

Fine
WoodWorking

Log cabin
workshop, p. 28



Tools & Shops

ANNUAL ISSUE

Hand-tool buyer's guide

Outfeed table for
mobile tablesaws

TOOL REVIEW

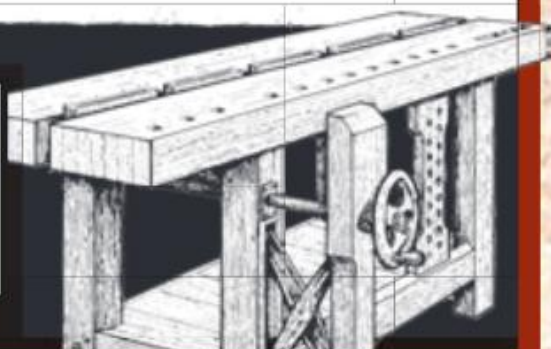
Wall-mounted
dust collectors

Cut cleaner
joinery on
the tablesaw

Keep tools safe
and close at hand
with a tool chest



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Restored log shop

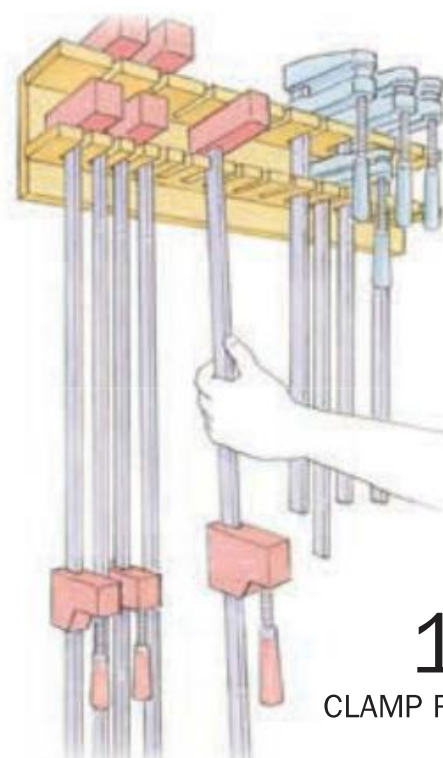
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VIDEO

Shop tours

We visit shops all over the country and take our members along for the ride. From tool selection and layout to workflow and storage, there is something to be learned anytime you peek into the shop of one of our contributors.



VIDEO

Box-making wonder

Known for efficiency in his work, Mike Pekovich has built a few iterations of his sled for making mitered boxes (p. 50). In this video, he shows the progression of sleds he built, and unveils the final version. Or is it?

Online extras

Free content at finewoodworking.com/286



VIDEO

Rabbet plane

Not every woodworker has a shoulder plane (p. 18). Mike Pekovich shows how to use a less expensive alternative to true up a tenon for a perfect fit.



VIDEO

A look behind the tests

Asa Christiana demonstrates the test he performed to find out which wall-mounted dust collectors stood out (p. 52).

VIDEO

Michigan mule

Get a bird's-eye view of Dawson Moore's process as he uses his spoon mule (p. 78) to carve a large cooking spoon.

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VIDEO WORKSHOP

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contributors

Karen McBride (Shop Design: “Rebuilt log shop”) came late to woodworking. First she studied engineering, apprenticed as an auto mechanic, and settled for a career in high tech. Then, in 2005, an apprenticeship with her fellow Ontario resident Michael Fortune set her on the right course, igniting her passion for furniture making. Her workshop is an early 19th-century hand-hewn log building that she dismantled, moved, and rebuilt and continues to fill with lovingly restored vintage machinery. When she isn’t in the shop, she’s usually out on the farm birding with her dog Daffy, working in the veggie garden, or cross-country skiing.



A few years ago, **Dawson Moore** (Greenwood: “Expand your woodworking with a spoon mule”) returned home to Harbor Springs, Mich., and his sixth-generation family farm. Since then, he has refined his process for using traditional methods to transform his local trees into everyday household items. Honing his finishing regimens, from ebonizing to a food-appropriate oil finish, has been just as important. Now he’s branching out into other areas of green woodworking, such as chairmaking and teaching at regional folk schools. You can follow his work on Instagram at @michigansloyd.



Bob Van Dyke (Handwork: “Setting up and using a shoulder plane”) owns and operates the Connecticut Valley School of Woodworking, but he still doesn’t call himself a woodworking expert. He attributes his growth in the craft to the instructors he has worked with over the years, many who are now close friends. “How can you not learn something when you have Phil Lowe, Will Neptune, Steve Latta, and Mike Pekovich as friends and instructors?” he says. In his leisure time, Van Dyke says he’s either hanging out with his four grandsons, or sleeping.

Steve Fikar (“Folding Outfeed Table”) took over his dad’s woodshop in high school and made a host of wild projects, including a steam generator, a garbage compactor, and a one-man hovercraft. From there he began a decorated career in the Air Force and attended Columbia University, where he studied flight structures. After leaving the Air Force, Fikar co-founded a software firm that he later sold, allowing him to retire early and build his dream home and shop on Florida’s Gulf coast. “I’ve led a charmed life,” he says.



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From the Editor

A shop to call home

Welcome to our annual *Tools & Shops* issue. I've always thought that it was a cumbersome title, but I guess it's true that not only do we need the tools necessary to get a job done, but we need a place to work as well. Of the two, I think that finding or making a place to work is the bigger challenge. It can be a stumbling block and a barrier to entry for aspiring woodworkers, but we all seem to manage somehow. My garage has never seen a car since we've lived in our house, and I'm aware of more than a few basements that are littered with sawdust. And, yes, spare bedroom workshops are not as uncommon as you might imagine. I've seen sheds and front porches and back patios and renovated mill buildings put to use as shops. In this issue, we feature a log cabin that has been retrofitted into a wonderful work space. More and more, urban woodworkers are making use of shared spaces. On the rare occasion, I've even come across that most elusive prize, the custom-built stand-alone shop.

While I might pine for more space and better dust collection, I have to say that my far-less-than-perfect shop suits me just fine. Even if I could conjure up my ideal shop, it wouldn't be perfect for another woodworker. Someone specializing in built-ins is going to need a much bigger space, while a spoon

carver may get by with a stool by the fire. I sometimes envy the chairmakers with just a lathe and bandsaw in the shop.

As the end of fall points to the onset of another Connecticut winter, my shop, heated and insulated from the cold, becomes more than just a place to work, but a refuge of sorts as well. It

becomes a place to think and plan over a cup of coffee at the bench, a floor to sweep, a shelf to finally reorganize, a set of chisels to sharpen. In that way our shops come to reflect not just what we make, but who we are as makers. So, while there is no such thing as a perfect shop, we are all quite capable of making a shop that is perfect for us.

—Michael Pekovich, editor and creative director



The more things change ...

Having read Mr. Edwards's letter ("More handwork, less machine work," *FWW* #284) I am reminded of a conversation I had with a fellow woodworker. This chap is a traditionalist in woodworking, a craftsman who uses hand tools only, eschewing the use of power equipment that many woodworkers, such as myself, enjoy in our shop. My position in our discussion was that one could still be a wood craftsman while using power tools, while his was, respectfully, that one is more truly a craftsman if he lets himself be intimate with the wood, without artificial help. I have since wondered what the next generation of craftsmen would look like, those who would look at me the same way as I saw this gentleman. And now I see it: Your last (and earlier) editions have introduced portable CNC routers that follow programmed commands to shape wood. Essentially, you tell the machine what to do, and it goes about its business with very little further effort from the worker. There will surely continue to be advancements in CNC and other forms of automation which in turn will make the craft of woodworking easier; nevertheless I hope and believe that traditional woodworking, however that is defined, will always exist.

—HARRY VERSTRAATEN, Victoria, B.C., Canada

Dovetail problems solved

As a beginning dovetailer, I have found there are many steps to this process and for each step there are many technique options available. I have consulted several different sources and adopted those techniques that work best for me. A most valuable source was the "Hanging Wall Cabinet" video series with Mike Pekovich. The attention to detail and the unedited quality of this series was most helpful. I have been spending lots of time and frustration lining up the tail and pin boards for marking pins. The two small jigs shown in Episode Four solved all my problems. Now the whole process will be much more efficient, accurate, and enjoyable.

—ALLEN OVERFIELD, Comptche, Calif.

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workshop tips

Best Tip



Mike Guldenstern runs an energy-efficiency consulting firm and has been woodworking since 1997. In 2014, he built his dream shop, but as happens so often, he moved shortly afterward. His new dream shop has a few key updates, but one thing he didn't need to improve was his drill-press table, which is this issue's winning tip.

Drill-press table tackles dust and more

Drill presses are notoriously messy, because chips are so hard to collect from them. My solution is nothing fancy, but it works amazingly well. It's a wide drill-press table with an integrated dust-collection box and two vacuum slots through the top of the table.

When I'm drilling small workpieces, all chips and dust are sucked into the slots as I drill, down into the box, and out the vacuum port. With large panels and plywood, the slots are covered, and the suction acts as a workpiece clamp (happy accident—wish I could say I intended it!). In that case, the chips stay on the panel, so when I'm done, I just tilt the panel toward the slots and the mess disappears.

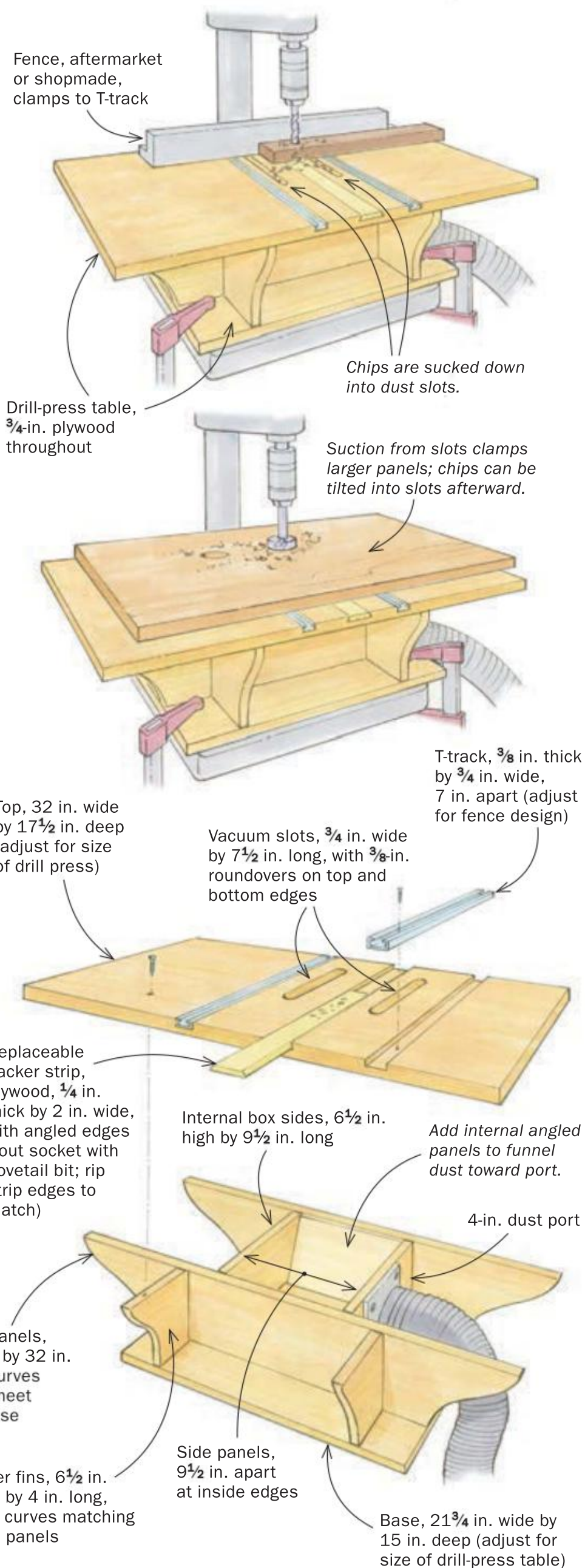
To make the dust box more efficient, I inserted angled panels inside it, creating a sloped trough that funnels chips into the port.

Alongside the vacuum slots I inset two lengths of T-track, which secure an aftermarket drill-press fence. Between the vacuum slots I routed a shallow dovetailed socket for a sacrificial strip of $\frac{1}{4}$ -in. plywood. The strip slides back and forth to present a fresh backer surface for clean drilling, and can be replaced altogether in minutes.

—MIKE GULDENSTERN, Newburyport, Mass.

A Reward for the Best Tip

Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a Veritas Standard Dovetail Saw.



I've discovered an easy way to shape my tool handles to fit my hand. I have used this approach on hammers, mallets, and replacement saw handles, as well as custom drawer pulls, tool totes, and a custom recurve bow.

To create a form, I simply soak and squeeze standard paper towels, adding and removing towels until the form looks good and feels perfect. From there, I trace the form onto my handle blank and cut it to shape at the bandsaw. I do the final shaping and finessing with rasps and a sanding drum, checking the feel as I go.

Build up a wad of wet paper towels and squeeze them to create a comfy hand grip.

Trace the shape onto your handle stock.

Use rasps and a spindle sander to refine the shape.

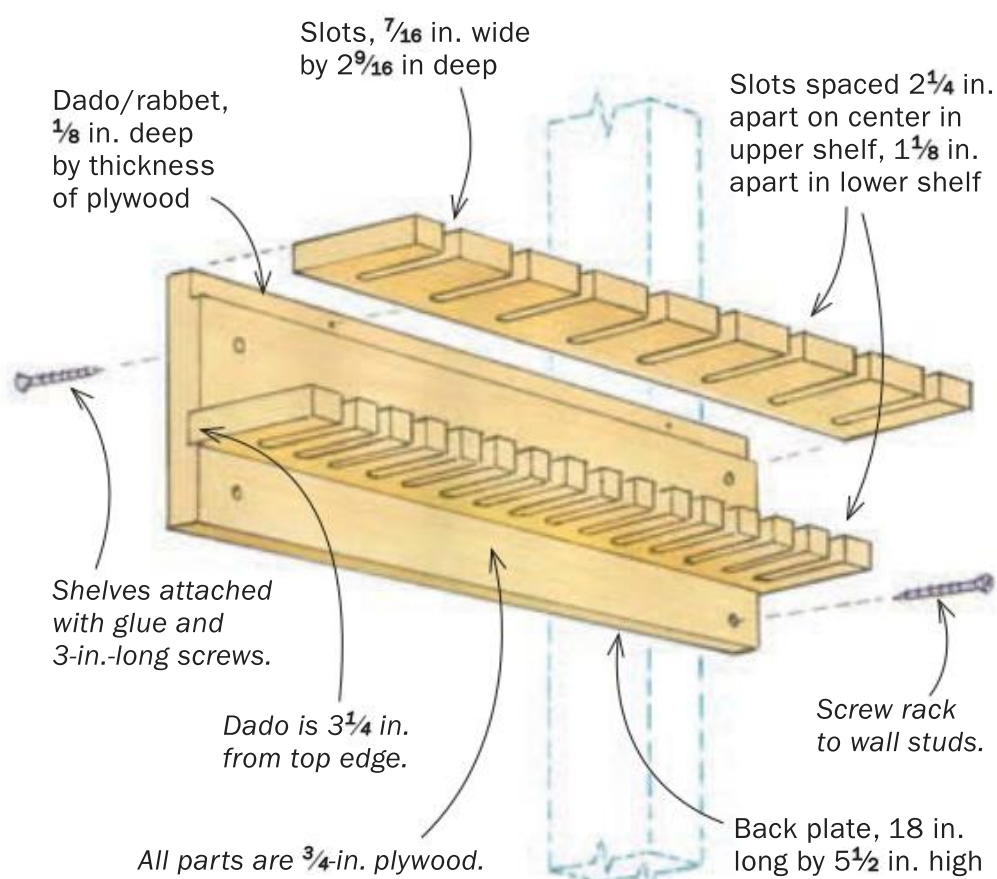
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Double-stack clamp rack saves space

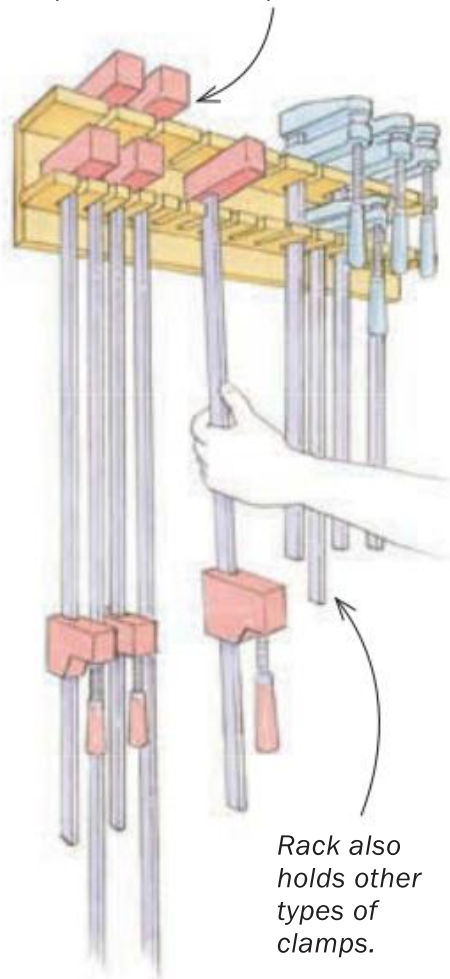
Wall space is at a premium in my shop, and floor space is even more precious. So I decided against a cart for clamp storage and came up with this space-saving wall rack. I built it to hold parallel-jaw clamps and large bar clamps, but it can easily be adapted to other types of clamps, and expanded as needed. To get adjacent clamps to drop into place you may have to stagger their lower jaws, but that only takes a moment or two.

I made the rack from $\frac{3}{4}$ -in. plywood, and cut a shallow rabbet and dado for the shelves to help them withstand the weight of the clamps. To slot the shelves, I drilled a $\frac{7}{16}$ -in. hole at the stopped end of each slot, then cut the sides on a tablesaw crosscut sled. If your sawblade won't reach high enough, finish the slots with a jigsaw or bandsaw. I clamped the two shelves together and cut the wider-spaced slots in both parts at once, then unclamped the shelves and cut the additional slots in the lower shelf. I screwed and glued both shelves to the back plate, and mounted the rack to wall studs.

—C.J. MARQUARDT, Scappoose, Ore.



Rack holds two rows of parallel-jaw clamps in the same space as one.

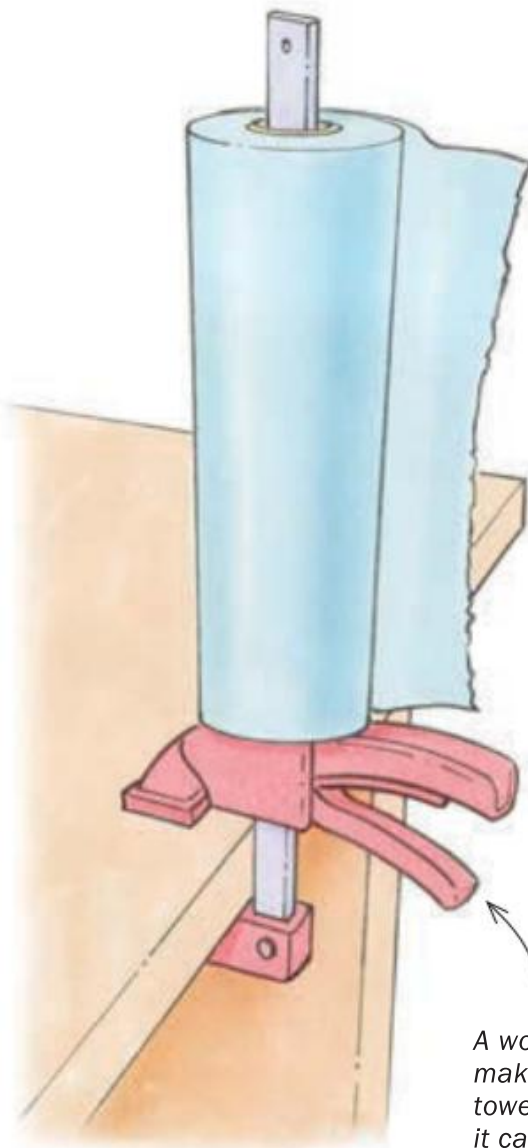


Rack also holds other types of clamps.

Short clamp makes great tape and towel holder

When a few of my quick clamps started to wear out, I realized they make the best darn shop-towel stand you've ever used. They go anywhere, and work either vertically or horizontally. Clamped vertically on a shelf, they'll also hold your entire tape-roll collection, plus twine, extension cords, and more.

—DEAN LAUGHREN, Winnipeg, Man., Canada

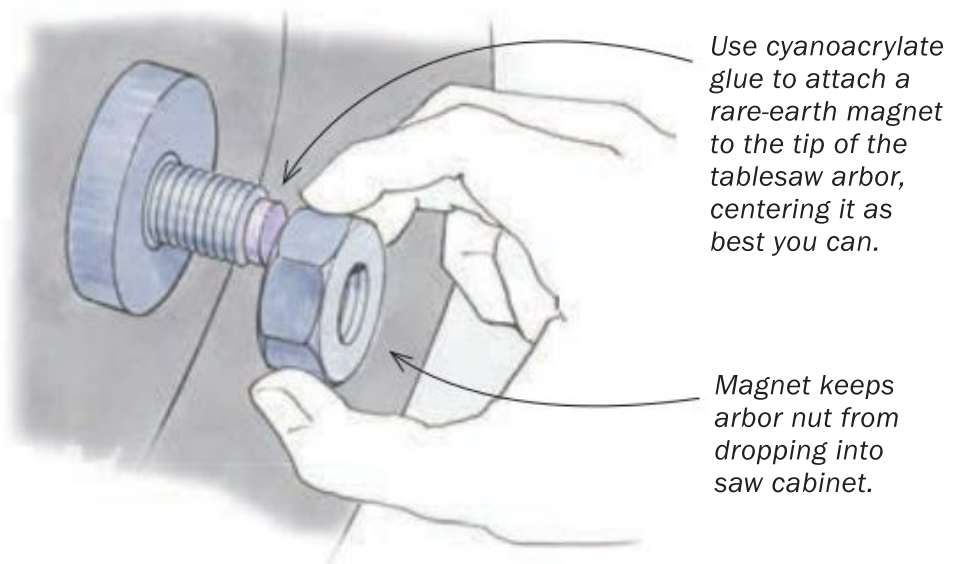


A worn-out "Quick-grip" style clamp makes a portable holder for paper towels. Attached to a shelf as shown, it can also hold tape rolls and more.

Tired of dropping your arbor nut? Add a magnet

Every time I used to switch blades on my tablesaw, I would dread dropping the arbor nut into the dust-filled cabinet below. I solved the problem with a rare-earth disk magnet, simply attaching it to the end of the arbor with a drop of cyanoacrylate glue. Clean the steel first with rubbing alcohol and center the magnet as best you can. Not only does the magnet catch the nut when it comes loose, but it also makes it easier to start threading on the nut. In case you're wondering, my tablesaw is a SawStop, and the magnet hasn't caused any problems with the touch-sensing technology.

—FRED BECK, Denver, Colo.



Use cyanoacrylate glue to attach a rare-earth magnet to the tip of the tablesaw arbor, centering it as best you can.

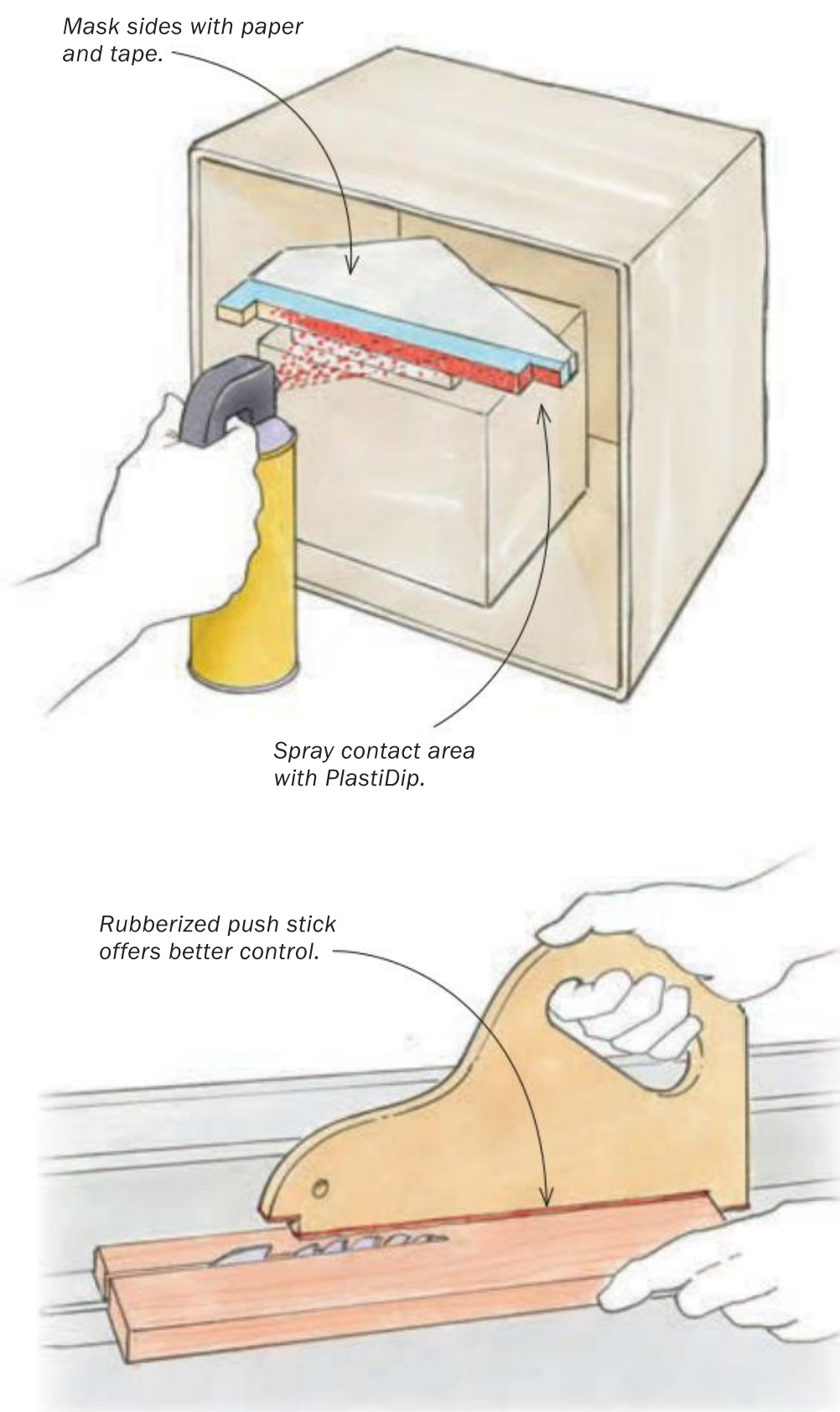
Magnet keeps arbor nut from dropping into saw cabinet.

Spray-on rubber makes push sticks grip better

Like many woodworkers, I make my own wooden push sticks for the tablesaw, jointer, and router table. To give them a better grip on workpieces, and give me much better control, I coat the contact area with a flexible rubber material called PlastiDip, designed for metal tool handles. It comes in a number of colors and can be applied by dipping or spraying. I buy it in a spray can, which lets me use only what I need. After spraying, I remove the spray tip and soak it in lacquer thinner to keep it clog-free for the future.

I recommend masking off the sides of your sticks and pads with newspaper and painter's tape when spraying, so those areas don't drag on machine tables and fences.

—TOM ROSGA, Sandstone, Minn.





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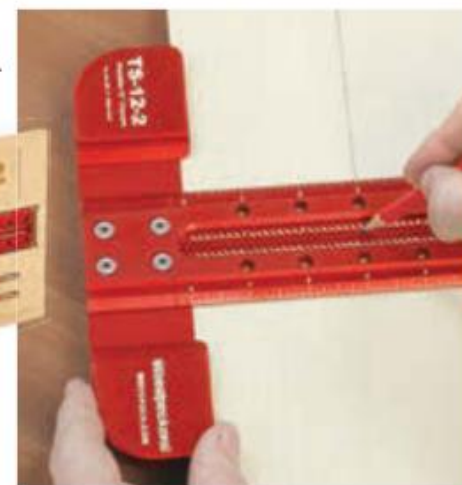
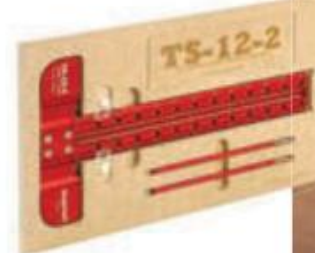
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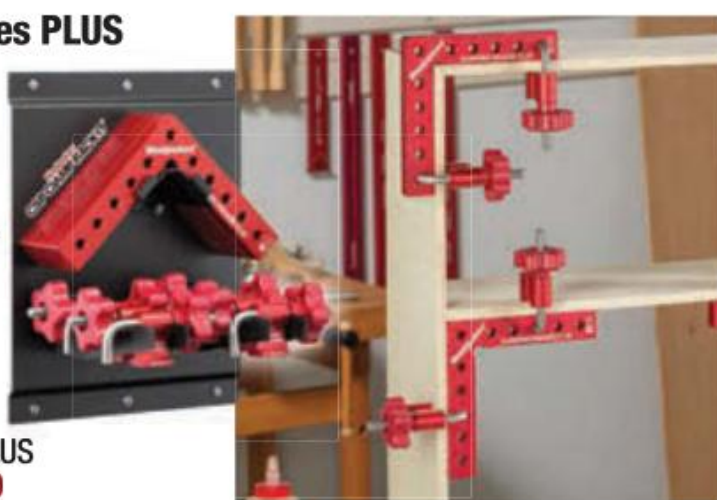
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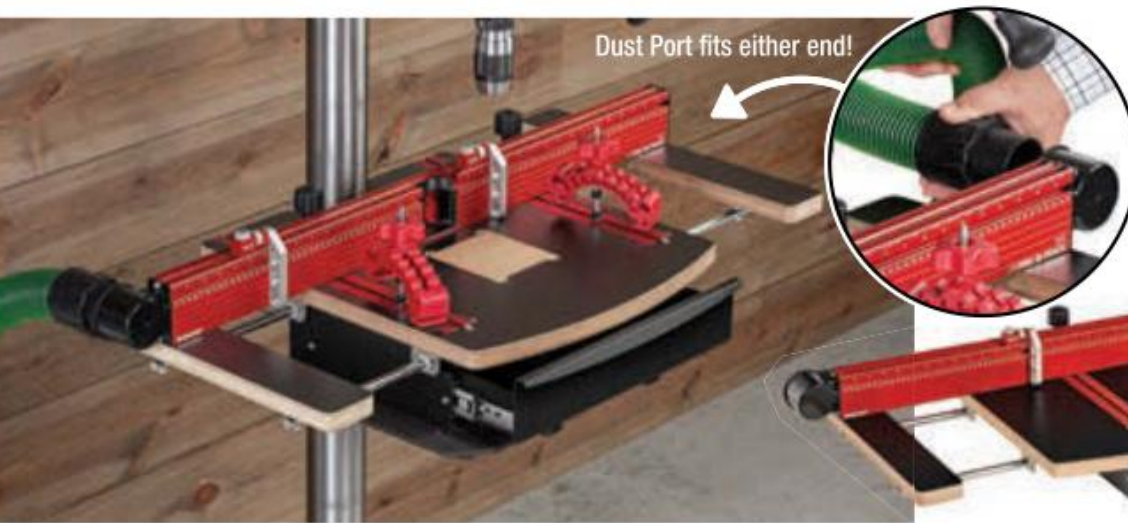
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NEW
TOOL

handwork

Setting up and using a shoulder plane

BY BOB VAN DYKE



There are three planes I would be lost without: my No. 4 bench plane, my low-angle block plane, and my shoulder plane. These essential tools allow me to pick up where the machines leave off. With a typical plane shaving 0.002 in. thick, nothing does as good a job at refining and straightening surfaces, adjusting a shaped edge, and precisely dialing in the fit of a joint one shaving at a time.

Shoulder planes differ from bench or block planes because the iron extends the full width of the plane body and the

sides of the body, being reference surfaces, must be 90° to the sole. The mouth on most shoulder planes can be adjusted, allowing the user to close the mouth significantly for the finest shavings.

The shoulder plane is usually not used to create joints but it is the perfect tool to fine-tune them. It is most commonly used to adjust the thickness of a tenon,

but it is also the first tool I pick up to correct an out-of-square tenon shoulder. Because the iron is the full width of the plane body, rabbets that need a slight adjustment can be quickly and accurately fixed and a molding's sharp edges that might be inaccessible to other planes can be quickly relieved and softened.

Like any plane, a shoulder plane that is not properly tuned up and sharpened will not work to its fullest potential.

Out of the box

When purchasing a shoulder plane, verify that the sides are square to the

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1. Check for square



Square route. Your shoulder plane should come out of the box with a flat sole and sides that are square to the sole. The sides register against the work, so a plane that isn't square will make joints that aren't square. Use a straightedge and a square to check your new plane's body. Van Dyke would reject a plane rather than trying to correct any manufacturing deficiencies.

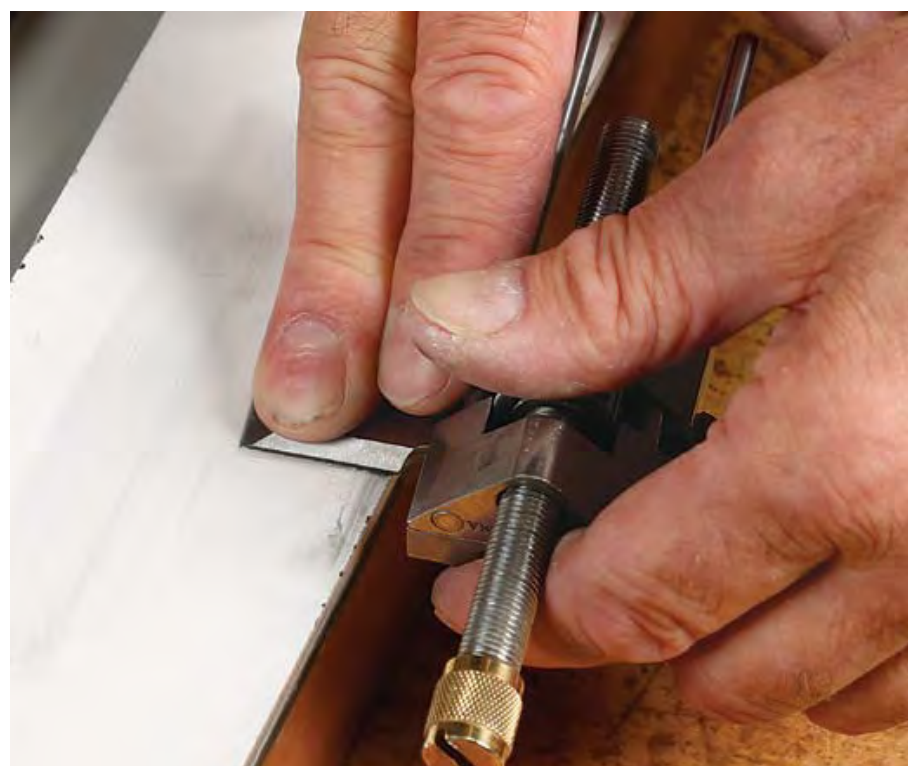
sole and the sole is dead flat. The plane iron will usually be a hair wider than the body because it is essential that the plane cut right into the corner where the shoulders and cheeks of a tenon or other joint meet. The iron must cut shavings of full width and equal thickness.

It might seem ideal that the plane iron be exactly the same width as the plane body with the iron sharpened exactly square. This is a standard that many woodworkers set for themselves, but an iron that is around 0.005 in. wider than the body allows a little wiggle room. The iron still must be sharpened at exactly 90° but the extra width allows you to set the iron flush with the side of the plane that will be up against a shoulder (or wall of a rabbet), leaving the extra width to hang out the other side. That extra width allows for minute lateral adjustment to ensure a full-width, even-thickness shaving while still allowing the corner of the iron to project fully into the corner of the joint. The extra width provided by the manufacturer (usually around 0.008 in.) gives the user the option of grinding the iron narrower or not.

2. Hone the blade



Honing. Van Dyke uses a honing guide to create and maintain a 30° microbevel. The shine of the microbevel should be of even width all the way across the edge.



The ideal iron. The iron supplied with most high-end shoulder planes is ground perfectly square to its sides and the back is dead flat, requiring only a final polish on your finest stone.

3. Insert and adjust the blade



Put it all together. Insert the iron, taking care not to let the sharpened edge hit any of the metal surfaces on the inside of the plane. Place the lever cap in position and loosely tighten it. Move the iron until you can just feel it come through the mouth.



Push the iron flush. Lay the plane on one side and push the iron flush with that side of the plane. Take two test shavings on a narrow piece of pine, one on either side of the iron, and compare their thickness.

Because the cutting edge of the iron must be firmly seated against the mouth opening of the frog, some high-end manufacturers go so far as to slightly raise the tang of the iron off the frog. This ensures full solid contact just behind the cutting edge when the lever cap is tightened down.

The best makers of shoulder planes pay attention to these critical manufacturing requirements. The soles are typically dead flat with sides exactly 90° to the sole. The irons are usually 8 to 10 thousandths wider than the plane body and the only “tune up” needed is a final honing of the iron.

Sharpening the iron

The sharpness of any plane is critical, but a shoulder plane's blade also needs to be sharpened perfectly square. With little to no lateral adjustment possible in a shoulder plane, an iron that's sharpened out of square will not cut equal thickness shavings, making the tool quite inaccurate. After determining that the blade is ground square, I use a honing guide to create



Compare the shavings. To produce an even full-width cut, the two narrow shavings should be the same thickness.

Tune a tenon

Inspect the joints. Label each tenon to match its mortise, and test the fit. If the joints were cut by machine, it is a safe bet they are all consistent and whatever you do to one tenon can be done to all of them.



and maintain a 30° microbevel. Keep checking that the shine of the microbevel is an even width all the way across the edge. You do not want to inadvertently hone an angle into what was a square edge.

Setting up the plane

Grip the plane in one hand with your thumb and forefinger on either side of the mouth opening. Place the newly sharpened iron into the plane. Make sure that the tang end of the iron is engaged with the advancement mechanism. Place the lever cap in position over the iron and loosely tighten it. Advance the iron until you can just feel it start to protrude through the mouth. At this point, lay the plane on its side on a flat surface and push the iron flush with that side of the plane.

I test the setting using a narrow piece of pine. Put the pine in a vise and take two test shavings, one on either side of the iron. To guarantee that the plane cuts even full-width shavings, it is critical that the two narrow shavings are equal in thickness. Anything other than that introduces inaccuracy. Visually compare the thickness of the two shavings and adjust accordingly.

Using the plane: tenons, rabbets, dadoes, and molding

To fine-tune tenon cheeks, put the workpiece against a bench hook (or two bench hooks for long parts). Draw pencil lines on the cheek and make a set of crossgrain shavings beginning at the base of the tenon and working out to the end. The pencil



Fine-tune the cheeks. Draw a series of pencil lines on both tenon cheeks. Make a set of crossgrain shavings beginning at the base of the tenon and working out to the end. Test the tenon's fit when the pencil marks are about 90% removed (leaving a little ensures that you do not take too much). Pencil and plane more if necessary.

Square a miscut shoulder



Fix a non-square shoulder. With a square, scribe a line across the offending shoulder. Starting at the high end, plane to the line with tapering cuts, finishing with one shaving all the way across. To prevent splintering, clamp a block flush with the shoulder.



lines clearly show how much wood you are removing, ensuring that you do not remove too much. If a second set of shavings is needed, plane the opposite cheek. Remember to draw pencil lines each time you plane or replane a tenon face.

Tenon shoulders cut on the tablesaw are usually dead square, but if they're not, a sharp, well-tuned shoulder plane excels at fixing the problem. Using an accurate square, knife a line across the offending shoulder. Reference off the opposite shoulder to keep the whole shoulder in the same plane. Make a series of tapering cuts, starting at the high end and ending with one final shaving all the way across. The iron must be set flush with the side of the plane that is referencing off the tenon's cheek.

Rabbets sometimes need to be adjusted both in depth and width. The shoulder plane's ability to cut all the way into the

corner makes it the perfect tool to both adjust the rabbet and remove any machine marks.

Frequently a molding has a fillet that needs to be softened or some other detail that needs to be rounded or chamfered. Block planes do not allow the access to do this, but a shoulder plane takes care of it easily. Make sure that the iron is flush with the face riding against the profile; if the iron projects out beyond the plane on that side it can damage the molding.

The shoulder planes being produced these days by premier tool manufacturers allow even novice woodworkers to have success with this versatile tool. All aspiring furniture makers should have one. □

Bob Van Dyke runs the Connecticut Valley School of Woodworking.

Clean up profiles

Adjust rabbets and profiles. Shoulder planes are perfect for reaching into places other planes can't, letting you cut all the way into the corners of rabbets and enabling you to trim molding details a block plane wouldn't be able to access.



■ POWER TOOLS

Big miter saw cuts accurately

THE GRIZZLY PRO T31635 is a double-bevel sliding compound miter saw that's well made and well thought out. The saw performed very well. My work includes light construction, architectural details, cabinetry, and furniture, and this saw was well-suited for everything I've thrown at it. It has enough power to cut through 8/4 maple or a double stack of 2x12 Douglas fir. The saw can also handle compound cuts. Regardless of the configuration, the saw cuts true, leaving joinery-ready surfaces behind. Changing and locking the angle are both very intuitive, and the stops for angles are all accurate.

The T31635 also has a built-in LED worklight, a laser cut guide, an aluminum crosscut fence with extensions, locking bed extensions with flippable stops, an integrated hold-down, and a 1½-in. dust port and bag. It's important to note that with its impressive crosscut capacity the saw requires almost 4 ft. of clearance front to back.

—Josh Finn is a furniture maker in the Hudson Valley of New York.

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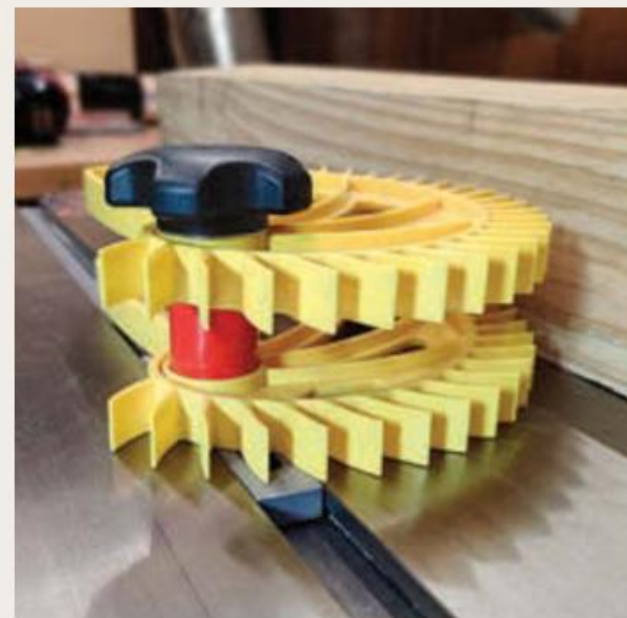
■ TOOL NEWS

New tools to look out for

Festool is releasing its **STM 1800** Mobile Sawing Table, a knockdown worktable for letting one person load, tip, and align large sheet goods by themselves. The table securely supports sheet goods up to 10 ft. by 7 ft., and it doubles as an assembly bench. It pairs with Festool's portable track saws and guide rails to create a mobile panel saw station.



The popular **Hedgehog Featherboard** (FWW #269) is getting some extra capacity. There's now the **HH-30** Tall Stacking Accessory, which spaces two Hedgehog featherboards 1½ in. apart, combining for a total height of 2¼ in. This extra space allows more control when working with thicker stock or resawing.



For hand-tool maintenance, **Jet** is introducing its **JWS-10**, a new variable speed wet sharpener. It comes with a 10-in. by 2-in. 220-grit aluminum oxide grinding wheel with a ½-in. arbor. The sharpening wheel's speed is variable from 90 rpm to 150 rpm. The wet grinder also includes a storage tray for holding jigs and accessories.

—Barry NM Dima is an associate editor at Fine Woodworking.



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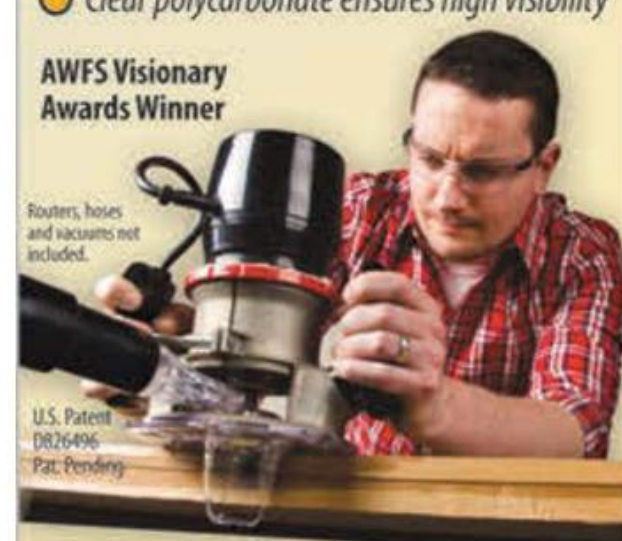
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Restored log shop

BY KAREN MCBRIDE

Reclaiming the past. To build her log shop in rural Ontario, Karen McBride dismantled and restored a long-abandoned house. Inside, she has equipped the shop with an array of restored vintage machines and hand tools along with more recent models.



As a kid I spent weekends at our family's old, derelict grist mill. The mill had no running water or power and its windows were large, glassless, gaping holes. It was like camping indoors, alongside millstones and massive pulleys and gears. Those weekends fostered a passion for decrepit musty buildings and mysterious machinery. So the seed was planted long ago for my shop of today, an early 19th-century log building that had stood vacant and deteriorating for decades when I found it, dismantled it, and rebuilt it on my farm in Ontario, giving it a solid foundation, new chinking, and packing it with woodworking equipment.

As I planned the layout of my log workshop, my affection for big vintage machines provided a constant reminder that workshops come in only one size, and that's too small. But space and machine layout were not my only considerations. All along the way my choices made the shop personal as well as functional. An inspirational workspace is important to me, as it feeds my soul and encourages me to do my best work.



Repurposed pieces

I often repurpose old furniture to make workstations or storage units. There are many examples in my shop, but let me describe one of the most notable. Created from an old mahogany kneehole desk, it is the outfeed table for my tablesaw. But it's a lot more than an outfeed table.

I removed the original desktop and replaced it with a subtop made by laminating four layers of $\frac{3}{4}$ -in. plywood, producing a 4-ft. by 5-ft. work surface that is massively strong and solid and cantilevers beyond the desk's original footprint. I drilled holes through the subtop on 4-in. centers across the whole surface, making it an ideal steam-bending table. I use holdfasts to fix bending forms to the subtop wherever I need them.

To make the table useful as a downstairs workbench (most of my handwork happens at a traditional joiner's bench upstairs), I bolted a sheet of $\frac{3}{4}$ -in. Baltic-birch plywood to the subtop, using insert nuts to facilitate easy removal. I drilled rows of holes through the Baltic birch (aligned with holes in the

Online Extra



Rescue story. Karen McBride lays out in this article much that she has done inside her shop. To read the inspiring story of how she found, moved, and rebuilt the 200-year-old log building with help from friends and her father, go to [FineWoodworking.com/286](https://www.finewoodworking.com/286).



Power desk

McBride is wizardly at repurposing old furniture for use in the shop. This mahogany kneehole desk is the outfeed table for her tablesaw, but it's also a multi-functional workbench and steambending table, and its drawers are home to six routers and a bevy of other tools and supplies. Oh, and its kneehole is the garage for her shop vacuum.

Quick fix for a vise. So she can set up auxiliary vises temporarily—but firmly—McBride bolts each one to a special pegged platform. Holes in the worktable accept the pegs and a threaded hold-down locks the vise in place.



Converting to steam. When she needs a place to set up steam-bending forms, McBride removes the top from her outfeed table, revealing the rock-solid subtop below. Made by laminating four layers of $\frac{3}{4}$ -in. plywood and lipped with solid wood, the subtop has holes drilled on 4-in. centers to accept holdfasts.

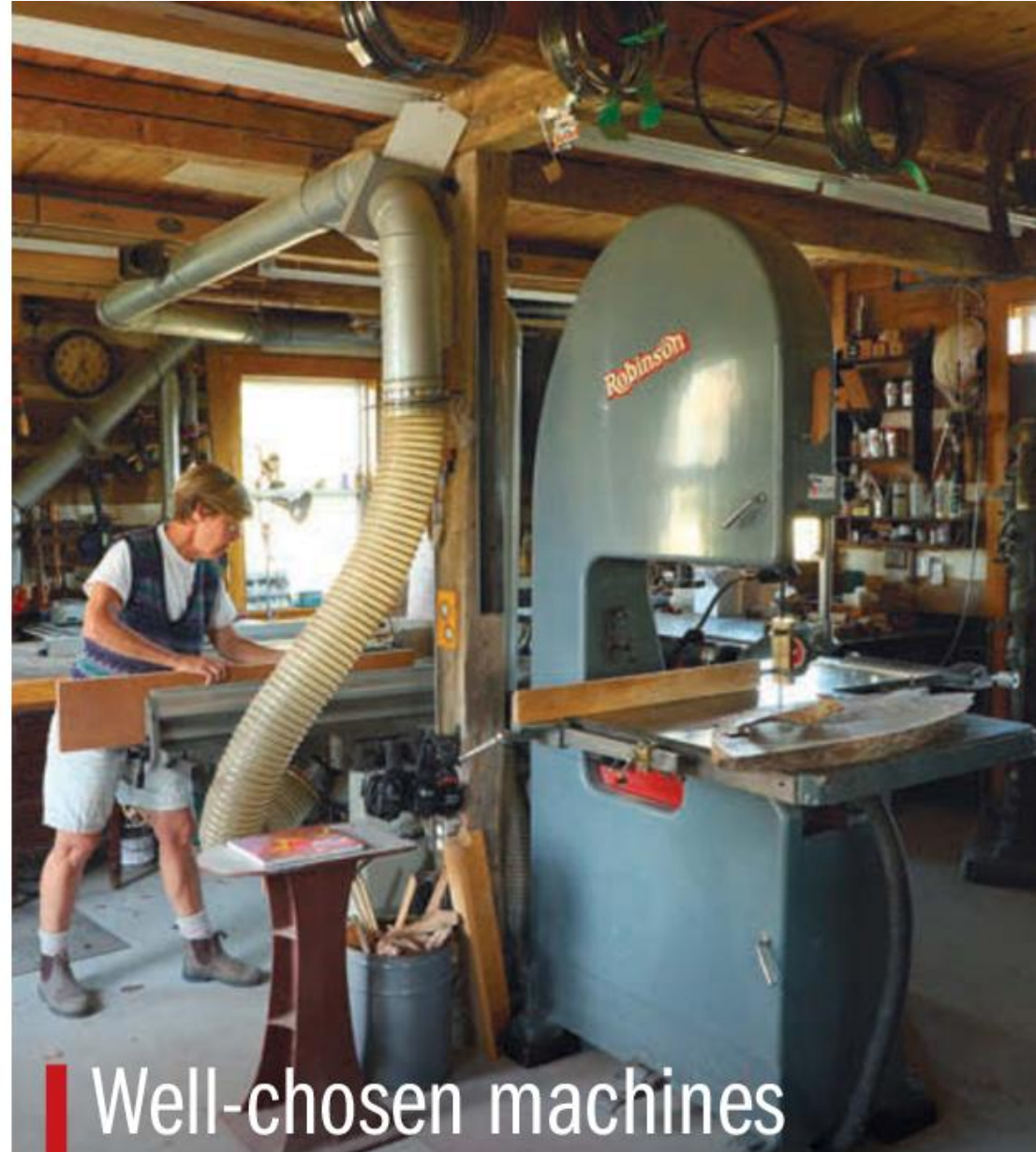
subtop) to hold bench dogs for a front vise and a Veritas insert vise. The holes are sized to work with Festool accessories too.

I drilled some additional holes in the benchtop that let me temporarily mount my mechanic's and guitarmaker's vises. Each vise gets bolted to a platform with two pegs underneath, and the pegs fit into holes in the benchtop. A hole in the platform accepts a threaded holddown that securely fastens the vise for brute force work. These auxiliary vises can be set up in a few seconds and just as quickly removed to restore the outfeed path for the saw. I cut stopped dados in the benchtop to accommodate the tablesaw's crosscut sleds.

The desk's knee-hole cavity turns out to be a top-notch home for a shop vacuum. And with an air line dangling from the ceiling above, the desk is a fine place for sanding. The deepest desk drawer has enough room for six routers while other drawers store sanding supplies, screwdrivers, and wrenches.

Old iron

The beating heart of my shop is a 24-in. Robinson EY/E bandsaw made in Britain in the 1960s. At 1,800 lb. and 7 ft. tall, it is the smallest bandsaw that Robinson ever made! The saw is powered by a 3-hp, 208–220 volt three-phase direct-drive motor that I wired to a dedicated variable frequency



Well-chosen machines

A beautiful beast. The British-made 24-in. Robinson bandsaw McBride restored stands 7 ft. tall and weighs just under a ton. It's a towering presence in her shop, but it's the smallest model Robinson ever made.



Type cutter's tablesaw and a colony of grinders. Designed for printers who used it to cut lead type for letterpress printing, the Hammond Glider sliding tablesaw (left) delivers great precision in a small space; the top of this 1960's version measures 22 in. by 21 in. McBride mounted her grinders and polishers in a corner of the shop (above) to segregate their grit and filings from other work areas.



Smart, simple storage

Scraps on the move. McBride's scrap bin, equipped with heavy-duty wheels, is usually tucked under the side table of her tablesaw, but it glides smoothly to wherever she's working.

drive (VFD), which provides electronic phase conversion. The Robinson's massive bulk all but eliminates vibration, the bane of all hand and power tools. I set the saw on riser blocks so a workpiece being sawn rides from the Robinson's table right over another vintage machine, a Hammond Glider tablesaw.

The Hammond Glider, an object of devotion among certain precision-loving woodworkers, was originally used by printers to cut metal letterpress typeface blocks. The Glider's sliding table has a 90° miter fence, or "finger assembly," that cannot be removed and a blade that does not tilt, making the saw's limitations its strong point. The deadly accurate miter fence and its micro-adjust, indexed stop are perfect for fine joinery work. In addition, the saw's cam clamp gives the Glider the ability to cut the very tiniest workpieces. Although the saw has no dust collection, its closed body and airflow force sawdust into the rolling "chip buggy" bin (complete with a handle) housed in the base of the saw. The Glider's Art Deco lines, its heft, and the quality of its materials and workmanship set it light years ahead of (or perhaps I should say behind) today's machinery.

My grinders and polishers hang on the wall in one corner of the workshop, placed there to keep metal filings well away from benches and tools. This concentrated setup operates



One concrete concept. Sonotubes, the inexpensive cardboard cylinders used for pouring cast concrete columns, provide the perfect way to utilize odd-shaped empty spaces for storage of long, thin scraps and other items. Using tie straps, McBride hangs Sonotubes between the rafters, under her outfeed table, and elsewhere.





No wasted space

A drawer on the floor. To take advantage of dead space beneath the stairs, McBride built a drawer to fit. She tacked strips of slippery UHMW plastic to the bottom, which makes it easy enough to drag in and out.



How to file finishes. As every woodworker knows, finishes propagate like bunnies. McBride finds that a lateral three-drawer office file cabinet serves beautifully as storage for a huge population of jars, cans, and bottles.

successfully by placing the polishers with the finest grits above the coarser ones, as coarse grit on a fine polishing wheel would be a nightmare. I can stand or sit to use the sharpening grinder. Mounted 27 in. off the floor, it has a 6-in. wheel for hollow grinding and an 8-in. wheel to sharpen turning tools.

Savvy storage

My log workshop is 1,000 square feet, spread over two floors, but I still treat it like a boat and use every inch of storage space possible. To create storage space overhead, I hang durable and inexpensive cardboard Sonotubes (forms for pouring cylindrical concrete columns) between the rafters. For long skinny items that get regular use, like drawing paper or vacuum-pressing bags and mesh, I'll mount Sonotubes under the overhang of a table or bench.

Not wanting to waste the dead space under the first few treads of the shop staircase, I fashioned a sliding drawer to fit there. The drawer is a simple plywood box with UHMW plastic runners screwed to its underside. The runners allow me to slide it out from under the stairs. The same system could suit other confined floor-level spaces, such as under a workbench.

Pound for pound, my most efficient storage system is a three-drawer lateral filing cabinet that I use to house finishing supplies. The full-extension drawers not only store a massive amount of material but also allow me to see their entire contents at once. To differentiate finishing containers with similar-looking lids, I label the tops with a marker.

I garnered many shop storage tips during my internship with



Cluster your clamps. Applying an idea she gleaned while apprenticing with fellow Ontarian Michael Fortune, McBride built racks that allow her to stack clamps and arrange them in dense groupings.



Walk upstairs into a haven for hand tools. McBride's workbench and most of her carefully selected hand tools are found on the shop's airy second floor. Into the risers of the stair she carved a quote from the writer Antoine de Saint-Exupéry: "Perfection is achieved not when there is nothing more to add, but when there is nothing left to take away."



Upstairs hand-tool shop

A new function for old furniture. A painted sewing table from a garment factory provides a generous surface for drawing or reading plans. And a vintage dropfront desk with pigeon holes and flanking shelves, purchased for \$50, made an instant hand-tool cabinet.





Michael Fortune, but none as handy as his stacking clamp storage system. Stacking clamps one on top of the other greatly increases the storage density and enables you to grab a fist full of clamps with just one hand.

The large, easily accessible rolling scrap bin I built, which lives beside my tablesaw, not only squirrels away potentially useful pieces of wood but can quickly be rolled anywhere to be filled while I work.

Spray booth for a skydiver

Sometimes spatial constraints are a gift. I like to spray finishes but I didn't want to dedicate shop space to a permanent spray booth. Confronted with this dilemma, and with an odd configuration of walls around the dormer window on the second floor of the shop, I came up with a design for a collapsible spray booth with walls made from parachute fabric. Between uses, the fabric is rolled up and stored in wall-mounted PVC tubes. When it's time to spray, I simply unroll the fabric panels and secure them to tie-off points with bungee cords. I mounted an exhaust fan on a hinged bracket screwed to the ceiling. That way I can store the fan against the ceiling, but when it's needed I simply release a cord and swing the fan down into the window for use. Once the lights and fan are plugged in, I am ready to spray.

SUDDENLY, A SPRAY BOOTH



Parachute panels. Pulling a sheet of parachute fabric from a length of PVC central vacuum tubing, where it is rolled for storage, McBride unfurls one wall of her temporary spray booth. Once it's pulled fully open, the fabric wall is held in place with bungee cords stretched to tie-off points.



The fan is handy. Mounted on a bracket that is hinged to the ceiling, the fan is fastened overhead most of the time but lowered down into the window when needed.



All ready to spin and spray. The stand for McBride's rotating spray table is made with two threaded cast iron pipes, one nested inside the other. One attaches to the car rim at the floor, the other to the tabletop.

My log shop is a simple, rustic structure, and most of the tools inside were made when the aesthetic design of a bandsaw was as important as its working guts. Together, my shop and tools create more than just an inviting place to work. They guide my creative dance and instill in me a sense of adventure and delight. □

Karen McBride, who makes furniture and sculpture in Dunrobin, Ont., Canada, also teaches and writes about her craft.

Twenty Years with a Tool Chest





A good tool chest can be a flexible way to store and protect hand tools

BY CHRISTOPHER SCHWARZ

While many woodworkers regard tool chests as antiquated or quaint, I have found that they can offer the perfect combination of protection, access, and flexibility for storing hand tools.

Fortunately, the simple and common forms of chests are far more useful than their fancy, inlaid cousins with French-fitted compartments. My chests are tools themselves, and I design them to be used for the long term. From its size to its mode of storage, a tool chest should aid your work, not hinder it, even when your work inevitably evolves. After decades using them, I've learned many of the advantages, and a handful of the disadvantages, of working out of tool chests. I've also learned how to stack the odds in my favor.

Two main designs

I mostly work out of either a full-size floor chest or a Dutch tool chest. The former is time-consuming to build but holds more tools. It is also stronger. The floor chest's shell is typically dovetailed together and wrapped by skirt boards, which are also dovetailed. The bottom boards are nailed in place. Skids attached to the bottom let the chest slide easily if it has no casters. The lid has a dust seal. Inside, there are usually two or three dovetailed tool trays that slide forward and back. Sometimes there are tills for saws and molding planes.

The Dutch chest, being smaller and simpler, is easier to travel with and quicker to build. The chest sides are dovetailed at the bottom corners. The shelf is captured in a dado. The rest of the parts are nailed or screwed in place. The chest has a sliding lock on its fall-front. Historically, these chests didn't have many dividers or tool holders. Most had only one divider in the top compartment. Some had a drawer, either below the top compartment or attached at the base of the chest. Some chests are a little taller and have two lower compartments.

Despite their differences, the pros and cons of each, as well as my strategies for working out of them, are largely the same.

Portability

If you take woodworking classes (or teach them), a tool chest is ideal for travel.

Whenever possible, I take the entire floor chest with me. This ensures I won't forget an essential tool. With heavy-duty locking

Traditional floor chest

These chests are sized to fit a complete array of hand tools, from saws to chisels to molding planes, and are designed to keep storage flexible.



Ready to roll. A chest puts all your hand tools in one place, not spread out across a wall. And when the chest is on casters, you can roll it to the work, ensuring your tools are always close at hand. Schwarz relies on the flat frame-and-panel lid as a place to glue up panels (inset photo), knowing the surface won't introduce twist.



Open trays that slide. These tills allow you to store lots of tools in a small space, and because they slide it's easy to access any tool in the chest in one or two moves.



Plenty of open storage below. The standard size of a floor chest provides enough space for a good set of bench, joinery, and molding planes, plus plenty of the saws and other tools you'll need for furniture work.

BIG AND STRONG

Overall dimensions, 24 in. wide
by 24 in. tall by 40 in. long



Dutch tool chest

Quick to build and great for travel, this chest holds the necessities, and then some.



Built for travel. A Dutch chest fits a surprising number of tools but still can be carried by one person, making it an excellent option for use in small shops, and for taking to woodworking classes and job sites. Just grab the handles, put the backboards against your chest, and go.

casters screwed to the bottom of the chest, it's a one-person job to roll the chest up a ramp into the back of my pickup truck. In fact, at about 40 in. long, it fits nicely between the wheel wells of any car.

Even if I am just rolling it across the shop, the chest keeps my tools in one place, so I wander around less looking for them. Besides, the flat top of a chest is great for gluing up panels. I've used mine like this for years. I know the top is flat, so it won't twist a glue-up. Flat-top chests were also frequently used for handsawing.

When I don't need my entire tool kit, I take my Dutch chest, which still holds a surprising number of tools. It's so lightweight I can carry it alone even when it's fully loaded, jointer plane included.

Still, portability has downsides. If you can easily move your chest, so can thieves. In my neighborhood, however, a burglar is more likely to walk past a chest filled with hand tools to steal the cordless drill next to it. Regardless, I still lock up my tools, which leads to my next point.

Physical protection

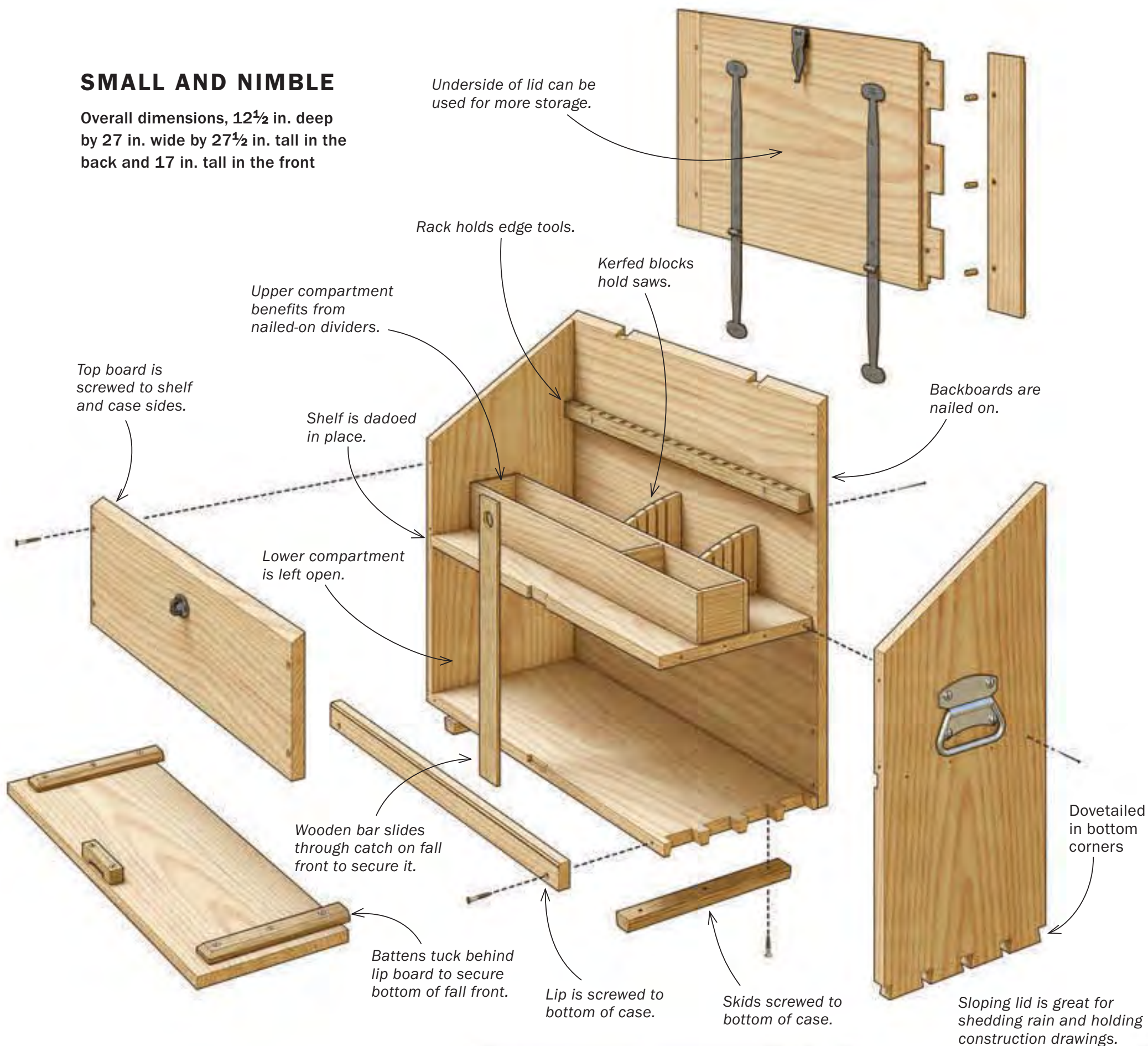
One big advantage of tool chests compared with open racks or pegboard is that a chest protects your tools from rust, rain, and casual borrowing. Tools that are protected by a chest can look like new after 100 years.



Sized for storage. With its removable front, the lower compartment of a standard Dutch tool chest allows you to store molding planes and other joinery planes so you can see their profiles (top), and even the underside of the lid makes for good storage space. The upper compartment is easily modified with simple racks and compartments.

SMALL AND NIMBLE

Overall dimensions, 12½ in. deep by 27 in. wide by 27½ in. tall in the back and 17 in. tall in the front



Chests are ideal if your shop lacks HVAC; I've found the sealed environment protects tools from humidity in most climates. Unless you're in a high-humidity place like Hawaii or Florida, you probably won't need to go to extra lengths to ward off ambient moisture. Also, tools stored in a chest need a lot less dusting or vacuuming than those on open racks.

And though you hope it never happens, if your shop is damaged in a storm, a chest will protect your tools from the rain. In fact, the Dutch chest's slanted lid is designed to shed rain (among other things). A side benefit of that slanted lid is that it's great for displaying construction drawings.



FRONT VIEW



SIDE VIEW

Straightforward storage

No matter the chest, keep tool spaces simple so your chest can evolve with your tools and interests.



Nailed-in dividers for everyday tools. To guarantee space for his most frequently used tools, like his block plane, Schwarz nails dividers into place. This makes them quick to install and a breeze to remove.



Racks with holes and spacers. A simple rack with holes holds and protects a variety of narrow tools. The tools are easy to move around and reorganize, too. Adding spacers between the rack and the chest carcass allows you to store wide tools, such as chisels and saws.

Protect delicate edges. With open trays and compartments, your tools can jostle around. To shield sharp edges from dings, Schwarz covers them. For example, he keeps his marking knife in a wine cork. Tool rolls also work.



Safe as a kangaroo's pouch. Like the racks, shopmade leather pouches offer durability and fast access. This one, sewn and riveted together using leather scraps, takes advantage of the open wall space on a Dutch tool chest.



If you work in a group shop, a closed chest lid—particularly one that's locked—reduces tool borrowing. Lastly, a chest's finite capacity also limits my tool greed. Most woodworkers don't need three jack planes, and a chest helps keep those urges in check.

Versatile storage

On the whole, I prefer open storage, like trays and spacious compartments, so I rarely make a specialized holder for an individual tool. The fact that the tools touch one another horrifies some woodworkers, but open storage allows you to fit lots of tools in a small space. And they let you easily reorganize based on which tools are the most important at that moment. Just move them to the top tray, like in a traditional English chest, or to the front of the compartment, like in a Dutch tool chest with its open area below. Plus, with traditional trays, your tools are never hidden. No more opening 10 drawers to find the nail set.

Still, I don't want sharp, delicate edges getting dinged in these open trays. I protect these types of tools using tool rolls or wine cork, or I store them in a rack.

I use two types of racks, one with holes and one with spacers. A simple rack with 1/2-in. holes drilled 1 1/8 in. apart holds and protects awls, screwdrivers, cutting gauges,

and dividers without making it hard to reorganize them. A rack set away from the case side with spacers, also called a French rack, works great in a tool chest, allowing you to store tools such as chisels and saws.

For storing handplanes, most tool chests have an open well. A traditional floor chest is sized so there's enough space for a good set of bench, joinery, and molding planes. The lower compartment of a standard Dutch tool chest lets you store your molding and joinery planes so you can see their profiles. Note, though, that these areas don't have dividers or specially fitted compartments. Again, this allows you to reconfigure your tool set without ripping out a bunch of precisely made wooden walls that you constructed right before you bought that new shoulder plane.

Molding planes are usually stored vertically against the back wall of a floor chest with the help of a single divider, which is simply nailed to cleats, making it easily removable. Or the molding planes are stored in a compartment with the toe of the tool facing forward. Either configuration allows you to see the tool's profile with ease.

For storing larger saws, most people go overboard with custom-fitted holders for the handles. While some saws were stored that way in old chests, I prefer using blocks of wood on the floor of the chest that are kerfed to hold the sawblades.

Divide with discretion

Admittedly, there are times when I do prefer dividers and dedicated tool holders. I make these for tools that I'll need no matter how my work changes in the future. In my Dutch tool chest, I have built dividers sized for a jack, a jointer, and a smoothing plane—core planes it's difficult to imagine working without. Still, these dividers are pine scraps pinned together without glue. That makes them easy to pry out and reconfigure should I take up knitting.

Also, sometimes it's easier to make tool holders out of leather than wood. If you own a utility knife, nail snips, and a hammer you have all the tools you need to rivet together simple leather tool holders. For example, I made a leather pouch for my block plane using scraps from a chair commission and copper rivets from a local store. □

Christopher Schwarz is a writer and furniture maker in Covington, Ky.

Photo, bottom right: David Lyell



Other forms

FARMER'S TOOL CHEST

This simple chest is a nailed-together pine box with a lid. The bottom boards are nailed or screwed on. Casters are attached to the bottom of the chest to make it move easily. The interior can be completely open, though some chests have one or two sliding trays. The only seals against dust or rust are simple battens on the ends of the lid. A typical size is 15 in. deep by 36 in. wide by 17 in. high.



GENT'S CHEST

These chests were designed to hold a few tools for home repair or hobby woodworking. They come in many configurations, from an inlaid and dovetailed box down to a nailed-together crate. Their common characteristic is they are too small to hold a full kit of hand tools for a furniture maker. A typical size is 12 in. deep by 15 in. wide by 12 in. high.



SITE BOX

Commonly used for carpentry, briefcase-like tool chests were adopted by some woodworkers in the 20th century. This box held a couple saws, a couple planes, a brace and bits, and the other tools you might need to install cabinets in a customer's house. A typical size is 5½ in. deep by 26 in. wide by 15 in. high.

Crosscut Sleds for Joinery

Quick to make and easy to store,
these sleds are a must for every shop

BY MICHAEL PEKOVICH

I've always considered making a crosscut sled a big undertaking. I worked hard to get mine as accurate as possible and then I tried to hang onto it as long as I could. My current go-to sled has been around for a couple of years now and the surface and fence have been patched up a number of times due to the odd dado or miter that I needed to cut.

However, when I began to travel more to teach, I would often put together a quick sled from scraps and use a pair of miter gauges as runners. The miter gauges allowed me to fit the sled to saws with varying miter slot spacings, but they also did away with the fussy chore of mounting runners. Of course once I had them around the shop, I tended to use them quite a bit.

While my everyday sled is still great for crosscuts, I use the others for specific joinery jobs—such as cutting dadoes, miters, tenons, or dovetails—those that require a wider blade or one tilted at an angle. Luckily, these tasks don't require big sleds, so it's easy to keep a number of them stacked in a corner and ready to go when I need one.

Michael Pekovich is Fine Woodworking's editor and creative director.



DOVETAILS

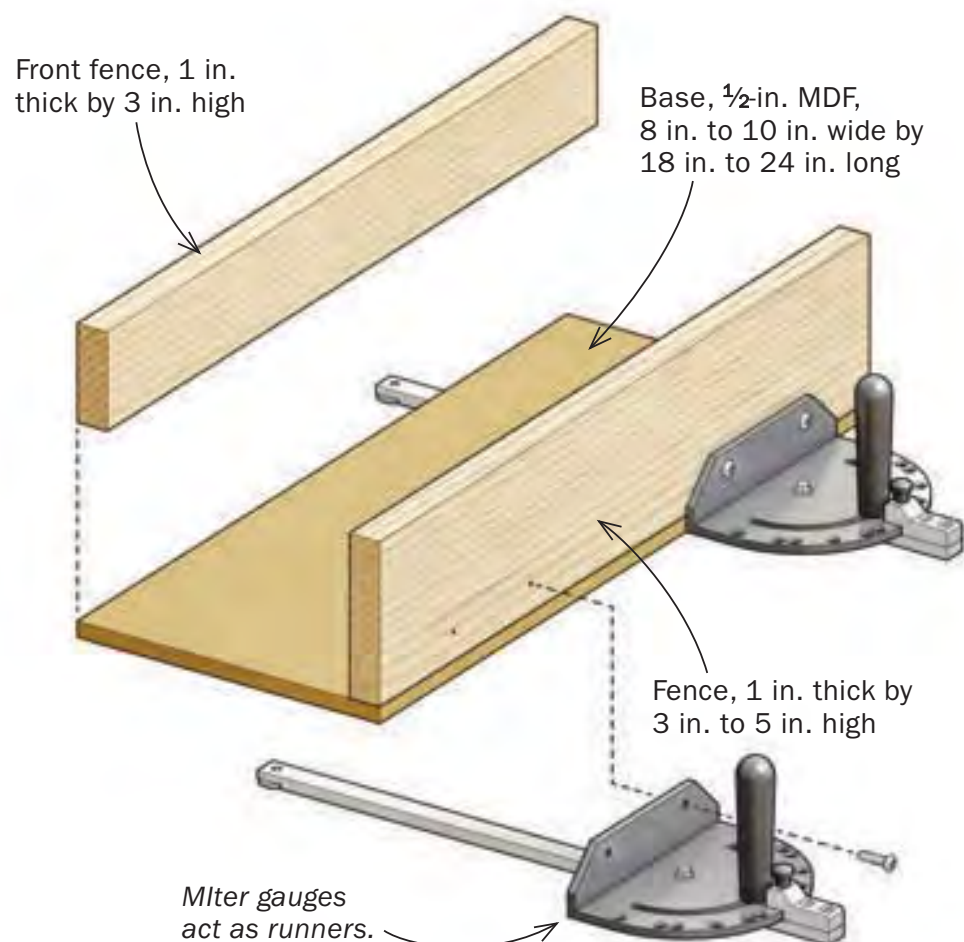
A SLED FOR EVERY JOB

Put away your crosscut sled and turn your tablesaw into a precision joint-making machine with these single-task sleds. From dovetails to tenons and miters to box joints, these simple sleds combine to handle essential tablesaw joinery. Small and easy to make, they store out of the way until you need them.



DADOES

Size the sled to the task



For jobs where the stock is positioned vertically, such as dovetailing, tenoning, and cutting box joints, the depth of the sled can be minimal, but a higher fence will serve you well. Conversely, a sled for dadoses may need to be deeper depending on the width of your workpieces. The sled for mitered boxes is wider in order to support the offcut.

For the base, I use 1/2-in.-thick MDF or Baltic-birch plywood. A stable hardwood is nice for the fences, and I often glue up



No runners needed. Glue and screw the fences to the base, making sure to keep the screws well clear of the blade area. Instead of adding runners, attach a pair of miter gauges to the rear fence.



scraps to make them. I glue and screw the fence to the base, keeping the fasteners clear of the cutting area.

For most of my joinery sleds, I screw the miter gauges directly to the fence. On my box-mitering sled they bolt to a T-track, which I'll explain later. Either way, if you check to make sure that the miter gauges are square to the blade, once you attach them to the sled, it should be square as well.



BOX JOINTS



TENONS



MITERED BOXES

Dado sled: Add stops for accuracy

For dados in large projects, I'd need a larger sled, or I might skip the tablesaw altogether and break out a router. But for smaller wall shelves and cabinets, this 10-in. by 24-in. sled with a 3-in.-high fence can handle the job just fine. Typically, I clamp a stop block along the fence and register the end of the workpiece against it when dadoing, but for stock that's longer

than the sled, I use a hook stop instead. A hook stop consists of a long arm with a stop screwed to one end. By clamping the arm to the crosscut sled fence I can set the stop beyond the length of the sled. To help keep the hook stop level, screw a cleat to the top edge of the arm. The cleat rests on the top of the fence and keeps the stop level when clamping.

A simple stop for repeatable cuts. A cleat screwed to the top of the stop rides along the fence and helps to keep the stop square when clamping. It also elevates the bottom of the stop off of the base of the sled, preventing sawdust from getting trapped between the stop and the workpiece.



Extend your reach with a hook stop. This stop is a great way to handle stock that's longer than the sled base. A cleat along the top keeps the hook stop level and makes positioning and clamping easier.



A tall fence for tenons



I typically use a tenoning jig or dado blade for single tenons where the tenon is parallel to the face of the part. But double tenons that are perpendicular to the face of the board can be trickier

to cut that way, and a dedicated crosscut sled can make the job much easier. The sled doesn't need to be very deep, but a tall fence will help you secure the work more easily. This sled is 9 in. deep by 18 in. wide with a 5-in.-tall fence. I clamp a tall stop to the fence for the edge of the stock to rest against. The stop is the same height as the fence and long enough to provide room for a pair of clamps.

To hold the workpiece in place, I use a notched hold-down made from MDF with a strip of sandpaper glued to the notch to keep the workpiece from shifting.



Hold it steady. A hold-down secures the part for accurate tenons. A notch in the hold-down helps to keep the part snug in place. Angle the face of the notch so that it is parallel to the stock when its opposite end is placed against the fence. Sandpaper glued to the notch adds extra insurance against shifting during the cut.



Support for long stock. A tall fence and stop make tenoning safe and easy. For tenons perpendicular to the face of a board, a sled can be a better choice than a tenoning jig.



A sliding fence for box joints

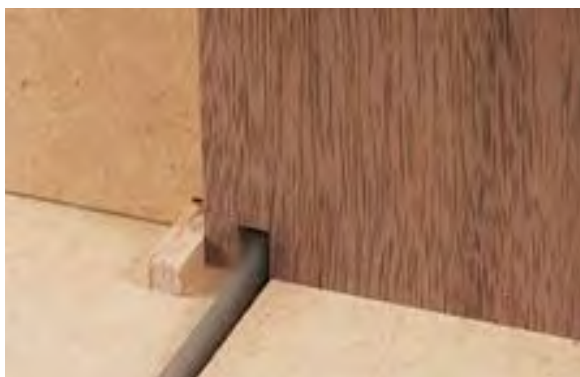


The key to accurate box joints is using an indexing pin that each successive kerf fits onto. The pin must be accurately positioned in relation to the blade, and you have to make small adjustments to dial in a perfect fit. The best way to do this is to glue the pin into a notch in a piece of MDF and clamp the MDF to the crosscut sled's fence. By loosening the clamps slightly and tapping the MDF one way or the other, you can quickly work toward a perfect fit. I use my tenoning sled for this job.

The pin must be the exact width of the kerf but this is easy to do. Cut a notch in the MDF using the same blade you'll use to cut the box joints, and trim a piece of stock to fit the notch. Cut a short length off one end and glue it into the notch. To position the auxiliary fence, place the remaining length of the pin stock against the blade and slide the fence over until the pin is snug against it. This should get you close, but you'll need to make a test joint to verify the placement. Make a series of fingers on the ends of a pair of boards by cutting a notch near the edge of the board, then slipping that notch onto the pin and repeating the cut. Any error in alignment will be multiplied by the number of fingers in the joint, so any minor adjustment will have a big effect on the fit. If the pins are too narrow, move the indexing pin away from the blade. If the pins are too wide, move the indexing pin toward the blade.



Add an indexing pin. Cut a notch in the sliding fence and size a strip of wood to fit it. Cut off an end and glue it into the notch by adding a drop of cyanoacrylate (CA) glue. The height of the pin should be lower than the box-joint notches you'll be cutting so that the parts sit flat on the sled base.



Position the fence. Use the extra length of pin stock to set the distance from the pin to the blade. Start with the stock against the pin for the first cut. Then position the notch over the pin for the remaining cuts.



Dovetails on the tablesaw

When dovetailing a lot of parts, I speed the process by cutting the tails at the tablesaw using a blade ground especially for the job and a small 8-in. by 18-in. crosscut sled equipped with a 5-in.-high fence. On my blade, each tooth is ground 8° in the same direction so that when I tilt the blade to that same angle, the teeth will cut a flat-bottomed groove with angled side walls.

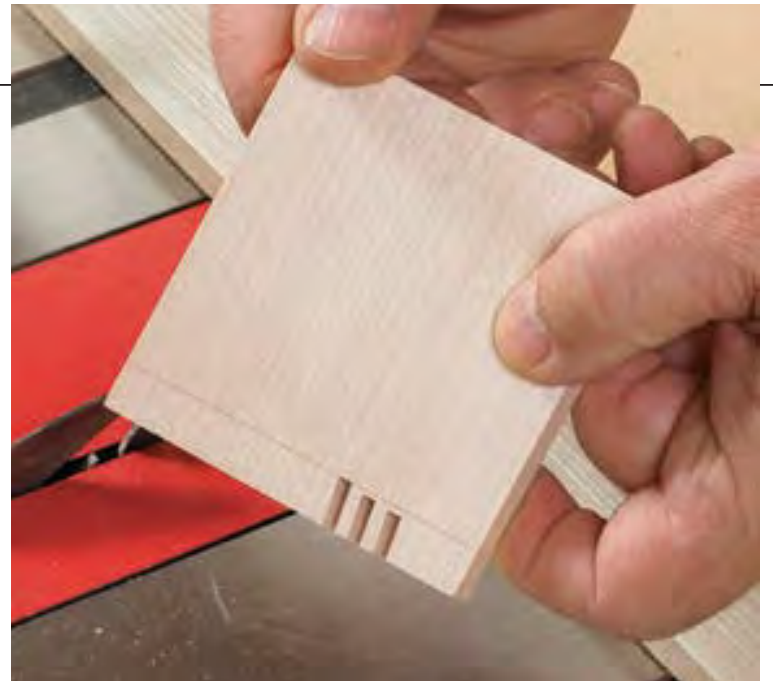
The boards stand on end, so the tall fence helps to keep them steady during the cut. To dial in the height of the blade, scribe a shoulder line on a piece of scrap. Starting with the blade lower than the shoulder, make test cuts, raising the blade between each one until it just hits the line. Rather than marking the tails on every board, I'll mark centerlines for the pin sockets on just one board. Slide the board over until one of the marks is centered on the kerf in the sled, and make a mark on the sled base at the edge of the workpiece. Repeat the process for the remaining sockets. The end marks on the sled provide a road map for cutting the rest of the parts.

Layout is quick.

Rather than drawing all of the tails, all you need is a mark at the center of the pin socket. To cut the tails, align each mark with the center of the blade kerf in the sled and make a cut.

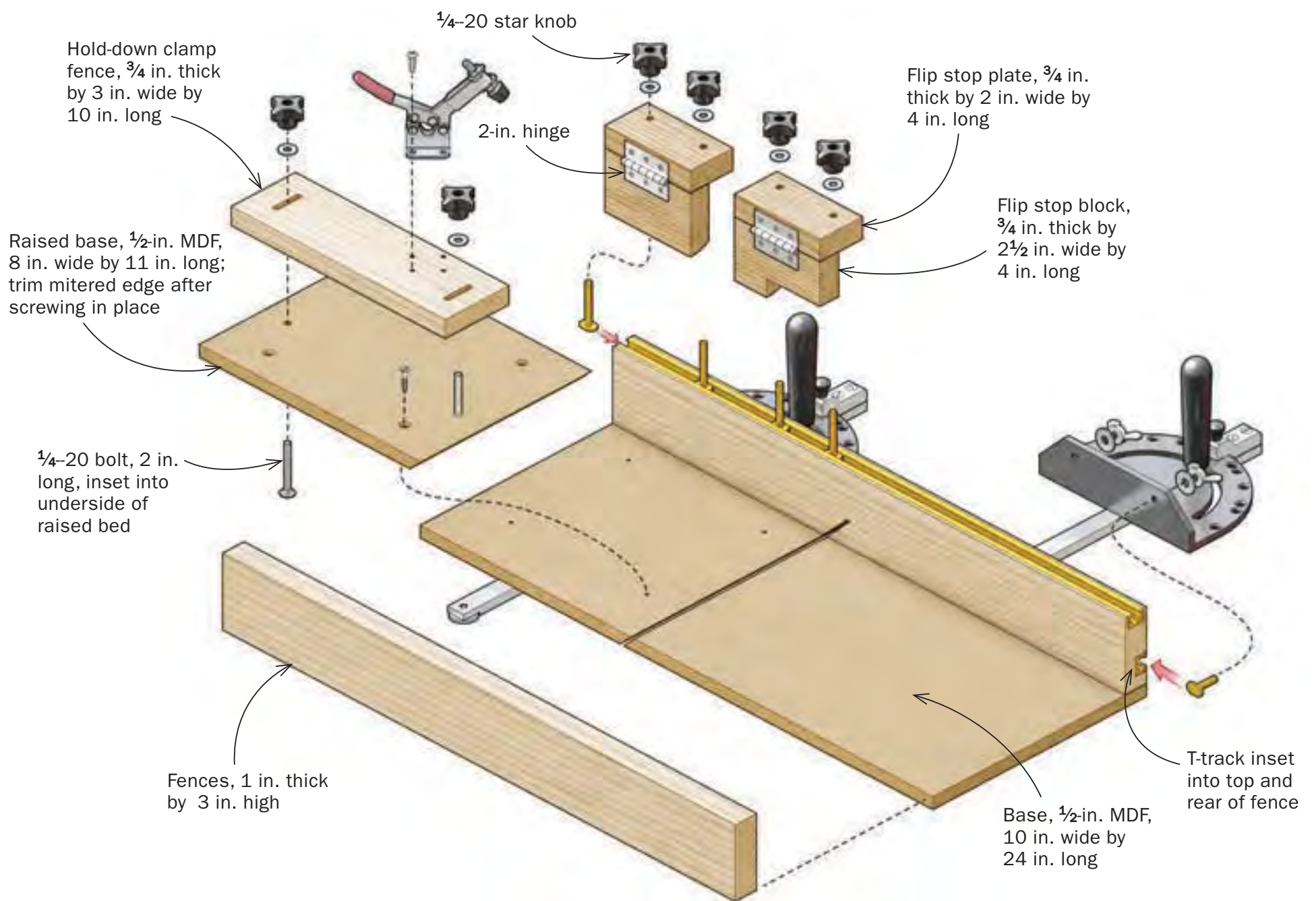


Complete the tails. The first pass will cut half of the tail sides. To cut the remaining sides, rotate the stock and align each kerf in the stock with the kerf in the sled.



Sneak up on the line. Scribe a shoulder line on a test piece, tilt the blade to the correct angle, and slowly raise the blade until it hits the mark.

A dedicated sled for mitered boxes



A mitered box is a simple thing to make, yet a lot can go wrong if you don't take the time to set up properly. I've fine-tuned my approach over years of teaching, and I have an efficient and accurate way to go about it. At the heart is my miter sled. It secures the stock safely and has a pair of stops that allow me to cut all four sides of a rectangular box without changing the setup. Building it required just a handful of inexpensive hardware.

The sled doesn't have to be very deep, but it should be wide enough to support the stock through the cut. I bolt the miter gauges to a T-track in the back of the fence instead of screwing them in place, which allows me to slide the fence sideways for a fresh zero-clearance cut after the kerf has been widened with use. This helps minimize chipout when mitering the box parts. There's also a T-track along the top of the fence that makes adjusting the stops easy. To mount the T-track, run continuous grooves along the top edge and back of the fence. Inset a full-length piece of T-track on the top, but on the back use a pair of shorter tracks, staying clear of the blade area.



Sliding sled. Twin miter gauges bolt to T-tracks inset into the rear of the fence. This allows the sled to be adjusted side to side in order to create a fresh zero-clearance kerf to prevent chipout.



A raised bed. An important feature of the sled is a raised base to one side of the blade. Screw down a piece of ply or MDF that overlaps the kerf, then trim it flush.



Adjustable stops and hold down. A pair of hinged stops attach to the T-track on top of the fence with bolts and star knobs, and allow you to cut box sides of different lengths. The hold-down clamp is screwed to a slotted fence that is bolted to the base.

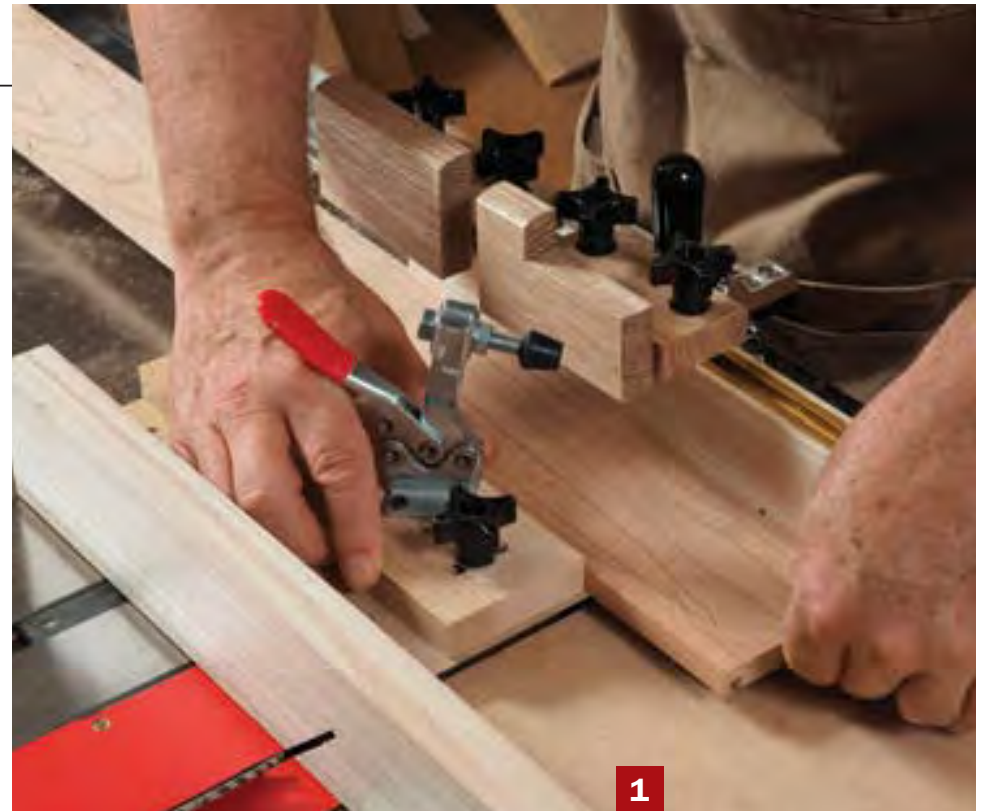
An important feature of the sled is its split-level base: I screw a piece of MDF to one side of the base to elevate it above the other. This allows the offcut to drop away from the blade when cutting a miter instead of being trapped beneath it. My saw tilts left, so I mount the piece of MDF to the right of the blade.

Once the sled is mounted to the miter gauges, tilt the blade to 45°, raise it slightly above the base, and make a cut. Next mount the raised base, which should be sized to cover half the sled base and extend slightly beyond the kerf. Before screwing it in place, drill holes for the bolts that secure the clamping fence, counterboring them on the underside to recess the bolt heads. Next raise the blade to trim the raised base flush with the kerf.

Each of the stop blocks consists of two blocks of wood that are hinged together. The top piece is drilled for bolts that mount to the T-track. The swinging portion of the stop is beveled on the bottom inside corner to allow clearance when lifting it.

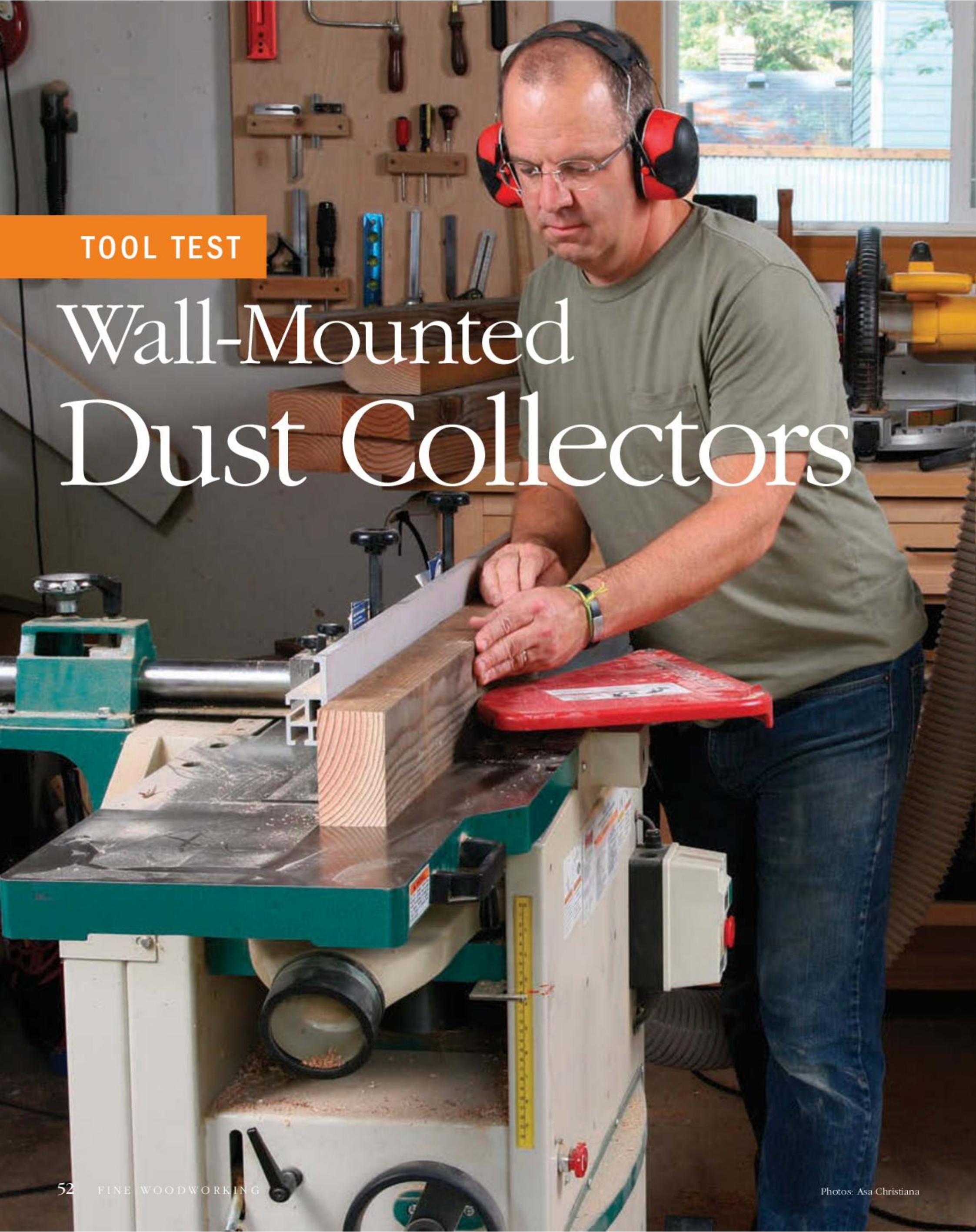
I add a hold-down clamp to secure the parts and keep fingers away from the blade. The clamp is screwed to the adjustable fence that is bolted to the raised base through slotted holes. This lets the sled accept stock of varying widths. To set the fence, slide the fence snug to the workpiece and tighten the star knobs.

To make a mitered box, start with a length of stock that can yield all four sides. Lift both stops and slide the stock in place with one end just past the kerf in the fence. Snug up the clamp fence, tighten the hold down, and miter the end. Rotate the stock, lifting the near stop to allow the newly cut miter to contact the far stop, and make a cut. Rotate the offcut stock, trim a clean miter on the end and repeat, alternating between the near and far stops.



A quick, accurate mitered box.

Start with stock long enough to yield all four sides of the box. Slide it in place and adjust the hold-down fence snug to it to prevent the box parts from pivoting during the cut (1). Clamp the stock down and cut a miter on one end (2). Then rotate the stock and place the mitered end against the far stop to complete the box side (3). Repeat the process using the near stop to cut a short end of the box (4). Alternating between long and short pieces will result in continuous grain on all sides of the box.

A man wearing safety glasses and large red and black earmuffs is working in a workshop. He is using a large industrial planer to smooth a thick piece of wood. The planer is white and green, with a red dust collector attached to its side. Wood shavings are visible in the dust collector's opening. The background shows a workshop with various tools hanging on a pegboard and a window looking out onto a building.

TOOL TEST

Wall-Mounted Dust Collectors



When woodworkers are considering dust-collection options, wall-mounted models often get overlooked. Designed to save valuable floor space in tight workshops, these come in a range of sizes, with smaller units best dedicated to one machine or two, and larger ones capable of pulling chips at a distance from four or more.

I recently took a close look at six of these units to see how they stacked up. While there are more than six on the market, I limited the field to those with filtration of 3 microns or better. That left in dust collectors with pleated cartridge filters and heavy felted bags, and left out the thin, frankly outdated bags that only grab larger chips and particles, while emitting clouds of fine dust at head height.

I also eliminated cyclone collectors, some of which can be mounted on the wall but are much larger and generally cost much more than these small, single-stage units.

These space-saving units have the power to get the job done

BY ASA CHRISTIANA

Of the six I tested, five are similar in size and power—at $\frac{3}{4}$ to 1 hp—and allow a measure of portability if additional wall brackets are placed around the shop. The sixth is much larger: a heavy $1\frac{1}{2}$ -hp model designed to stay put and connect to multiple machines.

To assess the portability and power of the units, and to see how each model might be used most effectively, I put them through a series of basic tests. Along the way, I looked at their overall chip capacity and what it's like to dump and reattach the bag, a frequent task that should be straightforward.

Real-world power test

The primary test for any dust collector is power, its ability to pull chips through a typical hose of a given length. While manufacturers provide airflow ratings for their units—in CFM, or cubic feet per minute—these are sometimes based on the blower motor only, without the filter attached, which significantly affects bottom-line efficiency.

Two ways to use them

Five of the wall-hung dust collectors we tested are 1 hp or less, and each will do a fine job collecting chips and dust from a machine placed a few feet away. The sixth—a much larger, heavier unit from Rockler—is capable of acting as a central dust collector in small shops.

Single-machine specialists. Use one of the smaller dust collectors as a companion to a larger collector placed elsewhere in the shop. By dedicating a wall-mounted model to one or two machines, you can avoid stretching a long hose from your main collector.



So I devised my own power test, designing it to be fair to the five smaller units but relevant to the big guy too. Using a standard 4-in.-dia. hose, roughly 6 ft. long, I connected each wall-hung collector to my jointer-planer combo machine, and made 100 passes over the jointer with large fir timbers, 2½ in. thick by 30 in. long. The jointer directs chips into the semi-closed chamber between the cutterhead and planer bed where the dust port is located. After each set of passes I could compare how many chips remained uncollected by each unit.

In general, while I could discern power differences between the five smaller units, they were minor. Each one collected more than 95% of the chips and dust produced—the same result I get with my large 1½-hp rolling dust collector, albeit with a longer hose. So I can say with certainty that each of these smaller wall-mounted collectors will do a fine job in your shop, provided that you keep hose runs shorter than 6 ft. or so.

The big unit from Rockler was a different animal, sweeping the jointer chamber almost clean throughout the test, meaning it could handle a much longer hose than the 6-footer in my test—no doubt up to 10 ft. or more—and therefore act as a central unit connected to three or four machines with a system of blast gates.

Bag capacity and attachment are important too

Five of these units have canister-type filters, dropping chips into clear plastic bags that hang below. One Shop Fox model gathers

Larger model can do it all. The 1½-hp Rockler is strong enough to pull chips from 10 ft. away, letting it serve a range of machines in a compact shop on its own. Keep in mind, though, that while wall-hung collectors save space compared to floor models of similar power, they have smaller bags, which means more frequent emptying.





Real-world testing

To compare the power of the units in use, Christiana hooked up each collector to his jointer-planer with 6 ft. of hose, and made 100 passes over the jointer with a 2½-in.-thick, 30-in.-long fir timber. In the process he noted bag capacity, and assessed the ease of emptying each unit.



Joint and check. The combination machine directed chips into a semi-closed space under the jointer table, which has a 4-in. dust port. He lifted one jointer table after 40, 80, and 100 passes to document the chips left uncollected.

chips and dust in the same felted bag that serves as its filter. The five smaller collectors, including the Shop Fox with the felted bag, have nearly identical capacity, with each comfortably accommodating the 100 jointer passes before they had to be emptied.

Strangely, the big Rockler 1250 had the smallest bag, which overflowed with chips before the jointer test was over. However, the taller bag from the Rockler 650 unit happens to fit the 1250 even better, and packs of five are available from Rockler for \$10.

As for emptying and reattaching the bags, the best plastic ones stayed stretched over the bottom of the canister when empty, freeing up both of my hands for re-attaching their long band clamps. The felted bag was more troublesome to deal with.

Reality check on portability and best uses

While some manufacturers suggest that users buy additional hanging brackets and move the smaller models around the shop as needed, I'm not buying it as a solution to whole-shop dust collection. Even the lightest unit is 40 lb., and the models with cartridge filters are all 50 lb. or more. Moving any of those regularly would be a pain in the back for all but the burliest lumberjack. This reality became very clear as I shouldered the units on and off their brackets during testing.

That's why I would consider all of the wall-mounted units I tested as stationary fixtures, with the key differences being the hose runs each can support while delivering effective suction to the end of the hose.

In small shops like mine, one of the five smaller models would make a great companion to a larger dust collector. I probably would put the wall-hung unit near my tablesaw, saving me from dragging a long flexible hose across the floor from my rolling 1½-hp dust collector, which sits near the other major machines. And I wouldn't lose a foot of floor space. So think of the smaller units as companion collectors for out-of-the-way machines.

For even smaller shops, with too little floor space for a rolling unit, the Rockler 1250 could serve as a main dust collector, hung in a convenient spot and connected to multiple machines with blast gates.



Capacity and bag changes. Five of the six bags are equal in size, and easily handled the 100 jointer passes. Ease of bag changes varied between units.



Asa Christiana is a woodworker, writer, and photographer in Portland, Ore.

Wall-mounted dust collectors, head to head

The “good” suction ratings on the five smaller collectors are relative to hose length. If each is kept close to a tool or machine, the efficiency rises to excellent. Chip capacity was virtually equal on the smaller units.



GRIZZLY G0785

Price: \$325 with canister
Motor: 1 hp
Weight: 54 lb.
Filtration: 1 micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Very good



RIKON 60-101

Price: \$450 with canister
Motor: 1 hp
Weight: 54 lb.
Filtration: 1 micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Fair



ROCKLER DUST RIGHT 650 CFM

Price: \$500 with canister
Motor: ¾ hp
Weight: 57 lb.
Filtration: 1 micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Very good

Seemingly identical to the Shop Fox W1844, the Grizzly G0785 collected a few less chips in our test—but was still roughly average among the five small models. Emptying was easy, thanks to a bag that stays in place on the canister while you operate the band clamp, which also works well. Both units hang well on their brackets.

The Rikon's power and capacity are comparable to the other smaller models, but a few issues held it back. Because the chip bag hangs a bit loosely on the canister, it tends to slip off during changes. On the plus side, it's the only small collector with a 5-in.-dia. intake, so if you discard the Y-junction with the 4-in. ports, and run a 5-in. hose closer to your machines, you'll add efficiency.

While all five of the smaller units will collect chips efficiently when deployed properly, the ¾-hp Rockler was just a bit more powerful in our suction test. Bag changes were very easy too, thanks to a lip on the lower edge of the canister, which holds the bag in place while you operate the clamp. The Rockler 650 also hangs very solidly on its bracket, which helps when you turn the filter-cleaning crank.



Easy bag changes. The Grizzly's plastic bag wraps tightly over the canister, freeing up your hands for the band clamp.



Tricky bag. The Rikon bag tends to slip off its canister while you are positioning the band clamp. Practice helps.



Easy bag changes too. A handy lip on the bottom of the canister keeps the bag tightly in place while you operate the clamp.



ROCKLER DUST RIGHT 1250 CFM

Price: \$830 with canister
Motor: 1½ hp
Weight: 78 lb.
Filtration: 1-micron canister
Suction: Excellent
Chip capacity: Fair with standard bag
Emptying bag: Fair with standard bag

The big motor on this collector left the chamber under my jointer very clean. You'll need help to get this heavy unit onto its bracket, but if you're looking for a central dust collector that won't gobble floor space, this may be the unit for you. Strangely, this huge unit comes with the smallest plastic chip bag, but you can replace that with a taller one from Rockler.



Handy remote. The big Rockler is powerful enough to serve as a small shop's main dust collector, and comes with a remote.



Replace the bag. The small bag on the Rockler 1250 is easily replaced with the taller type from the Rockler 650.



SHOP FOX W1844

Price \$450 with canister
Motor: 1 hp
Weight: 54 lb.
Filtration: 1-micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Very good

Although seemingly identical to the Grizzly G0785, the Shop Fox W1844 delivered slightly better suction than the Grizzly. Bag changes are easy on both machines, thanks to a nice-fitting bag that stays in place while you operate the band clamp. And both units hang solidly on their brackets.



Good power. Barely edged out by the Rockler 650, the Shop Fox W1844 demonstrated admirable efficiency after 100 passes.



SHOP FOX W1826

Price: \$230
Motor: 1 hp
Weight: 40 lb.
Filtration: 2.5 micron felted bag
Suction: Good
Chip capacity: Good
Emptying bag: Fair

The thick, felted bag on this Shop Fox is a plus and a minus. On one hand, it makes the unit much less expensive than collectors with canister filters, and also lighter and easier to hang on the wall. Without a separate plastic bag to catch chips, however, they stay in the felt bag, and the shortish zipper on the bottom makes it tough to shake them out. Otherwise, the W1826 is an excellent value.



Head outside to dump it. Packed chips come out slowly at first so it's a good idea to empty this thick bag outdoors.

Hand-Tool Buyer's Guide

Two decades of tool tests reveal the essential kit

BY ASA CHRISTIANA



Whether you're trimming machine-cut tenons for a perfect fit, leveling one surface to another, planing decorative chamfers, or squaring up a router-cut corner, you can count on hand tools to do the job quickly and efficiently. They'll also do it quietly.

Appreciation for the peacefulness and pleasure of handwork has grown markedly in recent years, fueling an explosion of products, from handmade collector's items to excellent factory-made options. But with so many options available, it can

be hard to know where to start. Luckily, *Fine Woodworking* has been conducting real-world tests on the best hand tools for decades now, with the help of a small group of trusted, independent experts.

In this article, I've compiled a list of the tools that came out on top in our tests in each essential hand-tool category. Whether

you're at the beginning of your hand-tool journey, or are looking to make a long-awaited purchase, you can rely on these recommendations to find excellent tools that will soon become trusted friends.

Asa Christiana is a woodworker, editor, and writer in Portland, Ore.

**GOOD
VALUE**

In addition to presenting the best tools in each category, we've also included, where appropriate, a less expensive option that, while it may not quite measure up to the winners, represents a good value for woodworkers on a tighter budget.

Measuring and marking

For hand-tool work especially, success starts with accurate layout. There are lots of measuring and marking tools out there, but sliding squares, marking knives, and marking gauges are must-haves. Here are the best we found.

SQUARES

Phillip C. Lowe tested his two favorite types of squares: the indispensable 12-in. combination square, used for everything from measuring and marking to setting up machines accurately; and the handy 4-in. double square, which fits in your apron pocket and is easier to handle for smaller tasks. After trying out 61 products, he favored Starrett and PEC for both types.

STARRETT 12 IN., \$100

Head is easy to remove and lock down; well machined, easy to read, and an excellent all-around performer.



STARRETT 4 IN., \$80

Head is easy to remove, replace, and lock down; narrow blade, at 5/8 in., made it easier to fit into tight places.



GOOD VALUE

PEC 12 IN., \$80

Very good product; nearly identical to more expensive models from McMaster-Carr and Brown & Sharpe.



PEC 4 IN., \$40

Good fit and feel and comfortable to use; locknut occasionally needed extra tightening.

GOOD VALUE



HOCK VIOLIN KNIFE, DOUBLE-BEVEL, \$33

Heavy blade stayed solidly on track in all situations.



BLUE SPRUCE CLASSIC MARKING KNIFE, \$80

Spearpoint blade with a flat back made it a champ at laying out dovetails.

GOOD VALUE



X-ACTO, NO. 1 PRECISION KNIFE, \$4

Thin, flexible blade was nimble enough to trace delicate inlays.

MARKING KNIVES

As Steve Latta said in his review, “Marking out with a knife instead of a pencil means that you care about the details. A good marking knife will do a number of things well. It will cut wood fibers cleanly, leaving a narrow, crisply defined line, easily visible and deep enough to anchor a chisel. The blade will fit into tight spaces and the tool will be easy to hold in a pencil-style grip.”

MARKING GAUGES

Marking gauges do one thing very well: mark a line parallel to an edge. To narrow a crowded field, Jeff Miller looked at cutting gauges only—those that use a knife or a sharpened wheel to cut clean lines in any direction—and eliminated pin-style gauges, which tend to tear the wood when used across the grain.



TITE-MARK, \$90

Has an excellent micro-adjuster. Can be easily and precisely adjusted with one hand.

GOOD VALUE

VERITAS, STANDARD WHEEL, \$37

An O-ring inside the fence provides just the right amount of friction to hold it where you put it but still allow it to slide, making fine adjustments easy.



Handplanes

There's an overwhelming array of handplanes on the market, for everything from smoothing boards and trimming joints to shaping moldings. The best come ready to make fluffy shavings, save for a quick sharpening. Sharpening is easy too. Thanks to blades with dead-flat backs, they need only a light polish before you hone the bevel.

LOW-ANGLE BLOCK PLANES

These planes are effective on both end grain and long grain, more comfortable in the hand, and less prone to chatter than higher-angle, standard block planes, making them the obvious choice if you're buying just one. As Mario Rodriguez pointed out in his review, a block plane's small size makes it easy to control on an assembled piece, say for chamfering a table edge, and well-suited for jobs like removing machine marks from the edges and ends of a board, planing curved edges, and trimming joinery flush.



LIE-NIELSEN
NO. 102, \$125

Compact, easy to set up and adjust; no better block plane available for the money.



LIE-NIELSEN
NO. 60½, \$165

Adjustable mouth for coarse work or tricky grain; all adjustments smooth and precise; very well-balanced and comfortable to hold.



VERITAS
DX60, \$225

Well made and very comfortable, smooth and responsive blade adjustments, adjustable mouth.



VERITAS
LOW-ANGLE,
\$170

Largest and heaviest of the group; comfortable, with indents for fingers; smooth, precise adjustments, adjustable mouth.

JACK PLANES

If you can afford only one bench plane to start with, Jeff Miller recommends the versatile jack plane, which handles smoothing, but can also be used for the flattening and straightening tasks often reserved for the longer planes. While the standard versions are easier for beginners to adjust and handle, the bevel-up blade orientation in low-angle jacks (bottom row) lets you alter the cutting angle by resharping.

LIE-NIELSEN NO. 5, \$350

Very well-machined; back of the blade perfectly flat; chipbreaker seated fully against the blade; frog/mouth adjustments quick and easy.



VERITAS 5¼W, \$257

Great overall fit and finish; Norris-style adjuster was tight and precise; blade was flat, easy to sharpen; screws in plane body prevent lateral blade movement during adjustment.



LIE-NIELSEN NO. 62
LOW-ANGLE JACK PLANE, \$245

Very well machined, flat blade back, flat sole, and square sides; cut very well; blade and mouth adjustments were precise and easy; using hammer for lateral adjustments takes getting used to.



VERITAS LOW-ANGLE
JACK PLANE, \$252

Adjustable mouth; Norris-style adjuster was tight and precise; blade was flat, easy to sharpen; screws in plane body prevent lateral blade movement during adjustment.



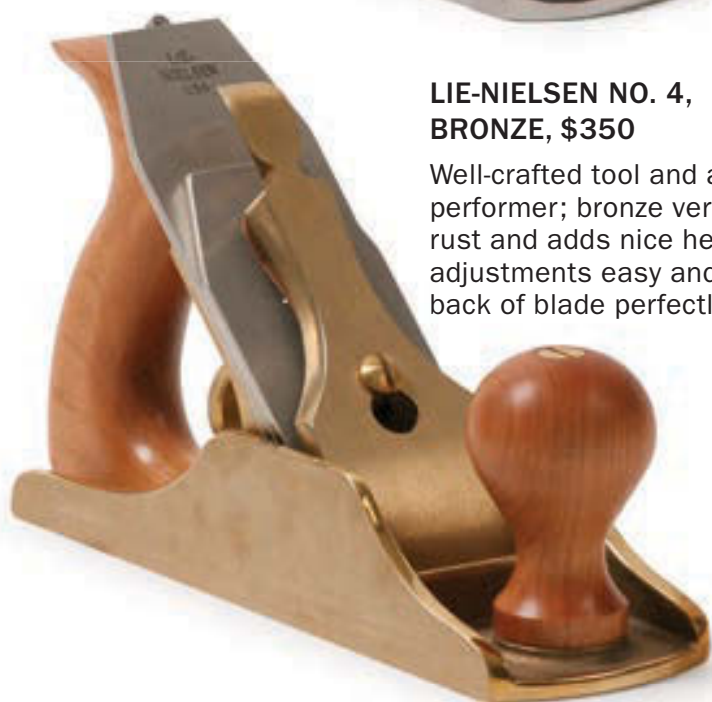
SMOOTHING PLANES

As Chris Gochmour said in his test, “Properly tuned and sharpened, a smoothing plane can leave a pristine finish on almost any board. Yet it is still compact enough to be ideal for general planing jobs like fitting and trimming parts.” Because so much rides on the finished surface, quality means everything with this purchase. All three of our recommendations will deliver flawless results, and all allow mouth adjustments without removing the blade, a big plus.



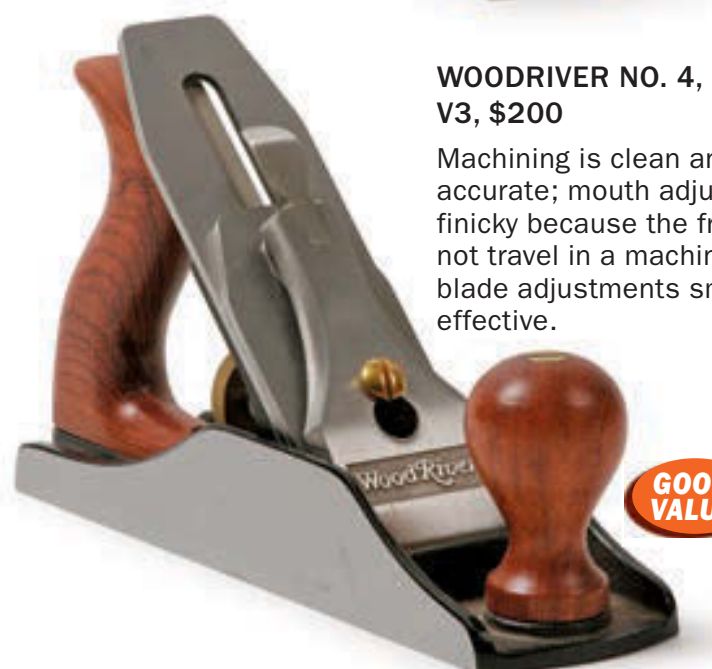
CLIFTON NO. 4, \$390

Handled every test with ease; a hefty tool, but perfectly balanced; thick blade holds an edge well and has a stout, two-part chipbreaker; back of blade needed some flattening, a minor inconvenience.



LIE-NIELSEN NO. 4, BRONZE, \$350

Well-crafted tool and a fabulous performer; bronze version won't rust and adds nice heft; blade adjustments easy and precise; back of blade perfectly flat.



WOODRIVER NO. 4, V3, \$200

Machining is clean and accurate; mouth adjustments finicky because the frog does not travel in a machined slot; blade adjustments smooth and effective.

GOOD VALUE

PLANES FOR TUNING TENONS

Gochmour looked at both shoulder planes and rabbet block planes, the two types of specialty planes he uses for fine-tuning tenons off the tablesaw. While some woodworkers use the shoulder plane on tenon cheeks as well as on shoulders, many turn to the wider rabbet block plane to shave thin, precise layers off the cheeks. Both tools excel at cutting into corners, but used in tandem they fit traditional tenons to perfection.



VERITAS LARGE SHOULDER PLANE, \$255

Flawless tool; very comfortable to grip with one hand or two; blade lapped dead flat; mouth easy to adjust.

LIE-NIELSEN RABBIT BLOCK PLANE, \$175

Cut quality is good; square, full-width blade cuts rabbets on both sides; depth adjuster tended to shift blade laterally, so you must be careful.



GOOD VALUE



VERITAS SKEW BLOCK PLANE, \$240

Cut quality is excellent; easy to set up; comfortable to hold; there's a learning curve associated with sharpening angled blade; buy version that suits your favored hand.

Handsaws

Every woodworker needs a good handsaw or two to make quick, precise cuts on parts that power tools can't easily handle. Dovetail saws are essential for their namesake joint, but they do a lot more. All-purpose backsaws, useful for a range of joinery, are even more versatile than dovetail saws. Then there's the coping saw, which excels at handling curves. And Japanese saws, which cut on the pull stroke, deliver speed, accuracy, and a thin kerf.

ALL-PURPOSE BACKSAWS

Also known as carcass saws, these larger joinery saws can do it all, making them a great first handsaw for beginners, and a big-joinery specialist for those with a dovetail saw already. These are Western-style saws, which cut on the push stroke, with a thick spine down the back for stiffness. Of his four favorites, Gochnour said, "They were sharpened extremely well, so they started easily, cut fast, and tracked perfectly. They also performed well on both rip- and crosscuts."



BAD AXE 12-IN. HYBRID SAW, \$245 AND UP, DEPENDING ON OPTIONS

Not fastest, but ripped and crosscut equally well; starts smoothly; most comfortable handle.



LIE-NIELSEN TAPERED CARCASS SAW, \$140

Longest saw; thin kerf; fast ripping and crosscutting.



ROB COSMAN PROFESSIONAL LARGE TENON SAW, \$300-\$350, DEPENDING ON HANDLE

Very easy to start; cut smoothly; molded resin handle available in two sizes.



VERITAS CROSSCUT CARCASS SAW, \$90

Ripped fast and tracked well during ripcuts; crosscuts quick too; started smoothly; very good saw and fantastic value.

DOZUKI "Z" SAW, \$40

Best crosscut performer, also rips adequately.

GOOD VALUE

GYOKUCHO DOVETAIL SAW, 240MM, NO. 311, \$54

Made dovetail cuts extremely well at an affordable price; replaceable blade.

GOOD VALUE



DELUXE 240MM RIP DOZUKI SAW, \$100

Best saw for dovetailing; performed superbly.

JAPANESE-STYLE SAWS

A fair number of woodworkers prefer Japanese-style handsaws, which cut on the pull stroke. They start much easier than push saws, cut faster, and very seldom bind. And they are much less expensive than Western saws. While most can't be resharpened, when their hardened, razor-sharp teeth finally dull after years of use, it won't cost you much to replace them—just the blade, or the whole saw. Charles Durfee recommends that if you only want to cut dovetails, then buy a rip saw. For both ripping and crosscutting, the Dozuki "Z" crosscut saw is the best buy.



**BAD AXE
STILETTO,
\$250-\$350,
DEPENDING ON
OPTIONS**

Cuts with ease, accuracy, and speed; amazing overall.



**LIE-NIELSEN,
\$125**

Performed beautifully on multiple tasks, starting a cut, traveling smoothly, and tracking a line; well balanced.



SKELTON, \$320

Excelled at every task in both oak and cherry, from beginning the kerf to tracking a line quickly; company offers custom handle sizes.



**VERITAS
STANDARD, \$76**

Best value; cut extremely smoothly; quite maneuverable; composite spine saves weight.

WESTERN-STYLE DOVETAIL SAWS

When Gochnour tested these Western-style dovetail specialists, he invited seven skilled friends to help him narrow a wide field of saws to those that work well for all sorts of people. They are available at prices for every budget. While precise dovetail cuts were a great test for these tools, all four of his favorites will do a lot more than dovetails, from trimming parts to length to cutting quick, accurate miters.



KNEW CONCEPTS, \$160

Stood well above the rest; light and rigid frame; easiest blade changes; eight positive detents for blade rotation; convenient knurled knob for adjusting blade tension.

COPING SAWS

As Gochnour said, "Coping saws can be used to remove waste in joinery, make cope cuts on molding, and saw tight curves of all kinds. Motorized bandsaws and scrollsaws perform similar tasks, but require the workpiece to be brought to the tool, a task that can be difficult, awkward, or even impossible...This makes the coping saw an indispensable tool in the woodshop."

LEE VALLEY, \$17

Smooth and easy blade rotation; very good blade tension; cuts very well; very good saw overall.

**GOOD
VALUE**

Bench chisels

This general-purpose tool is suitable for a broad range of tasks, including dovetailing and mortise-and-tenoning, paring pegs flush, installing hinges, chamfering edges, and even cleaning up glue squeeze-out. They can be driven with a mallet, or used two-handed for controlled paring cuts, and work equally well with hard or soft wood. Popular sizes start at 1/4 in., so that's where our prices start too.



LIE-NIELSEN BEVEL-EDGE CHISELS, FROM \$55

Almost flawless out of the box; back was lapped flat and nearly polished; beveled edges tapered precisely; tool's size and feel make it the ideal bench chisel; A2 blade's durability was middle of the pack, but the ergonomics prevailed.

GOOD VALUE

NAREX CLASSIC BEVEL-EDGE CHISELS, FROM \$14

Easy to grasp whether chopping with one hand or paring with two; back of chrome manganese blade was flat and edges beveled sufficiently for dovetailing; cutting edge held up quite well.

MATSUMURA BLUE STEEL BENCH CHISEL, FROM \$73

Blue-steel chisel is finely crafted and set to go out of the box; end of handle creates a comfortable pad for your hand; blade held an edge with the best, and is slightly longer than other Japanese blades; moderately priced for such a high-quality chisel.

GRIZZLY JAPANESE CHISELS, FROM \$20

Diamond in the rough; back was slightly concave along length, but lapped out without much trouble; end of handle must be mushroomed over to set hook—plan on 30 minutes for this task; performed admirably and edge held up nicely; a real bargain.

STANLEY SWEETHEART SOCKET CHISELS, FROM \$33

Precisely machined with clean beveled edges; some backs needed extra work to flatten and you'll need to lightly hammer handles into sockets; short length gives nimble, fingertip control; edge retention is very good; well-made, great form, great value.



VERITAS BENCH CHISELS, FROM \$72

Flawless out of the box; blades stout with bevels that extend all the way to tip; backs lapped dead flat; handles comfy to grasp and won't roll off bench; very solid feel under mallet blows; edge easy to sharpen and held up well; on par with the best.

Sharpening

For a hand tool to perform well, it has to be sharp. A set of waterstones and a honing guide make it fast and simple to get razor sharp and back to work.

WATERSTONES

As Gochmour said in his test, “there’s no doubt in my mind that waterstones are the best choice for honing chisels and handplane blades. They produce a fine polish quickly, and are more durable and less expensive (in the long run) than sandpaper.” Prices are based on the 800- or 1,000-grit stone, and go up for finer grits.



OHISHI, FROM \$55

Stones cut very fast; very hard so they remain flat for a long time, and don’t need to be soaked in water.



NANIWA PROFESSIONAL (WAS CHOSERA), FROM \$74

Smoothest cutting action; create nice slurry with use; easiest to flatten.



SHAPTON GLASSSTONE, FROM \$54

Performed great; didn’t cut quite as quickly as other winners but dished the least; very hard—blades occasionally chattered across surface.

HONING GUIDES

We finish with yet another tool test from Gochmour. “While some may prefer to sharpen freehand, I’m a big proponent of honing guides, and I recommend one for anyone looking to get sharp edges,” Gochmour said. There are excellent honing guides for all budgets.



LIE-NIELSEN, \$125 PLUS \$25–\$35 FOR ACCESSORY JAWS

Machined to tight tolerances; held blades tight and square; easy to use; narrow chisels pose problems with squareness; accessory jaws for narrow and skewed blades.



VERITAS MK. II DELUXE, \$125

Did an excellent job sharpening every type of blade; comfortable to use and easy to set up; clamping blades square takes some care.



GENERIC SIDE-CLAMPING GUIDE, \$15

Comfortable to hold, easy to set up, and performed basic tasks well; nice job honing straight and cambered plane irons, and also spokeshave blade; struggles to hold chisels level—be mindful where you apply pressure in use.



GOOD
VALUE

Folding Outfeed Table

Spacing-saving mobile support can handle big jobs too

BY STEVE FIKAR

After 40 years of moving around—thanks to military life and job commitments—my wife and I settled down on Florida’s Gulf Coast and finally built our dream home. That home includes the woodshop I’ve been designing for decades, filled with all of the ideas I’d saved.

Although my shop is dreamy too, it has a somewhat small floor plan, which puts a premium on space and mobility. But I’m an engineer by trade, and I enjoy opportunities for problem solving. Here I’ll show you how I solved my outfeed table problem.

While a large outfeed table is nice to have and adds another large work surface to the shop, I needed one with a small footprint for daily use. I came up with a compact design that packs a big punch—thanks to a folded extension that flips up in seconds to support workpieces up to 10 ft. long.



Compact, mobile, and adjustable. This outfeed table flips up for long workpieces, rolls along with a mobile saw, and adjusts for uneven floors. For the vast majority of work, the extension table stays down, saving valuable floor space in compact shops. With the extension table flipped up, the outfeed table supports boards up to 10 ft. long.



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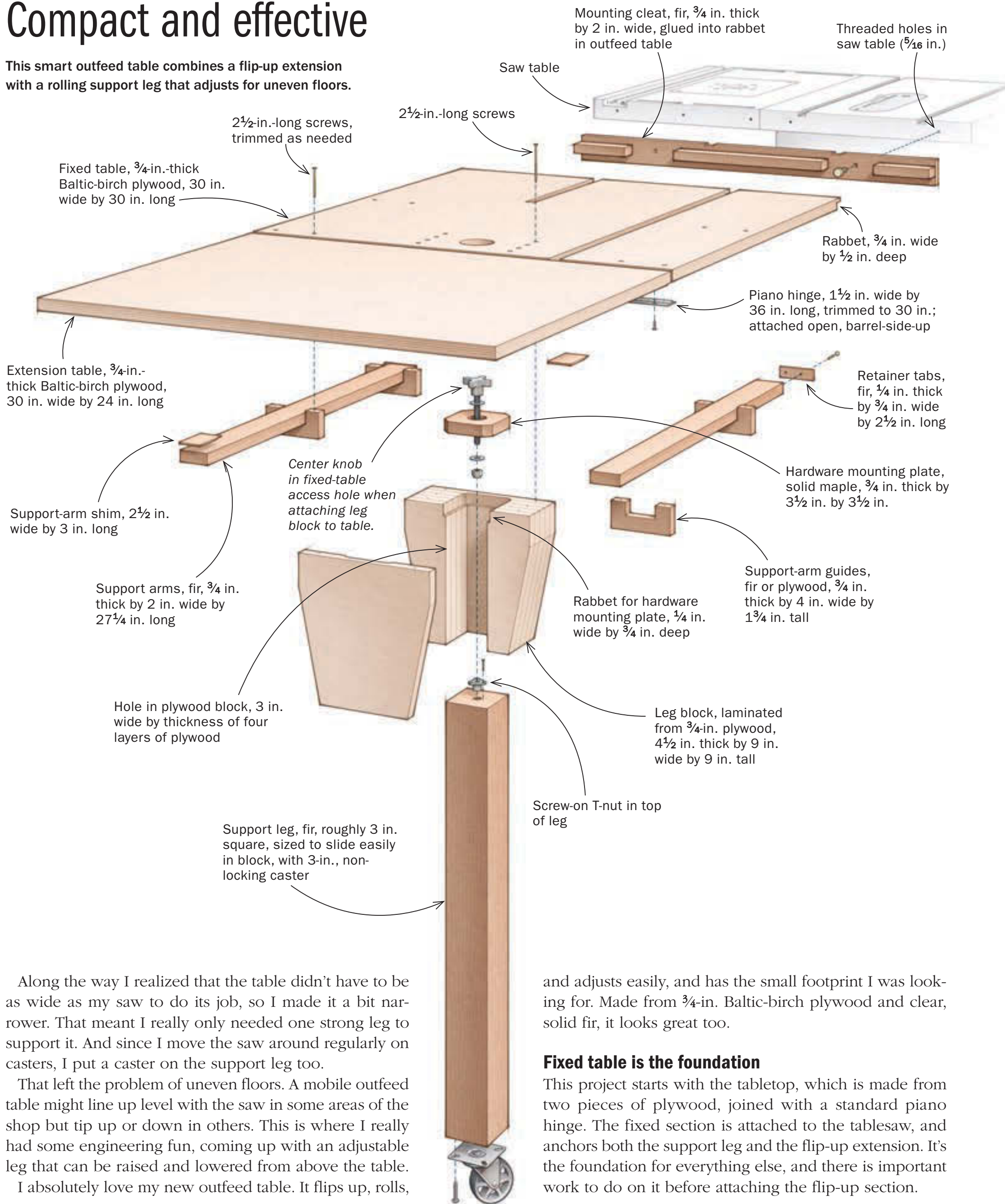
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Easy height adjustment. The sturdy support leg can be adjusted from above the table to compensate for uneven floors, as well as for mobile bases that raise and lower the saw.

Compact and effective

This smart outfeed table combines a flip-up extension with a rolling support leg that adjusts for uneven floors.



Along the way I realized that the table didn't have to be as wide as my saw to do its job, so I made it a bit narrower. That meant I really only needed one strong leg to support it. And since I move the saw around regularly on casters, I put a caster on the support leg too.

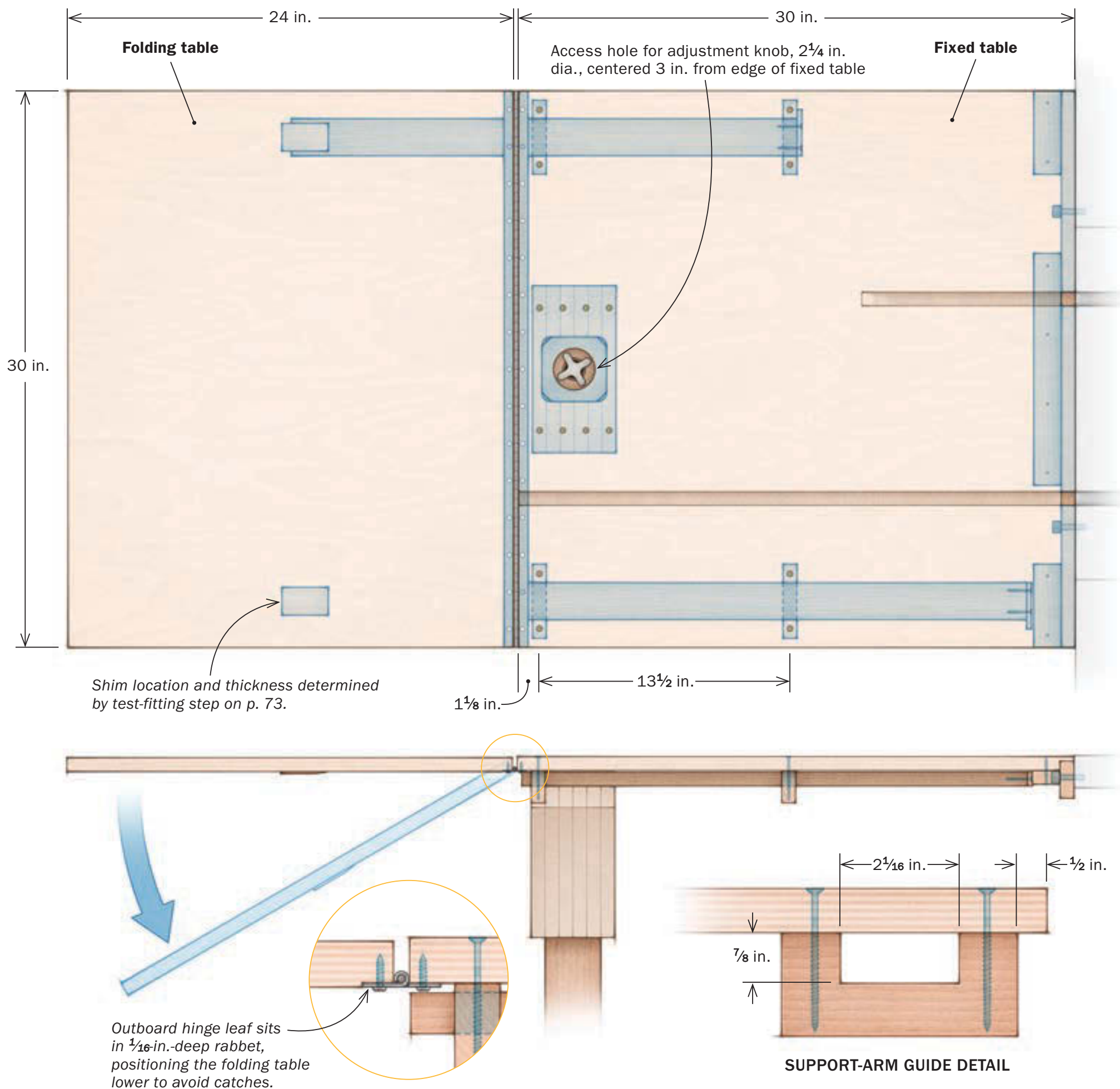
That left the problem of uneven floors. A mobile outfeed table might line up level with the saw in some areas of the shop but tip up or down in others. This is where I really had some engineering fun, coming up with an adjustable leg that can be raised and lowered from above the table.

I absolutely love my new outfeed table. It flips up, rolls,

and adjusts easily, and has the small footprint I was looking for. Made from $\frac{3}{4}$ -in. Baltic-birch plywood and clear, solid fir, it looks great too.

Fixed table is the foundation

This project starts with the tabletop, which is made from two pieces of plywood, joined with a standard piano hinge. The fixed section is attached to the tablesaw, and anchors both the support leg and the flip-up extension. It's the foundation for everything else, and there is important work to do on it before attaching the flip-up section.



Attach the support arms—The flip-up table is supported by arms that slide in C-shaped guides, which are attached to the fixed table. Since I made these guides from solid fir, I attached them to the tabletop with long screws that extend through their full 1 3/4-in. height, so they don't split under load. In retrospect, I could have made them from plywood for better strength in every direction.

I made the openings in the guides 1/8 in. oversize in depth to allow the support arms to clear the piano hinge. Once past the hinge the support arms run onto shims that push the extension table upward—level with the fixed half.

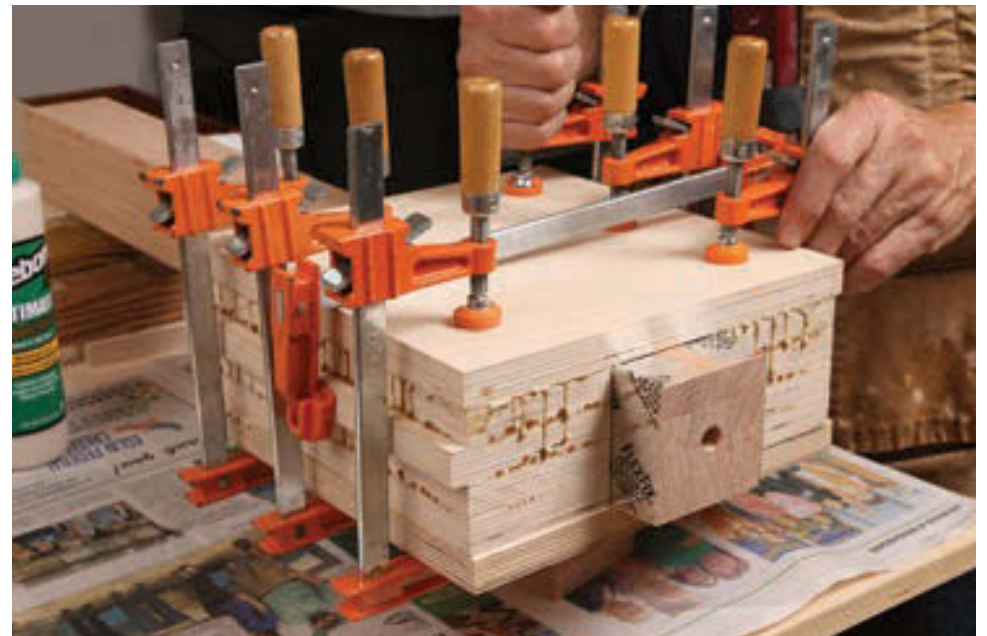
The support arms are also solid fir. Make them now, and attach the little retaining tabs at the back end that keep them from sliding out of their guides.

Make clearance slots for tablesaw jigs—To allow the guide bars on your miter gauge and tablesaw sleds to slide freely, you'll need to cut clearance slots in the outfeed table. Start by deciding where the table will mount on the saw and then lay out slightly oversize slots in the plywood.

My left-hand clearance slot extends the length of the fixed table, due to my oversize crosscut sled, but the right-hand slot is stopped at the end of the miter gauge travel. I cut the slots with a dado set,

A clever adjustable leg

1. MAKE THE BLOCK



Build up the leg block. After applying tape to the finished leg to keep glue from sticking and create clearance for the sliding action, build up the plywood around it, gluing and clamping a few layers at a time.



Trim the block. After trimming both sides, trim the ends using the miter gauge. After that, Fikar used the bandsaw to cut tapers on both sides, smoothed those cuts, and rounded over all of the edges.

SOURCES OF SUPPLY

Threaded-stud knob, style 14, 2-in. head, four-arm grip, with $\frac{3}{8}$ -16 by 3-in. long stud, \$10, McMaster.com

Screw-on T-nut, $\frac{3}{8}$ -16, various sources

Piano hinge with holes, 0.06-in.-thick leaf, $1\frac{1}{2}$ in. wide, 0.245-in. knuckle dia., 3 ft. long, \$6, McMaster.com

Caster, 3 in. dia, aluminum-spoked, non-braking, \$22, Woodcraft.com



Rabbet the top. Make multiple passes with a rabbeting bit, extending the depth each time, to cut a rabbet that fits the thickness of the mounting plate for the leg-adjustment mechanism.

2. ADD THE ADJUSTER



Add the adjustment mechanism. The hardware consists of a hand knob with a threaded stud, two washers, and a lock nut, plus a T-nut that gets attached to the top of the leg. Cut a solid piece to fit into the rabbet, then center a hole in it for the threaded stud. To ensure proper alignment, the T-nut hole in the leg is centered in both dimensions.

which leaves a little ramp at the end of the stopped one, making it easy to brush out sawdust.

Adjustable leg is fun to build

The most time-consuming part of construction is the adjustable leg assembly, but it's fun to build, and well worth the effort.

The support leg needs to be sturdy. I laminated it from solid-fir boards and built up a thick plywood block around it, which attaches to the underside of the fixed table near the hinge.

I created the big channel in the block by arranging six plywood layers around the leg as I glued them together (see photos, opposite page). Start with the leg around 3 in. square, and then take light passes in the planer until the leg is a hair thinner than four layers of plywood, so it will slide freely in the block without wobbling. Then chop your plywood pieces to size, and arrange them around the leg as you glue them together, as shown.

Afterward, I trimmed the block on the tablesaw to clean up the rough edges, bandsawed a taper on both sides for good looks, and then sanded it and rounded the corners with a router bit.

Before mounting this big guide block, you need to insert the adjustment assembly that gets trapped at the top and connected to the leg. I created that mechanism by attaching a clamp knob and threaded stud (for part details, see Sources of Supply, opposite) to a solid mounting plate, and then rabbeting the top of the guide block to accept it.

The threaded stud screws into a T-nut attached to the top of the leg, raising and lowering the leg as needed. Use the type of T-nut with holes that let you screw it into the wood, which will keep the leg attached if you pick up the table for some reason. If you center the clamp knob in its mounting plate, and center the

3. ATTACH IT TO THE TABLE



Drill the access hole. Use a hole saw to cut the 2¼-in.-dia. access hole through the tabletop.



Attach the leg block. With the adjustment mechanism trapped in the top of the leg block, just center the clamp knob in the access hole to align the block. Clamp the block so its wide side is parallel to the end of the table, and then drive in 2½-in. screws from above.

Assemble the outfeed table

Cut the miter-gauge slots. Mark the slot locations on the end of the table, and then use a dado blade to cut the slots. For slots that don't need to run the entire length of the table, clamp a stop block to the rip fence to limit the cut.



Insert the adjustable leg. Lay the table on a work surface, in this case the tablesaw itself, and thread the leg into the block.

T-nut in the top of the leg, they'll line up perfectly with each other.

The last step before attaching the big leg block is cutting a large hole through the fixed table for access to the adjustment knob. I used a hole saw and a hand drill. After that, lining up the block is as easy as clamping it to the underside of the table with the adjustment knob centered in its access hole. Then you can drive long screws down through the tabletop and into the block.

Attach a nice-looking, 3-in. caster to the leg, then push the leg up into its channel until the adjustment bolt threads into the T-nut in the top of the leg. Now the table is ready to roll.

Table attachment varies by saw

The way you attach the fixed table to your saw table will depend on the saw. Mine has two threaded holes on its back edge, which made it easy to attach the outfeed table solidly with a simple mounting cleat (see drawing, p. 68). To make the table easy to detach in a pinch, I attached it using knurled-head thumbscrews, which you tighten by hand. I leave them a little bit loose, to allow the table to flex up and down as it rides over uneven floors.

Other saws have an L-shaped rail at the back edge that creates a nice lip for attaching the outfeed table.

Whatever attachment method you use, set the outfeed table below the saw top by $\frac{1}{16}$ in. or a bit less. And make sure it can't rise off its mounting points. With just one leg supporting the end, both points must be fixed.



Add the extension table. The barrel of the piano hinge faces toward the top of the table, separating the two tables slightly, and there is a $\frac{1}{16}$ -in.-deep rabbet in the extension side, designed to lower that table, so boards don't catch on its edge.

Mount and level the table



Attachment depends on tablesaw design. Fikar's saw has threaded holes at the back edge, so he added a cleat to the outfeed table to let him use those. He used attachment bolts he can turn by hand.

Now you're finally ready to attach the folding section of the table. I used a 3-ft.-long piano hinge, cutting it down to the 30-in. length I needed. I attached it in the open position with the barrel facing up. I also cut a shallow rabbet in the folding section, inseting the hinge slightly on that side. This means that in use the folding section will sit a little below the fixed side. Some boards curve downward, and you don't want their tips getting caught at the table transition.

Level the table and put it to use

The last step is leveling the outfeed table with your tablesaw. For the fixed section, simply adjust the support leg. I do this whenever I move the saw, and it only takes a few seconds.

Leveling the folding table with the fixed one takes a few extra minutes, but it's a one-time job. Its alignment is determined by two permanent shims—glued to its underside—that push down on the sliding support arms.

To figure out how thick those shims need to be, raise the folding table, extend the arms, place a long straightedge on top, and push temporary wedges under the arms until the folding side is where you want it. Mark the wedges as shown at right, and that's how thick the permanent shims need to be. Make the real shims flat, but with a little ramp at the front edge to guide the support arms into place. To attach them, just rub some glue on their top faces, stick them in place above the support arms, and pinch the table and arms with clamps.

A couple of coats of your favorite oil finish will bring the birch and fir together visually and add a measure of protection. Then your sparkling new outfeed table is ready to use. □

Steve Fikar is a former U.S. Air Force fighter pilot and a retired software engineer, who lives in Shalimar, Fla.



Adjust the leg to level the fixed table. This is easy to do anytime, using the adjustment system you just built. Fikar is using a level here, but any straightedge will do.



Add a shim to level the folding table. To clear the piano hinge, the support arms are a bit loose in their guides; shims under the extension table will lift it level. To figure out the thickness of those shims, extend the arms fully, slide wedges under their tips, and mark their thickness as shown when the two tables are parallel. Then mill the actual shims to that same thickness and glue them in place.

gallery

THE VIEW FROM YOUR BENCH

For this year's *Tools & Shops* Gallery we once again dove into Instagram and asked our followers to share photos of their shopmade benches, cabinets, and tools ... and their shop pets. Here are a few of our favorites.



RYAN D. CHENEY

Louisville, Colo.

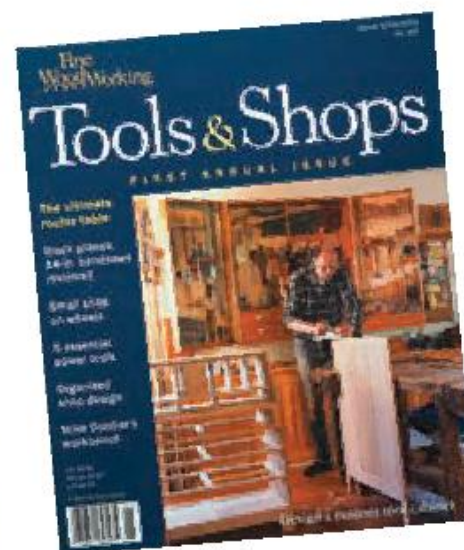
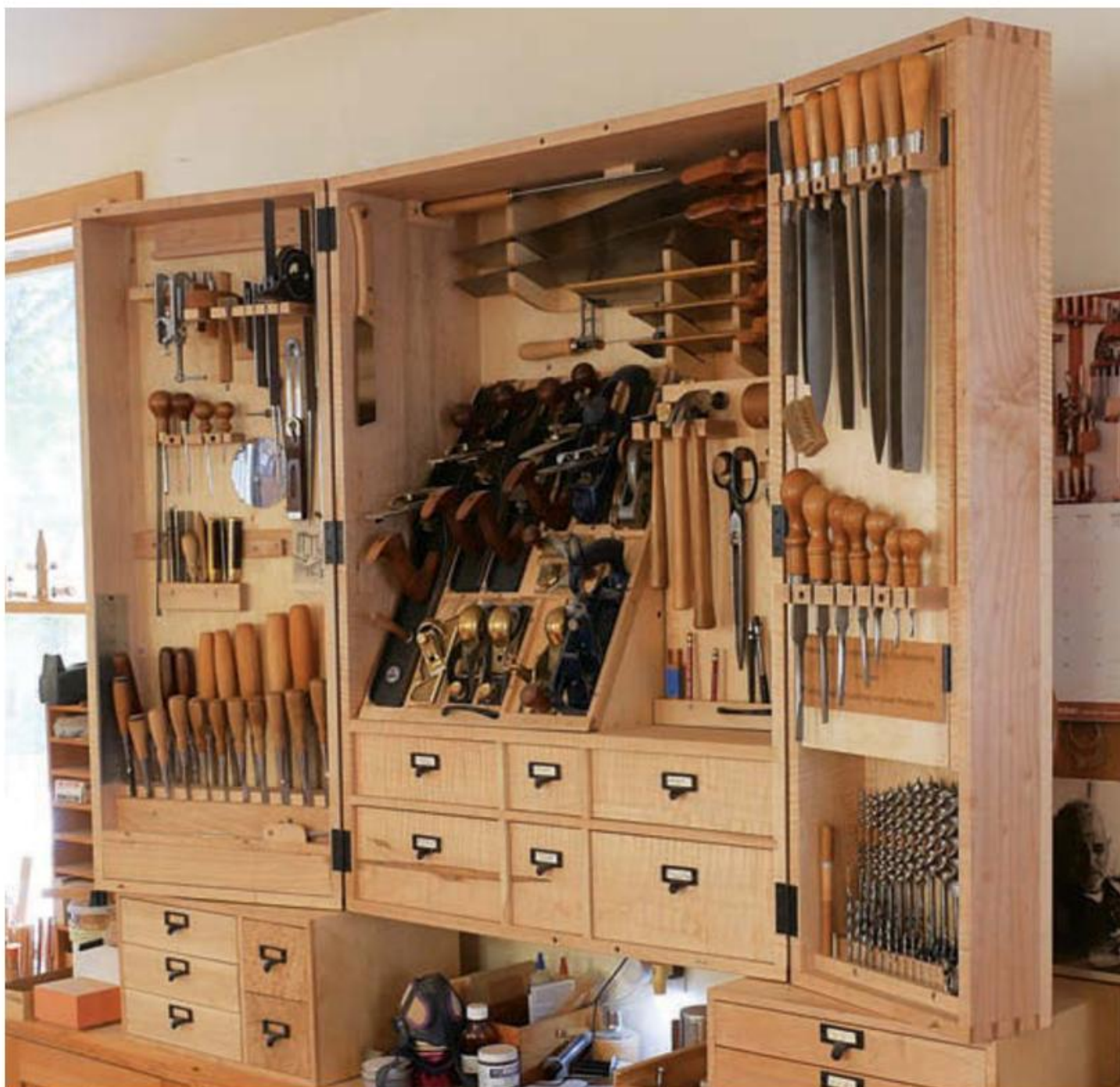
The three-piece laminated head of Ryan's dead-blow mallet has chambers filled with lead shot for functionality and is faced with leather to prevent marring. The handle is octagonal and tapered, and terminates in a matching pommel for a secure, comfortable grip. "The primary wood is maple," Ryan says, "while the secondary wood was recovered from a shipping pallet of Pacific Asian origin and remains a mystery, although I suspect it is padauk."

HARD MAPLE AND "MYSTERY" PALLET WOOD

2 1/8"D X 5 3/4"W X 14 3/16"L

@MOUNTAINTOPJOINERSSHOP

Photo: Dan Knudson



CHRIS BECKSVOORT

New Gloucester, Maine

Chris's old tool cabinet, featured in the very first *Tools & Shops* (above) in 2002 had served him well, but he wanted something smaller and lighter to fit the tools he uses most often. "The biggest challenge was the initial layout of the tools. I made paper templates of the tool groups and moved them around until I had the most efficient layout. Tools had to be easily accessible, without wasting space. All in all, the new wall-hung box is smaller, lighter, and more efficient."

SOFT MAPLE, BIRCH PLY PANELS, APPLE HANDLES, WALNUT PINS

17D X 32W X 43H

Photo: Ben Strano

MEIR HOROWITZ

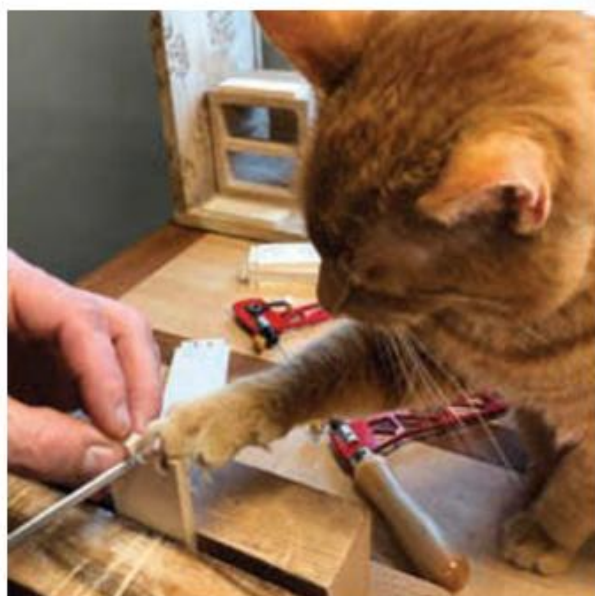
Israel

Meir designed his workbench after reviewing many different styles of bench and adopting what he liked from each of them. He says he has invested as much creativity in the bench as if it were a fine piece of furniture. "It inspires me when I use it for creative work," he adds.

MAPLE AND SAPELE

28D X 64W X 32H (APPROX.)

Photo: Baruch Grinberg



ALEX WARD

Sandwick, Shetland Islands, Scotland

Trying to cut fine dovetail pins can be awkward when Garfield, the family cat, does quality control. According to Alex, this Garfield steals lasagna, just like his cartoon namesake. He also spends a lot of time sauntering around the workshop and the bench. Alex makes fine bespoke furniture, crafted using predominantly hand tools, in the beautiful Shetland Islands north of mainland Scotland.

@SHETLANDFINECRAFT

JEFF MILLER

Chicago, Ill.

When Jeff's assistant's dog, Lola, isn't using this bench, the furniture maker, author, woodworking instructor, and frequent *Fine Woodworking* contributor builds his furniture and shoots videos here. Lola isn't allowed to use many of the tools, but is essential for moral support.

@FURNITUREMAKING





GRAHAM TRAFFORD

Melanchthon, Ont., Canada

"I built this chisel caddy to challenge my joinery skills," Graham says. "The pins on the dovetails taper to 0.020 in., the thickness of my dovetail saw." The caddy was inspired by one he saw on Instagram made by @skanwoods. Rare-earth magnets hold the chisels securely in the caddy.

BIRD'S-EYE MAPLE AND PADAUK

8D X 15½W X 13½H

@GRAHAMTRAFFORD



JOE CUNNINGHAM

Middletown, Conn.

All the joinery in Joe's hand-tool cabinet was hand-cut, and the fact that everything now has its own place made the long hours building it worthwhile. Joe says much of the inspiration for this cabinet came from Mike Pekovich's hand-tool cabinet. Atticus, an Australian shepherd pup, enjoys spending time with Joe in the shop. He rarely sits still though, so this photo was a lucky shot.

POPLAR, WALNUT, AND BALTIC-BIRCH PLYWOOD,
13D X 28W X 32H (CLOSED)

@JCUNNINGRAM



ANDREW BRANT

Mendocino, Calif.

After making four or five benches during his time as a woodworker, Andrew finally made the one he hopes to use for the rest of his life. He cites Christopher Schwarz and his research into the timber-framed bench form as inspiration, and Laura Mays for helping him remotely after the pandemic closed The Krenov School, where he has been a student. "It's rock-solid heavy with the wheels flipped up and out of the way but easy to flip down and move," he says of the bench, "and the deep Benchcrafted leg vise, with the live oak chop, is a dream."

DOUGLAS FIR AND OAK

22D X 72W X 32H

@_ANDREWBRANT



GRAHAM TRAFFORD

Melanchthon, Ont., Canada

Graham built this bench, based on the Roubo design, from plans sold by Benchcrafted. "I made some minor adjustments to the size and personalized some of the profiles on the components," he says. "I am proud to have a bench in my shop that showcases the skills I have acquired over many years of work."

MAPLE, WALNUT, AND BIRD'S-EYE MAPLE

26½D X 89W X 35H

@GRAHAMTRAFFORD

RYAN D. CHENEY

Louisville, Colo.

Inspired by the fantastical work of Italian furniture designer Carlo Bugatti and the H.W. Studley chest, Ryan wanted to build something that captured the same sort of complexity and design whimsy. This chest was some three years in the making, with no computer design or mockups used. "While some of the more complicated tool holders were worked out full scale on paperboard, most of the cabinet was designed 'on the fly,' with each part taking its cues from previous ones, and built largely using the hand tools it now contains," he said.

BLACK CHERRY, WITH SAPELE, CURLY MAPLE, EBONIZED WALNUT

16D X 35½W X 72H @MOUNTAINTOPJOINERSSHOP

Photo: Dan Knudson



DANIEL WHITESIDE

Alton, Ill.

Lucy comes down to Daniel's shop and visits from time to time. She mainly supervises and oversees quality control. Daniel, a firefighter, is a hobbyist woodworker but says he sometimes thinks about choosing it as his next profession when he retires in a few years.

@DWHITESIDE67



Show your best work

For submission instructions and an entry form, go to FineWoodworking.com/rg.

Expand your workholding with a spoon mule

BY DAWSON MOORE

If you're into green woodworking, you've likely heard of a shaving horse. Mine, based on Tim Manney's split-rail design in *FWW* #262 ("Build a Thoroughbred Shaving Horse"), is invaluable, particularly when shaping long, skinny parts, like for chairs. However, as your workpieces get shorter and more sculptural, the shaving horse becomes less helpful because its clamping head is more likely to get in the way. Unfortunately, this precludes using it for a number of green woodworking projects, like spoons, cups, and bowls, that are a struggle to hold to begin with. Enter the spoon mule.

USE



Spacer helps clamp thin parts. Sometimes parts are too narrow to be clamped effectively. To close the space between the jaws, Moore adds a $\frac{3}{8}$ -in.-thick spacer that's notched to fit around the wire.



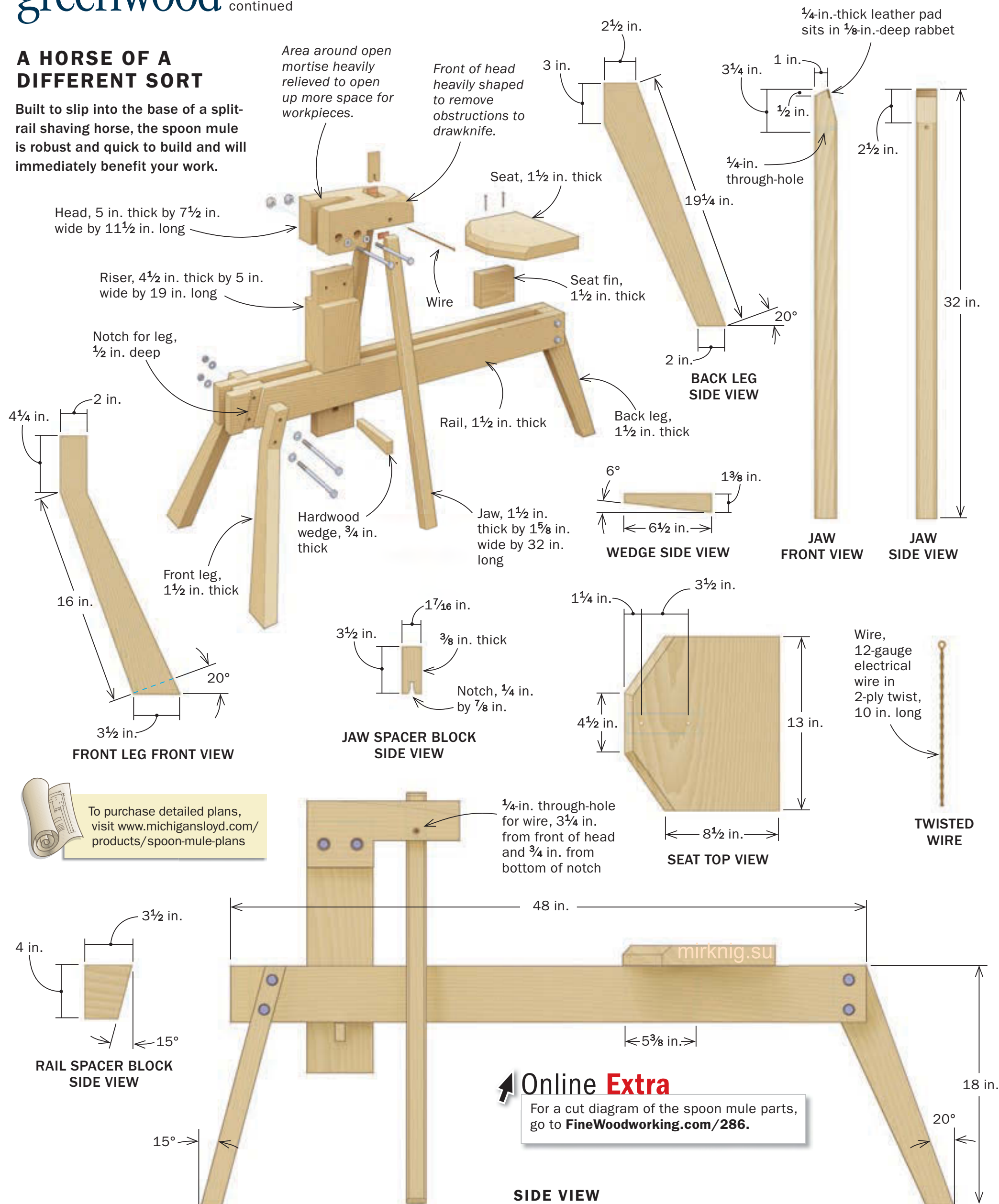
Plenty of support. The flat areas in front of and behind the jaws offer good support in a variety of circumstances. On this wooden cup, for example, the spoon mule can handle everything from the handle (left) to the backside of the bowl (above), a tricky place to work.



Flip it around for better angles. Don't hesitate to rotate the mule head. Moore does so here (left) so he can work on the front exterior of the cup's bowl while still supporting the piece from below (above).

A HORSE OF A DIFFERENT SORT

Built to slip into the base of a split-rail shaving horse, the spoon mule is robust and quick to build and will immediately benefit your work.

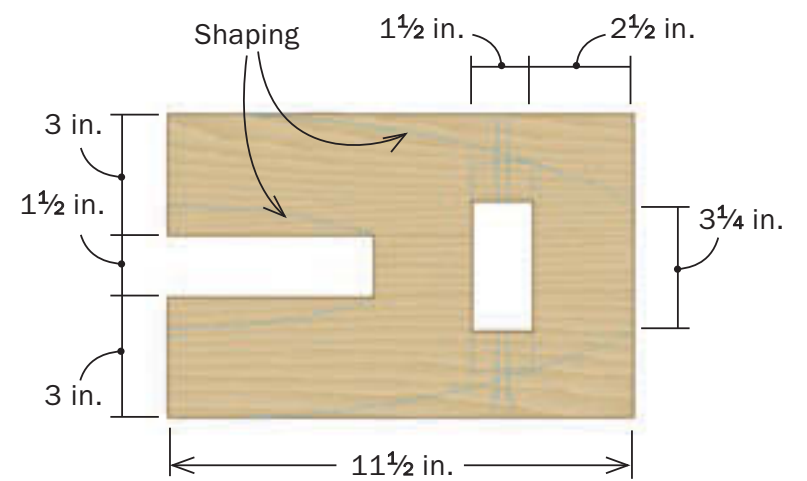




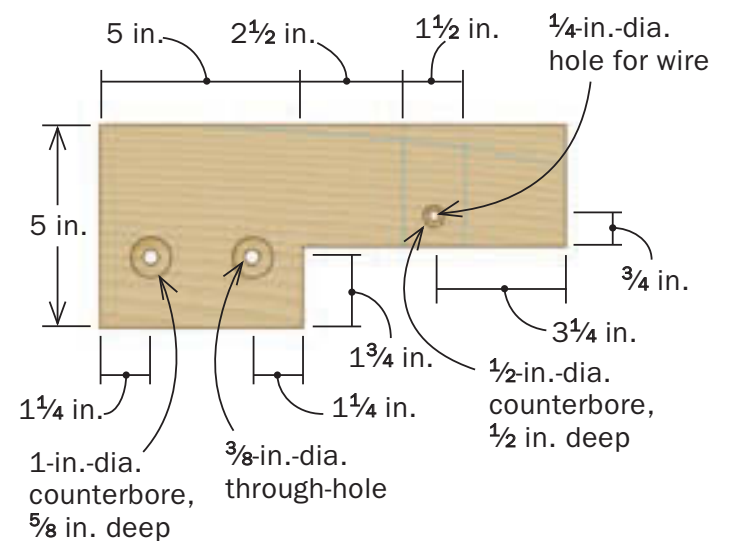
HEAD

Half of an angled mortise for the jaws. To ease construction, Moore builds the head in three layers. Here, he's paring the end of what will become an angled mortise in the final assembly.

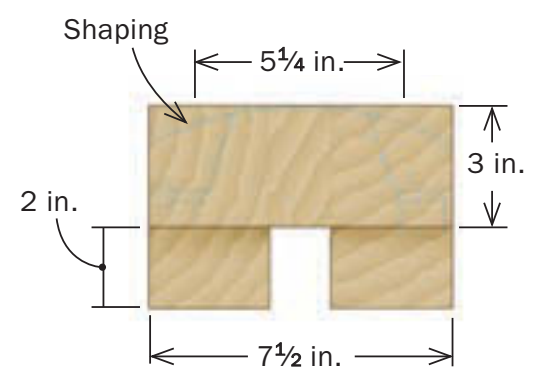
Drill for the bolts and wire. After glue-up, the head gets bolted to the riser. Drill the holes for these, including the counterbores, now. Also drill for the wire that will hold up the jaws.



HEAD TOP VIEW



HEAD SIDE VIEW



HEAD REAR VIEW



First glue-up. Moore laminates the head in stages to make the process easier. The first glue-up includes short blocks that help create the mortises for the jaws and the riser.



Second glue-up. Next Moore glues up the whole head, taking care to be sure the parts stay aligned. He slides the bolts in place to help with this.

While a shaving horse clamps from above, a spoon mule clamps low and from the sides. You still use your feet to apply clamping pressure—using them to push out at the bottom of long, levered jaws—leaving two hands free for the drawknife and spokeshave, powerful and efficient tools. My mule, adapted from one built by fellow green woodworker Jarrod Dahl, has a removable head that fits into the base of a split-rail horse; the mule head can be swapped in and out for a typical head. For more details on making the horse, see Manney's article.

These jaws bite

The heart of the mule is its long pincer jaws, which, with just a bit of outward

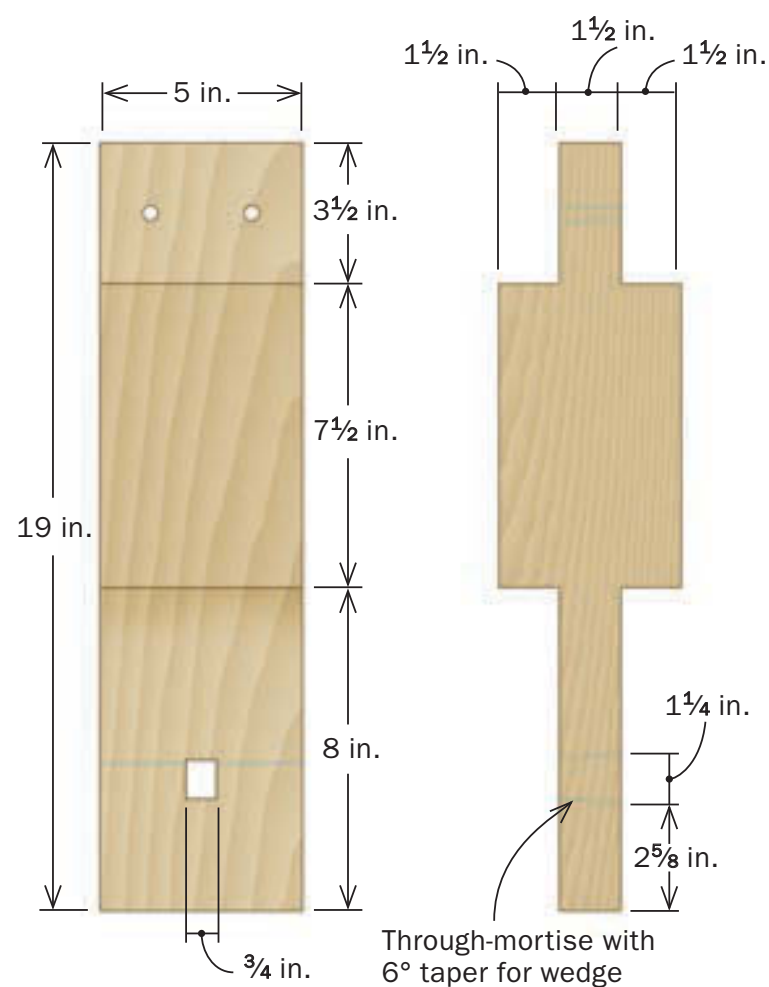
RISER

Riser is also a sandwich.

Laminating short and long pieces creates a large tenon with little work.

Angled mortise for a locking wedge. To lock the riser to the base, Moore cuts an angled mortise for a hardwood wedge.

Drill clearance holes for bolts into riser tenon. Moore clamps the head to the riser to use it as a drilling guide. He uses T-nuts on the other side of the head to receive the bolts. This creates a rock-solid joint that will withstand the constant pullings and pressures of workholding.



RISER SIDE VIEW

RISER FRONT VIEW





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pressure, clamp narrow pieces tightly and quickly—great for sculptural pieces, where you're constantly moving the workpiece around to work a different edge, shape a facet, or feel a thickness. For maximum leverage, I run these jaws all the way to the floor. At rest, their top ends sit about $\frac{5}{8}$ in. above the head.

Don't be shy to test different shapes at the top of the jaws; they're sized to be a 2x4 ripped in half so they're cheap and easy to experiment with. Different profiles will let you better clamp different projects. □

Dawson Moore is a green woodworker in Harbor Springs, Mich. See his work at michigansloyd.com.

Round over the front of the head. Doing so gives plenty of clearance for your hands and tools when working (inset). Bring in the jaws afterward, making sure they have some vertical play.



Wire holds up the jaws. Moore uses a twisted length of 12-gauge electrical wire. An eye loop at one end stops the wire at the bottom of the counterbore.



Bury wire in dado on other side. This keeps the metal wire out of the way so you don't hit it with your knuckles or a sharp drawknife. Don't overtension the wire. A little slack maintains that up-and-down play.

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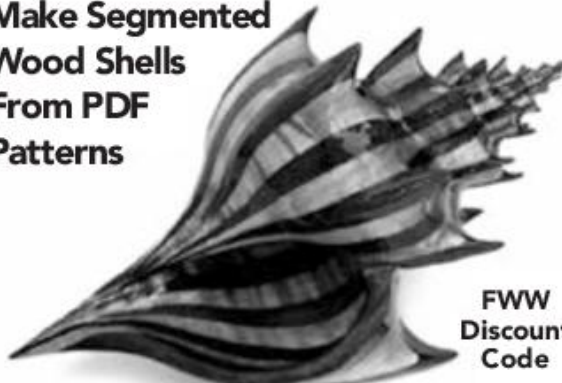
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from the bench

From woodworker to entrepreneur, and back again

BY MARK SINGER



For nearly 60 years, I have been designing, shaping, and crafting furniture. My journey has taken some interesting twists and turns, from framing tract homes, working for Knoll International, and founding my company Giati Designs, to creating the brand, product, and company known as Gorilla Glue. Most recently I have come full circle back to where I started: two hands, a piece of wood, and trying to make things that are beautiful and functional.

As I grew up in California, my father had a small hobbyist woodshop in our basement, so at about age 10, I began woodworking. Like many, I took shop class throughout junior high and high school. I also learned from wood turner Bob Stocksdaile and spent two years working for Sam Maloof, a huge influence on my life. At 15½ I left home, working summers as a carpenter, dropping out of college, and getting my journeyman's union carpenter license in 1972.

Early on, I believed that if I designed a beautiful piece of furniture, naturally it would be sought after, manufactured, marketed, and sold by a company like Knoll, Herman Miller, Thonet, or Steelcase. I tried for years to break into the furniture design business, and I had

a lot of doors closed in my face. I was naive in thinking that craftsmanship was all it took. I submitted drawings, photos, models, and prototypes to countless companies. I traveled to headquarters and met with design directors. On more than one occasion I actually walked the streets of Manhattan carrying a wooden chair on my back. Eventually one of my prototypes came together in a way that helped me break through and get my

As the years passed, although I never stopped designing and making furniture, I wanted to experience again the joy of working wood full time.

furniture commercially produced. One success led to another, as it does.

The birth of Gorilla Glue

In 1986, after having worked on the East Coast for about a dozen years, I returned to California and set up shop in Santa Barbara. In 1991, I founded Giati Designs for the purpose of having my high-end teak outdoor furniture manufactured and sold. At the time, Indonesia was one of the only sources for plantation-grown certified teak. Teak is a particularly difficult wood: The resin dulls cutting tools, and the oil in the wood makes it tough to glue. And for outdoor use

gluing it is even more challenging.

I needed a better glue. I learned that a form of moisture-cured polyurethane glue was being developed to replace epoxy for environmental reasons. I first ran across this new type of glue at a small factory in Bandung, West Java. It didn't work well. About a year later, our factory in East Java showed me another moisture-cured polyurethane glue made by a small Danish company. It was pretty

good, so I asked if they could make some changes to the product. Then I acquired the rights for North America and other territories.

I came up with the name, drew up the logo, and Gorilla Glue was born.

Back to the heart of things

As the years passed, although I never stopped designing and making furniture, I wanted to experience again the joy of working wood full time. So I sold Gorilla Glue to a wonderful family in Cincinnati. Through their hard work, the business has grown nearly a hundred-fold.

Only recently do I feel that I have finally found my voice as a woodworker. I'm enjoying the luxury of living to work, instead of working to live, and the continued joy I find in exploring what wood can do.

Mark Singer is founder of Giati Designs in Carpinteria, Calif.

Some time ago, a book of stories arrived in the mail. The author, Mark Singer, is a woodworker, metalworker, inventor, production furniture designer, owner of several companies, and the entrepreneur who brought Gorilla Glue to the United States. The book he sent us, *Heartwood: Lessons Learned During a Lifetime Working with Wood*, was written as a portfolio of his work, but grew to include reflections on his career for his children to read. Presented here are a few snippets of his story. For more, go to FineWoodworking.com/286.

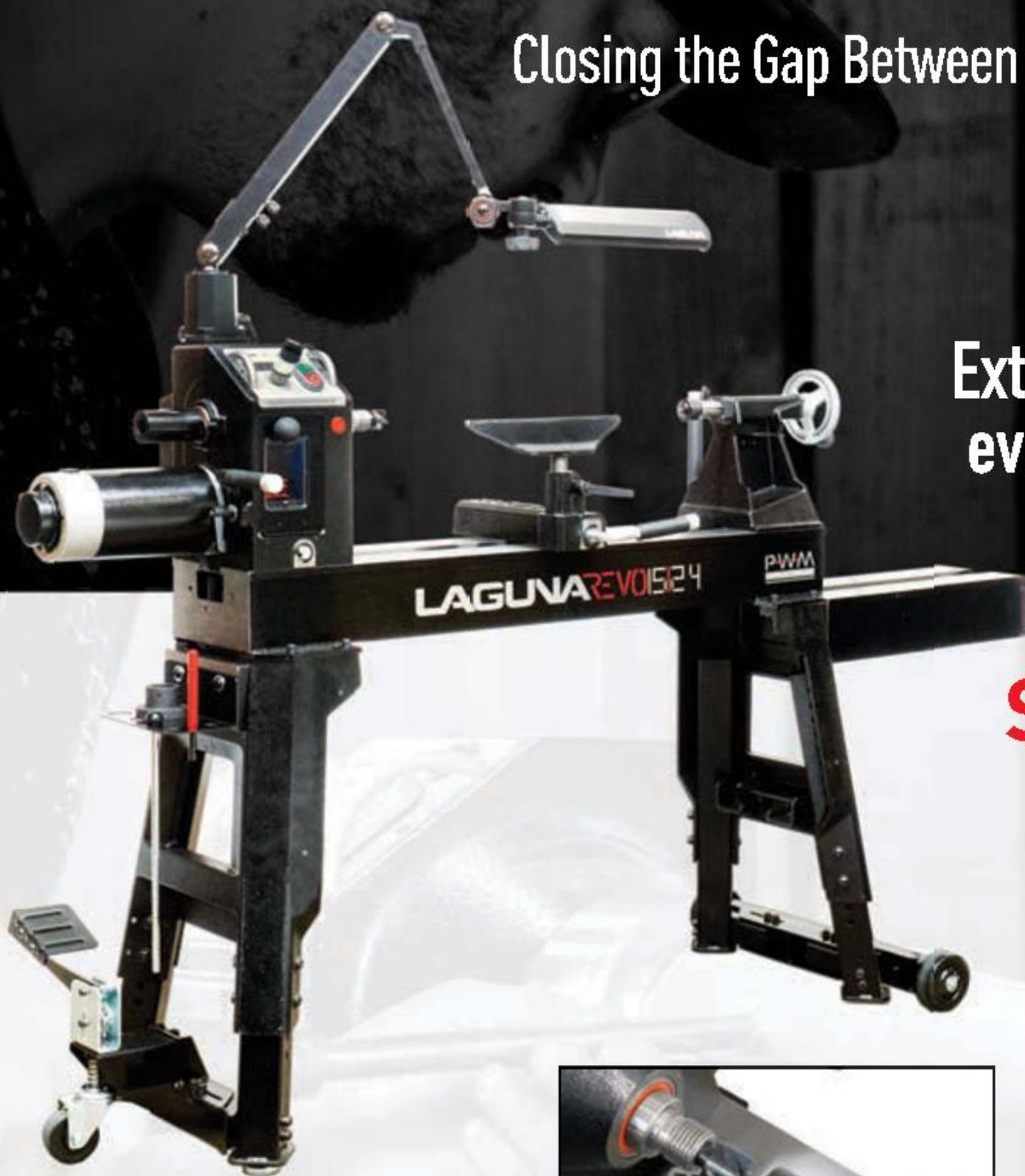
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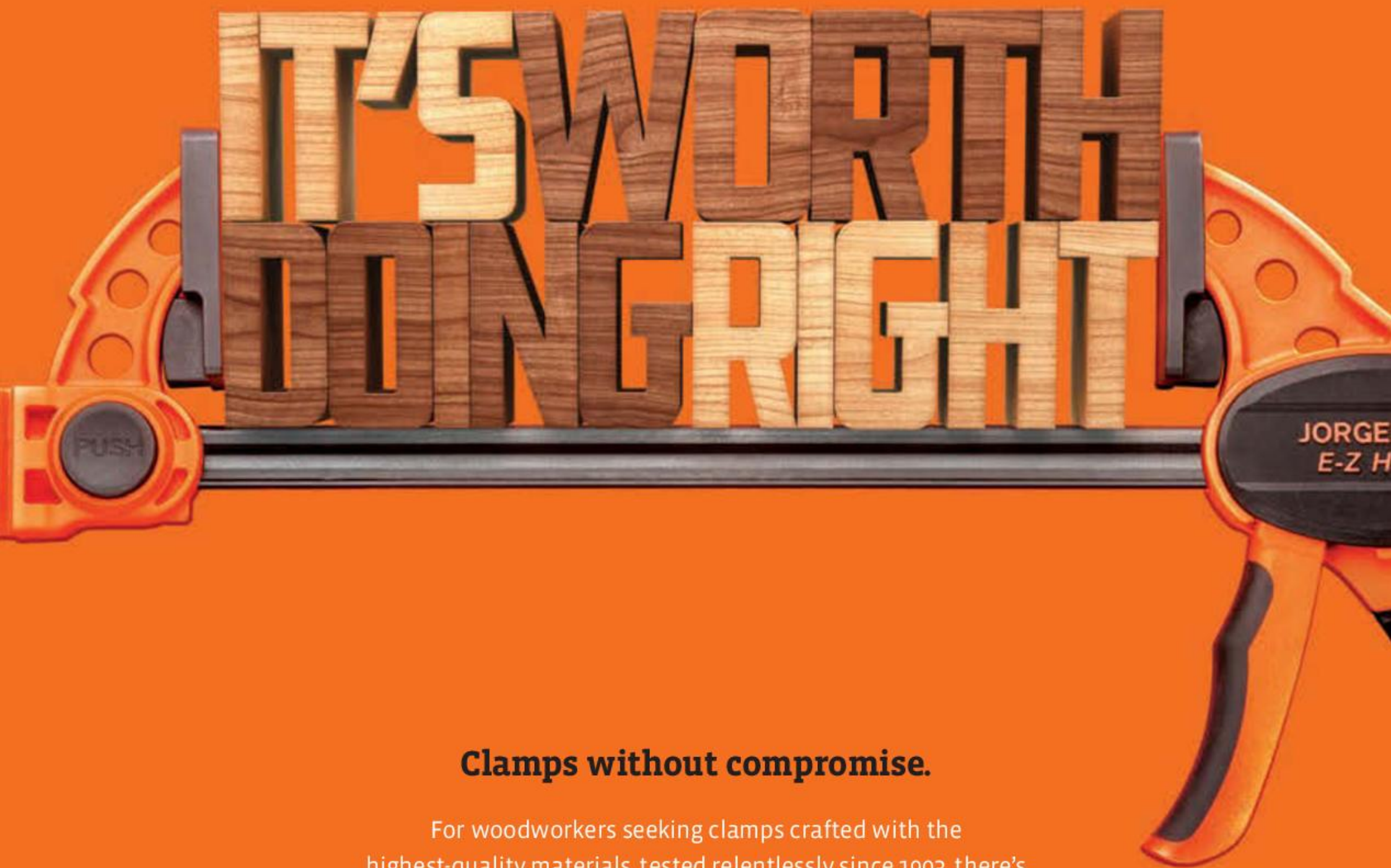


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