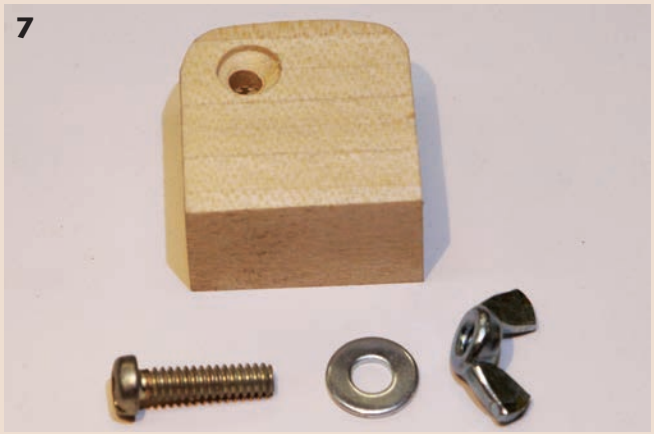
A 3/4" brass brad seated in the top end of each leg braces the lower edge of the turning and keeps it from sliding off the front of the legs. I like to sleeve the brads in plastic to eliminate wood-on metal contact and reduce the chance of damage to the turning. I make the sleeves from 3/8"-long pieces of the spray nozzle tube that comes with a can of WD40 (**Photo 9**). Drive the brass brads through the plastic tubes and into the pre-drilled holes at the leg tips.

Shape the pivot



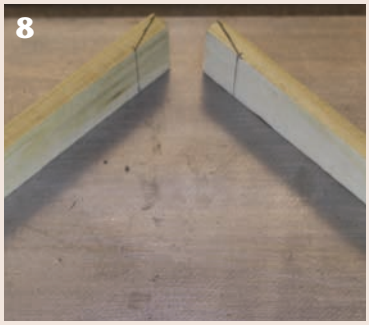
Shape the pivot using abrasives (the author used a disk sander). With the pivot held securely in a vice or clamp, drill a hole to match your metal rod about 5/8" deep in the narrow end.

Mill the body



Trim the body to shape and drill a 3/16"-diameter hole through the side. Countersink the left side for the head of the machine screw pivot.

Shape the legs



Lay out the bevels and drilling locations and cut (or shape) the bevels. Drill 3/64" holes, 3/8" deep near the tips to receive the brass brads.

The author sleeves the brass brads in short lengths of plastic tubing to prevent wood-on-metal contact.

Assemble the legs

All the elements are now prepared and ready for assembly (**Photo 10**).

I use two 3/4" × 3/4" brass hinges and their included brass screws to attach the legs to the body. I found it easiest to glue the hinges in place before driving the screws. This serves two purposes. First, it's easier to control the placement of the hinges—if screw holes are only a tiny bit mislocated the hinges will be misaligned and cause frustration. Second, securely glued hinges are less likely to work loose through use.

Before applying adhesive, rough the back of each hinge side with a Dremel-style tool and a small grinding stone (**Photo 11**). Apply a small amount of thin cyanoacrylate (CA) to the hinge location on one leg and let it cure. Follow this with a coat of thick CA to the area and put the roughed surface of the hinge carefully in place. Avoid getting glue into the hinge pin area. Hold the hinge down with something like a stiff wire (that won't adhere to the hinge if a little CA sneaks out) until it cures (**Photo 12**). When the CA is cured, drill a 3/64" hole in the center of each hinge hole and set the screws. Repeat the process for the second leg.

Prepare to assemble

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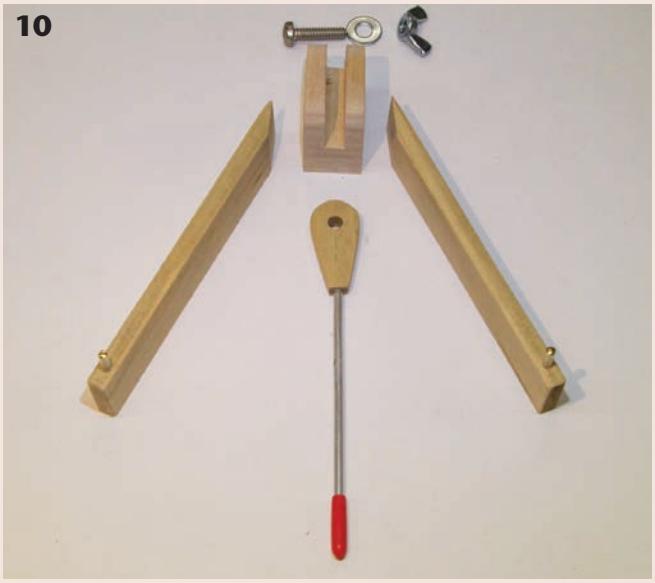
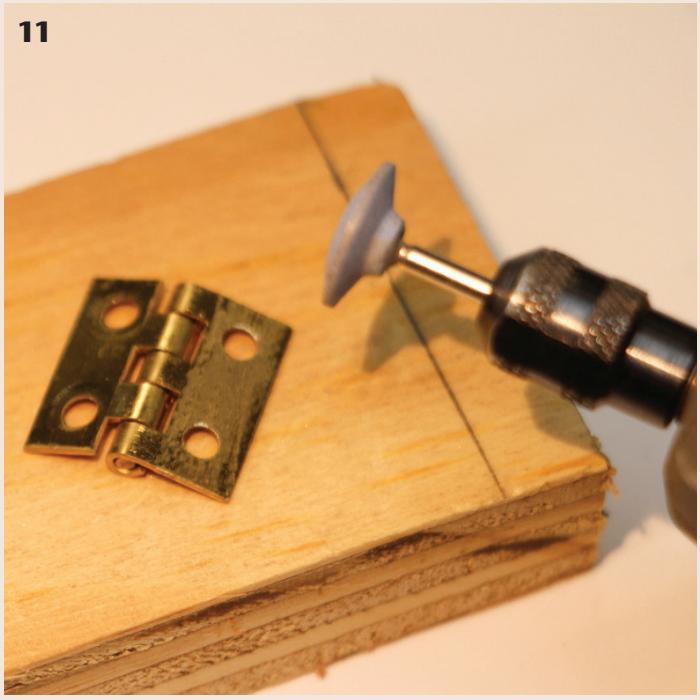


Lay out all of the components to prepare for assembly, including the two legs, the pivot with its rod, and the body that connects the legs and pivot.

Install hinges on the legs

11



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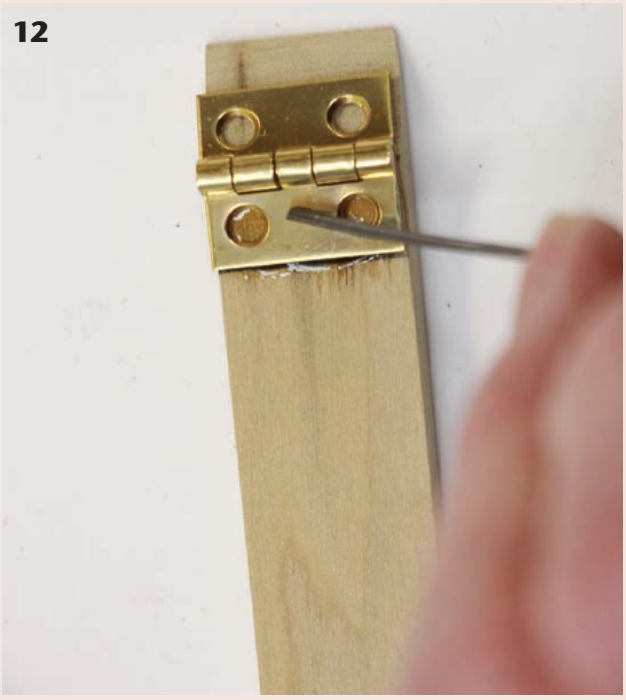
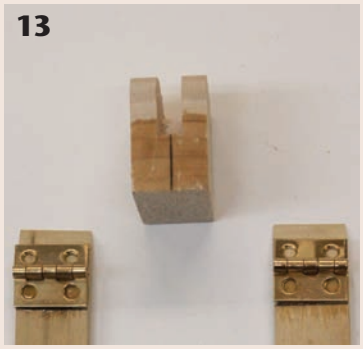
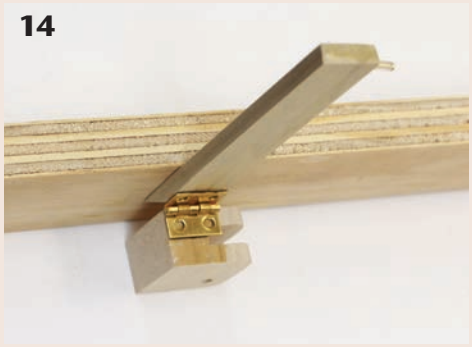


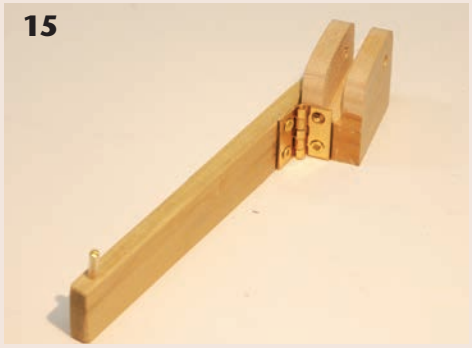
Roughen the back side of the hinges to improve the adhesive's grip on the metal. Glue one hinge flap in place—the back of the unsecured hinge flap aligns with the beginning of the leg bevel; secure the hinge with pressure from a piece of rigid wire or a nail until the adhesive begins to cure. Repeat the process for the second leg.

Install hinges on the body



Mark a center line down the front of the body below the dado.





Install the hinges on the body, aligning the hinge flaps with the center line. You may need to improvise a bit to brace the components until the CA begins to cure. Seat the hinge screws.

Legs meet body

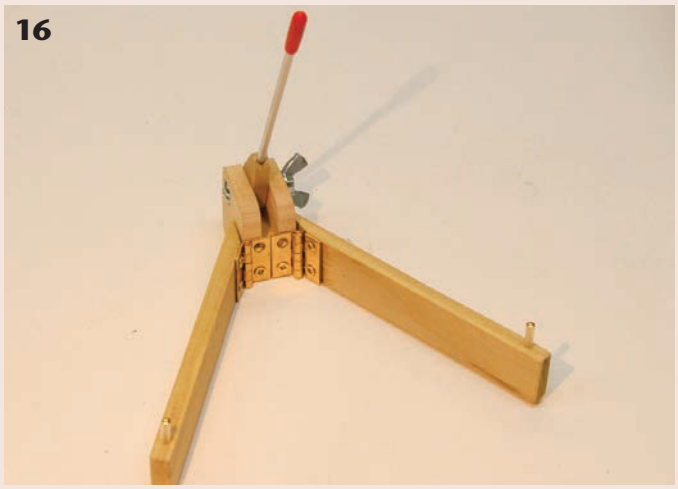
Mark a center line down the front of the body below the dado to the bottom (**Photo 13**). Use the same CA prep procedure as on the legs, applying a coat of thin CA followed by a coat of thick and holding the hinge plate in place until it is secure (**Photo 14**). Finally, set the screws (**Photo 15**).

The pivot

I don't glue the metal rod in place on the pivot because, for deeper items, I can replace it with a piece of a bamboo skewer, thus increasing the versatility of the stand. Attach the pivot to the stand using a machine screw, wing nut, and washer (**Photos 16, 17**). ■

Although Gary has been a woodworker for as long as he can remember, it wasn't until he retired that he focused his interest on woodturning as an artistic outlet. Gary joined the AAW in 2005 and has expanded his interests to include ornamental turning. He designed, built and continues to evolve his own rose engine, which he demonstrated at the Pittsburgh Symposium. At the age of 84, he continues to enjoy experimenting and developing his woodturning skills.

Assemble the pivot



Use the #10 machine screw with matching washer and wing nut to attach the pivot.

The pivoting rod is easily adjusted to display a range of forms, and can quickly be cut or replaced with a piece of a wood skewer or dowel.

TURNING A QUICK-RELEASE TOOL HANDLE

BY JOHN LUCAS

Many years ago, Ed Graham designed a tool handle that incorporated R8 metalworking collets. The collets made this a quick-release handle that facilitated easy tool changes. He called them Big Stick Tools. They were made from 1" (25mm) ID aluminum tubing and had a rubber cover. The collet mechanism worked by unscrewing the bottom a few turns and tapping it on a hard surface—you could then pull the tool steel right out. Among the many benefits of this design, separating the tool from its handle made sharpening easier. I love them and own two of them.

Unfortunately, the tools are no longer in production. I wanted another one but did not have a metal lathe, so I wondered if I could make one out of PVC pipe. That handle has worked well for fifteen years. You might think PVC would not be strong enough for a tool handle. I wasn't the turner fifteen years ago I am today and yes, I got some catches. The metal collet and the tool's drawbar take most of the force; it's plenty strong. I will take you through the process of building one of these handles.

Collets and drawbar

You can buy R8 collets online in a wide variety of sizes (**Photo 1**). There is one drawback. The size of the tool shank must be really close to the collet size—you only get about 0.010" (0.25mm) tolerance.

Fortunately, most of the tools I've encountered do have a shank sized to fit. And you can buy R8 collets in sets or individually from 1/8" up to 7/8" (3mm – 22mm), giving a pretty good selection of sizes.

The collet needs a drawbar to pull the fitting into the handle and lock the tool in place. The internal thread of the collet is 7/16" × 20 tpi. You only need threads on the end of the drawbar that engages the collet, but a piece of all thread rod will work fine. Or, if you have a die and handle, you can cut threads on one end of a 7/16" (11mm) rod as I did for this article (**Photo 2**). You need to reduce the rod to about .430" (10.9mm) to get the die to start. I did this on my grinder by rotating the rod by hand (**Photo 3**). If you don't have a way to measure the rod, simply grind a little chamfer and try to start the die. If it won't start, reduce the shaft size even more. It does help to taper the first 1/16" (2mm)

Purchase collets

R8 collets are readily available online. Just be sure the ID of the collet is within about 0.01" of the tool shank you plan to handle.

Make a drawbar

If you have the appropriate tap and die, you can easily cut threads on the end of a rod to create a drawbar. Alternatively, buy a piece of all thread rod long enough to suit your handle.

If you cut your own threads, you will need to reduce about 3/4" of one tip's diameter of a standard 7/16" rod to about 0.43" using a bench grinder.

or so. Don't grind too much. Take your time and sneak up on the size until you can cut about 1/2" – 3/4" (13mm – 19mm) of threads. You can cut the rod to length later.

The handle

I purchased 6' (2m) of 1" ID PVC to make several handles. To construct the handle, cut a piece of PVC pipe to length. Making handles of several lengths will increase the versatility of a single tool. A short handle is generally better for small-scale work and detailing, while a larger handle can be better for larger scale work. Note, though, that not every tool is capable of such a wide range of projects. Mount the PVC in your chuck; my number 2 Vicmarc jaws will grip the PVC securely.

If your chuck jaws will not contract enough for this task, you can turn a wood clamp ring actuated by your existing chuck jaws. Pick a scrap of wood just small enough in diameter to fit in your chuck jaws in compression mode. You don't need much length here—1" - 2" (5cm) is fine. Drill (or turn) a hole in the center that is the same diameter as the pipe and, if necessary, turn the outside to fit your jaws. You will have turned a ring by now, and you will need to remove it from the lathe and cut a slot through the side with a handsaw or bandsaw. Now you can insert the end of the PVC pipe in the center of the ring and mount the assembly in the chuck. Tighten the jaws around the wood ring, clamping and centering the pipe in your chuck.

Fit the collet

You will need a steady rest to brace the outboard end of the PVC pipe. I use my live center to position the PVC and then tighten the rollers of the steady rest around the pipe. Then I remove the tailstock to cut a taper inside the PVC pipe. I use a 1/2" spindle gouge and cut with the bottom wing, just like hollowing a box (**Photo 4**). You could just as easily use a round scraper. You need to cut a taper that approximately matches the angle of the taper on the collet. The drawbar pulls the collet into the handle and squeezes the jaws together to hold the tool. It would probably work without a taper, but the taper gives more surface area to exert pressure on the collet. Turn the taper until there is about 1/4" - 3/8" (6mm – 10mm) of the collet protruding (**Photo 5**).

Hold the drawbar

You need to turn a wood plug to fit in the bottom of the handle to hold the drawbar in line. The plug only needs to be about 1" long. Turn a scrap of hardwood down to just slip into the end of the pipe and drill a hole through the center—15/32"- (12mm-) or 1/2"-diameter; whichever bit size you have as this isn't a critical dimension. Glue the plug into the bottom of the handle (**Photo 6**).

Fit the collet

Form a taper on the inside of your PVC handle using a spindle or bowl gouge and a scraping cut. A steady rest is essential for working this far out from the chuck's support.

Test fit the collet. The taper doesn't have to be perfect, but you do need to be able to seat the collet.

Secure the drawbar

Turn a short wood plug to fit the bottom end of the handle. The drawbar passes through this plug, so drill a hole through the center before securing the plug in the bottom of the handle with adhesive.

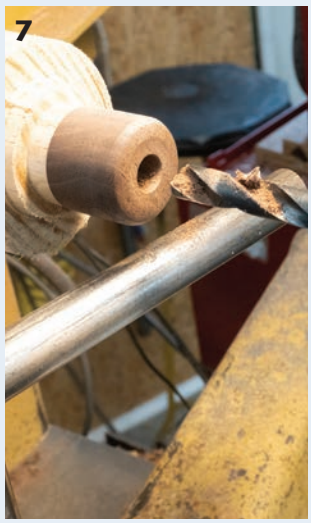
Turn another piece of hardwood that is roughly the same diameter as the outside of the PVC pipe and about 1"-long. Drill a hole in the center about 3/4"-deep with a 7/16"-diameter bit (**Photo 7**). This will be the tightening nut to pull the collet into the pipe, so I texture the outside a little to give me a gripping surface.

Assemble the collet and rod

Screw your threaded rod about five or six turns into the bottom of the collet. Insert the rod into the PVC pipe with the collet on one end and through the wooden plug in the bottom. Let the collet sit naturally, don't push it down at this point. Now mark the rod where it extends just a hair less than 3/4" beyond the bottom. Cut it to length.

Remove the rod and the collet from the pipe and glue the end of the rod into the wooden knob. You will want to add a pin through the side of the knob and into the metal rod to secure this connection. I typically use an 1/8"-diameter brass rod as my pin, but I have also used cut-off nails if I have a matching drill bit. Drill through the side of the knob and the rod, insert your pin with a bit of epoxy and cut or grind it flush with the knob (**Photo 8**).

Secure the drawbar



Turn a hardwood tightening nut and drill a hole in (not through) the center to accept the end of the drawbar.

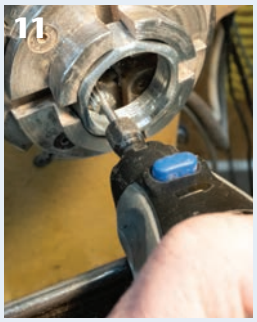
Drill a hole through the tightening nut and into the drawbar and pin the two elements together to help secure this connection.

Ferrule

All the parts are done, but the handle needs a ferrule to keep the tapered collet from splitting the PVC pipe. The Big Stick Tools were made from aluminum and didn't need a ferrule. I made my first one and couldn't find the right size metal for a ferrule so I lashed string around the tube and then soaked it with CA. I figured that would last until I found the right metal to fit. That was fifteen years ago, and the string is still holding.

I did go out and looked harder for ferrule material for this article and found a 1" compression fitting at Lowe's (**Photo 9**). The threads in the nut were just a hair smaller than the PVC so I put the pipe back on the lathe and turned it down just a little (about .015" (0.4mm)). Then the nut screws on with some force (**Photo 10**). The internal opening to the nut is too small. I chucked it up on the lathe and used a Dremel tool with a rotary cutter and was able to open it up until the opening was perfect. I found holding the Dremel on my tool rest and gently pushing and pulling the cutter against the inside of the nut took off the metal quickly (**Photo 11**). There are many options for ferrules, including some low-tech approaches that will do the job (**Photo 12**).

Install a ferrule



A 1" compression fitting can be modified to work as a ferrule. This requires a very slight reduction of the OD of the pipe as well as enlarging the interior of the nut with a grinder.

Lashing the end of the pipe with string set with a soaking of CA glue is a low-tech approach to a ferrule.

Finish

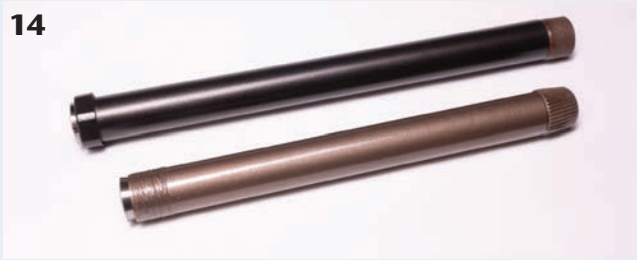
Now it's just a matter of putting whatever finish or handle material you want over the PVC. I painted these, but in the past I have used bicycle handlebar tape or golf club handle tape to make fancier handles (**Photo 13**).

In use

Select the properly sized collet for your tool and assemble everything (**Photo 14**). After inserting the tool, tighten the drawbar until the collet grips the tool securely. To remove the tool, loosen the drawbar knob about two or three turns and then tap the tool handle knob end down on a firm surface. That pops the collet loose and you can remove the tool. ■

Retired photographer John Lucas has been working in wood for more than 35 years; he also dabbles in metalworking. John enjoys modifying machines, making tools, and sharing his knowledge through written articles and videos. He has taught classes at John C. Campbell Folk School, Arrowmont, and The Appalachian Center for Craft.

Assemble the handle



Wrap, paint, or otherwise finish (or don't) the exterior of the handle to your preference. Assemble the components and get back to turning.

Shopmade Chuck Jigs

"Every tool reveals the spirit of its maker."
WERNER HEISENBERG

BY ERNIE NEWMAN

Since the invention of chucks, woodturners have made accessories to render their chucks more efficient. Some of the devices shown here took a few minutes to make and some a few hours, but they all work well. What a pleasure to tinker in the workshop and make a good tool better.

Flexible sanding disk and stropping disk

The flexible and rigid sanding disks (**Photos 1, 2**) employ the hook-and-loop attachment system, allowing the use of abrasive disks of various grits. I have 36-grit (that's not an abrasive, that's a tool!) through 2000-grit for these pads. The finest grits can be used to polish metal, stone, and shells.

The flexible disk is one of the best things I've ever made—thanks to Alain Mailland for the idea. It can sand what a rigid disk can't. It also allows me to sand turnings which can't be sanded on the lathe. For example, I turned the spherical shaped piece in Photo 1 between centers from a coiled, woody vine. Sanding on the lathe would have rounded-over the natural edges. Because I sanded it with the flexible disk, all the edges are crisp. The waste material that showed marks from the turning center was also finish-sanded with this disk. Flatter curves can be sanded at higher speeds, for example 1500 rpm. Strongly convex curves are better sanded at lower speeds—500 rpm or less—because the leather bends more easily, allowing it to conform to sharper curves.

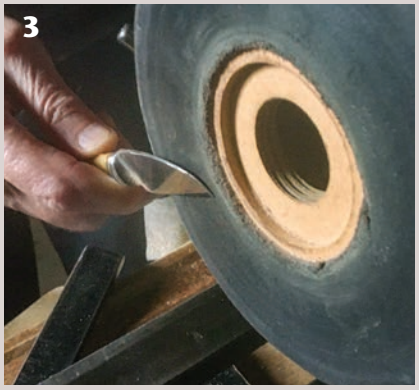
CA glue fixes wood to leather well. It also fixes leather to the hook-backed half of the hook-and-loop team, but it does need occasional regluing. The sanding disks pictured here are only 6" (15cm) in diameter because I need them to be light for air travel, but bigger would be better, though expensive. A wide range of abrasive grits are available in 6" diameter disks.

Charging the leather disk with metal-cutting compound will give you a tool to quickly sharpen honed knives and other cutting tools to a mirror finish (**Photo 3**). Present the tool so that the leather is spinning past--not into—the cutting edge. Otherwise, the leather will grab the tool. It's also critical to rub the bevel first and gradually adjust the tool until the cutting edge is in contact with the leather. If you apply too much pressure, you will round-over the cutting edge. Subsequent attempts to strop the tool

Flexible sanding disk and stropping disk

Flexible-grid sanding disks and leather-faced strop (lower left). The author sanded the intricately curved form in the center using this system.

Extending the backing and abrasive sheet beyond the perimeter of the wood backing surface allows the sanding surface to flex and conform to convex shapes.



Charge a leather-faced disk with honing compound to make a quick and efficient stropping disk.

accentuate the problem. For this reason, some expert carvers turn their noses up at this system for stropping carving tools. They have a point; if you want to strop the flute of a carving gouge, make the leather slightly larger in diameter than the wood.

Protectors and tailstock support

You can remount finished turnings in a chuck without damage by using protectors made from electrical flex or split polyethylene (**Photo 4**). I use a polyethylene food chopping board to make the rings. The work runs surprisingly true. When tailstock support is needed, a shopmade revolving live center also protects finished work (**Photo 5**).

To make your own tailstock support, turn a Morse taper between centers but make the taper slightly concave to guarantee contact at both ends. "Rough enough is good enough," in this instance. Tap it into the headstock opening and turn a recess to receive a ball race, or ball bearing. Epoxy the ball race in the recess, ensuring that the epoxy doesn't get into the workings and that the center of the ball race spins freely. Turn snug fitting tenons on the inserts, but not too tight—they need to slide in and out without dislodging the ball race.

Cube-holding jaws

Aluminum jaws are easy to bend and hold cubes securely without marking the wood (**Photo 6**). The cube with the steel ball bearing trapped inside is a fun project. You could also trap a wooden sphere in a contrasting color.

Drill a hole on each face. The hole should be a fraction smaller than the diameter of the sphere by about 1/32" - 1/16" (1 mm). Boil the cube in water for about 10 minutes to make the wood more plastic then force and trap the sphere inside. My choice is Monterey pine (*Pinus radiata*), which is quite elastic when steamed or boiled. Other pines and other species can work well, but you may need to experiment.

RESOURCES

Shopmade jigs are also an option for safely bandsawing turned objects. For one approach, see Betty Scarpino's article "A Jig for Bandsawing Round Objects," (American Woodturner, v31n1, pp. 20-21).

tiny.cc/BandsawJig

Work protectors & tailstock support

Position chuck jaw inserts made from a cutting board or scrap insulated wiring between the jaws and work piece to prevent the jaws from marring the work.

Shopmade tailstock live centers, made possible by the use of ball bearings, expand the range of work-holding options at the tailstock end of the operation. These are based around a turned Morse taper tenon inserted into the tailstock quill.

Protect your cubes

Chuck jaws will hold square stock, but not without marring the surface. Jaw inserts to secure a small cube for turning are easily made by bending narrow aluminum stock.

Sphere-holding chuck

Spheres can be held securely (**Photos 7, 8**). The outer ring is secured to the back piece by three long screws which can be adjusted so the ring doesn't wobble excessively. I mark the ring and the back piece so the two can be aligned in the same orientation every time. Protect the sphere by choosing soft wood for the chuck. The sphere on the right was inspired by Vivien Grandouiller (*American Woodturner*, v32n1, p. 55).

Multi-center chuck

The duck and offset-pin leg can be made on two centers with this multi-center chuck (**Photo 9**). (Mike Darlow explains how to turn a similar duck in his book, *Woodturning Methods*.) Sharpened screws in the recesses stop workpieces from spinning. The offset-pin leg splays outwards and supported the TV sets that engaged millions of us in the 1960s. After turning a conical-shaped leg, the small end is held off-center in the chuck recess and the large end in the tailstock. A tenon can then be turned at the tailstock end.

Support for screw-chuck mounting

Faceplate work mounted on a single screw may wobble if the chuck jaws are small. Minimize this problem by placing a ring outside the jaws that sits against the body of the chuck, then add a backing plate that rests against the ring (**Photo 10**). The ring is held in position when the blank is screwed against the backing plate. I use a range of backing plates of varying diameters to maximize support. The larger the backing plate the better, as long as it allows access to the workpiece. Backing plates can be used to reduce the length of the screw projection, which is useful when mounting thin workpieces. Medium density fiberboard and plywood are ideal as they are more dimensionally stable than wood.

Hold that sphere

Sphere-holding jigs essentially clamp the ball between two pieces of wood with an opening for turning access.

Multi-center chucking

A multi-center chuck can produce the practical (an angled table leg) and the whimsical (duck—everything but the "quack").

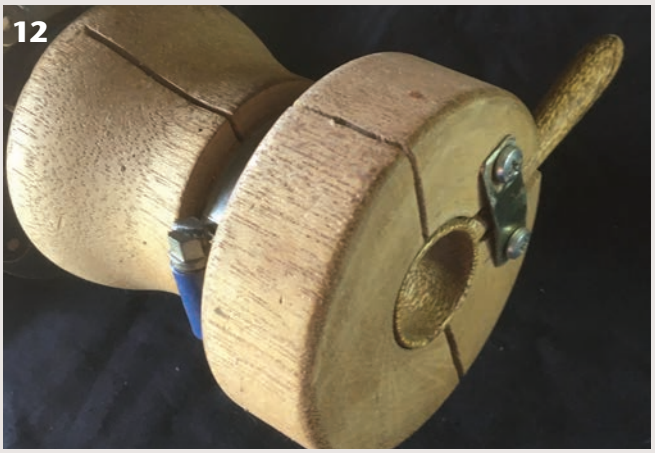
Faceplate support ring and backing plates

Adding surface area around chuck jaws allows the chuck to function as a faceplate. The system includes a support ring and backing plates, all easily made from sheet goods.

Friction chucks and mandrels

Taking advantage of close tolerances, friction jigs and drives can hold spheres and drive spindles or vessels. If an object needs to be re-chucked multiple times during a project, a friction drive can be a time saver.

Spoon jig



Spoons and some scoops need to be mounted on two axes for turning—one for the handle in spindle orientation, one for hollowing the facegrain bowl. This handy jig holds the form for hollowing the bowl with a slot to accommodate the handle.

Scuffing tubes

Metal insert tubes (for pens, for example) need to be scuffed to give adhesives a bonding surface. This leather pen tube holder makes the task easy and keeps your fingers out of the way of the abrasives.

Friction chucks and mandrels

Friction chucks can hold odd-shaped pieces. For example, the 2"- (5cm-) diameter sphere shown here is held securely by a friction chuck with a 1/64" (0.5 mm) smaller opening (**Photo 11**). Ideally, the friction chuck should be made from softer wood than the workpiece it holds to reduce marring.

The mandrels shown here allow pre-bored work to be turned so the outside is concentric to the hole. Mandrels rely on friction to hold workpieces but the small nails on these mandrels were added to lock the workpiece so it wouldn't slip.

Spoon jig

The spoon chuck holds the spherical head of the spoon securely for hollowing when the hose clamp is tightened and compresses the split (**Photo 12**). A soft-wood spacer is placed under the metal clamp before it is screwed down onto the spoon handle to prevent marring. A handsaw can be used to create the slot. It is difficult to safely cut a slot into turned work with a bandsaw as the workpiece will roll. One way to do this is to leave a square waste section on the turning and remove it later. The flat face of the square stops the workpiece from twisting.

Pen-tube holder

My students have often built better mousetraps than mine. Malcolm Ireland came up with this clever device that allows pen tubes to be quickly scratched with coarse abrasives so they bond better with wood (**Photo 13**). If the hole is fractionally smaller than the tubes, they can be inserted and removed while the lathe is running, a time-saver if lots of tubes are prepared in one go. I used two pieces of leather here but one thick piece may be sufficient.

The "Longworth" Chuck

This chuck is named for Australian turner Leslie Longworth who publicized the design in the 1980s, although John Jacob Holtzapffel showed a version in his first book

BUILDING THE LONGWORTH-HOLZAPFFEL

For one approach to building this useful chuck, check out Paul Jenkins' video, 'Build a Longworth Chuck' linked to the right.

tiny.cc/Longworth

published over a century earlier. This self-centering chuck grips hollowed bowls and other vessels for further turning and is especially useful for finishing the vessel bottom (**Photo 14**). Run the lathe at low speed when using one of these chucks. Many videos demonstrating the construction of this chuck are online.

The Fly

This sanding system was designed by Henri Groll to sand the inside of hollow forms (**Photo 15**). One way to hold the abrasive on the spindle is to slip it into a sawn slot. The slot can be compressed with one or two screws. The sanding stem can either be mounted in a chuck or held by hand.

Sanding drums

With sanding drums it's easy to add facets to spinning tops, platters, candlesticks... (**Photo 16**). Wood glue will affix the abrasive sheet to the drums. When replacing the abrasive, true the drum in the chuck with a scraper before gluing on the new abrasive sheet.

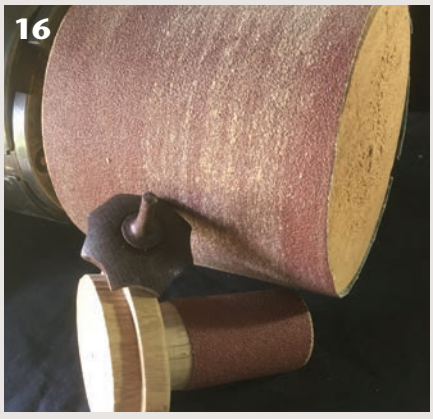
The Longworth-Holtzapffel chuck

Commercial examples abound, but an afternoon in the shop will produce one you'll be proud to show off.

Interior sanding

Attempting to sand the interior of small hollow forms and boxes by hand at the lathe is inviting injury. The fly sander holds small strips of abrasive, extends your reach, and keeps your fingers well out of harm's way.

Sanding drums



Chuck-mounted sanding drums are handy in the woodshop and can be used on anything from curved table legs to adding decorative elements to a turned form. Add foam backing material if you need a less-rigid surface.

Threaded vise chuck holder

This steel billet, cut with male threads to match your chuck, can be held in a vise (**Photos 17, 18**). Screw the chuck onto the threads to provide easy access to the turned form for carving or texturing. You'll need access to a machine shop to pull this one off, but this is a handy accessory if you do any off-lathe embellishment.

Chuck handles

Longer chuck handles provide extra leverage and are much more comfortable in the hand than the shank of a hex wrench (**Photo 19**). For maximum torque, fix the long arm of the hex key into a wooden or steel tube handle or weld a steel extension onto the short arm. This idea came from Richard Raffan.

Bonus tips

If you've made it this far, you deserve two bonus tips. Most of these devices are marked with a number corresponding to a chuck jaw number so they can be remounted exactly the same way every time. This means they are more likely to run true each time they are used.

Have fun. Really, that's why we do this, isn't it?

I learned a lot of this stuff from George Hatfield who taught the three-year trade Woodturning Certificate Course for apprentices at Sydney Technical College. It was a terrific course and thirty-five years on I am still very grateful for the experience. ■

Ernie Newman lives in the Blue Mountains near Sydney, Australia. He has taught and demonstrated in China, Samoa, England, France, Ireland, USA, Canada, New Zealand, and Australia. Ernie has written more than seventy magazine articles. In the 1990s, he taught a three-year trade course for woodturning apprentices at a technical college. Since 2003 he has taught an extended version of this course emphasizing sculpture and design. His website is https://ernienewman.weebly.com/, and he can be reached at ernienewman@hotmail.com.

Chuck holder


17

With a little help from a metal shop, thread the end of a metal billet to match the internal threads of your chuck adapter. You can now move your chucked form to a vice for carving, pyrography, painting, or other forms of embellishment.


18


19

Wrench handles

Hex keys are hard to grip, hard to exert leverage, hard to find after you set one down, and always dive for the middle of the shavings pile. (Insert your favorite Ikea joke here.) Turn handles for your most frequently used sizes and you'll never look back.

Have you tried MAGNOLIA?

BY DAVE SCHELL

Here was a new wood to me! I've turned dozens of local, domestic woods, but there are a few I haven't had the pleasure of trying yet. Magnolia was one of those.

There are three species of magnolia, all with ranges in eastern North America. Southern magnolia *(Magnolia grandiflora)* is the iconic magnolia of Southern lawns and coastal plain forests. Sweetbay *(M. virginiana)* is also a coastal plain species, but its range extends northward to New Jersey. Cucumbertree *(M. acuminata)* prefers cooler, moister sites than its genus mates, and of the three species its range extends furthest north into southern Ontario. *M. acuminata* is sometimes intermixed and sold with yellow poplar. Without nearby trees to compete for resources, magnolias can sprawl across the landscape and all but devour a city lot (**Photo 1**). The flowers are showy and distinctive (**Photo 2**).

Horticulturalists have tinkered with magnolias to develop varieties with desirable landscaping features, including selecting for a more diminutive, compact form. Most of the trees I see locally (Southcentral PA) are ornamentals with narrow trunks, so magnolia wasn't a wood I thought about turning.

I received a call from a neighbor who had a newly cut 50-year-old magnolia and they wanted to see if I could make some bowls for them before they moved. I was shocked when I arrived to pick up the wood. The trunk was at least 14" (36cm) in diameter! I believe this tree was the "Daybreak" variety. I grabbed some blanks and headed for the shop.

I prefer to make bowls from seasoned wood because I like to turn, sand, finish, and sell, all in short order. But I decided to try turning one piece of the magnolia while it was still green. It turned easily, but it cracked and warped while drying. The experience reminded me of turning green apple wood.

I dried the rest of the bowl blanks and was able to make six bowls with different colors and wood grain patterns, which made the customer happy. I didn't experience any cracking or warping after the wood was dry. A few of my pieces had some rot, which discolored the wood and added some pleasing character, so there were some cracks and voids, though none of them suggested the integrity of the wood was compromised. Where rot was absent, I found no hidden cracks.

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Native magnolias (as distinct from cultivated varieties) can spread to dramatic proportions.

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Magnolias have distinctive, showy, fragrant flowers.

Dried magnolia was easy to turn. I sharpened my tools a little more than normal to get cleaner finish-cuts, especially when turning the heartwood. I was pleasantly surprised to smell the strong scent of magnolia flowers while turning. I saved the dust for a local metaphysical shop to see if it can be used for

incense. I would assume that some people may not have a pleasant experience turning magnolia if they are bothered by perfume. Once finished, the scent disappeared and was not present in the final bowls.

I usually sand my bowls through 400-grit abrasive. With magnolia, the wood started to shine at 220-grit (**Photo 3**). I finished with tung oil and it helped bring out the grain and darkened the heartwood (**Photo 4**).

Magnolia has a pleasing grain pattern. The sapwood is light tan while the heartwood is dark brown. The grain in the sapwood is prominent with distinct, dark growth rings, reminiscent of Kentucky coffeetree.

Streaks of purple in the wet wood oxidized to brown as the wood dried. It was interesting if confusing to see purple streaks as I turned the bowl. I had to stop the lathe on the first few pieces to see if my eyes were playing tricks on me! According to the Wood Database (see sidebar), these purple streaks can appear in any of the three species of magnolia.

I haven't seen magnolia available in any local lumber yards. There are a few places online to purchase Southern magnolia blanks. I would assume the Southern magnolia wood turns the same as the smaller, decorative magnolia tree I used.

Magnolia isn't used for many things, but can be seen in veneers, some furniture, and as a utility wood. I will be keeping an eye out for small magnolia trees to use for turning wooden trees and magic wands. Some pieces may be suitable for woodworking projects like decorative tea boxes or pendants.

Although I had not turned magnolia prior to this experience, it has quickly become one of my favorite woods, and as I drive around developments, I keep my eye out for dying magnolia trees. I'll be contacting my favorite lumber yard to see if they can order some magnolia boards for me to use for woodworking projects.

If you can find magnolia wood, I strongly encourage you to try it! I think you'll enjoy this fragrant, beautiful wood that turns easily. ■

Dave Schell lives in Mount Joy, PA and is a website designer and business consultant by day, and bowl turner by night and weekends. Email Dave questions at dave@imakebowls.com, or view his work (including more magnolia) online at: imakebowls.com, facebook.com/imakebowls, or instagram.com/imakebowls.

Magnolia shows a high shine from sanding.

Some magnolia can tend towards plain, although the summer and winter wood show strong tone contrasts. This specimen has some staining from incipient rot, which gave it dramatic color contrast.

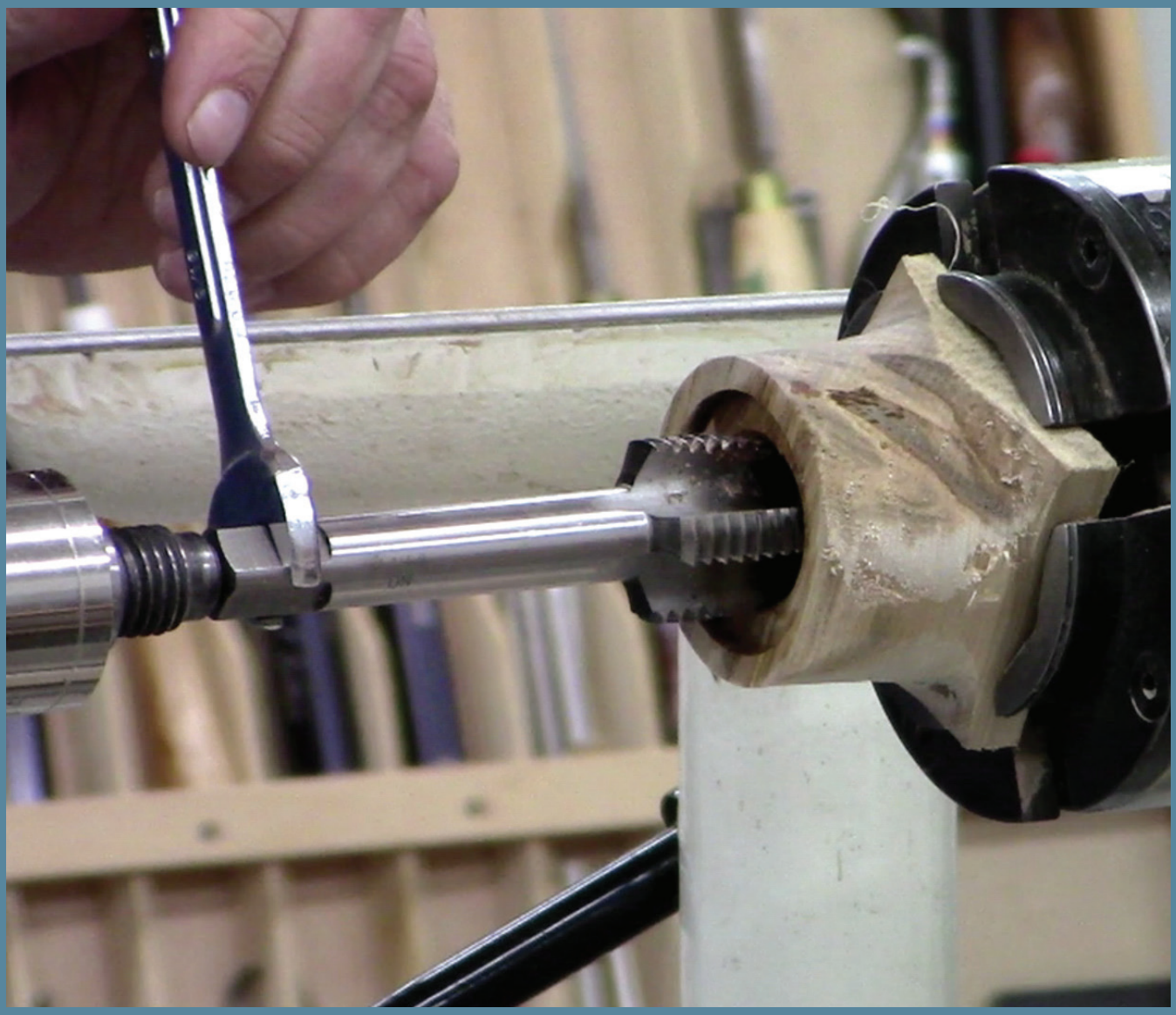
ADDITIONAL RESOURCES

For more information on magnolia, including toxicity data, check out Eric Meier's Wood Database using one of the following links.

Wood Database

Woodturning FUNdamentals

is an informative digital publication and online learning portal aimed at new turners. Whether you're starting a new hobby or plan to become a pro, the projects, techniques, tips, videos, and resources in *Woodturning FUNdamentals* will help you build essential knowledge and skills. The AAW publishes *Woodturning FUNdamentals* digitally, four times each year and free to members.



KEVIN FELDERHOFF

Taps to create threads in wood are available in numerous sizes and can greatly expand your bag of woodworking tricks. Taps that correspond to the size and pitch of your lathe's drive spindle will allow you to make jigs that will thread right onto your lathe (see Ernie Newman's article, starting on page 34). You can use the same tap to thread a small box lid (see Kevin Felderhoff's article, starting on page 20).

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