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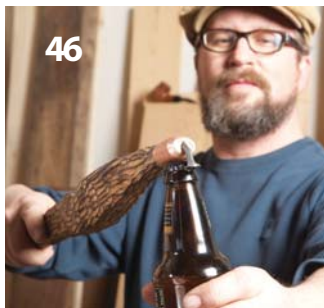
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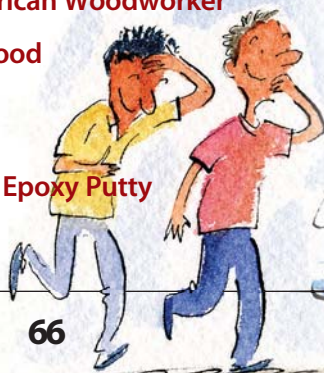
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Terrific Tip!

Bandsaw Dust Box

MYVINTAGE Delta bandsaw has no provision for dust collection, so I made a shroud to go under its table. To be effective, I knew that the shroud must enclose the area on at least three sides. To be practical, it had to be easy to remove.

I made a dust port for the shroud by cutting a hole sized to fit my vacuum's hose in a 2x4, then cut 45° angles on both ends of the 2x4. I fastened pieces of 1/2" plywood to the 2x4 to make the shroud's sides.

To attach the shroud to the saw, I cut a notch that engages with the saw's bottom door latch. This single-point attachment makes it easy to remove the shroud for changing blades or tilting the table.

Dan Martin



PHOTO COURTESY OF CONTRIBUTOR

Plane Sack

A RUSTY TOOL makes me cringe, especially if it's one of my favorite hand planes. If your shop is an unheated garage, how do you protect your prized tools? Storing them in drawers can help; so can coating them with paste wax or camellia oil. But in my experience, neither method is totally effective.

Here's a simple solution: Put your tools in plastic bags. A bag like the one shown with a zip-style seal works well. For reference, that's a 1 gallon bag and a #4 smoothing plane. For larger items, you can use freezer bags or trash bags.

Tom Caspar



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Workshop Tips

continued



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Sharpening Lube

LUBRICATING A DIAMOND STONE is an important step that many people skip. You need something to float the fine metal particles created while sharpening so they don't clog up the stone. Most manufacturers recommend just using water, but a mixture of water and detergent seems to do a better job.

I use a 50/50 mix of Simple Green detergent and water. Simple Green is available almost anywhere cleaning supplies are sold. For some reason, it works better than other detergents I've tried.

When I'm done using my stones, I always rinse them off and dry them with compressed air. Then I wipe on a very light coat of WD-40 to ensure any metal particles left on the stone don't rust.

Charles Mak



Dado Catalog

SIZING A DADO to fit a piece of plywood often requires many trial-and-error cuts, which can be really frustrating. No two pieces of plywood are the same thickness! After buying a new dado set, complete with shims, I started making a "test board" to make the process much easier. If a piece of plywood fits a groove in the test board, I know exactly how to set up the saw.

I made the test board from MDF; it's so stable that the grooves won't change in width over time. Before cutting the grooves, I labeled each shim with a letter to make the shim easier to identify. After cutting each groove, I wrote the combination of chippers and shims used to make it on the board.

The test board will eventually be a permanent record of all the combinations of chippers and shims I might need. Of course, there are dozens of combinations possible. I didn't take the time to make a groove for each one—I figure that I'd just start with a few grooves and add more as needed.

Brad Holden

Ready-Made Mobile Base

MOBILE TOOL BASES are essential in my small shop because I'm always shuffling things around. When the weather's nice, I like to roll my tools outside and work in the fresh air.

Small filing cabinets with casters make perfect mobile bases for benchtop tools. Plus, their drawers work well for storing accessories. The only problem is that the casters usually don't lock. When you want the tool to stay put, you have to block the wheels.

A good source for an inexpensive cabinet is your local office surplus or thrift shop. You can even dismantle an old desk with drawers and add locking casters to one section of it.

Robert Thorpe



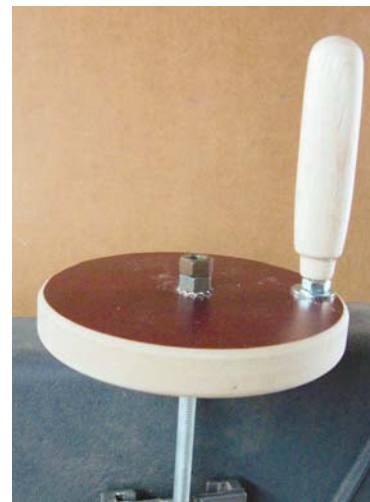
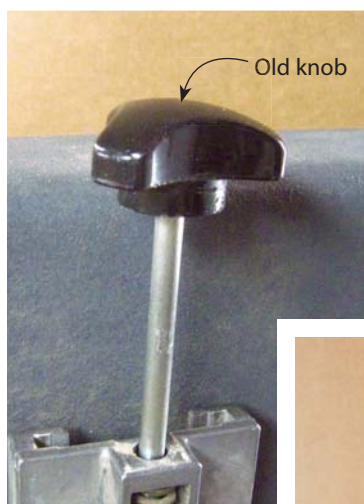
Better Bandsaw Crank

I MADE A CRANK for adjusting the tension on my bandsaw because the original knob was awkward to rotate. It made my wrist sore! My new crank, patterned after a handwheel on my tablesaw, is very comfortable to turn.

To make the crank, I unthreaded the bandsaw's original shaft and cut a new 5/16" threaded rod to replace it. Then I cut a 5" dia. MDF disc and drilled a 1/4" hole near one edge. I installed a 1/4" x 4" carriage bolt in this hole and secured it in place with a nut and washer. Next, I turned a handle and drilled a 4" deep hole in it so the handle would slip over the carriage bolt. To make the handle turn smoothly, I slipped a plastic straw over the bolt before inserting the bolt into the handle.

I sandwiched the disc between lock washers with two nuts on each side of the disc. Now my tension adjuster doesn't cause me any tension!

Serge Duclos



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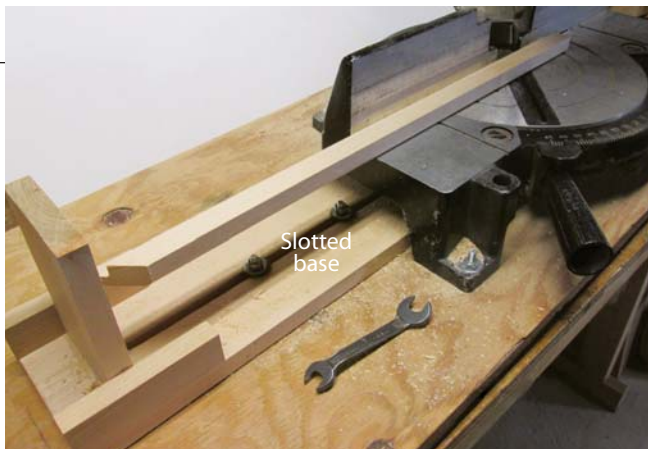
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Sliding Stop

MY OLD MITER SAW sees lots of action making picture frames. I made this adjustable sliding stop for cutting multiple parts of the same length.

My stop consists of an upright, two support blocks to keep the upright perpendicular, a slotted base and two carriage bolts. The carriage bolts are mounted in the plywood base that the saw is bolted to, and they protrude through the slot in the stop's base. Washers and nuts complete the assembly and make the stop infinitely adjustable. Tightening the nuts on the two carriage bolts locks the sliding stop in place.

Fred Burne



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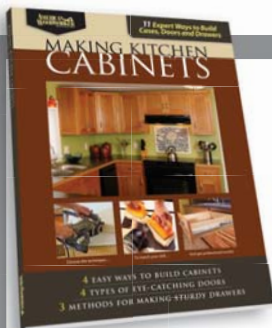
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Soda-Can Shim Stock

AN AFTER-MARKET MITER GAUGE is often much better than the one that comes with your tablesaw. I have a very nice after-market gauge, but it's not perfect. I improved its performance with part of a soda can. Here's the story:

I had set the correct angle for making an octagon using the gauge's pin stop. The stop is accurate enough for cutting narrow pieces, but I was making a large octagon from fairly wide pieces. As you know, the wider the piece, the more accurate the angle has to be.

After cutting each piece and assembling the octagon, I found that the angle wasn't quite right. The final joint had a gap, and that meant that the angle of the miter gauge needed to be tweaked just a bit.

To solve the problem, I planned on shimming the miter gauge's fence. Picking up a can of soda, I proceeded to look everywhere in my shop for some shim stock. No luck. But it dawned on me that I was holding the stock in my hand all the time—the soda can. Its sides are about .004" thick. I downed the rest of my soda, got my scissors and cut the can into narrow strips. Works great!

Richard Tendick

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8-Sided Insert

I DESIGNED an insert for my drill press table that lasts longer than most inserts I've seen. Its center is offset from the center of the chuck. When I need a fresh surface under my workpiece, I just lift the insert out of the table and rotate it or flip it over.

My table is made from 3/4" MDF, and so are my inserts. I cut a 4" x 4" square cutout in the table, then made a bunch of inserts from the same material. The inserts must fit snug, so they don't wiggle, but not too tight. To remove an insert, I just insert a screw into one of its holes and use the screw as a handle.

Richard Helgeson



PHOTO COURTESY OF CONTRIBUTOR

Sharpening Curved Scrapers

I USE CONCAVE SCRAPERS quite often in my work, but sharpening them isn't easy. I've tried wrapping a dowel or burnisher with sandpaper, but sandpaper is a bit clumsy to use and wears quickly.

It dawned on me that I could use a round sharpening steel like the ones used on kitchen knives. They're available in stores that sell cutlery.

The fastest-cutting sharpening steels come with either diamond or ceramic abrasive in various grits. Mine is a 7 micron ceramic, which is the equivalent of 1000 grit (See Source, below). As long as I regularly touch up my scrapers, this works really well, as I can achieve a mirror polish.

When black residue accumulates on the rod's surface, I clean it with a Scotch-Brite pad.

Alejandro Balbis

SOURCE

DMT, dmtsharp.com, 800-666-4368, 12" Ceramic Steel, #CS2, \$57.

Homespun Plugs

USING A WOODEN PLUG to make a repair is a time-tested method. If you're careful, you can make your goof nearly invisible.

One option for making a plug is to use a set of plug cutters, but they have a couple limitations. First, you're limited to the hole sizes provided. Second, plug cutters have a tendency to burnish the outside of the plug. This can leave an unsightly dark ring around your repair.

My solution is to turn my own plugs—without using a lathe. To do this, hot-glue plug stock onto a short length of 1/2" dowel. Using a belt sander and holding the dowel in your hand, take off the corners until the piece is reasonably round, then chuck the dowel into your cordless drill.

Set your drill at its fastest speed and adjust it to spin in the opposite direction from your sander. Turn on the drill and hold it so the plug contacts the sanding belt at a slight angle. This will make the plug perfectly round and taper it, too, making the plug easier to fit into a hole. Use a light touch so you don't pop the plug off of the dowel.

Gary Coyne

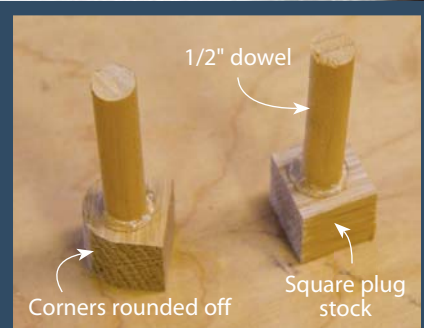


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Simple Router Lift

A ROUTER TABLE LIFT can be very handy for adjusting the height of a bit, but it can also be very expensive. I built this one for just a few bucks.

First, I made a shelf to fit under my router table. I installed a 3/8-16 T-nut in the shelf and threaded a leveling screw through it. (Leveling screws are generally used under washers and dryers. You might be able to find one in a hardware store, but they're also available online. See Source, below.) I made a handle from a piece of hardwood and epoxied it to the end of the screw.

Next, I attached the shelf under the table to support the router at a height that would accommodate the required range of adjustment.

To adjust the router's height, I first release the locking lever on the router's base. Then I rotate the lift's handle to raise or lower the router motor to the required height. Finally, I re-engage the locking lever on the router's base. (If your router doesn't slide straight up or down when you release its locking lever, this system won't work.)

The 16 threads-per-inch pitch of the leveling screw's threads is quite handy. One revolution of the handle moves the router 1/16"; one-quarter turn moves the router 1/64".

John Cusimano

SOURCE

McMaster-Carr, mcmaster.com, 630-833-0333, Leveling Mount, 3/8"-16 thread; 3-1/2" long, 1-3/8" dia. base, 4-1/2" overall height, #23015T66, \$5.46 (pkg. 4).



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Roller Guides

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are always welcome in my shop. When they also improve the results I get, well, I'm sold.

That's the double benefit of JessEm's new Clear-Cut Precision Stock Guides. They help prevent kick-back—the safety angle—and hold the work tight to the fence of a router table or a tablesaw, enabling me to make a smooth, even cut. On top of that, JessEm's guides are solid, well-built and easy to set up.

The guides come in pairs. You mount one guide on the infeed side of the bit or blade and the other on the outfeed side. Their urethane wheels turn in only one direction, which prevents the workpiece from kicking back. The wheels are also canted 5° inward, steering your work toward the fence.

Setting up the guides is very easy, but your fence must have a T-track. If your fence doesn't have a T-track, just make a sub-fence and add a T-track to it.

Made from thick anodized aluminum, Clear-Cut Guides have large, knurled steel knobs for easy height adjustment. Each guide has two knobs: a stationary knob for clamping the guide to the T-track and a pivot knob for adjusting the guide's height. The range of adjustment is 2-3/4", but the minimum and maximum thickness of boards you can use with the guides will depend on the height of



your T-track above the work surface.

After using the guides, I have to admit that I prefer them to a traditional featherboard. With a featherboard, you have to push the work harder than normal to overcome the friction created by its fingers. Pushing is much easier with the Clear-Cut Guides. Their urethane wheels compress a little—applying downward pressure—but there's less friction because they rotate. Nice!

SOURCE

JessEm Tool Company, jessem.com, 866-272-7492, Clear-Cut Precision Stock Guides, #04215, \$100/pair.

PHOTOS BY JASON ZENTNER



PHOTO BY JASON ZENTNER

Diamond Stropping Spray

A MIRROR FINISH on your edge tools results in clean, effortless cutting. Achieving this polish is quick and easy with DMT's new DiaSpray.

DiaSpray contains .5 micron diamonds—the equivalent of a 15,000 grit waterstone. You can apply it to any stropping material such as leather, thin cardboard, denim, MDF or balsa wood.

DiaSpray is more expensive than a typical stick of green rouge polishing compound, but it has a distinct advantage: speed. DiaSpray polishes steel much faster than rouge.

If you own any high-end chisels or plane irons, which are often made from very hard steel, DiaSpray's superior polishing power will be a huge advantage. I have a few very hard Japanese chisels, and I've never enjoyed stropping them with rouge—it takes way too long. Using DiaSpray is another story. Ten strokes on a piece of leather and I'm done.

SOURCE

DMT, dmtsharp.com, 800-666-4368, DiaSpray Diamond Suspension, #DSPRAY.5, 0.85 fluid oz. bottle, \$20.

EDITOR: TOM CASPAR | PHOTOGRAPHY: COURTESY OF MANUFACTURER UNLESS NOTED

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WINTER 2013-14



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Always-Fresh Finish

BRUSHING A FINISH from a freshly opened can is a real pleasure. The next time you use the finish, though, things can start to go downhill. The finish gets thicker through evaporation; solids start to form around the liquid's edges; dried finish clogs up the can's lip, preventing a good seal. Couldn't someone improve the can to stop this? Well, here's an out-of-the-can solution: Store your finish in a StopLossBag. A StopLoss finish will always be fresh.

A StopLossBag isolates a finish from exposure to air, preventing evaporation or oxidation—conditions that cause a finish to thicken and render it more difficult to brush. None of the finish in a StopLossBag will dry and solidify.

The idea is to decant your finish into a StopLoss-Bag right away. Squeeze out the extra air from the bag, screw a cap on the spout and you're all set. When you're ready to brush, pour what you need into a container and have at it. Return the remainder to the bag. Put simply, these bags are a new and better way to store finishes. Toss the can!

Filling a StopLossBag isn't too difficult, but you'll need a method for holding the bag upright to get started. Each bag comes with plans for building a "filling station" that works quite well. The manufacturer recommends using a turkey baster to get the first inch or so of finish out of the can, so it'll pour without making



a mess. I just used the included adapter tubes to attach a funnel to the bag's spout, held the works over a trash can and started pouring. Worked great! As the bag fills, the pleated bottom unfolds, so it'll stand by itself.

StopLossBags can be reused indefinitely as long as you have a dedicated bag for each finish. Just write the name of the finish in the provided space on the bag. Each bag holds 1.2 quarts.

SOURCE

Finishing Solutions, LLC, stoplossbags.com, StopLossBags, one bag, \$4.50, two bags, \$7.50, four bags, \$12.

Beat the Heat

GOT AIR CONDITIONING in your shop? I don't, which can make the summer months a miserable time to build a project. If you're in the same fix, a portable evaporative cooler from Port-A-Cool just might be the ticket.

These coolers can lower the temperature of a small area by as much as 30° F, according to the manufacturer. They're a bit pricey, but they're very energy-efficient. The advantage they have over a conventional air conditioner is that you can put them wherever you want—no window required.

In a nutshell, here's how an evaporative cooler works. Water saturates a set of pads. Air is drawn through the pads, creating evaporation. Evaporation cools the air, which is then pushed out by a fan.

Depending on the model, these coolers are designed for 500 to 700 sq. ft. areas. Their output ranges from 2000 to 3200 cfm (cubic feet per minute). They have their own water tanks that you can refill manually, but for ease of operation it's best to hook up a hose. A float in the tank keeps the water at an optimum level.

Port-A-Cool Cyclones all have casters for mobility and feature a quiet centrifugal fan. They run on 110V and draw a miniscule 2.5 to 5.6 amps.



SOURCE

Port-A-Cool, port-a-cool.com, 800-695-2942, Port-A-Cool Cyclone, \$650 - \$850.

110-Volt Cabinet Saw

STACK UP A BUNCH OF TABLESAWS, and who comes out on top? For performance, the winner is always going to be a cabinet saw. Price aside, it's too bad that many woodworkers can only dream of owning one.

What's stopping them? Most cabinet saws pack so much power that they require 220 volts—a non-starter for the thousands of shops with only 110 volt circuits. Fortunately, a few new cabinet saws have broken the mold and are equipped with 110 volt motors. I welcome the new Powermatic PM1000 as the latest member of this class.

In general, a cabinet saw has four advantages over hybrid and contractor saws: more power, more mass, easy blade alignment and a smaller footprint. Let's look at how well the PM1000 does in these categories.

- **Footprint.** A cabinet saw, by definition, doesn't have a motor sticking out the back. The motor is housed inside the cabinet. (Hybrid saws have this feature, too.) If a cabinet or hybrid saw is on a mobile base, you can push it up against a wall. You can also push an outfeed table up close to its back.

- **Alignment.** The trunnions on a cabinet saw—also by definition—are attached to the saw's base. (On a hybrid or contractor saw, they're attached to the top.) On a cabinet saw, aligning the blade with the top's miter slots is simple: You just loosen the top and shift it. This operation is much more difficult when the trunnions are mounted to the top. Here's another difference: On a cabinet saw, the blade stays in alignment when you tilt it 45°; on a contractor saw, the blade's alignment might shift, giving you a burnt cut.

- **Power.** Most cabinet saws have 3 hp or larger motors; the PM1000 features a 1-3/4 hp motor. (Basically, this is the most power you can get from a 15 or 20 amp, 110 volt circuit; a few hybrid saws also have 1-3/4 hp motors.) Powermatic's



motor draws 15 amps, so you'll need a 20 amp circuit to run it without fear of popping a breaker. In my experience, 1-3/4 hp is sufficient to tackle most jobs, although ripping thick stock takes a bit longer.

- **Mass.** Cabinet saws weigh considerably more than hybrid and contractor saws because their cast iron parts are larger and thicker. This extra mass noticeably cuts down on vibration. The PM1000 weighs 350 lbs., which is more than the weight of a typical hybrid or contractor saw. Powermatic's PM2000—their 220 volt cabinet saw—has even more mass, however. It weighs 550 lbs.

The PM1000 is a left-tilt saw, equipped with the usual blade guard and riving knife required on all saws today. The blade is surrounded by a funnel-style shroud that directs dust into a 4" dustport. A large hinged door in the cabinet allows you to clean out the dust that bypasses the shroud.

The saw is equipped with a T-style fence and miter gauge. Large, beveled cast iron tables come in either 30" or 52" (pictured) sizes.

SOURCE

Powermatic, powermatic.com, 800-274-6848, PM1000 w/30" fence, #179100K, \$2000; PM1000 w/52" fence, #1791001K, \$2100.

Stops for T-track

T-TRACK presents a world of possibilities to woodworkers. I've used it many times to make a jig or fixture adjustable or to add featherboards to a fence, for example. These T-track Stops from Rockler add yet another dimension. Imagine having a bench dog that could pop up anywhere—that's the idea.

Rockler's stops were intended as companions to Rockler's T-track table, but you certainly don't need this table to take advantage of them. You can easily add T-track to any bench or worktable just by routing a groove.

The stops are only 5/8" tall, which is fine for work that's 3/4" thick or more. (You'll have to punt for thinner stock.) The cam-action clamping handle on each stop folds flat.

T-track Stops come in three styles: long, short and inline. Each stop has a key milled on the bottom that prevents the stop from rotating. The key runs parallel to the faces of the long and short stops and perpendicular to the face of the inline version.

Rockler T-track Stops are not compatible with all brands of T-track. If your T-track accommodates T-bolts, the stops will probably work OK.

SOURCE

Rockler, rockler.com, 800-279-4441, Short Stop, #47482, \$7 each; Long Stop, #46010, \$13 each; Inline Stop, #43807, \$7 each; Stop Kit, includes two Short Stops and two Inline Stops, #45091, \$25.



Short Stop



Inline Stop



Long Stop

Ferd Sobol

**Master
miniature furniture
maker.**

by
Arthur Montes De Oca

IN MARCH OF 1985, THE VERY FIRST ISSUE OF *AMERICAN WOODWORKER* FEATURED A STORY ABOUT FERD SOBOL, A BUILDER OF SPECTACULAR MINIATURE FURNITURE PIECES. OVER THE PAST THREE DECADES, *AMERICAN WOODWORKER* AND MR. SOBOL HAVE SHARED THE SAME COMMITMENT TO EXCELLENCE. WE'RE PLEASED TO RECONNECT WITH FERD AND UPDATE HIS STORY.



MORE THAN THREE DECADES have passed since I first stumbled into Ferd Sobol's workshop. Now known internationally as "The Workshop Wizard" and the creator of "The Ferd Sobol Editions," Ferd (short for Ferdinand) is clearly recognized as one of the world's finest builders of miniature furniture. His fantastic 1/12th scale limited editions are often sold out before they're completed, and collectors from all over the world have standing orders to purchase anything he builds.

Following frank advice

With a wistful smile, Ferd recalls humble beginnings and shares a pivotal moment in his life. While growing up in Green Bay, Wis., his dream was to become an architect and builder of fine homes and civic buildings. During World War II, because of the teacher shortages, Ferd took over the teaching of his high school drafting class, even though he was still

a student. When Frank Lloyd Wright, the most famous architect of the 20th century, came to Green Bay, Ferd seized this unique opportunity to meet Wright and share with the great man his own dream of becoming an architect and builder.

Wright was, well ... frank. He asked Ferd if he knew how many architects there were in the world. Ferd answered that he had no idea but figured that there were about 20 in his hometown of Green Bay. Wright laughed loudly and said there were perhaps a grand total of seven real architects in the entire world. Then he stated, "You are currently addressing one of them."

Wright went on to say that many who called themselves architects were merely draftsmen and told Ferd, "Do not delude yourself, young man. If you have not already shown great promise by your age, you simply do not have enough time to become a great architect." Wright continued, tell-

ing Ferd that if his heart was in building, and if he really wanted to realize his dream of creating buildings, he should abandon his dream of architecture, and solely devote himself to the pure act of building. To this day, over 70 years later, Ferd still vividly recalls this bittersweet moment. Eventually, though, he was able to concentrate on the positive insights that Wright had shared with him about becoming a builder.

Two careers, one partner

After serving as a medic in the Korean War (for which he was awarded three purple hearts and a bronze star), Ferd came home to a wife and child. He devoted himself to building a home for his family and then to building custom homes throughout the Green Bay area, and later, in California. That was the start of Ferd's 30-year career as a contractor.

Ferd had been the poster boy for the first sheetrock installation in Green Bay, and appeared in his overalls in some early ads for sheetrock. In the 1950s, he embraced technology and transitioned from hand tools to power tools. "My first circular saw and pneumatic nailer were wonderful timesavers," he recalls. "I used to drive 16-penny nails in three strokes—one to set and two to seat. But these new tools made me feel as if I could cut rafters with one hand while framing with the other."

Ferd's contracting career ended when his doctors told him he'd become allergic to the copious sawdust he encountered while building houses. This diagnosis turned out to be no hill for a climber such as Ferd. He followed doctor's orders and modified his wood exposure by starting to build in miniature scale. The rest is history: For more than 35 years he's been building spectacular 1/12th-scale furniture in his workshop.

Ferd's wife, Millie, is his professional partner. She does much of the upholstery work and hand caning on the miniatures. Ferd met her during World War II, when she was in college and he was training to be a fighter pilot. He wooed her long distance and they married in 1947. Married for 70-plus years and parents to three daughters, they have a partnership made in heaven and forged with doses of adversity and rapture. Ferd is quick to acknowledge how blessed he is to have a partner, muse, critic and helpmate rolled into one. "Without doubt, Millie is my better half," Ferd quips. "Everyone says so."

Like Ginger Rogers

When asked how he creates such masterful work, Ferd smiles and draws a delightful analogy. "Woodworkers who build in full size will appreciate that building in

The Chippendale Sideboard (1992); 3-1/2" x 5-1/4" x 2-1/4". Gorgeous burled wood, bombé construction, gold hardware and graceful cabriole legs with acanthus draped knees and feet grace this handsome piece.



The Breakfront, First Edition (1987); 8" x 5-3/4" x 2".

Ferd will only re-release an edition if he feels he can improve it. Due to continuing requests, Ferd released a Second Edition of this piece in 2006 and a Third Edition in 2014.



A delicate touch installs this gold-gilded curved tambour door, which will slide open to reveal the breakfront's 1/12th-scale pigeonholes.



A Great American Woodworker



Ferd's wife Millie is also his shopmate. She does much of the upholstery and hand-caning work and, according to Ferd, has "had his back" for over 65 years.



Designing jigs to perform delicate operations is part of Ferd's genius. This jig drills holes for the micro nails used to fasten the banding around a drop-leaf table top.



continued

1/12th scale is similar to what Ginger Rodgers said about dancing with Fred Astaire: 'I did everything Fred did, only backwards and in high heels.'" Then Ferd explains that builders specializing in miniatures struggle with all the challenges faced by woodworkers in general, but must also face many additional issues that "full-size" woodworkers might take for granted.

Scale becomes the law of the land, Ferd says. From design to tools and materials, everything is dictated by scale. The wood's figure must match the scale. Sandpaper grits start at 200 and everything is measured to .001". With miniatures, the eye is unforgiving. All tool marks must be removed and a speck of dust on a lacquer finish will stand out like a golf ball on a putting green.

Ferd spends days drawing each piece, adjusting the proportions and other design elements, and then doing it again. "A builder can't just measure a full-sized piece and scale it down," he says. "It won't look right. Subtle design adjustments must be made to please the eye. This is the first step."

Standard woodworking tools are almost always too big. Ferd has ditched his Rockwell, Makita and Delta power tools in favor of smaller Dremel rotary tools and replaced his bench lathe with a jeweler's lathe.

But his innovative adaptation of traditional techniques and his creative use of jigs are the keys that make his editions not only possible but also unique. Ferd's shop is loaded with the jigs he's designed to shape, build and assemble his furniture pieces. Such custom-made jigs are a mainstay of his work.

Modern skills

Ferd has embraced the digital world. He uses the Internet to host his website and blog and sees it as a powerful tool for historical research and inspiration that supplements his extensive personal library of 18th-century furniture styles. His favorite is the Federal Period (1750–1830). Ferd feels the furniture of this time combined the best neo-classical design elements favored by old-world craftsmen with the innovative design evolution of new-world craftsmen.

"Sometimes I just lose myself in the pictures," he says, "imagining with awe what the craftsmen of yesteryear produced with only hand tools. What fabulous skill they had! I sometimes almost feel like I'm cheating by incorporating electricity and technology. We all really do stand on the shoulders of those who preceded us."

Using this last statement as his inspiration, Ferd has

The Queen Anne Dining Room (1993)

Table: 2-3/8" x 6" x 3-3/8", Chair: 3-1/8" x 1-3/4" x 1-7/8".

This impressive set displays hand-carved ball and claw feet inspired by master cabinetmaker Thomas Chippendale, as well as sand-charred inlay and a petite drawer.

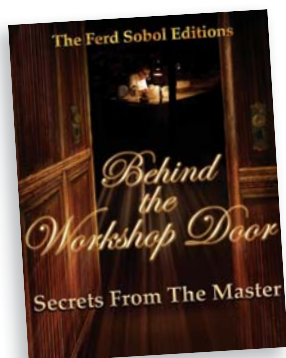
published a series of how-to articles synthesizing his experience and making projects available through his website. Intended to assist and inspire amateur miniaturists, Ferd explains, "I hope that through this sharing, I'm able in a small way to impart the magic of creativity with the next generation of miniaturist woodworkers."

Looking ahead

Ferd still spends time in his workshop every day, motivated by an artist's need to create and challenged by the logistics of building his remarkable pieces. "I'm very fortunate to have the opportunity to create and share my vision with others," he says. "And I'm humbled by the patronage of the many wonderful people who embrace my miniature editions. Even after all these decades, my heart is still thrilled every day by the simple act of going into my workshop and building."

Ferd's progression from traditional builder to miniaturist craftsman and esteemed Fellow of The International Guild of Miniature Artisans (IGMA) is a fascinating story. His oeuvre, the distilled essence of his craft in both scale and aesthetic, speaks eloquently of that journey. Now in his ninth decade and still passionate about woodworking, The Workshop Wizard is the first to admit that Mr. Wright was indeed right.

See more of Ferd's work at SobolEditions.com.



Art Montes De Oca is an award-winning photographer whose work has been published worldwide. His book *Behind the Workshop Door, Secrets From The Master—The Ferd Sobol Editions* (Amazon.com) will be available at SobolEditions.com in early 2015.

Fitting dovetail joints requires measuring in .001" increments.



Each drawer is carefully fitted during the building process to assure it opens and closes smoothly, without racking or binding.

The China Cabinet (1996); 7-3/4" x 4-1/2" x 2". Appointed with an open curved scrolled bonnet and hand-carved legs, this limed-oak cabinet also features a Greek key cornice and a draped finial coronet.



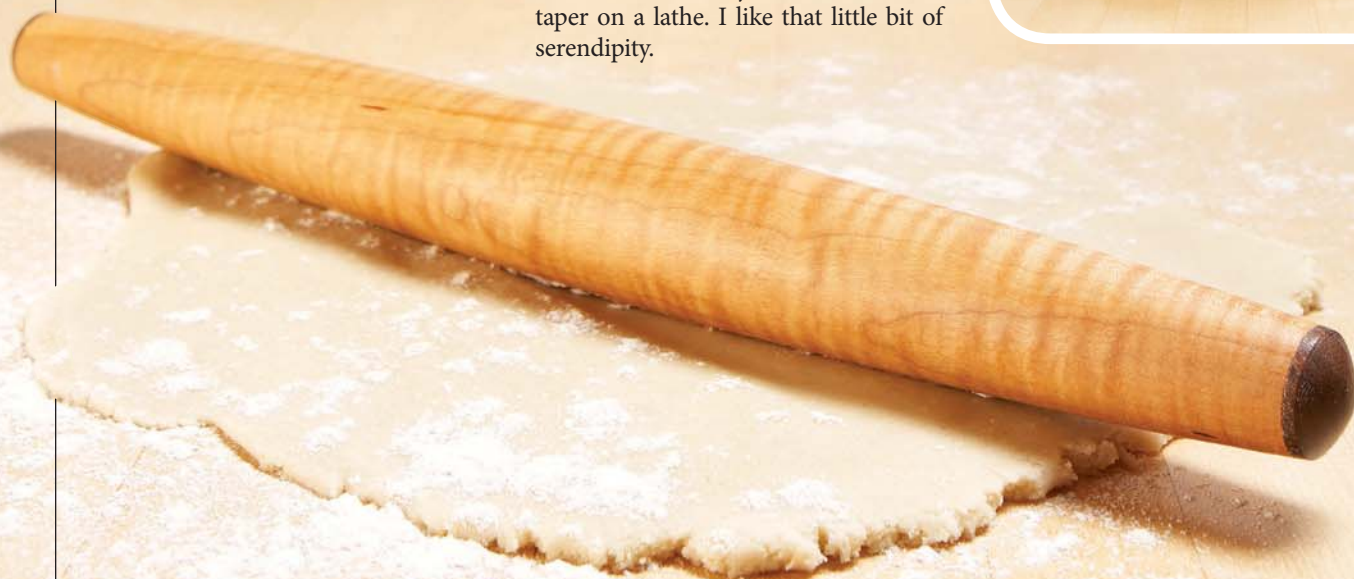
French Rolling Pin

It's a paper-towel holder, too!

ROLLING PIN or paper-towel holder? I'm not sure which function inspired me to design this project, but it works equally well both ways.

No doubt you're familiar with the shape of a standard rolling pin, but a "French" rolling pin is different: It's merely a slender rod, straight or tapered. Apparently, a taper allows you to pivot a rolling pin in order to create a perfectly round pastry. I'm not too particular about the exact shape of my dough, but I do know a beautiful turning when I see one. The shape of this rolling pin really appeals to my eye, but there's more to it than that.

The hole in the base piece is tapered, like the rolling pin itself. When you insert the rolling pin in the hole, it automatically fits nice and tight. When it's time to make pastry, the tapered fit allows you to easily remove the rolling pin from the base. When you think about it, this fit is just like the Morse taper on a lathe. I like that little bit of serendipity.





1 Round both ends of a curly maple blank.



2 Shape both ends so they're perfectly straight, square and smooth. Use a skew or a parting tool.



3 Mount the blank in a scroll chuck, then drill 3/8" dia. holes in both ends.



4 Rough out two short walnut blanks. True an end of each piece, then mount one in a scroll chuck.



5 Adjust your calipers to match the 3/8" bit.



6 Turn a short 3/8" dia. tenon. Repeat this operation on the second piece of walnut.

Begin with the body

Start by chucking up a 2" x 2" x 15" blank, using a cone-shaped live center. Round the tailstock end of the blank (**Photo 1**). You'll be mounting the blank in your scroll chuck later on, so the exact diameter of this round portion doesn't matter. But its width and shape do matter.

The width of this portion—let's call it a "tang"—should equal the depth of the scroll chuck's jaws. I believe that you get the best support in a scroll chuck when a tang contacts it at two levels: First, the butt end of the blank should bottom out on the face of the chuck; second, the shoulder of the tang should sit on top of the chuck's jaws.

I usually shape a slight outward flare on a tang that will be held by a scroll chuck. Think of the shape as a dove-tail—it prevents the blank from being pulled out of the chuck. And when might that happen? When you bore a hole into it and withdraw the bit, later on.

After rounding, shape the butt end of the blank to make it flat (**Photo 2**). The easiest way to check your progress is to place a 6" rule all the way across the blank's end. You'll be able to tell immediately whether the end is domed or dished. Cut as close to the live center's point as you can.

When you've completed these steps, turn the blank around and repeat the process.

Next, mount a scroll chuck and a Jacobs chuck in your lathe. Tighten the blank in the scroll chuck and drill a 3/8" dia. hole 5/8" deep in one end (**Photo 3**; Fig. A, page 25). Turn the blank around and drill a similar hole in its other end. Remove the blank and set it aside.

Make the decorative caps

The walnut caps on each end of the rolling pin are just for show; you could omit them, if you wish. To make the caps, you'll need two blanks that are 2" x 2" square and 4" long. Turn each piece to a rough cylinder and true one end (**Photo 4**), then mount the piece in your scroll chuck. Set your calipers to 3/8" (**Photo 5**), then turn a 9/16" long tenon on the end of each blank (**Photo 6**). Use the 6" rule to make sure that the shoulder of each tenon is dead flat, so it will mate with the ends of the rolling pin's body.

Epoxy both walnut caps to the body (**Photo 7**). Quickly mount the assembly on your lathe and advance the tailstock's spindle to squeeze the parts together (**Photo 8**). Let the glue cure overnight before proceeding.



7

Glue both walnut pieces to the rolling pin's body using 5-minute epoxy.



8

Clamp the assembly in your lathe. This method ensures that the glue-up will be straight.



9

Begin shaping the rolling pin. Establish diameters in the middle of the blank, halfway down its length and at both ends.



10

Taper the rolling pin using a roughing gouge. On the last passes, steady the piece with your hand to obtain a smooth surface.



11

Reduce the diameter to 7/8" where the maple and walnut pieces meet. Continue tapering the rolling pin's body down to this diameter.

Finish the body

Use your parting tool and calipers to establish a 1-1/2" dia. in the center of the rolling pin (Fig. A). Halfway down the length of the maple body, on the right side only, establish a 1-3/8" dia. (**Photo 9**). At the point where the maple and walnut meet, on the right side only, establish a 1" dia. (This is 1/8" larger than the final dia.) Use a roughing gouge to "connect the dots" (**Photo 10**). Repeat the same procedure on the left side of the rolling pin.

Why not shape both sides at the same time? If you're an experienced turner, you know that whip and chatter increase as you make a spindle thinner and thinner. And that's bad: When a spindle whips, it's hard to make a smooth surface. The best way to minimize whip and chatter is to work your way from right to left; that is, begin work at the tail end of a spindle, then gradually move down to the drive end.

After you've tapered both sides of the rolling pin to an approximate shape, use your parting tool and calipers to establish the final dia. of 7/8" at both ends (**Photo 11**). Continue tapering the rolling pin, on both sides, down to this diameter. Make sure the maple portion is nice and

smooth before proceeding.

Slow down the lathe's speed and use a detail gouge to round over the right end of the rolling pin (**Photo 12**; Fig A). Leave a 3/8" dia. neck connecting the workpiece and waste. Repeat this process at the left end, but this time cut all the way through (**Photo 13**). As usual when parting off, support the workpiece in one hand to catch it as the two parts separate from each other.

Use a handsaw to cut off the waste from the right end of the rolling pin. Smooth both ends with a file and sandpaper.

Make the base

Saw a round blank about 1-1/4" thick by 7-1/2" dia. One side must be flat. Using double-faced tape, attach the blank's flat side to a support piece screwed to a faceplate (**Photo 14**). True the base's edge, then shape its face into a dome. Drill a 7/8" hole all the way through the base and continue about 1/2" into the support piece (**Photo 15**). I use a spade bit cut very short to make this hole; a spade bit left at its normal length vibrates too much.

Taper the hole using a parting tool held at a slight



12 **Shape** the right end of the rolling pin using a detail gouge. Leave a neck about $\frac{3}{8}$ " dia., then repeat this cut on the other end.



13 **Part** off at the drive end. Saw off the waste at the right end of the rolling pin, then smooth both ends by hand.



14 **Make** the rolling pin's stand. Begin by attaching a round walnut blank to a support piece using double-faced tape.



15 **Shape** the piece as you wish, then drill a $\frac{7}{8}$ " dia. hole all the way through it.



16 **Taper** the hole using a parting tool. Make very shallow cuts.



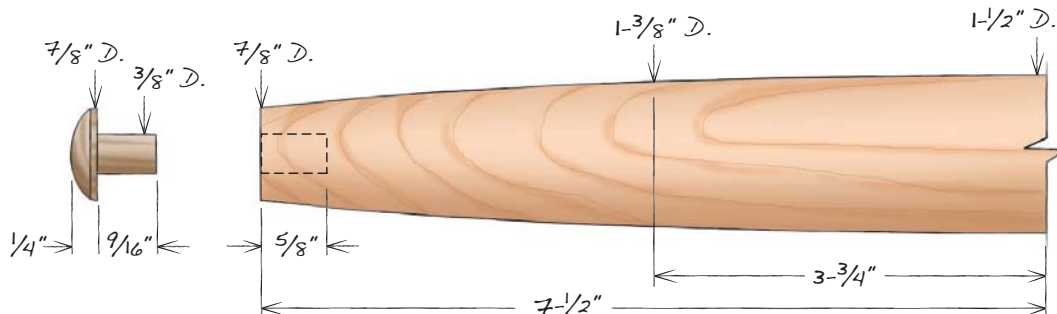
17 **Test** the fit of the rolling pin in the hole. If the fit is loose, adjust the hole's taper with the parting tool.

angle (**Photo 16**). The idea, of course, is to make a hole that matches the shape of the rolling pin. You won't have to remove much wood to achieve this, so take it easy and check your progress often (**Photo 17**). When the fit is good, it's OK if the rolling pin extends beyond the bottom of the base. Add three feet of your own design to the base and you'll be all set. 🐿



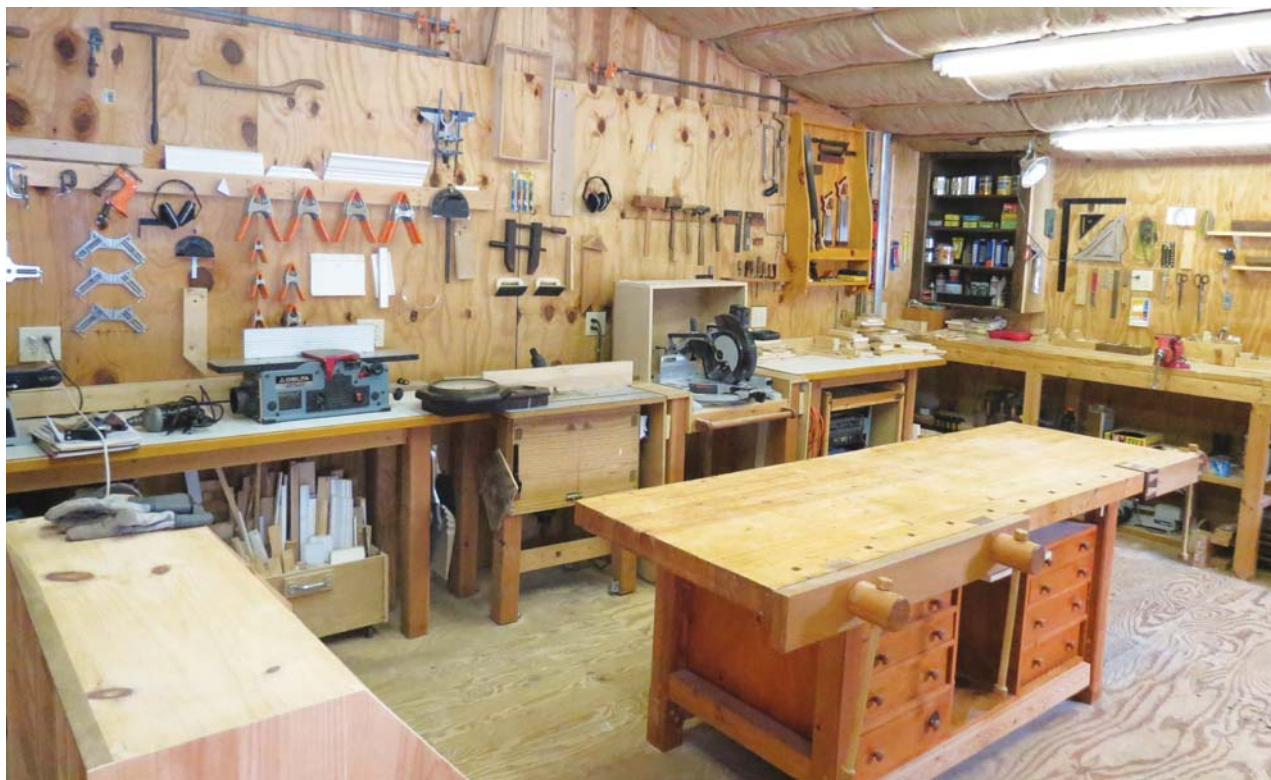
Tim Heil A turner since high school, Tim specializes in functional pieces—particularly anything that needs a handle. See more of his work at timheilwoodturner.com.

Fig. A Exploded View



See how to make a standard rolling pin at AmericanWoodworker.com/WebExtras

Finally, A Place of My Own



I created optimal space for my favorite tool by selling my tablesaw.

WE'VE MOVED A LOT over the years, so I've had 10 different shops. They've always been in a garage or a basement; some were fairly small, others were adequate and one was even pretty good. But in every shop I shared space with something else: cars, laundry, household storage—you name it.

Our last move finally brought us to a house in Columbus, Ga. with a 356 sq. ft. outbuilding. It was a prefab structure that wasn't totally finished, but it was considerably larger than my prior spaces and a great improvement, overall.

My introduction to "doing it myself" came from my father, who learned resourcefulness from his father in the 1930s, when everyone pretty much did everything themselves. I had woodshop class in junior high school, and although I didn't realize it at the time, I inherited from my mother an appreciation for fine furniture, especially that of the late 18th century.

After getting married and having three kids, my wife and I could ill afford to buy the kind of furniture we both wanted,

so I figured I'd better learn to build stuff. Then I discovered Norm Abrams and woodworking magazines. I've learned a great deal from both sources—my thanks to Norm and to all who contribute so eloquently to those publications.

Thus began a love for woodworking, cabinetmaking and carpentry that has lasted for more than 35 years. This affinity started slowly, but has built to the point where I hope to sell some pieces, such as the desk that appears in some of the photos—if I ever finish it!

Perhaps the most interesting thing about my current shop is what's not in it. I owned the requisite Delta tablesaw for years, but during an economic downturn, I decided to sell it.

Since then I've found other ways to do the same things I did with the Delta. From time to time this presents some interesting challenges, but I keep thinking what the colonial woodworkers at the Williamsburg Anthony Hay Shop accomplish using simple hand tools in a fairly small space with



no electricity—and with tourists watching!

My favorite tool is the workbench, which I made from a magazine's plans some years ago. It's 100% wood (of 7 different types), save four lag bolts on one end. The frame joinery is all double-pegged mortise and tenon with no glue. The top is stationed on the legs with mortise and tenon joinery as well, so the bench can be broken down if necessary.

I wanted my bench to sit in the middle of the shop, so I could build a leg vise on one side and a tail vise and twin-screw vise on the other. This central location also allowed for drawers that go all the way through, so they can be opened from either side.

All in all, it's such a luxury to have my own shop. I can't believe it took this long!

*David Mitchell
Columbus, Ga.*



11 Tips for Using an Extraordinary Fix-it Tool



by Kevin Southwick

I USE QUICKWOOD epoxy putty in my furniture restoration work for everything from making small cosmetic repairs to fixing stripped screw holes, rebuilding damaged joinery and broken-off carved decoration, repairing dog-chew damage and replacing missing veneer. Many other epoxy putties are available, but I trust QuickWood for my work because it's the original putty stick and has been available for more than thirty years.

A two-part formulation, QuickWood comes as a roll containing both resin and hardener (see Source, page 31). Rolls are available in two sizes and three shades: original (for pale, unfinished wood), pine and dark. The pine and dark shades are fast-cure formulations with three to six minutes working time; the original shade has 15 to



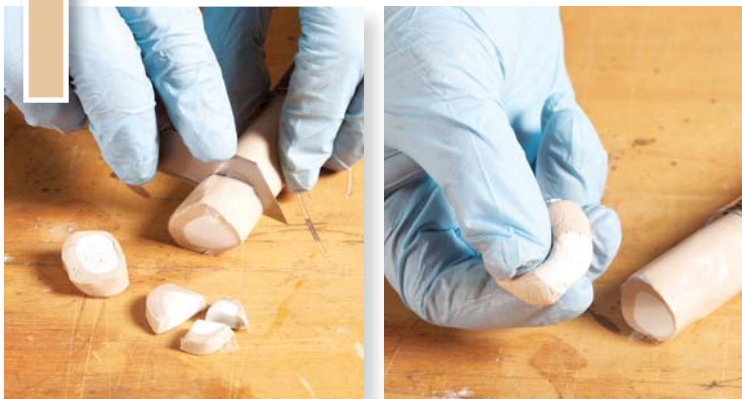
Excellent adhesion. Once fully cured, QuickWood bonds well to wood, with a high degree of structural integrity.

25 minutes working time. I prefer to work with original QuickWood because of its longer working time and light color.

QuickWood cures to about the same hardness as cherry or walnut and behaves very much like wood. It can be sanded, scraped, drilled, carved and machined with standard woodworking tools. It's easy to color and is unaffected by all chemicals used in wood finishing.

QuickWood is stable enough to withstand extremes in temperature, and when properly applied to wood, it bonds so well that the wood's fibers typically pull apart when enough force is applied to separate it. In fact, this moldable wood substitute will stick to almost anything, including glass and steel.

1 Simple Two-Step Prep



QuikWood comes in a roll that contains both resin and hardener, so wear gloves and take all other normal precautions when using such chemicals.

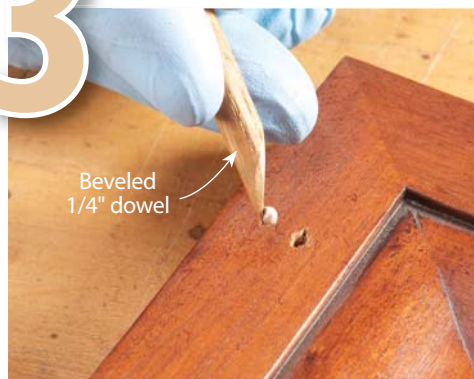
Cut a slice from the roll, using a razor blade or sharp knife (left). Correctly portion tiny amounts by dividing a slice in half or quarters. Always start with a bit more than you'll need, so you don't run short in the middle of a repair. QuikWood shrinks less than 1%, so it's fairly easy to determine the appropriate amount. Peel off the plastic wrap and then knead the putty until the color is consistent (right). As soon as the material begins to get sticky it's ready to use—this only takes a couple minutes.

2 Lubricate to Ease Shaping



QuikWood sticks to almost anything, including gloved fingers. To temper this stickiness, lubricate those fingers with denatured alcohol, rubbing alcohol or hand sanitizer (which is primarily alcohol). So doing makes it much easier to mold the soft putty while reconstructing missing parts.

3 Fill Small Holes



Thanks to QuikWood's stick-to-it-tiveness and thick consistency, you can avoid putty smear when filling nail holes and other small imperfections by using a simple tool, such as this beveled dowel.

4 Add Color Easily



Simply add oil-based gel stains, artist paints (oil or acrylic), Mixol tints or dry-powder pigments immediately after mixing the putty to make QuikWood just about any color you want. Note: Dyes don't work as well as pigmented colorants.

I always start with original light-colored QuikWood, so I can mix in colorants to match each situation. This offers the most control and allows me to be as fussy as I want. Sometimes adding color is sufficient. However, to hide a fill really well usually requires some color adjustment and a little practice with touch-up techniques (see "Restore Damaged Veneer," page 31).

5 Mimic Spectacular Grain



This marbled "board" was made by blending a variety of colorants in layers, while folding, pressing, twisting and pulling the soft QuikWood putty like taffy.

Tool Talk

continued

6 Make Ergonomic Tool Handles



QuikWood is perfect for making custom-fit handles for files and other such tools because it sticks to steel.

7 Replace Missing Parts



QuikWood is easy to mold when it's soft and easy to shape when it's dry, so you can replace furniture parts—or make your own.

8 Patch Puppy Damage



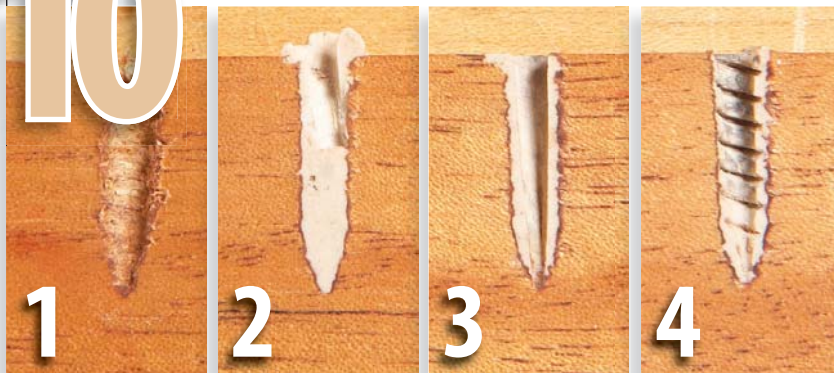
Replace chewed-off bits with molded QuikWood. This repair was disguised by adding gel stain twice—first to the soft putty and again later for additional touch-up after the hardened putty had been shaped.

9 Realize Your Artistic Vision



You'll always have leftover putty because it's important not to run short in the middle of a repair. Why not put it to good use?

10 Recondition a Stripped Screw Hole



This hole is so worn (1), the screw simply fell out. To repair such damage, fill the hole with freshly-mixed QuikWood. Start by using a wooden matchstick to force the soft putty into the torn threads (2).

Next, dip an awl in denatured alcohol and then press it down into the center of the putty-filled hole to create a pilot hole (3). Drilling the pilot hole after the putty has hardened also works, but takes longer.

Let the putty harden for at least one hour. Then thread in the screw (4). The new epoxy walls form a threaded hole as strong as, or stronger than, the original wood.

11

Restore Damaged Veneer



Before

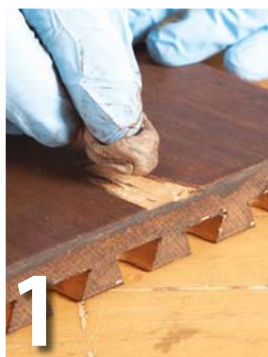


After

A missing chunk of veneer or solid wood (left) can be filled reliably and hidden more easily and quickly with QuikWood than with real wood (right).

Step back frequently during the repair process to check your work from the proper perspective and under appropriate lighting, and bear in mind that most repairs only need to be good enough to go unnoticed by a casual observer.

How to make the repair



1



2



3

Start by making sure the void is clean and dry, free of grease, wax and dust. If the void's surface is very smooth, rough it up a bit with coarse sandpaper or cut small scratches in it to aid adhesion. Remove hidden bits of wood dust and loose splinters from the void by daubing with the freshly mixed putty (1).

Then prime the void with a thin layer of putty (2). Press hard to force the putty into the void's nooks and crannies. This assures a solid bond and helps avoid gaps around the edges. Form the putty into a thin film that's the approximate shape of the void and press it into the damaged area (3).



4



5



6

Wear clean gloves lubricated with water or alcohol to shape and smooth the putty (4). Without such lubrication, the sticky putty is likely to pull away from the void's edges. It's easiest to leave the putty a little proud and let it harden so that it can be sanded or scraped level.

However, with practice, you can level the putty while it's still soft, using a utility knife blade lubricated with hand sanitizer (5). Cut in grain lines or scratch in subtle texture, as necessary, to match the surrounding area (6).



7



8

Adjust the background color by lightly pressing powdered pigments into the putty's soft surface (7). This background color should be a little lighter than the surrounding wood, so you can dial in the final finished color with a little touch-up after the putty has hardened. Apply these final bits of color and grain pattern using an artist brush and gel stains, artist paints or tinted shellac. Commercial touch-up markers and colored pencils also work well (8). Then apply finish, as necessary, to complete the repair. 🛠️

SOURCE

Polymeric Systems, Inc., polymericsystems.com, 800-228-5548, QuikWood Wood Repair Epoxy Putty Sticks, Original, 1 oz. stick, \$5, 2 oz. stick, \$7; Fast-Cure Pine or Fast-Cure Dark, 1 oz. stick, \$5.50.

Kevin Southwick is a wood finishing specialist and furniture restorer/conservator. For more information, visit southwickfurnitureconservation.com.

18 Shop Storage Tips

**Want to get organized?
Just hold it, hang it, box it or roll it!**

by Tim Johnson

1 Tubular Shelves

Store wood trim, dowels and other long, narrow stock in a cardboard concrete form. Maximize the space inside the form by sliding in plywood dividers and securing them with screws. Use plumber's strap to hang the form. One 10' roll is enough to hang a 12" dia. by 8' long form. Concrete forms and plumber's strap are available at home centers.



2 Sturdy Brackets

Make lumber-storage brackets by cutting, gluing and clamping 3/4" plywood sides to a 12" long chunk of 2x4, as shown. Fasten the brackets to the wall studs with 3/8" x 3-1/2" bolts. Then attach a plywood shelf.



See 18 tips for buying and using rough lumber at AmericanWoodworker.com/WebExtras

3 Double-Duty Lumber Rack

Keep long clamps handy by storing them on the same heavy-duty shelf brackets you use for lumber. Storing these heavy, hard-to-manage clamps horizontally makes them easy to remove and return, because you don't have to hoist and twirl them as you would if they were stored vertically. Heavy-duty brackets and slotted standards are available at home centers.



4 Benchtop Tool Cabinet

Store small tools in this 9-3/4" x 30-1/4" x 11-3/4" plywood cabinet. Its shallow drawers are ideal for layout tools or carving gouges. Deep drawers hold marking gauges and block planes. Place your cabinet on a shelf or hang it from a wall by fastening through the back.

Use 1/2" Baltic birch for the case and back, which assemble with rabbet joints that are glued and nailed. Use 1/4" tempered hardboard for the drawer bottoms and pine for the drawer boxes. Cut 3/16" deep dadoes for the drawer bottoms to slide in—the bottoms function as both drawer slides and drawer pulls. Stagger the dadoes in the middle divider so it stays strong. Note: The lowest drawers don't

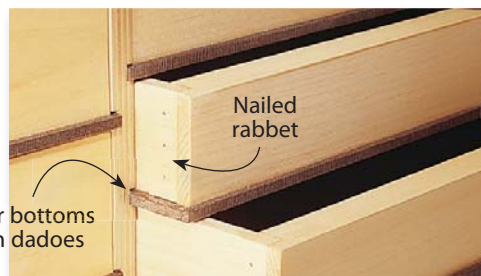
require dadoes; they slide on the bottom of the case.

To make the pulls, drill a stopped hole in the front of each drawer bottom and use epoxy to install a washer. Then remove the waste of both sides to create the pull's protruding profile.

Cut rabbet joints to assemble the drawer boxes, and nail and glue them together. Even up the bottom edges on each box and then glue it to the hardboard bottom. The stiffness of the drawer box keeps the hardboard from bending under the weight of your tools.



Get the complete plans for this project at AmericanWoodworker.com/WebExtras



Drawer bottoms ride in dadoes

Nailed rabbet

5 Instant Drawers

Large plastic boxes used by restaurants for busing dishes are perfect for shop drawers. Strong, durable and light in weight, they come with built-in handles that make them ideal for storing and transporting workshop essentials, from screws to power tools.

Bus boxes are super-easy to install. They're designed to hang from their rims, so screwed-on cleats make perfect drawer supports. To store large items, simply reduce the number of boxes in the stack, so each box has ample headroom. Thanks to bus boxes, you may never have to build another storage drawer!

SOURCE

U.S. Foods Culinary Equipment & Supplies, superprod.com, 866-636-2338, Heavy-Duty Bus Box, 5" x 15" x 20", #1066877, \$13.59 ea.; #9332750, case of 12 boxes, \$142.49.

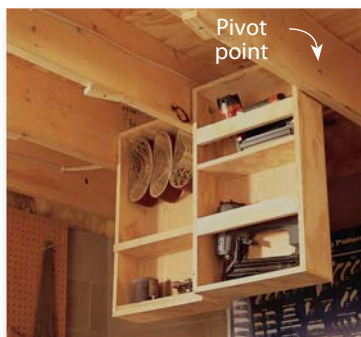


Cleat

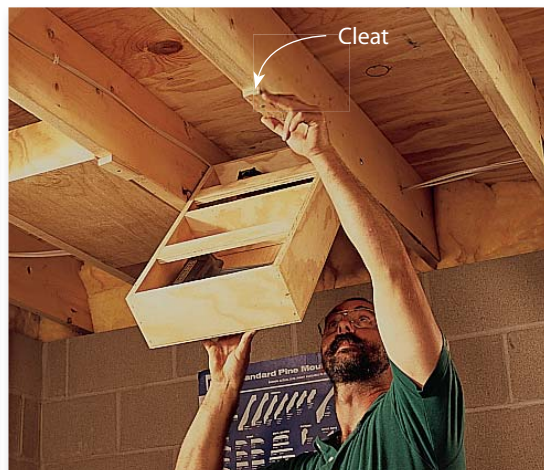
Restaurant bus box

6 Ceiling Tuck-Away

Eke out every cubic inch of storage in a basement shop by hanging these pivoting drawers between the ceiling joists. They're perfect for tools and supplies you don't need to get at all the time. Use lag screws or bolts for pivots and a pair of swiveling cleats to store each drawer between the joists. Simply drop down the drawer for easy access to its contents.



Pivot point



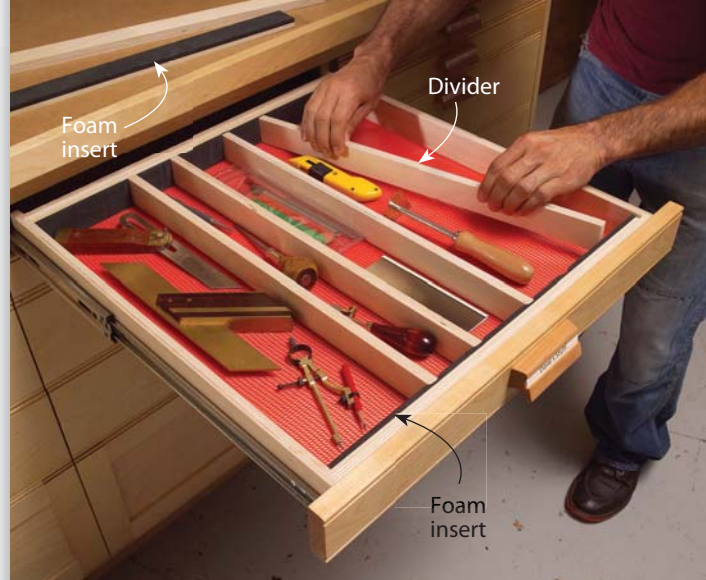
Cleat

7 Adjustable Interiors

Foam-covered inserts make it easy to reconfigure your drawers as your storage needs change. To make the inserts, cut pieces of 1/4" hardboard to fit across the drawer and use spray adhesive to adhere 1/4" closed-cell foam to the hardboard. Then cut dividers for a friction fit. Start long and slowly trim the dividers until they fit snugly.

SOURCES

- Foam Factory, foambymail.com, 586-627-3626, Cross-Linked Polyethylene Foam-2 lb., black, 1/4" x 24" x 48" sheet, #MC2, \$11.99; 3M Super 77 Spray Adhesive, 16 oz., #3M, \$17.49.
- Craftsman, craftsman.com, Craftsman Non-Slip Drawer Liner Roll, 85-1/2" x 22-1/8", black, #65514, \$24.99.

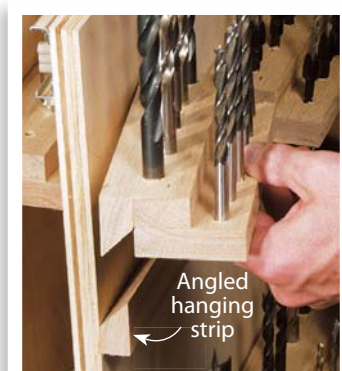


8 Drill Press Station

Create cavernous storage under your drill press by recycling an old kitchen cabinet. Shorten the cabinet's drawer and move its back panel in about 8" so it fits around the drill press. Add a new top and mount pullout dividers inside, using full-extension drawer slides. Removable drill bit indexes make storing and handling different bits a breeze. Install casters so the cabinet is easy to move out of the way when it's time to sweep.



To see plans for a shop-made drill press cabinet, go to AmericanWoodworker.com/WebExtras



Full-extension drawer slide

Pullout divider



9 Clamp Leash

Spring clamps have an uncanny knack for disappearing.

To solve this problem, simply suspend your dog's old leash over your workbench. Not only will this keep your spring clamps within easy reach, they'll also be easy to transport around the shop.



10 Sharp Edge Saver

Use the spine from a sliding bar report cover to protect the sharp edges of scrapers and handsaws. Cut the spines to length with a utility knife. A pack of six sliding bar report covers costs about \$4 at an office supply store.



11 Clamp Camp

Store a lot of clamps in a little space by drilling 5/8" dia. holes through 3/4" plywood at a slight upward angle and gluing in 5/8" dia. x 9" long dowels. Each pair of dowels holds six clamps. This rack hangs up to 18 F-style clamps and four spring clamps in only 2 sq. ft. of wall space.



12 3D (Triple-Duty) Chisel Holder

This see-through rack makes it easy to identify the proper tool for the job at hand. It also protects the sharp edges of your chisels and keeps your hands from the chisels' sharp edges.

Arrange your chisels across the strip in whatever order you prefer. Add spacer blocks to fit the width of each chisel blade and install a third 1/2" wood strip to create the chisel holes. Then screw a piece of acrylic on top.



13

Squares' Corner

Store your precision squares safely and conveniently. The brackets have beveled tops so the squares stay put. Make the back at least 1" thick—tools are easier to grab if they sit well away from the wall.



14

Drop-Down Bit Board

A scrap of plywood, a leftover length of continuous hinge and a shop-made wire hook are all you need to store your router bits under a shop cabinet, where they're out of the way until you need them. Here, a parts bin acts as a support, but a block glued near the hinge on the underside of the plywood will also do the trick.



15

Portable Compressor Platform

Forget lugging around that heavy pancake-style compressor. Instead, bolt it to the bottom of a small rolling cabinet with an air hose reel on top. Mount the hose reel on a 12" lazy-Susan bearing and you'll be able to unroll the hose in any direction.



16 CA Glue Life Support

Once the bottle is opened, cyanoacrylate (CA) glue remains usable for only three to six months. But if you zip the bottle in an airtight plastic bag and store it in a refrigerator (out of the kids' reach), the glue will last indefinitely. Cold doesn't affect the glue's bonding properties, but it's best to let the bottle reach room temperature before using it.



17 Bandsaw Blade Clip

Binder clips from the office supply store make coiled bandsaw blades easy to carry and hang. They're inexpensive, more convenient to use than twist-ties and come in a rainbow of colors, so you can even color-code your blades by size.



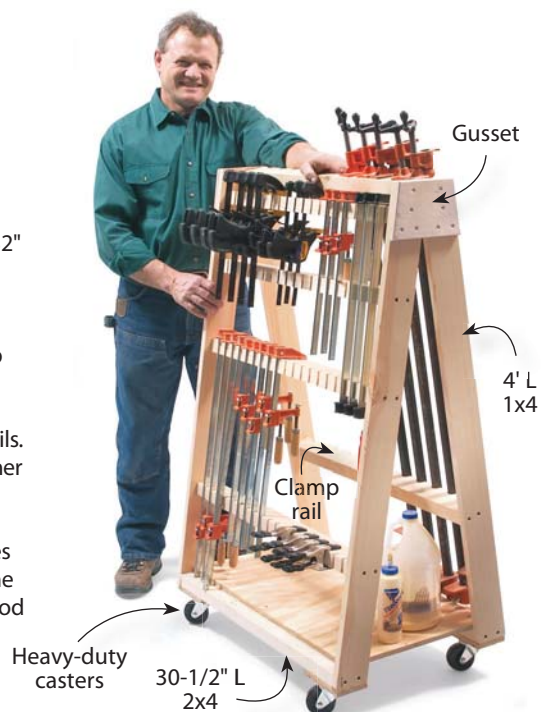
18 Mobile Clamp Cart

Stop dragging clamps around your shop. One side of this cart holds up to 36 F-style clamps, the other side holds twelve 4' pipe clamps and it requires only 21" x 32" of floor space.

Each clamp frame consists of 2x4 and 2x6 rails screwed to 1x4 ends. Rip the 2x6s in half to make the clamp rails. Stagger the two top rails so the pipe clamp rail sits higher.

On one frame, use a tablesaw, a dado set and the miter gauge to cut slots for adjustable clamps in the rails. To make half-round cutouts for pipe clamps for the other frame, drill centered holes in the 2x6s before ripping them in half.

Taper the ends of the 1x4s at the top of both frames to fit before screwing them together with gussets at the top and a plywood shelf at the bottom. Glue on plywood pads to reinforce the bottom corners. Then install 3" swivel casters. 



Pullman Desk

A flip-down, pull-out shelf turns a sleek dresser into a handsome desk.

by
Mario
Rodriguez



EDITOR: TOM CASPAR | PHOTOGRAPHY: MARIO RODRIGUEZ | ILLUSTRATION: FRANK ROHRBACH





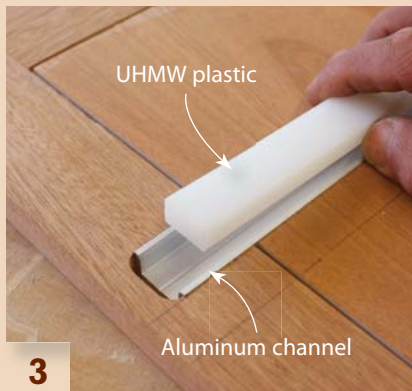
1

Start by building the cabinet's frame-and-panel sides. Cut the joints so that the panel is flush with the frame, inside and out.



2

Rout dados in the cabinet's sides. The dados will house two different types of drawer guides.



3

Glue a piece of aluminum channel in the top dado. Cut a piece of UHMW plastic to fit the channel. You'll attach this piece to the desk's sliding shelf later on.



4

Cut biscuit slots for the cabinet's top rails, cubby shelf, web frames and bottom. Mark reference lines on a stick to space the biscuits.



5

Glue a solid-wood edge on a plywood panel to make the case's bottom. Both parts should be about 1/8" extra long.

I NAMED this desk after the old Pullman railway car, which could be quickly transformed from a coach to a sleeper. My design can change equally fast from a chest of drawers into a compact desk. It's perfect for an apartment, guest room or dormitory.

To make the change, you just flip up the front portion of the desk's top and flip down the upper drawer front. Then you pull out a generously sized writing surface. Pulling out this sliding shelf gives you plenty of elbow room, just like you'd get with an old slant-front desk or secretary.

The sleek mid-century look of the Pullman desk is accented by an unusual base that raises the case about 8" off the floor. This space lightens the desk's appearance and provides room for a sitter's feet.

I built my desk from cherry—its light but warm color will deepen over time to a rich, coppery hue.



Build the case

Begin by building the cabinet's sides (**Photo 1**). Each side is composed of two stiles (A1), a top rail (A2), bottom rail (A3) and a plywood panel (A4). Mill the solid pieces the same thickness as the plywood, then cut grooves centered on the inside edges of the rails and stiles (Fig. C). Cut stub tenons on the ends of the rails and tongues all around the panel. (Note that the panel's tongues are 1/16" longer than the depth of the grooves in the stiles and rails. This will produce a handsome 1/16" reveal all the way around the panel.) Glue the sides together.

The desk's pullout shelf and two lower drawers require guides that are let into the cabinet's sides. The guides (A5) for the pullout shelf are made from aluminum channel; pieces of UHMW plastic (D4) screwed to the shelf will run in them (see Sources, page 45). The drawer guides (A6) are made

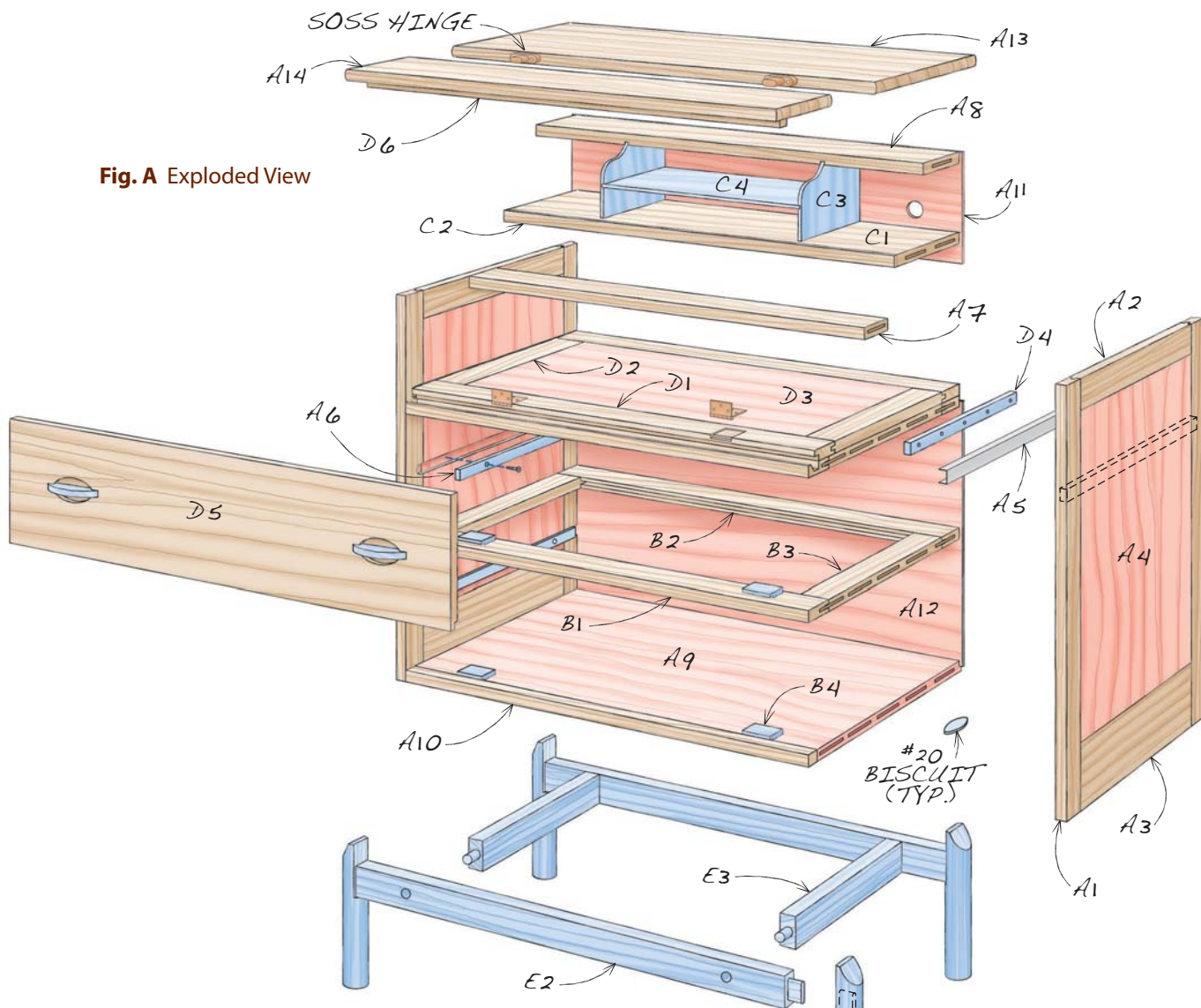


Fig. B Inside View

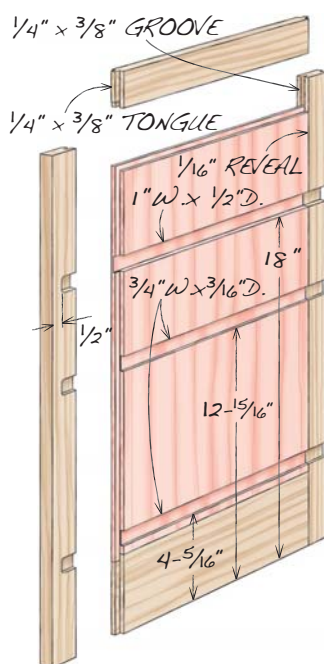
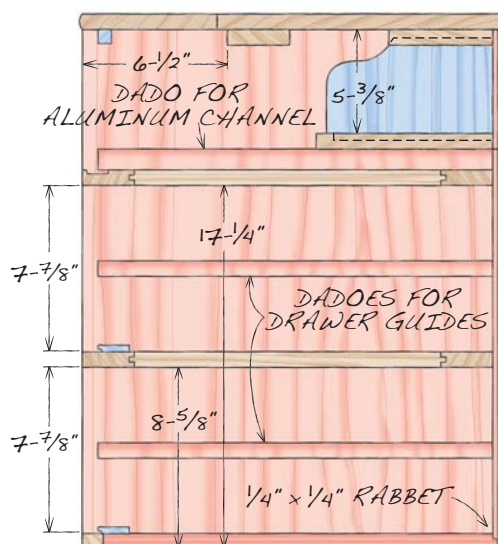


Fig. C
Exploded View of Side

Fig. D Web Frame

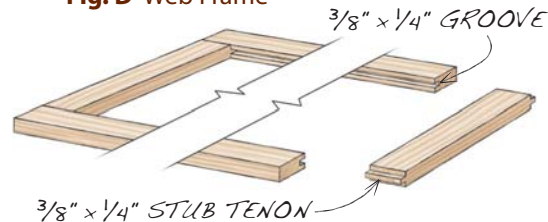
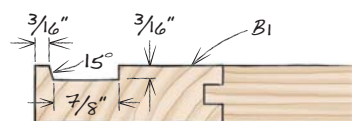


Fig. E
Upper Web Frame Details





6

Glue up the web frames. Like the bottom, they should be 1/8" extra long, side to side. Trim the web frames, bottom, cubby shelf and top rails to exact length.



7

Cut biscuit slots in the web frames, top rails, cubby shelf and bottom. Use the same stick with reference marks to space the slots.



8

Cut a groove in the front edge of the top web frame. This groove allows the top drawer front to fold down before you pull out the sliding shelf.



9

Glue up the case. Use cauls to force the case's sides tight against the bottom, all the way across.



10

Fit the cubby partitions into dados that you cut before gluing the case together. Plane or sand the partitions so they'll slide easily.

from maple. They will stand about 1/16" proud of the cabinet's sides; the sides of the drawers ride against them. Rout stopped dados for all three sets of guides in both of the cabinet's sides (**Photo 2**; Fig. C). I used a shop-made device and a templet guide, but there are many ways to do this.

Cut the pieces of channel to length and glue them into the cabinet's sides using cyanoacrylate (CA) glue. Cut the UHMW to size and make sure it slides easily in the channel (**Photo 3**).

Cut #20 biscuit slots in the sides for the top rails (A7, A8), lower cubby shelf (C1), two web frames and the cabinet's bottom. Space the slots about 2-1/2" apart (**Photo 4**). Note that the slots for the upper web frame must be positioned so that the top of the web frame will be even with the lower edge of the aluminum channel (Fig. B).

Next, move on to the parts that fit between the sides. Make all of these

about 1/8" extra long for now. First, glue up the cabinet's bottom (**Photo 5**). It's composed of a plywood panel (A9) and solid edging (A10). Second, make the lower cubby shelf, which is also composed of plywood (C1) and edging (C2). Third, mill the two top rails. Lastly, make the web frames (**Photo 6**, Fig. D). They're composed of a front stile (B1), rear stile (B2) and two side rails (B3). Note that the web frames are 1/4" shallower than the depth of the cabinet. The cabinet's back (A11 and A12) will be fastened to the back of the web frames.

Trim the top rails, lower cubby shelf, two web frames and the cabinet's bottom to final length at the same time. Cut biscuit slots in the ends of each part (**Photo 7**).

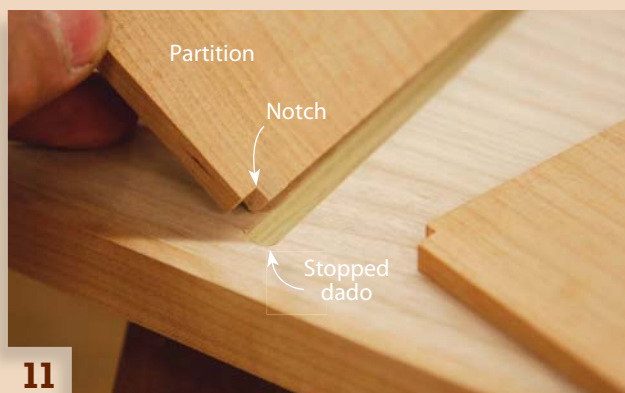
There are a few more steps before gluing the cabinet together. First, cut a groove along the front edge of the top web frame (**Photo 8**; Fig. E). Next, cut

dados in the rear top rail and lower cubby shelf to receive the cubby partitions (C3). Note that the dados go all the way across the rear top rail; they're stopped on the lower cubby shelf (Fig. L). Also, drill holes in the top rails for fastening the cabinet's top. Lastly, cut rabbets along the rear edges of both of the cabinet's sides and bottom to receive the two-piece back (Fig. B).

Assemble the whole case, without glue, to make sure everything fits. You'll probably need a helper. When you've got everything figured out, glue the case (**Photo 9**). After the glue dries, rout a rabbet along the top and front edges of the sides (Fig. H). This rabbet will create a reveal between the cabinet's top and sides.

Cubbies and shelf

Next, make the cubby partitions. Thickness the partitions to fit into the dados you cut in the top rails and



11

Notch the lower front end of the partition to hide the dado it slides in. Note that this dado is stopped.



12

Build the sliding shelf, which slides right under the cubbies. Trim it 1/8" narrower than the distance between the cabinet's sides.



13

Screw the strips of UHMW plastic to both sides of the sliding shelf. These strips will ride in the aluminum channel you glued into the cabinet's sides.



14

Begin work on the base. First, draw a cross section of the leg and its joinery on one of the leg blanks.



15

Cut mortises in the blanks, then cut a long step into the blanks using a dado set.

lower cubby shelf. Cut dados in the partitions to receive the middle cubby shelf (C4), then bandsaw the front edge of the partitions to make a pleasing curve. Slide the partitions in place to make sure they fit (**Photo 10**), then cut notches on their lower front edges (**Photo 11**; Fig. L). Make and fit the middle shelf. Remove the middle shelf and partitions, sand them, then glue them in place.

Next, tackle the sliding section of the flip-down drawer (**Photo 12**; Fig. F). This shelf is composed of two stiles (D1), two rails (D2) and a panel (D3). Use the same joinery, producing the same reveal, that you used to build the cabinet's sides. Build the sliding shelf wide enough to fit tight inside the case, then joint one side and rip the other so that the shelf's width is 1/8" less than the distance between the case's sides.

Fit and test the UHMW guides for the sliding shelf (Fig. A). Remember,

they will ride in the aluminum channels you've glued into the cabinet's sides. First, drill holes in the UHMW and corresponding pilot holes for fastening the guides to the shelf. Place some washers around the screws and under the plastic to act as shims (Fig. J), then fasten the guides to the shelf (**Photo 13**). Slide the shelf in from the back of the case. To adjust the shelf's fit, add or remove washers. This method is so precise and easy that your shelf should soon slide in and out without wiggling.

Make the base

The base is independent of the case, but its legs fit tight against the cabinet's sides. Start by making the legs (E1) from 1-3/4" x 1-3/4" x 9-1/2" squares. Use an awl to mark the center of both ends of each leg, then draw a cross section of the leg on the end of one of these pieces (**Photo 14**, Fig. G). Rout

mortises in the blanks, using the cross section layout lines as a guide for how deep to go. Use a dado set to create long rabbets on the top ends of the legs (**Photo 15**)—again, use the layout lines as a depth guide.

Mill the wood for the base's long rails (E2) and short rails (E3). Trim these pieces about 1" extra-long, but plane them to final thickness and cut them to final width. Turn the blanks to about 1-5/8" dia. (**Photo 16**). Your goal is to reduce each leg's diameter until the width of the flat portion that you cut away from the blanks equals the thickness of the long rails. This way, the flat faces of the rails will blend right into the curved surfaces of the legs. Form small 45° chamfers on the bottom ends of the legs.

Trim the long rails exactly 2" longer than the width of the cabinet, then cut 1" long tenons on both ends of the rails (**Photo 17**). Drill 3/4" dia. through



16

Turn the blanks round. Your gouge won't catch on the step or mortise.



17

Cut tenons to fit the mortises and glue the base together. The distance between these tenons' shoulders must exactly equal the width of the case.



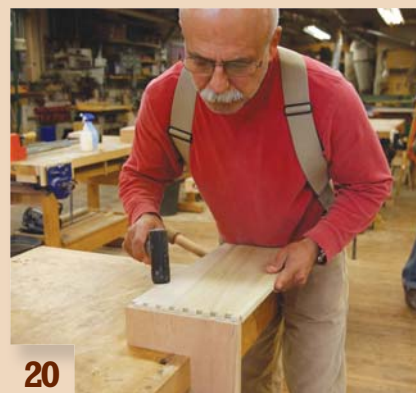
18

Make the flip-down drawer front. Cut mating rabbets in this piece and the front edge of the sliding shelf. Note the gap.



19

Route and chop mortises for the hinges that will attach the top drawer front to the sliding shelf.



20

Build the drawers. They're dovetailed in front and rabbeted in back. Their fronts are flush with their sides.

holes in the long rails to receive the short rails. Trim the short rails to final length and turn 3/4" tenons on their ends. Bandsaw large 45° chamfers on the top ends of the legs, then clean up the cuts on a disc sander or with a block plane. Sand all of the base's parts and glue the base together. Center the cabinet on the base and fasten the two together with screws running through the cabinet's bottom.

Build the drawers

Make the flip-down drawer front (D5) and the fronts for the two drawers below (F1). Cut these pieces 1/8" narrower than the height and 1/8" narrower than the width of their openings. Cut rabbets in the lower edge of the flip-down front and the front edge of the sliding shelf (**Photo 18**; Fig. F). Note that the drawer front rabbet is 1/16" wider than the sliding shelf's rabbet.

Route and chop mortises for the hinges that will connect these pieces (**Photo 19**; see Sources). Install the hinges and test the drawer front—it should open flat, without requiring any support. Here's a neat trick to prevent the front from slamming open: Remove the hinges and peen the hidden portion of the hinge barrel. This will cause the hinge to stick, just a little.

Move on to making the lower two drawers (**Photo 20**). Mill their sides (F2) and back (F3), then route half-blind dovetail joints to connect the front and sides. Form rabbets and tongues to connect the back and the sides (Fig. K). Cut grooves for the drawer bottom (F4). (Note that the bottom will slide under the back.)

Before you glue the drawers together, route two ovals in the face of each drawer front (Fig. M) to receive the drawer pulls (F5). Make an MDF template for this job and use either a

templet guide in your router or a top-bearing flush-trim bit (**Photo 21**; see Sources).

Glue the drawers together, then plane, scrape or sand the dovetail joints flush. Cut and install the drawer bottoms, then test fit the drawers. If the guide strips are exactly 1/16" proud and the drawers are exactly 1/8" too narrow, the fit should be pretty tight. Plane the drawer guides to adjust the fit (**Photo 22**). Make the drawer stops (B4) and glue them to the web frames (**Photo 23**). Plane the front edges of the stops so the drawer fronts will be flush with the case. Make and install a stop (D6) for the front of the flip-down drawer, too.

Make and install the two parts of the case's back (**Photo 24**). Make both parts of the case's top (A13 and A14) and join them with Soss hinges (see Sources). Route a bullnose around the top (Fig. H) and fasten the top to the case.

Fig. F
Pull-Out
Shelf

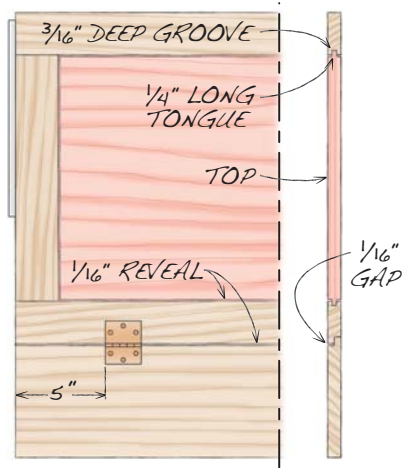


Fig. G
Base Details

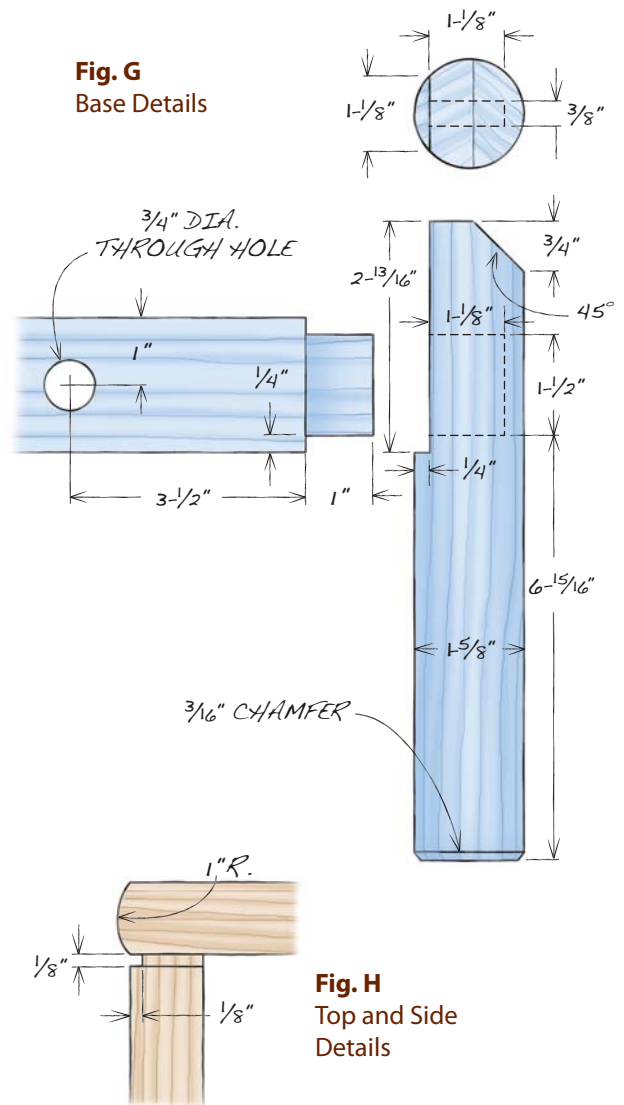


Fig. H
Top and Side
Details

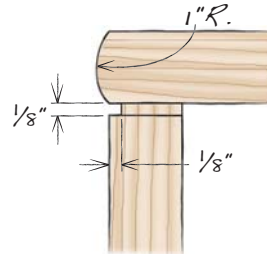


Fig. J
Pull-Out
Shelf Guide

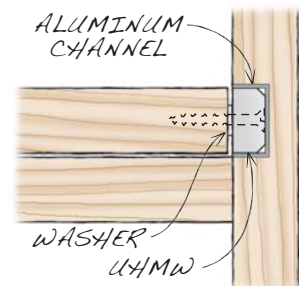
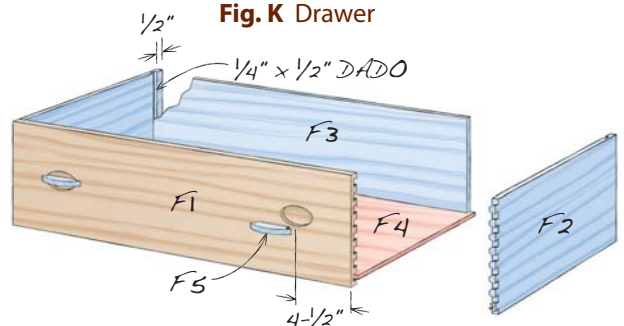


Fig. K Drawer



Cutting List

Overall Dimensions: 34-9/16" H x 34-3/4" W x 20-1/2" D

Section	Part	Name	Qty.	Material	Th x W x L
Case	A1	Side stile	4	Cherry	3/4" x 1-7/8" x 25"
	A2	Side rail, top	2	Cherry	3/4" x 1-7/8" x 17" (a)
	A3	Side rail, bottom	2	Cherry	3/4" x 4" x 17" (a)
	A4	Side panel	2	Cherry plywood	3/4" x 17" x 19-7/8" (b)
	A5	Channel	2	Aluminum	1/2" x 3/4" x 16"
	A6	Drawer guide	4	Maple	1/4" x 3/4" x 16"
	A7	Top rail, front	1	Cherry	3/4" x 3" x 30-3/8"
	A8	Top rail, rear	1	Poplar	3/4" x 5" x 30-3/8"
	A9	Bottom	1	Plywood	3/4" x 19" x 30-3/8"
	A10	Bottom edging	1	Cherry	3/4" x 1" x 30-3/8"
	A11	Back, upper	1	Cherry plywood	1/4" x 5-3/4" x 31-1/8"
	A12	Back, lower	1	Plywood	1/4" x 18-1/2" x 31-1/8"
	A13	Fixed top	1	Cherry	3/4" x 14-1/2" x 32-3/8"
	A14	Flip top	1	Cherry	3/4" x 6" x 32-3/8"
Web frames	B1	Front stile	2	Cherry	3/4" x 2-1/2" x 30-3/8"
	B2	Rear stile	2	Poplar	3/4" x 2-1/2" x 30-3/8"
	B3	Side rail	4	Poplar	3/4" x 2" x 15-1/4" (c)
	B4	Drawer stop	4	Poplar	5/16" x 1-1/2" x 2"
Cubby	C1	Lower shelf	1	Cherry plywood	3/4" x 8-3/8" x 30-3/8"
	C2	Shelf edging	1	Cherry	1/8" x 3/4" x 30-3/8"
	C3	Partition	2	Cherry	1/4" x 8" x 5"
Flip-down drawer	C4	Middle shelf	1	Cherry	1/4" x 8" x 16-1/8"
	D1	Stile	2	Cherry	3/4" x 2-3/8" x 30-1/4"
	D2	Rail	2	Cherry	3/4" x 2-3/8" x 14-1/2" (a)
	D3	Panel	1	Plywood	3/4" x 14-1/2" x 26-1/4" (b)
	D4	Guide strip	2	UHMW plastic	3/8" x 3/4" x 11"
Base	D5	Drawer front	1	Cherry	3/4" x 6-1/4" x 30-1/4"
	D6	Drawer stop	2	Cherry	5/8" x 5/8" x 30"
	E1	Leg	4	Cherry	1-5/8" dia. x 9-1/2" (d)
Other drawers	E2	Long rail	2	Cherry	1-1/8" x 2" x 34" (e)
	E3	Short rail	2	Cherry	1-1/8" x 2" x 16" (f)
	F1	Front	2	Cherry	3/4" x 8" x 30-1/4"
	F2	Side	4	Poplar	1/2" x 8" x 18-3/4"
	F3	Back	2	Poplar	1/2" x 7-1/2" x 29-3/4" (g)
	F4	Bottom	2	Plywood	3/8" x 18-1/8" x 29-5/8"
	F5	Pull	6	Cherry	3/8" x 1" x 3-3/8"

Notes:

- a) Length includes 3/8" long tenons on both ends.
- b) Width and length include 7/16" wide rabbets.
- c) Length includes 3/8" stub tenons.
- d) Turn 1-3/4" squares to final dia.
- e) Length includes 1" long tenons on both ends.
- f) Length includes 1-1/8" long tenons on both ends.
- g) Length includes 1/4" long tongues.



21

Rout two oval recesses in each drawer front, then glue the drawers together.



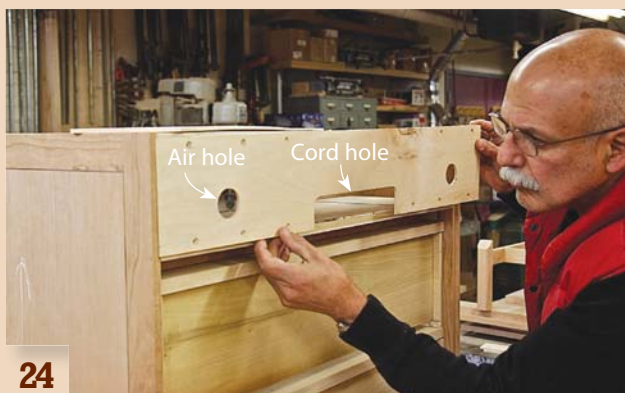
22

Try fitting each drawer. If a drawer is too tight, plane a little off the drawer guides.



23

Install stops for each drawer. If a drawer's front protrudes beyond the case, plane the stops. Their rabbets make this easier to do.



24

Install the case's back. Both of its two sections have holes cut in them to allow air to escape when you close the desk. Yes, you can get the fit that tight!



25

Finish the case and drawers, taping over the area where the pulls will be glued. A matte finish looks best.

Fig. L
Cubby
Details

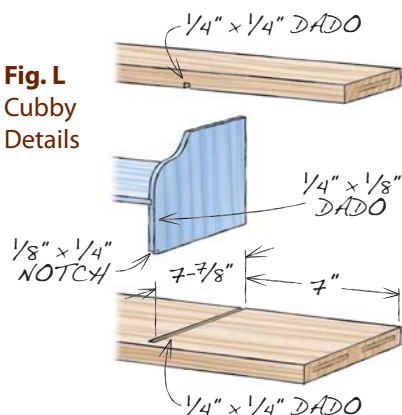
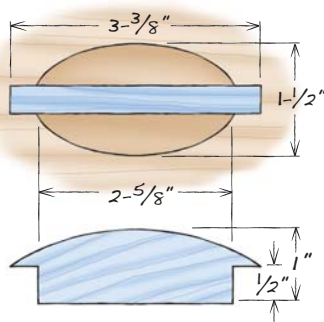


Fig. M Pull Details



Finish the desk

There is little need for a super durable, high-gloss finish on a piece like this. A wipe-on varnish (see Sources) or a tung oil finish will work fine. Good pre-finishing preparation is key to a successful finish. I started with 100 grit and carefully worked my way up to 220 grit, wiping down the chest with denatured alcohol between grits. Be sure to thoroughly sand the parts (particularly those of the cubby) before assembly.

I taped off the area where the drawer pulls go (**Photo 25**), then made the pulls. I brushed on a coat of the urethane, waited about 10 minutes, then carefully wiped off any excess with a turpentine-dampened cloth. After waiting 24 hours, I rubbed out the surface with a Scotchbrite pad, cleaned everything with a tack rag, and applied another coat of finish. I repeated this until I achieved a pleasing satin finish. For the final step, I applied a light coat

of paste wax to all of the desk's parts, plus the pulls, then buffed it out.

Last of all, glue the pulls. The drawers are pretty large and may well get filled with lots of heavy things, so it's a good idea to reinforce the pulls with screws, too.

SOURCES

- Lee Valley, leevalley.com, 800-871-8158, Veritas Miter Slot Extrusion, 3' x 3/4", 12K79.07, \$13.20; UHMW Strips, 4" x 3/8" x 3/4", 46J90.16, \$12.50; Soss Invisible Hinges, #OOH02.05, \$20.90/pr.
- Horton Brasses, horton-brasses.com, 800-754-9127, Drop Leaf Table Hinges #H-510, \$26/pr.
- MLCS, mlcswoodworking.com, 800-533-9298, Pattern/Flush Trim Router Bit, 3/8" cutting length, 1/4" shank, #6501, \$13.
- General Finishes, generalfinishes.com, 800-783-6050, GF Gel Oil Based Urethane Topcoat, \$21./qt.



Nail-Head Bottle Opener

by Jason Zentner

Make a lid lifter that'll spark a conversation.

ORDINARILY, a bent nail is no cause for celebration. But this bottle opener is no ordinary project. There are no detailed plans or strict rules to follow—and a bent nail is actually the (church) key to a celebration.

So go ahead: just wing it—have fun and use those scraps of beautiful wood that you haven't been able to throw away to make unique gifts for all your beverage-drinking friends!

Gather nails and ferrule stock (**Photo 1**). Use whatever you find appealing; you can pretty much go nuts here. Any nail with a head will work, although it should be at least 2" to 3" long. I've used forged nails, copper nails, standard 16-penny nails and heavier spike-type nails.

A ferrule isn't strictly necessary to keep your handle from splitting, as it doesn't take much force to remove a bottle cap. That said, a ferrule

adds a little flair to almost any opener. If you decide to use a ferrule, choose the ferrule stock before you shape the handle. I can almost guarantee you'll find interesting ferrule stock in your junk drawers at home. But if you don't, just head to the plumbing section at the hardware store.

A round ferrule works fine, but a ferrule that's flat on the side that bears against the bottle's cap is easier to use. (You can create a flat surface with a file or belt sander.) Round ferrule stock can also be pounded into an oval shape.

Shape the handle any way you wish. As you can see, the possibilities are virtually endless. When you're sizing the end of the handle for the ferrule, go for a snug fit—tight enough that you need to use a mallet to tap the ferrule into place. Use a dab of epoxy to assure the ferrule will never come off.

Finish work on the handle by drilling a hole for the nail. If you're not using a ferrule, size the hole so the nail slips in easily. Then there's no chance it'll split the handle.

Now bend the nail. Where you bend it depends on the location of the hole you've drilled in the handle. The nail's head should extend a little more than a bottle cap's height below the surface that bears against the bottle cap—about 5/16". Hold the nail over the end of the handle, along with a bottle cap, and mark the nail directly over the hole (**Photo 2**).

Clamp the nail in your vise so that the mark you made is even with the top of the jaws. Then pound it over (**Photo 3**). The optimum bend for a good grip on a bottle cap is just past 90°. You may need to reposition the nail in the vise to accomplish this. If you're using a really thick nail, you may have to heat it in order to bend it. Forged square nails also lend themselves to heating and twisting.

Insert the nail in the hole drilled in the handle along with a drop of epoxy to make sure it stays put (**Photo 4**). Apply any finish you like—or no finish—and start testing your work! 🍻



1

Choose a nail and ferrule. This is half the fun, as almost anything goes. A hardware store is a gold mine for ferrule stock; any nail with a head will do.



2

Mark where to bend the nail after drilling a hole in the handle. When the nail is bent and installed, its head should project slightly more than a bottle cap's height.



3

Bend the nail at the mark you've just made, using a vise and a rawhide or similar non-marring mallet, so you don't distort the nail's head.



4

Insert the nail after dabbing a little epoxy in the hole. It's best for the bottle cap to bear against a flat surface, so if you're using a ferrule with a hex head or flat side, make sure the nail's head aligns with the flat surface.



Silver Chest

Store precious flatware in an elegant box with a tarnish-preventing liner.

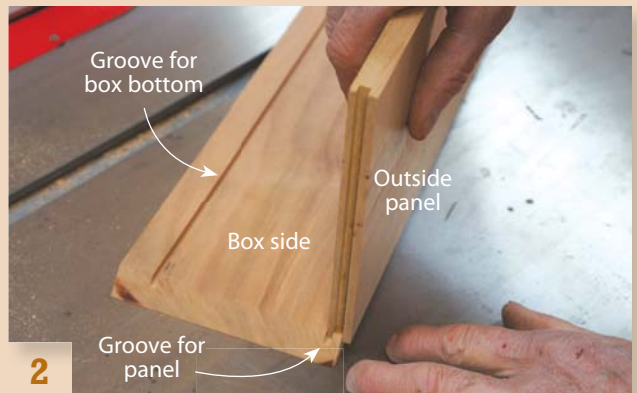
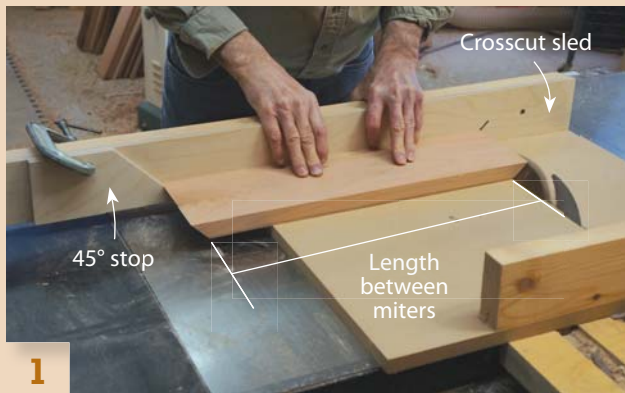
by Doug Stowe

IN ORDER to pass on the family's heirloom silverware to her oldest daughter, a friend of mine asked me to build a suitable chest to hold it. She didn't want to pass along the burden of polishing, however, and supplied a storage liner for the silverware that has dividers and is treated to keep the silver from tarnishing (see Sources, page 53).

This simplified my task as a box maker, because I wouldn't have to figure out how the various forks, knives, spoons and serving utensils would fit. Beyond sizing the chest to hold the storage liner and making sure it was suitably constructed for the weight of its contents, I was free to concentrate on the chest's appearance.

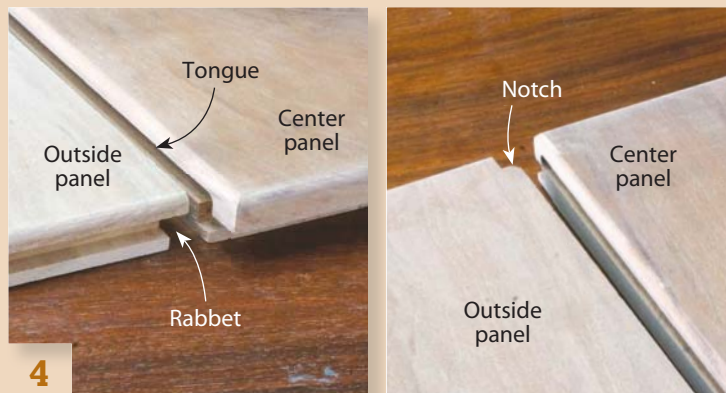
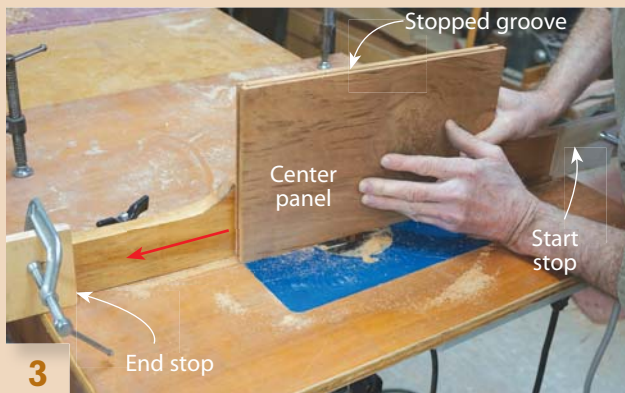
The front of the chest is thicker than the sides and back, to accommodate its curved profiles (A–C, Fig. A and Cutting List, page 50). The corners are mitered and strengthened with hidden splines (D). A 1/8" plywood bottom (E) is sufficient,





1 Miter the box parts after marking the length between the miters on each inside face and installing a 45° stop. This assures the lengths will match, even though the parts are different thicknesses.

2 Cut grooves in the box's front, back and side pieces for the bottom and the panels. Then cut grooves in the panels so they nest in the box pieces.



3 Rout a stopped groove on each side of the center panel after installing stops to set its length. Lower the panel onto the bit while holding it against the fence and the start stop. Then slowly advance to the end stop.

4 Rabbet the inside edge of each outside panel to create a tongue that fits the stopped groove you've just routed in the center panel (left). Notch the back end of each tongue to fit (right).

because the liner has a 1/4" hardboard bottom of its own.

The lid's stepped construction is designed to hide (but allow) the seasonal movement of its panels (F–G). Hawthorne Craft's new large neat hinges provide an elegant look when the lid is open (see Sources). And as this chest will be heavy when it's filled with silver, its sides are cut out to allow a good grip.

Build a box

The process is to build a box and then cut it apart to create the lid. Start by milling the box front, back and sides to thickness and cutting them to width. Miter one end of each piece. Then mark the final length by measuring between the miters on the inside face. Install a 45° stop to cut the second miters (**Photo 1**). The angled stop accommodates the extra length of the thicker front piece, so you can cut both the front and the back pieces from the same setup.

Cut 1/8" x 3/16" grooves in the front, back and sides for the bottom and the three panels (Fig. B). A blade that cuts a flat-topped kerf makes it easy to measure for a perfect fit (see Sources).

Make the panels

Assemble the box with tape. Then measure its inside dimensions—including the grooves—to precisely calculate the sizes

of the center and outside panels. Mill these panels to thickness and cut them to width and length. Next, cut 3/16" x 3/16" grooves in both ends and on the outside edge of each outside panel (**Photo 2**; Fig. C). Use the same setup to groove both ends of the center panel—make adjustments as necessary to cut the deeper groove in its front end. Then trim the front end's bottom tongue's length to match the tongues on the outside panels.

Next, rout stopped 3/16" x 3/16" grooves in both sides of the center panel, 5/16" up from the bottom, 3/8" from the front end and 3/16" from the back end (Fig. C). Install stops on the router table fence to make this blind cut (**Photo 3**).

Rout a 3/32" roundover all around the top of the center panel and on the three grooved edges of each outside panel. Then cut or rout a tongue on the inside edge of each outside panel to fit the stopped grooves you've just routed in the center panel (**Photo 4**).

Cutouts and contours

Use a double-sided template to mark the box's bottom cutouts and contoured front (Fig. D). Mark the bottom cutouts first (**Photo 5**). To mark the box sides and back, align the template's 3/8" tick mark with both mitered ends of each piece. The cutout is slightly elliptical, so make sure to flip over the template to mark each opposite end. To mark the box front (which is

Fig. A Exploded View

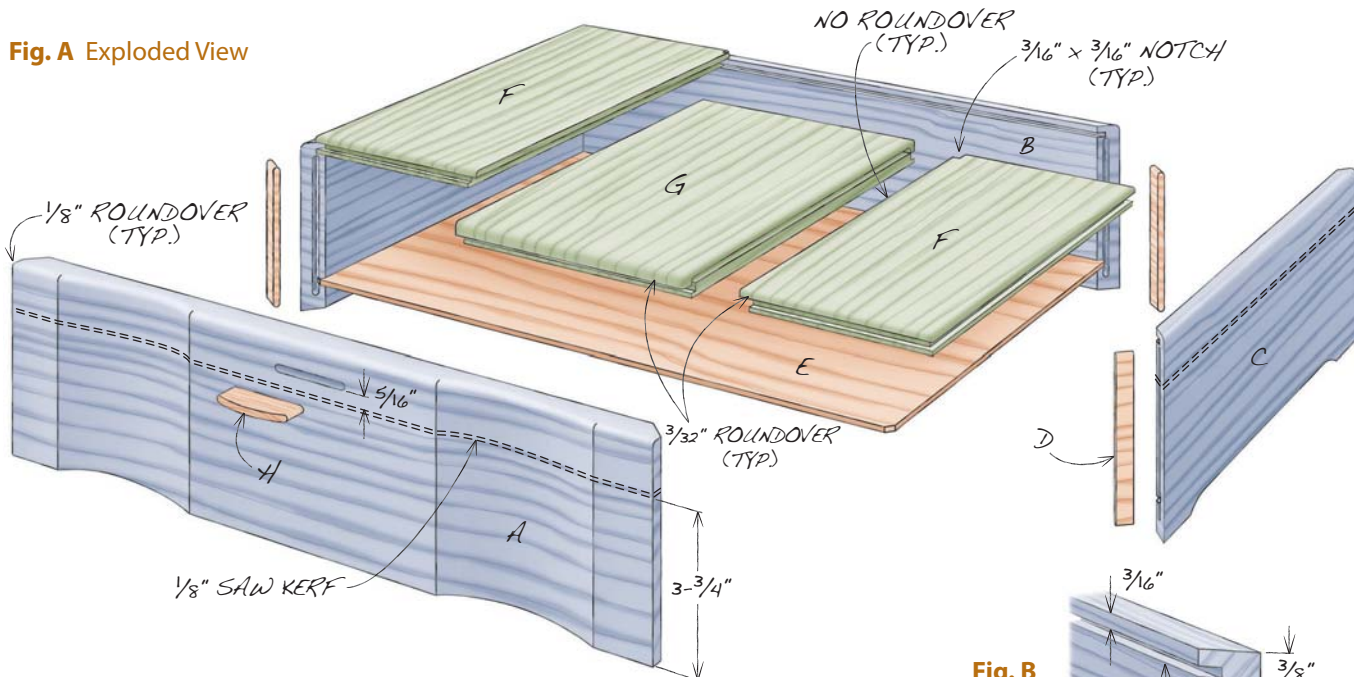


Fig. B
Box Joinery

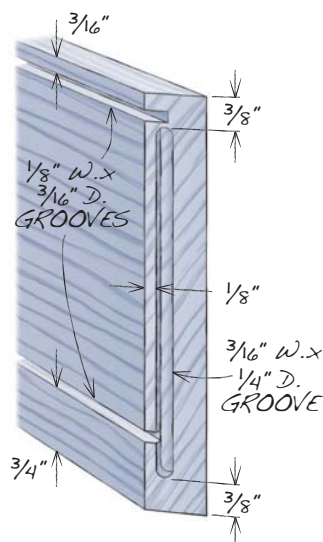
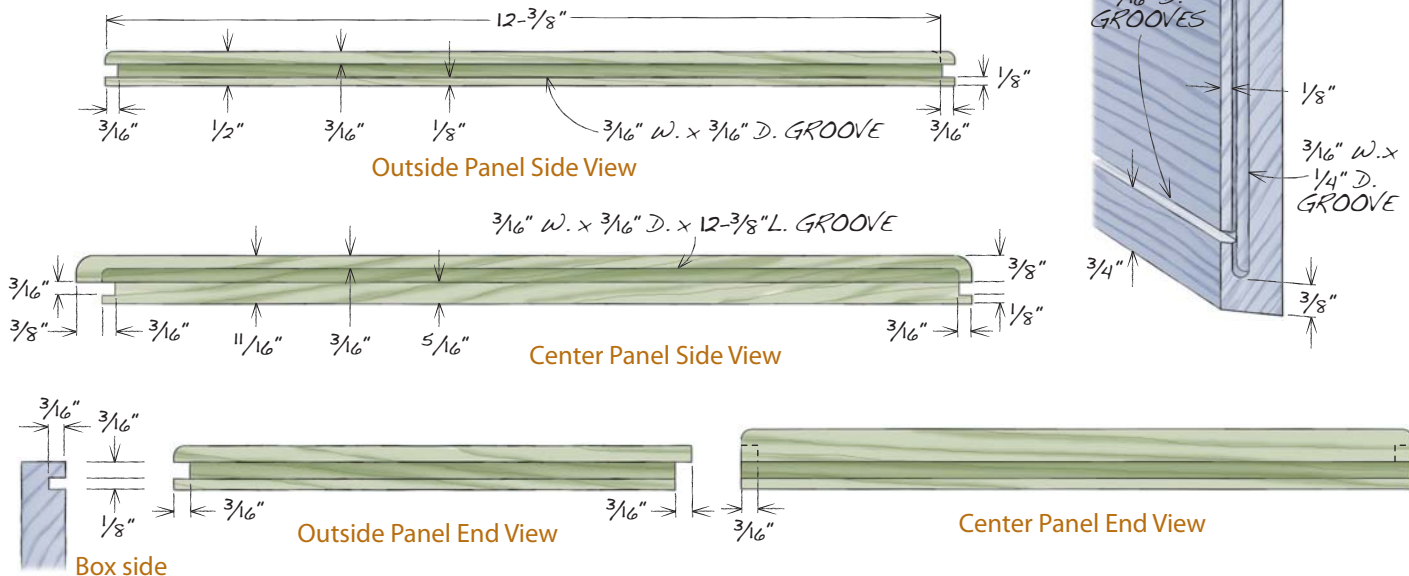


Fig. C Panel Joinery



Cutting List

Overall Dimensions: 5-1/8" x 13-9/16" x 20-3/16" (a)

Part	Name	Qty.	Material	Th x W x L
A	Front	1	Cherry	7/8" x 4-7/8" x 21" (b)
B	Back	1	Cherry	1/2" x 4-7/8" x 20-3/16" (b)
C	Side	2	Cherry	1/2" x 4-7/8" x 13-3/16" (c)
D	Spline	4	Maple	3/16" x 1/2" x 4-1/8"
E	Bottom	1	Baltic birch plywood	1/8" x 12-5/8" x 19-1/2"
F	Outside panel	2	Cherry	1/2" x 6" x 12-9/16"
G	Center panel	1	Cherry	11/16" x 7-3/4" x 12-15/16"
H	Lift	1	Maple	3/16" x 1/2" x 2-13/16"
J	Box hinge support	2	Cherry	1/8" x 7/8" x 2"
K	Lid hinge support	2	Cherry	1/8" x 5/8" x 2"

Notes:

- a) Inside dimensions: 3-1/2" x 12-3/16" x 19-3/16".
- b) 19-3/16" between miters.
- c) 12-3/16" between miters.

Fig. D Template for Cutouts and Profiles

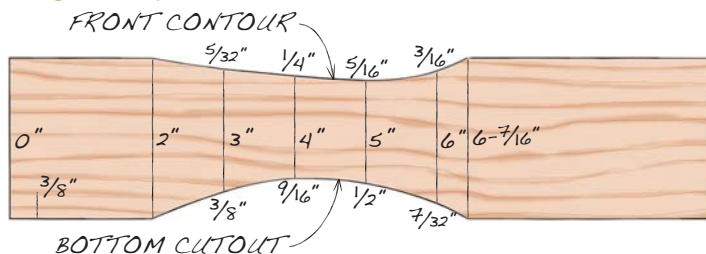
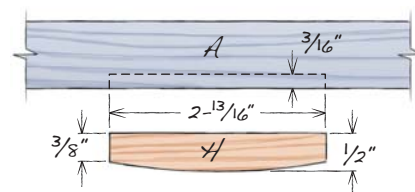
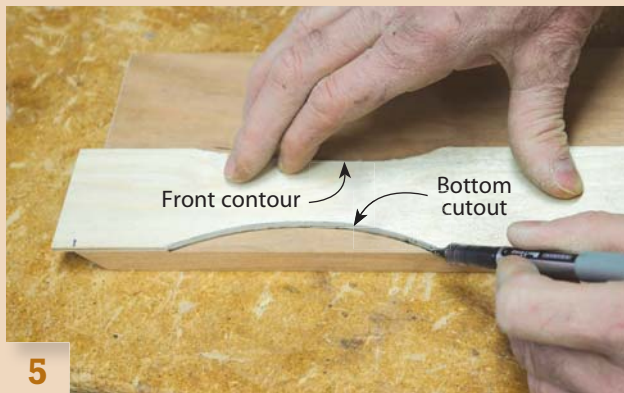


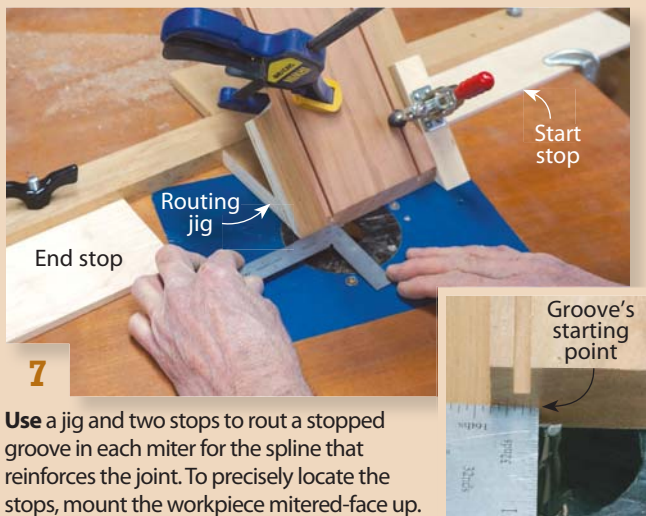
Fig. E Lift





5 **Mark** the bottom cutouts on the box parts using a double-sided template. Use the other side of the template to mark the box front's concave contours.

6 **Smooth** the contours and cutouts by sanding after bandsawing the rough profiles.



7 **Use** a jig and two stops to rout a stopped groove in each miter for the spline that reinforces the joint. To precisely locate the stops, mount the workpiece mitered-face up.

8 **Rout** each stopped groove with the workpiece mounted mitered-face down. As before, lower the workpiece/jig assembly onto the bit while holding it against the start stop. Then move forward to the end stop.

still longer than the box back) position the end of the template flush with each miter.

Mark the concave contours on the outside face of the box front after positioning the template flush with the long end of each miter. (These contours align with the bottom cutouts.) As before, make sure to flip over the template to create symmetry.

Bandsaw the bottom cutouts and front contours. Then smooth the curves by sanding (Photo 6). To make the box easy to pick up, remove the waste between the cutouts on both end pieces.

Rout the spline grooves

Make a jig to rout grooves in the mitered ends of the box front, back and sides for the splines that reinforce the joints (Fig. F).

Use a router table with a fence, two stop blocks and a 3/16" straight bit to rout the grooves (Fig. B). Set the bit's height at 1/4" and position the fence to cut the groove 1/8" from the inside face of the miter. Then clamp stop blocks to the fence in order to start and stop the groove 3/8" from each end (Photo 7). To accurately set the fence and the stops, mount the workpiece with its inside face out, so you can measure directly from the mitered end.

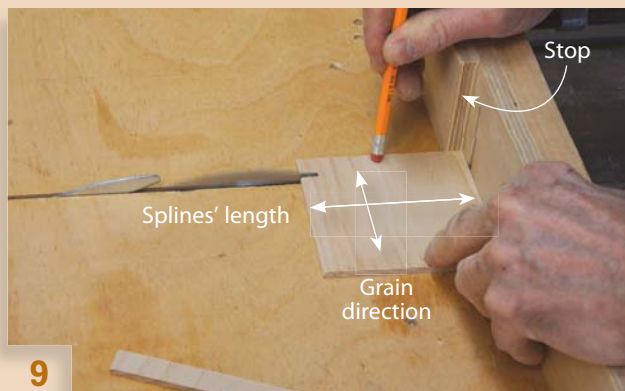
To rout the groove, mount the inside face of the workpiece against the face of the jig. Clamp the workpiece to the jig while

holding them both against a flat surface. Make sure the workpiece is flush against the jig's fence and that the surfaces of the miter and the jig are perfectly flush—any discrepancies can cause the two sides of the joint to misalign. Hold the jig firmly against the fence when you rout the groove (Photo 8).

Make splines

The splines' grain is oriented to run across its width, so it will run parallel to the grain in the box front, back and sides when it's installed. Plane a blank to thickness by checking its fit in the grooves you've just routed in the miters. The blank should slide in and out with slight finger pressure; an overly tight fit will cause problems during glue-up. Rip the blank to width to establish the splines' length—slightly shorter than the length of the grooves. Then use a sanding block to round the edges to match the grooves' rounded ends.

Crosscut the spline stock to create individual spline pieces (Photo 9). Then test the fit with the splines installed to make sure all the joints pull completely together, without any gaps. Sand or trim the splines as necessary. While the box is assembled, mark the overhang on both ends of the too-long mitered front piece. Remove the waste after you disassemble the box—it's best to leave the ends a bit long so they can be sanded flush with the sides after the box is glued together.



9 Cut the splines so the grain runs across their width by using a crosscut sled, a stop and a blank ripped to the splines' length. This grain orientation creates a stronger, longer-lasting joint.



10 Glue the box together after installing the lid panels, the bottom and the splines. Use band clamps at the bottom, middle and top of the joints to pull the miters tight.

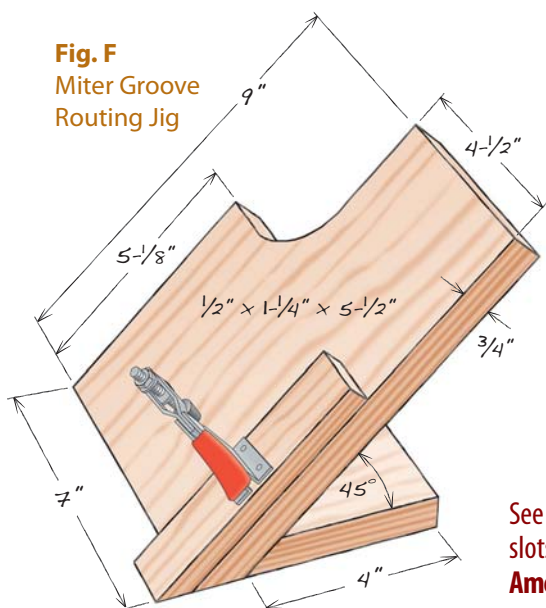
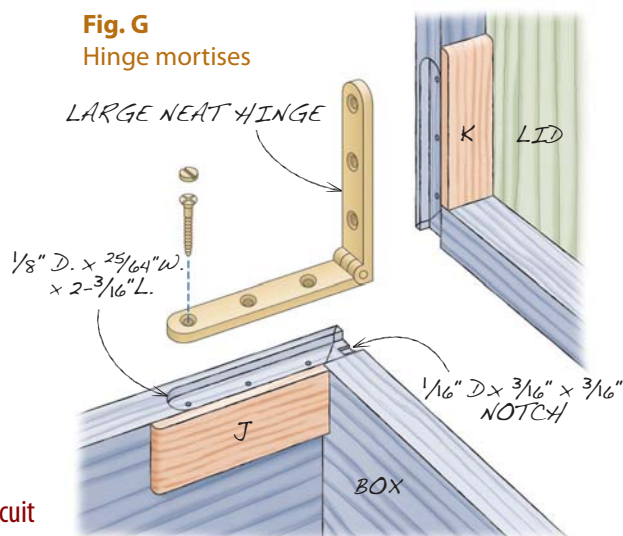


Fig. F
Miter Groove
Routing Jig



See a jig for making biscuit slots in mitered corners at AmericanWoodworker.com/WebExtras

Fig. G
Hinge mortises



Assemble the box

After making sure the splined miter joints fit properly, the next step is to assemble the box with the bottom and the lid panels installed, to make sure they fit properly as well. Notch the corners of the bottom to facilitate its fitting. Center the center panel on the box front and back pieces. On the underside, install 1/16" spacers between the center panel and each outside panel, to allow seasonal movement. When everything fits well, it's time to glue the box together.

Gluing the box is a complex process, so it's best to use glue with a long open time (see Sources). Start by placing the panels on the box front, with a dab of glue at the center of each tongue, so that expansion and contraction will occur from that point. Install the 1/16" spacers to hold the panels in the correct position. (The spacers will be removed later, after the lid has been cut from the body.)

Spread glue on each miter and inside the spline grooves. Insert the spline and assemble the first miter joint by installing one side on the box front as you simultaneously fit the outside panel in its groove—without glue. Install the bottom next and then install the box back (after placing dabs of glue on the

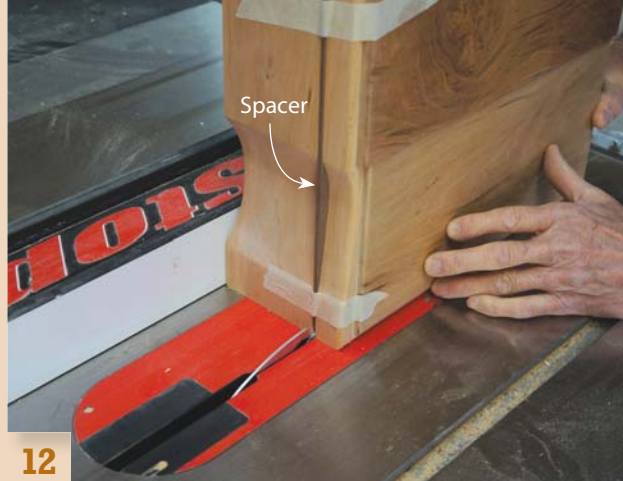
three panels, at the center of each tongue). Gradually work the first two mitered joints close together (but not all the way) and prepare to add the remaining box side. Because of the hidden splines, the last two miter joints have to be carefully nursed into position, gradually working from both ends.

Use band clamps to draw the parts tightly together (**Photo 10**). I prefer Merle band clamps (see Sources). Make sure the corners are square and the three panels are centered at both the front and back. If necessary, you can nurse the miter joints into position with bar clamps.

Cut the lid from the base

Sand the entire box before separating the lid from the base. (Sanding the lid and base separately is likely to cause some misalignment.)

When you set up the saw to cut the lid from the base, make sure the box slides smoothly and will be fully supported at all times as it travels along the fence during the cut. As not all saws are the same, this may require attaching a long board to the fence for additional support. Set the blade height at slightly more than 7/8" to cut through the front of the box (**Photo 11**). Then lower



Cut the lid from the box body in stages. First, set the blade just high enough to cut through the 7/8" thick front.

Lower the blade, install a spacer sized to fit the saw kerf and tape the box together before making each successive cut.



Install the lift after routing a stopped groove in the lid, using the method described earlier. Round the ends of the lift to fit the groove.

Follow the hinge manufacturer's instructions to rout the hinge mortises after gluing on supports to widen the box sides. Drill pilot holes before installing the screws.

the blade to slightly more than 1/2" to cut through the sides and back (Photo 12). Use scrap-wood spacers and tape to stabilize the box, so the blade won't pinch. After separating the lid from the base, use a sanding block to smooth the cut edges.

the box—any closer and you'll have to chamfer the back edges of both parts to allow the lid to open. You'll also have to cut or rout tiny notches at the back of the mortises in the base to allow clearance for the hinges' 95° stop tabs. 🛠️

Install the lift and hinges

Rout a stopped, centered groove in the lid (Fig. E), 5/16" up from its bottom edge, using stops at both ends, as before, to control the groove's length. Then make a curved lift to fit the routed groove and install it with glue (Photo 13).

Hawthorne Craft's new large neat hinges are perfect for mounting the heavy lid (Photo 14) and they come with complete installation instructions. Before routing the hinge mortises, glue 1/8" thick supports on the inside of the box and lid (J, K, Fig. G). As always, it's a good idea to rout test pieces to assure the bit height and fence positions are correct. In addition to verifying the fit of the hinges in the mortises, test cuts also help you to get the feel of the operation.

Follow the router-table method detailed in the instructions to rout the mortises. If you don't have the recommended 10mm bit, make two passes with a 3/8" bit—adjust the fence by 1/64" between passes. Set the length of the mortises so that the hinge pivot points stand just outside

SOURCES

- The Container Store, containerstore.com, 888-266-8246, Hagerty Silver Flatware Storage Tray, 2-1/2" x 12" x 19", #358060, \$39.99.
- Hawthorne Crafts, hawthornecrafts.com, +44 0-28-90-836-987, Large Neat Hinge, Brass, available summer 2014, price (per pair) TBD.
- Forrest Manufacturing Company, forrestblades.com, 800-733-7111, Woodworker 2 10" Saw Blade-40T, #1 Grind, WW10401125, \$135.
- Woodcraft, woodcraft.com, 800-225-1153, Titebond Extend Wood Glue, 16 oz. bottle, #140441, \$7.50.
- MLCS, mlcswoodworking.com, 800-533-9298, Merle Band Clamp, #9012, \$29.95.

Doug Stowe began his career as a woodworker in 1976, making custom furniture and small boxes. He is the author of seven woodworking books and teaches box making at Marc Adams School of Woodworking and at the Center for Furniture Craftsmanship. His blog, written in advocacy of hands-on learning is wisdomofhands.blogspot.com.

Folding Outfeed Table

A built-in work support makes any saw safer and easier to use.

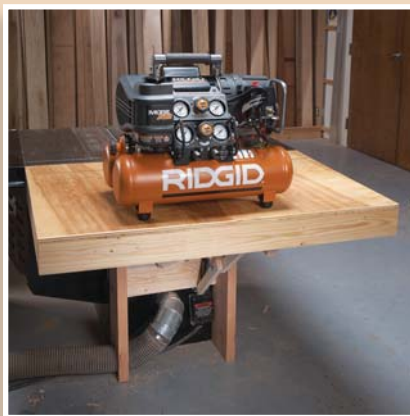
by Richard Tendick

IN A SMALL SHOP like mine, you have to squeeze the most use out of every square foot—including the area behind a tablesaw. In an ideal shop, that spot would be dedicated to a large, permanent outfeed table. My shop is too crowded for a table like this, so I designed one that folds up when you need it and down when you don't.



It saves space

Folding the table gets it out of the way—perfect for a small shop.



It's strong, but light

Built as a hollow torsion box, the table can support plenty of weight.



It's easy to release

To lower the table, just give its brace a nudge with your foot.



1

Begin by building a large box. Drill pocket holes in its framing pieces to make assembly quick and easy.



2

Glue and clamp the frame together, then drive in the pocket screws.



3

Fasten a 3/4" plywood top to the frame. You're building a "torsion box"—a form of construction that is light in weight, yet very stiff.



4

Staple a 1/4" plywood bottom to the torsion box. Round over the box's edges with a trim router, then move on to making the parts that will support the outfeed table.

When you're using your saw just for crosscutting—or not using it at all—the space behind it can be quite valuable. Maybe you need it for parking a cart, wheeling in another tool, or simply for walking from one side of the shop to the other. Any way you look at it, a folding table is the answer.

I tried using roller stands for years, but they all suffered from the same problem: If the board you're ripping sags too much as it comes off the saw, the board's front edge bumps into the stand and knocks it over. I don't know how many times I've had to stop the cut, turn off the saw, walk around the saw, pick up the stand and start over. Now, I'll never have to go through that dance again.

I designed this outfeed table for a cabinet saw that stays in just one place. The weight of the table bears down on the floor and against the saw. If your

saw has a mobile base, or a motor sticking out the back, you'll have to make a few modifications to my design to make it work. But these plans will be a good head start!

Build a torsion box

Begin by building the swinging portion of the outfeed table. Composed of an internal frame and two plywood skins, this part is constructed as a "torsion box." A torsion box is light, flat and stiff. All three factors are important here: A light outfeed table is easy to raise and lower; a flat table is essential for precise work; a stiff table resists sagging under a load. A torsion box is also very easy to make, so let me take you through the basic steps.

I used 2x4s to build the box's frame, but any wood will work as long as it's dry and stable. Fresh 2x4s aren't dry or stable, of course, so you should buy this

type of wood months in advance and let it sit. When you're ready to build, cut the wood into shorter pieces to make two stiles (A) and four rails (B). Trim each piece at least 1" extra-long, then joint one edge and rip the pieces 3-1/4" wide.

Trim the stiles and rails to final length, then drill pocket holes in the ends of the rails in order to join them to the stiles (**Photo 1**). Drill additional pocket holes along the sides of both rails and stiles for fastening the torsion box's top. Apply glue to the ends of the rails, then assemble and clamp the frame so the edges of the rails and stiles are flush. Screw the frame together (**Photo 2**; Fig G, page 58).

Note: The position of the two inside rails is very important—they must be in line with two swinging arms (J) that you'll build later on. The screws that fasten the arms to the torsion box go into

Fig. A
Exploded View

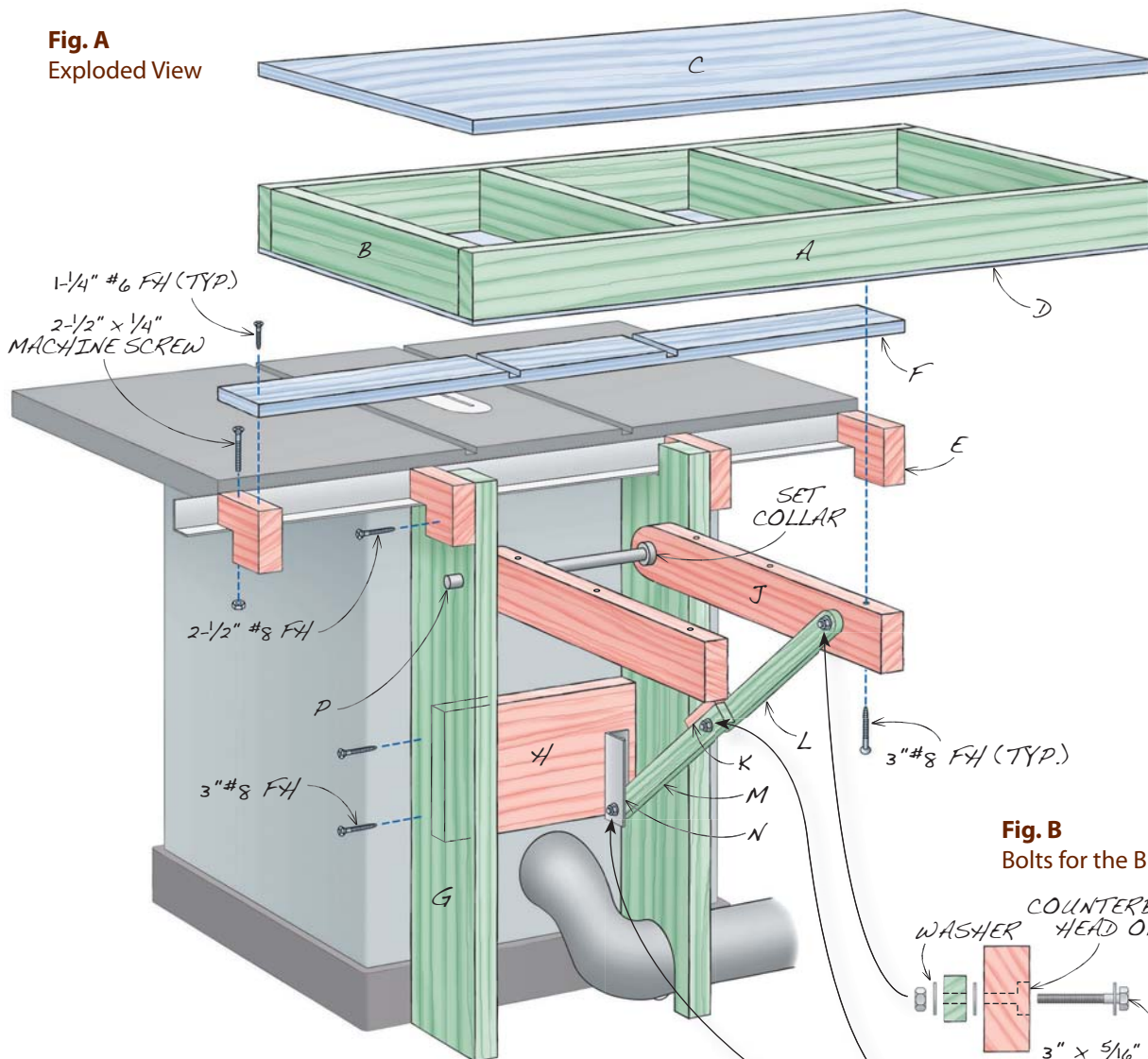
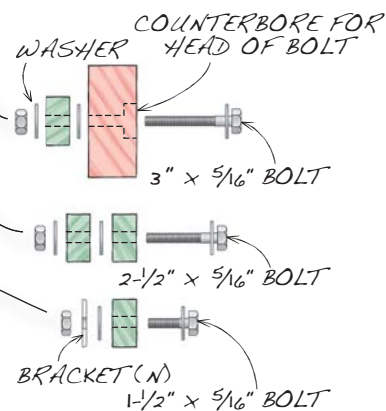


Fig. B
Bolts for the Brace



Cutting List

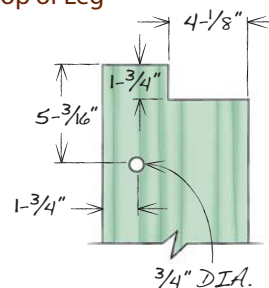
Overall Dimensions: 43-7/8" W x 27-1/4" L

Section	Part	Name	Qty.	Material	Th x W x L
Torsion Box	A	Stile	2	2x4	1-1/2" x 3-1/4" x 43-7/8" (a)
	B	Rail	4	2x4	1-1/2" x 3-1/4" x 21" (a)
	C	Top	1	Plywood	3/4" x 43-7/8" x 24"
	D	Bottom	1	Plywood	1/4" x 43-7/8" x 24"
Ledge	E	Bracket	4	2x4	1-1/2" x 3-1/4" x 5" (b)
	F	Top	1	Plywood	3/4" x 5" x 43-7/8" (b)
Leg Assembly	G	Leg	2	2x8	1-1/2" x 7-1/2" x 33-1/4" (b)
	H	Stretcher	1	2x8	1-1/2" x 7-1/2" x 15-5/8"
	J	Arm	2	2x4	1-1/2" x 3-1/4" x 22"
	K	Brace stop	1	Poplar	3/4" x 1-1/2" x 4"
	L	Upper brace	1	Poplar	3/4" x 1-1/2" x 14-1/2"
	M	Lower brace	1	Poplar	3/4" x 1-1/2" x 15-3/4"
	N	Bracket	1	Angle iron	1-1/2" x 1-1/2" x 6"
	P	Rod	1	Steel	3/4" dia. x 20-3/4"

Notes:

- a) Joint and plane wood to this width.
b) Customize size to fit your saw.

Fig. C
Top of Leg





5 **Fasten** brackets to the back of your saw with machine screws and lock nuts.



6 **Place** a long piece of plywood on the brackets. Using shims, raise this piece level with the saw.



7 **Fasten** the plywood to the brackets. These pieces, forming a ledge, must stick out beyond any parts of the saw below.



8 **Clamp** two legs to the ledge brackets, then align the legs by inserting a 3/4" rod between them. The outfeed table will pivot on this rod.



9 **Fasten** the legs to the brackets, then remove the rod.

these rails. If the dimensions of your saw require you to place the arms in different positions left or right, be sure to move these rails accordingly.

Cut the torsion box's top (C) and bottom (D) the same size as the frame, then glue and screw the top to the frame (**Photo 3**). Place the bottom on the frame, then draw lines on the plywood that correspond to the centerlines of the frame's inner rails. Staple or nail the bottom to the frame (**Photo 4**). Round over all of the edges of the torsion box so it's comfortable to handle, then set it aside.

Add a ledge to your saw

Using the same 2x4 material, make four brackets (E) to attach to the back of your saw. Your pieces may have to be longer than the ones I made, depending on the type of saw you have. The ends of the brackets must clear everything that

sticks out the back of the saw, such as a motor or dustport, because the table must be able to hang vertically, free of any obstruction (Fig. E).

The shape of these brackets will depend on how you attach them to your saw. My saw has a large steel angle on the back, so my brackets are notched to fit around it. I drilled holes through the angle and fastened the brackets with machine screws and lock nuts (**Photo 5**). The position of the inner two brackets is important—they're offset by 1-1/2" from the arms that will support the torsion box (Fig. F). The arms, as mentioned above, must be directly below the inner rails of the torsion box. Everything has to line up just so.

Cut a 3/4" plywood top (F) to fit the brackets. Saw dadoes in the top to correspond to your saw's miter slots. Make the dadoes wider and deeper than the miter

slots, so there's no chance that a miter gauge or sled will bind in them. Place the top on the brackets and use shims, if necessary, to raise the top level with the saw (**Photo 6**). Fasten the top to the brackets (**Photo 7**).

Build the understructure

Make a pair of legs (G) long enough to rest on the floor and cut a stretcher (H) to go between them. The outfeed table will pivot on a 3/4" dia. rod (P) that passes through both legs; drill holes for the rod now (Fig C). Cut the rod to length and grind chamfers on both ends to make it easier to insert the rod in a hole. Clamp the legs to the inner brackets—tight against the saw's base—and insert the rod into the holes (**Photo 8**). The rod must be able to rotate without binding. If it does bind, adjust the position of the legs. Fasten the legs to the

Fig. D
Up Position

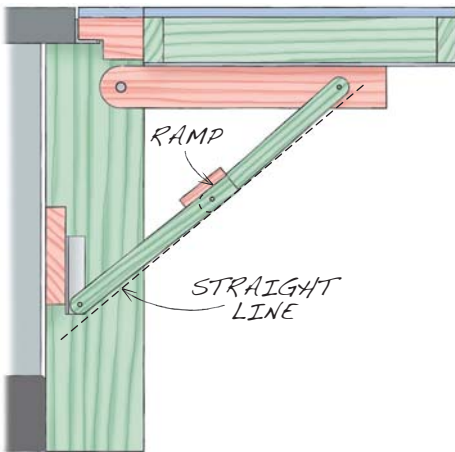


Fig. E
Down Position

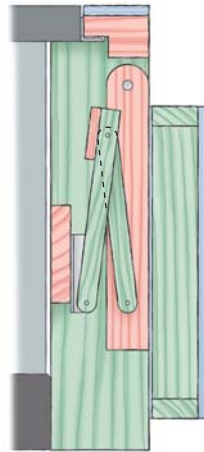


Fig. F
Bracket and Arm Locations

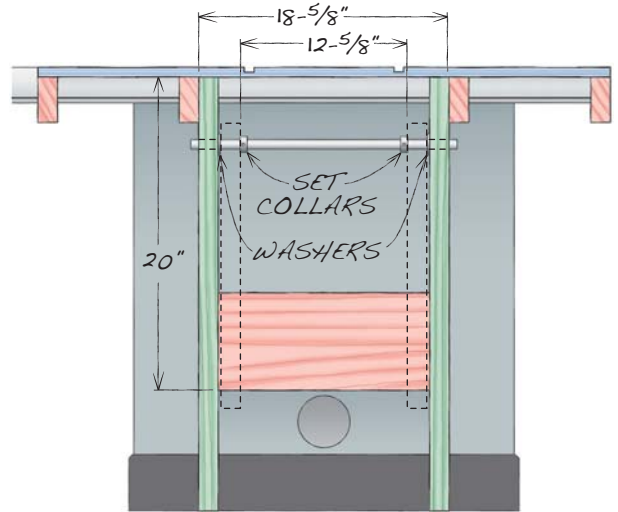


Fig. G
Torsion Box Layout

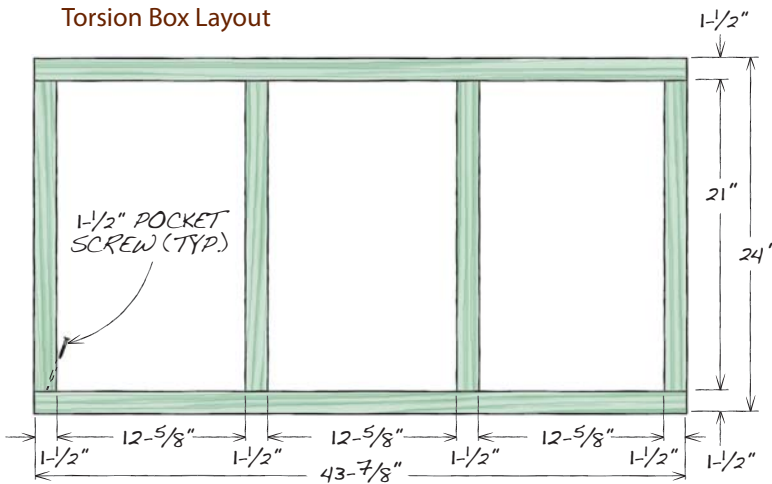


Fig. H
Front and Side Views of Lower Brace

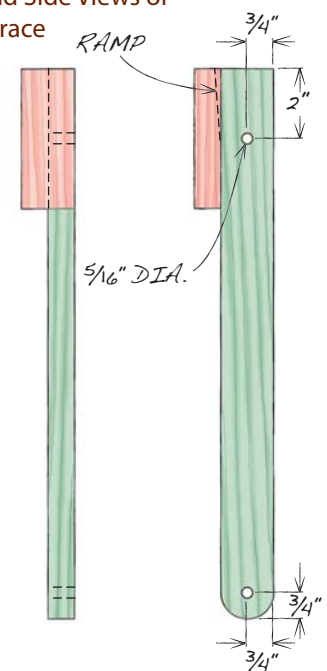


Fig. K Upper Brace Details

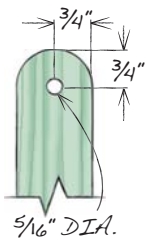


Fig. J Brace Stop Details

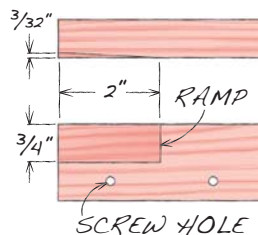


Fig. L Arm Details

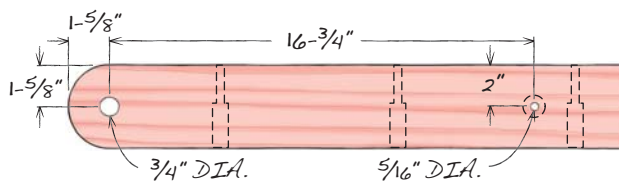
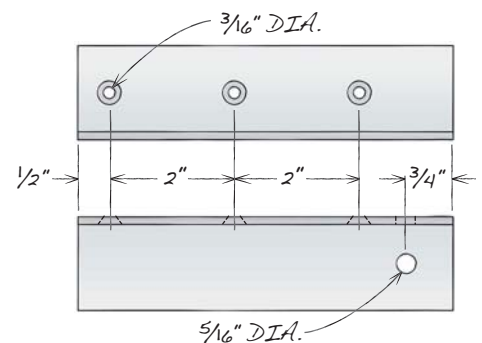
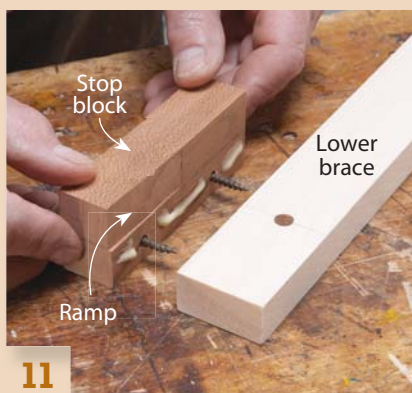


Fig. M Bracket Details





10 **Insert** the rod back through the legs, this time adding two “arms.” Level the right arm and temporarily support it with a prop.



11 **Build** a folding brace to support the outfeed table. Glue and screw a stop block to its lower half. Note the block’s “ramp.”



12 **Assemble** the brace, then attach it to the right-hand arm using bolts, washers and lock nuts.



13 **Position** the brace side to side so it will fold without binding, then fasten the brace to a stretcher connecting the legs.



14 **Place** the outfeed table on the arms. Add shims to level the table with the ledge. Fasten the table to the arms and you’re all set.

brackets (**Photo 9**). Fasten the stretcher between the legs, tight against the saw’s base (Fig. F).

Make the arms (J). Drill holes in the arms for the rod and for the screws you’ll use to fasten the arms to the torsion box (Fig. L). Counterbore and drill a hole in one arm for a bolt that will also pass through a supporting brace. (Recessing the head of this bolt in the counterbore is essential for the brace to fold up.)

Reinstall the rod, adding arms, washers and set collars (Fig. F). Tighten the screws on the set collars to lock the arms in place and to prevent the rod from slipping out of its holes. Raise the right arm, level it, then support it with a prop (**Photo 10**).

Build the brace. It’s composed of four parts: a stop (K), an upper section (L), a lower section (M) and a bracket (N). Make the upper and lower sections first

(Figs. K & H), then make the stop block and glue and screw it to the lower section (**Photo 11**; Fig J).

Note the angled “ramp” on the stop block—make this with a rabbet plane, chisel or file. When the brace is assembled, the ramp allows the brace to open more than 180° (Fig. D). This slight downward bend is very important: When the table is in the up position, its weight forces the brace to stiffen and become rigid. If you accidentally jostle the outfeed table, it won’t fold down. To lower the table, you have to push up on the center of the brace with your foot or hand (see page 54).

Make the bracket from a piece of iron angle. Drill holes in the angle for mounting the brace and for mounting the bracket to the stretcher between the outfeed table’s legs (Fig. M). Fasten the bracket to the brace’s lower section, then

fasten the upper section to the lower section. Be sure to use lock nuts—they have a nylon insert that prevents the nut from loosening. Fasten the brace to the right arm (**Photo 12**).

Lift the brace up to the stretcher and position the brace side to side so it will fold without binding. Fasten the bracket to the stretcher with a single screw (**Photo 13**). Remove the prop from the arm and try swinging the arm. You may have to reposition the bracket slightly for the brace to fold without binding, but when all is well, secure the bracket with three screws.

Lift up the left arm and support it with a prop, then place the torsion box on the arms, spaced about 1/16" from the ledge (**Photo 14**). Add shims, if necessary, to level the box with the saw, then fasten the arms to the box. Remove the prop and try out your new toy! 🛠️

Slab on a Wall



Sometimes, the best way to display an unusual piece of wood is to hang it up.

by Tom Caspar

THIS GORGEOUS piece of burl elm was originally meant to be the top of a coffee table, but things didn't quite work out. Unfortunately, its irregular edges proved to be too sharp and fragile for a high-traffic area. So, what to do?

Hang the slab on a wall!

I'm sure that you, too, have come across a large piece of wood that is as beautiful as a fine painting or sculpture. You may have thought, "It's a crime to cut this thing up into little pieces." So the piece just sits in a lumber rack, waiting for the right project to come along. Perhaps, leaving the piece intact and hanging it on a wall is the right project.

This huge piece of elm is 5' long by 3' wide. It's 1-1/2" thick and weighs about 75 lbs. Obviously, it can't be hung with a picture hanger. I think the best method for hanging something this large and heavy is to use a pair of 5" wide French cleats, one screwed to the back of the wood and the other screwed into studs behind the wall. The cleats make the wood appear to float in front of the wall—a neat effect.

Each cleat is just a straight board with a bevel sawn down the length of one edge (**Photo 1**). The exact angle really doesn't matter as long as it's the same on both boards. Leave a 1/8" wide blunt edge on the angled side of the

board to strengthen the joint.

Drill pilot holes through one cleat, then fasten the cleat to the wood (**Photo 2**). The trick here—particularly with this irregular board—is to position the cleat so that it's parallel to the flow of the board's grain. I just eyeball it. Position the lower, angled edge of the cleat in the center of the board. This will help you to figure out how high the other cleat should be on the wall.

Find the studs in your wall, then drill pilot holes through the second cleat to hit the studs. Level the cleat, then fasten it to the wall (**Photo 3**).

To hang your prized board, just drop it in place (**Photo 4**). 



1

Make a pair of French cleats for hanging the slab. Saw a 30° angle on the edges of both cleats.



2

Place one cleat on the slab, angled edge pointing down. Center it by eye, then fasten the cleat to the slab.



3

Fasten the other cleat to the wall, angled edge pointing up. Be sure to hit the studs inside the wall.



4

Lift the slab and place it on the lower cleat. The slab will automatically stand upright and appear to float in front of the wall.



French Cleats

French cleats are often used for hanging cabinets of all sizes. They always come in pairs—one goes on the cabinet, the other goes on the wall. French cleats can be large or small, thick or thin, long or short. Whatever their size, French cleats have three advantages over other methods for hanging cabinets:

- *They're invisible.* Nothing shows from inside the cabinet. That's perfect if your cabinet has a fancy back whose appearance would be marred by screw heads, like the one shown at left.

- *It's easy to hit the studs inside the wall.* Just mark the locations of the studs directly on the wall, put the wall cleat wherever you want it, then transfer the marks from the wall to the cleat. You can't miss!

- *It's easy to hang the cabinet.* You don't have to come up with some way to support its weight while trying to level it. You just level the cleat that goes on the wall, fasten it, and you're good to go.



French cleats are a strong but invisible method of hanging any cabinet. To hang a cabinet flush to a wall, inset the top cleat into the cabinet's back.



Get the plans for making this Krenov-style cabinet at AmericanWoodworker.com/WebExtras

Dovetailer's Dream Vise

Treat yourself to the secure, even grip that's essential for precision work.

by Brad Holden



Saw comfortably

When the vise is clamped vertically, it raises the workpiece to a comfortable height for sawing pins and tails.



Chop accurately

When the vise is clamped flat, the jaw acts as a support fence to assure precise, perpendicular cuts.



Clamp quickly

The jaw's spring-loaded cam clamps provide fast, secure clamping of stock from 3/16" to 1" thick.



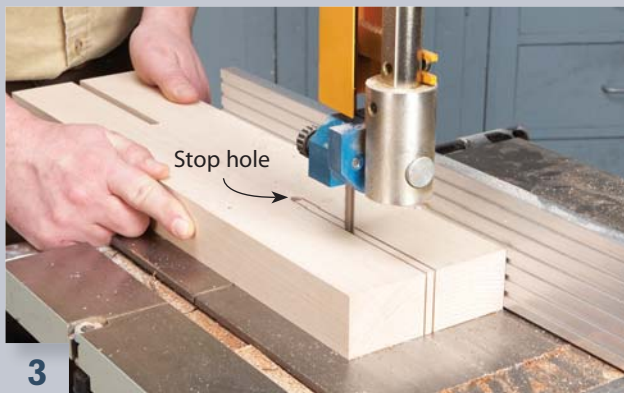
1

Fasten the vise's sacrificial chopping plate and support spacer after assembling the platform and installing the T-track.



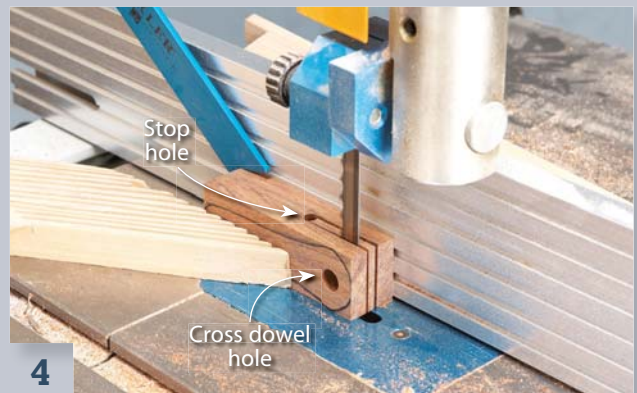
2

Mill the jaw dead-on square to assure perpendicular chisel cuts when removing the waste between your saw cuts.



3

Bandsaw the jaw's slots after drilling stop holes to define the ends.



4

Cut a slot in each cam clamp after laying out a blank and drilling the holes.

CUTTING DOVETAILS BY HAND is satisfying and rewarding work, but securing the boards for sawing and chopping is anything but. Face vises typically don't grip boards firmly enough for sawing, because they rack. The solution—adding a spacer of equal thickness to the workpiece on the jaw's other side—prevents racking, but it's a hassle.

Securing boards for chopping—wide boards especially—is also awkward, because it usually calls for two clamps and three hands. This two-position vise solves both of these problems, and it'll hold boards up to 18" wide.

Glue up three layers of plywood to make the platform (A, Fig. A and Cutting List, page 64). When the glue is dry, cut the platform to final dimensions. Saw or rout a groove for the T-track and install it (see Sources, page 64). Then drill holes near each corner to allow clamping the

vise in the vertical position. Make sure to size the holes to fit your clamps.

The chopping plate (B) and support spacer (C) function as the vise's rear jaw. Cut both parts from a single piece of plywood to assure they're exactly the same thickness. Attach the chopping plate in front of the T-track and the support spacer behind it (**Photo 1**). Use screws to fasten these parts, so that when the chopping plate gets too nicked up, you can easily replace them.

Find a suitable block of hardwood for the jaw (D); hard maple is a good choice. When you're using the vise for chopping, the jaw's front edge guides the chisel, so the jaw must be square and its front edge must be perpendicular to the platform (**Photo 2**).

Lay out the jaw's slots and drill a 5/16" hole at the point where each slot will end. Create the slots by sawing in to

each hole (**Photo 3**). Ease all of the jaw's sharp edges except for the front edge of the face that contacts your workpiece. You'll want that crisp and sharp for lining up with your workpiece's layout line.

Next, make the cam clamps (E). You could buy them, but they're easy to make and a great way to use up some nice offcuts. Lay out the clamps' holes, slots and profiles on two blanks (Figs. B and C). Drill holes for the cross dowels and cut the slots using the same method as for the jaw (**Photo 4**).

Cut out the cam clamps and sand them to the profile lines (**Photo 5**). For each clamp to function properly, its break-over points must be slightly in front of the cross dowel's center diameter. So when sanding the cam's large end, be careful not to change these points.

To assemble the cam clamps, slip the hardware onto each bolt in this order:



Fig. A
Exploded View

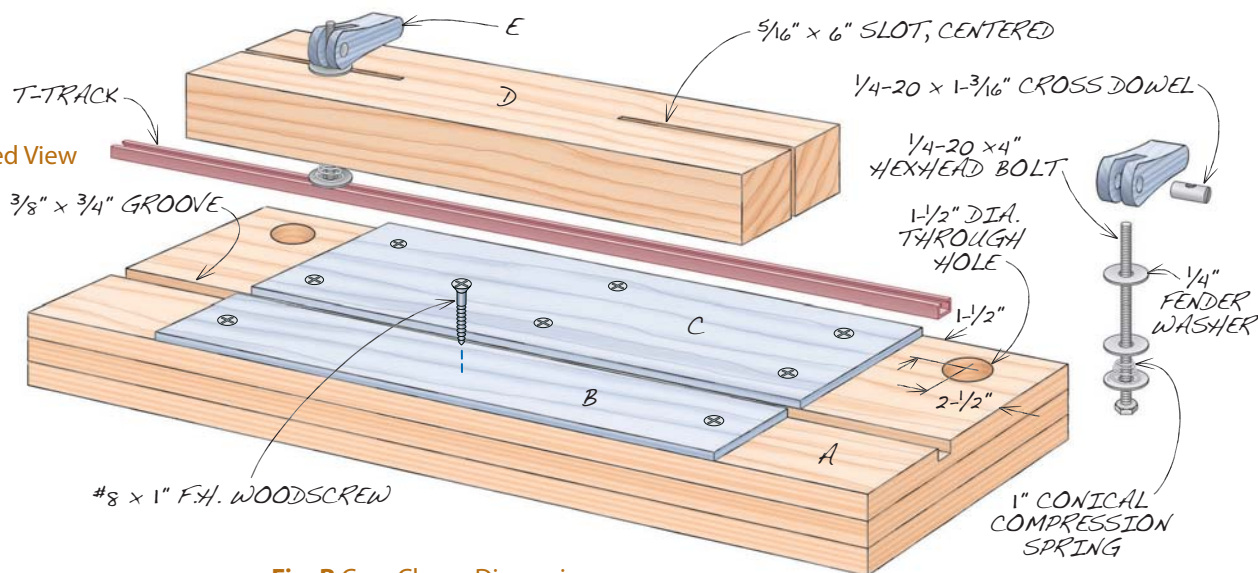


Fig. B Cam Clamp Dimensions

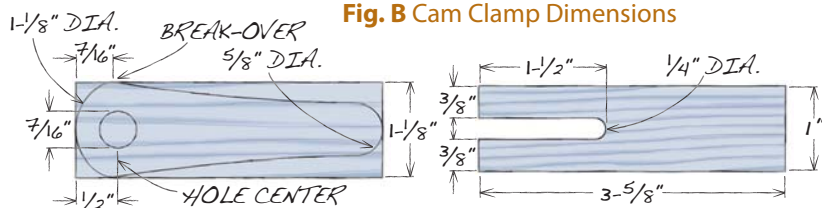
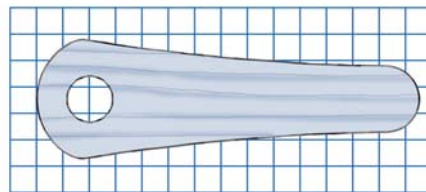


Fig. C
Cam Clamp Pattern
(1 square = 1/4")



Cutting List

Part	Name	Qty.	Material	Th x W x L
A	Platform	3	Baltic birch	3/4" x 12" x 30"
B	Chopping plate	1	plywood	1/4" x 4" x 20"
C	Support spacer	1	plywood	1/4" x 7-1/4" x 20"
D	Jaw	1	maple	2" x 5-1/2" x 20"
E	Cam clamp	2	hardwood	1" x1-1/8" x 3-5/8"

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Mooned Roof

SEEING MY KEYS still in the ignition, I immediately regretted having pressed the lock before I closed my pickup's door. I was installing new kitchen cabinets on-site and had been distracted by the huge load of tools I was carrying in order to minimize the number of trips into the house.

I'd left the sunroof slightly open, so I climbed into the cargo box, retracted the roof by hand and reached into the cab. But while stretching to grab the keys, I lost my balance and began to tumble in. Fortunately, the speed square in my back

pocket caught on the sunroof's frame and stopped my fall. Unfortunately, my fully-loaded tool belt added so much weight I couldn't wriggle back out. I was trapped.

Did I mention that when the speed square caught on the sunroof's frame it also pulled down my jeans? Exposed and helpless, I've never been so mortified. Thankfully, a couple of passers-by came to my rescue, even though they couldn't help but laugh at my predicament. And who could blame them?

Dale Thompson



Problematic Prop

HAVING BEEN ASKED to make a wooden propeller for an aviation-themed child's room, I laminated several boards to create a 6" square by 5' long blank.

I'd bartered some time on a large bandsaw to cut away the waste wood. Once the blades and hub were roughly shaped, I planned to finish the job with drawknives and other hand tools.

As luck would have it, the bandsaw's table would only tilt one way. I'd have to reverse my design, but that didn't appear to be a problem. I made the cuts, said my thanks and headed home.

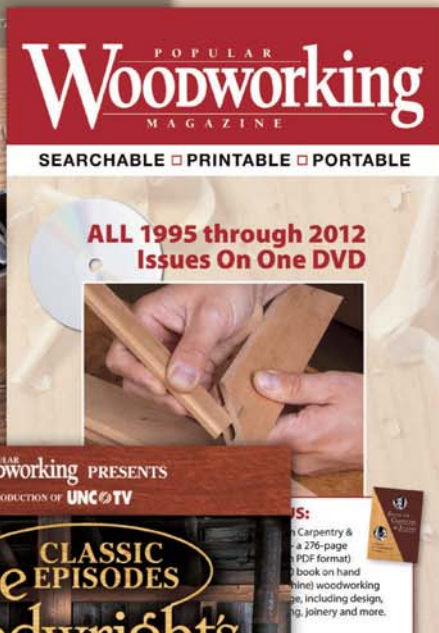
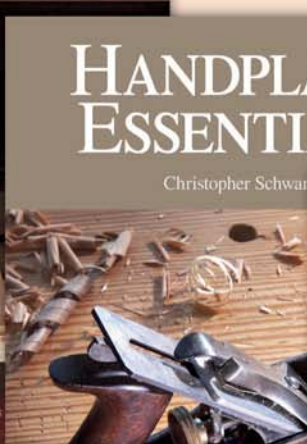
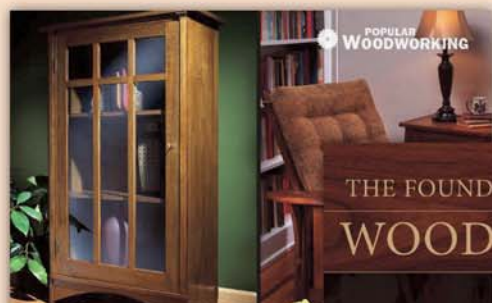
After completing work on the propeller, I added

some decals and sealed it with varnish. Being quite pleased with my creation, I showed it off to a neighbor who happened to be a pilot. He looked a little perplexed and then said, "Traditionally, American aircraft propellers turn clockwise."

Only then did I realize the effect of my design changes. Seeing my crestfallen look, my neighbor quickly added, "This must be a British propeller. Not only do the Brits drive on the wrong side of the road, their propellers turn the wrong way, too!"

Roy Steele

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