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2014

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Editor's Letter



Whenever I ask a home woodworker, "What's one thing you'd like to add to your shop to make it better?" I often hear "more room!" But going bigger isn't the only way—or necessarily the best way—to improve a home workshop.

A well-conceived small shop often proves far more efficient and enjoyable than a large space full of tools and equipment set up without adequate forethought. So we've filled this publication with solid solutions for planning, equipping, and organizing a shop to provide maximum capability in a modest footprint.

Inside, you'll find tricks that will help you make better use of every square foot in your shop. Tips on tool selection, including how to buy a tablesaw (usually the anchor machine in a home woodworking shop), will help you equip your workspace. And, of course, we've included complete instructions for building workbenches, tool stands, organizers, and other projects designed to increase your workshop's versatility. With all this great information, you can't help but make your shop better, no matter the size.



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Big Ideas for Small Workshops 2014

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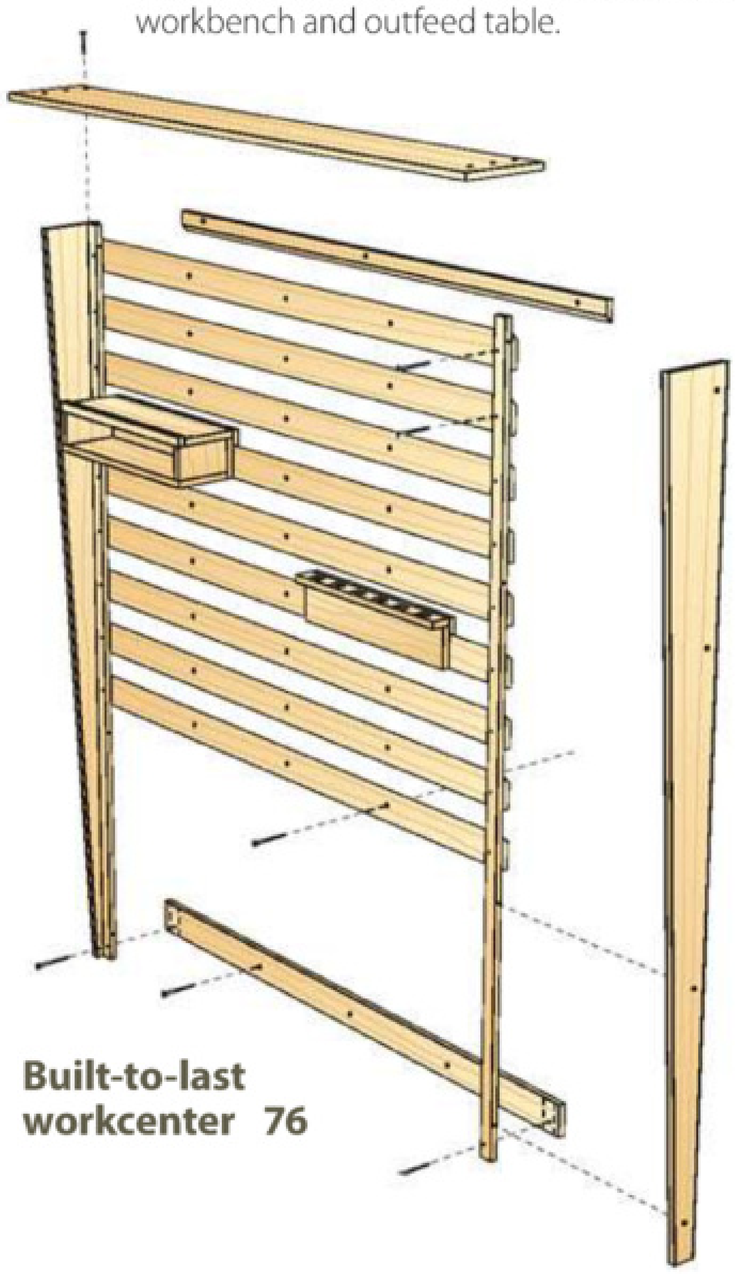
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111 Shop Tips
Put these helpful hints and tricks to use in your shop.

WOOD® magazine editors unveiled the Idea Shop in the September 1992 issue. The shop demonstrated how to lay out and organize an efficient, fully functional workshop in the space a home woodworker might have. Here are proven methods for maximizing workshop efficiency learned from the Idea Shops, plus more examples from readers' shops.

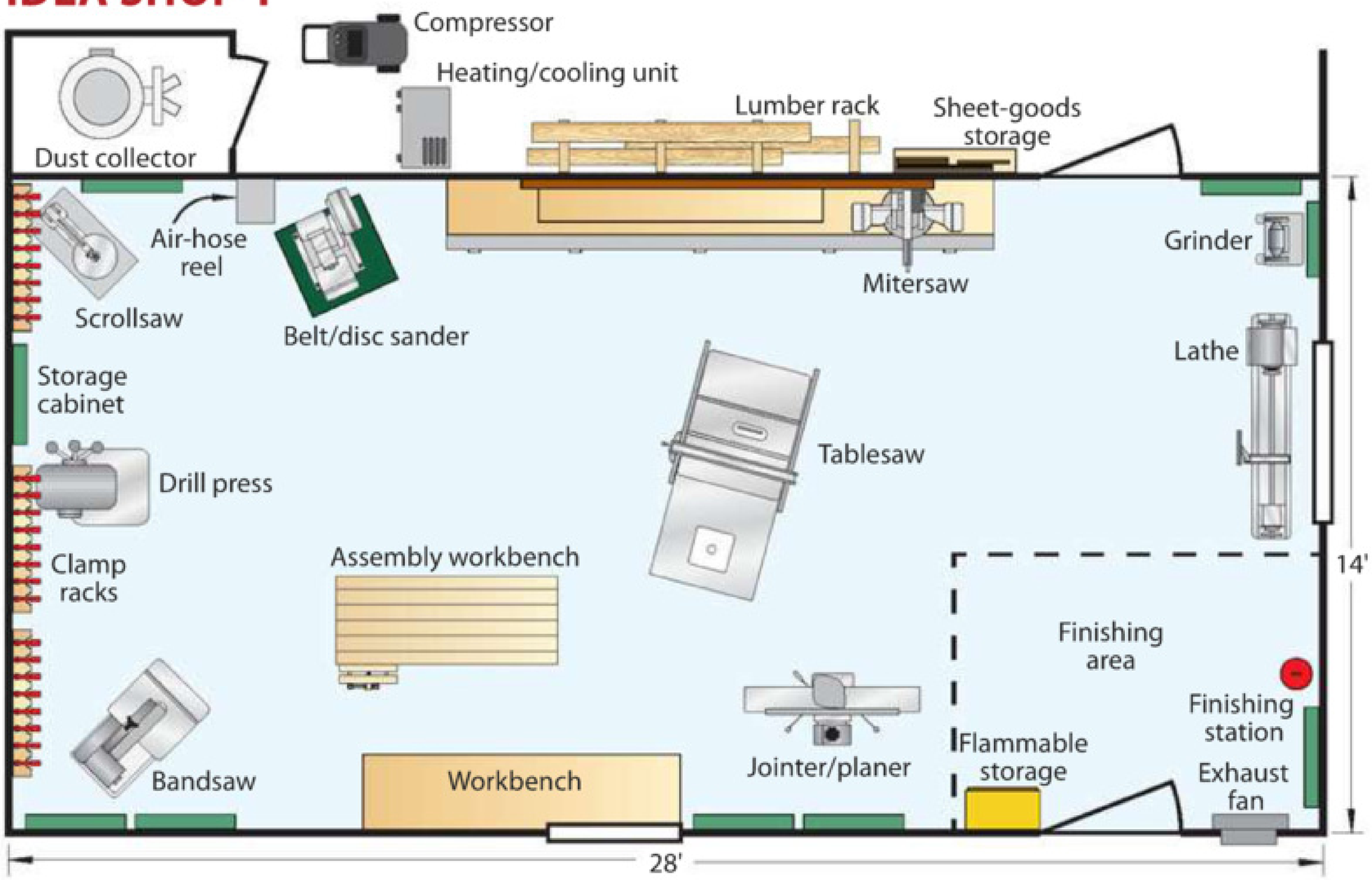
Lessons for your shop from *WOOD's* Idea Shops



The first Idea Shop proved so popular with readers that it led to Idea Shop 2 a mere two years later. From the beginning, *WOOD Magazine's Idea Shop*®—five layouts in all (see *page 6*)—brought innovative thinking to home-workshop design and construction. Effective space utilization, tool selection, storage and organization, lighting, heating, dust collection, and more came under the editors' microscopes for study and analysis. Readers' comments and suggestions provided additional ideas and design criteria for consideration.

The shops demonstrated layouts, tool choices, and storage options that fit into typical home-workshop spaces—a room in a garage, a two-car garage, a basement, an outbuilding, and a single bay in a three-car garage. Here are the shops and some lessons drawn from them.

IDEA SHOP 1

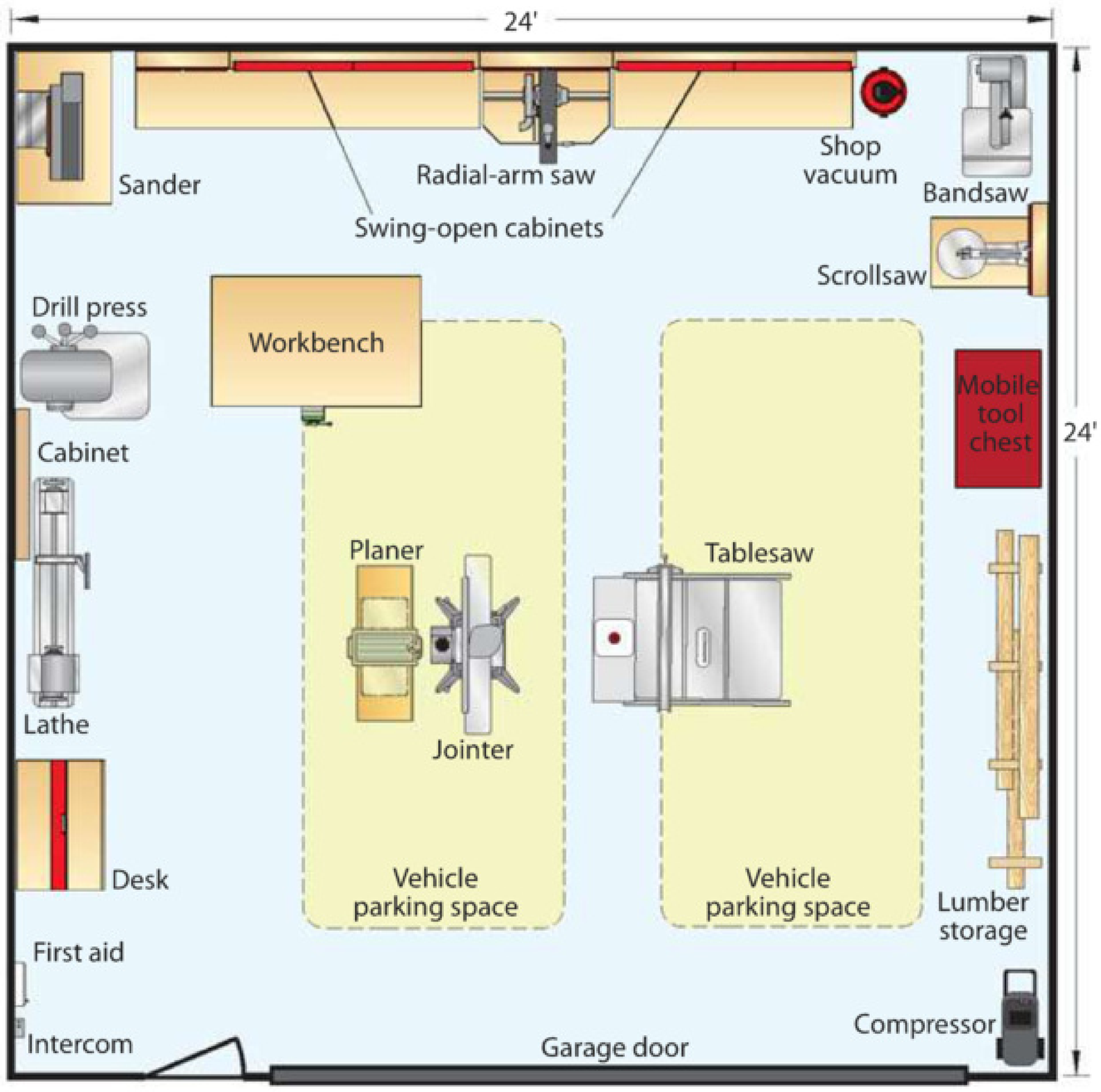


The original *WOOD* magazine Idea Shop (photo *above*) filled a 14×28' room in a rural garage with a full complement of tools and equipment. Innovative storage and organization made the shop work effectively.

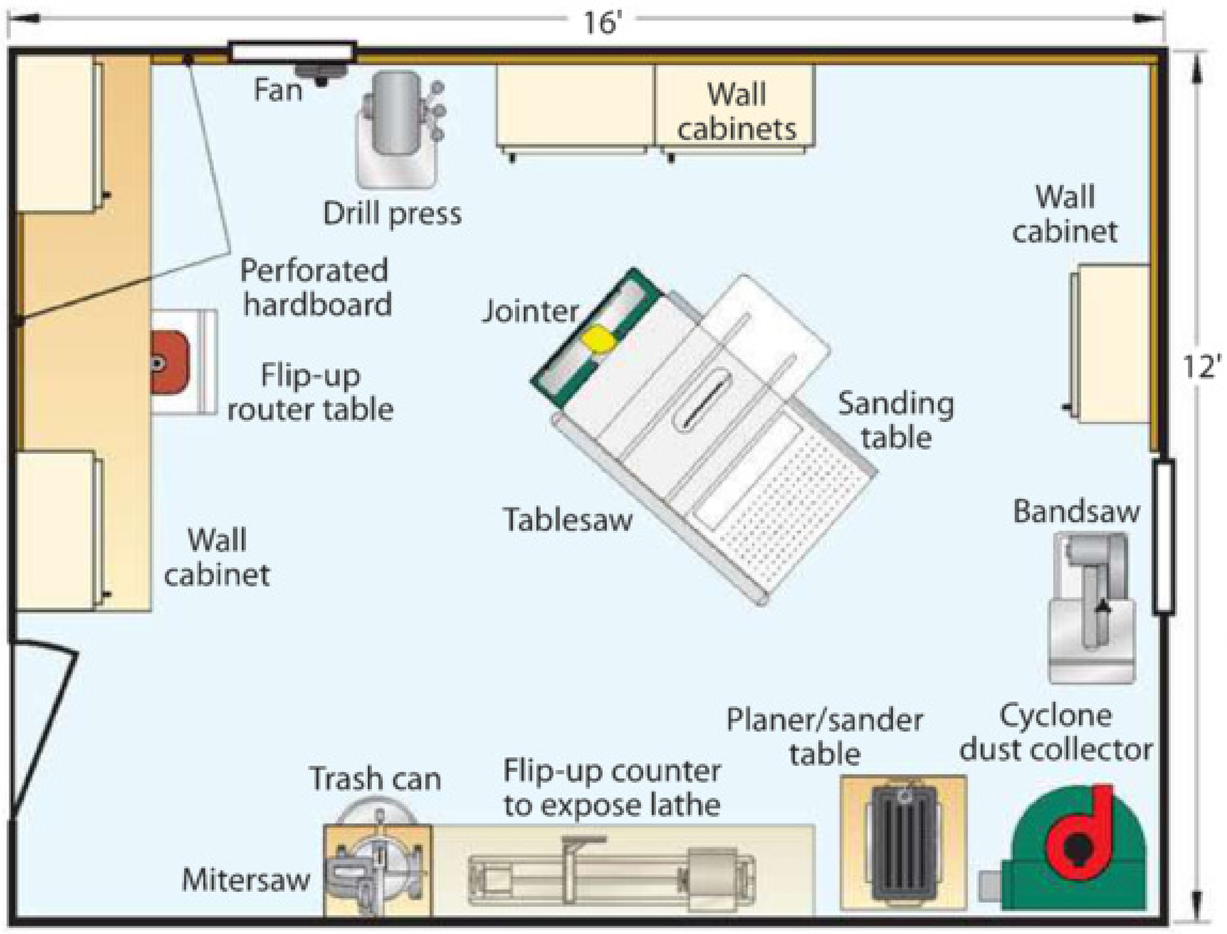


Idea Shop 2 showed how a full workshop could fit into a suburban two-car garage while still enabling the garage to shelter vehicles between work sessions.

IDEA SHOP 2



IDEA SHOP 3



Idea Shop 3 took the traditional basement workshop to new standards of efficiency and capability. Keeping dust and noise out of the living space received special attention.

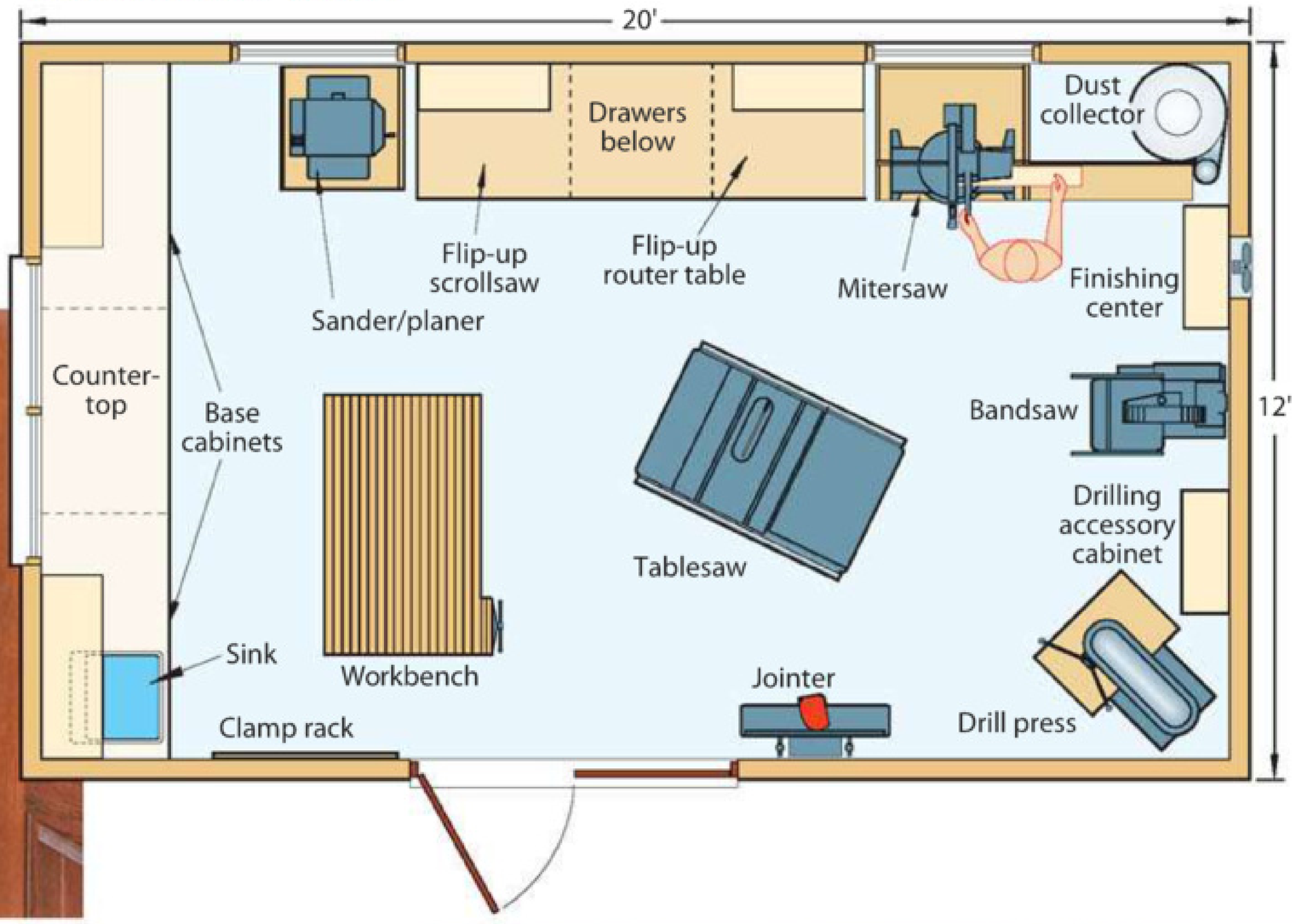


Small-shop success tactics

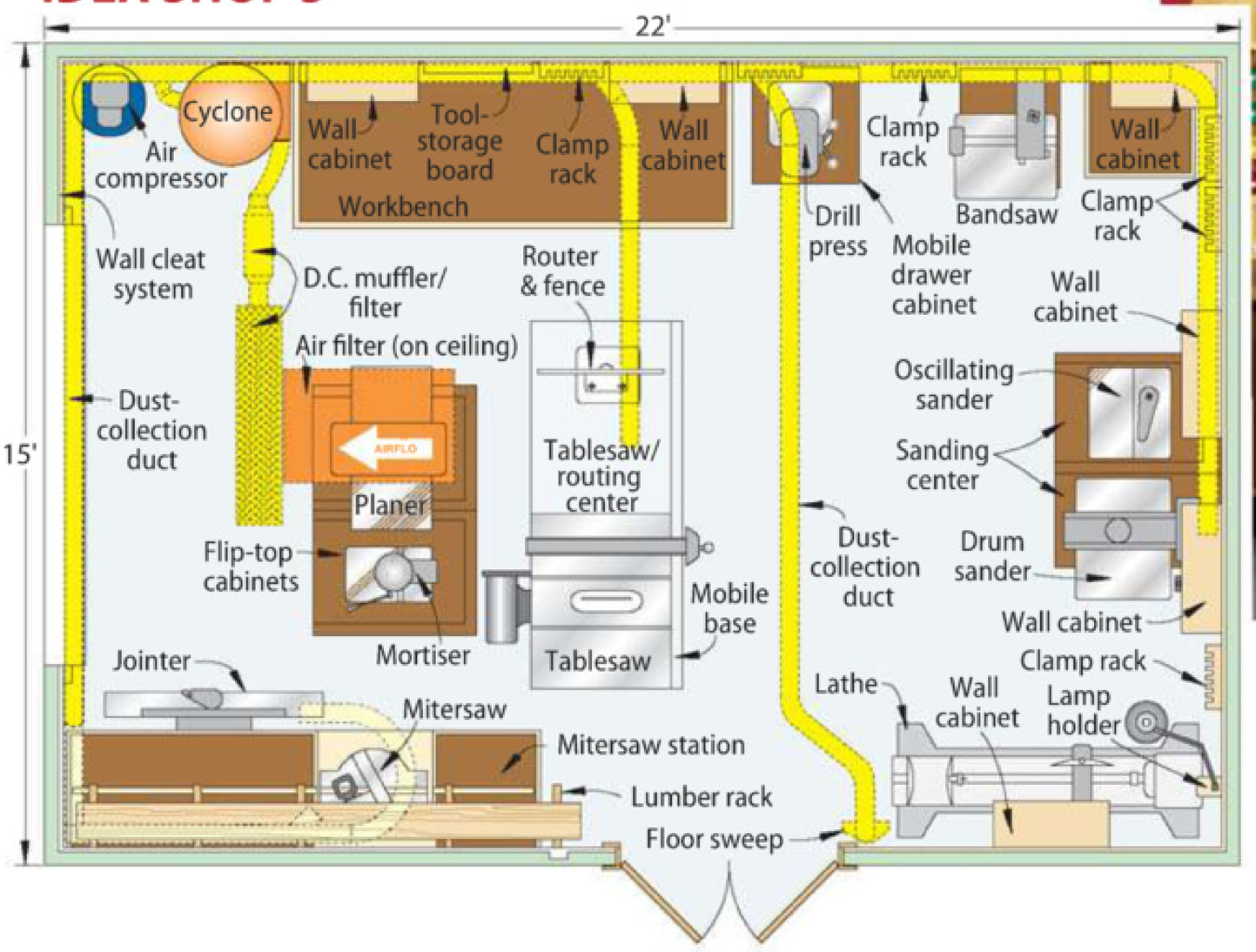
IDEA SHOP 2000

A 12×20' outbuilding behind a suburban home became the site for the next Idea Shop. Mobile tools can be wheeled out onto a covered portico between the house and shop to expand work space.





IDEA SHOP 5





Idea Shop 5 outfitted a 15×22' bay in a three-car garage with versatile modular cabinets and tool bases for maximum adaptability. A wall-cleat system allows easy storage reconfiguation.

Issues in which shops first appeared

- Idea Shop, Issue 54, (September 1992)
- Idea Shop 2, Issue 72, (September 1994)*
- Idea Shop 3, Issue 100, (November 1997)
- Idea Shop 2000, Issue 119, (December 1999)*
- Idea Shop 5, Issue 151, (October 2003)*

*Purchase copies of these issues at woodmagazine.com/backissues.

More Resources

See more photos and descriptions of the Idea Shops, including the workbenches, storage organizers, and other projects developed for each shop, along with links to purchase individual plans for those projects at **woodmagazine.com/5ideashops**.

Find Idea Shop projects and more on the *Maximizing Your Shop Space* digital article collection, $29.95, **woodmagazine.com/shopprojects**.

Tactic 1:

Establish workstations

To make the best use of any shop space, arrange tools and equipment to keep everything you need for certain operations close at hand. Concentrating your clamps, gluing supplies, and fasteners near your assembly bench, for instance, saves both time and space. You won't have to search all over the shop for the things you need; having everything together enables you to accomplish more work in less space.

In most workshops, the tablesaw is the de facto primary workstation. Positioning it for easy infeed and outfeed access often proves the best starting point for shop planning. In small shops, a mobile base allows repositioning the tablesaw to meet more needs. Set up workstations to accommodate the kinds of projects you do.

Here are a few of the many workstations from the Idea Shops.





▲ Woodturning area

The lathe, storage for turning tools, and a grinder for sharpening fit neatly into a corner in **Idea Shop 1**. The mobile base for the lathe enables it to swing out to make a corner workstation and to facilitate cleanup.

The freestanding dust-collector hood behind the lathe catches chips as they fly off the woodturning and can move elsewhere in the shop to suck up dust.

◀ Mitersaw station

The long wall-hung mitersaw bench in **Idea Shop 5** fits into a corner beside the overhead door yet still allows cutting long pieces without interference. The cleat-mounted mitersaw station moves easily to afford more space to the right of the saw, if needed.

Lumber comes in through the garage door and stores on racks above the mitersaw to minimize lumber handling. With a jointer mounted on a mobile base, it's easy to set up a lumber prep workstation where boards can be cut to length and jointed without toting them all over the shop.



▼ Finishing area

Drawing the curtain shields the finishing corner in **Idea Shop 1** from dust. With the curtain open, the space can serve other uses. Cabinets keep finishing supplies close. A covered metal container provides safe disposal for finish-soaked rags

The drop-down table includes a turntable for contortion-free finishing. When not in use, the table folds into the wall cabinet to free up floor space.

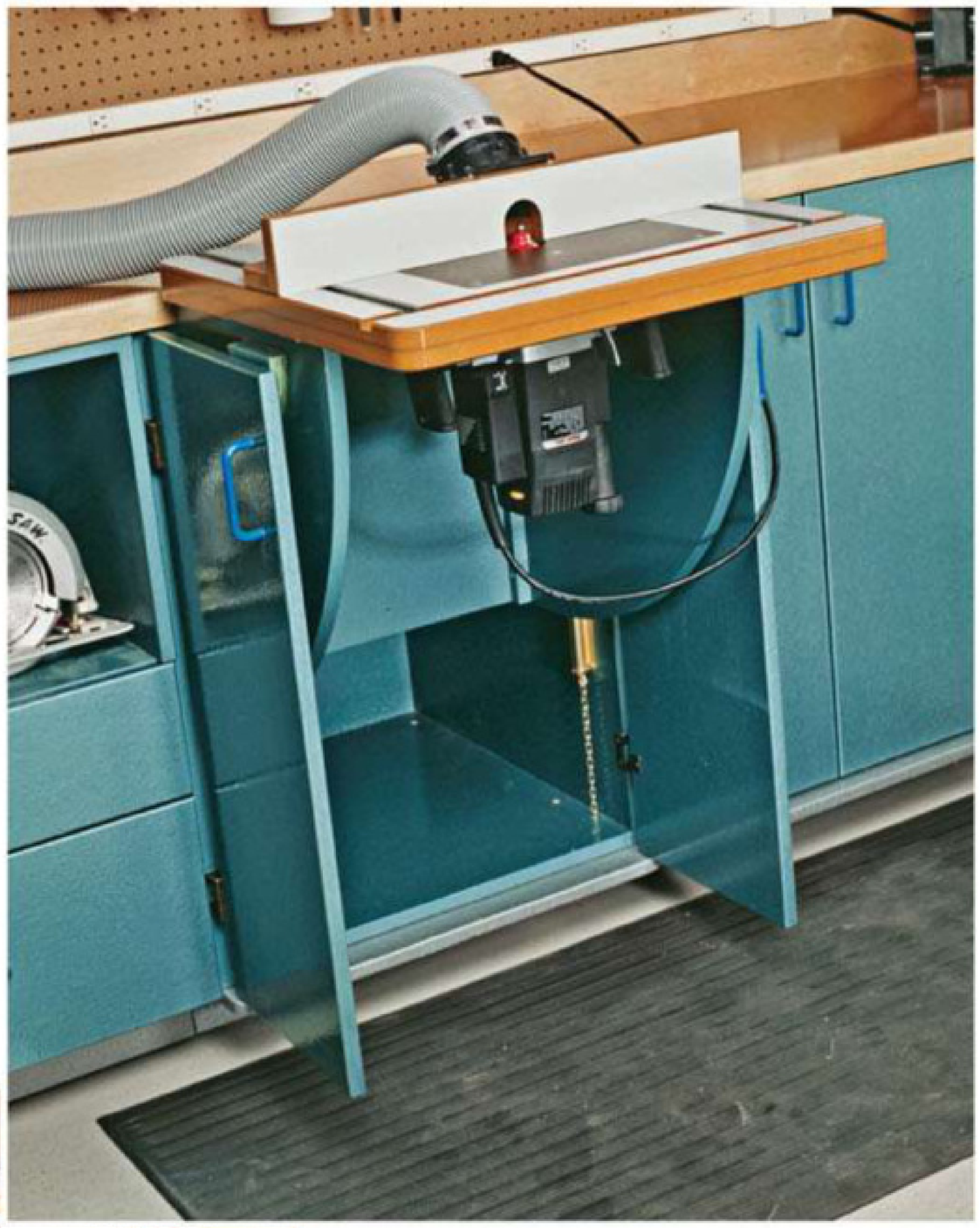


Tactic 2:

Focus on flexibility

When you have only a little space to play with, think about ways to make each square foot of floor (and wall) meet multiple needs. Mobilizing equipment to allow easy shop reconfiguration, mounting several tools on a single base, and creating work surfaces that fold up when not in use are just some of the ways you can make your shop seem bigger.

Often, the tablesaw and a workbench or assembly table earn the center ring in a shop layout, with other tools and equipment arrayed in leftover space around them. Simply putting those two largest pieces of equipment on casters lets you open up floor space in your shop for more efficient use when the situation demands.





▲ Workbench contains pull-up router table

A router table (*above*) pulls up from inside the workbench (*left*) in **Idea Shop 3**. A separate router table would eat up lots more room.

Compact solutions like this work best for tools you don't use very often. In this case, if you rely on a table-mounted router frequently, a better solution might be to set a full-size router table on a mobile base. You'll enjoy the advantages of a full-featured table when you work on it, but you can move it out of the way when you don't need it.

▶ Mitersaw moves to work

A rolling mitersaw stand with swing-up work supports parks out of the way in a corner of **Idea Shop 2000** (*right*). For cutting stock, the cart goes anywhere in the shop that affords enough space. For long stock, just roll the stand out through the double doors onto the walkway between the house and shop (*far right*). The outdoor workspace solution works at least seasonally in most places, if not year-round.









◀ Wall cabinets store double

Wall-mounted cabinets in **Idea Shop 2** feature tool storage on the inside of the doors, effectively doubling the amount of storage available. Closed, the doors shield tools from prying eyes (*below left*) when the garage doors are open.





▲ Cars and tools all park inside

Equipment on mobile bases parks along the wall (*above*) when **Idea Shop 2** serves double-duty as a two-car garage. With the cars out, mobilized equipment allows setting up a shop layout that fits the needs for any project (*above middle*).

Tactic 3:

Keep things tidy

Working in a clean, well-organized shop always makes a project go better. A small shop is no excuse for a cluttered shop. Always provide adequate storage for tools and equipment rather than just stacking stuff on open shelves; enclosed storage keeps things from getting dusty and makes shop cleanup easier. Avoid tripping hazards—run dust-collection ducts overhead instead of draping hoses across the floor and provide plenty of electrical outlets near workspaces to minimize extension-cord use.

Here are some ways the Idea Shops tackled organizational and environmental issues.



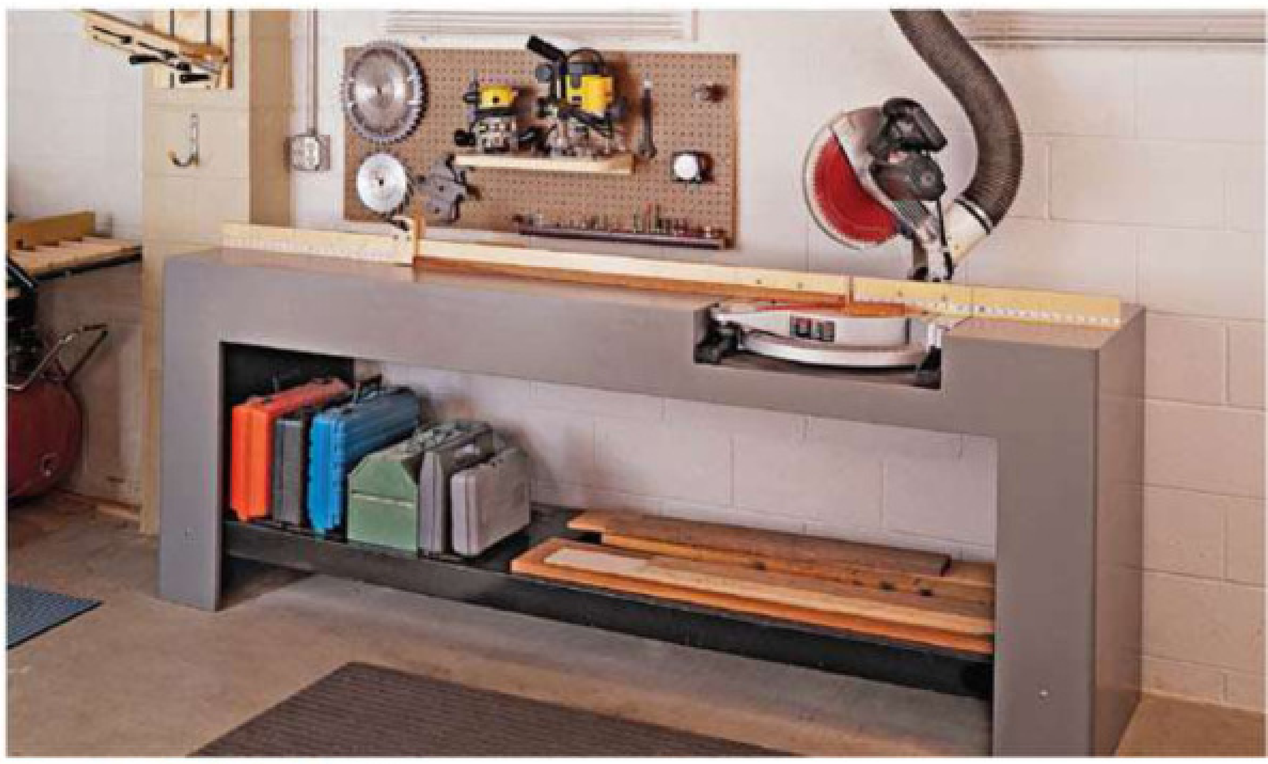
▲ Collect dust and chips

You can probably find enough space in any shop for a high-efficiency cyclone dust collector, like this one in **Idea Shop 5**. Effective dust collection at the sources keeps a shop enjoyable to work in and helps you breathe better air.



▲ Keep stuff close

Cabinets and tool boards clustered above the **Idea Shop 5** workbench keep tools and supplies handy. Slide-out shelves hold larger tools in cases.



▲ Use all your space

The long mitersaw bench in **Idea Shop 3** offers storage underneath for portable tools in cases. Routers, accessories, saw blades, and a tablesaw miter sled all reside out of the way on the wall behind the saw station.



▶ Tuck tools away

A lift-up scrollsaw (similar to the **Idea Shop 3** router table, *page 8*) and a flip-over planer-and-jointer stand, *right*, pack a lot of tools into a small space in **Idea Shop 2000**.

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Tactic 4:

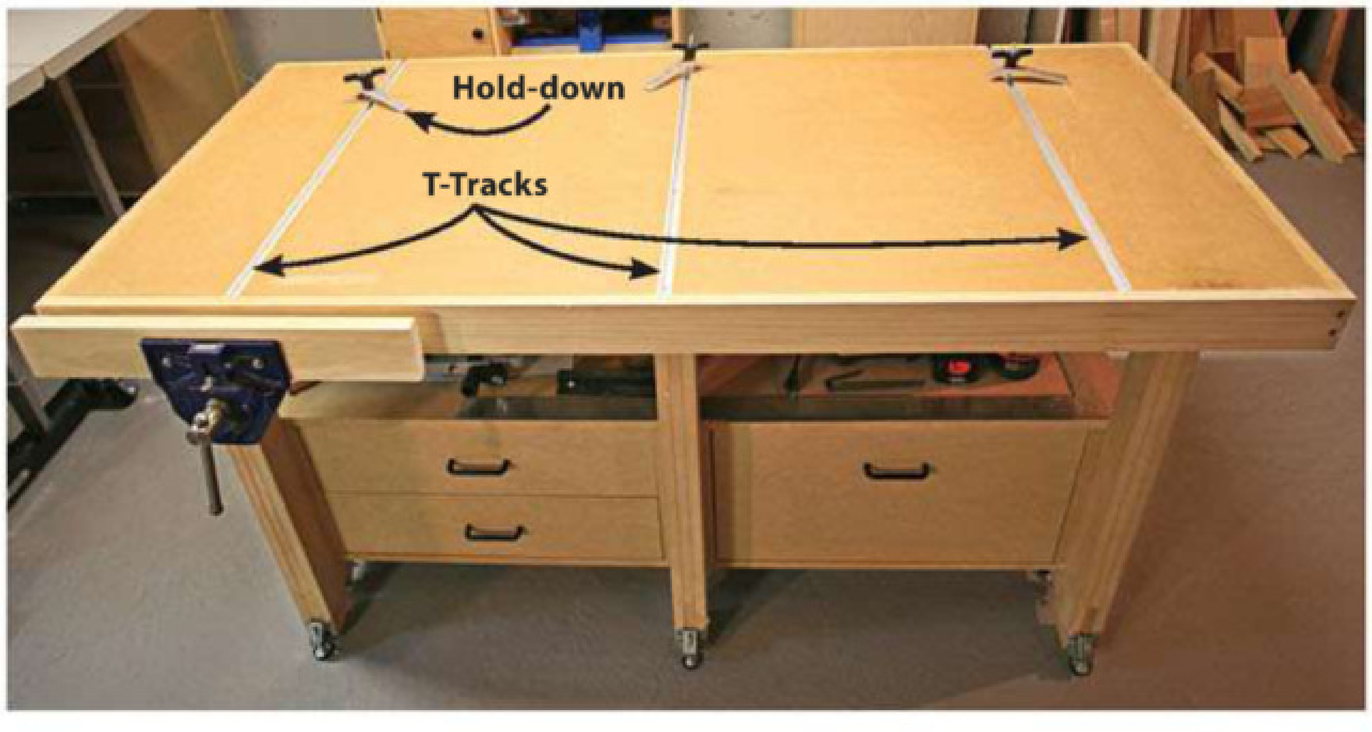
Make the most of your workbench



◀ A maple top and hefty maple legs make this workbench heavy and stable, ideal for cutting, chiseling, and planing. Drawers and shelves in the otherwise dead space under the benchtop hold tools and supplies.



▶ An end vise, a leg vise, and well-spaced holes for bench dogs add versatility and multiple work-holding options to any bench. Position a nonmobile bench in the workshop so you can work from both ends and both sides.



◀ T-tracks set into this benchtop provide adjustable hold-downs. Adjustable feet enhance stability and make leveling easy. Drawers provide storage, and a shelf above the drawers helps reduce benchtop clutter.



◀ Drawers beneath this workbench, plus a tool board and supply bins on the back wall, create a compact workspace with plenty of storage. Kreg plates set into the benchtop receive clamps for easy workholding. The benchtop planer and drill press beside the bench sit on mobile bases, so they can move to accommodate long workpieces on the bench.



▶ A pair of drawers for portable tools and a cabinet that holds routers on slide-out shelves give this workbench plenty of useful storage space. Holes for bench dogs, a pair of Kreg plates for clamps, and two vises provide many workholding options. A power strip under the benchtop keeps cords under control, and a holder on the end corrals clamp supports (shown in use in the *inset* photo).



◀ A deep drawer and two sets of shallower drawers add substantial storage to this 6' bench. A shelf above the drawers provides a place to keep tools and supplies near at hand during a project but off the benchtop. The bench features vises on an end and a side.





▶ Slate countertops salvaged from a high-school science lab give this storage-rich wall-mounted bench a solid, smooth worksurface. Windows let in lots of natural light.





◀ ▲Cabinetry and workbench combine in this built-in garage wall unit. A drop leaf with vises (*above*) increases workbench versatility. The worksurface features ¼" hardboard covering, which is easy to replace if it becomes marred.



▶ Casters carry this massive bench (it weighs more than 500 pounds) into place; then it sits solidly and stably on laminated wood pyramids. The 6'-long side vise boasts two chain-drive screws that help it close evenly to accommodate long workpieces on the bench.







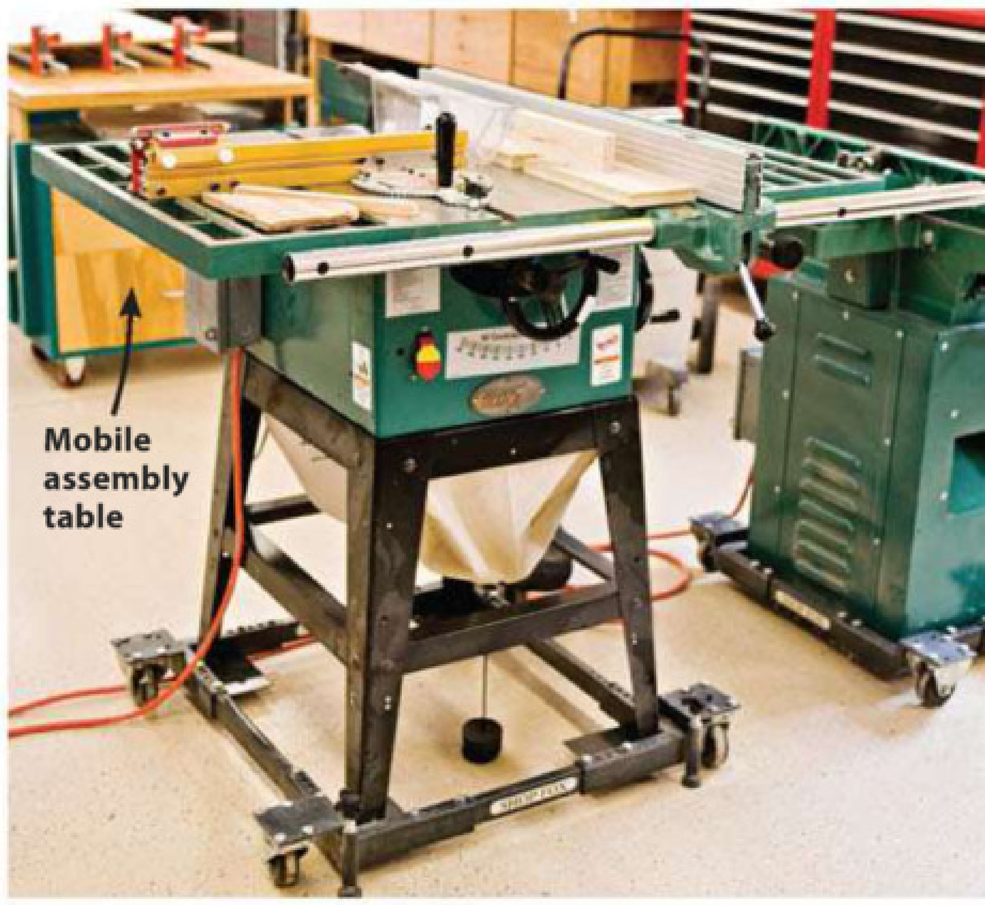
◀ ▼ This sturdy workbench, built from 2×4s and OSB, features a top glued up from 4/4 lyptus (a dense, sustainable hardwood) and hard maple. End and side vises, clamp storage cleats on one end, and a storage shelf round out the versatile and inexpensive design.

Tactic 5:

Get things rolling



▲ Tools on mobile bases park along one wall, leaving plenty of floor space in the middle of the shop that can be configured for any need.



▲ Sturdy mobile bases for the tablesaw and jointer allow them to be positioned for the most effective handling of wide or long material. The mobile assembly table has an adjustable-height top, so it can serve as an outfeed table for the tablesaw.

▶ This mobile assembly table incorporates clamp storage, so everything remains close at hand for glue-ups and project assembly.







◀ This cart keeps an assortment of clamps ready for use anywhere in the shop, and makes it easy to get them out of the way when not needed. A cart like this could park under a workbench.

▲ Heavy-duty casters make this workbench easy to wheel around the shop. When positioned, the casters retract, and the bench stands solidly on its legs.

Tactic 6:

Store accessories with tools



▲ This bandsaw's fence, miter gauge, pushstick, pushblock, and hexhead wrench ride right along with the saw when it rolls to a new location on its mobile base. Custom-fit holders attached to the saw base hold the accessories securely.



▶▼ Adding two drawers to this drum sander's base provides plenty of storage for sanding supplies.





◀▼ Just a little work transformed the stand for an old radial-arm saw into a spindle-sander base with plenty of drawers for sanding supplies. Mounted on a mobile base, the stand keeps the tool and accessories together wherever they go in the shop.



◀ Router bits store in holders on the doors of this router-table cabinet. The cabinet also holds additional routers and accessories.





▲ This 20×24" cabinet organizes tablesaw blades and accessories in one compact unit. The cabinet rolls under the saw's extension table for out-of-the-way storage.





▲▶ This mobile lathe station puts turning tools and pen-making supplies close at hand for turning sessions and makes it easy to put everything away when finished. Sections of PVC plumbing pipe attached to the ends hold turning tools and protect their cutting edges.



▶ Here's another bandsaw with its accessories—a fence, miter gauge, and tapering jig—on board and ready for use wherever the saw is set up.



▲ Plenty of storage space in this router table keeps bits and accessories handy. Easy access to the router facilitates adjustments and bit changes.



▲ This cabinet collects tablesaw blades, jigs, and accessories in one convenient location—right next to the saw cabinet beneath the table extension.

Tactic 7:

Give tool bases extra duties





◀▼ A benchtop drill press jointer, and bandsaw share space on this mobile base. Drawers hold shop supplies as well as accessories.



▲ This flip-over base holds a mitersaw and a planer. The design could be adapted to hold other tool combinations—a bench grinder and a sharpener, for example.

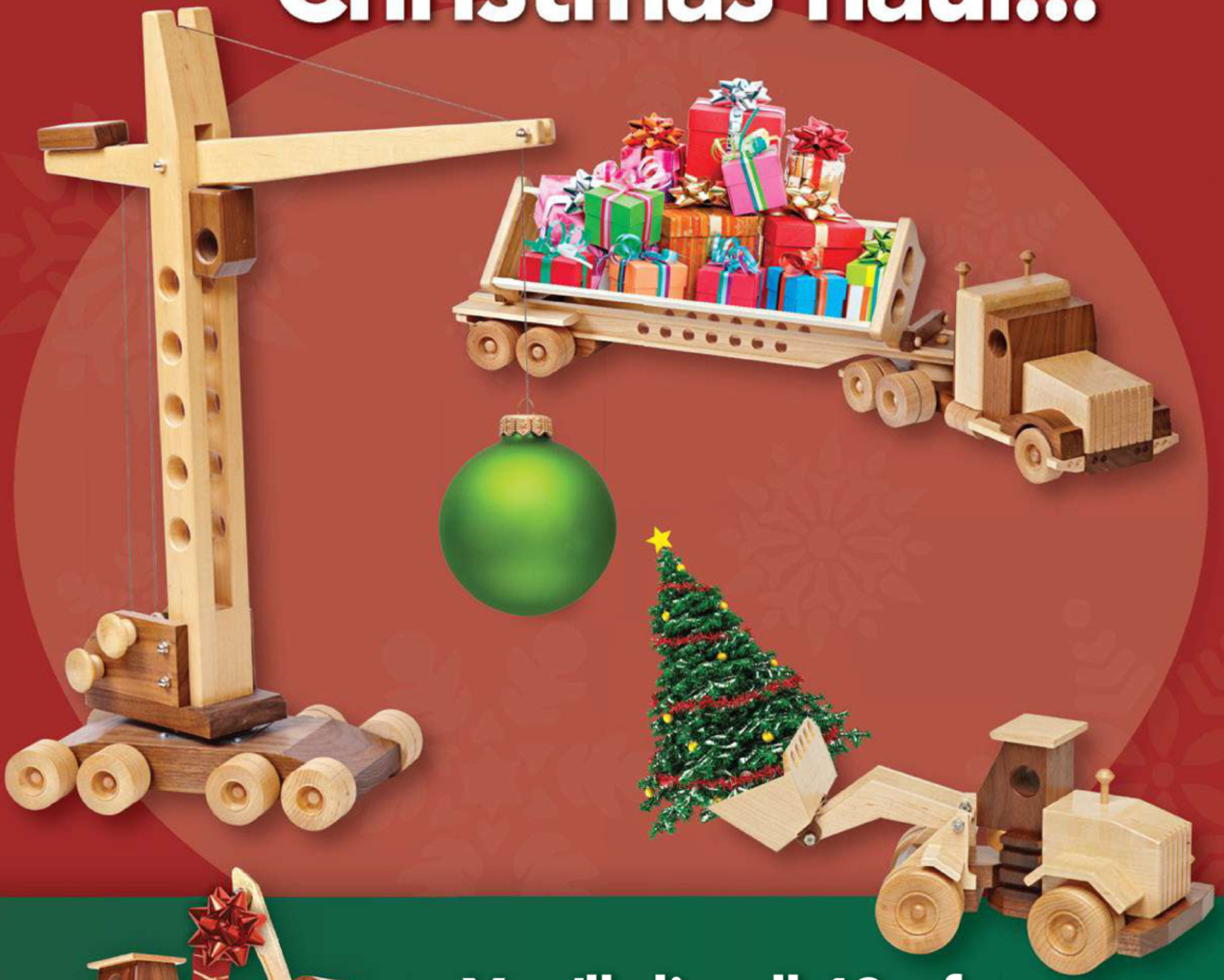






◀▲ Sanders make great candidates for clustering on a common base, as these three examples show. Dust-collection hoses can be routed to one or two connections, so you can gather dust from any machine with minimum hose-switching. Size drawers and storage compartments to hold supplies for the machines on the base.

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If you think a decent workshop requires factory-size floor space, think again. These four examples show how smart use of limited space can create a super shop.

Reclaiming spaces



This enterprising woodworker found the right materials, from reclaimed to repurposed, to finish the interior of his small shop just the way he likes it.

Wes Bowling's shoestring budget forced him to spend a great deal of time planning the interior of his shop. Then he put in more time networking with friends to scrounge materials.

The drywall, for example, came from friends who had material left over after finishing their basement. His shop wiring was left over from a previous house project. And when a local photography store remodeled, he carted off the old flooring for his shop. "I am always looking for a good deal," he says.

Wes set up his shop in a standard 8×14' wood-framed utility shed he built on the large concrete patio behind his home. Of course the patio provides a rock-solid foundation for the building. But because Wes knew interior space would be at a premium in his shop, he also picked the patio location to give him access to a sizable area for constructing larger projects outside the shop.

From the exterior, the finished building looks just like what it is: a well-built, nicely painted and shingled utility shed. But on the inside, it's far from typical.

(Re)claim to fame

Another reclaimed material lines two opposing walls of Wes' shop—the slatwall system

continued on page 23

SHOPSPECS

TYPE: Dedicated shed

SIZE: 8×14' (112 sq. ft.); 8' ceiling with open rafters

CONSTRUCTION: 2×4 frame and OSB exterior; drywall, slatwall, and perforated hardboard on interior

HEATING AND COOLING: Wall-mounted 220-volt combined heating/AC unit

ELECTRICAL: 220- and 110-volt service with eight duplex outlets

LIGHTING: Main lighting is two 4', four-bulb fluorescent fixtures, with a 4' single-bulb fluorescent unit over the workstation. Two magnetic-base spotlights provide task lighting.

DUST COLLECTION: 1-hp Jet system with five ports dropped from ceiling ductwork





Left: Limited space inside his shop doesn't limit project size for Wes. Whenever he needs to work on larger projects, he rolls his tools down a small ramp (not shown) and onto the concrete patio.

Above: For a small shop, there's a surprising amount of storage. Wes keeps power tools, a selection of turning blanks, and project supplies in this melamine cabinet.

Previous page: Rolling steel tool chests hold hand tools while wall cabinets contain mostly lathe supplies.

Great shops less than 400 sq. ft.

Wes puts a premium on proper lighting in his shop. "I have magnetized lights that I can move closer to my work to help with turning," he says of his setup, below. "The extra illumination proves critical when I'm finish-sanding and applying finish to a project."



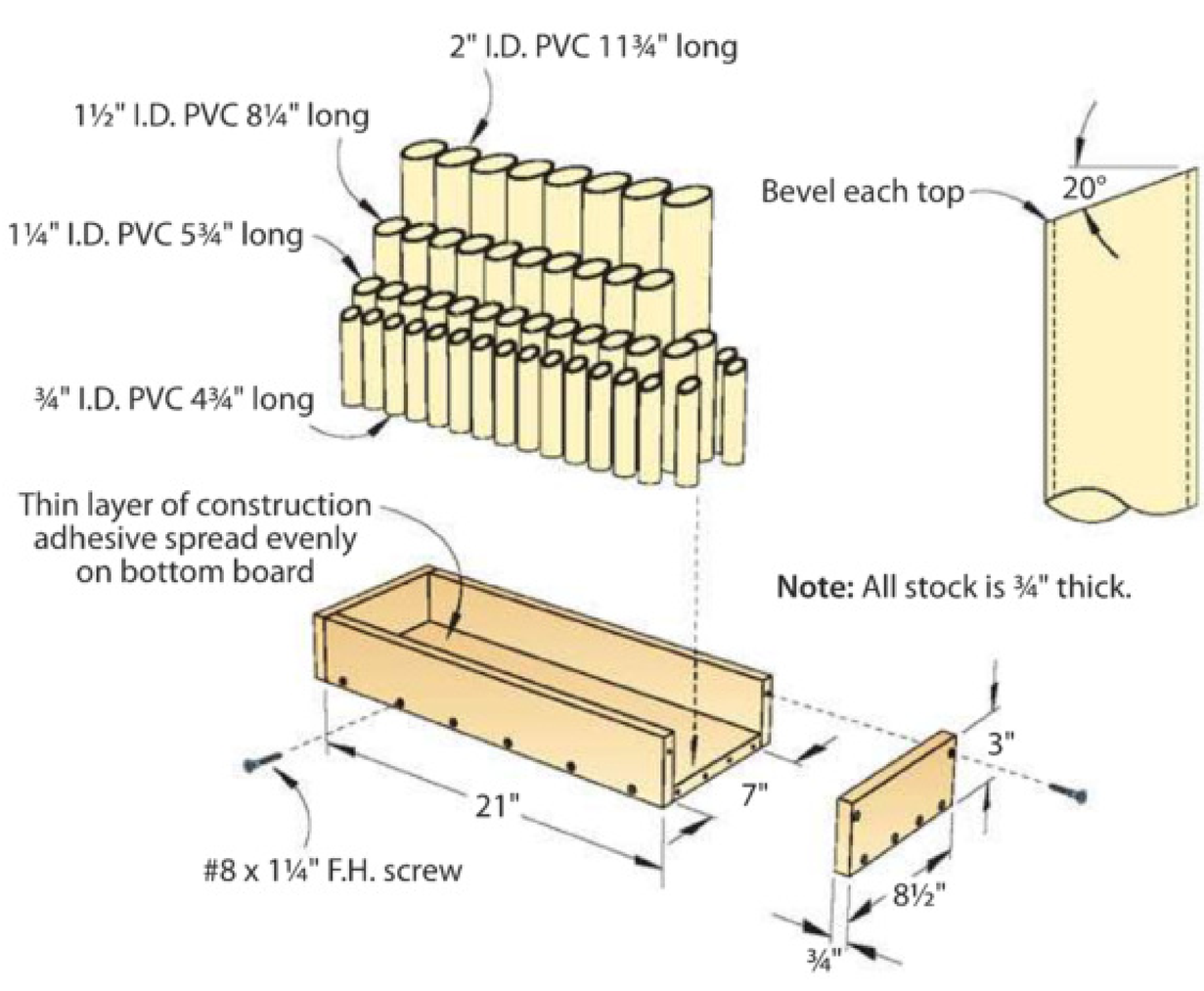


A slatwall hanging system with numerous tool hooks offers maximum flexibility. "The great thing about slatwall is the ability to move and adjust storage to accommodate my needs at any given moment," Wes says.

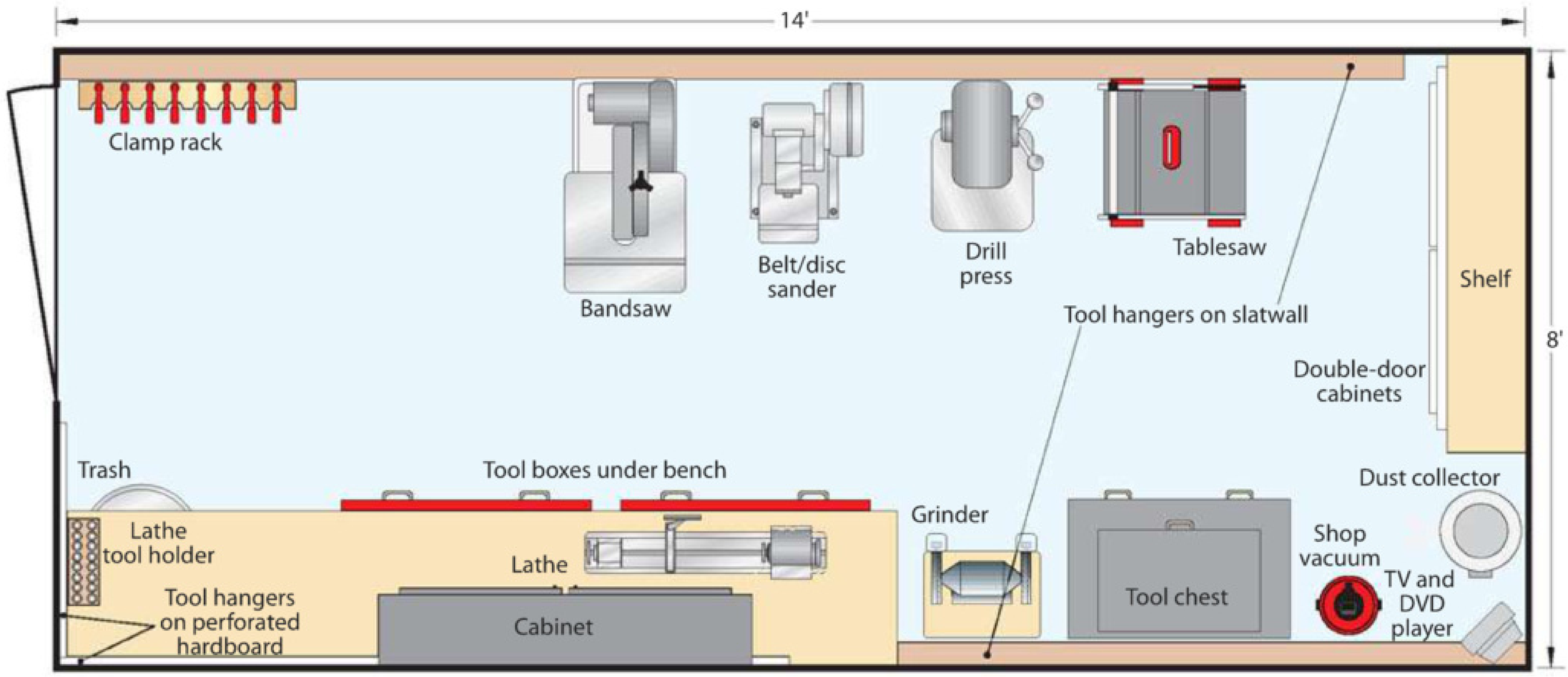
LATHE TOOL HOLDER



Wes' lathe-tool holder is simplicity in itself. He made the main box out of scrap 1× pine, with dimensions calculated to keep various diameters of PVC snug once placed inside. Each length of tubing holds a chisel or other lathe accessory.



FLOOR PLAN



Power tools on mobile bases provide plenty of flexibility in this shop. The linear layout gives a straight path to the shop entrance for those occasions when Wes wants to roll tools outside onto the patio.



Because Wes does much of his own auto maintenance (he learned mechanical skills in his dad's gas station), this rolling metal tool chest houses an extensive selection of mechanic's tools as well as woodworking drill bits, chisels, and various lathe accessories.

continued from page 20

that holds clamps, hammers, and other hand tools.

"The slatwall system was a fluke," he recalls. "My wife was shopping for last-minute deals at a going-out-of-business sale. She called me about the slatwalls that the manager said they were going to sell." Wes ended up buying three sections of it, plus lots of hooks and hangers, for a nominal cost. As a result, just about every tool he needs hangs within arm's reach.

Close, but not cluttered

At 112 square feet, the shop is admittedly small, but Wes keeps things clean and uncluttered, thanks to more storage space than you might expect. Steel tool chests hug the wall or tuck under his workstation, while a large cabinet houses power tools and wood.

Putting major power tools and tool cabinets on mobile bases allows Wes to move equipment around as needed while he works. The maneuverability also helps with regular cleaning.

However, his long-term goals include adding more storage to the back of the shed to open up the interior a bit. That was part of the plan all along. "I positioned the workshop with space to extend it if necessary," he says.

Teaching the art of pen-turning



Woodturning occupies most of Wes' shop time. But when he's not making his own pens, like the ones shown *above*, he teaches entry-level pen-turning classes at his local Woodcraft store. "Pen-turning is a great way for new woodturners to hone their skills," he says. "I find that it is the most rewarding when someone walks out of a turning class with a finished project."

Written by **A.J. Hamler**
Photos: **Kevin Lunt Photography**

Less is more

Instead of a shop stuffed with tools collected during three decades as a woodworking editor, a regular deep cleaning keeps everything to a minimum in this garage shop.

During a 27-year career at *WOOD*® magazine, Marlen Kemmet had access to a plethora of woodworking tools and accessories. But instead of "one of everything and two of some" for his shop, he embraces the principles of tenkara—the traditional Japanese method of fly-fishing where only a rod, line, and fly are used. Like the disciples of tenkara who believe the more you know, the less you need, Marlen has become a shop minimalist.

345 square feet of shop

"For more than 20 years," Marlen says, "I've worked out of a 15×23' single-stall garage. From here, I've furnished our home with dozens of Greene & Greene-style furniture pieces and have worked with my children to make numerous pieces for their own homes and apartments.



By keeping on hand only the absolutely essential tools and materials for what he builds, Marlen avoids clutter while maximizing the floor and wall space of his single-stall garage workshop.



"For extra light and ventilation, I often work with the garage door open," Marlen says, "so I like to keep my workshop clean and presentable to the neighbors."



A wall-mounted ¾-hp, 650-CFM dust collector serves stationary tools. A 20'-long hose extends to connect to each machine as needed.



Marlen found a home for clamps, hearing protection, and pneumatic tools and accessories on two backing boards to the right of the overhead door track.

SHOPSPECS

TYPE: Shop occupies third stall of a three-car garage. Lathe located in adjoining garage stall.

SIZE: 15×23' (345 sq. ft.) with 9'6" ceiling

CONSTRUCTION: Drywall over 2×6 frame

HEATING Wall-mounted propane heater

ELECTRICAL: Two dedicated shop circuits are part of 200-amp house panel; 220-volt service powers the tablesaw and lathe.

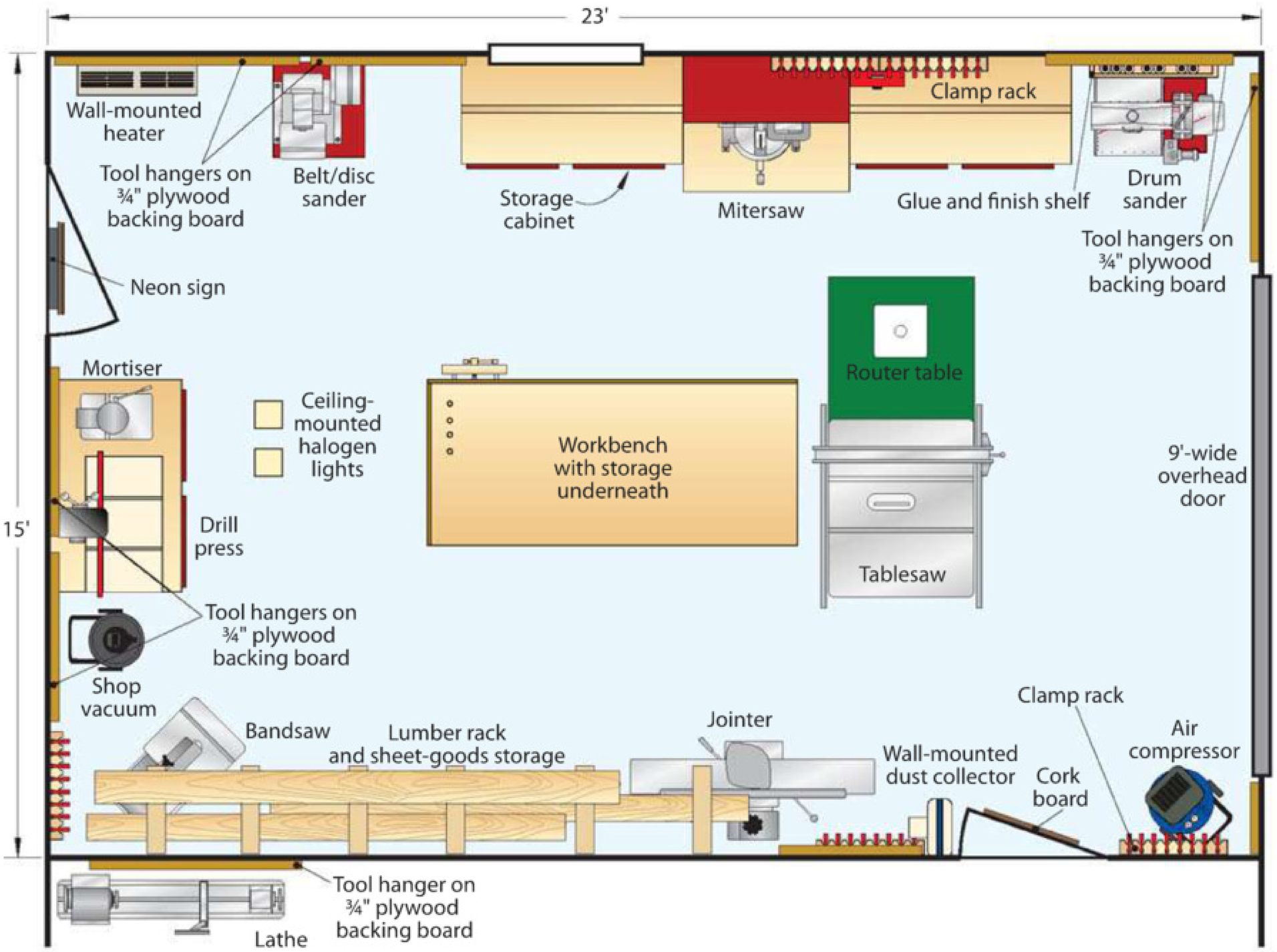
LIGHTING: Four 300-watt compact fluorescent fixtures and two ceiling-mounted halogen lights for task lighting

DUST COLLECTION: ¾-hp Rockler wall-mounted dust collector; 650 CFM rating; 5-micron bag

AIR COMPRESSOR: 5-hp, 20-gallon Campbell Hausfeld portable compresor.

Great shops less than 400 sq. ft.

FLOOR PLAN







Tool hangers on plywood

"Drywall isn't conducive to hanging tools," Marlen says. "So I framed ¾" plywood with ¾" oak quarter-round and attached these backing boards to the wall studs."

The boards allow Marlen to hang commonly used tools on the walls. Putting tools, bits, and other accessories in enclosed cabinets keeps them dust-free, he admits, "but I like not having to open and close doors to access my tools."

"With my small-shop limitations, I've found that less has to be better. So every five years, I clean my shop from top to bottom. I empty every drawer and review each and every tool and supply. Unless I know I'm going to use it in the next year, I give nonessential items to my woodworking neighbor or the local high-school shop. I've given away hundreds of dollars worth of tools and supplies, but since they weren't getting used, I really didn't miss them," he explains.

Frequently used router bits and battery chargers have a home just two steps away from Marlen's workbench.

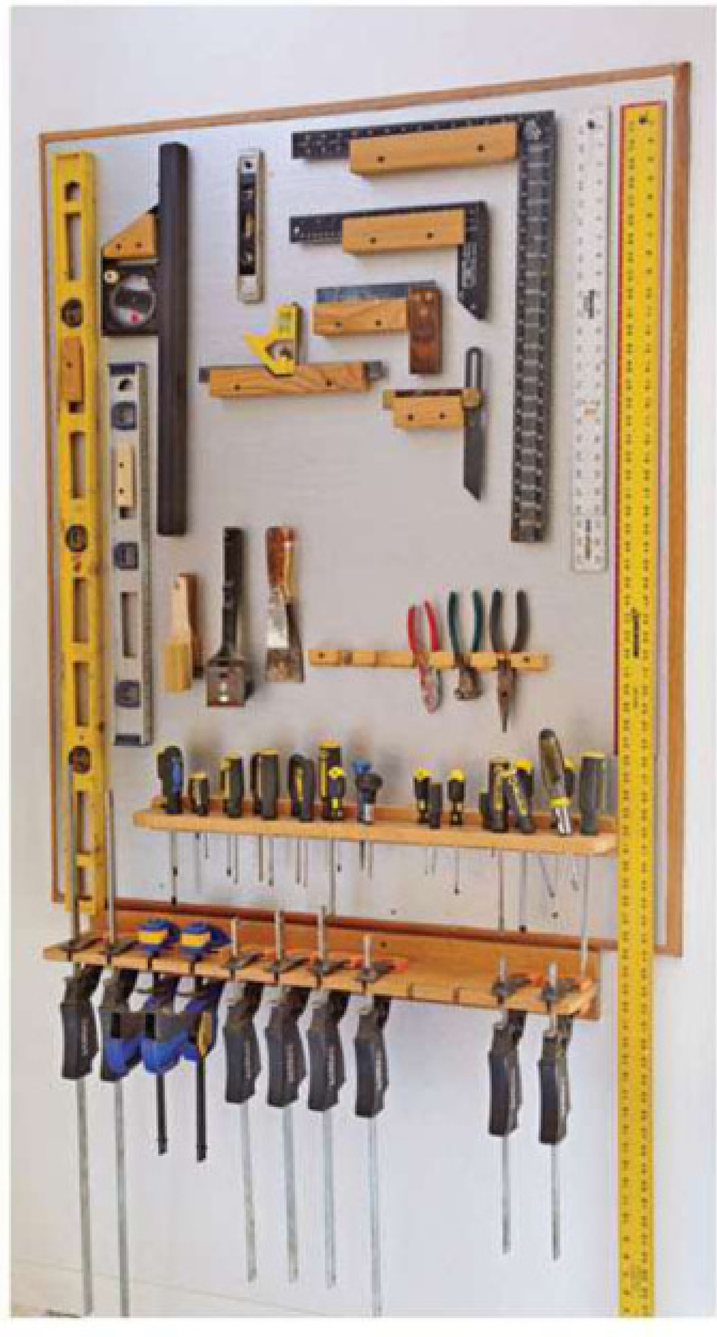
The end wall of Marlen's garage workshop provides plenty of space for clamps, bandsaw blades, wrenches, and stationary and benchtop tools. He purchased the mortiser (near the service door to the backyard) when he began building Greene & Greene-style furniture. A mortiser simplifies making the mortise-and-tenon joints and the inset square accents found on this style.



A 22×34" corkboard fastened to a service door keeps project plans visible. Marlen built the crib *(inset)* from the drawings shown.



Measuring and marking tools fill most of a plywood backing board on a narrow shop wall to the left of the garage door.





For easy access, Mike prefers open-face tool storage. He is standing in front of a fold-down outfeed table, shown opened up on *page 26*.

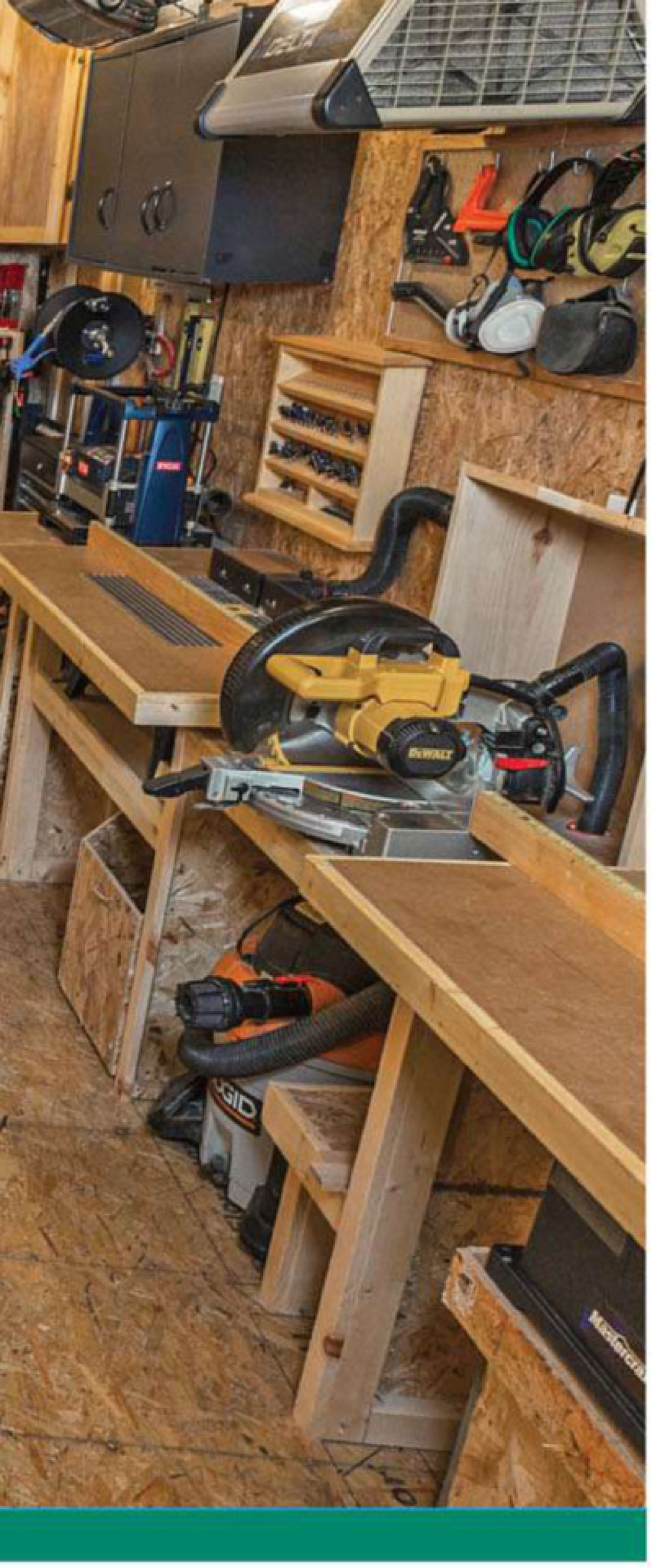
Recipe for a small shop

When Mike Hayes started planning his new shop, he stirred in skills learned as a restaurant chef and kitchen manager to make sure his shop was done to perfection.

When your shop fits into less than 400 square feet of floor space, every inch counts. With a budget and a tight footprint in mind, woodworker Mike Hayes spent a year researching shops in magazines and online. Mike even built a cardboard model (1"=1') of his 16×24' shed and tool arrangement before breaking ground in his backyard.

"I worked 12 years in Newfoundland [Canada] kitchens," he explains, "and I had to know every day that all my tools were in the right place. Everything we needed was hanging on racks. I never did like drawers—in a kitchen, there wasn't time to look for things in a drawer.

"And we spent a lot of time on recipe preparation before trying anything new. So I've carried a lot of those chef's disciplines into planning and building this shop. I originally planned a 16×20' shop, but it wasn't working out right, so I added on to my model.





Mike Hayes' 16×24' shop is just 20 steps from his back door. A family member framed the structure and cladded its exterior, and Mike finished off the interior. The 5×6' overhead door and ramp make it easy to move equipment and materials in and out.

"I'm glad I did, too. The only thing I would change now is that I could have easily built 10' walls rather than 8' walls. I was used to low ceilings in my old basement shop, so I am just now realizing how nice 10' ceilings would be when handling 4×8' sheet goods. Of course, without a roof, the luxury of a 10' ceiling didn't show up on my scale model," he says with a chuckle.

"I planned everything down to the dartboard in my model. Lots of my neighbors have a dartboard in the shed or garage. It's a popular game around here."

continued on page 31

SHOPSPECS

TYPE: Outbuilding

SIZE: 16×24' (384 sq. ft.) with 8' ceiling

CONSTRUCTION: Wood frame on pavers; 2×4 stud walls; 12" insulation in ceiling

HEATING 1,000-watt baseboard heater and ceiling-mounted radiant heater

ELECTRICAL: 100-amp sub-panel with 12 110-volt outlets

LIGHTING: 12 compact fluorescent bulbs (100-watt equivalent)

DUST COLLECTION: Delta Shopmaster ceiling-mounted air scrubber and Powerfist 1-hp wall-mounted dust collector. A shop vacuum serves for general cleanup.

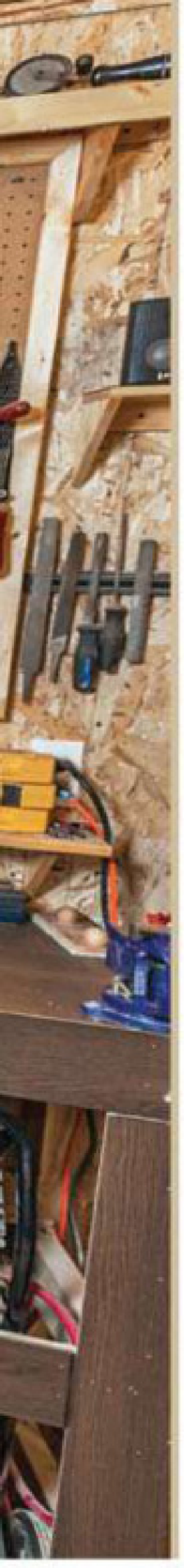
AIR COMPRESSOR: 2.5-hp, 10-gallon Brute by Briggs & Stratton



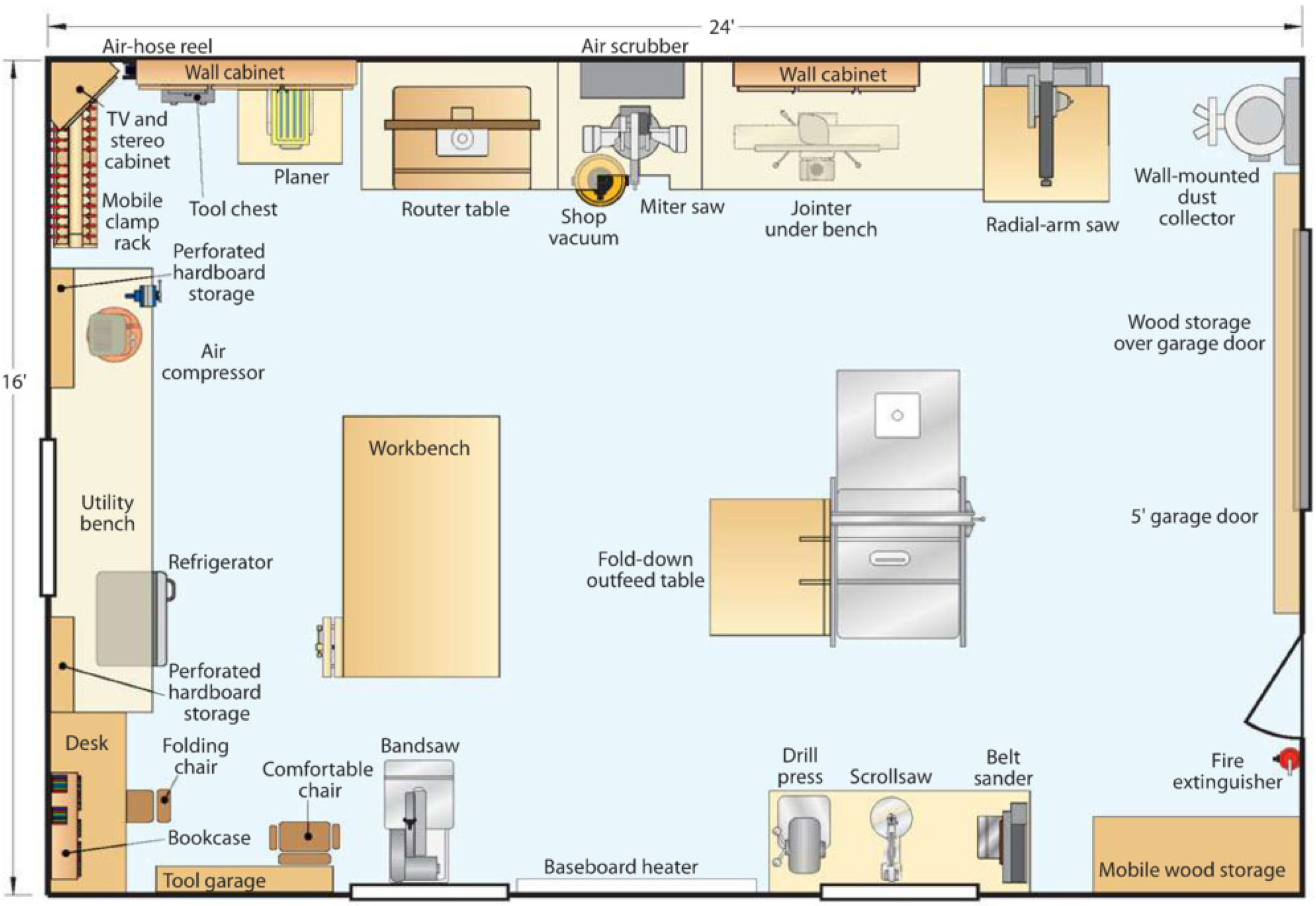
A 26×71½" bench provides space for Mike's drill press, scrollsaw, and 4" belt sander. Mike constructed the top from two layers of ½" plywood and then covered it with ¼" hardboard. He stores a mini-lathe and other tools below.

Mike squeezed a small desk, refrigerator, and even a comfortable chair into his shop, despite its small floorspace.

When he doesn't need the outfeed table, Mike removes the legs and folds it down, adding just 5½" to the saw's footprint.



FLOOR PLAN





continued from page 29

"Most of my tools are out in the open for easy access," Mike continues. "I even have some tools on perforated hardboard—the tools look fine, and they're easy to find. Nothing fancy for me.

"I think my next project will be to build a cabinet with hinged doors—something that doesn't take up too much space but allows me to expand my hand-tool collection. I want to keep everything hanging."

Mike wheels his clamp caddy into a corner when not in use. He stores additional clamps behind the caddy. The corner cabinet hides a 19" flat-screen TV, stereo, and DVD player.

Bare necessities

With just 308 square feet of floor space, every nook and cranny of this shop has a purpose, allowing plenty of room to work.

Compared with the coal cellar where he once set up shop, Rick Campbell now works in palatial surroundings. Daylight streams through the windows into his 14×22' shop, and he actually can stand up instead of being hunched beneath low joists. Although you'll find plenty of shops boasting larger footprints, this backyard retreat suits Rick to a T.

"The only tools I keep in my shop," Rick explains, "are the ones I use regularly. And I'm ruthless when it comes to lumber storage. I only buy materials for



Corded and cordless drills hang together on slatwall hangers Rick assembled from ¼×3" carriage bolts, 1¼" fender washers, and ¼" flat washers. He stores removable battery packs in a nearby charging station or in a drawer.

Previous page: In Rick Campbell's shop, every tool has a home. Rick covered much of the wall space with slatwall or custom movable panels that hang on beveled cleats (also called French cleats).

Right: Rick stands outside the entrance to his 14×22' shop. "I kept the construction costs low," Rick says. "The simple design allowed me to spend more on interior fixtures and equipment."

Below: One corner of Rick's shop includes a mobile drill press; wall-mounted mortiser; thickness planer and router table, each on casters; plus a mobile bench/cart/ infeed-outfeed table. The router table accommodates two routers with different setups. Above it, two of Rick's cabinets have removable frame inserts for project photos.



SHOPSPECS

TYPE: Dedicated building

SIZE: 14×22' (308 sq. ft.) with 8' ceiling

CONSTRUCTION: 2×6 frame construction on a poured concrete slab; vinyl siding

HEATING Ceiling-hung 220-volt space heater

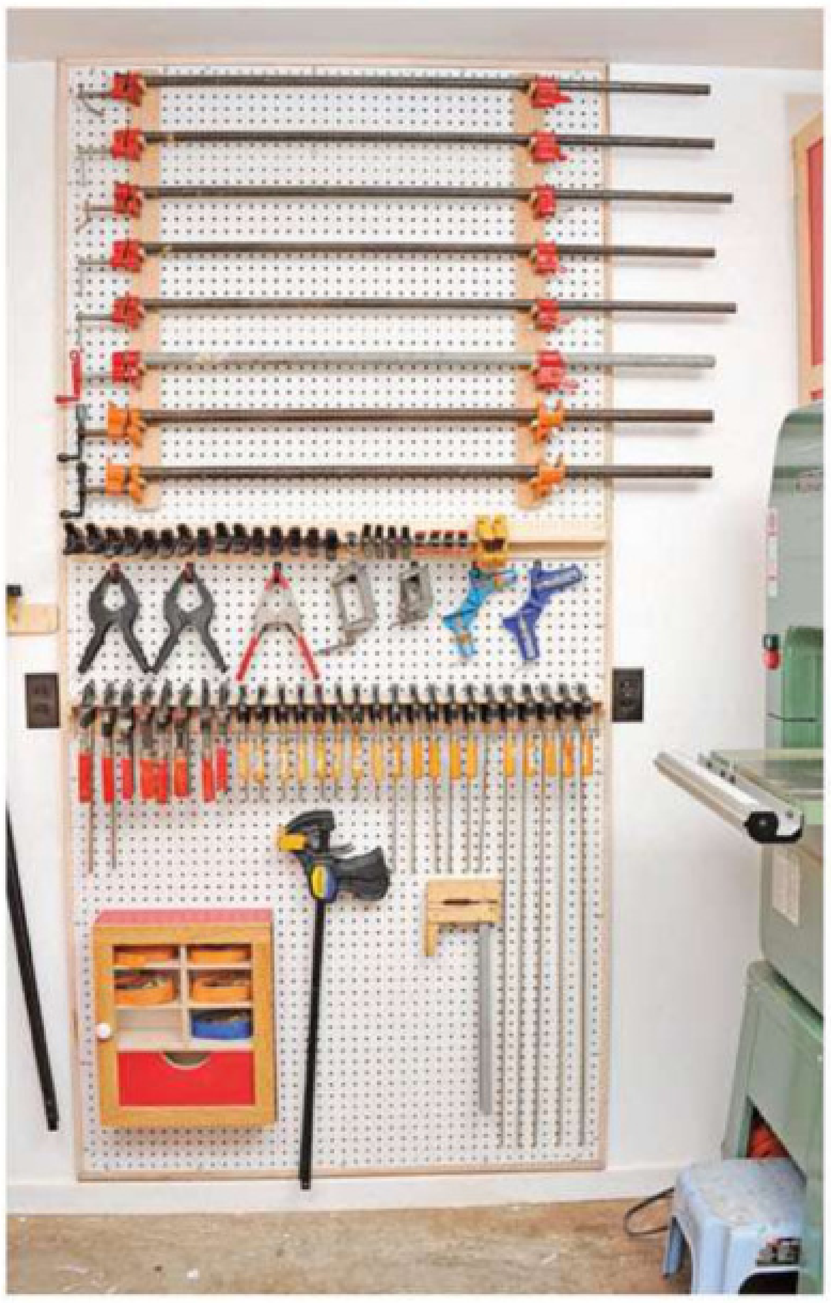
ELECTRICAL: A subpanel brings in 100-amp service from the house to power both 110- and 220-volt circuits.

LIGHTING: Five banks of double fluorescent fixtures recessed into the ceiling between the joists to maximize ceiling height

DUST COLLECTION: A 1-hp collector on wheels connects to any machine; separate systems service the bandsaw and stationary sanders. A ceiling-mounted air cleaner removes airborne dust.



Door pulls from leevalley.com fit perfectly in a shop environment. Rick makes notes on the green chalkboard panels (purchased at Home Depot) in his cabinet doors.



"This clamp rack organizes my entire assortment of clamps in one location," Rick says. "The small cabinet in the lower corner of the panel houses compartments for web clamps and a pull-out drawer for clamping accessories."

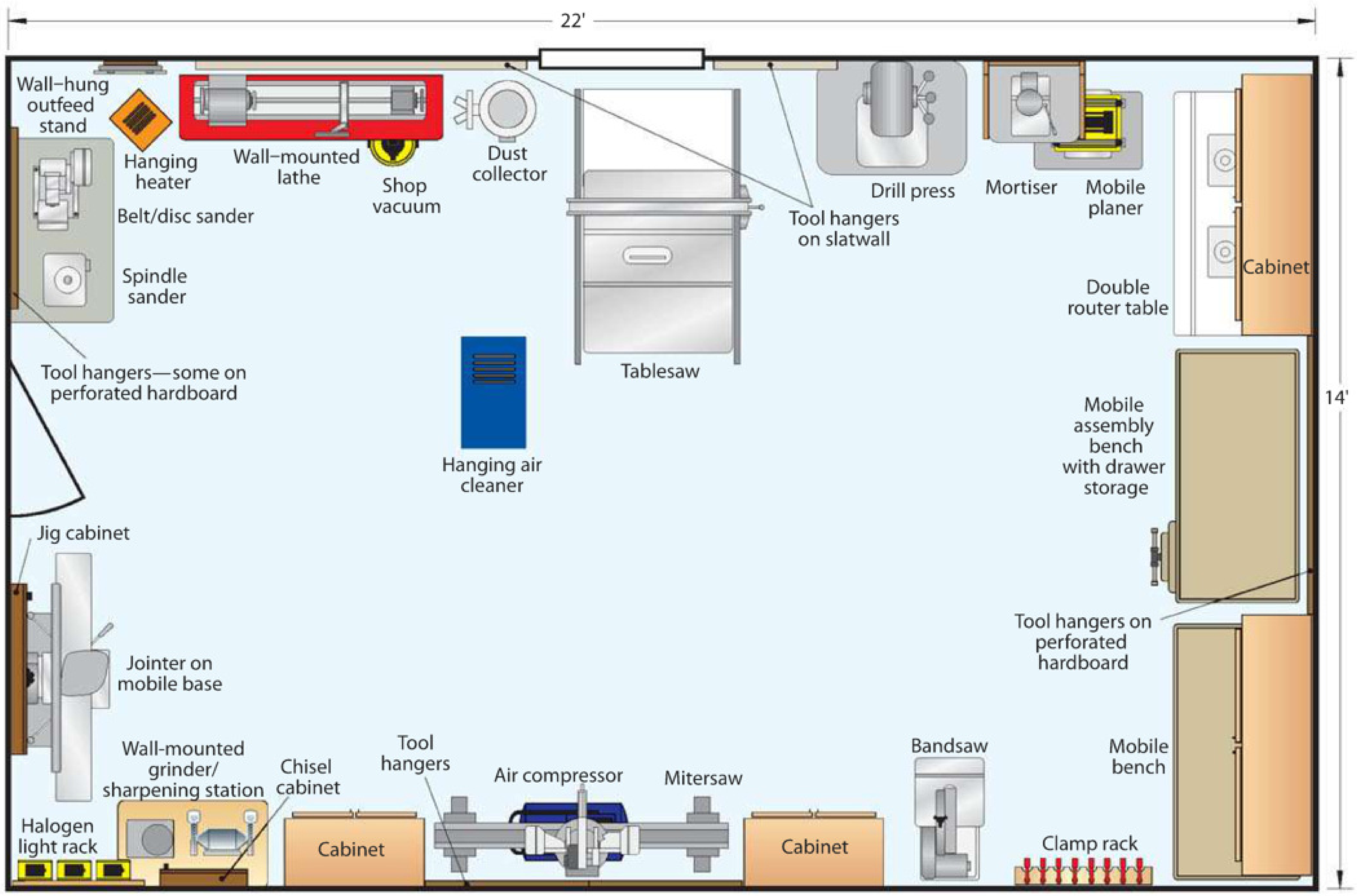
the project I'm working on. I have a 4×10' lean-to shed outside my shop with one lumber rack, but everything else gets burned in the fireplace or taken to the recycling center."

Thumbs up for benches

"I probably get more comments about my two workbenches than anything else," Rick says, "because they're so versatile. I replaced a long bench with two smaller ones—each about 2×4'—and it's made a big difference in how I work. They're both on casters, so I can position them end-to-end or side-by-side—whatever the project calls for. Or I split them apart as infeed or outfeed support for my tablesaw.



FLOOR PLAN



"I kept the tops real simple—a torsion box sandwiched between ¾" plywood sheets. The hardwood sides of the box stand ¼" proud of the ¾" plywood top, creating a recess for a replaceable ¼" hardboard top. When it gets too worn, I pop it out and drop in a new one.

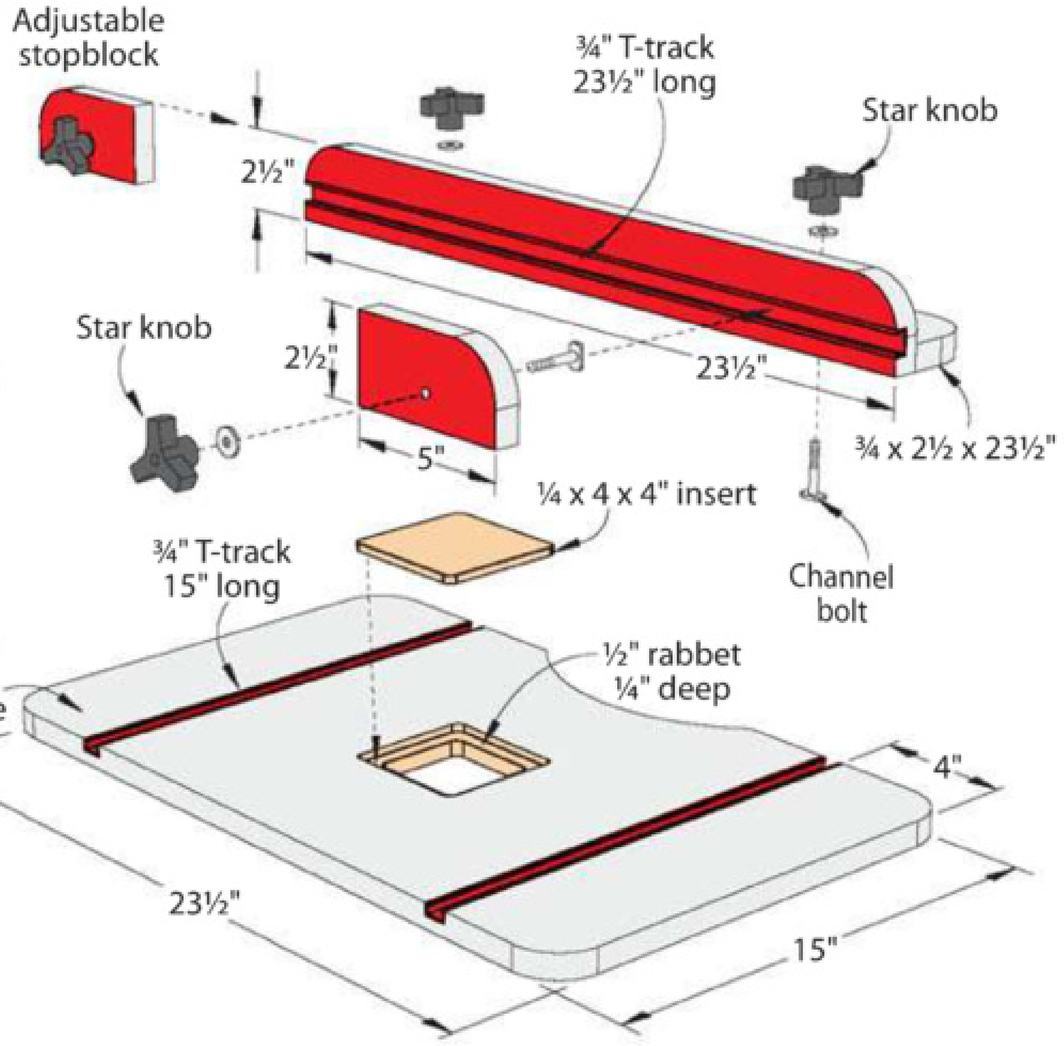
"The other tool that catches people's eyes is my dual router table. [It's in the corner in the photo on *page 33*.] It's a real time-saver—plus it improves accuracy. If a project requires two bits to cut a rabbet and an ogee profile, for example, I keep both bits in a router. I don't lose any time with setups—especially if I make a mistake and need to cut a replacement part."



Rick organized turning tools and accessories directly above the lathe on slatwall panels. His wall-mounted lathe support secures directly to the studs with 3" lag screws.

DRILL-PRESS TABLE AND CABINET MAXIMIZE UTILITY AND STORAGE

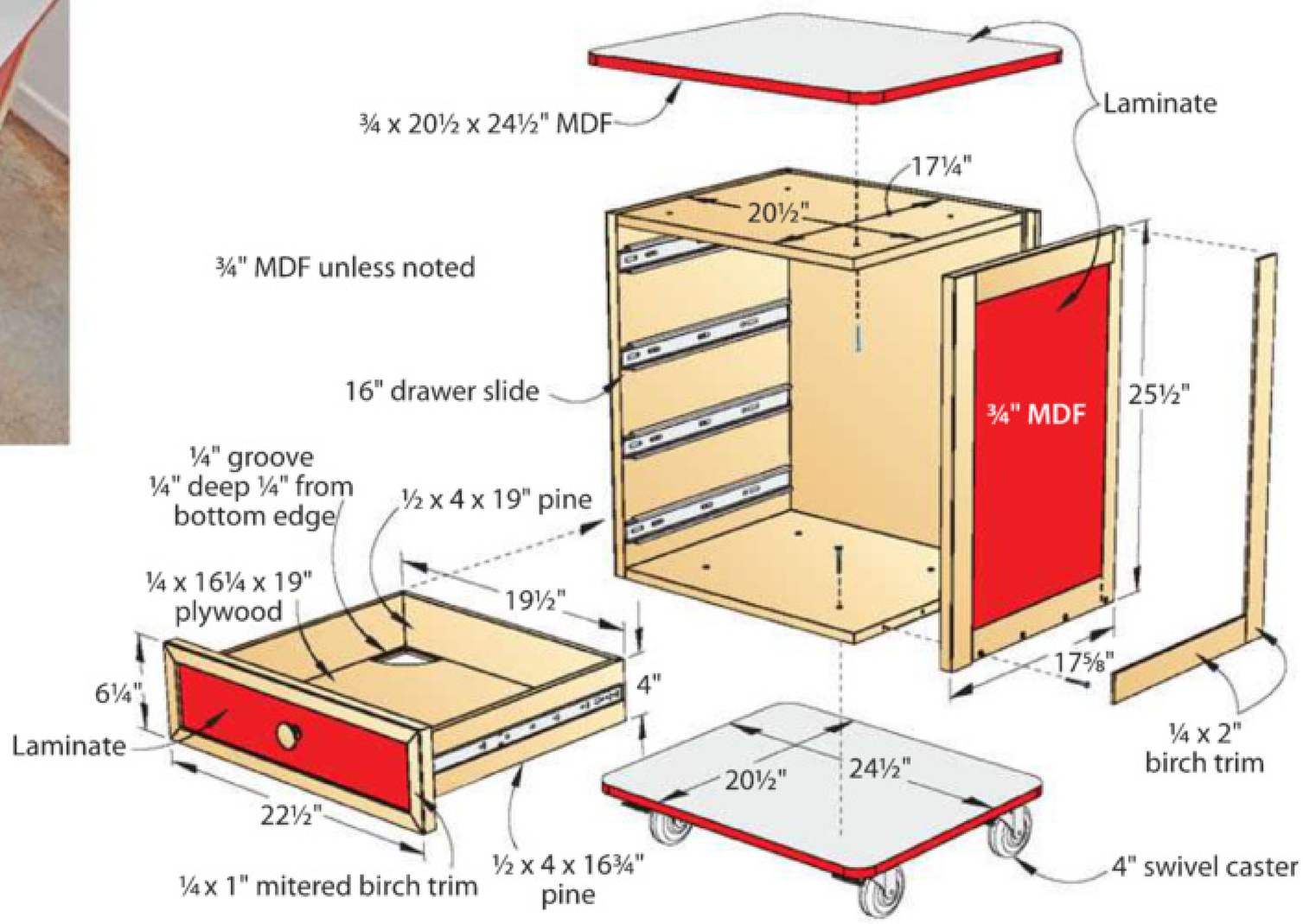
Rick designed his drill-press table with a ¾" MDF worksurface covered on the top and edges with durable plastic laminate. Replaceable solid-wood inserts recessed into the center of the table prevent permanent damage when drilling through material. Recessed T-tracks enable quick adjustment of the movable fence and sliding stops.







To match the rest of his shop décor, Rick built his rolling drill-press stand from ¾" MDF clad in plastic laminate and birch trim. Four drawers provide organized space for drill bits and other related accessories. "For a while," Rick says, "I had this benchtop drill press and a really nice floor drill press with all the bells and whistles, like laser alignment. But I sold the floor drill press. Besides no storage, it wasn't mobile. Plus, I rarely need a drill press with so much vertical capacity."



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Tools Editor Bob Hunter tried out a number of tablesaws for this article, and turned that into buying advice for you.

How to buy a tablesaw

Get one that's right for your shop and the way you work.

Ask a hundred woodworkers which machine a beginner should buy first, and most will heartily recommend a tablesaw. And with good reason: It's ideal for sawing stock to size, getting it square, machining miters and bevels, and cutting nearly all types of joinery.

Whether you're buying a tablesaw for the first time or upgrading your old clunker, begin by narrowing your focus. First, you'll have to choose from the four types of tablesaws: benchtop/job-site, contractor, hybrid, and cabinet. Any of these saws, when well-tuned, make accurate cuts, but step-up features increase a saw's usefulness, as well as its cost.

8 key factors to consider when buying a tablesaw

- **Power.** If you regularly work with hardwoods more than ¾" thick, get a saw with at least a 1½-hp motor. (It takes 3 hp to make heavy cuts with no bogging down.) Totally enclosed fan-cooled (TEFC) induction motors run cooler and quieter than the universal motors typically found on benchtop/job-site saws.
- **Electrical service.** Tablesaws with 2-hp or larger induction motors typically require 220-volt service. Know your shop's power capabilities before you buy, or be willing to add a 220 line. Also, consider what machines you'll operate at the same time, such as a dust collector, so you don't overload circuits.
- **Price.** You can pay anywhere from $120 for a benchtop saw to well over $4,000 for a professional-level cabinet saw. As the

RIVING KNIFE PREVENTS KICKBACK



A riving knife attaches behind the blade and moves up and down with it. This device holds the kerf open and prevents kickback.

woodworkers' creed says, "Get all the tool you can afford."

■ **Capacity.** All tablesaws feature at least a 10"-diameter blade, but tabletop sizes vary greatly. And maximum rip capacity ranges from 1' to over 4', an important consideration if you work regularly with sheet goods.

■ **Safety.** Newer saws include better safety guards and features (anti-kickback riving knives, blade-brake technology) than older models, but often at a higher price tag. For example, a riving knife, shown *above*, keeps boards from pinching against the back edge of the blade, thus preventing kickback. Since 2012, all new saws must have this feature to comply with more stringent safety regulations. Blade-brake technology, available exclusively on models from SawStop, almost instantly stops a spinning blade should a hand or finger come into contact. It could mean a small cut instead of an amputation.

■ **Space.** If you work in a small garage or basement, your shop might not accommodate a tablesaw with 7' fence rails. Instead, opt for a more compact machine with a rip capacity of 30" or less. In addition to the footprint of the machine, you'll need to leave infeed and outfeed space for ripping long workpieces, and side space for crosscutting long stock. Don't let a too-big tablesaw eat up the very space you need to work in.

■ **Dust control.** Cutting wood creates dust, but not all tablesaws can control it. Closed-base saws with dust ports prove most effective at channeling debris to a dust collector, while many open-base contractor and benchtop/job-site saws simply let the dust fly.

■ **Availability and service.** Online dealers can ship a tablesaw to your shop, but will they provide parts should it break down? You might prefer to buy from a local retailer if you're not confident in making your own repairs.



Cabinet saws deliver powerful performance

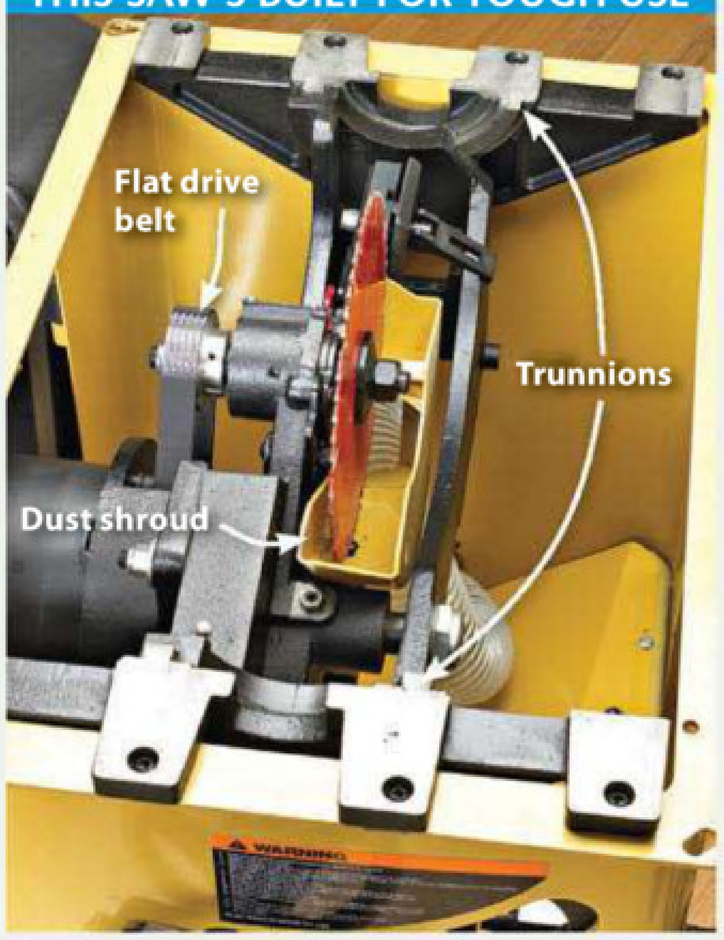
Just as automobile enthusiasts dream of luxury vehicles or speedy sports cars, woodworkers long for cabinet-style tablesaws. With heavy-duty components and 3-hp motors, these machines slice through wood like it's pudding, yet deliver and maintain pinpoint accuracy when set up correctly. The term "cabinet saw" comes from the enclosed steel base that enhances dust collection as well as reduces blade and motor noise, though not all tablesaws with cabinets belong in this group. The saw of choice for professional woodworking shops, this will cost you at least $1,000 for a new machine.

A typical 3-hp cabinet tablesaw weighs 500 lbs or more because of its big motor and cast-iron components. (Pro models feature 5-, 7½-, or 10-hp motors and also can have 12" or 14" blades.) The motor, mounted below the blade inside the cabinet, drives the blade with either two or three V-belts or one wide, ribbed flat belt.

To harness this kind of power, cabinet saws feature an all-cast-iron inner structure (yoke, trunnions, gears). The large trunnions mount to the cabinet, shown *above right*, rather than to the cast-iron top, as with other tablesaw styles. This is an advantage because adjusting the top parallel to the blade—necessary for accurate cuts—requires loosening only three of the four bolts that connect it to the cabinet and pivoting the top.

Cabinet-style saws typically come with fence rails that provide 50–54" of rip capacity—mighty handy for working with 4×8' sheet goods. Don't need that much? You can get one instead with 30"-capacity rails, an attractive option for small shops. Most cabinet saws feature T-square-style fences with heavy-duty rails.

THIS SAW'S BUILT FOR TOUGH USE



Heavy-duty trunnions provide durability and accuracy, and also dampen vibration.

Pros:

- Powerful motor for bog-free cuts
- Trunnions mount to cabinet for easy, long-lasting table adjustments
- Heavy-duty fence and rails
- Large rip capacity
- Enclosed base improves dust collection
- Large, comfortable handwheels
- Low blade and motor noise levels
- Typically, a large power switch in an easy-to-reach location
- A few models have built-in or included mobile bases

Cons:

- Prices start at around $1,000
- Requires 220-volt electrical service
- Heavy, so mobility is limited
- Large footprint on saws with long fence rails

These tablesaws aren't just for contractors

The contractor-style tablesaw gets its name from decades back, when home builders used them on location. Today, you'll seldom see one on a job site, thanks to the evolution of the lighter-weight benchtop/job-site saw.

Contractor-style saws feature cast-iron tops, and most now include cast wings. This added vibration-dampening weight helps hold an accurate setup longer than a saw with stamped-steel wings. However, the trunnions, much smaller than those on a cabinet saw, mount to the tabletop from below, as shown *above right*. This makes alignment more difficult because you must reach inside the saw to loosen and move the arbor assembly rather than the top.

Power ratings on these saws range from 1½ to 2 hp with 110-volt motors, which extend out the back of the saw (as shown *above*) and drive the blade with one belt. Because the hanging motor adds 15–20" of depth to the saw, it limits the use of outfeed stands or tables and prevents you from stowing the saw flat against a wall.

With a contractor saw, you get 30" to 36" of rip capacity standard (with 50"-capacity rails optional on some models), smaller handwheels, and much lighter weight (200–350 lbs). These saws tend to vibrate more than cabinet-style saws, suffer greater likelihood of drive-belt slips (because only the weight of the motor provides tension), and generate higher noise levels. Many models include dust hoods for connection to a dust collector, and some even include a plastic shroud around the blade to channel dust.

Although its components are made for lighter duty than those of cabinet saws, you still can set up a contractor-style saw for pinpoint precision. However, you might have to compensate for the reduced power with slower feed rates and thin-kerf blades. Cuts in thick, hard stock may prove difficult or impossible.

A bare-bones contractor saw costs about $400, or as much as $1,800 with added features. Deluxe models overlap the price range of hybrid tablesaws—and even approach some low-cost cabinet saws—so compare before buying.

SMALLER PARTS=MORE WORK



The small forged-steel trunnions on this saw secure to the top rather than the base, making top-to-blade alignments trickier.

Pros:

- Prices range from $400 to $1,800
- Rip capacity equals cabinet-style saw on some models
- Dust hoods or shrouds on some models
- Lighter weight than cabinet saws
- Accurate when set up correctly
- A few models have built-in mobile bases

Cons:

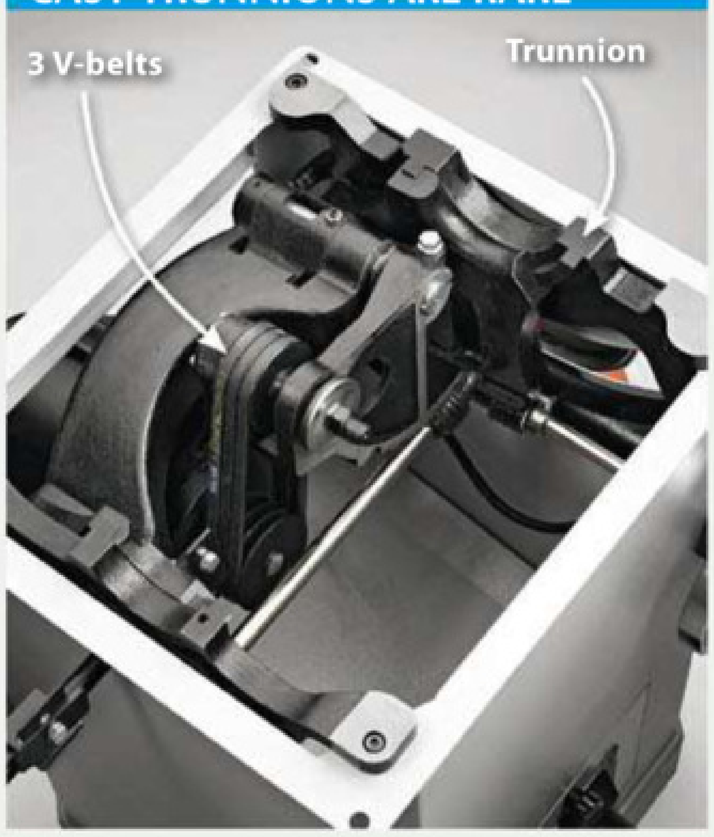
- Limited power means struggles in thick, hard materials
- Trunnions mount to top rather than base, making adjustments difficult and shorter-lasting
- Lighter-duty components allow more vibration
- Open design reduces dust-collection efficiency and increases noise
- Motor hangs out the back of the stand, adding to footprint



Hybrids blend big-saw features at 110 volts

A hybrid tablesaw marries the small-shop needs of a contractor-style saw (110-volt electricity, light weight) with some of a cabinet saw's benefits (cast-iron guts, enclosed base for good dust collection and noise reduction) in a modest price range. The features vary from one saw to another. For example, some models have forged-steel trunnions as on a contractor saw, and others have cast-iron trunnions,

CAST TRUNNIONS ARE RARE



The trunnions on this Steel City saw, as well as on Craftsman's hybrid, mount to the cabinet rather than the top.





though they're smaller than those on a cabinet saw.

To enclose the cabinet, manufacturers mount the motors below the arbor assembly, as with cabinet saws, but these 1½- to 2-hp motors won't have the muscle of a cabinet-style saw. Like a contractor-style saw, most have trunnions that mount to the top rather than the cabinet, making top-to-blade adjustments even more difficult (thanks to the enclosed base) and increasing vibration slightly. See the photo, *opposite*, for a welcome exception to this style.

Hybrids come standard with 30"-rip capacity fence rails, but you can upgrade to longer rails for up to 54" capacity. The fences typically are the same heavy-duty models sold with cabinet saws.

Pros:
- Prices range from $700 to $1,400
- Up to 54" rip capacity on some models (with optional fence rails)
- Enclosed cabinet aids dust control and reduces noise
- Heavier weight than contractor saws
- Motors run on 110-volt electricity
- Some models have cabinet-mounted trunnions

Cons:
- Most models have top-mounted trunnions, making blade/table alignment more difficult
- Power (1½ to 2 hp) similar to contractor-style saws

Benchtop saws: Good options for small shops

You don't have to be a contractor or trim carpenter to appreciate these portable tablesaws. In spite of their small stature and light weight, you can cut hardwoods if you slow your feed rate and use a thin-kerf blade, but some struggle in 2"-thick hardwoods.

Benchtop/job-site saws feature 110-volt universal motors that provide respectable power but are loud and prone to vibration, thanks in part to direct- or gear-drive power trains. Models with closed bases feature good dust collection, but the smaller ports are sized for shop vacuums. Many benchtop saws have shallow table slots that accept only light-duty miter gauges. They also can be unsafe when cutting large workpieces by yourself because of the narrow footprint and small tabletop. Rip capacity tops out at 25" on the better saws in this class, with some as little as 12". Because of the small tops, you'll need infeed and outfeed support for boards more than 4' long, as well as support for crosscutting stock of that length. The better-equipped benchtop/job-site saws carry price tags that rival those of middle-of-the-pack contractor saws.

Written by **Bob Hunter**

BIG PUNCH IN A SMALL PACKAGE



Ryobi's job-site saw features a sliding crosscut table that locks into place when you want to make a rip cut or for storage.

Pros:
- Prices range from $120 to $700
- Lightweight and easily portable, especially with collapsible, wheeled stands
- Motors run on 110-volt electricity
- Up to 25" rip capacity on some models
- Decent dust collection on closed-base models
- Small footprint

Cons:
- Noisy universal motors tend to lack the power of full-size tablesaws
- Increased vibration leads to less-than-furniture-quality cuts.
- Aluminum or molded plastic tabletops lack the durability and vibration dampening of cast iron
- Some models cannot accept a full ¾" stacked dado set on their arbors
- Blade-height adjustments typically made with a single, small, uncomfortable handwheel
- Most models don't have geared-bevel adjustments and must be done manually, making them tougher to set accurately
- Higher-priced saws overlap mid-priced contractor-style saws
- Light-duty fences
- Thin throat insert plates make it difficult or impossible to make your own zero-clearance inserts



Pocket-hole jigs

You can't beat these affordable tools for creating quick, rock-solid joints.

Three "S" words describe pocket-hole joinery: simple, speedy, and strong. After using a jig, such as the one shown at *left*, to bore angled holes into one pece, you drive screws to join the mating pieces. That's it!

The screws and the holes that house them typically hide on the inside or back side of a project. Pocket-hole joints excel on cabinet face frames, where they allow you to join stiles and rails without driving screws into end grain. They're also a great choice for carcase assemblies, dust-panel frames, drawer boxes, and picture frames.

The jigs for making pocket holes with a drill range in price from $15 to $200, so you might wonder how much jig you really need and which ones work best. We tested 11 widely available jigs, and here's what we learned.

What to look for in a jig

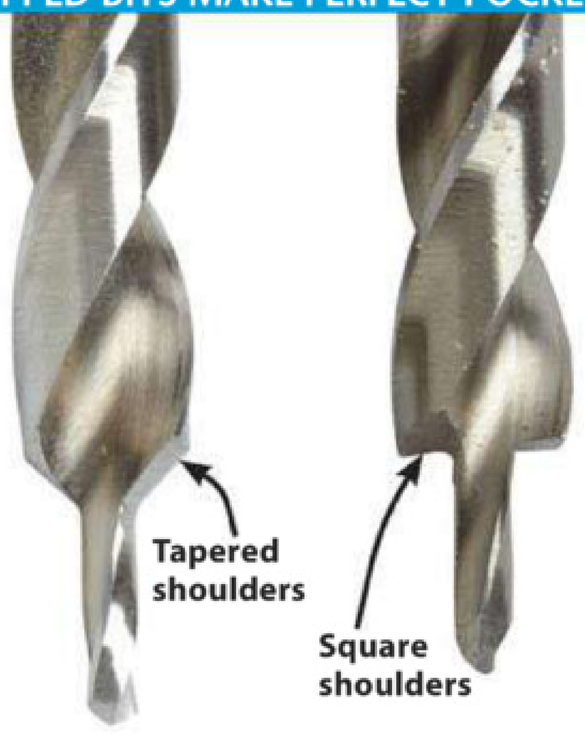
■ **Dependable drill guides.** The heart of each jig is one or more tubes that guide the bit for drilling holes at about a 15° angle. Most jigs use steel guides for long life, but aluminum guides in the Craftsman 29133 and essentially identical General Tools E-Z Pro Deluxe 850 wore away during testing, as evidenced by metal shavings in the wood dust, even after boring multiple holes. The Drill Master 96264, despite having steel guides, also continued to produce fine shavings.

All but the Kreg Mini jig have at least two drill guides, allowing you to bore more than one hole without repositioning the jig. The Drill Master, Porter-Cable 560 Quik-Jig, and Steelex D1060 have variable spacing, letting you adjust the guides to best suit your workpiece's width. Three fixed guides on Kreg's K4MS and K5 give you three spacing options with each placement of the jig. All the jigs except Kreg's Mini let you drill two pocket holes in 1½"- and 2"-wide stock—the two most common widths for cabinet face frames—without repositioning the jig.

We prefer jigs with centerlines marked on the guides for quickly aligning workpieces before clamping and drilling. All but the CMT PPJ-002, Craftsman, and General Tools jigs have this feature.

■ **Clean-cutting bits.** All the tested jigs use stepped drill bits, similar to those shown on the *next page*, which bore both a pocket for the screwhead and a smaller pilot hole for the shank, leaving a shoulder for the screwhead to snug against. A stop collar, secured by a setscrew, limits the bit's drilling depth based on the workpiece thickness. All the provided stop collars

STEPPED BITS MAKE PERFECT POCKETS



Craftsman's tapered bit works best with flathead screws. All the other jigs use bits that bore holes with square shoulders for the washer-head screws.

CAN'T-MISS BIT-DEPTH SETTING



To precisely set the stop collar for the Kreg R3 jig, place the bit in the case's holder, slide the collar to the workpiece thickness, and tighten the setscrew.

BETTER BITS MAKE CLEANER HOLES



After 40 holes, a Kreg bit made the left pocket hole in veneered plywood. But after equal testing, the Drill Master bit caused substantial tear-out *(right)*.

maintained the set depth without slipping, but the Kreg and Porter-Cable models were easiest to set correctly.

In our testing, the supplied bits from Kreg, Porter-Cable, and Sommerfeld Tools cut cleanest over the greatest number of holes. The Craftsman, General Tools, and Drill Master bits dulled noticeably while drilling 40 holes, causing workpiece tear-out, shown at *top right*. Only the Steelex jig comes without a bit; you can buy one separately for $11, but it does not include a stop collar. (Any bit from the other jig-makers would also work.)

■ **Simple thickness adjustments.** Most woodworkers use pocket-hole screws primarily with ¾"-thick material, and we were able to create tight joints in ¾" stock with all the test models. The CMT, Drill Master, all of the Kreg jigs, and the Porter-Cable can make pocket holes in ½" stock. All tested jigs make pocket holes in 1½"-thick material as well, but with the Craftsman and General Tools jigs, you can't center the screw's exit point on the workpiece's thickness, resulting in weaker joints.

Porter-Cable's jig has a simple adjustment for workpiece thickness, shown on the *next page*. With the Sommerfeld jig, you swap the ¾" drill guide for a 1½" guide; there's no adjustment for thicknesses in between.

■ **Ease of clamping.** The jigs that come with built-in clamps—Drill Master, Kreg K4MS and K5, Porter-Cable, and Sommerfeld—work best as benchtop jigs, where you bring the workpiece to the jig. CMT's jig comes in two parts (drill guide and clamp) that must be mounted to a board. Among those five better-for-benchtop jigs, all but the Porter-Cable and Kreg K5 require loosening a jam nut before threading the clamp face in or out—a fussy process. All clamp securely once adjusted. Workpiece supports on the Kreg and Porter-Cable jigs have stops for repeatable workpiece positioning.

Should you ever need to drill pocket holes in an assembled or built-in project, the Kreg R3, K4MS, and K5 and Sommerfeld jigs work best. The K4MS comes with a holder into which you slip the drill guide,

CMT PPJ-002, $90
888-268-2487, cmtusa.com



Craftsman 29133, $40
800-549-4505, craftsman.com



General Tools E-Z Pro 850, $50
800-697-8665, generaltools.com



Drill Master 96264, $70
800-444-3353, harborfreight.com



PUSH TO ADJUST, TWIST TO LOCK, DONE!



With the Porter-Cable Quik-Jig's clamp locked, you insert your workpiece, push down on the adjustment knob until the drill guide contacts the board, and then twist the knob to lock in the setting. After drilling, release the clamp lock to change workpieces.

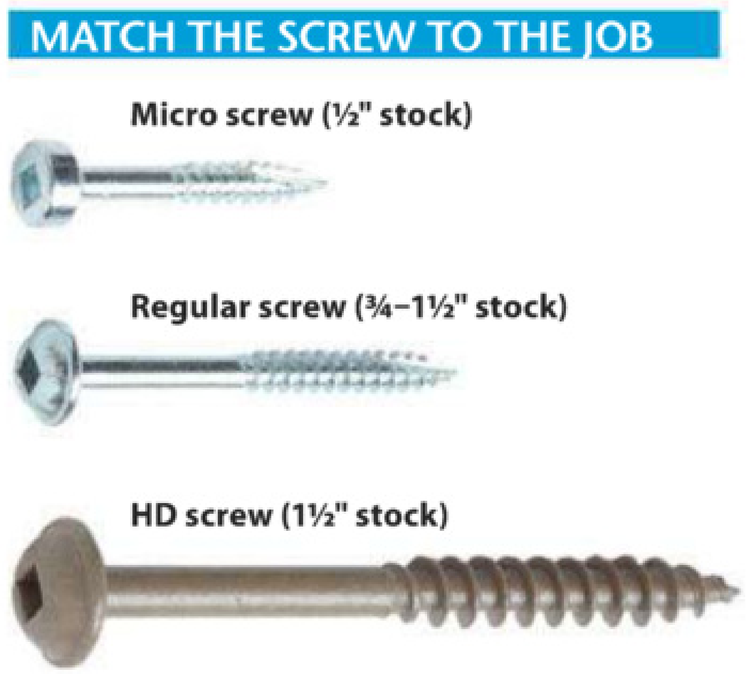
effectively making it a larger version of the R3 jig. The K5 includes an attachable heel stop. The Kreg R3 does not come with a clamp, but secures to a workpiece easily with a bar clamp or Kreg's locking-pliers clamp. Sommerfeld's drill guides also work like the R3 when removed from the jig.

More difference-makers

■ **Driver bits.** We prefer a 6"-long bit for driving the square-drive screws in pocket holes, because 3" driver bits can cause the drill's chuck to contact and mar the workpiece. A 3" bit does prove handy, though, for driving screws in tight surroundings. The Kreg K4MS, Porter-Cable, and Sommerfeld jigs come with both bits; the CMT, General Tools, and Kreg R3 and K5 jigs just have 6" bits. The other jigs come without driver bits.

■ **Optional drill guides.** Kreg sells specialized drill guides that fit into the K4MS and K5 jigs so you can better match the pocket-hole and screw size to the material thickness. For example, the Micro guide works with ½"-thick stock and comes with a smaller drill bit and screws. And the HD guide works with 1½"-thick stock, using a larger-diameter bit and screw. (See the photo at *right*.)

MATCH THE SCREW TO THE JOB



Kreg Mini, $22

800-447-8638, kregtool.com



Kreg R3, $45

800-447-8638, kregtool.com



WOOD MAGAZINE TOP VALUE APPROVED

Kreg K4MS Master System, $150

800-447-8638, kregtool.com



WOOD MAGAZINE TOP TOOL APPROVED

We found winners at 3 price points

The feature-laden Porter-Cable 560 Quik-Jig ($200) sets itself apart with its quick and easy clamping and adjustments for workpiece thickness, one-time depth setting on the drill bit, adjustable guide-hole spacing, a vacuum attachment, and chip tray. Those features earn it a Top Tool award. But it's strictly for benchtop use.

The Kreg K4MS Master System ($150) does all that the Quik-Jig does (with slightly less convenient adjustments), works easily on built-ins and assemblies, and sells for $50 less, so it shares Top Tool honors. The K4MS creates clean pocket holes accurately and consistently, and comes with more accessories than any other jig.

The Kreg K5, at about the same price, another Top Tool, offers quick three-step setup for workpiece thickness, and the added convenience of a front-mounted clamp lever. Built-in side extensions add stability and provide storage for accessories.

To save a little money, you can buy just the K4 jig ($100) with a drill bit, 6" driver bit, screw and plug assortment, and case.

To save a lot of money, go with Kreg's R3 jig. Despite its smaller size, it makes pocket holes just as well as the Top Tool jigs, and sells for only $45. You don't get a clamp, but it works well with most one-hand bar clamps. It's our Top Value.

Produced by **Bob Hunter** with **Steve Feeney**

Kreg K5, $140
800-447-8638, kregtool.com



Porter-Cable 560 Quik-Jig, $200
888-848-5175, portercable.com

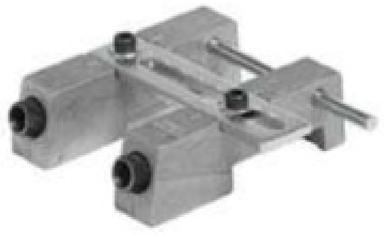


Sommerfeld Tools 31PC, $90
888-228-9268, sommerfeldtools.com





Steelex D1060, $17
800-840-8420, woodstockint.com





With big-router features packed into a small body, you'll find one of these mighty mites invaluable for your shop.

Compact routers

If you do a lot of handheld routing, especially edge profiles and shallow cutouts, you'll really appreciate one of these little/big routers. In fact, in the *WOOD*® magazine shop, we find them so handy and nimble that we reach for them more than any other router. But this new category of routers has a few limitations, so make one of these your second router purchase; your first should be a mid-size router or kit.

Here are some things you need to know before adding a compact router—either a plunge model or a multibase combo kit—to your tool collection.

Meet the Router family, from Baby to Big Daddy

Trim routers/laminate trimmers came out of the cabinetmaking industry as tools used primarily for flush-trimming countertops. But woodworkers appreciate them for their light weight, especially when edge-routing round-overs, chamfers, and coves. They typically have a small, fixed base and a ¼" collet, limiting your selection of bits. **HP rating:** Less than 1 hp. **Weight:** 3–4 lbs. **Price:** $30–$125.



Compact routers combine the nimbleness of a trim router with much of the functionality of a mid-size fixed and plunge router, but in a body slightly larger than a trimmer. Whether in a combo kit (multiple bases sharing a motor) or a dedicated fixed or plunge base, these routers excel at signmaking and routing inlays and hinge mortises. They beat trimmers for jobs that require more muscle, such as mortising and routing profiles with larger-diameter bits. Most have only ¼" collets, but a few accommodate similar metric sizes, such as those used with some dovetail jigs. **HP rating:** 1–1¼ hp. **Weight:** 4–6½ lbs. **Price:** $100–$240.





Mid-size routers, available in fixed and plunge bases—including many models in combo kits—have plenty of power for most woodworking tasks and a weight that's not cumbersome for handheld routing. Most routers in this class come with variable-speed motors and ¼" and ½" collets, opening you up to a greater selection of bits. They're suitable for most routing jobs, including mounting in a table. **HP rating:** 1½–2¼ hp. **Weight:** 7–12 lbs. **Price:** $100–$300.



Full-size routers excel at demanding tasks, such as deep mortises or wide profiles for raised door panels and architectural moldings. Often unwieldy and heavy for handheld duties, these routers work best mounted in a table. Although most routers in this class are dedicated plungers, you'll find a couple of fixed-base models. They all come with ¼" and ½" collets. **HP rating:** 3–3¼ hp. **Weight:** 10–18 lbs. **Price:** $200–$400.



TRIM HARD-TO-REACH EDGES



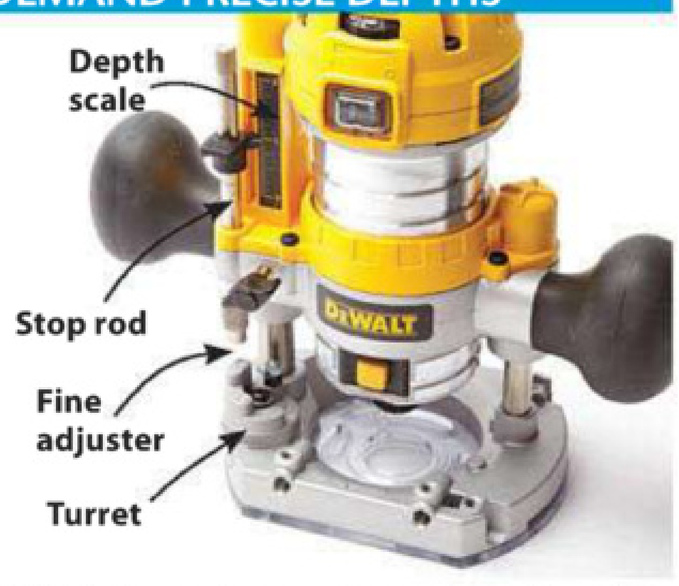
The Makita offset base—with a belt powered collet—lets you keep the weight of the motor solidly on the workpiece as you trim the edges.

INSTALL BUSHINGS EASILY



Subbases on the DeWalt and Porter-Cable routers have molded openings with recesses for attaching standard P-C-style guide bushings.

DEMAND PRECISE DEPTHS



DeWalt's plunge base not only has a five-step turret for incremental routing, but also has an easy-to-use scale and a fine-depth adjuster.

■ **Combo kits rule.** The ability to switch the motor between bases adds versatility to the multibase kits compared to a plunge-only router. Three kits (Bosch Colt PR20EVSPK, DeWalt DWP611PK, and Porter-Cable 450PK) come with plunge and fixed bases, the best combination of price and versatility. The Makita RT0700CX3 kit adds tilting and offset bases (*next page*). You can also buy each of these four routers with only a fixed base. And Bosch sells a Colt kit with fixed, tilt, and offset bases, but no plunge, for $190.

■ **Speed changes prove handy.** Sometimes you need to change the router speed for bits larger than 1" in diameter or to avoid burning woods, such as maple or cherry. Only four tested models (Bosch, DeWalt, Makita's kit, and the Trend T4) provide variable speed settings.

■ **They're surprisingly stout.** We plunge-routed mortises in maple with each router using a ½" straight bit, and only the Bosch required a slightly slower feed rate than the others. Granted, that's a job better suited to a midsize router, but it's nice to know these tools have the muscle when you need it. We also like soft-start motors, which eliminate the sudden jerk at start-up. All but the Makita RP0900K and Trend T4 have soft start.

■ **Gear up for guide bushings.** If you plan to use these routers for closed-template routing, such as for signs or inlays, you'll want the ability to use guide bushings, shown *above*. So at least one base, preferably the plunge, should be so equipped. But some models require proprietary bushings, an adapter, or an additional subbase for use

Compact yet capable: The lowdown on six small-size routers

Bosch Colt PR20EVSPK, $190

877-267-2499, boschtools.com

Bosch launched the Colt in 2005 with only a fixed base; to this day it still proves easy to grip and use. The new plunge base mirrors Bosch's mid-size plunger (MRC23EVS), only smaller. This base has the greatest plunge travel and tied for best fine-depth adjustment in our test. But, because the motor fits into the bases only one way and the handles on the plunge base (though comfortable) angle back, it's not practical to operate the router from its "back" side. (Sometimes we like to angle the power cord toward us.) Neither base comes equipped for using guide bushings—you need to buy an optional attachment (no. RA1126, $8) to use Bosch's proprietary bushings. The kit comes with an edge guide for the fixed base, but you must buy an optional guide (no. RA1054, $45) for the plunge base. Also optional: plunge-base dust-collection hoods (no. PR012, $19; no. RA1175, $15).





DeWalt DWP611PK, $200

800-433-9258, dewalt.com

Our favorite kit for a lot of reasons: LED lights around the collet and clear subbases help you see your work better than with other models we tested; the motor slides into both bases in two positions, letting you angle the power cord toward you or away from you when routing. On the fixed base, you adjust bit depth by turning a ring, making fine adjustments easy; and its D-shaped subbase adds stability and gives room to hold with a second hand when needed. The plunge base comes with a molded guide-bushing opening in the subbase, has the best depth scale, and tied with the Bosch for best fine adjustment. We'd prefer a two-wrench bit-changing system to this model's one wrench and push-button collet lock, especially when changing bits with the motor removed from its bases. Edge guide (no. DW6913, $40) and dust-collection hoods (no. DNP615 and DNP616, $9 each) are sold separately.





with bushings. To determine the specific requirements for each model, read the product summaries.

■ **Plunge levers must be easy to use.** We prefer plunge bases on which you depress the lever to lower the bit because they default to locked when released, avoiding accidental plunges. The Bosch, DeWalt, and Porter-Cable routers function in this manner. The other models stay in free-plunge mode until you push or lift their levers to lock them.

■ **Accuracy proves crucial.** This router class excels at fine-detail handheld work because of each unit's light weight, so the tools must be capable of delivering pinpoint accuracy. The plunge-base depth-control mechanism (scale, stop rod, and turret) makes sure you maintain cutting depth whether locked in or making repeated plunges, and the Bosch, DeWalt, and Porter-Cable routers do this best. The other models proved finicky or lacked fine adjustment.

Makita RT0700CX3, $240

800-462-5482, makitatools.com

This kit includes fixed and plunge bases as well as tilting and offset bases. The latter two, used primarily for trimming laminate countertops, serve cabinet installers best. But you can save money by purchasing the fixed-base router (no. RT0700C, $130) and then getting the plunge base (no.196563-0, $80) separately. In addition to the bases, you get a fixed-base edge guide, two dust-collection hoods, a proprietary guide bushing for each base, ¼" and ⅜" collets, and a picnic-basket-sized fabric bag to carry it all. The router worked well in the fixed base, although its slim body felt awkward to grip at times. (You might prefer this if you have small hands.) The plunge base has a low starting height, a short plunge range, a complicated depth-stop system, and a difficult-to-use plunge-lock lever that worked loose on several occasions during our testing.



Makita RP0900K, $150

800-462-5482, makitatools.com

One of two dedicated plunge routers in our test, this model bested the field in our power testing (routing ½" mortises and dadoes), but lacks variable speed. We like the trigger-type power switch on one handle—with the other models you have to let go of one handle to turn power on and off—but it lacks a lock, leading to finger fatigue on lengthy jobs. With a low starting bit height, short plunge, no fine adjustment, and a plunge lever that easily pops loose from the machine, this plunger lacks the user-friendly features of other routers in the test. It comes with an edge guide, but a guide-bushing adapter (no. 321492-3, $30) and dust hood (no. 194733-8, $12) are sold separately.



Porter-Cable 450PK, $190

888-848-5175, portercable.com

This kit is nearly identical to the DeWalt DWP611PK with the following differences:

- It lacks LED lights and variable speed, although it does have a soft-start motor.
- The fixed base has a differently textured (and not as effective) grip and a smaller, round subbase.
- Both subbases have guide-bushing-ready bit openings.





Trend T4, $100

877-918-7363, trend-usa.com

You get a lot for this price, with included edge guide (and the longest rails in our test), guide bushings, dust hood, and 6mm and 8mm collets (some router jigs come with metric bits) to go with the ¼" collet. This dedicated plunge router finished just slightly behind the Makita RP0900K in our power test, has variable speed (but no soft start), and its handles and power switch proved easy to use. But it has the stiffest plunge action, a short plunge range, no fine adjustment, and a metric scale that's difficult to read. The collets have a spring inside for easier bit removal, but it also limits how deep you can insert the bit.



When it's time to buy, yellow means speed up...

...and get the DeWalt DWP611PK, our Top Tool. This kit proved the easiest to use—in both fixed and plunge bases—for jobs best suited to a compact router. And even though it doesn't include an edge guide or dust hood, we'd gladly buy them later, if needed, to get its user-friendly features.

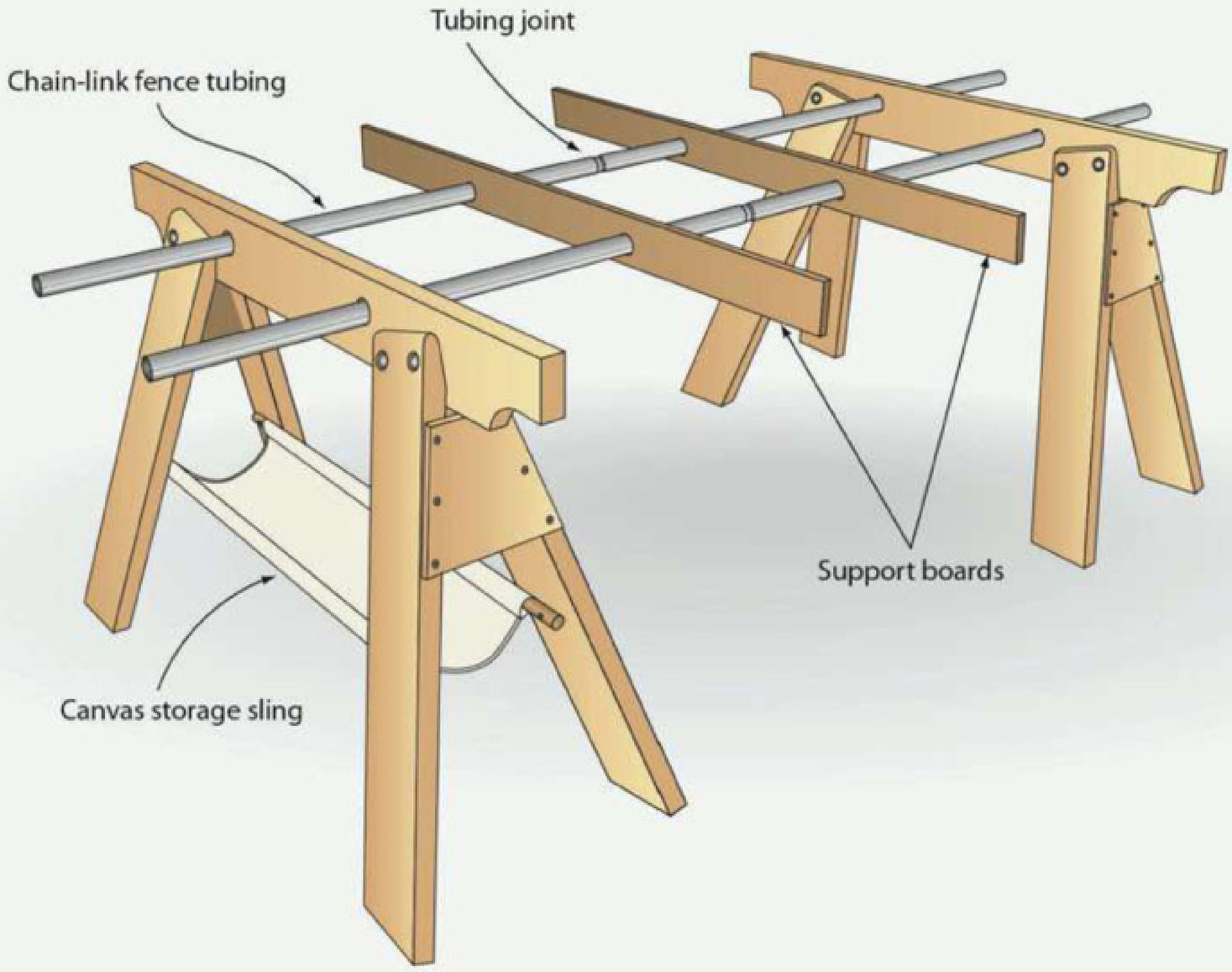
Collapsible work support made entirely of scrap

Working in the surplus and salvage business, I come across plenty of perfectly reusable materials. So when designing a collapsible work support that assembles in the field and breaks down for storage, I combined found 2×6 stock, chain-link fence tubing, and scrapwood.

The tubing slides through holes drilled in the sawhorse rails and the center support boards to act as stretchers. To hold smaller tools and parts, I made a storage sling by wrapping a piece of canvas around a pair of dowels and attaching them to the inside of a sawhorse's legs.

This support works especially well for cutting down sheet goods and other long or large pieces, and becomes a large, rock-solid worksurface by adding a sheet of ¾" OSB or plywood as a top.

—Bob Folty, Tonica, Ill.

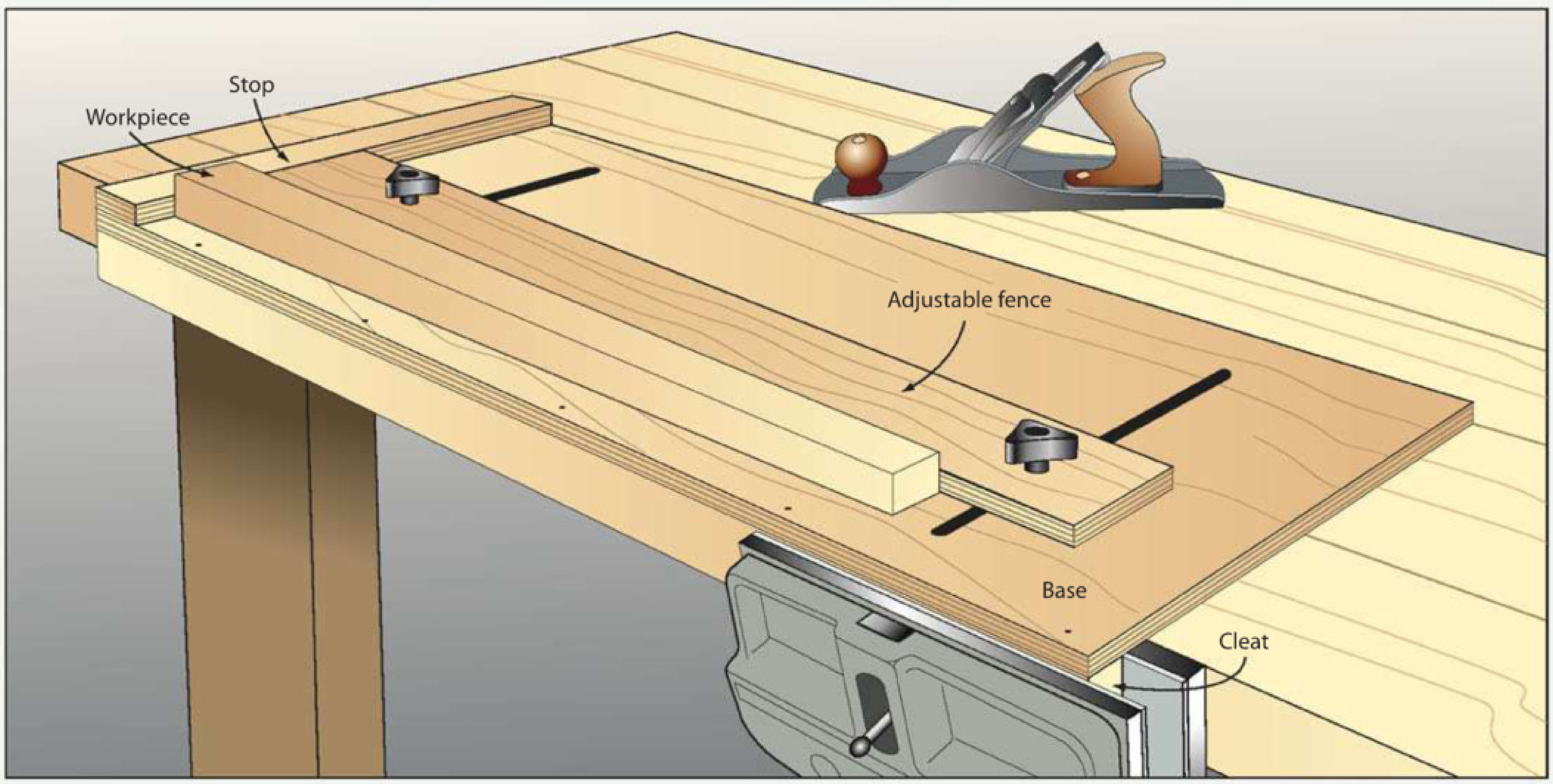


Benchtop catcher stops the slide

Because my workbench lacks dog holes, I always found myself needing to clamp a stopblock to the edge of the bench while hand-planing boards. But long or wide pieces still shifted side to side while I worked them, so I made this adjustable benchtop holding jig to keep those pieces firmly in place. It works on any workbench with a front-edge vise and could easily adapt to an end-vise bench.

To use it, I simply clamp the jig's base cleat in my bench's vise and position the adjustable fence to suit the width of the workpiece.

—Charles Mak, Calgary, Alta.



One-hand bar clamps

Only buy these clamps if you intend to work with wood, tools, glue, fasteners, or need to pull two things together. To find the best, we tested 11 models from seven makers.



Because you can tighten these clamps with one hand while holding your work with the other, one-hand bar clamps have become the standard for convenience and ease of use. We like 'em so much we have 142 of various lengths and brands in the *WOOD*® magazine shop! Your shop needs some, too.

The original clamp in this category, the Quick-Grip, debuted in 1989. But these days, you have many models and brands to choose from; so how do you know which to buy? And in what lengths? Read on to find out.

The force *may* be with you

Despite most of the tested clamps being light and made of plastic composites, the majority demonstrated surprising force. To test this aspect, we asked *WOOD* staff members to use one hand to squeeze a hydraulic ram with pressure gauge in each clamp until they "maxed out" the clamp's potential, as shown *above*. We then averaged the results and multiplied by the surface area of the ram (1.08") to find maximum clamping force. (See the chart on the *next page* for the results of our tests. Your results might vary based on your hand strength.)

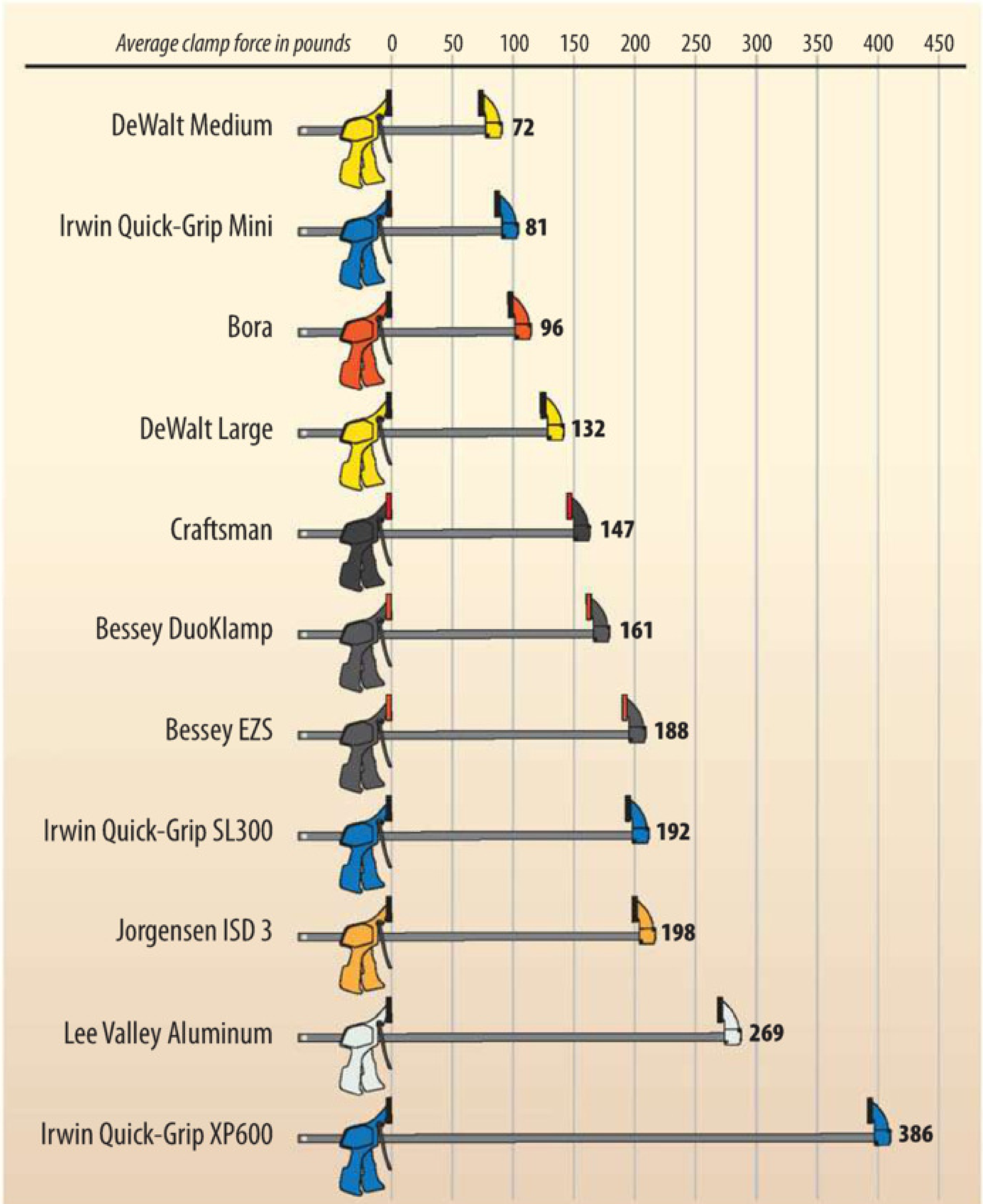
Irwin's largest Quick-Grip, the XP600, topped the test with an average of 386 pounds of force. It achieves this with beefy components and the smallest jaw-travel-per-handle-squeeze (⅛"), for greater torque. By comparison, only one other clamp, the Lee Valley Aluminum, averaged more than 200 pounds of force. But you typically need only about 100 pounds of force to pull together well-fitted joints. So most of the clamps we tested will do the job when it comes to gluing up a project. And even the lightweight clamps that fall below this threshold work well enough for holding things in place, such as an auxiliary face to your tablesaw's rip fences or a workpiece to your benchtop while you chop dovetails.

In addition to clamping strength, a clamp's jaws should close parallel—and stay parallel—for best results when gluing up assemblies. The Bessey EZS and Jorgensen ISD 3 clamps did this best in our tests. On the other hand, the Quick-Grip XP600 jaws deflected more than the others, especially as we increased the force, causing glued butt joints to slip, slide, and misalign. Still, these clamps—which weigh more than any other in the test—would be suitable for construction and heavy-duty work-holding tasks.

Let's give the boys a hand

Regardless of a clamp's strength, if it doesn't feel comfortable in your hand, or squeezing the trigger to close the jaws seems unintuitive, you probably won't like

ONE-HANDED CLAMPING POWER



using it. The Craftsman clamp, shown on *page 52*, feels awkward with its ratcheting trigger *behind* the handle, so you squeeze with your palm rather than your fingers. To work around this, we held the Craftsman "backwards," with the fixed jaw nearer to our bodies. Bessey's DuoKlamp, shown on *page 52*, also differs from the field in that its trigger and handle run inline with the bar rather than a typical pistol-grip style. In some cases, such as clamping below waist level, this works well, but it takes some getting used to.

Once you tighten a clamp, at some point you have to release it. All but the Bora disengage easily with a pull of the trigger release, but the more force we applied, the more difficult some were to unlock. With the Bora, we often had to knock the release loose with a mallet.

Other considerations

■ **Clamp lengths.** We like 6" and 12" clamps for their light weight and for work-holding, where their shorter bars don't get in the way. We also like 24" lengths for some larger assemblies because they weigh less than pipe or crank-handle bar clamps. However, these 2-footers lack the clamping force those heavier clamps are able to deliver.

All the tested brands have 12" models, and all but Lee Valley offer 6" lengths. DeWalt's Medium and Large clamps, though similar in appearance, perform differently based on their size: The 6" and 12" lengths clamp with only half the force of the 24"- and 36"-long clamps. The Jorgensen ISD 3 clamps uniquely combine by interlocking, as shown *top right*, to double capacity and possibly save you the cost of buying additional, longer clamps. This works well, but setup takes some time.

***Quick Tip:** Buy bar clamps in multiples of four because rectangular projects typically require four clamps at a time during assembly.*

■ **Spreading.** Except for the DeWalt Medium and the Quick-Grip Mini, all the clamps feature jaws that reverse for spreading, such as when disassembling a mortise-and-tenon or dovetail project, *above*. This proves an easy task with all but the Bora clamps, which require a screwdriver to reconfigure.

LINK TWO CLAMPS FOR EXTRA REACH



Jorgensen's jigsaw-puzzlelike connectors at the ends of the fixed jaws *(above)* hook together for added length. You must first flip both fixed jaws as shown *(below)*. Either of the sliding jaws will tighten the combined clamp.



SPREAD 'EM!

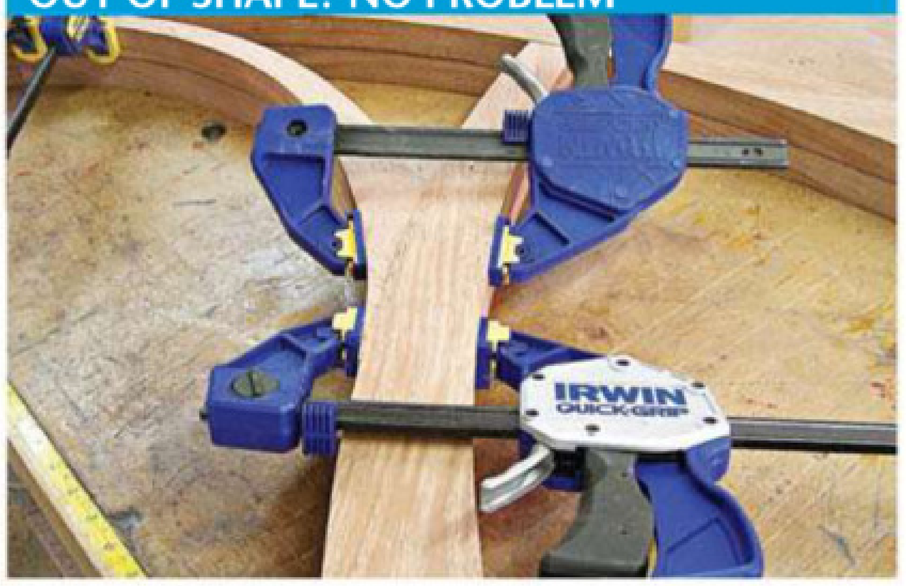


Bessey's DuoKlamp proved easiest to convert to a spreader: Swap the pads to the opposite jaw sides and rotate a dial on the sliding jaw.

■ **Jaw pads.** All but two models have smooth pads; textured pads on the Bora and Jorgensen clamps can mar your wood. Jorgensen is correcting the problem by changing to smooth-face pads for new-production ISD 3 clamps.

Both jaws on the Quick-Grip XP600 pivot 3° upward or 12° downward to accommodate nonparallel assemblies, such as the situation shown at *right*. On the Quick-Grip SL300, only the fixed jaw pivots. The jaws on both models lock square to the bar when pivoting isn't needed.

OUT OF SHAPE? NO PROBLEM



The jaws of the Quick-Grip XP600 can pivot, allowing them to conform to curved and angular shapes.



Bessey DuoKlamp
800-828-1004;
besseytools.com



Bessey EZS
800-828-1004;
besseytools.com



Bora
866-588-0395;
boratool.com



Medium

Large

DeWalt
800-433-9258;
dewalt.com



Craftsman
800-349-4358;
craftsman.com



Jorgensen ISD 3
312-666-0640;
ponytools.com



Irwin Quick-Grip SL300
800-464-7946; irwin.com



Irwin Quick-Grip XP600
800-464-7946; irwin.com



Irwin Quick-Grip Mini
800-464-7946; irwin.com



Lee Valley Aluminum
800-871-8158; leevalley.com

A pair of favorites emerges

At the end of our tests, we found ourselves reaching most often for the Bessey EZS and the Quick-Grip SL300 clamps. They both do a great job with anything you ask of them, and they share our Top Tool award. The Besseys sell for about 20 percent less per clamp—effectively netting you five for each set of four Quick-Grips. But the Quick-Grip SL300 clamp exhibits slightly greater clamping force, weighs a few ounces less in the shorter lengths, and features the pivoting jaw.

Produced by **Bob Hunter** with **Matt Seiler**



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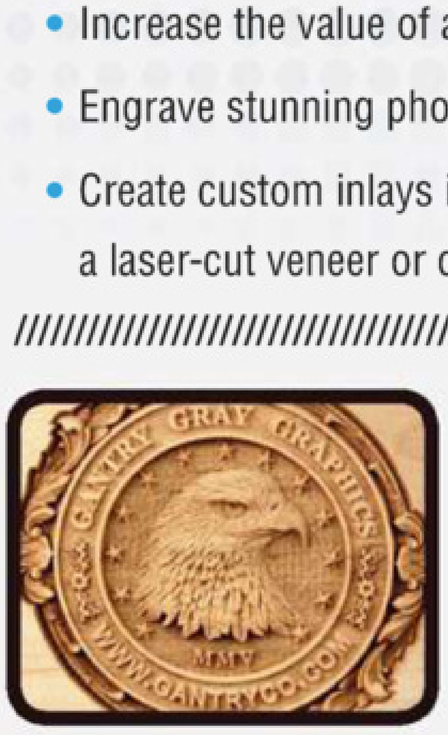
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Golden, Colorado

Hand planes
for power-tool woodworkers

Hand planes excel at many chores in a power-tool woodworking shop. Equip your shop with a low-angle block plane and a jack plane to get started.

For more than a century, hand planes have remained essentially unchanged in form and function. Even in the age of power tools, these classic hand tools still earn their keep in a woodworking shop.

A properly sharpened hand plane can eliminate milling marks to leave a glass-smooth edge or skim a whisper-thin shaving off a project part for a perfect fit. Hand planes even do some jobs better than power tools (*page 56*).

For a starter set of planes in your shop, pick a low-angle block plane (*above*) and a jack plane (*page 57*).

The compact block plane makes short work of cleaning up edges, softening sharp edges, trimming tenon ends, and dozens of other quick tasks. You can use it one-handed and its small size makes it easy to tuck into your apron pocket.

The jack plane handles larger jobs, such as jointing gluing edges or flattening board faces. Much larger and heavier than a block plane and with a wider blade, the jack plane takes two hands and more force to use.

More Resources

Learn how to tune up a hand plane at **woodmagazine.com/blockplanebasics**. Find instructions for restoring vintage planes to use in your shop at **woodmagazine.com/planerehab**.



1

Lie-Nielsen 60½ adjustable-mouth, low-angle block plane (no. 1-60-1-2), $165, 800-327-2520, lie-nielsen.com.



2

Veritas Apron Plane (05P27.02), $89, Lee Valley, 800-871-8158, leevalley.com.

Buying a plane

When you shop for a plane, look for these three qualities:

A flat sole. The sole of a plane must be flat for it to slide smoothly over the wood and cut evenly. Check it by holding the edge of a metal rule against the sole and looking for light between them.

Easy, accurate adjustments. Planes usually have two blade adjustments, one for cutting depth and another for cant, the lateral movement of the blade that squares the cutting edge to the sole. Some planes feature an adjustable throat, too. Look for adjustments that work smoothly with little looseness and lock easily.

A thick blade. When comparing two planes, the one with the thicker blade will probably cut more precisely and cleanly. That's because the heavier blade resists flexing and chattering.

When *WOOD®* magazine editors tested several low-angle block planes, the Lie-Nielsen 60½ (*above*) emerged as the Top Tool. The Veritas 05P27.02 (*above right*) came close in overall performance and costs less.

THE ANGLE OF ATTACK AFFECTS CUTTING PERFORMANCE



These two Lie-Nielsen hand planes are identical except for the cutting angles: the standard-angle 103 (left) and the low-angle 102 (right).

Why a low-angle plane?

Good question. Low-angle planes use a blade that's ground to a 25° bevel and held in the tool at an angle of about 12°. Combined, that places the cutting angle at about 37°, compared to a standard block-plane cutting angle of 45°. (See photo *above*.) The standard angle works well in face grain and edge grain because it's easy to part the soda-strawlike wood fibers.

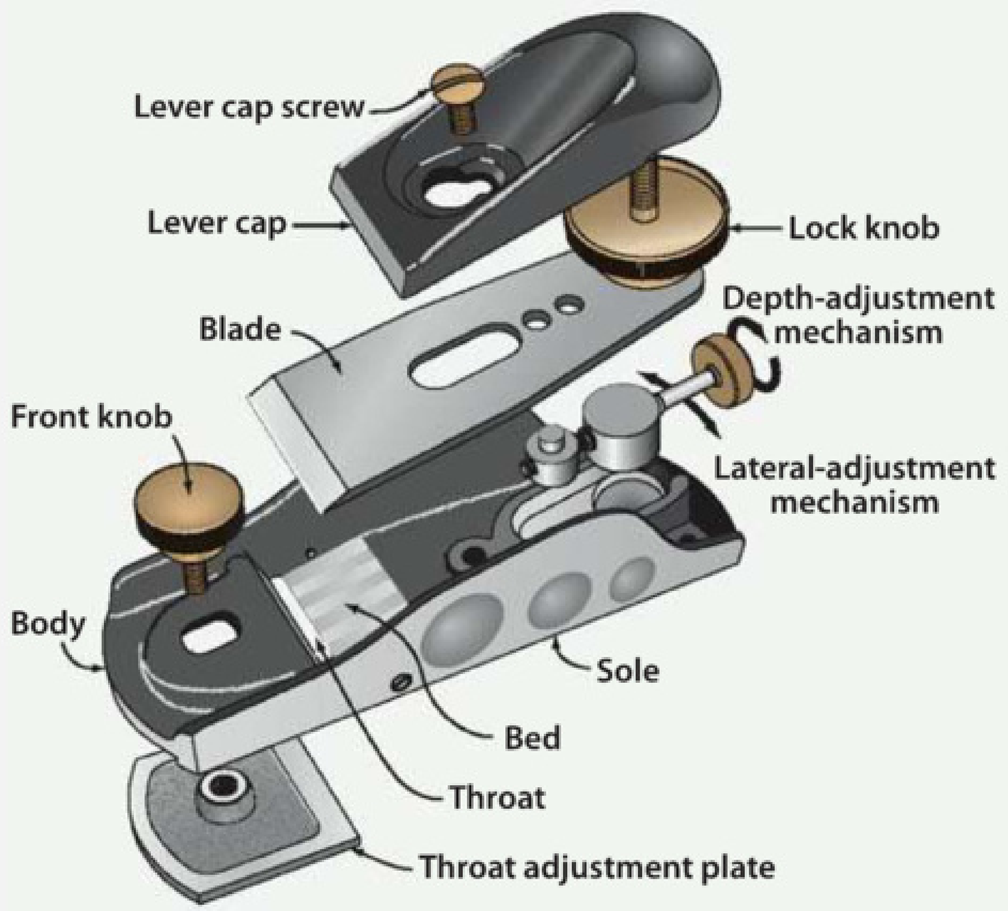
On a low-angle block plane, the shallow cutting angle helps the blade cut more efficiently in end grain. Yet, it still cuts well going with and across the grain, making it the more versatile of the two.

Know your plane parts

This drawing shows the anatomy of a typical block plane, although the specific adjustment mechanisms may differ depending on the model.

The body comprises the bed, which establishes the angle between the blade and the sole — the flat bottom of the body. Many block planes have a throat adjustment plate that slides forward or backward to control the amount of material the plane removes with each pass. The front knob serves two purposes: to secure the throat adjustment plate on planes so equipped, and to provide a place for your index finger (or other hand) for better control.

A hole (or sometimes a notch) in the blade engages the depth-adjustment mechanism. Turning the knob clockwise projects the blade farther through the sole causing the plane to cut deeper; counterclockwise rotation withdraws it. To ensure that the cutting edge of the blade parallels the sole, a lateral-adjustment mechanism rotates the blade slightly on the bed. The lever cap secures the blade to the bed with help from the lock knob (or lock lever, on some planes).



Three jobs a hand plane does better than a power tool

Tools with motors cut faster and with less effort than many hand tools, to be sure. But the quiet and simple block plane performs some tasks better and faster without all the racket.

1 Smoothing end grain. You won't believe how glass-smooth your cross-grain cuts (such as dovetails, box joints, and tenons) can be until you've sliced them clean with a sharp block plane. Power-tool crosscuts in hardwoods can burn and softwoods may fuzz. Trying to sand away those imperfections causes even more fuzzing.

To clean up end-grain cuts, secure the workpiece in a vise with the end grain up. It's easy to blow out the end of the cut as the plane exits the workpiece, so clamp on a scrapwood backing board or slightly chamfer the trailing edge before making your first cut. Cut shallow on end grain; you should be able to peel off a thin shaving like the one shown at *right*. If the plane chatters across the cut, sharpen the blade and/or back out the blade slightly.

NOW THAT'S A CLOSE SHAVE



Don't try to remove too much wood at once when planing end grain. This translucent walnut shaving is just about perfect.

2 Planing edge grain. Think a jointer gives you a perfect gluing surface? Think again. Any rotating cutter, including router bits and a power planer, creates a series of closely spaced scallops, as shown at *near right*. A few quick strokes with a hand plane levels those peaks and valleys into a truly smooth surface for gluing (*far right*).

Obviously, wood cuts easier with the grain than across it, so you can cut a little deeper in this situation. If your plane has an adjustable throat opening, close it so just a sliver of light peeks between it and the blade. Without this limitation, the knife tends to "dive" into the grain and then bounce back up, breaking off the shaving and leaving the wood with a rough surface.

FROM SCALLOPED TO SMOOTH IN THREE EASY STROKES

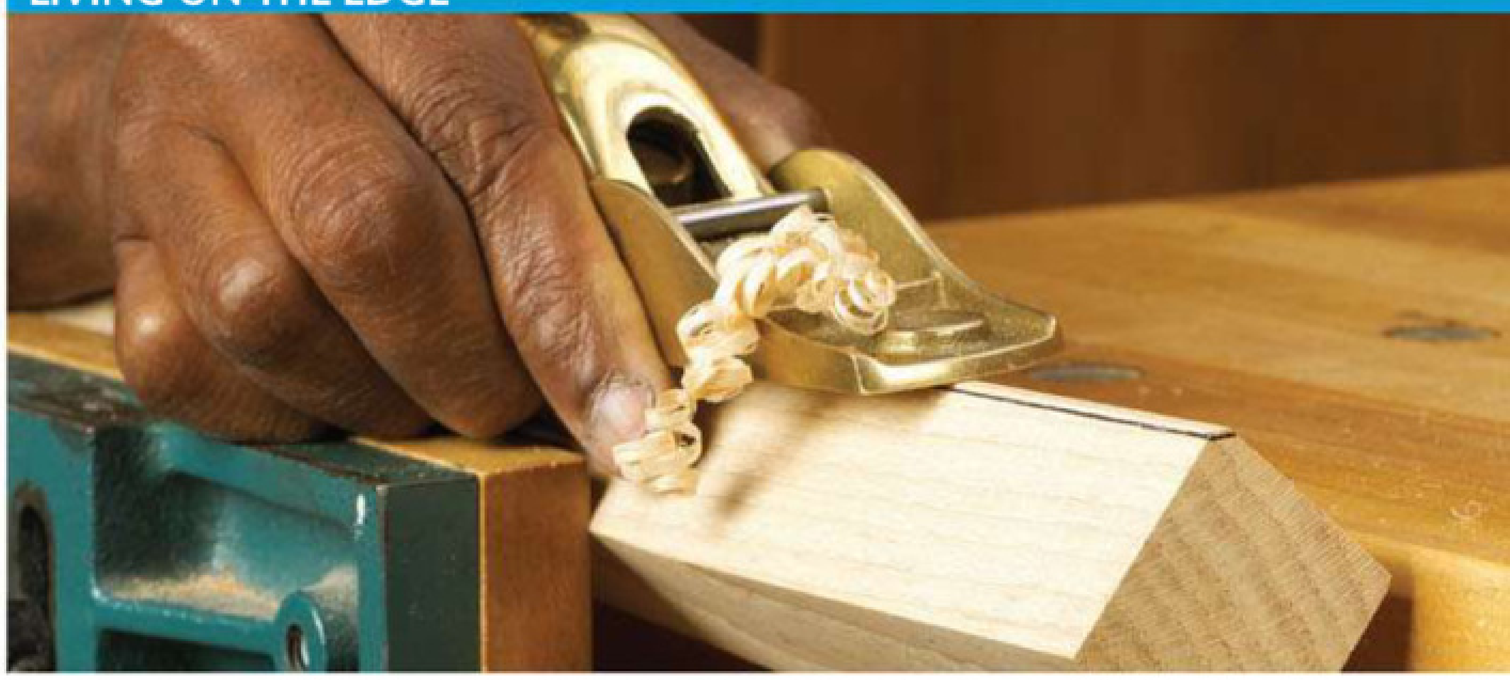


Looking close up at the edge of this power-jointed board (left) reveals a not-so-smooth surface that can weaken a glue joint. A few shallow passes with a sharp block plane removed the scallops and left a noticeably smoother edge (right).

3 Chamfering. To soften the sharp edge where two adjoining faces meet on, say, a table leg or bed post, you might be tempted to reach for your router or a sanding block. By the time you find your chamfering bit (much less install it), you could have knocked off those hard edges with a plane with less effort and smoother results than sandpaper. Not only is a plane faster, but it also can chamfer in ways power tools cannot, such as creating a tapered or asymmetrical chamfer.

Simply breaking an edge requires no special instructions: Set the plane's cutting depth for a light cut; then make a few passes holding the plane at about a 45° angle to one face of the workpiece. For wide, tapered, or asymmetrical chamfers, draw layout lines, as shown at *right*; then gradually plane down to the lines.

LIVING ON THE EDGE



Draw layout lines to define the limits of the chamfer on a table leg. As you plane, adjust the angle of the tool on the table leg as needed to meet the lines.

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About our product tests

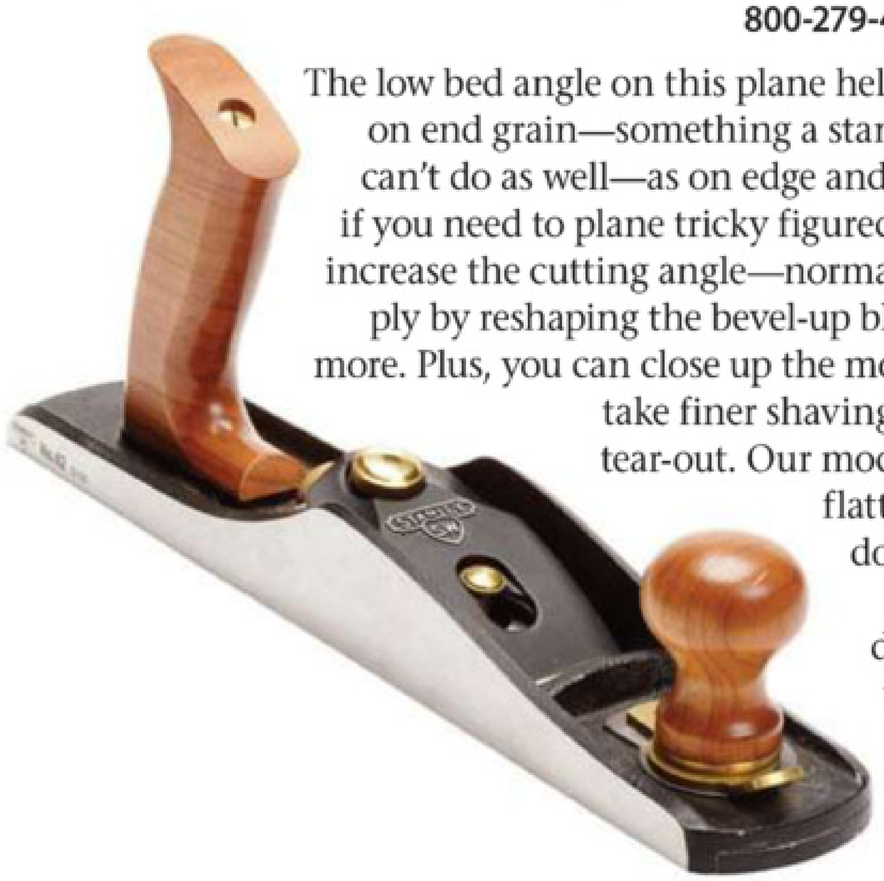
We test hundreds of tools and accessories each year, but only those that earn at least three stars for performance make the final cut and appear in this section. Go to toolreviews.woodmagazine.com for reviews of all the products tested, including those that don't make the cut. Prices shown are current at the time of article production and do not include shipping, where applicable.

WISE BUYS: Jack planes

Named for its "jack-of-all-trades" versatility, a jack plane works great for both flattening and smoothing the faces and edges of a workpiece. And its momentum-making mass means you can hog away material without wearing out your arms. *WOOD*® project builders Kevin Boyle and John Olson tested eight jack planes over several months, and they recommend these four models.

Best for end grain

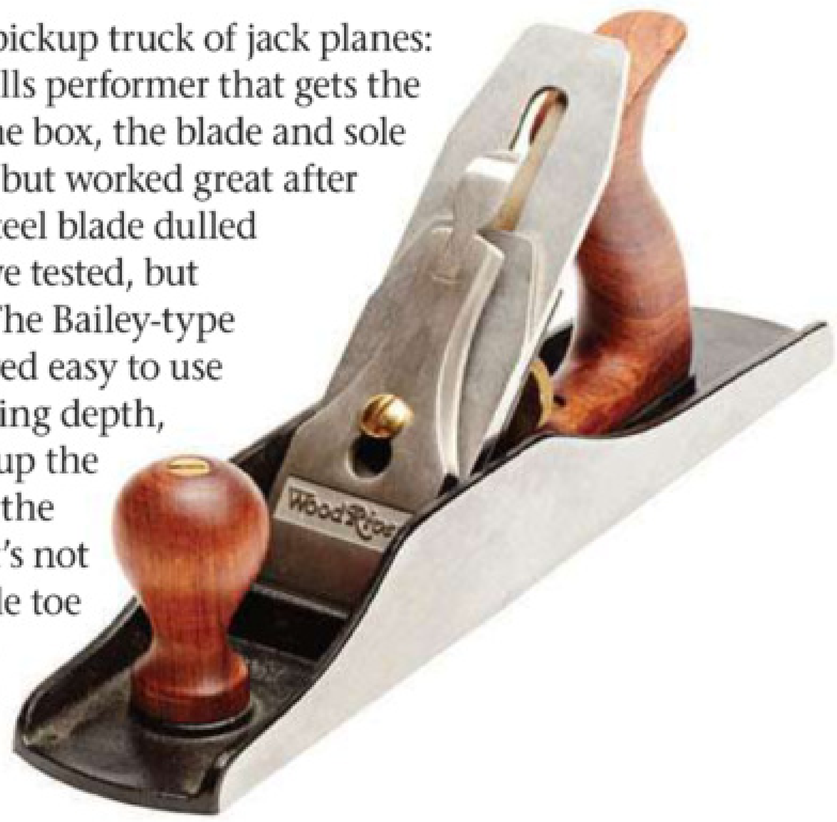
Stanley Sweetheart no. 62 low-angle, $160
800-279-4441, rockler.com



The low bed angle on this plane helps it cut as great on end grain—something a standard-angle jack can't do as well—as on edge and face grain. And if you need to plane tricky figured wood, you can increase the cutting angle—normally at 42°—simply by reshaping the bevel-up blade angle 5–10° more. Plus, you can close up the mouth opening to take finer shavings and eliminate tear-out. Our model's sole needed flattening, but once done it performed nicely. And we didn't care for its thick, wide tote; we'd prefer a classic Stanley design.

Best bang for the buck

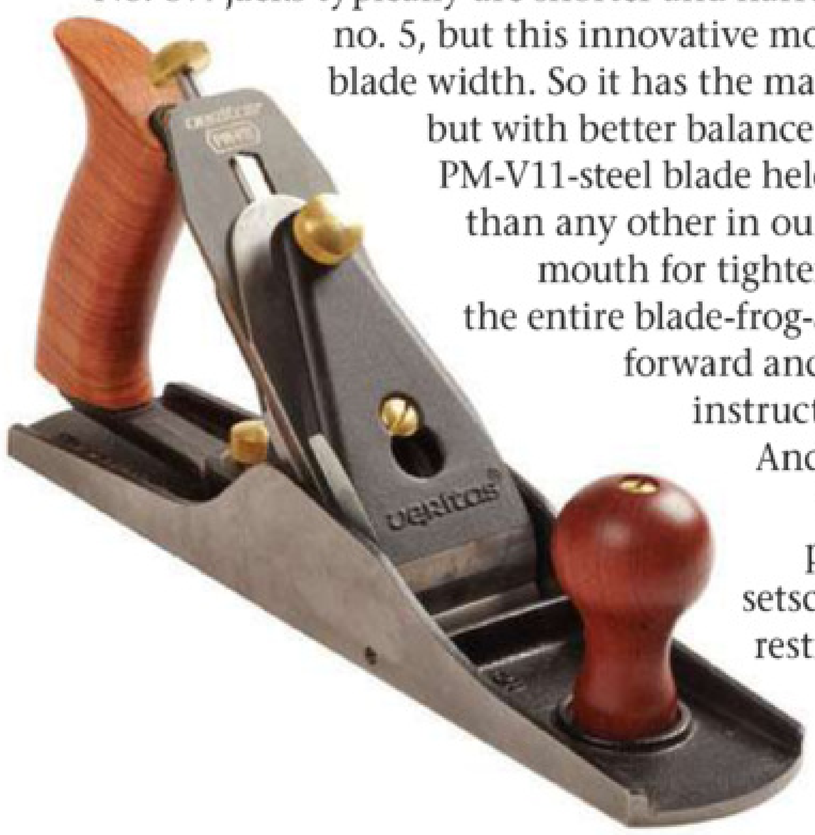
WoodRiver no. 5 (150875), $170
800-225-1153, woodcraft.com



This is the Chevy pickup truck of jack planes: a midpriced, no-frills performer that gets the job done. Out of the box, the blade and sole needed flattening, but worked great after that. The carbon-steel blade dulled quickest of those we tested, but sharpened easily. The Bailey-type blade adjuster proved easy to use for setting the cutting depth, and you can close up the mouth by moving the frog forward, but it's not as easy as a movable toe that slides front to back. The bubinga handles are a nice touch.

Best if you dread sharpening

Veritas no. 5¼ W (05P24.71), $242
800-871-8158, leevalley.com



No. 5¼ jacks typically are shorter and narrower than a standard no. 5, but this innovative model maintains the 2" blade width. So it has the mass and feel of a no. 5, but with better balance. And the proprietary PM-V11-steel blade held a sharp edge longer than any other in our test. To close up the mouth for tighter shavings, you move the entire blade-frog-and-handle assembly forward and back. (The included instructions make this easy.) And although the Norris blade-depth adjuster proved fussy at times, setscrews near the mouth restrict side-to-side blade movement.

Most likely to hold its value

Lie-Nielsen no. 5, $325
800-327-2520, lie-nielsen.com



Based on the classic Stanley designs from a century ago and built in Maine, this jack feels comfortable in your hands and proves easy to use right out of the box. The A2-steel blade takes longer to sharpen than others, but holds an edge longer than carbon-steel blades. You can buy extra frogs ($75–$85 each) for this plane to quickly change the cutting angle using the same blade; the blade and frogs are also interchangeable with Lie-Nielsen's no. 4 smoothing plane. Plus, these tools have proved to hold their resale value should you later choose to sell yours.

All about wood chisels

Author and teacher Tim Peters shows you which ones you need, how to use them correctly, and how to keep them sharp.

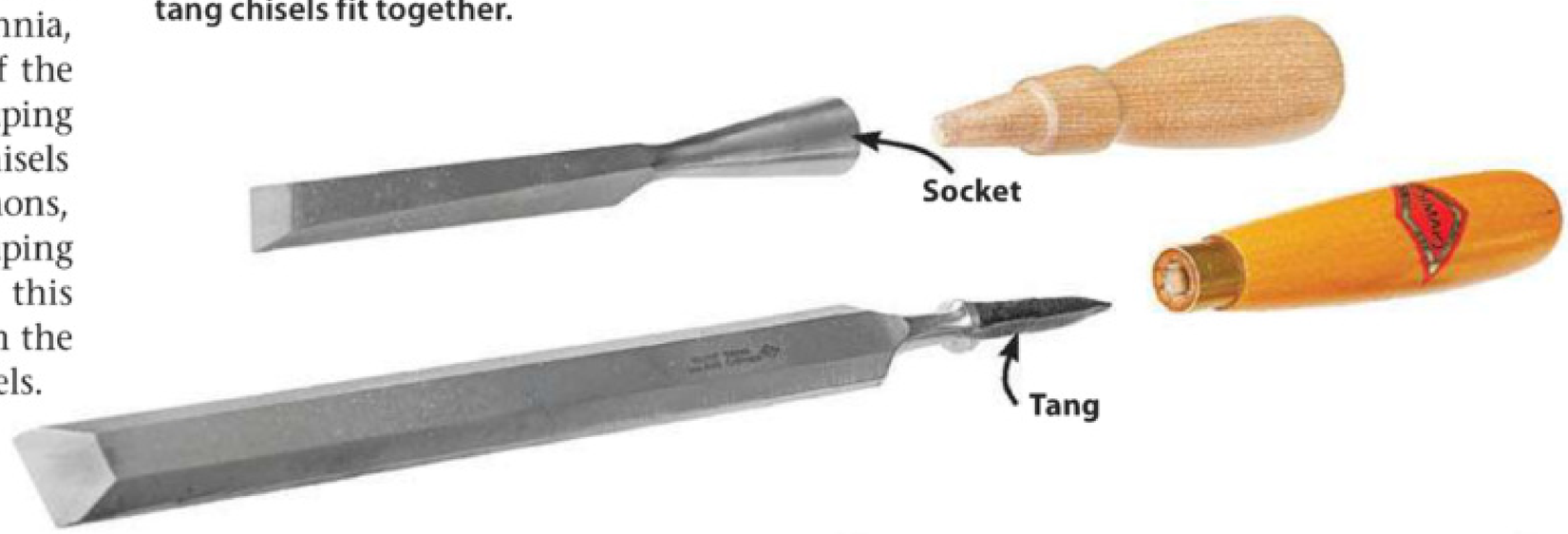
At the root of all woodworking lies a simple notion: A sharp tool can quickly and effectively change the shape of wood. And for several millennia, the wood chisel has served as one of the fundamental tools for cutting and shaping wood. In the classes I teach, we use chisels for chopping mortises, paring tenons, cutting dovetails, carving reliefs, shaping table and chair legs, and so on. In this article, I'll focus on getting more from the most common furniture-making chisels.

First, understand the blade/handle connections

Chisels come in primarily two styles: socket chisels and tang-type chisels, as shown *below right*. That means the handle either slips into a tapered hollow socket, or it slips over a tapered square or round tang milled into the blade. One big difference between the two is the relative strength of the blade-to-handle connection. Both types can be struck with a mallet, but socket chisels prove best for heavy chopping and prying. That's because the force of mallet blows disperses around the rim of the socket and evenly down the shank to the cutting edge. The more you strike the chisel, the tighter its handle fits in the socket. This style of chisel also resists bending and fracturing in situations, such as mortising, where the tool might be subjected to prying forces or twisting as you retract the cutting edge from a tight joint.

CHISEL ANATOMY

Disassembled, you can see how socket and tang chisels fit together.



At the top of the handle where you strike it, manufacturers often place a metal ring, known as a ferrule, or a leather washer to protect the wood end grain from splintering. Over time, the wood mushrooms over the ferrule, further protecting the integrity of the handle shaft. Socket chisels typically cost about one-and-a-half times the price of tang chisels because they're more complex to manufacture.

Tang chisels, on the other hand, feature 2"- to 3"-long tangs, typically with four sides that taper to a point. The tang almost always has a bolster (or shoulder) for the handle to seat against and absorb mallet strikes. Many manufacturers reinforce this area with a metal ring at the neck of the handle to resist splitting. The handle top on most of these chisels features metal rings, leather washers, or metal striking caps, meant to absorb and distribute mallet blows.



Tim Peters, master furnituremaker and professed hand-tool junkie, teaches courses in cabinetmaking, as well as furniture building and design in the construction technology and art programs at Orange Coast College in Costa Mesa, California.

Bench chisels: Buy these first

Fortunately, most woodworkers don't need dozens of specialized chisels. You can do the vast majority of your work with just a few common bench chisels. Bench chisels have 4"- to 6"-long blades with flat backs and beveled edges, as shown at *right*. The beveled edges make it easier to reach into tight spaces, such as narrow mortises or dovetail sockets. The cutting edge on a bench chisel typically has a 25° bevel, steep enough to resist wear, but too acute for heavy prying.

Butt chisels are similar to bench chisels, but have shorter blades and handles. These chisels work great for tasks where a longer chisel proves obtrusive or unwieldy, as with joinery on small projects such as jewelry boxes or toys. I use butt chisels when making shallow hinge mortises, shown on *page 61*, because the short lengths give me greater control.

For most home woodworkers, I suggest buying a set of bench chisels with at least three or four different widths, from ¼" to 1". You can do great work with a set of Stanley or Irwin chisels (available at home centers and hardware stores), as long as you keep them sharp. These dull quicker than chisels made of harder steel, so be prepared to sharpen more often. (Learn about sharpening techniques on *page 62*.) If you prefer professional-quality chisels made with harder steel, see "Chisel Sources" on the *next page*.



Paring chisels handle fine-cutting tasks


PARING CHISEL

These chisels should never be struck with mallets. Most paring chisels use tang-style construction, although any really sharp chisel could be employed to do some paring, slicing off thin layers of wood as you fine-tune a joint. Chisels specifically designed for paring usually have slender, 6"- to 8"-long blades used for reaching deep into joints. Paring chisels typically have steeply beveled edges, narrow necks (the transition area between blade and handle), and wooden handles with rounded ends, made to seat comfortably in your palm.

Chisels used exclusively for paring oftentimes have small-diameter tangs, but don't have washers, rings, or caps. Paring cuts should be made only with hand pressure pushing the tool. You'll find a more acute bevel angle, 15° to 20°, on the cutting edge. This provides a sharper edge for cutting precision, but the trade-off is an edge that is not as durable, particularly when paring harder woods such as white oak, hard maple, or many exotics.

Buy paring chisels if your work includes joinery that requires fine-tuning such as dovetails, box joints, or mortise and tenons. When you are ready, buy a ½" and 1" pair; add sizes as your needs grow.

Opt for specialty chisels only when needed

You might find these specialized chisels handy for your home shop:

■ **Mortising chisels.** Whether you're a hand-tool traditionalist or you just don't want to fuss with setting up a mortiser or drill press, you can, with a little practice, chop mortises by hand with these heavy-duty chisels. Beefy, tapered blades separate these chisels from others. The back of the blade is often slightly wider than the front to keep it from getting wedged, or bruising the side walls of a mortise. And the cutting edge, with a bevel in the 30° to 40° range, withstands hard mallet blows without breaking down the tip.

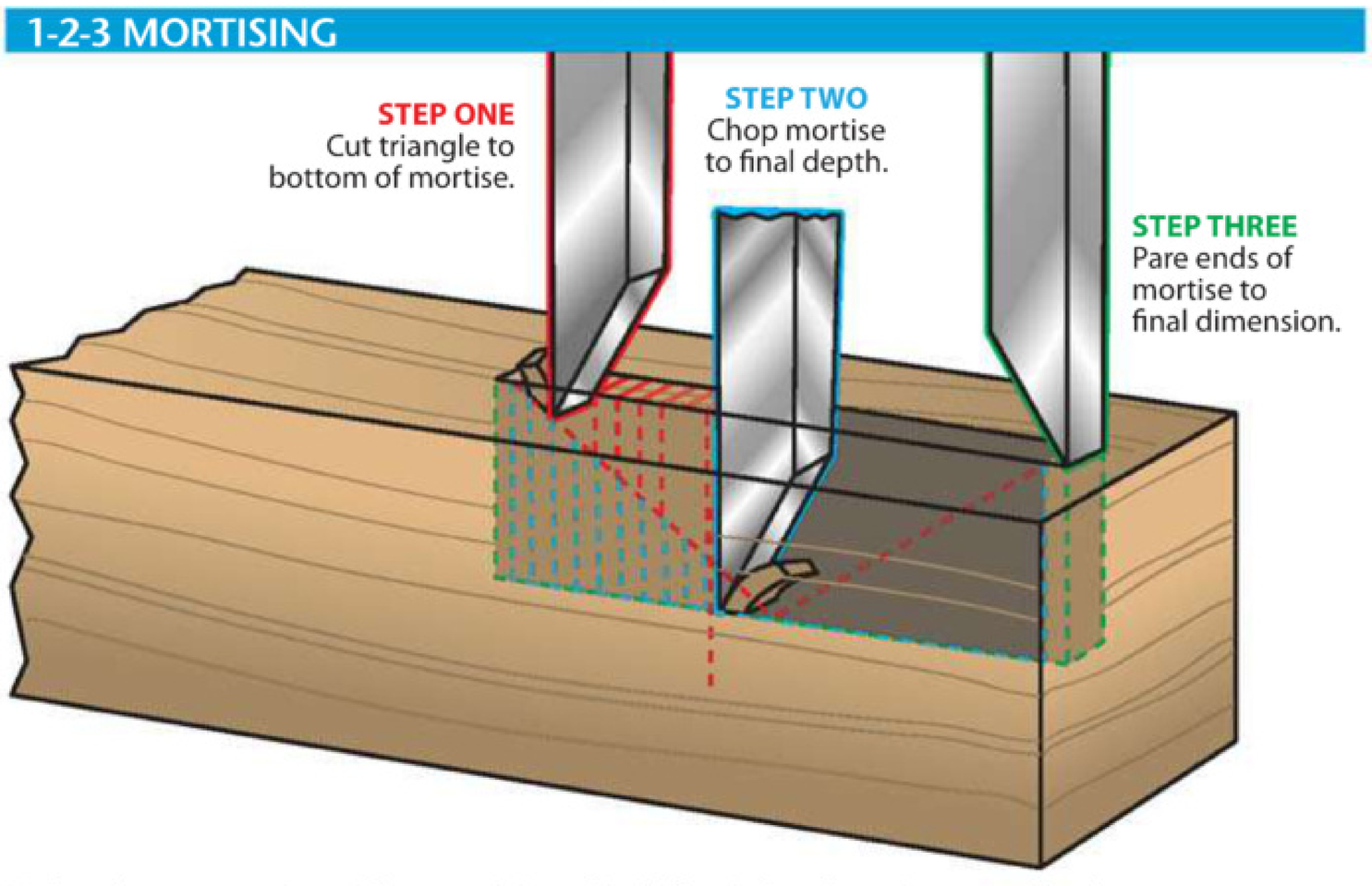
You can also pry with one of these chisels after sinking the tip into the wood to break loose the chips, as shown *below right*. Mortising chisels connect to the handles, which are usually elliptical in shape, with large, stout tangs and substantial bolsters for the handles to rest against.

■ **Corner chisels.** This type proves handy for squaring up corners of rabbets, dadoes, grooves, and mortises when struck by a mallet. So if you don't have a dedicated mortiser or mortising chisel, you can drill out most of the waste at the drill press, and then clean up the corners with one of these. The same goes for stopped channels made with a router.

■ **Crank-neck chisels.** Marrying the best features of a hand plane and a paring chisel, a crank-neck slices away material while you rest the chisel blade flat on the workpiece. You can grip the bent handle comfortably without scraping your knuckles on the wood. These work well for shaving off proud wood plugs or dowels and for removing glue squeeze-out from inside corners.

■ **Skew chisels.** Another form of paring chisel, the angled cutting edges on these work great for reaching into difficult areas to trim away material. I use them for paring dovetail sockets, shown *next page*, because I can hold the back flat against a surface and ensure a true cut. It's best to get right- and left-facing models for use on opposing sides of a socket.





To hand-cut a mortise with a mortising chisel, begin by chopping out chips between your scribed lines, leaving 1/16" at the ends. Move the chisel about 1/8" at a time, and strike it with a mallet. Then, pry out the chips. Make a triangular pattern to the desired depth; then, begin back-cutting the rest to match that depth. Finish by cutting away the remaining 1/16" at each end.

Chisel Sources

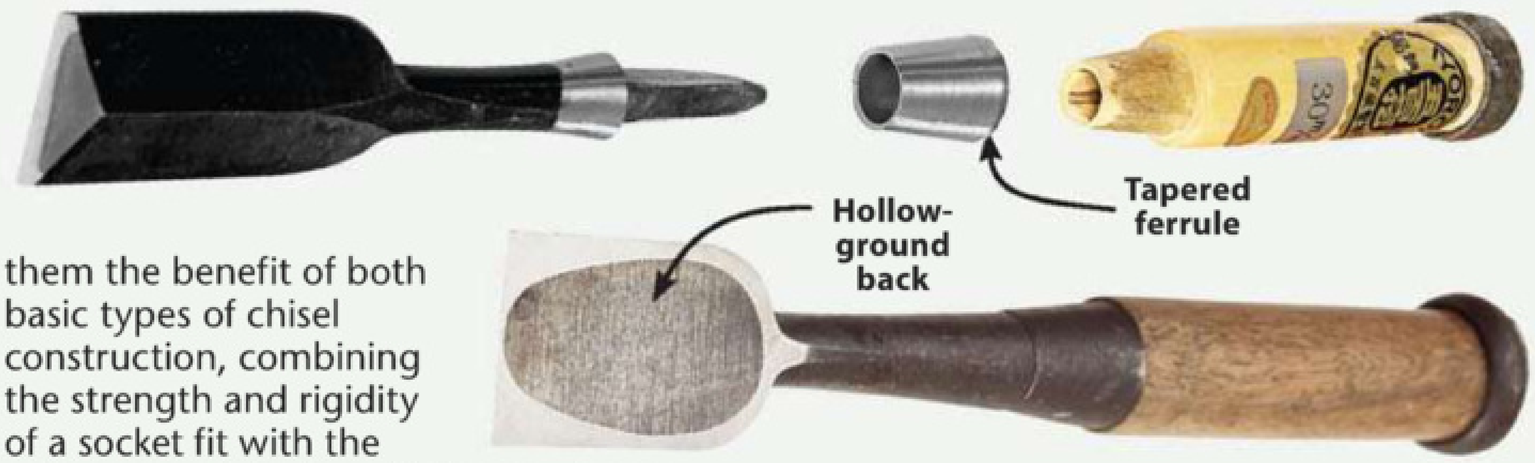
Tools For Working Wood: 800-426-4613, toolsforworkingwood.com
Traditional Woodworker: 800-509-0081, traditionalwoodworker.com
Garrett Wade: 800-221-2942, garrettwade.com
Lie-Nielsen: 800-327-2520, lie-nielsen.com
Japan Woodworker: 800-537-7820, japanwoodworker.com

Consider Japanese chisels for durable performance

The Western-style chisels I've shown you up to now originated in Europe and are perfectly adequate for most work. But in my opinion, Japanese chisels have no equal. Here's why:

Japanese chisels feature two layers of steel forged together into the blade: a harder, thin layer laminated behind a softer, thick front. As a result, the harder portion holds its sharp cutting edge longer than most Western-style chisels. Japanese chisel manufacturers also grind a hollow back onto the blade, as shown at *right*, so you have less material to remove when lapping the back flat.

At the handle end, these chisels use a hybrid socket-and-tang fit that gives them the benefit of both basic types of chisel construction, combining the strength and rigidity of a socket fit with the easier manufacturing of a longer, larger tang. A tapered ferrule at the union of the handle and blade serves as the socket for the handle's mating wood end, while also keeping the handle from splitting during mallet strikes or prying.



Because Japanese chisels are handmade from high-quality materials, they can cost $100 or more apiece.

Before using a new Japanese chisel, you have to fit and seat the tapered ring at the top of the handle. The chisel's instructions explain how to do this.

As a basic set, I recommend chisels with blades 3, 6, 9, 12, and 15 millimeters wide. This should be adequate for most cabinet- and furnituremaking joinery.

Chisel out a perfect hinge mortise in 3 easy steps



Begin by making a series of angled "chops," staying 1/16" from the ends and back.



Hold the chisel parallel to the edge of the workpiece and pare away the chips.



Clean up the bottom and perimeter walls with light cuts until the hinge fits snugly.

Hand-cut half-blind dovetails with only a pair of chisels and a mallet



Remove the socket waste with a bench chisel, staying 1/16" from the scribed sides and back.



After making a vertical cut, counter with a horizontal cut to remove the chip.



Pare down the angled side walls to the bottom of the sockets.



Using a clamped-on guide board, pare away the final material from the back walls.



Finally, use a skew chisel to clean out the corners to finish the sockets.



Now you have two perfect pin sockets for a project part, such as an inset drawer front.

Your chisels will only be as good as your sharpening makes them

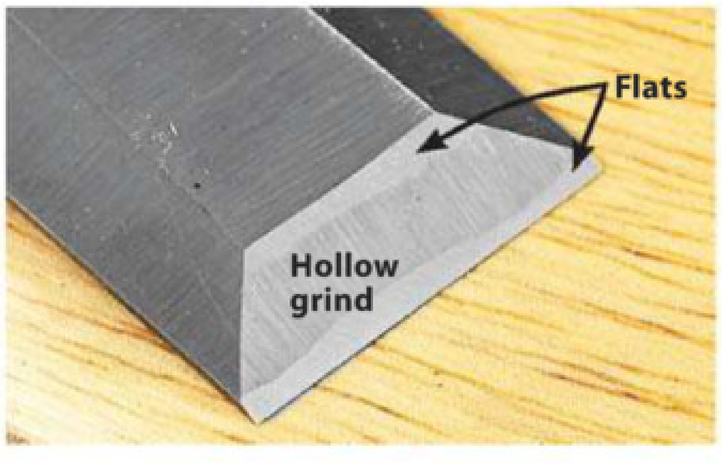
I see several hundred new students in my classroom each year, all eager to start chopping wood. But there's a little tough love waiting for them: I provide students with the least expensive home-center chisels available for two reasons. First, any accidental damage is no big deal because the chisels cost only a few bucks to replace. Second, and most important, these chisels have relatively soft steel blades, so they dull quickly. Why's that a good thing? Because frequent sharpening ingrains in their minds and muscle memories correct sharpening techniques, which are the same regardless of the chisel quality. And having a sharp chisel always trumps having an expensive chisel.

No matter what technique or mechanism you use to sharpen your chisels, get comfortable using it, and return to it regularly to touch up your tools. I favor sharpening freehand on water stones—years of sharpening experience mean I don't need fancy machines or gadgets. And, if treated properly, the stones last for years. But if you prefer to use a honing guide to hold your chisels at the correct bevel angle, or maybe a motorized sharpener, by all means do it. They all work if you take the time to become familiar with them.

Always start out a new—or, dare I say it, an abused—chisel with a hollow grind on a benchtop grinder, as shown *below*. I use 36- and 60-grit wheels because I want to shape the steel quickly and avoid heating up the tools. Overheating, usually indicated by a blue hue of the steel, causes the cutting edge to dull more quickly. And I prefer a hollow-ground bevel because it's easier and quicker to sharpen and touch up on the stones. (With less steel dragging across the stone, there's less friction, and the bevel's two-point contact helps maintain correct angle orientation on the face of the sharpening stone.)



Holding your chisel against the tool rest for leverage, grind a recess on the bevel that's perpendicular to the blade sides.





Slide the chisel forward and back on the wet sharpening stone. Latex gloves keep the soupy swarf from dirtying your hands.

After making the hollow grind, lap the back face of the chisel to make it perfectly flat, as shown *above*. You only need to do this on the bottom 2 inches. Some chisel work doesn't require a flat back, but other tasks, such as mortising and paring, do; so just get in the habit of lapping. Start with a coarse stone (800 grit) and repeat on several finer-grit stones. This only needs to be done again if the back goes out of flat, or if you have used up the flat portion of the chisel blade through sharpening.

Next, sharpen the cutting edge on stones or sandpaper grits. Begin with a coarse grit (800 water stone, gray Arkansas oil stone, or 150 sandpaper) to define the bevel, creating two narrow, flat points of contact above and below the scooped-out hollow grind *(left)*. Progress through several finer grits, up to 15,000 stone or 1,000 sandpaper, to hone the bevel to a razor-sharp edge. I go a step further and burnish the bevel on brown butcher paper or grocery bags.



The texture of common butcher paper produces a mirror finish and a cutting edge that's beyond scary-sharp.

Although it's not necessary, I like to add a secondary microbevel, about 1° steeper than the main bevel, for an even finer edge. To do this, after you've finished the first bevel, go back to an 8,000-grit stone or 1,000-grit sandpaper, raise the chisel slightly off the bevel so only the tip touches, and gently give it a few strokes. If you anticipate doing a lot of heavy chopping or working with a particularly hard or abrasive timber, such as white oak or silica-rich teak, add a secondary bevel. The more obtuse microbevel dramatically increases the edge-holding durability of the chisel in these situations.

The more you sharpen, the more you dish out the stones. Keeping the stones flat guarantees your chisels' edges remain flat. Use a flattening stone to remove the high spots. I probably do this more than I need to, but I'm in the habit of flattening every stone before I sharpen with it.

Written by **Tim Peters** with **Bob Hunter**
Illustration: **Tim Cahill**

More Resources

FREE VIDEO

▶ Watch a FREE video of sharpening with sandpaper at **woodmagazine.com/sharpenvid**.

RELATED REVIEW

▶ For a small fee, download a review of motorized sharpeners and handheld honing guides at **woodmagazine.com/sharpeners**.

Our favorite hand tools

We love power tools, but many times a hand tool does the job better and quicker, and always with less noise and dust—ideal for small shops. Here are eight "unplugged" tools that seldom leave our workbenches.





5" Pocket Saw

Cady Tools, $125
cadytools.blogspot.com

I keep this mini handsaw nearby for cutting small project parts that would be impractical or even dangerous to cut with a power saw. In spite of its stubby length, the handmade Pocket Saw has a full-size, quartersawn hard-maple handle that feels comfortable in my hand. Its durable blade is thicker than most small saws, with 16 teeth per inch, and a folded steel back for rigidity. It makes quick work of rips *and* crosscuts in small workpieces.

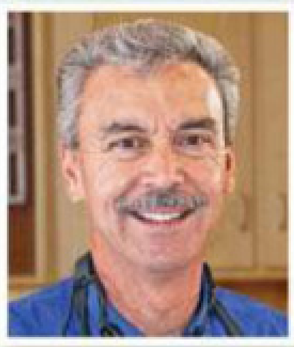


—John Olson,
Design Editor

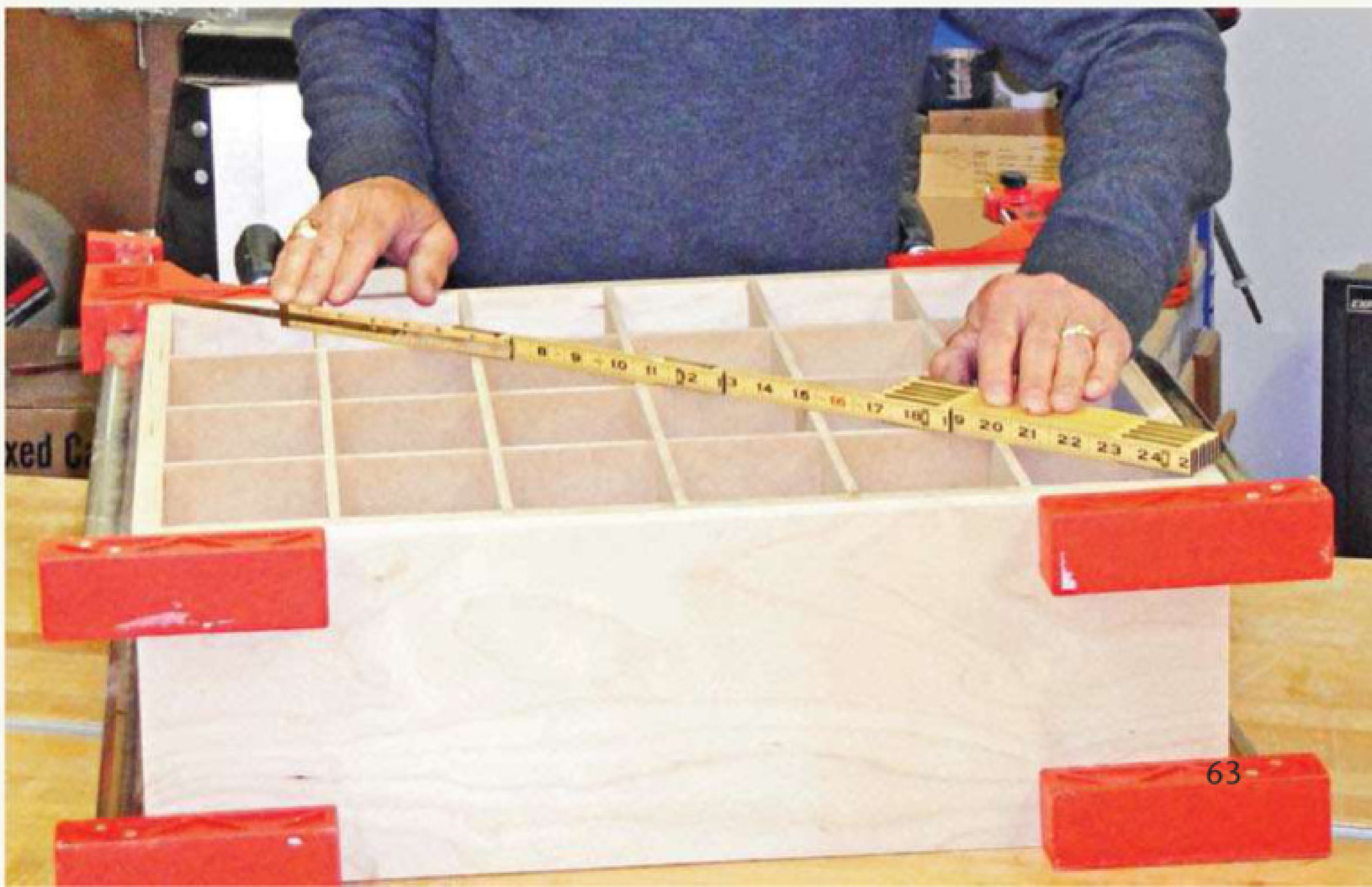
Folding wood rule

New equivalent: Lufkin X46, $14
Amazon.com

My favorite tool was also my kids' favorite: an old 6' Starrett rule, now no longer made. It saw as much action over the years in sword fights and light-saber battles as it did in the shop. (Okay, so they broke a few, but I quickly replaced them because I couldn't imagine working without one.) It's spot-on accurate, the brass extension reaches into tight spots, and it's perfect for checking carcase glue-ups for square.



—Jim Heavey,
contributing craftsman



1" Crank-neck chisel

Traditional Woodworker, no. 225-2100, $63
800-509-0081, traditionalwoodworker.com

I find this paring chisel useful for flush-trimming wood plugs, shaving tenon cheeks, and—I'm sure this will make a few purists grumpy—slicing glue squeeze-out off a joint. Its bent neck lets you rest the back of the chisel on the workpiece while maintaining a good grip on the handle, and it reaches places that regular bench and paring chisels just can't.



—Kevin Boyle,
Senior Design Editor





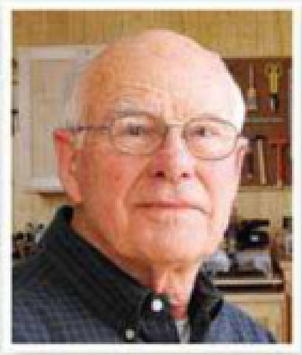
Stanley no. 140 rabbeting block plane

***(No longer in production; look for used models at auctions and online.)* New equivalent: Lie-Nielsen no. 1-60-1-2R-N, $175**
800-327-2520, lie-nielsen.com

My grandfather bought this plane in the early 1900s, and I'm its third-generation user. That speaks volumes about its usefulness and durability. The Stanley no. 140 functions as two planes: a *low-angle block plane (far left)* that slices end grain as cleanly as edge grain and; when you remove the side fence *(near left)*, a *rabbeting plane* that cleans up tenons and rabbets. Its blade cuts at a skewed angle, greatly reducing tear-out.



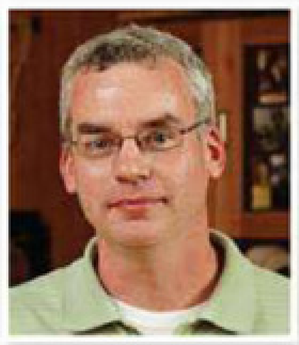
—Erv Roberts,
a longtime woodworker and *WOOD*® magazine contributor for more than 15 years



Japanese handsaw

Rockler, no. 26513, $37
800-279-4441, rockler.com

I grew up using Western-style saws for hand work. But the first time I tried a Japanese handsaw, I couldn't believe the difference. Like all Japanese saws, this general-purpose model cuts on the pull stroke rather than the Western-style push, so it's easier to start a cut, and it tracks straighter. Its thin blade flexes slightly for making flush cuts, and it leaves no errant scratches on the wood because the teeth have no set. Still, the blade is stiff enough to hold true for joinery cuts. I could probably never go back to the Western saws now gathering dust on my shelves.



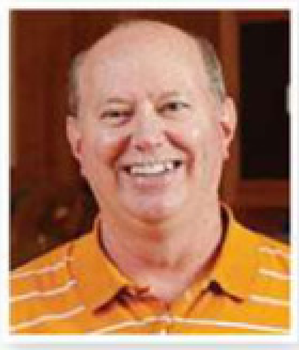
—Lucas Peters,
Digital Content Manager



No. 5½ jack plane

Lie-Nielsen, no. 1-5-1-2, $375
800-327-2520, lie-nielsen.com

For years, I used a no. 4 smoothing plane and no. 5 jack plane and got along fine. But then I tried a no. 5½ jack plane and was immediately hooked. Now it's my go-to bench plane, seeing action on almost every project I build. Although about the same length as a typical no. 5, this plane measures nearly ½" wider and weighs about a pound and a half more. I like that extra heft because it provides momentum to power through cuts without feeling cumbersome—making less strain for me in the long run—especially in figured or knotty wood. And if you prefer to buy a used Stanley model (made until the late 1950s) online or at auction, rest comfortably knowing that you almost can't find a bad one (unless it's broken).



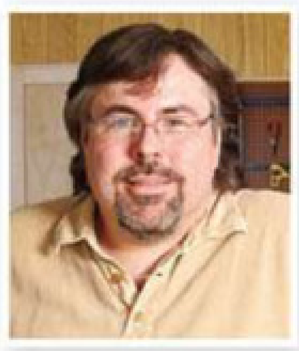
—Bob Hunter,
Tools Editor



Veritas apron plane

Lee Valley, no. 05P27.01, $89
800-871-8158, leevalley.com

I have two standard-size block planes, in regular and low blade angles, but I always reach for this compact plane to do light trimming or shaping tasks. Veritas' apron plane perfectly combines size, weight, and nimbleness, especially when I need to get in tight on a small project part that needs fine-tuning. Its low angle shaves end grain as easily as edge grain, and the blade adjusts quickly and holds an edge for a long time.



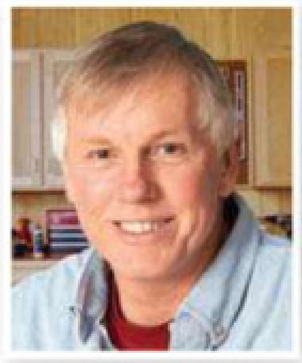
—Matt Seiler,
custom furnituremaker
and *WOOD* magazine
forum host



6" dial caliper

Amazon.com, no. MTDCF-06, $41

Whether checking the thickness of a tenon, the depth of a mortise, the spacing of box joints, or the diameter of a counterbore, this handy caliper delivers precision as no measuring tape or rule can. The large dial's 1/64" graduations make it easy to read, and when I'm feeling *really* picky, the inner dial provides 1/100" increments. It also comes in handy for setting up machines, such as dialing in router-bit and tablesaw-blade heights.



—Bob Saunders,
woodworking school owner
and teacher and *WOOD*
magazine contributor



Shop-Proven Products

These woodworking wares passed our shop trials.

About our product tests

We test hundreds of tools and accessories each year, but only those that earn at least three stars make the final cut and appear in this section. Go to toolreviews.woodmagazine.com for reviews of all the products tested, including those that don't make the cut. Prices shown are current at the time of article production and do not include shipping, where applicable.

Build a rock-solid workbench in no time

Kreg's Universal Bench system makes it fast and easy to build a sturdy workbench, assembly table, finishing table, or tool stand. Just bolt together a set of these 12-gauge, angled-steel legs and rails for a rock-solid stand, and then screw on a top you make to suit your needs. It's that simple.

The legs come in two adjustable heights: 15¼–21¼" and 29–35". The rails come in 14", 20", 28", 44", and 64" lengths, giving you 15 possible footprints from 14×14" to 64×64". In addition to the pre-drilled assembly holes, the legs and rails have holes for adding shelves or enclosing the sides.

We made multiple stands for the *WOOD*® magazine shop and love them. A 44×44" stand with a laminated MDF top doubles as a secondary workbench and tablesaw outfeed stand. A 28×44" bench with short legs, locking 3" casters ($60 for a set of four, part no. PRS3090), and ¾" sealed plywood top serves as an assembly and finishing table and nests under the larger bench. We also made a portable table with tall legs for finishing small projects. (No stooping for us tall guys!)

—Tested by Kevin Boyle, Senior Design Editor





Universal Bench system

Performance		★★★★★
Price	Legs (set of 4)	$60–80
Price	Rails (set of 4)	$20–80

Kreg Tool
800-447-8638; kregtool.com

Compact tablesaw cuts like bigger, pricier saws

I've been using a Bosch 4100 portable tablesaw for years with great results, but the $500-plus price pushes it close to the cost of a traditional contractor-style saw. Bosch's new GTS1031 provides nearly the same performance as the 4100 in a smaller package—and with a smaller price tag.

Bosch engineers cut the weight to 50 lbs by building the saw with a roll-cage-type frame rather than a closed cabinet. It's easy to carry one-handed like a suitcase, even going up and down stairs. But it's no toy. This saw's robust motor powered the thin-kerf blade through 2"-thick red oak without bogging down. The GTS1031 is accurate, compact, and solidly built, and I found myself using the three-position riving knife and blade guard because they're well-designed and effective. They're easy to remove when necessary, too. Plus, all the accessories store underneath the saw, keeping them protected during transport.

One sacrifice you have to make with this saw: The 18" maximum rip capacity measures 7" less than the 4100, meaning you can't rip to the midpoint of sheet goods.

—Tested by Dave Fish, a trim carpenter and cabinetmaker





10" benchtop tablesaw (GTS1031)

Performance	★★★★★
Price	$399

Bosch Power Tools
877-267-2499; boschtools.com

The best of the best in jigsaws

If you need a jigsaw that makes spot-on perpendicular cuts, even in thick woods and tight turns, then get the top-handle Bosch JS572EN. What makes this jigsaw so special? Two roller blade guides surround the blade to keep it cutting perfectly straight up and down. (Most other saws have only one guide, if any.) I used this saw to cut sweeping and tight curves in multiple species and thicknesses of solid wood and plywood, and the blade never deflected from 90°. Impressive. That cuts down on time (and abrasive) spent sanding edges with a spindle sander. In fact, when used with Bosch's Extra-Clean For Wood jigsaw blades, the JS572EN delivered such clean edges, they needed only a light hand-sanding.

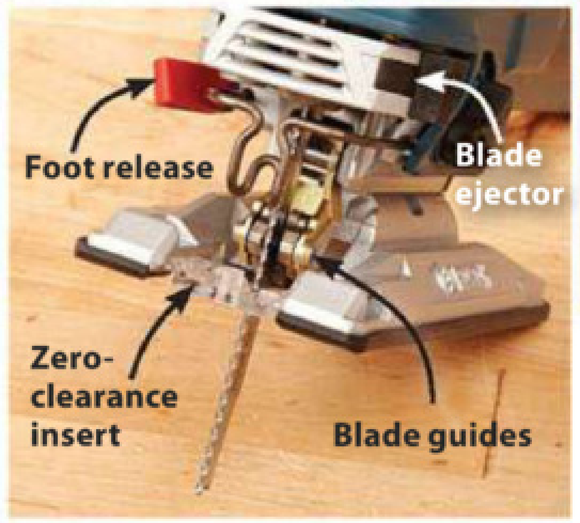
I also appreciate the LED light that illuminates the cutline—another first for jigsaws—making it easier to see and cut accurately. Other great features on this premium saw: a tool-free adjustment for tilting the footplate, tool-free blade ejection (so you don't grab a hot blade), low vibration, and a handy 13' rubber power cord with a swiveling mounting boot to prevent kinking.

Buy it in a kit (JS572EL) for $299, and you'll also get a sturdy storage box, dust-collection attachment, blade shroud, and hard-wearing steel shoe for the plastic-coated footplate. Bosch also makes this saw in a barrel-grip version at the same prices as the top handle.

—Tested by Bob Hunter, Tools Editor







7.2-amp jigsaw (JS572EN)

Performance	★★★★★
Price	$239

Bosch
877-267-2499; boschtools.com

Vacuum gobbles dust and seals it away

It's easy to suck up dust from big, stationary machines using a powerful collector, but not always so easy to capture the fine dust and debris created by portable power tools, such as a sander, router, or circular saw. DeWalt's DWV012 10-gallon wet/dry shop vacuum solved that problem in my shop. This vacuum has enough suction to keep up with those tools, while capturing even the finest dust in the included prefiltering felt bag. It also has HEPA filters to trap dust particles as fine as .3 micron that escape the bag—but even after sanding mahogany I couldn't find any sign of red sanding dust on the white filters.

A tool-actuated switch turns the vac on and off with the tool, and the motor runs so quietly, I couldn't hear it over the tool's noise. However, every 30 seconds the built-in filter cleaner pulses, and that noise can be annoying. Other great features: variable suction, a 1¼"×15' hose, easy-rolling casters (lockable in the front), and a telescoping handle for easy storage and transport.

—Tested by Craig Ruegsegger, Deputy Editor



Tool-triggered shop vacuum (DWV012)

Performance	★★★★★
Price	$529

DeWalt
800-433-9258; dewalt.com



Go-anywhere tool caddy

Keep frequently used tools organized, protected, and within easy reach wherever you go by rolling this compact cart right up to your work area. Its drawers, shelves, top tray, and doors create numerous storage opportunities.



Thanks to its large 6"-diameter wheels and easy-adjust, fully retractable, locking handle, moving the caddy is a cinch.

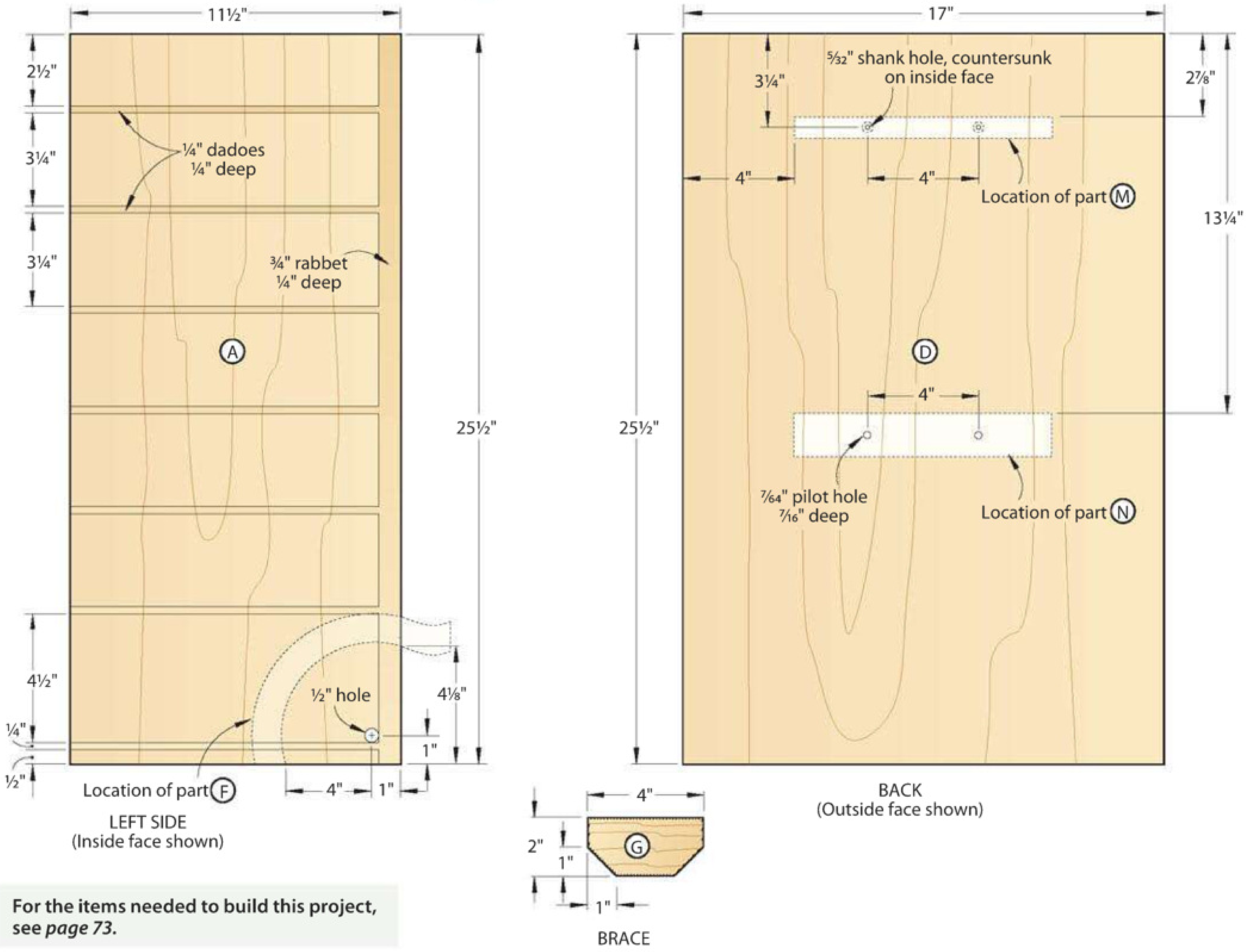


Inspired by a rolling carry-on suitcase, like those used by airline travelers, this handy portable cabinet provides on-the-go storage for tools and supplies. It parks in a small area and serves as a storage cabinet in your shop. But when you pull up the retractable handle, you can move it around the shop or roll it wherever you need for fix-ups outside the shop.

The top of the tool caddy flips up and the doors swing open to provide access to the items inside. Simple scrapwood holders keep everything in place while on the move, and removable drawers and shelves accommodate tools and hardware. The photo *above* shows the unit with one drawer and shelf, but you can build it with two of each if you wish.

***Note:** For a natural wood look and void-free edges, we used Baltic birch plywood for our tool caddy, and applied a clear finish. As a less expensive alternative, you can use type AC or BC plywood, particularly if you plan to paint the unit. Also, because the thickness of plywood varies, you may need to slightly adjust the size of some parts and the mating dadoes and rabbets.*

1 PARTS VIEW



For the items needed to build this project, see *page 73*.

Start with the case

1 Cut the sides (A), axle supports (B), fixed shelves (C), and back (D) to the sizes listed in the **Materials List.**

2 Using a dado blade in your tablesaw, cut seven ¼" dadoes ¼" deep across the width of the sides (A) and a ¾" rabbet ¼" deep along the back edge, where dimensioned on **Drawing 1**. Make sure they are mirror-image parts. Then, drill a ½" hole for the wheel axle through the sides, where dimensioned.

3 Bandsaw a ½×½" notch for the axle in a corner of the axle supports (B), where shown on **Drawing 2**. Then glue and clamp the supports to the sides (A), where shown, with the notches aligned with the ½" holes in the sides.

4 Using your tablesaw, cut ¼" rabbets ½" deep along the ends of the fixed shelves (C), leaving ¼×¼" tongues to fit the dadoes in the sides (A).

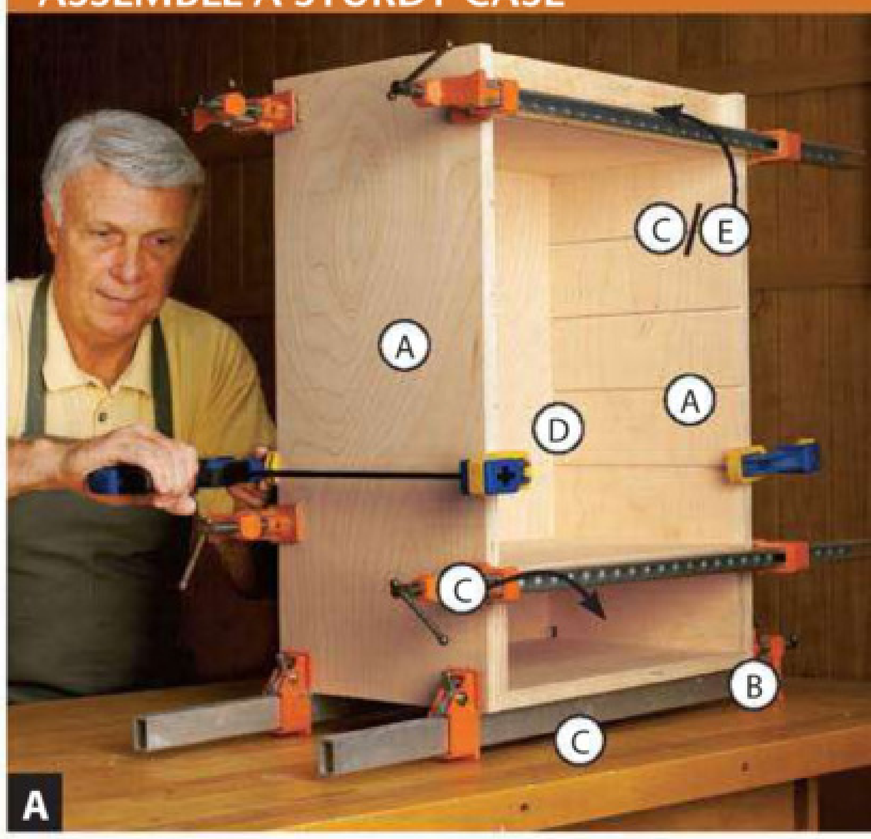
5 Cut the top divider (E) to size, making sure the length matches the shoulder-to-shoulder length of the shelves so the case will assemble correctly. Then, with the rabbeted edges of the top fixed shelf facing up, glue and clamp the top divider to it ¾" back from the front edge, where shown on **Drawing 2**. After the glue dries, assemble the case, as shown in **Photo A**.

Add the fenders and brace

1 To make the fenders (F), first cut four pieces of ¾" plywood to 5¼×7". Laminate the pieces together to form two 1½"-thick workpieces.

2 Make two copies of the full-size fender pattern on *page 74*. Using spray adhesive, adhere one fender pattern to each laminated workpiece. Then bandsaw slightly outside the outer radius on the patterns. Now sand to the line using a 100-grit sanding drum.

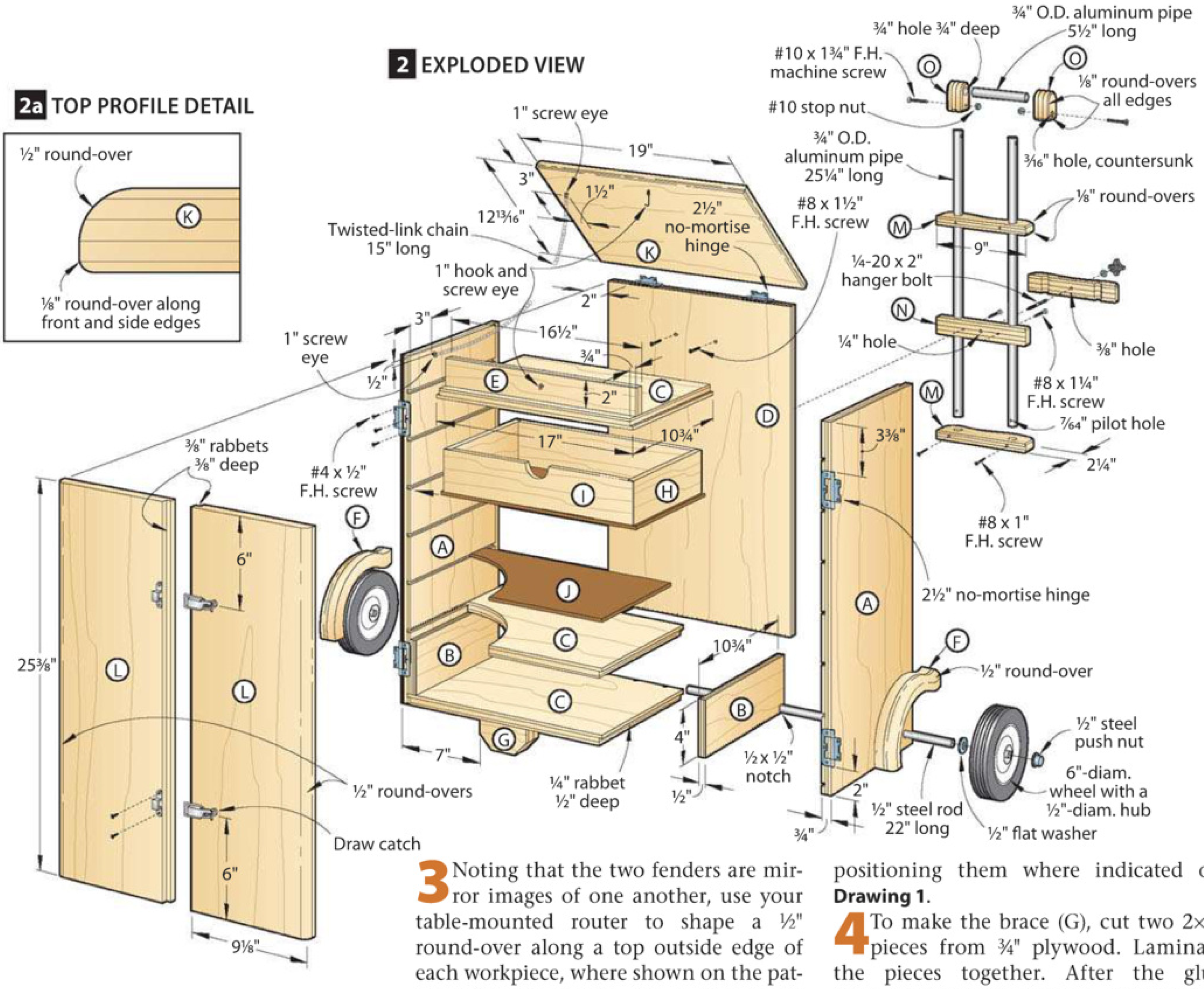
ASSEMBLE A STURDY CASE



Glue and clamp together the side assemblies (A/B), fixed shelves (C, C/E), and back (D). Make sure the rabbeted edges of shelves C face down and shelf C/E face up.

2a TOP PROFILE DETAIL

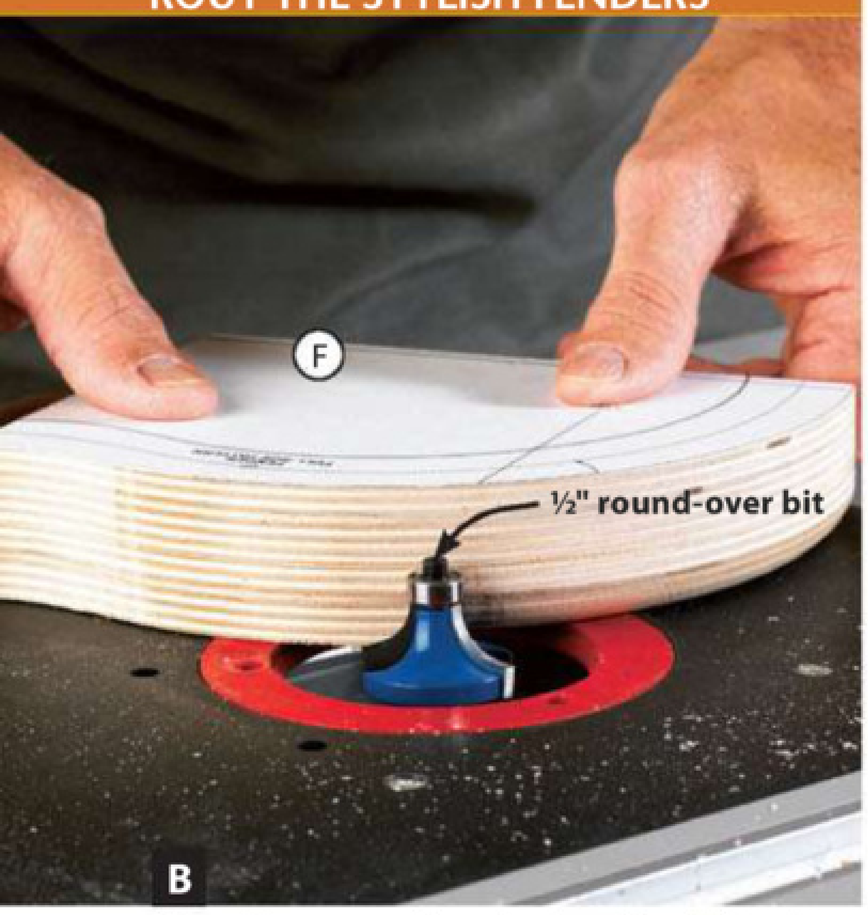
2 EXPLODED VIEW



3 Noting that the two fenders are mirror images of one another, use your table-mounted router to shape a ½" round-over along a top outside edge of each workpiece, where shown on the pattern and **Drawing 2**, and as shown in **Photo B**. Then bandsaw and sand the inner radius of the fenders to shape. Remove the patterns using a solvent, such as lacquer thinner. Then glue and clamp the fenders to the sides (A), positioning them where indicated on **Drawing 1**.

4 To make the brace (G), cut two 2×4" pieces from ¾" plywood. Laminate the pieces together. After the glue dries, bandsaw the beveled edges of the part, where dimensioned on **Drawing 1**, and sand smooth. Now glue and clamp the brace to the bottom fixed shelf (C) centered and flush with the front edge, where shown on **Drawing 2**.

ROUT THE STYLISH FENDERS

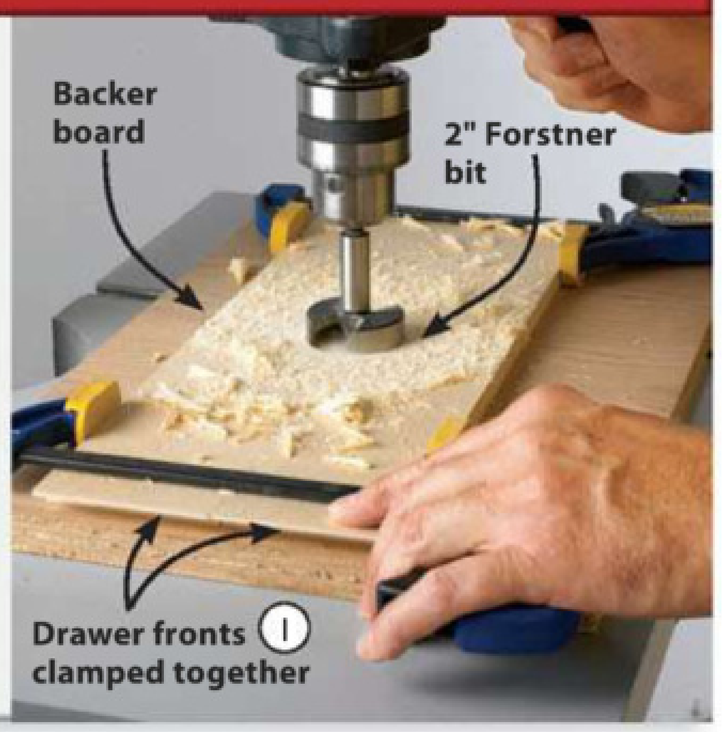


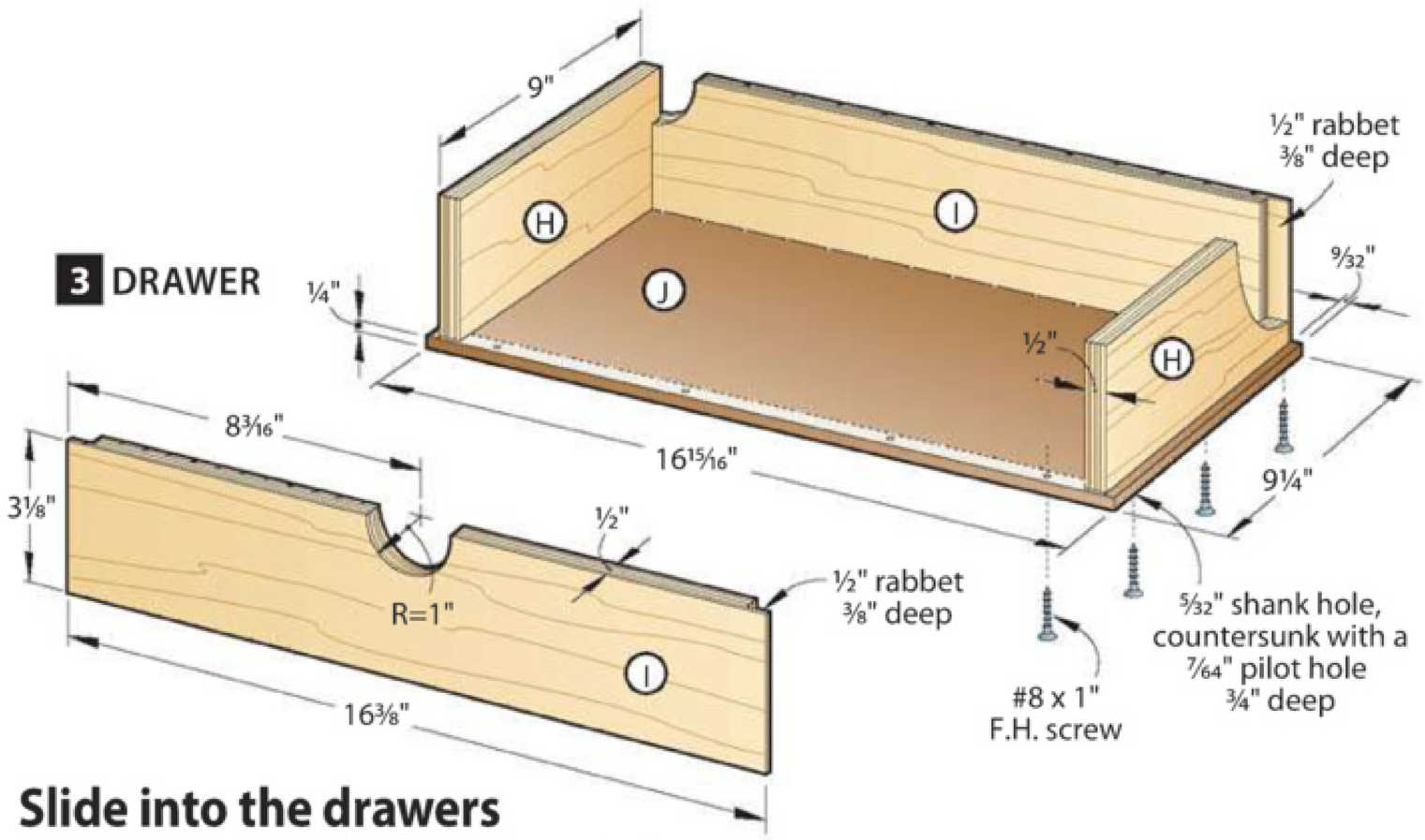
Round over a radiused edge of each fender, routing opposite top outside edges of the pieces to produce mirror-image parts.

SHOP TIP

An easy (and doubly fast) way to form drawer-pull openings

Here's how to quickly and simultaneously bore precise radiused openings in a pair of drawer fronts, such as those for the tool caddy. Clamp the two fronts together top edge to top edge, and mark the centerpoint for the openings. Then place the clamped assembly on top of a backer board on your drill-press table. Using the appropriate size Forstner bit, a hole saw, or a circle cutter for the desired opening radius, bore a hole through the fronts at the marked centerpoint, as shown at *right*.





Slide into the drawers

1 From ½" plywood, cut the drawer sides (H) and drawer fronts and backs (I) to the sizes listed. From ¼" hardboard, cut the drawer bottoms/shelves (J) to size.

2 Cut ½" rabbets ⅜" deep along the ends of the fronts and backs (I), where shown on **Drawing 3**. Using a circle template or compass, mark a centered 1" radius on each of the two fronts, where dimensioned. Bandsaw and sand the openings to shape. Or see the **Shop Tip**, *opposite page*, for a time-saving alternative.

3 Glue and clamp together the drawer sides, fronts, and backs, and check for square. After the glue dries, place the drawers on your workbench with the radiused openings facedown.

4 Mark the locations for mounting holes on the two drawer bottoms (J), where shown. (We marked the locations on white tape so we could easily see them.) Then position a bottom on each drawer, flush with the outside faces of the front and back and centered end-to-end with a 9⁄32" overhang on the sides, where shown. Clamp the bottom to the drawer. Now secure it in place, as shown in **Photo C**.

Top it off, and add the doors

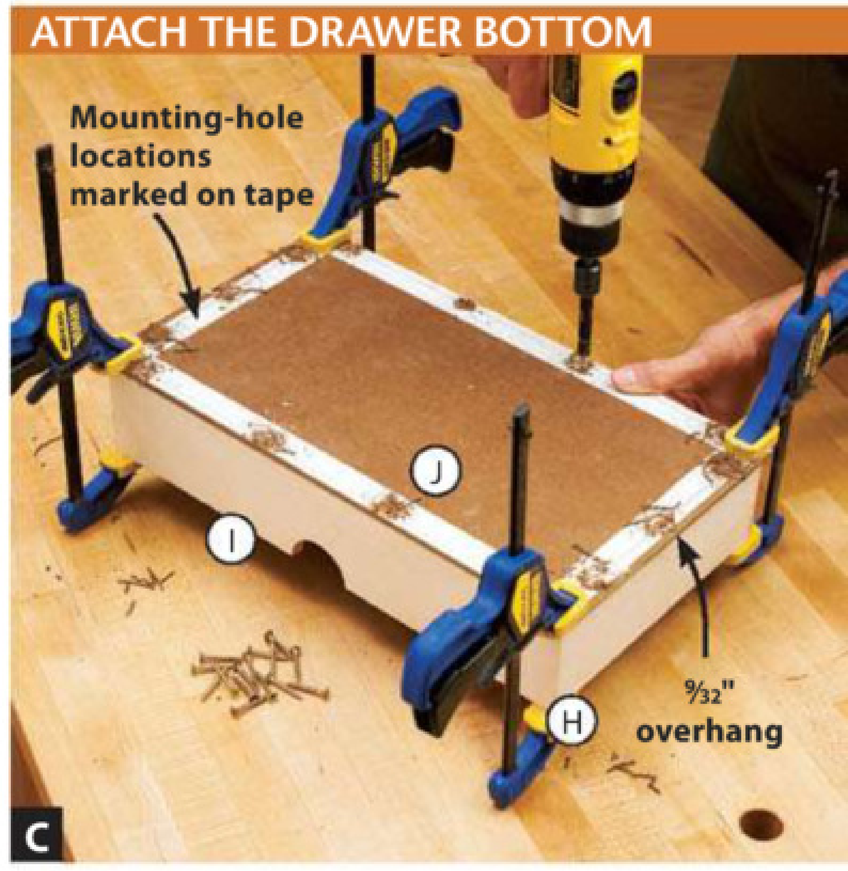
1 Cut the top (K) and doors (L) to size. Using your table-mounted router, rout a ⅛" round-over along the bottom front and side edges of the top, where shown on **Drawing 2a**. Switch to a ½" round-over bit, and rout the top edges. Now rout a ½" round-over along the long outer edge of each door on its outside face, where shown on **Drawing 2**.

2 Refit your router with a ⅜" rabbeting bit. Then rout a ⅜" rabbet ⅜" deep along the long inner edge of each door, cutting one door on the outside face and the other on the inside face, where shown, so the rabbets overlap when the doors close.

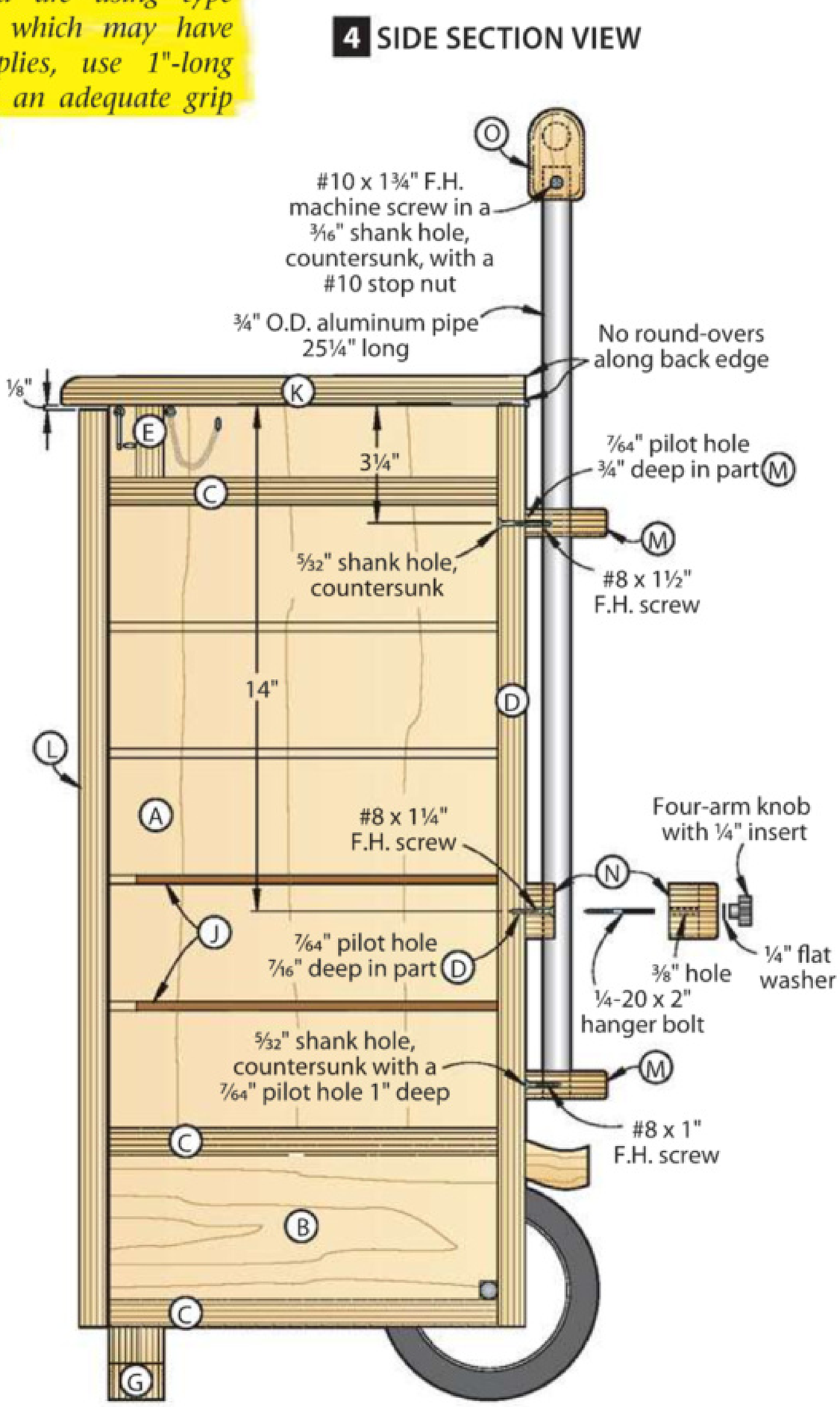
Note: *We used #4×½" flathead screws to fasten the hinges to the Baltic birch plywood case. If you are using type AC or BC plywood, which may have voids between the plies, use 1"-long screws to help ensure an adequate grip in the plywood edges.*

3 Mount hinges on the front edge of the sides (A) and on the top edge of the back (D), where dimensioned. Align the hinges flush with the inside face of the sides and back.

4 Fasten the top (K) to the hinges, placing the top flush with the back of the case and centered side-to-side with a ½" overhang. Next attach the doors (L) to the hinges with the doors flush with the case sides and a ⅛" gap between the top edge of the doors and the top, where shown on **Drawing 4**. For an easy way to hold parts in position while you mark the hinge mounting-hole locations, see the **Shop Tip** on the *next page*. Now mount draw catches on the doors, where dimensioned, using the screws supplied with the hardware.



Drill mounting holes through the bottom (J) and into the drawer frame (H/I) at the marked locations. Then drive the screws.



Time for the handle

1 From ¾" plywood, cut four 2¼×9" pieces—two for the pipe supports (M) and two for the pipe clamp (N). Laminate the two pieces for the pipe clamp together to form a 1½"-thick workpiece.

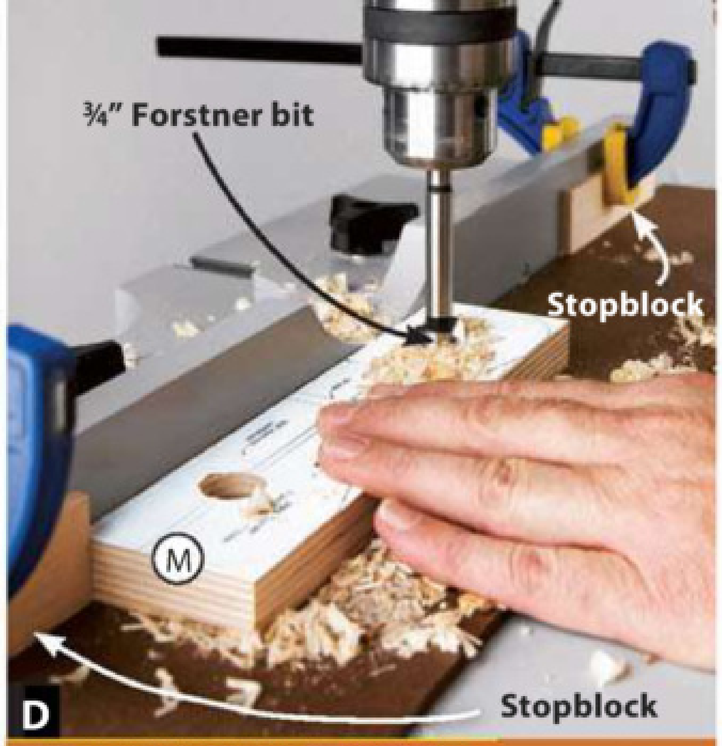
2 Photocopy the pipe supports/pipe clamp half-pattern (*page 74*) at 200 percent to make three full-size patterns, and spray-adhere them to the three workpieces. Using a ¾" Forstner bit in your drill press, bore holes through, one piece at a time, where shown on the pattern and as shown in **Photo D**.

3 Bandsaw and sand the pipe supports and pipe clamp to the pattern line. Then rout ⅛" round-overs along the top and bottom edges, where shown. Now drill a centered ¼" hole only through the clamp.

4 Using your tablesaw, rip the pipe clamp (N) along the cutline, where shown. Next, using your drill press and a twist bit, enlarge the ¼" hole in the contoured half of the clamp to ⅜". Then drill the countersunk shank holes in the other half, where shown. Position this half of the clamp on the back (D), where dimensioned on the back portion of **Drawing 1.** Using the clamp shank holes as guides, drill pilot holes in the back, where shown on **Drawings 1** and **4**, and drive the screws.

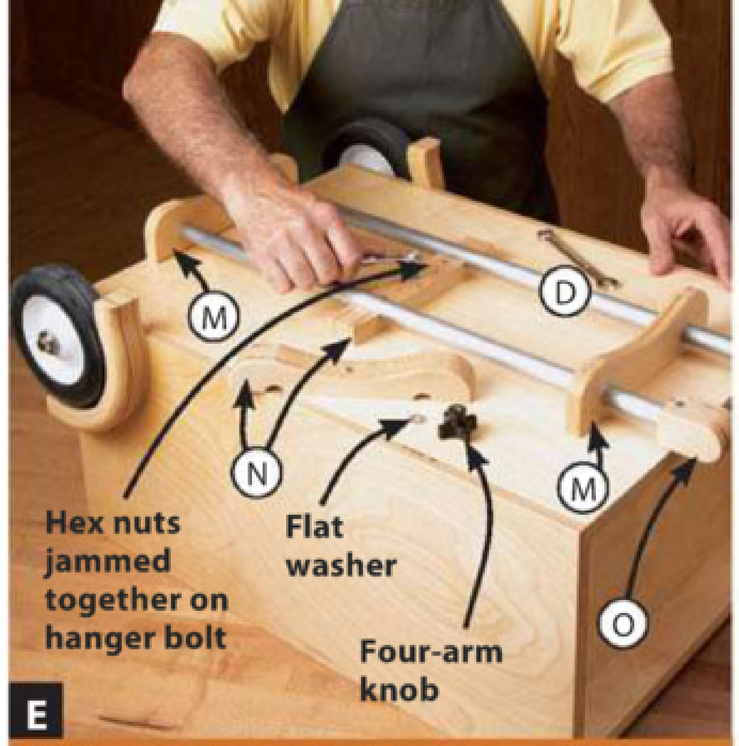
5 From ¾" plywood, cut four 1½×2½" pieces for the handle supports (O). Laminate the pieces together to form two 1½"-thick pairs.

6 Referring to the parts-view drawing on *page 74*, lay out the handle supports (O) on the workpieces. Then bore a ¾" hole ¾" deep in each, where shown. Draw diagonals on the bottoms of the parts to find the centers. Now bore a ¾" hole 1" deep at each marked center.



BORE THE PIPE HOLES

Using stopblocks to precisely position the pipe supports (M) and pipe clamp (N), bore ¾" holes through each part at the marked centerpoints on the pattern.



INSTALL THE HANGER BOLT

Jam together two ¼-20 hex nuts on the hanger bolt. Drive it into the pipe clamp (N) by turning the nuts with a 7/16" wrench. Then remove the nuts.

7 Bandsaw and sand the handle supports to the pattern lines. Then, using your table-mounted router, rout ⅛" round-overs along all of the edges. Now remove the patterns from the handle supports, pipe supports, and pipe clamp.

8 From a 60"-long piece of ¾" O.D. aluminum pipe, hacksaw one 5½"-long piece and two 25¼"-long pieces. Slide the two long pipes through the holes in the two pipe supports (M). Align one support flush with the ends of the pipes. Then drill mounting holes through the support and pipes, where shown on **Drawings 2** and **4**, and drive the screws. Do not fasten the other support to the pipes.

9 Capture the 5½"-long pipe in the ¾" holes in the sides of the handle supports (O). Then position this assembly on the ends of the long pipes, where shown. Drill countersunk 3/16" holes through the supports and pipes, where shown on **Drawing 2**, and secure with machine screws and stop nuts. For safety, trim the ends of the screws flush with the nuts using a hacksaw, and smooth with a file.

Head for the finish

1 Remove the top (K), doors (L), and all of the hardware. Sand any areas that need it with 220-grit sandpaper. Apply a clear finish, if you wish, or prime and paint the unit. (We applied three coats of water-based clear satin polyurethane to the caddy and aluminum pipes, sanding to 320 grit between coats.)

2 From a ½" steel rod 36" long, hacksaw a 22"-long piece for the wheel axle. Insert the rod through the holes in the case sides (A), where shown on **Drawing 2**. Then install the flat washers, wheels, and push nuts on the axle. (We used a 6"-diameter lawnmower wheel with a steel hub.) Use a hammer to drive the push nuts.

3 To attach the handle assembly, drill two 5/32" shank holes through the back (D), where dimensioned on **Drawing 1**, for mounting the upper pipe support (M). Then countersink the holes on the inside face of the back. Next, with the tool caddy facedown on your workbench, install a ¼×20×2" hanger bolt in the center ¼" hole in the case-mounted part of the pipe clamp (N), as shown in **Photo E**. Now position the handle assembly on the unit, as shown, and install the contoured half of the pipe clamp, a flat washer, and a four-arm knob on the bolt.

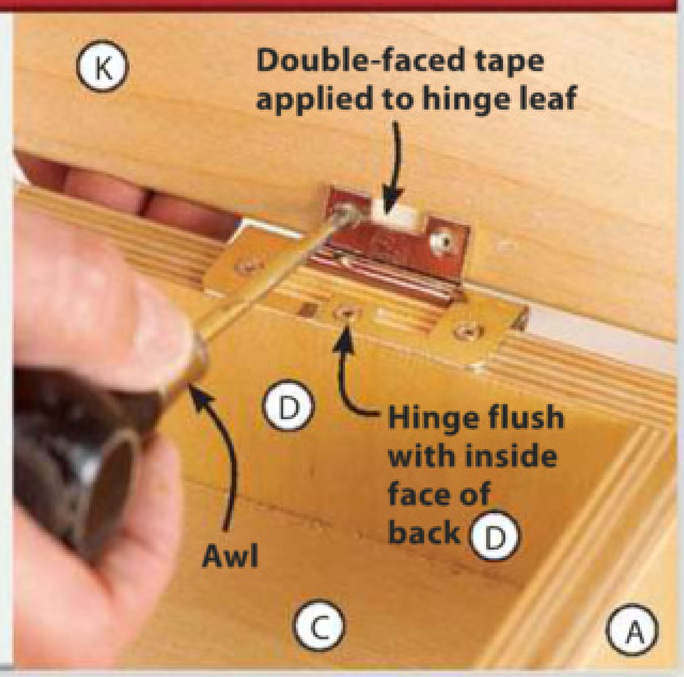
4 To secure the upper pipe support (M) to the back (D), position the handle to center the support over the shank holes in the back, and tighten the four-arm knob. Then, from inside the case and using the shank holes as guides, drill pilot holes through the support and pipes, where shown on **Drawing 4**. Now drive the screws.

5 Remount the top (K) and doors (L). To install a chain for holding the top open, drill pilot holes for 1" screw eyes in the left side (A) and top, where dimen-

SHOP TIP

Double-faced tape makes hinge mounting easy

Holding a cabinet door or case top in exact position while marking the hinge mounting holes can be awkward and frustrating. Here's a simple way to avoid the problem. Apply a piece of double-faced tape to the hinge leaves that attach to the door or top. Remove the tape backing. Align the part and press it firmly in place to adhere it to the tape. Open the door or top and mark the mounting holes with an awl, as shown at *right*. Remove the tape, and drill the holes.



Quick and easy ideas for mounting your tools and accessories

The tool caddy doors provide a convenient place to keep frequently used tools accessible and organized. To hang your tools and keep them secure when moving the caddy, you don't need to spend a lot of money on fancy holders. Using small pieces of scrapwood, dowels, and aluminum bar, you can make attractive holders in minutes that custom-fit your tools, such as the ones shown in the photos *below*.

Start by removing the doors, placing them on your workbench, and laying out your tools on them. Make sure you leave enough clearance around the items for easy handling. Also, keep in mind that because the fixed shelves (C) extend to the front of the case, you need to keep the tools at least 2⅝" below the top of the doors and 5½" from the bottom. Ensure your tools and holders extend no more than 1½" from the doors so they'll clear the drawers and shelves when you close the doors.

To allow for easy rearrangement of your tools later, omit glue and simply screw the holders in place. If some of your tools have their own holders, you can mount them to the door too.

DRILL BITS



To make a holder for tools that fit in round holes, glue two pieces of ¾" scrap together. Drill stopped holes slightly larger than the bit-shank or tool diameters.

TAPE MEASURES, PENS



A piece of ⅛×1½" aluminum bar (available at hardware stores) and two ¼×1½×1½" wood spacers make a handy holder for items that have a spring clip.

SQUARES



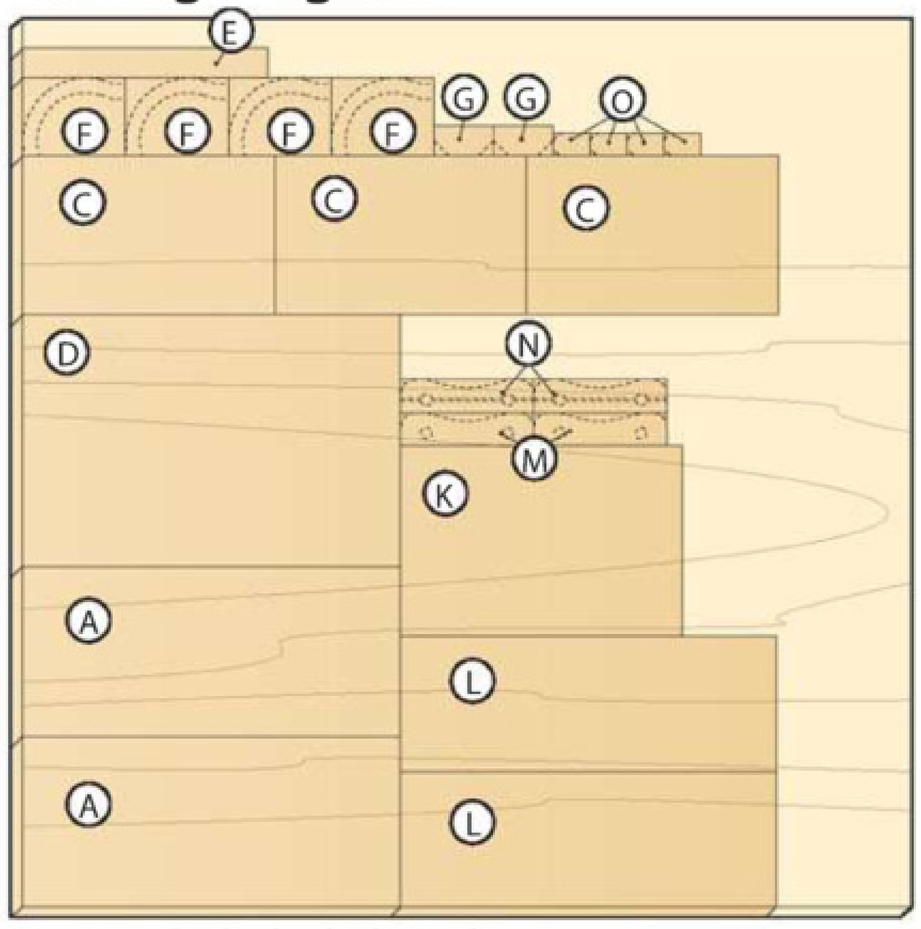
To create narrow slots, glue ⅛" spacers between strips of ¼" stock. A notched T-shaped holder made from ¼" stock keeps a sliding bevel securely in place.

sioned on **Drawing 2**. Install the eyes. Then, using needle nose pliers, open the eyes, slip the ends of a 15" length of twisted-link chain onto them, and close the eyes. To secure the top when it is down, drill holes in the top divider (E) and the top, and install a 1" hook and screw eye, where shown.

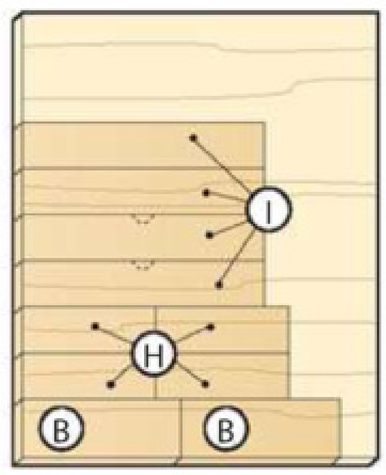
6 Slide the drawers and shelves (J) in place. Load the caddy with tools, hardware, and supplies and you're ready to roll to your work site. For ways to hang tools on the inside of the doors, see the sidebar "**Quick and easy ideas for mounting your tools and accessories**," *above*.

Written by **Owen Duvall** with **Chuck Hedlund**
Project design: **Kevin Hall** with **Kevin Boyle**
Illustrations: **Roxanne LeMoine**

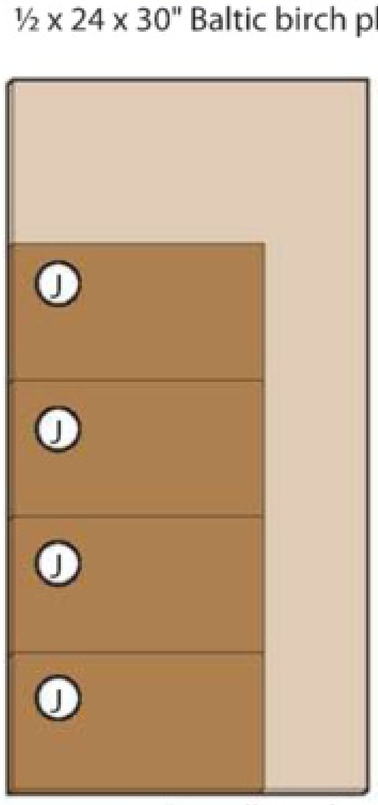
Cutting Diagram



¾ x 60 x 60" Baltic birch plywood



½ x 24 x 30" Baltic birch plywood



¼ x 24 x 48" Hardboard

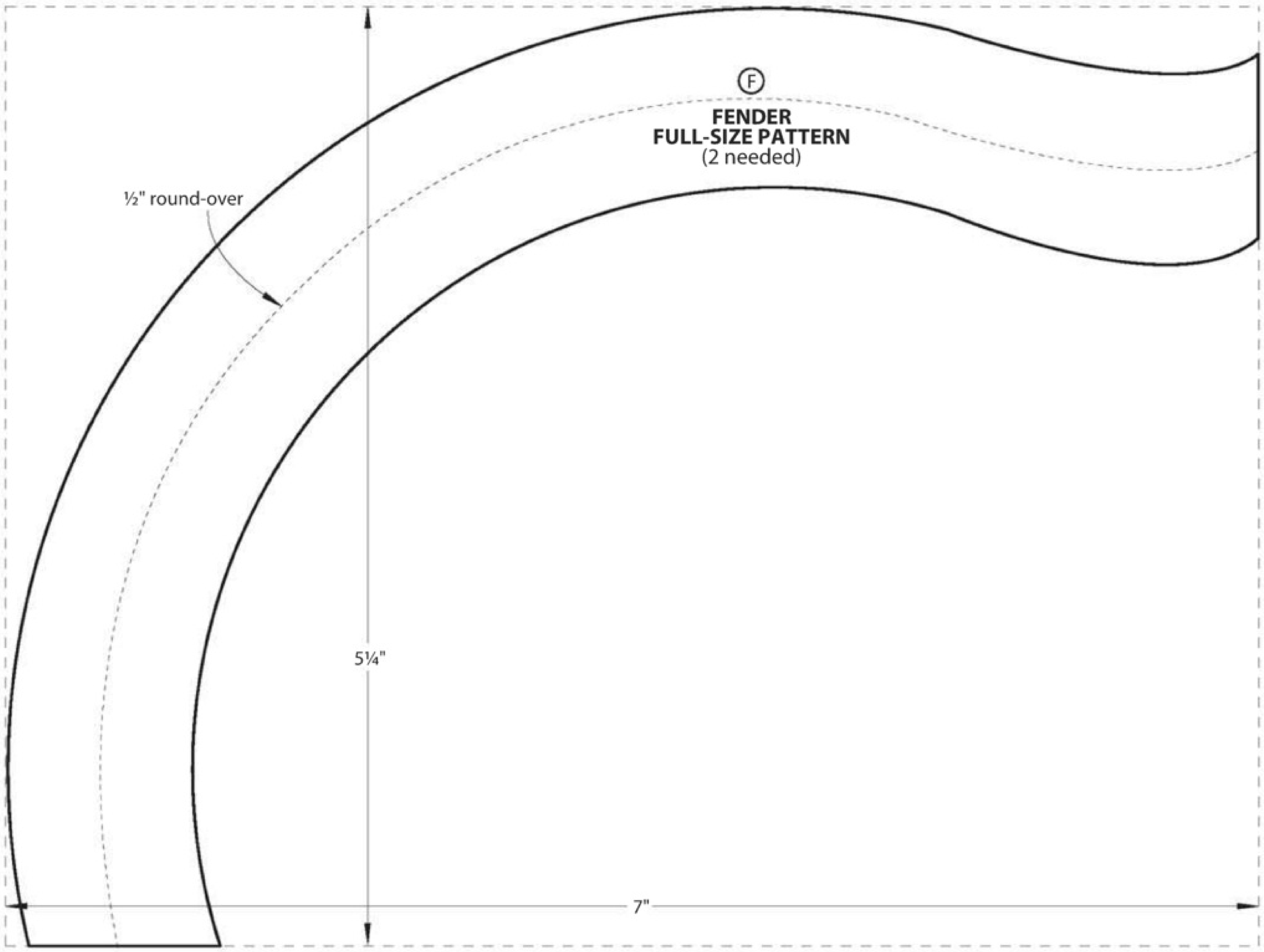
Materials List

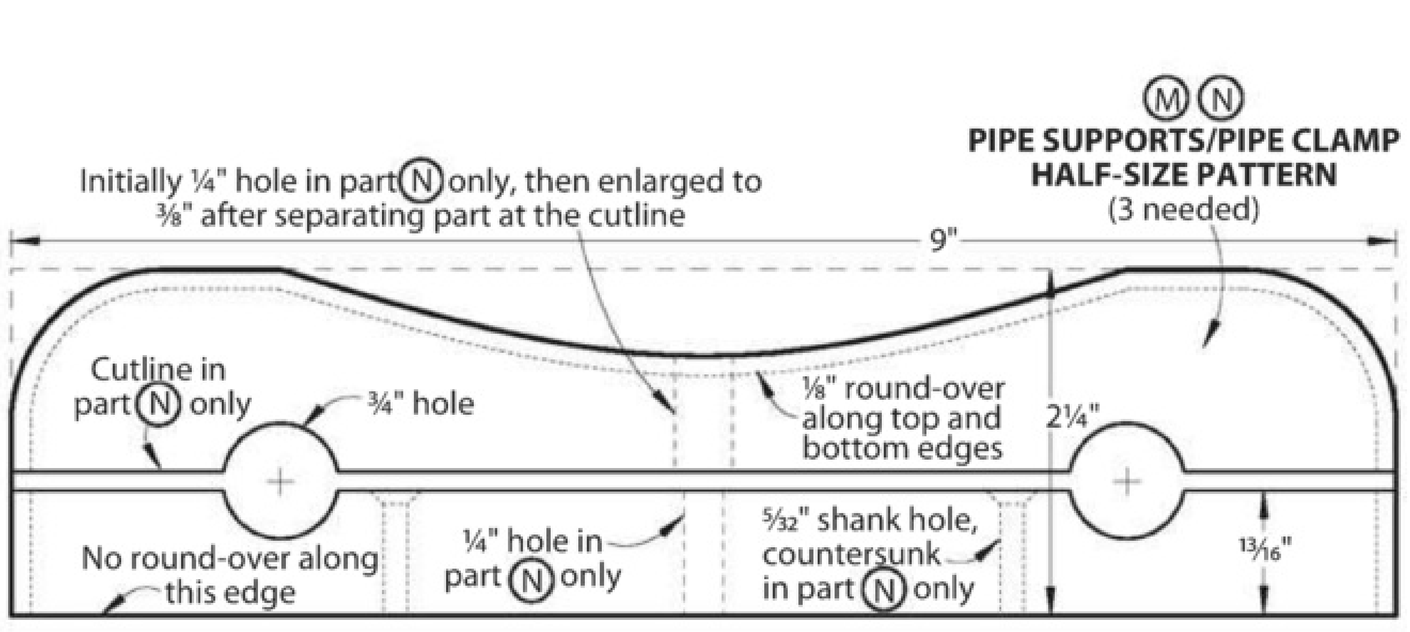
Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	sides	¾"	11½"	25½"	BB	2
B	axle supports	½"	4"	10¾"	BB	2
C	fixed shelves	¾"	10¾"	17"	BB	3
D	back	¾"	17"	25½"	BB	1
E	top divider	¾"	2"	16½"	BB	1
F	fenders	1½"	5¼"	7"	LBB	2
G	brace	1½"	2"	4"	LBB	1
H	drawer sides	½"	3⅛"	9"	BB	4
I	drawer fronts and backs	½"	3⅛"	16⅜"	BB	4
J	drawer bottoms/ shelves	¼"	9¼"	16 15⁄16"	H	4
K	top	¾"	12 13⁄16"	19"	BB	1
L	doors	¾"	9⅛"	25⅜"	BB	2
M	pipe supports	¾"	2¼"	9"	BB	2
N	pipe clamp	1½"	2¼"	9"	LBB	1
O	handle supports	1½"	1½"	2½"	LBB	2

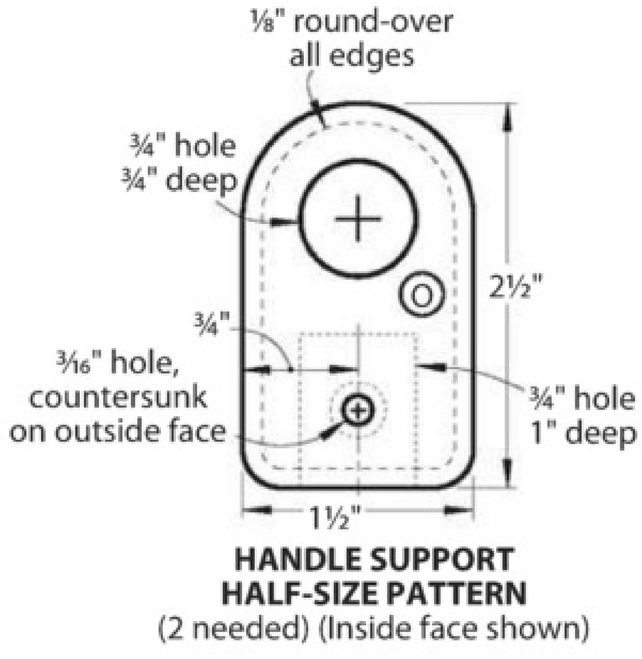
*Parts initially cut oversize. See the instructions.

Materials key: BB–Baltic birch plywood, LBB–laminated Baltic birch plywood, H-hardboard.
Supplies: Spray adhesive, 2½" no-mortise hinges (6), #4×½" flathead screws (30), #8×1" flathead screws (30), #8×1¼" flathead screws (2), #8×1½" flathead screws (2), #10×1¾" flathead machine screws (2), #10 stop nuts (2), draw catches (2), ¾" O.D. aluminum pipe 60" long, paintable wood putty, double-faced tape, ½" steel rod 36" long, 6"-diameter wheels with a ½"-diameter hub (2), ½" flat washers (2), ½" steel push nuts (2), ¼"-20×2" hanger bolt, ¼-20 hex nuts (2), ¼" flat washer, four-arm knob with ¼" insert, 1" screw eyes (2), twisted-link chain 15" long, 1" hook and screw eye.
Bits and blade: Dado-blade set, ⅛" and ½" round-over and ⅜" rabbeting router bits, ¾" and 2" Forstner bits.

Go-anywhere tool caddy







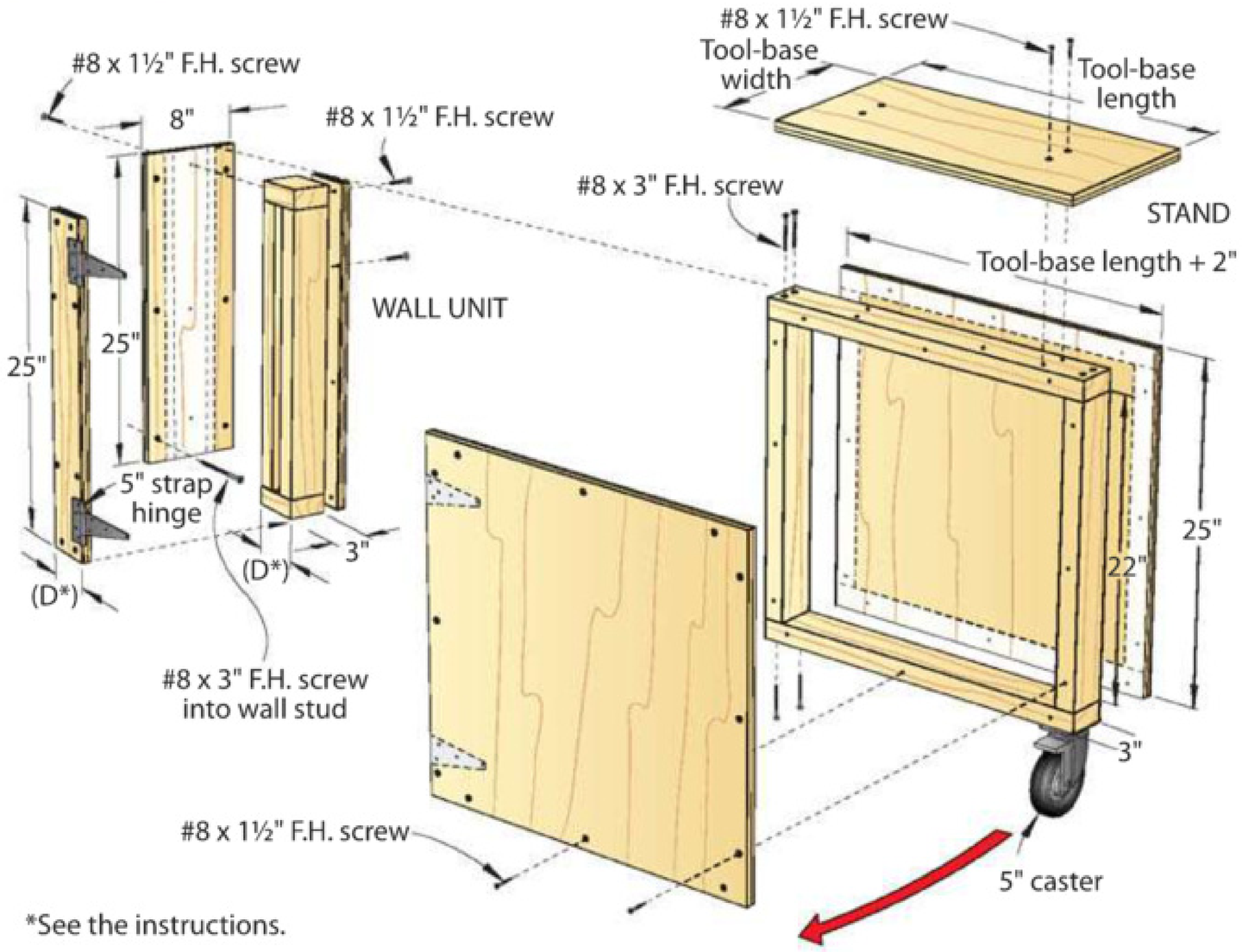
Photocopy the half-size patterns at 200 percent to make full-size patterns; verify dimensions on copies

Swing-out, fold-flat tool stand



When *WOOD*® magazine reader Dan Christen of Boise, Idaho, put together his garage shop, he wanted permanent mounts for benchtop tools that could easily move out of the way when it came time to park the cars inside. His swing-out tool stand accomplishes both tasks.

To make one, first measure the width of the tool base you want to mount, divide in half, and subtract 2" to find the depth (D) of the wall unit. Then, build the frame of the stand and wall unit using 2×4 stock ripped to 3" wide. Glue and screw ¾" plywood to the faces of the tool stand and wall unit, sanding or flush-trimming any overhanging edges. Connect the wall unit and the tool stand with strap hinges, attach the locking caster, and mount the assembly to the wall by screwing it into a stud. (If you're concerned about the tool stand holding up to a heavier tool's weight, cut a wider wall-mounting plate to reach two studs.) Finish the stand by screwing a plywood platform—sized to support the tool you'll use with it—to the stand's top. Bolt the tool to the platform, and you're set.



*See the instructions.

More Resources

Check out these other projects from the Fold-flat series:

- Fold-flat sheet-goods mover: **woodmagazine.com/FFsheetgoods**
- Fold-flat sawhorses: **woodmagazine.com/FFsawhorse**
- Fold-flat work table: **woodmagazine.com/FFworktable**

Built-to-last workcenter

Inexpensive and simple to build, this workbench and tool rack will provide years of service.



Overall dimensions:
Workbench: 66"W × 24"D × 34½"H
Wall storage unit: 72"W × 9"D × 83¾"H

Two easy-to-build components—a sturdy workbench and a versatile tool-storage wall complete with custom tool racks—will make your workspace the envy of your friends. The durable MDF benchtop provides a solid, stable worksurface, and an ingenious set of blocks behind the rails turns an ordinary one-hand clamp into a vise, as shown at *right*.

Laminate the bench's top

1 Cut the tops (A) from ¾" MDF, making them 1" longer and wider than specified in **Drawing 1**. From ¾" pine, cut sixteen 2¼×34" blanks. These will later become the leg components (B, C, D, E), but will first be used as clamping cauls to laminate the top.

2 Place one of the tops (A) on sawhorses and use a glue spreader (a cardboard scrap or an old credit card) to evenly distribute glue over its surface. Set the other top panel onto the first, clamp the panels together [**Photo A**], and allow to dry. Move quickly during this step so the glue doesn't set up before you get the assembly clamped.

3 Use a circular saw and straightedge to trim one edge of the laminated top straight and smooth [**Photo B**]; then, use the same setup to rip the top to final width. Next, trim one end square to the edge, and then cut the top to final length.

Build the legs and rails

1 From the pine blanks used earlier, cut each of the leg components (B–E) to length [**Drawing 2, Materials List**] on the mitersaw. Also, cut a spacer at least 4" long from a 5"-wide scrap piece.

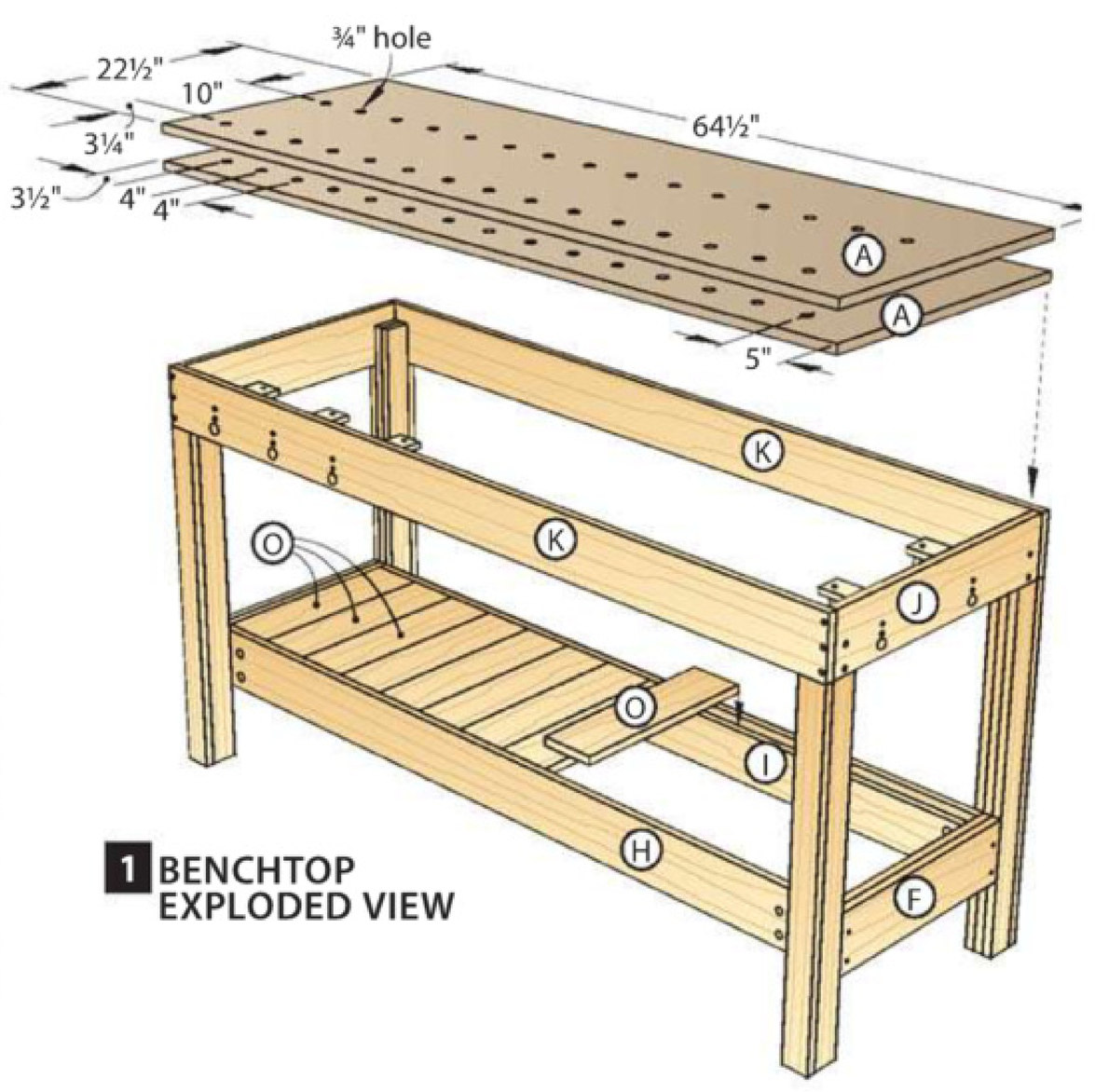
2 Begin assembling a leg by covering the top (A) with kraft paper; this keeps glue-ups from sticking to the top. Next, stand an inner leg face (E) on edge on the paper. Glue and clamp an upper leg core (C) and lower leg core (D) to the inner leg with a spacer between them to create the mortise that will hold the end rails [**Photo C**]. Remove the spacer when the leg has been securely clamped, and wipe away any glue squeeze-out with a damp rag. After about 30 minutes, the glue-up can be removed from the clamps and set aside. Repeat the process for the remaining legs.

3 When all leg assemblies (C/D/E) have dried, glue and clamp the outside leg faces (B) to them, again using the top (A) to keep edges and faces aligned. Be sure to make two mirrored pairs [**Drawing 2**].

EASY VISELIKE WORKHOLDING WITH A COMMON CLAMP



Clamp a board in place against a bench dog (Shop Tip, *page 80*) for easy face-planing, chiseling, or sanding. See *page 79* for details on the clamping blocks, mounted beneath the benchtop.



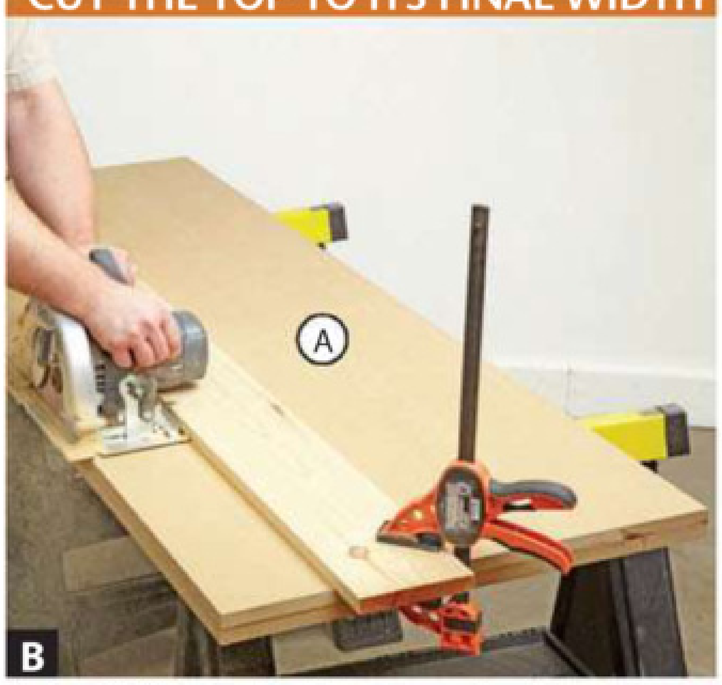
1 BENCHTOP EXPLODED VIEW

LEG BLANKS DOUBLE AS CAULS



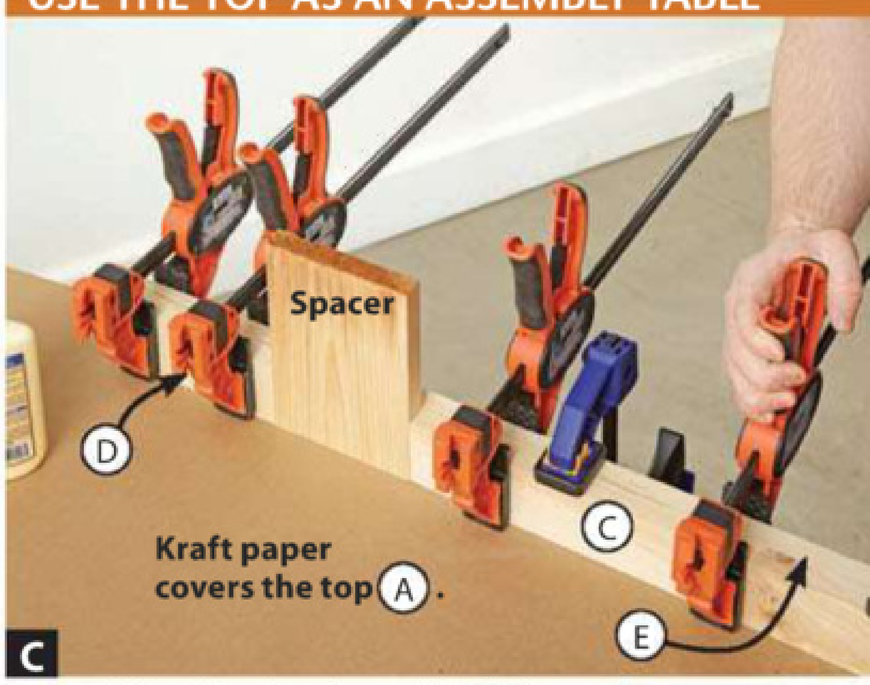
Distribute clamping force across the tops (A) by clamping pairs of leg blanks side by side and spaced evenly along the MDF panels.

CUT THE TOP TO ITS FINAL WIDTH



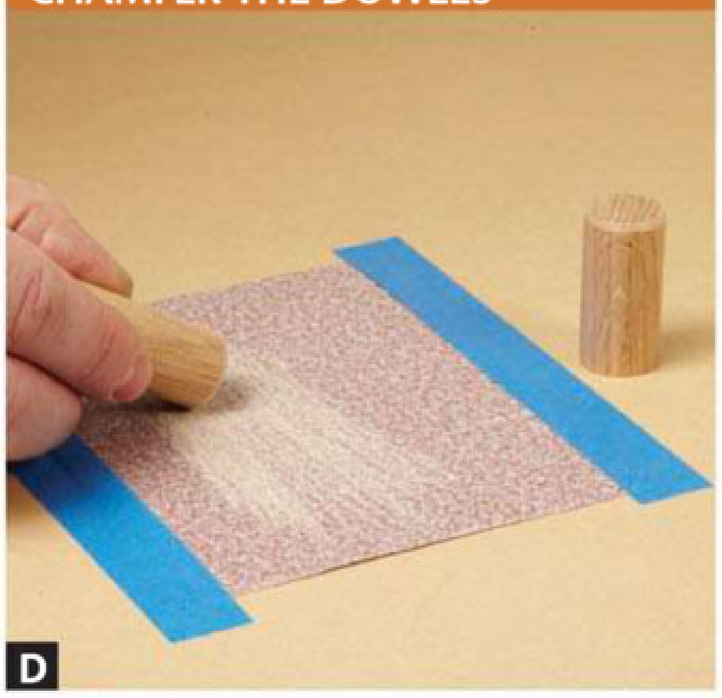
A straight board guides your circular saw when trimming the top (A). Clamp the board firmly to the top to prevent it from slipping.

USE THE TOP AS AN ASSEMBLY TABLE



Assembling the leg pieces (C, D, E) on edge keeps one edge aligned. Clamp the parts to the top (A) and to each other.

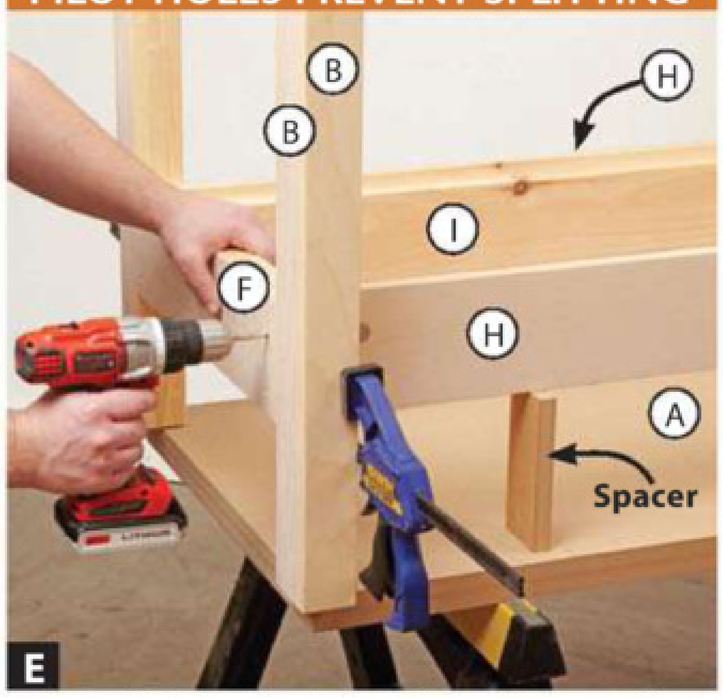
CHAMFER THE DOWELS



D

To make the dowels easier to insert into the stretchers (H/I), slightly chamfer one end of each dowel with sandpaper.

PILOT HOLES PREVENT SPLITTING



E

When drilling pilot holes through the end rails, extend the drill bit as far as possible from the chuck while still holding it soldly.

SCRIBING ENSURES ACCURACY



F

By allowing 1" extra length at each end of the front/back aprons (K), you can set them in position and scribe their final dimensions.

4 Cut the outer and inner end rails (F, G) to size [**Drawing 2**]; then, glue the rails together to make two assemblies.

5 Cut the outer and inner stretchers (H, I) to width, but 2" longer than specified [**Drawing 3**]. Glue and clamp these parts together with the bottom edges flush, wiping away any glue squeeze-out. Cut these stretchers to finished length when dry. Discard the kraft paper.

6 Use a ¾" spade bit to drill two holes where shown in each end of the stretchers (H/I) [**Drawing 3**]. Cut a ¾"-diameter hardwood dowel into eight 1½" lengths and chamfer one end of each [**Photo D**]. Apply glue in the holes and insert the dowels, tapping them flush with a mallet.

Bring the bench together

1 Glue and clamp one end-rail assembly (F/G) into the mortises of two leg assemblies (B–E) [**Drawing 2**]. Repeat for the other end.

2 Use 6½"-long spacer blocks to position the stretchers (H/I) against the leg assemblies (B–G) and flush with the top edge of the end rails (F/G) [**Photo E**]; clamp the stretchers in place. Transfer the locations of the dowels installed in the stretchers (H/I) onto the end rails. Drill 3/16" pilot holes through the end rails, centered on the dowels. The cross grain of the dowels gives the screws better purchase than the end grain of the stretchers. Next, drive 4½" structural wood screws [**Source**] through the pilot holes to secure the base assembly together.

3 Cut the end aprons (J) to size, and glue them to the ends of the top (A) flush with the top face. After the glue dries, set the top assembly (A/J) on the base.

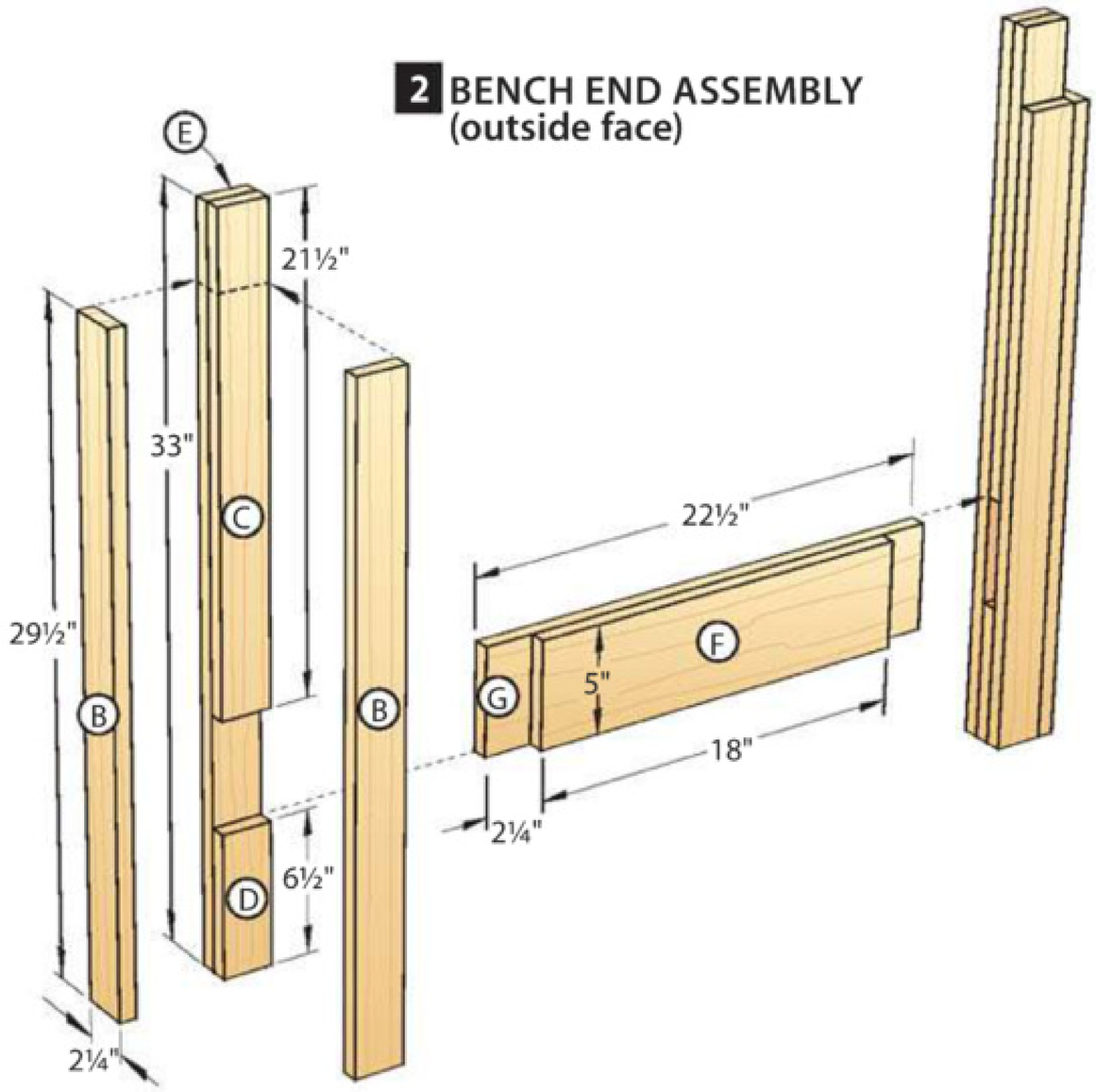
4 Cut the front/back aprons (K) to final width but 2" longer than shown [**Drawing 3**]. Rest them in place on the base, scribe the ends [**Photo F**], and cut the front/back aprons to final length. Glue the aprons to the top, and glue and screw the aprons (J, K) to each other and the base.

5 Lay out the dog-hole locations on the top (A) [**Drawing 1**], and use a ¾" spade or Forstner bit to drill the holes.

Quick Tip! *Use two squares as visual guides to keep the drill perpendicular as you drill* [**Photo G**].

Mark the ⅞" hole locations on one end apron (J) and the front apron (K) [**Drawing 3**] and drill them with a spade bit.

2 BENCH END ASSEMBLY
(outside face)



Add the clamp blocks

1 From ¾"-thick hard maple, cut one 2 3/16×14" blank for the front clamp blocks (L) and a 1⅝×10" blank for the end clamp blocks (M). ***Note:*** *Avoid using pine here because the slots you cut for the clamps will wear out in softer woods.* Rip a ¼" centered groove 1" deep along one edge of both blanks [**Drawing 4**].

2 Lay out three front clamp blocks (L) on the wider blank and two end clamp blocks (M) on the narrow one [**Drawing 4**]. Mark the location of the ¼" dado on each of the five blocks. Clamp an auxiliary fence to your tablesaw's miter gauge, line up a dado layout line with the blade, and crosscut the dadoes with two or three passes. Repeat for the remaining blocks.

3 Cut the taper on each clamp block (L, M) with a jigsaw. Then, crosscut the clamp blocks to final length.

4 Cut the clamp block mounting cleats (N) to size [**Drawing 4**] and glue and screw them to the clamp blocks (L, M).

BORE STRAIGHT BENCH-DOG HOLES



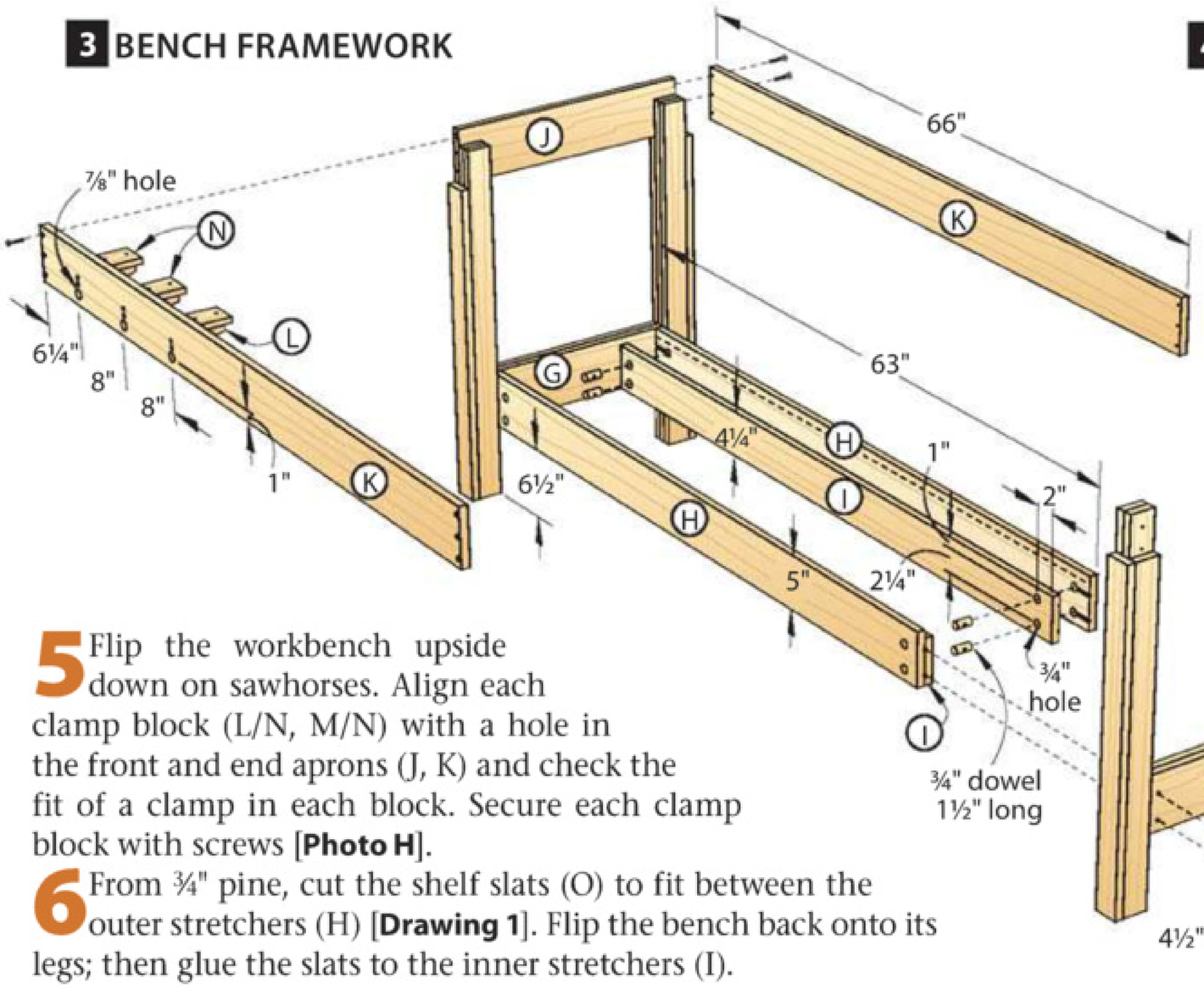
To drill perpendicular bench-dog holes in the top (A), have a helper assist you in keeping the drill aligned with one square while you watch the other.

INSTALL CLAMP BLOCKS

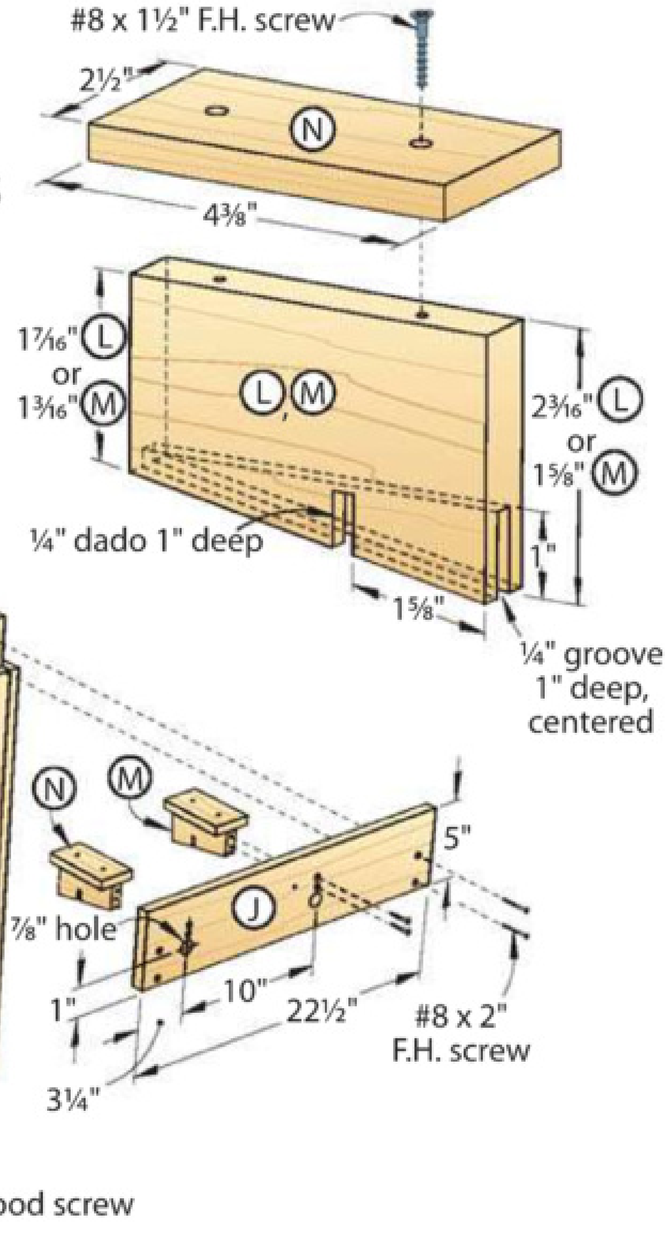


Center a clamp block (M/N) behind a hole in the upper end apron (J). check the fit and alignment of a clamp in the block (**Shop Tip**, *below*); Then attach the block to the underside of the benchtop (A).

3 BENCH FRAMEWORK



4 CLAMP BLOCKS



5 Flip the workbench upside down on sawhorses. Align each clamp block (L/N, M/N) with a hole in the front and end aprons (J, K) and check the fit of a clamp in each block. Secure each clamp block with screws [**Photo H**].

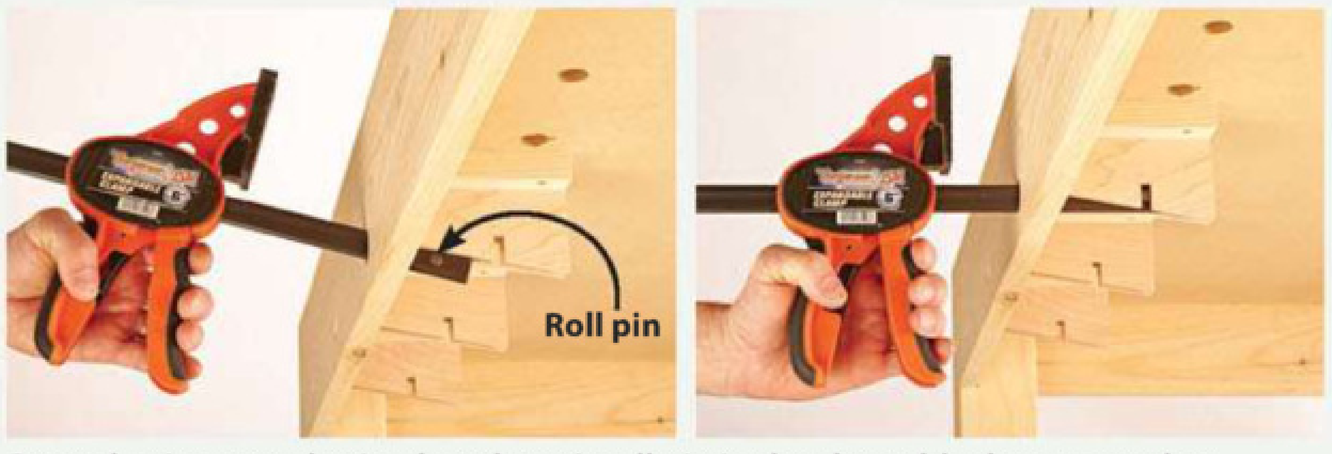
6 From ¾" pine, cut the shelf slats (O) to fit between the outer stretchers (H) [**Drawing 1**]. Flip the bench back onto its legs; then glue the slats to the inner stretchers (I).

SHOP TIP

Turn a bar clamp into a vise

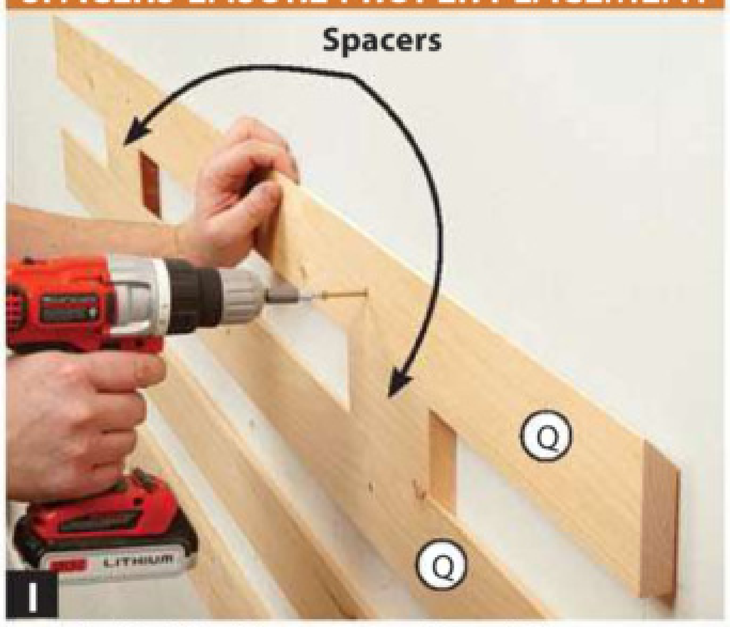
Instead of a pricey vise, this bench uses shop-made clamp blocks that hold typical one-hand ratcheting bar clamps inserted through holes in the bench's front and end aprons, shown at *right*.

After removing the fixed jaw, the bar fits into the groove of the clamp block, and the bar's roll pin holds the clamp in place once inserted, *far right*. These clamp blocks are designed to work with Irwin SL300 or Jorgensen ISD 3 expandable bar clamps. If you have a different clamp, test its fit in the blocks and make modifications to the grooves as needed, or install a larger roll pin in the clamp bar.



By anchoring a ratcheting bar clamp's roll pin in the clamp block, you can then squeeze a workpiece between the moving jaw and a bench dog.

SPACERS ENSURE PROPER PLACEMENT



Beveled 3¼"-wide spacers ripped from scrap cleat material consistently space each subsequent wall cleat (Q) as you screw it to the wall.

ATTACH THE BRACE CLEATS



Drive #8×3" screws through the brace cleat (U) and the ends of the wall cleats (Q) and into the underlying wall stud.

Now build some tool storage

1 From ¾" pine, cut to size the base wall support (P), wall cleats (Q), shelf (R), shelf cleat (S), shelf braces (T), and brace cleats (U) [**Materials List** and **Drawing 5**]. Tilt your tablesaw blade to 45° and rip bevels along the top edge of each wall cleat (Q) and along the bottom edge of the shelf cleat (S).

2 Locate the studs in the wall where you want to attach your wall unit, making sure each end lands on a stud. Then, place the base wall support (P) flush against the floor and screw it to the studs; do not drive screws at the ends yet, as these will be fastened when you install the brace cleats (U).

3 Position the bottom edge of the first wall cleat (Q) 30" off the floor. Check for level; then screw it to the studs. Again, do not drive screws at the ends of the cleats. Then, attach the remaining wall cleats [**Photo I**].

4 Glue the shelf cleat (S) to the shelf (R) flush with the shelf's rear edge [**Drawing 5a**]. After the glue dries, hang the shelf assembly on the topmost wall cleat and screw the shelf cleat to the studs.

5 Hold the brace cleats (U) flush with the ends of the wall cleats (Q) and screw through them to the wall studs [**Photo J, Drawing 5**]. Screw the shelf braces (T) to the brace cleats, and then drive screws through the shelf (R) from above and into the shelf braces.

Create custom tool holders

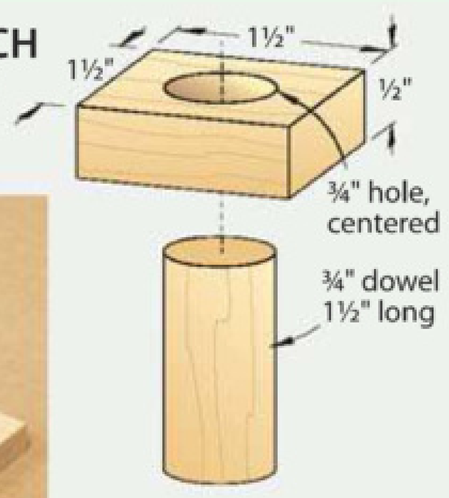
Now that you've built the workbench and wall-hung tool rack, build some holders for your tools. Use **Drawings 6, 7,** and **8** as the basis for constructing customized racks, using beveled cleats to hang them from the mating wall cleats.

SHOP TIP

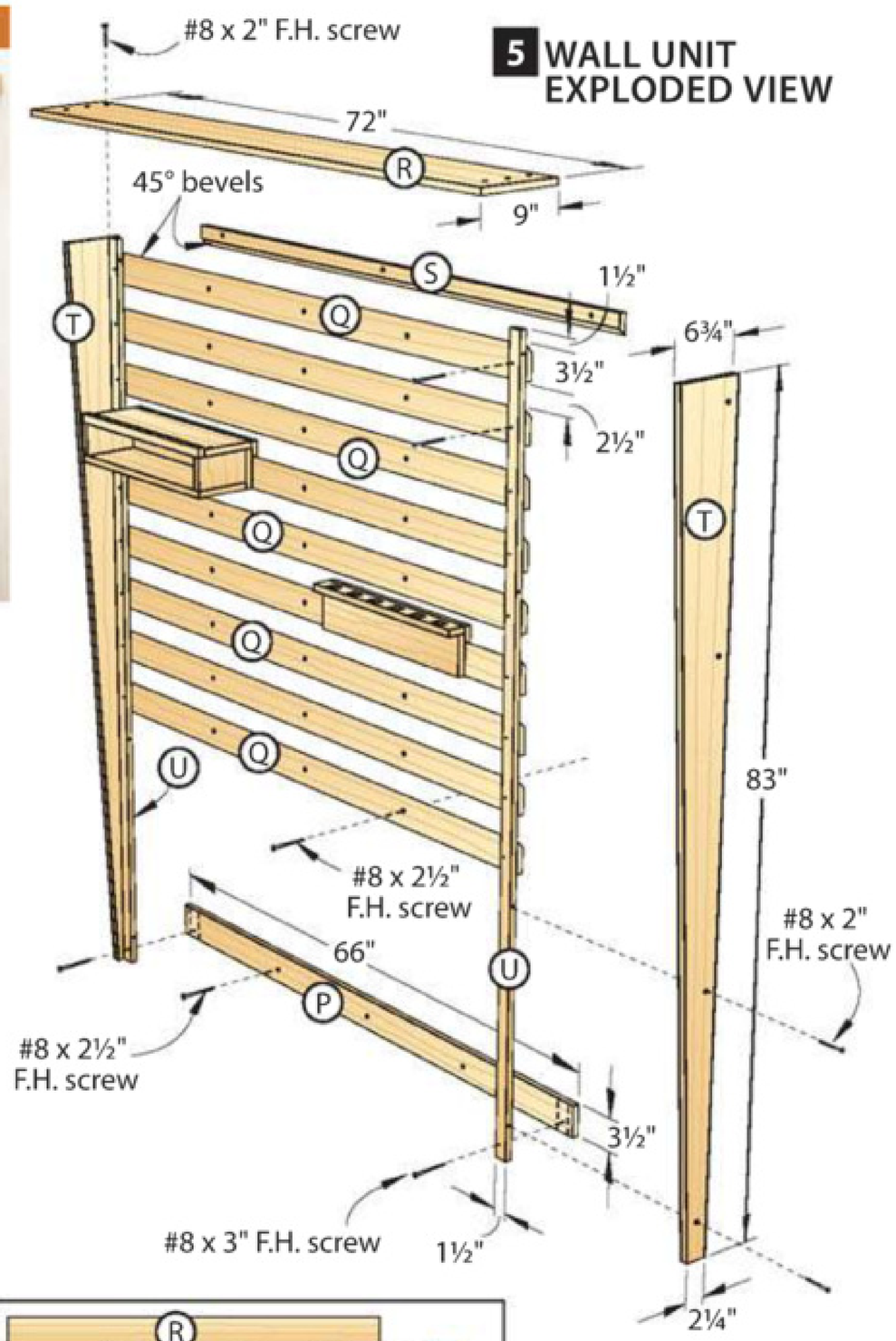
To use a clamp in the clamp blocks as a bench vise, you need a bench dog, as shown on *page 77*. Rather than buying bench dogs, consider making your own, as shown. If the dowels fit too snugly in the dog holes in the top (A), simply sand them until they slip in and out easily.

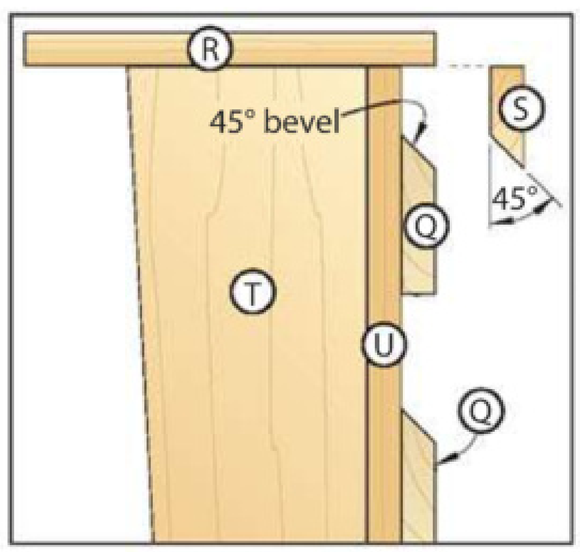


BENCH DOG



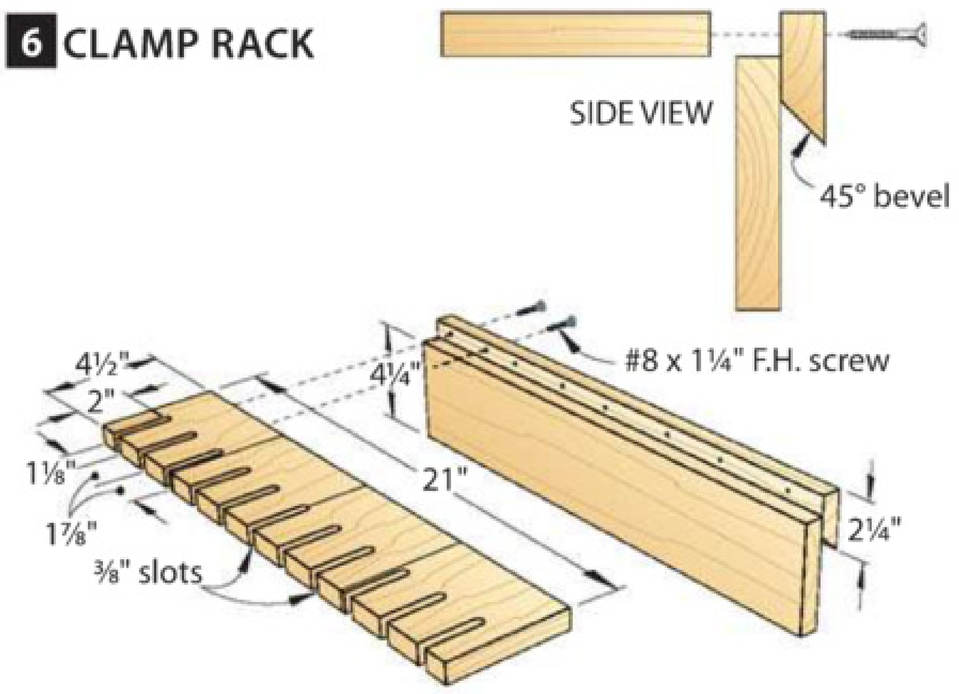
5 WALL UNIT EXPLODED VIEW





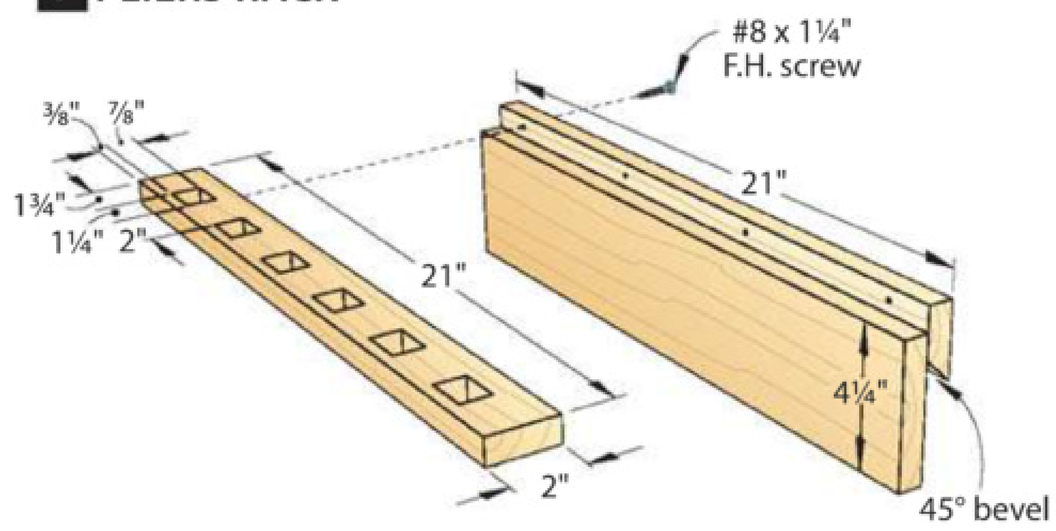
5a SIDE SECTION VIEW

6 CLAMP RACK



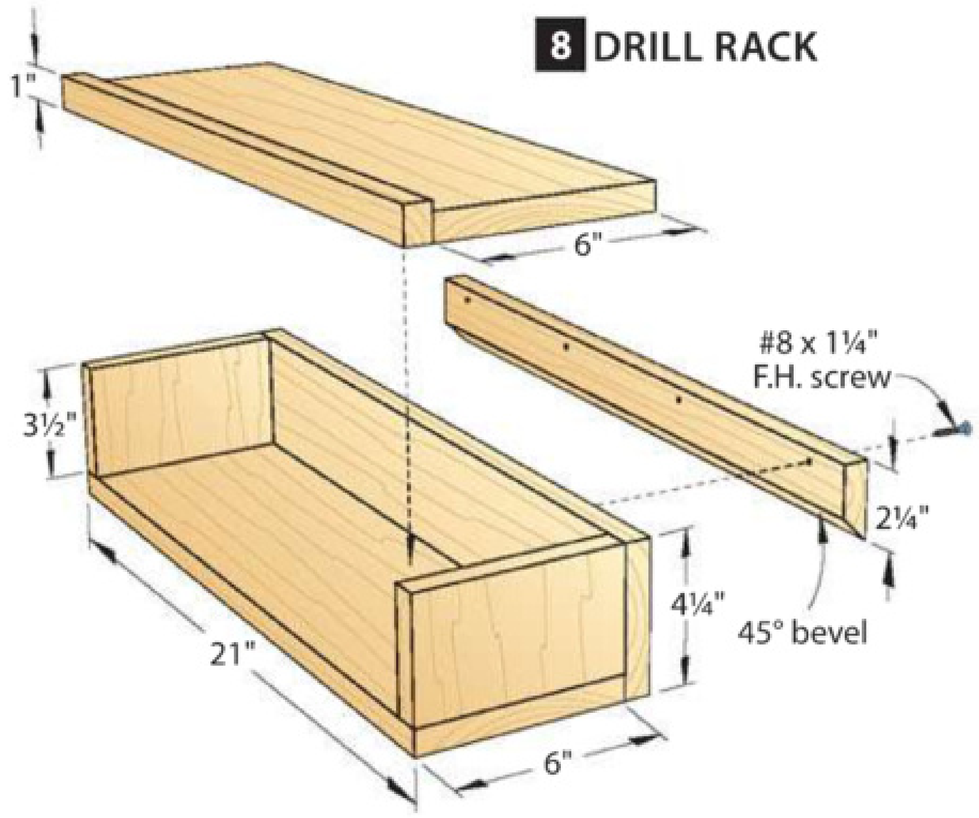
NOTE: If using pine (or any other softwood) for this clamp rack, glue together four 5¼×4½" segments edge to edge, so the grain runs front to back for maximum strength. When dry, sand it smooth; then drill ⅜" holes at the back of the slots. Cut the slots with a jigsaw; then glue and screw together as shown.

7 PLIERS RACK

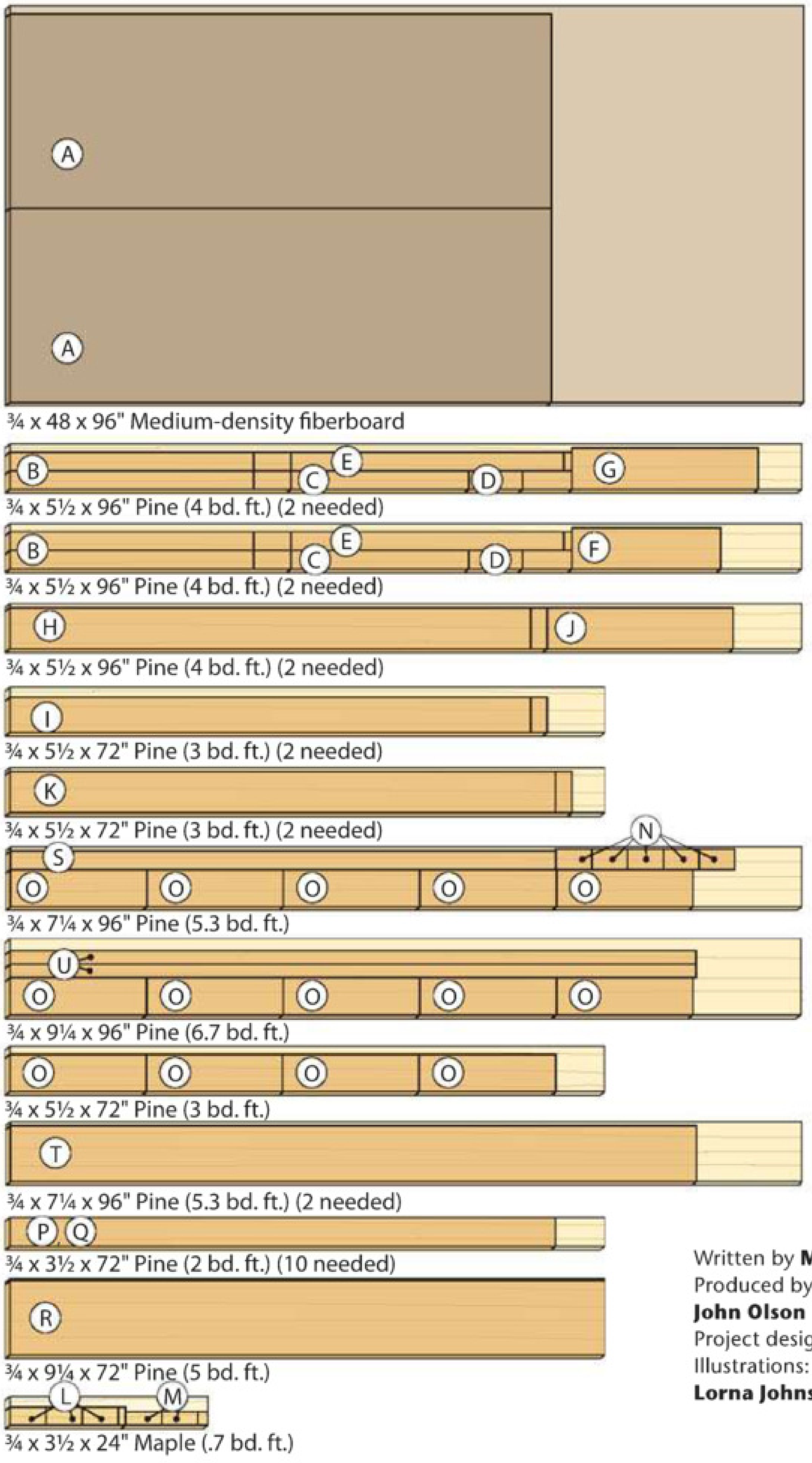


NOTE: Create the mortises for the pliers by first drilling ⅞" holes, and then jigsawing them to rectangular shape. Adapt the spacing to suit your tools.

8 DRILL RACK



Cutting Diagram



Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Bench						
A*	tops	¾"	22½"	64½"	MDF	2
B	outer leg faces	¾"	2¼"	29½"	P	8
C	upper leg cores	¾"	2¼"	21½"	P	4
D	lower leg cores	¾"	2¼"	6½"	P	4
E	inner leg faces	¾"	2¼"	33"	P	4
F	outer end rails	¾"	5"	18"	P	2
G	inner end rails	¾"	5"	22½"	P	2
H*	outer stretchers	¾"	5"	63"	P	2
I*	inner stretchers	¾"	4¼"	63"	P	2
J	end aprons	¾"	5"	22½"	P	2
K*	front/back aprons	¾"	5"	66"	P	2
L*	front clamp blocks	¾"	2 3/16"	4⅜"	M	3
M*	end clamp blocks	¾"	1⅝"	4⅜"	M	2
N	clamp block cleats	¾"	2½"	4⅜"	P	5
O	shelf slats	¾"	4½"	16½"	P	14
Wall Unit						
P	base wall support	¾"	3½"	66"	P	1
Q	wall cleats	¾"	3½"	66"	P	9
R	shelf	¾"	9"	72"	P	1
S	shelf cleat	¾"	2¼"	66"	P	1
T	shelf braces	¾"	6¾"	83"	P	2
U	brace cleats	¾"	1½"	83"	P	2

*Parts initially cut oversize. See the instructions.

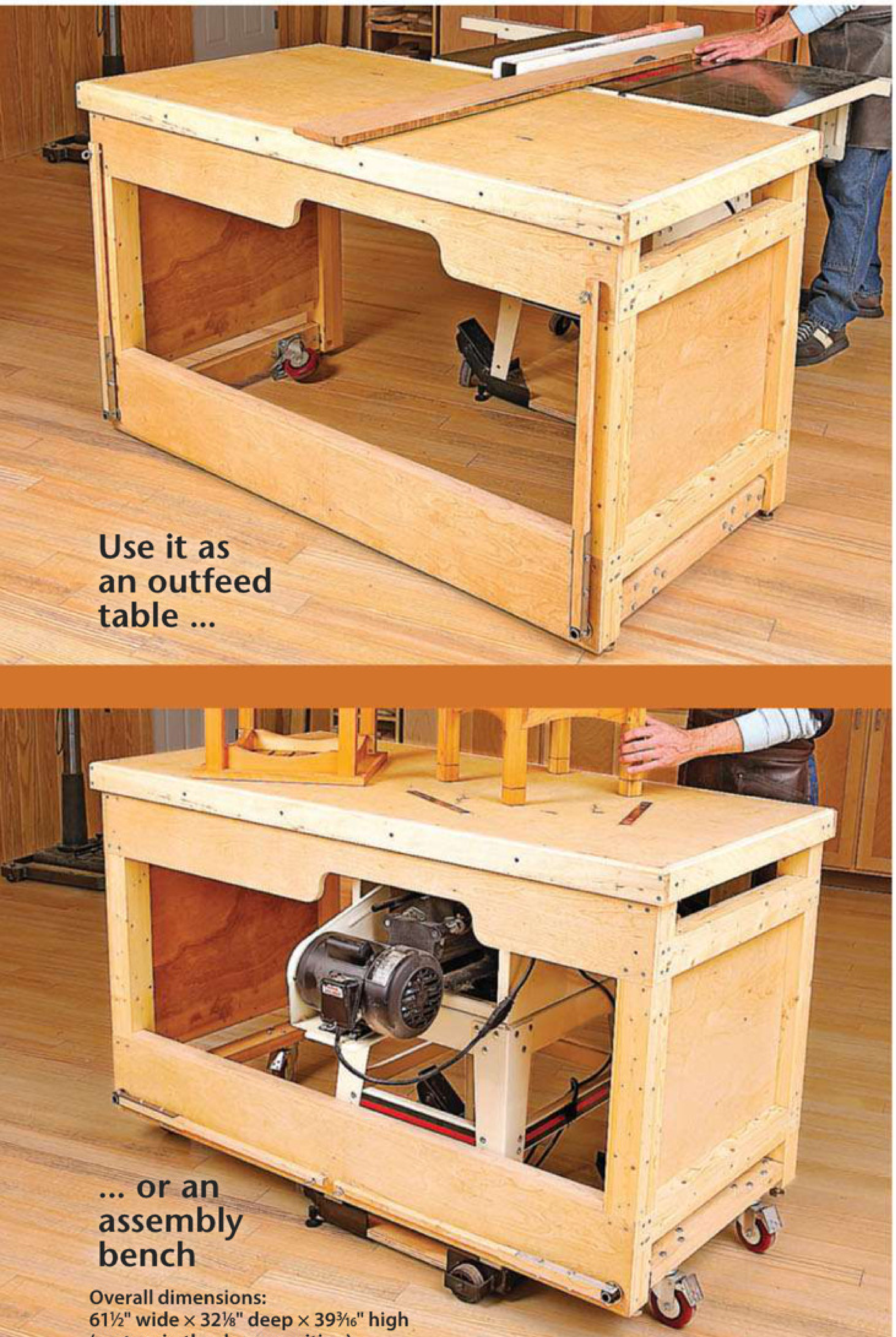
Materials key: MDF–medium-density fiberboard, P–pine, M–maple.
Supplies: #8×1½" F.H. screws (10), #8×2" F.H. screws (54), #8×2½" F.H. screws (33), #8×3" F.H. screws (20), ¾" dowel 36" long.
Bits: ¾" spade bit, ⅞" spade bit, 3/16" brad-point bit.

Source

Fasteners: FastenMaster 4½" structural wood screws, Lowe's, lowes.com, no. 194827, 12 per pack, driver bit included.

Written by **Mike Berger**
Produced by **Bob Hunter** with **John Olson**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

Space-saving double-duty tablesaw workbench



Use it as an outfeed table ...

... or an assembly bench

Overall dimensions:
61½" wide × 32⅛" deep × 39³⁄₁₆" high
(casters in the down position)

Park your tablesaw under this combination workbench and outfeed table to make greater use of valuable floor space in your workshop.

In a small workshop, the tablesaw may take up much of the floorspace. This multipurpose project allows you to put an assembly bench in that same space. And when you need to cut long material, roll the bench behind the tablesaw for outfeed support.

Locking casters [**Source**, *next page*] mounted on lever-operated pivots, raise and lower the bench and allow for easy movement around the shop. Levelers in the legs make it easy to adjust the height to match your tablesaw for outfeed use. When the plywood worksurface becomes scarred, you can easiy renew it by flipping or replacing the panel.

No matter the type of tablesaw you own, or how it's accessorized, you can customize this project to fit your needs. The bench shown *left* works with a contractor's saw equip -ped with a 30" fence [**Drawing 1**, *next page*].

Note: *To position the workbench over your tablesaw, remove the blade guard, rip fence, and miter gauge. The bench dimensions allow 1" clearance at the top of the tablesaw and 1" clearance at each side. There is no front-to-back clearance: With the workbench positioned over the tablesaw, the back fence rail touches the inside of the upper back rail (F) [**Drawing 4**], and the back of the front fence rail rests against the front legs (C).*



Watch a FREE two-minute video of the Tablesaw Workbench in action at woodmagazine.com/videos.

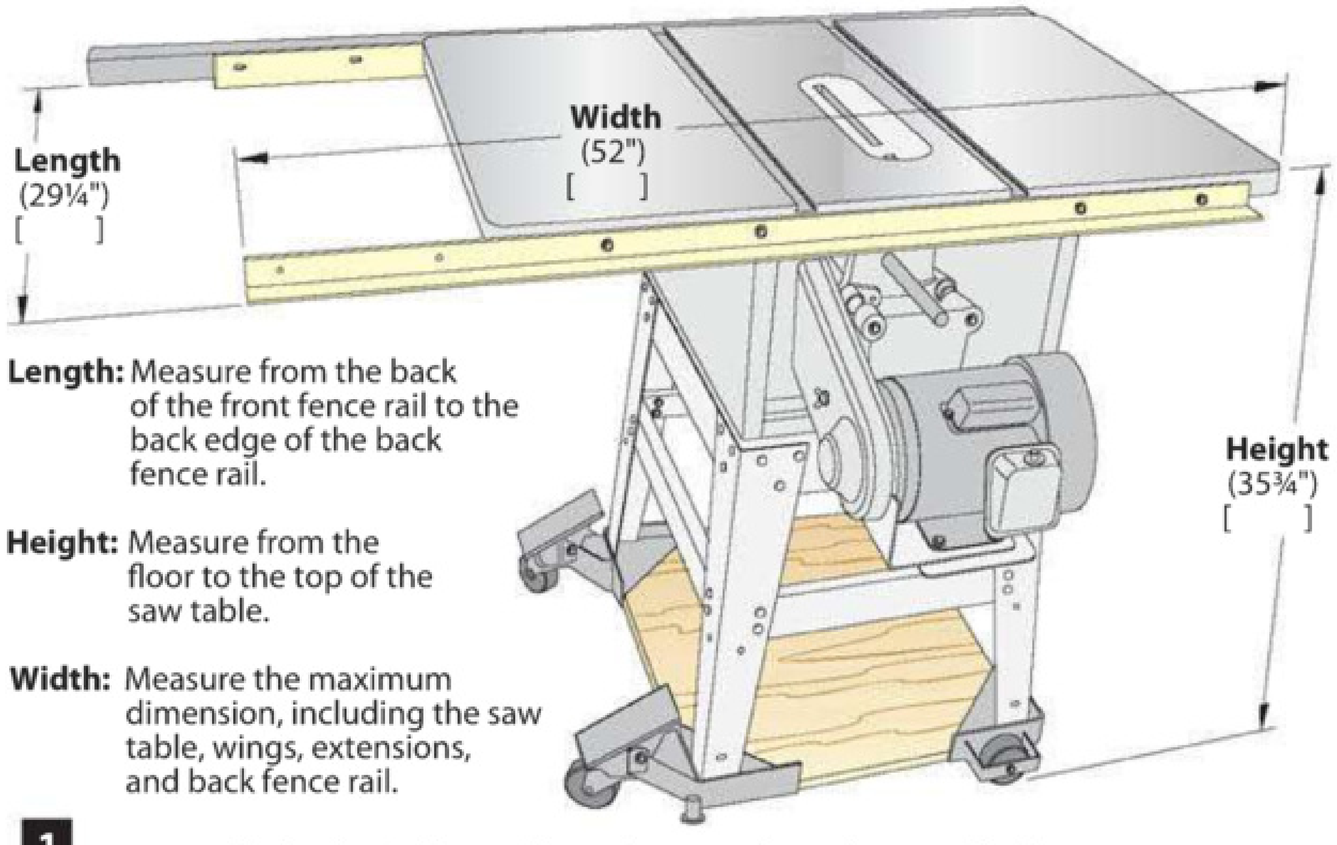
Take some measurements

1 Measure your tablesaw, and enter the dimensions in the empty brackets on **Drawing 1**. (Our sample tablesaw dimensions are shown in parenthesis.) If by chance your saw dimensions match those of the sample tablesaw, stop here. Simply use the part dimensions for the sample tablesaw shown on the **Materials List**, *below right*.

2 For dimensions in brackets larger or smaller than the ones in parenthesis [**Drawing 1**], here's how to size the workbench to your tablesaw. (Don't let the following lengthy explanation scare you off. The process is really quite simple.)

- Subtract the smaller *length* dimension from the larger one. Enter the difference in the **L** column under the **CALCULATE** heading on the **Materials List** for parts A, D, E, H, J, and K, and in the **W** column for part N, preceded by a plus symbol (+) for a length in brackets larger than the one in parenthesis, or a minus symbol (-) for a length in brackets smaller than the one in parenthesis.
- Subtract the smaller *height* dimension from the larger one. Enter the difference in the **L** column under the **CALCULATE** heading for part C, and in the **W** column for part E, preceded by a plus symbol for a height in brackets larger than the one in parenthesis, or a minus symbol for a height in brackets smaller than the one in parenthesis.
- Subtract the smaller *width* dimension from the larger one. Enter the difference in the **L** column under the **CALCULATE** heading for parts F, G, I, and N, preceded by a plus symbol for a width in brackets larger than the one in parenthesis, or a minus symbol for a width in brackets smaller than the one in parenthesis.
- Divide the width dimension difference determined in the previous step by four. Record the dividend in the **L** column under the **CALCULATE** heading for parts L and M, preceded by a plus or minus symbol, as directed *above*.
- For a *width* dimension in brackets smaller than the one in parenthesis, divide the dimension difference by two. Enter the dividend in the **L** column under the **CALCULATE** heading for part B, preceded by a minus symbol. (Do not make part B longer than the length listed for the sample tablesaw.)
- Now add the numbers in the **W** and **L** columns under the **CALCULATE** heading to, or subtract them from, the **W** and **L** dimensions under the **SAMPLE TABLESAW** heading. Enter the new dimensions in the **W** and **L** columns under the **YOUR TABLESAW** heading. Then, to avoid confusion, cross out the obsolete **SAMPLE TABLESAW** dimensions.

Now, for example, let's say your tablesaw measures 30½" long, and you've entered this number on **Drawing 1** in the brackets under **Length**. In this case, complete the row in the **Materials List** as shown [**Example**, *right center*].



Length: Measure from the back of the front fence rail to the back edge of the back fence rail.

Height: Measure from the floor to the top of the saw table.

Width: Measure the maximum dimension, including the saw table, wings, extensions, and back fence rail.

1

Note: Our tablesaw dimensions are shown in parenthesis.

EXAMPLE:

Step 1
30½"–29¼"=1¼"

Materials List

Base		FINISHED SIZE: T	W	L	CALCULATE W	L	YOUR TABLESAW W	L	Matl.	Qty.
A	pivot blocks	1½"	3"	~~23¾"~~		+1¼"		25"	M	2

Step 4
Cross out the obsolete dimension.

Step 2
The length in brackets is larger than the length in parenthesis.

Step 3
23¾"+1¼"=25"

Materials List

Base		FINISHED SIZE: T	W	L	CALCULATE W	L	YOUR TABLESAW W	L	Matl.	Qty.
A	pivot blocks	1½"	3"	23¾"					LM	2
B	levers	¾"	⅞"	27½"					M	2
C*	legs	3"	3"	34½"					LP	4
D	end rails	1½"	3"	29¼"					P	4
E	end panels	¾"	23"	24"					BP	2
F	back rails	¾"	8"	60"					BP	2
G	rail stiffener	¾"	1½"	54"					M	1
Top										
H	end trim	¾"	2½"	30"					M	2
I	front/ back trim	¾"	2½"	61½"					M	2
J	top supports	¾"	1¾"	29¼"					M	3
K	end cleats	¾"	1¾"	24"					M	2
L	outer cleats	¾"	1¾"	11⁷⁄₁₆"					M	2
M	inner cleats	¾"	1¾"	14⁷⁄₁₆"					M	2
N	top panel	¾"	30"	60"					BP	1

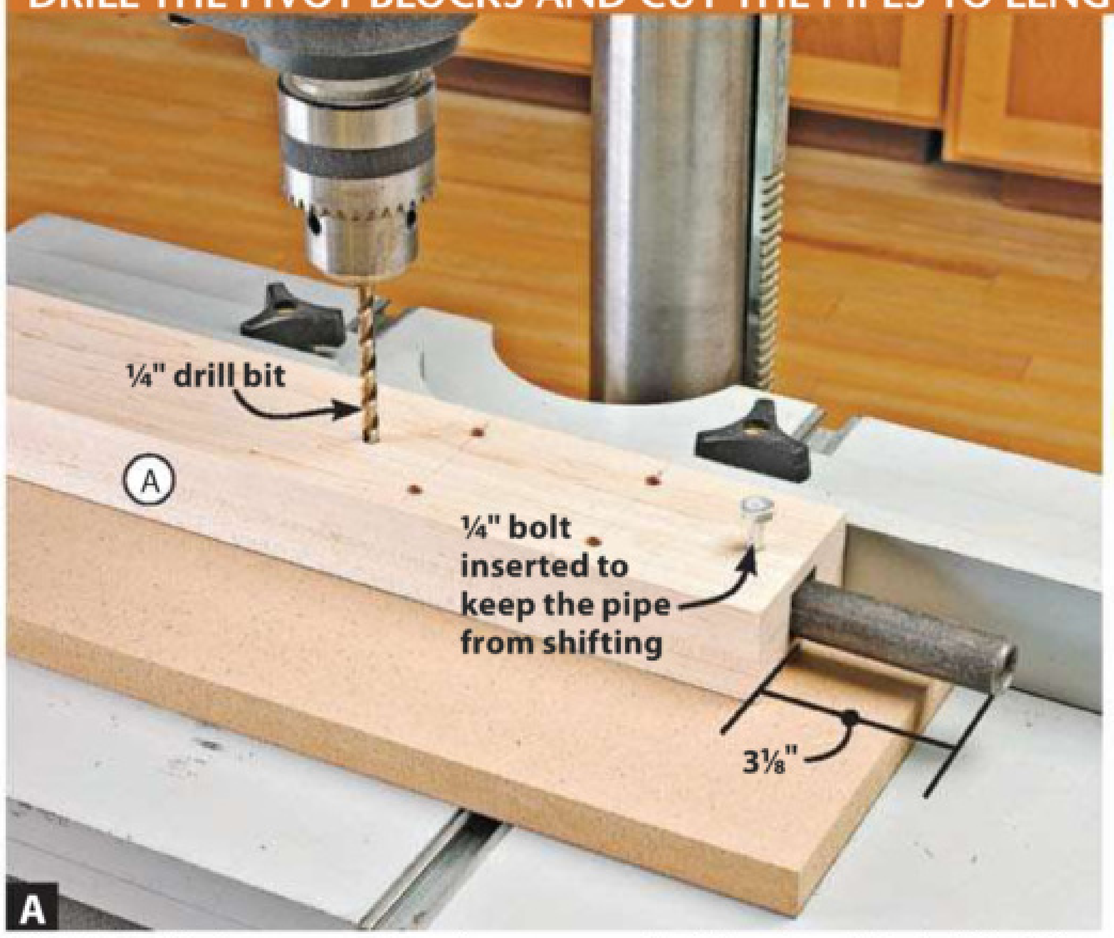
*Parts initially cut oversize. See the instructions.

Materials key: LM–laminated maple, M–maple, LP–laminated pine, P–pine, BP–birch plywood.
Supplies: #8×1¼", #8×1½", #8×2", #8×2½" flathead screws; ⅜" levelers with T-nuts (4); ¼×1½" hexhead bolts (6); ¼×2" hexhead bolts (24); ¼" washers (52); ¼" lock nuts (32); ¼×2" eyebolts (2); ⅞" washers (6); ⅛×¾×36" steel bar; ½×36" schedule 40 steel pipe (2).
Blade and bits: Stack dado set; ¼" round-over and 45° chamfer router bits.

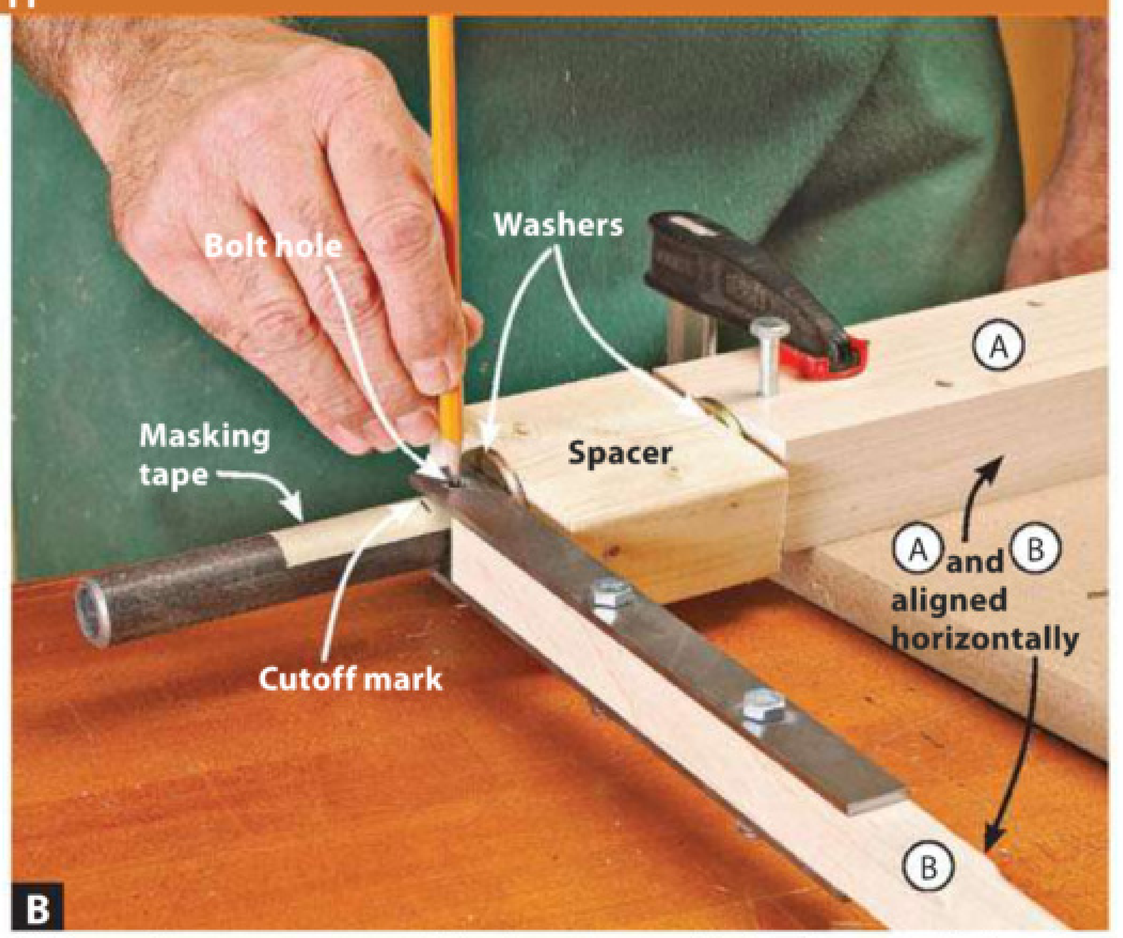
Source

Casters: 4" swivel caster with brake, no. 00K21.41, $14 each (4 required), Lee Valley Tools, 800-871-8158, leevalley.com.

DRILL THE PIVOT BLOCKS AND CUT THE PIPES TO LENGTH



With 3⅛" of pipe protruding from one end of the pivot block (A), drill holes through the block and pipe at the marked hole centers.



With washers, a spacer, and the lever assembly in place, mark the pipe length and lever attachment bolt-hole location.

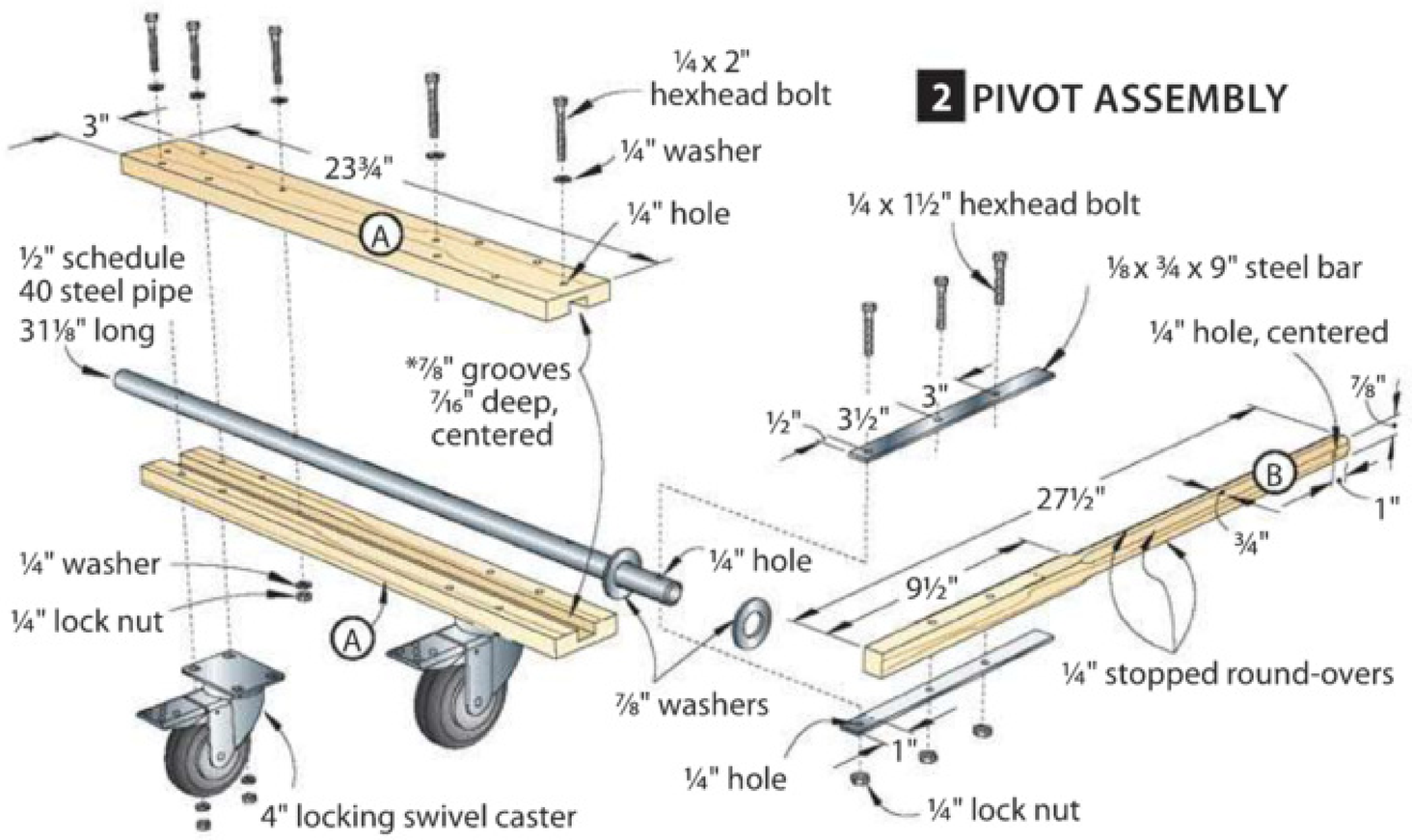
Build the pivot assemblies

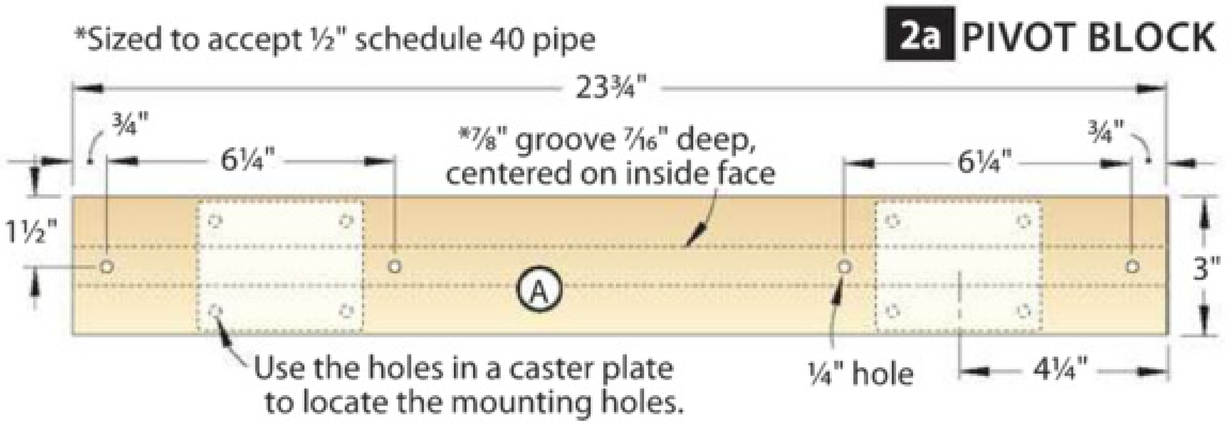
1 For the pivot blocks (A), cut four ¾"-thick pieces of stock to the width and length listed. (We used maple. If you've adjusted the length of part A, be sure to use the new length.) Then, making two passes with a dado blade, cut centered grooves in each piece [**Drawings 2** and **2a**]. Clamp the pieces together in the arrangement shown, and verify that ½" schedule 40 steel pipe slips through the square hole. Now glue and clamp the pieces, keeping the ends and edges flush.

2 Lay out the hole centers on the bottom face of each pivot block (A) [**Drawing 2a**]. (Use the caster plates to locate the caster-mounting holes.) Drill only the caster holes.

3 Cut two levers (B) to size. Rout stopped round-overs along the edges [**Drawing 2**]. Then, from a ⅛×¾×36" steel bar, cut four 9"-long pieces. Drill holes where shown. Now position a bar on each lever with the bar protruding 1" beyond the end of the lever. Using the holes in the bar as guides, mark hole positions on each lever. Also mark the hole center at the opposite end of each lever. Drill the holes on your drill press. Bolt the bars to the levers.

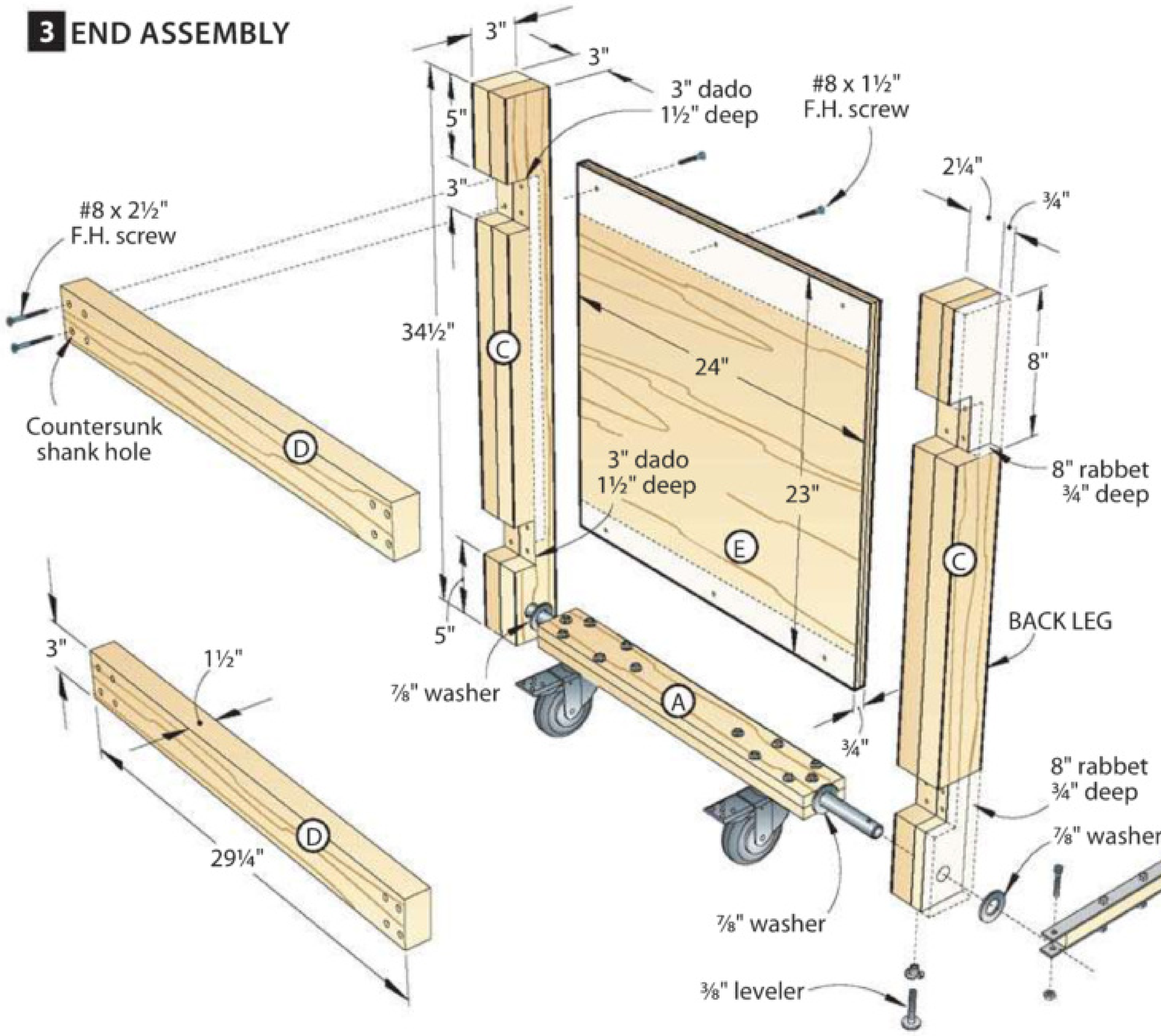
4 Slide a 36"-long piece of ½" schedule 40 steel pipe into each pivot block (A), letting the pipe protrude 3⅛" at one end. Then drill the four ¼" holes that go through both the pivot block and pipe, where previously marked [**Photo A**]. To keep the pipe from shifting in the pivot block, insert bolts into the holes as you drill them.



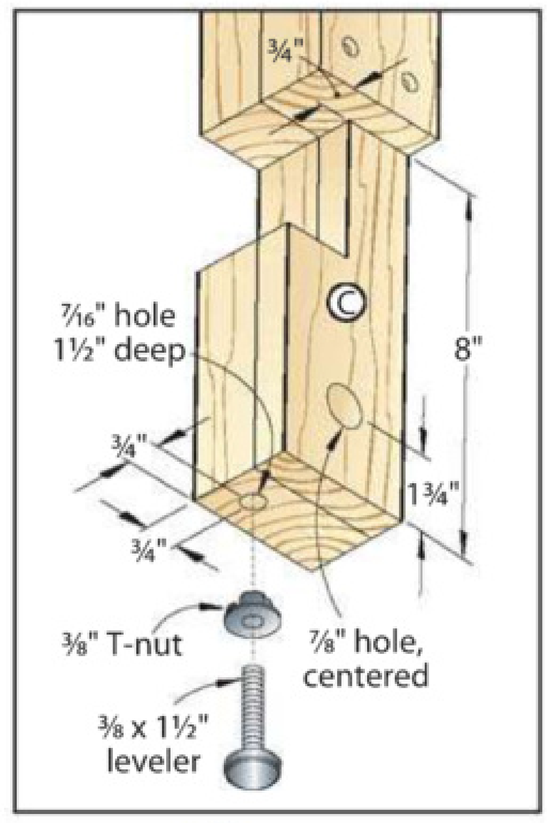


5 To cut the pipes to finished length, first cut a 3"-long spacer from 2×4 scrap. (The spacer represents the thickness of a leg [C].) Drill a centered ⅞" hole through the 3" dimension. Then slide two washers and the spacer onto the long protruding pipe end of one pivot block (A) assembly. Apply masking tape to the pipe, and with the lever (B) and pivot block aligned horizontally, mark the finished length and the bolt-hole location [**Photo B**]. Repeat with the other assembly. Now mark the pipes and pivot blocks for reassembly, remove the pipes, and cut them to length. Using a V-block on your drill press, drill the bolt holes.

3 END ASSEMBLY



3a LEVELER DETAIL
(back leg shown)



Assemble the ends

1 For the legs (C), cut eight 2×4 pieces ½" longer than listed. Laminate them in pairs to form four 3×3½" blanks. Then joint one edge smooth, rip the opposite edge to width, and crosscut the legs to length. To avoid problems when building projects from construction lumber, see the **Shop Tip**, *below*.

2 To form 3"-wide dadoes in the inside faces of the legs (C) [**Drawing 3**], install a ¾" dado blade in your tablesaw, and adjust it to cut 1½" deep. To establish one edge of the dadoes, position the fence 5" from the *right* side of the blade, and attach an extension to the miter gauge to back the cuts. Then, using the fence as a stop, cut a dado at both ends on the inside face of each leg. Next, to establish the other edge of the dadoes, reposition the fence 8" from the *left* side of the blade.

Again using the fence as a stop, cut a second dado at each end of all four legs. Now make repeat cuts to remove the waste.

3 To form the 8"-wide rabbets at the top and bottom of the back legs (C) [**Drawings 3** and **3a**], leave the tablesaw set up as in the previous step, but lower the blade to cut ¾" deep.

Then, making sure you will have mirror-image parts, cut a dado at both ends of the back face of each back leg. Now make repeat cuts to remove the waste from the dadoes, extending the rabbets to the ends of the legs.

4 Drill a ⅞" hole for the pivot assembly pipes through each leg 1¾" from the bottom [**Drawing 3a**]. Then, drill a 7/16" hole into the bottom end of each leg for the leveler T-nut.

5 Cut the end rails (D) to size. Glue and clamp them into the leg (C) dadoes with the rail ends flush with the front surface of the front legs and the rabbeted surface of the back legs [**Drawing 3**]. Check the assemblies for square. Then drill holes, and drive the screws. (For #8 screws in softwood, drill 5/32" shank holes and 3/32" pilot holes.)

6 Cut the plywood end panels (E) to size. Glue and clamp the panels to the upper and lower end rails (D) with the top of each panel flush with the top of the upper rail [**Drawing 3**]. Drill screw holes, and drive the screws.

SHOP TIP

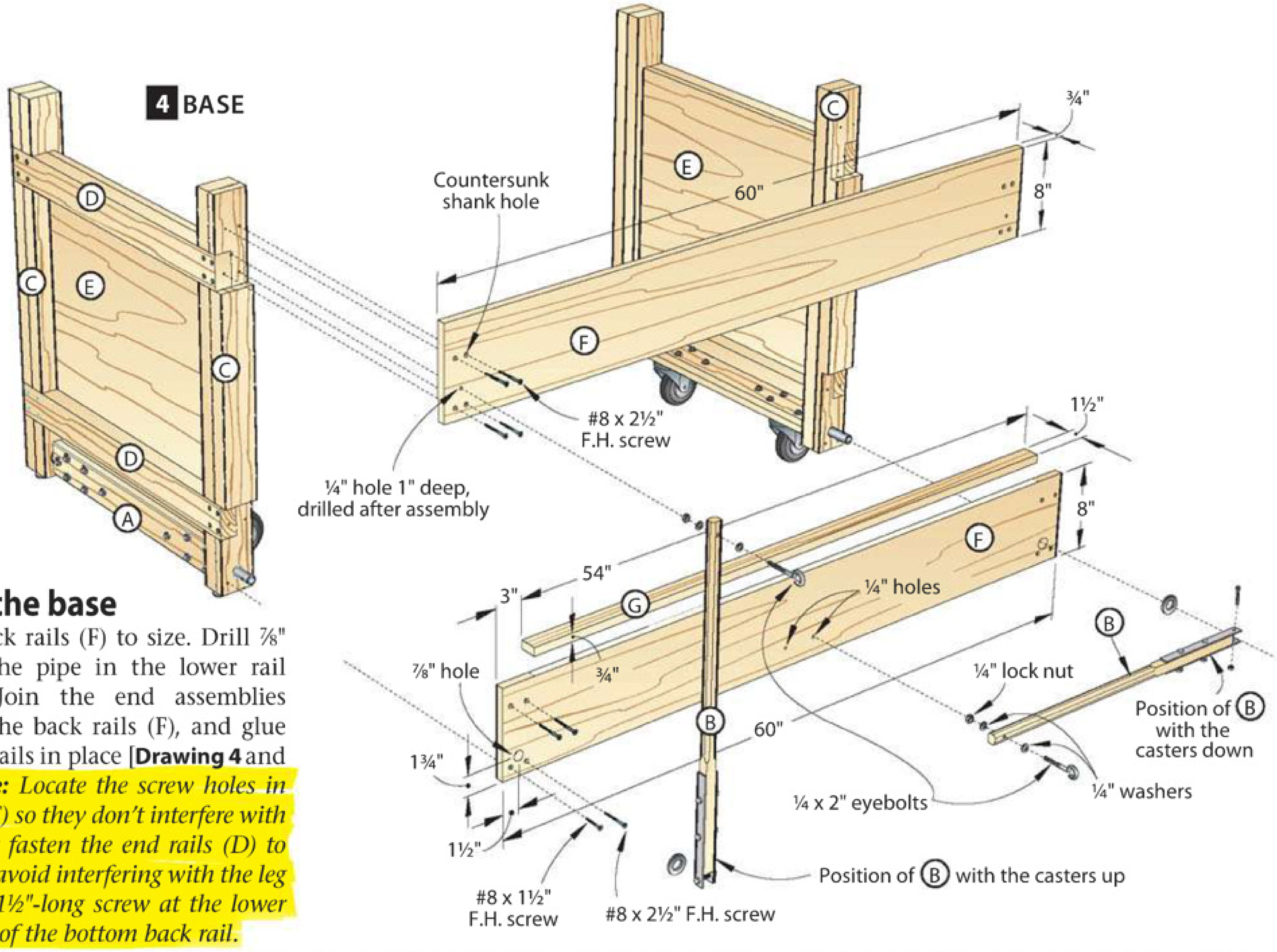
How to keep construction lumber straight

Construction lumber (2×4s, 2×6s, etc.) has a high moisture content. When brought into a shop, the lumber dries out, causing it to shrink and often twist. Of course, your project will go together easier with straight lumber. Here's a simple solution.

First, select lumber that does not include the center (pith) of the tree. Cut the parts to rough length as soon as you bring the lumber home. Then place the parts in a trash bag, as shown at right, and close it with a twist tie. Remove the parts for machining,



and return them to the bag until you are ready to assemble them. After building the project, the wood dries, but now twisting of any one part is restrained by the other parts.



Complete the base

1 Cut the back rails (F) to size. Drill ⅞" holes for the pipe in the lower rail [**Drawing 4**]. Join the end assemblies (C/D/E) with the back rails (F), and glue and screw the rails in place [**Drawing 4** and **Photo C**]. ***Note:*** *Locate the screw holes in the back rails (F) so they don't interfere with the screws that fasten the end rails (D) to the legs (C). To avoid interfering with the leg levelers, use a 1½"-long screw at the lower outside corners of the bottom back rail.*

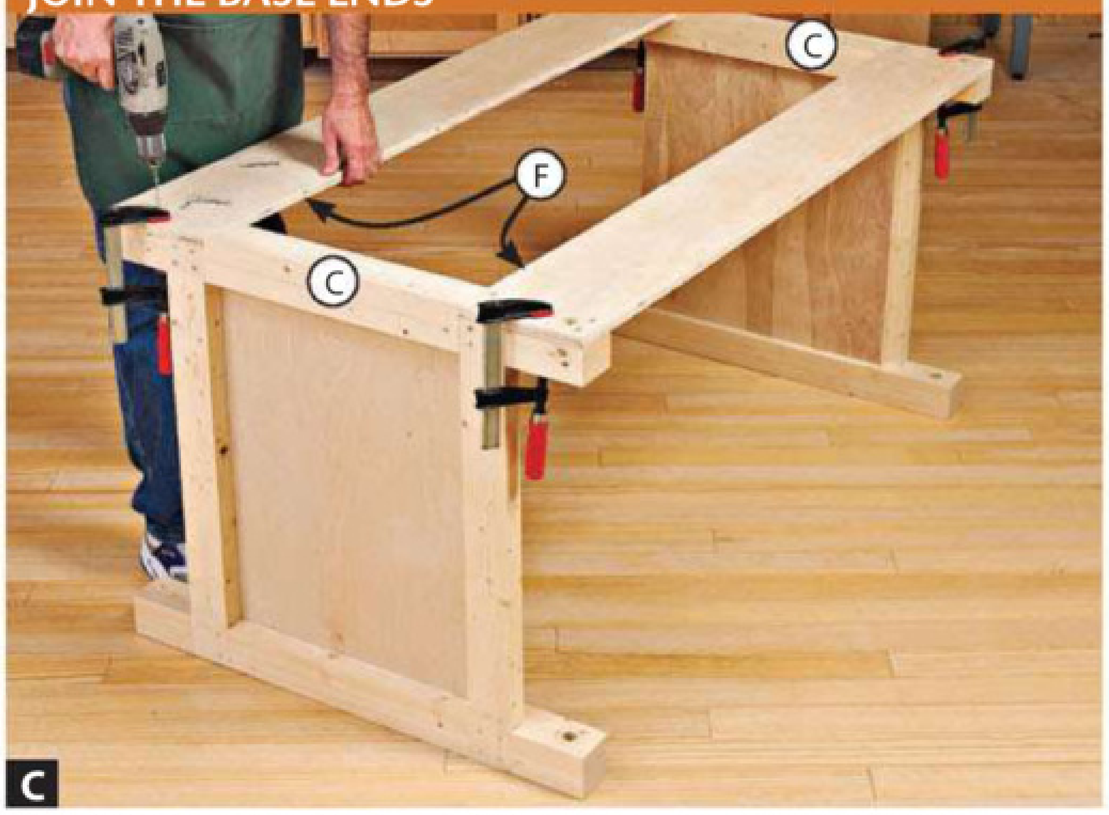
2 Apply a finish to the pivot blocks (A) and levers (B). (For an easy-to-apply and easy-to-repair finish, we applied two coats of Minwax Antique Oil Finish.) Attach the casters to the pivot blocks [**Drawing 2**].

3 Place the base upside down on the floor, and slide the pipes through the legs (C), washers, pivot block (A) assemblies, and lower back rail (F) [**Drawing 3**]. Align the pivot block holes with the pipe holes, and bolt the pipes in place [**Drawing 2**]. Now slip a washer and a lever (B) assembly onto each pipe, and bolt the levers in place [**Drawing 4**].

4 Adhere masking tape to the lower back rail (F) at the location of the lever (B) ends when the casters are in the down position. Draw a line on the tape 1¾" from the bottom edge of the rail. Drill holes in the rail for the eyebolt lever pins [**Drawing 4**, **Photo D**]. Apply tape to the upper back rail at the locations of the lever ends when the casters are in the up position. Mark lines on the tape 1½" from the ends of the rail. Rotate the levers so the casters are in the up position, and drill 1"-deep holes through the rail and into the legs (C).

5 Turn the base right side up. Cut the rail stiffener (G) to size, and glue and clamp it to the top edge of the lower back rail (F) [**Drawing 4**].

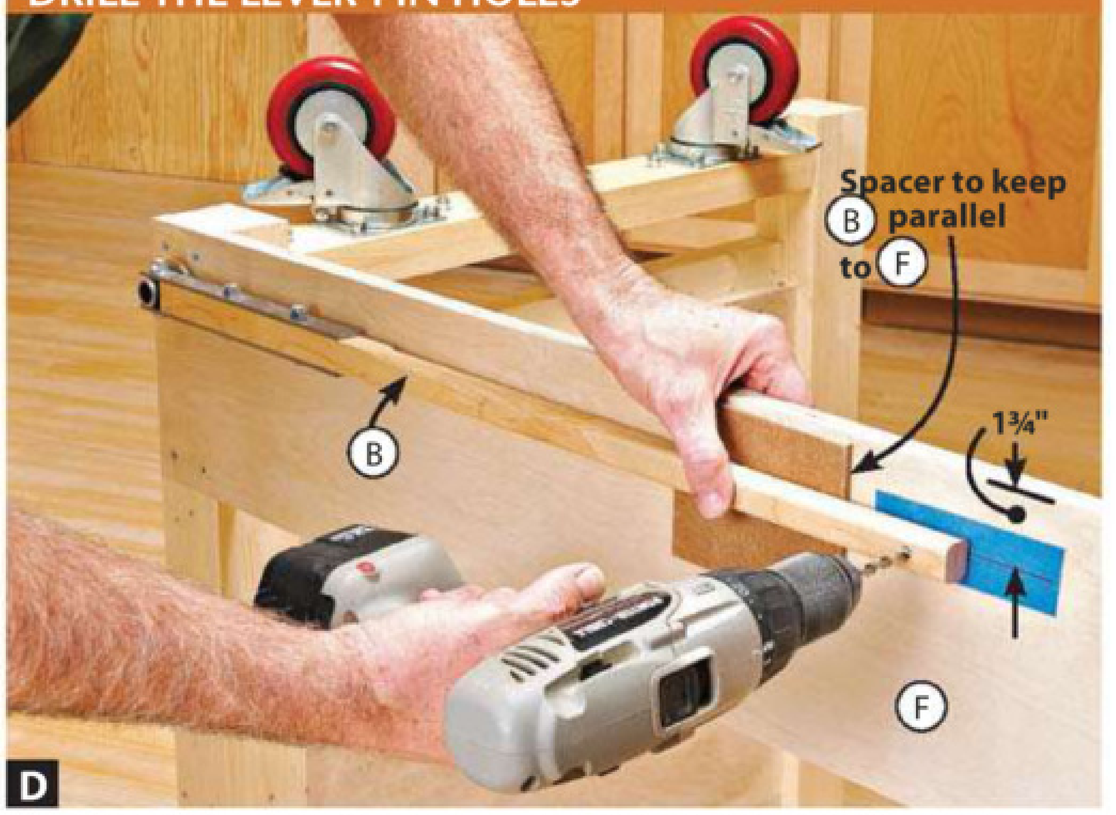
JOIN THE BASE ENDS



C

Glue and clamp the back rails (F) into the end assembly leg (C) rabbets. Check for square, drill screw holes, and drive the screws.

DRILL THE LEVER-PIN HOLES



D

Using the hole in the lever (B) as a guide, align the drill bit with the marked line, and drill a lever-pin hole through the rail (F).

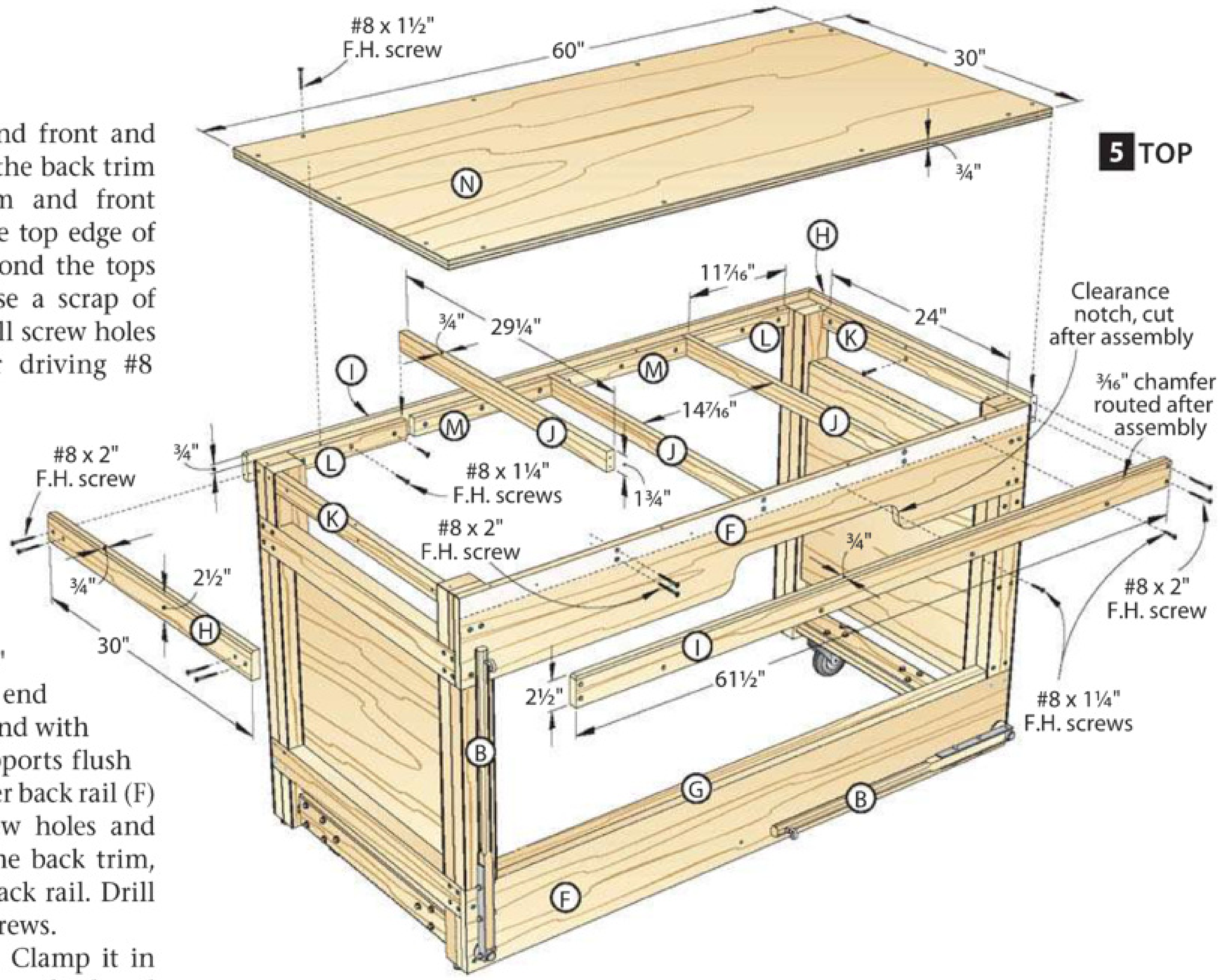
Add the top

1 Cut the end trim (H) and front and back trim (I) to size. Set the back trim aside. Clamp the end trim and front trim to the legs (C) with the top edge of the trim protruding ¾" beyond the tops of the legs [**Drawing 5**]. (Use a scrap of ¾" plywood for a gauge.) Drill screw holes and drive the screws. (For driving #8 screws into hardwood, drill 5/32" shank holes and 7/64" pilot holes.)

2 Cut the top supports (J), end cleats (K), outer cleats (L), and inner cleats (M) to size. Then clamp the parts in place with the top edges ¾" below the top edges of the end trim (H) and front trim (I), and with the top edges of the top supports flush with the top edge of the upper back rail (F) [**Drawing 5**]. Now drill screw holes and drive the screws. Retrieve the back trim, and clamp it to the upper back rail. Drill screw holes, and drive the screws.

3 Cut the top (N) to size. Clamp it in place, resting on the upper back rail (F), top supports (J), and cleats (K, L, M). Drill screw holes, and drive the screws. Rout a 3/16" chamfer along the outer edges of the trim (H, I).

4 Position the workbench over your tablesaw, and on the inside face of the upper back rail (F), mark the location of any part of the tablesaw that protrudes beyond the back fence rail and interferes with the upper back rail. Then transfer the marks to the outside face of the upper back rail. Now lay out a notch, adding 1" of clearance all around the obstruction. Jigsaw and sand the notch.



Apply finish and hardware

1 Inspect the bench, and finish-sand, where needed. Ease any sharp edges with a sanding block. Apply the finish.

2 Tap the T-nuts into the holes in the bottoms of the legs (C), and screw in the levelers. Insert eyebolts into the lever (B) end holes, and secure them with washers and lock nuts [**Drawing 4**].

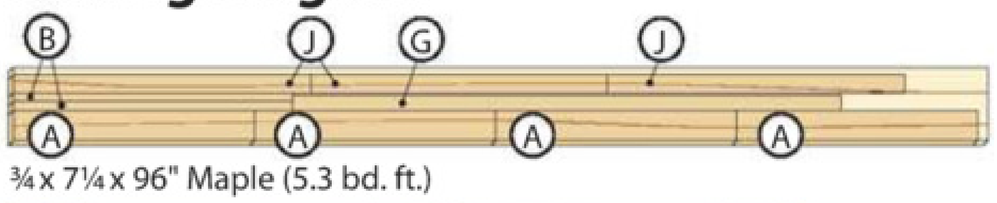
Using the workbench

1 To use the bench as a tablesaw outfeed support, rotate the levers (B) to the vertical position (casters up), and insert the protruding ends of the eyebolts into the holes in the upper back rail (F). Adjust the levelers so the bench height matches your tablesaw height.

2 To position the bench over your tablesaw, first remove the blade guard, miter gauge, and rip fence from the tablesaw. Then withdraw the eyebolts from the holes in the upper back rail (F). Rotate the levers (B) to the horizontal position (casters down), and insert the eyebolts into the holes in the lower back rail (F). Now roll the bench into place, and depress the caster locks with your foot.

3 To renew the worksurface, simply flip or replace the ¾" plywood top panel.

Cutting Diagram



¾ x 7¼ x 96" Maple (5.3 bd. ft.)



1½ x 3½ x 120" Pine (2x4) (2 needed)



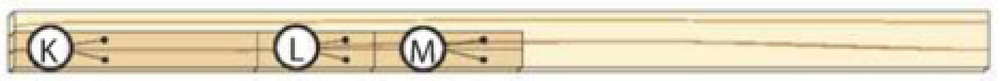
1½ x 3½ x 96" Pine (2x4)



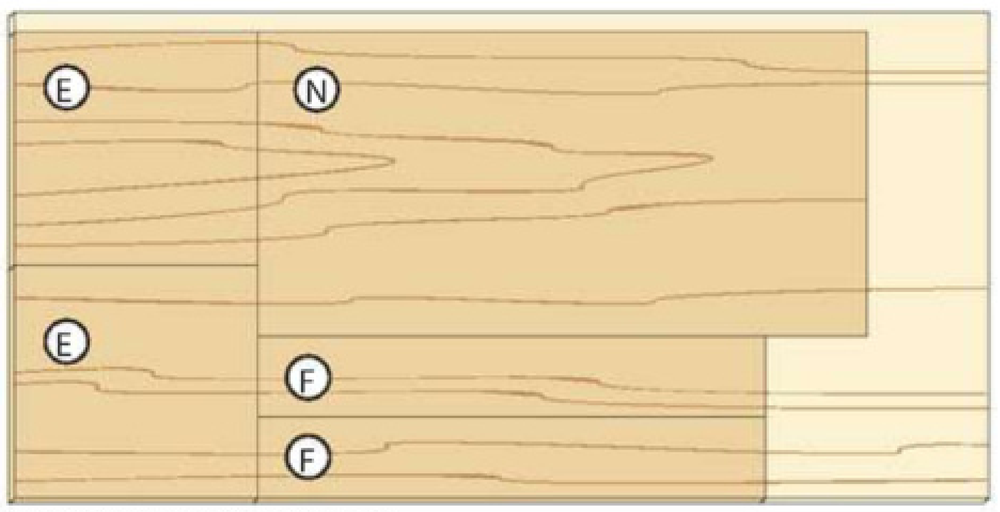
1½ x 3½ x 120" Pine (2x4)



¾ x 5½ x 96" Maple (4 bd. ft.)



¾ x 5½ x 96" Maple (4 bd. ft.)



¾ x 48 x 96" Birch plywood

Written by **Jan Svec** with **Chuck Hedlund**
Project design: **Jeff Norris**, Delta, B.C.
Illustrations: **Roxanne LeMoine; Lorna Johnson**





Flip-top, benchtop router table

The pivoting top simplifies bit changes and adjustments.

Short on space, but long on woodworking ambition? With room for even a 3-hp router, plenty of storage for accessories, and easy access for bit changes and router adjustments, this compact table fits your needs to a T.

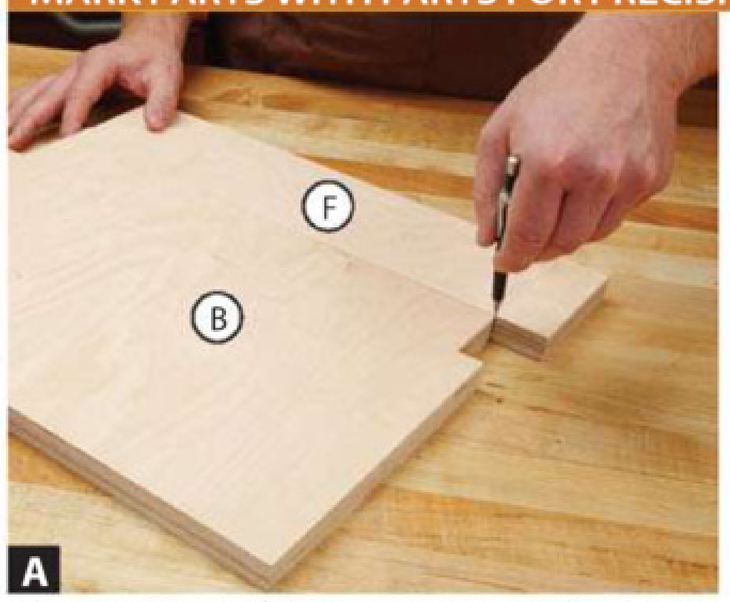
First, build a beefy base

1 Because many of the parts in the base share a 16" dimension, start by cutting a 16⅛×96" strip from a sheet of ¾" plywood, using your circular saw and a straightedge. (See **More Resources** for a video that shows how to safely handle sheet goods.)

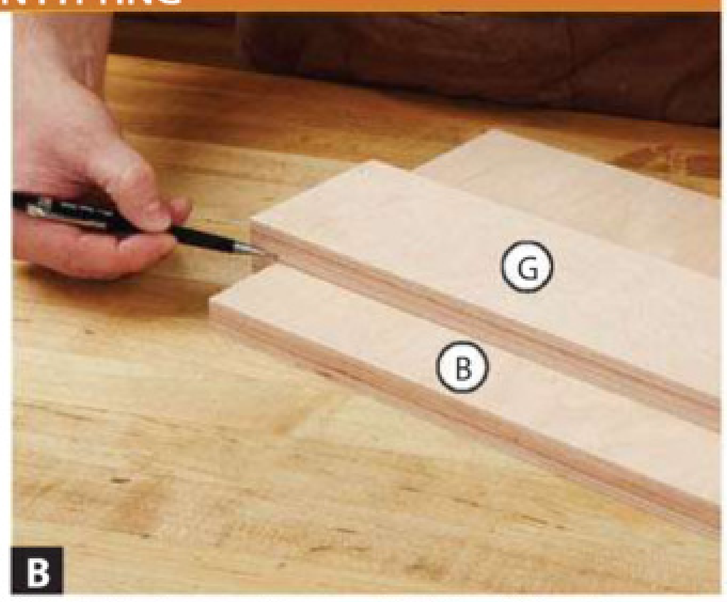
From this strip, cut a piece 25½" long for the top (A) and set it aside. Cut the remaining piece in half and rip each half to 16" wide. Cut the legs (B) from one half [**Drawing 1; Materials List** and **Cutting Diagram,** *page 92*] and parts C–H from the other, marking them with their part letters and setting them aside.

2 Glue and screw the right foot (C) [**Drawing 1**] to a leg (B). Set the assembly aside. Cut the table aprons (I) to size. Then, cut notches in the center leg for the table aprons. See the **Shop Tip**, *next page*, to learn how to cut the notch precisely.

MARK PARTS WITH PARTS FOR PRECISION FITTING



Align one end of the upper drawer divider (F) flush with a notch; then mark its width using the opposite notch as a guide.

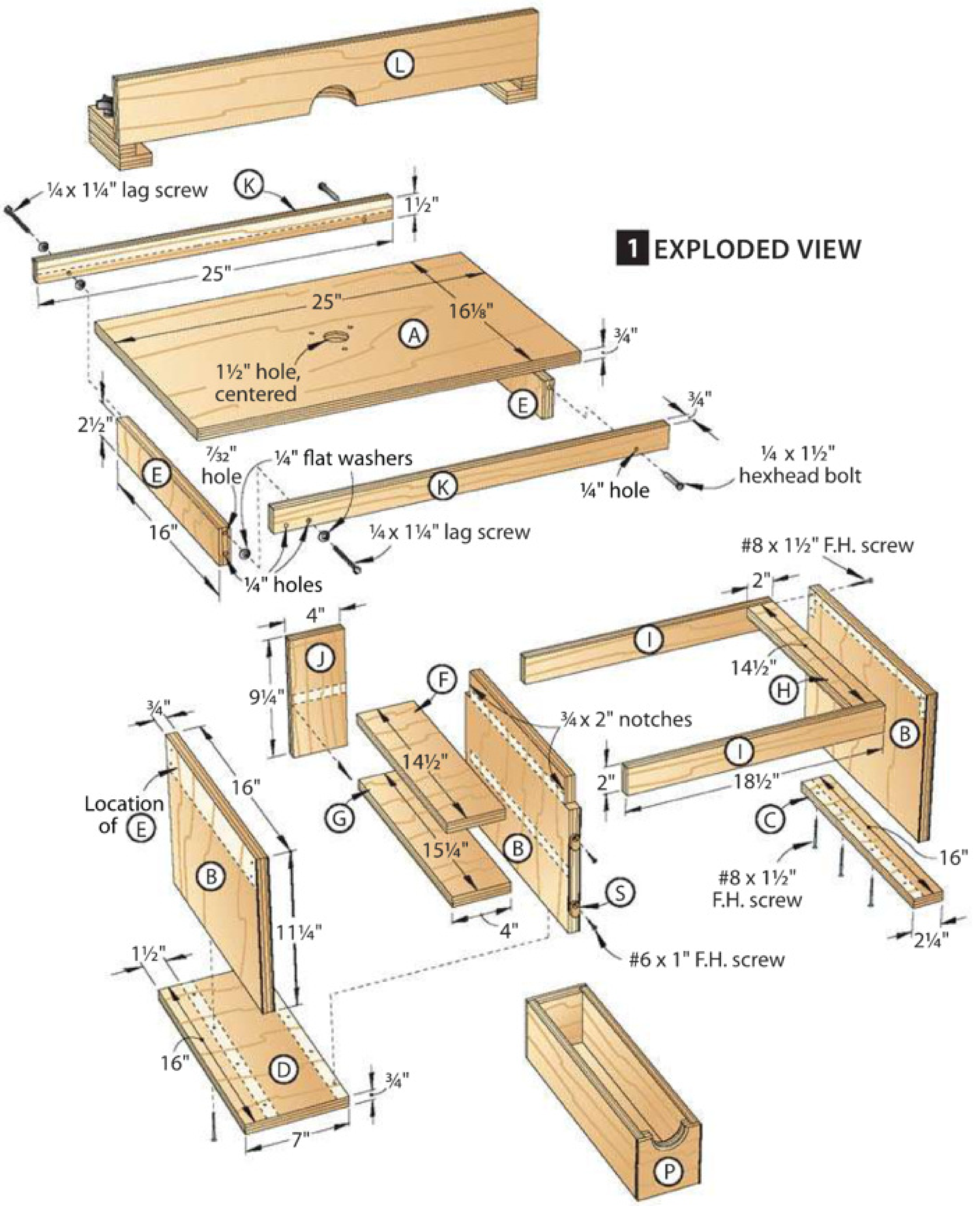


Stack the lower drawer divider (G) on the center leg (B), aligning the edges. Use the notch as a guide to mark the divider's width.

USE SPACERS TO GUIDE ASSEMBLY



Cut two 4¼" scrapwood spacers to position, glue, and clamp the lower drawer divider (G) to the center leg (B).



1 EXPLODED VIEW

3 Retrieve the upper drawer divider (F) and use the notches in the center leg (B) to help mark the drawer divider's width [**Photo A**]; then cut it. Next, mark and cut the lower drawer divider (G) to width as shown [**Photo B**].

4 Glue and clamp the upper drawer divider (F) to the center leg (B), aligning the bottom face of the divider with the top of the notches [**Photo C**]. After the glue dries, glue and clamp the lower drawer divider (G) as shown.

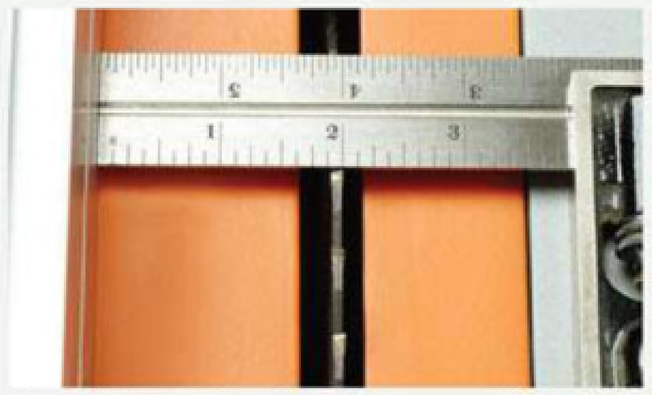
SHOP TIP

No-slop tablesawn notches

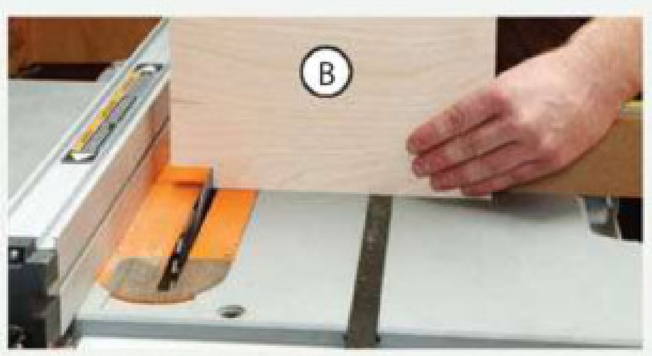
Measuring and marking a project part using a tape measure or steel rule can be hit-or-miss, especially with undersized plywood. Instead, use project parts, scrap material, and direct measurement on the cutting tools themselves to increase accuracy. Then, follow these steps to precisely cut the notches in the center leg (B) to fit the table aprons (I).



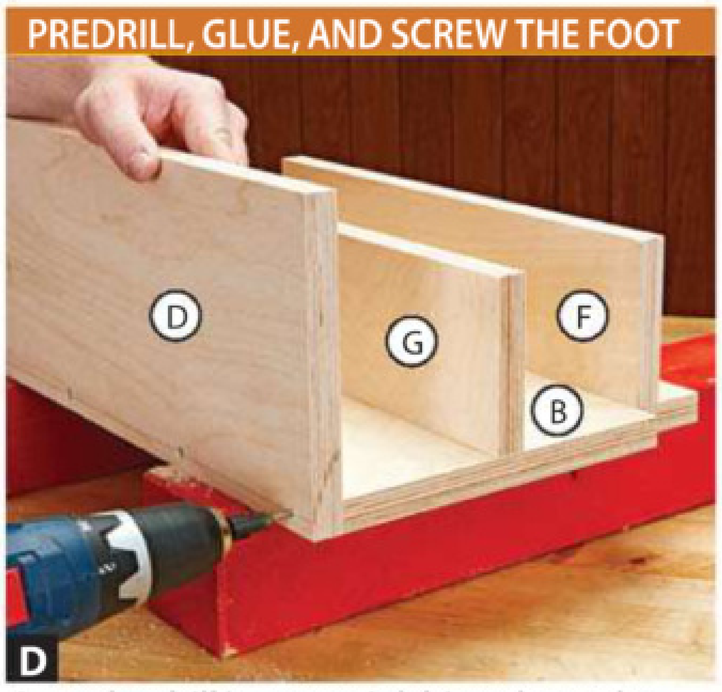
To set up for the notch's width, cut into a scrap of your plywood. Raise the blade until it just leaves splinters of veneer.



To set the notch depth, measure from the fence to the outside edge of a tooth on the saw blade.



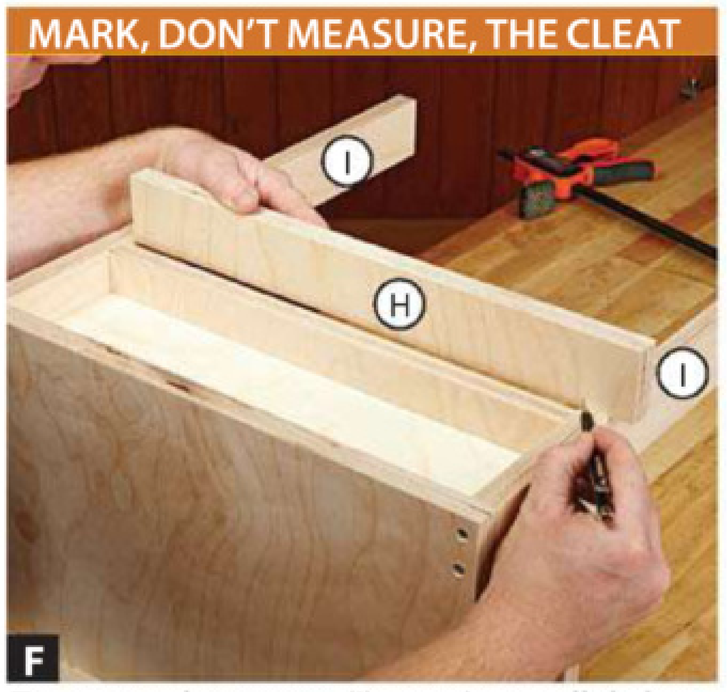
Using an auxiliary fence on your miter gauge, cut the notch in repeated passes. The fence acts as a stop for the final cut.



A combo drill/countersink bit reduces the bit changes necessary for drilling and countersinking for screws.



Glue, then clamp, the table aprons (I) into the notches and flush with the upper divider (F). Then glue and screw the left leg (B) in place.



To ensure the aprons (I) remain parallel along their length, mark the top cleat (H) for cutting by holding it near the left leg assembly.

5 Drill, glue, and screw the left foot (D) to the drawer assembly(B/F/G) [**Photo D**].

Quick Tip! ***Several base parts can be attached using glue and screws that get covered up later. Screws speed assembly because you don't have to wait for glue to dry before moving on to the next step.***

Cut the drawer-box back (J) to size, dry-fitting it to ensure the top edge aligns with the notch in the center leg (B) before gluing and clamping it in place.

6 Retrieve the table aprons (I), and glue and clamp them in place [**Photo E**]. Glue and screw the remaining leg (B) in place. After the glue dries, retrieve the top cleat (H). Mark it as shown [**Photo F**], and glue and clamp it in place [**Drawing 1**].

7 Retrieve the right leg assembly (B/C). Glue and screw it to the left leg assembly (B/D/F–J) [**Drawing 1**]. Retrieve the pivot cleats (E) and glue and clamp them to the left and right legs (B). Sand a ⅛" round-over on the top outer edge of the left pivot cleat with a sanding block.

Tackle the tabletop

1 Retrieve the top (A) and use a straightedge to mark diagonal lines from corner to corner, forming an X in the center. Drill a 1½" hole centered on the X using a holesaw [**Photo G**].

2 Remove the subbase from the router you intend to mount in the table and use the holes in it to help mark the location of the mounting holes [**Photo H**]. Drill and countersink holes sized for your router's mounting screws at the marked locations.

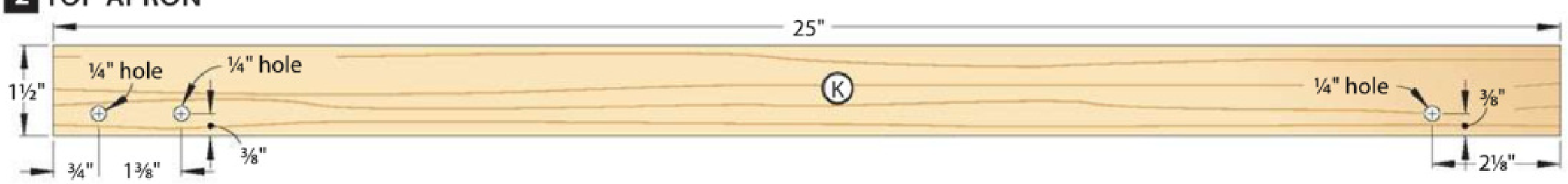
3 Cut the top aprons (K) to size. Lay out the locations of the three holes on one of the aprons [**Drawing 2**] and drill them with a ¼" bit, as shown in **Photo I**. Glue and clamp the top aprons to the top (A).

4 Clamp the top (A/K) to the base, centering the pivot hole on the end of the pivot cleat (E). (Use the center ply of the plywood as a gauge to line up the hole.) Then use the holes in the top apron (K) as a guide for drilling a 7/32" hole for the pivot screw and a ¼" hole for the right linchpin bolt [**Drawing 1, Photo J**]. Add washers and snug the ¼×1¼" lag screws in the pivot hole. Raise the top and use the left linchpin hole as a guide to drill a ¼" hole for the linchpin bolt.

Finish the full-size fence

1 Cut the fence face and base (L) to size. Lay out the identical radiused cutouts [**Drawing 3**]. Then, use the method in the **Shop Tip**, *next page*, to

2 TOP APRON





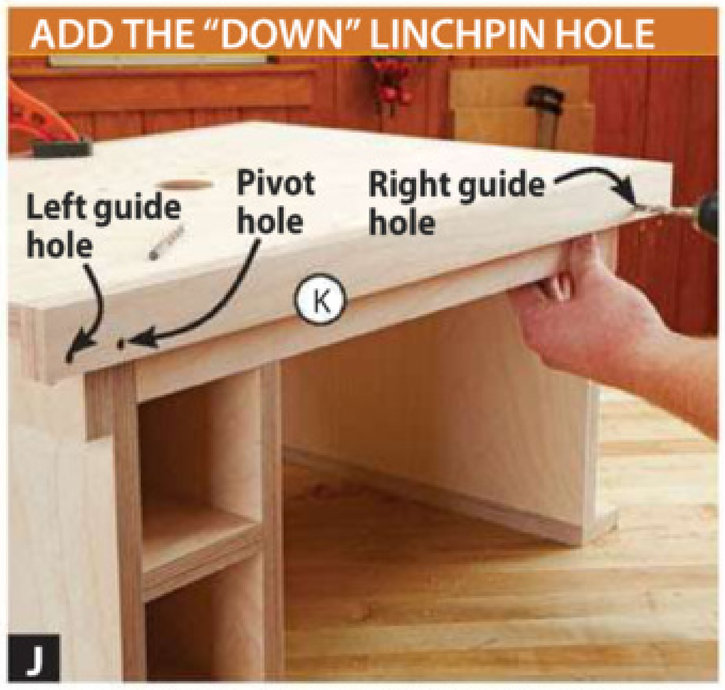
Clamp the top (A) to a worksurface with a scrap backer board underneath to prevent tear-out. Then drill the bit-access hole.



Center the subbase on the top (A), oriented so that the router's controls may be easily accessed from the front of the table.



To ensure that the holes match, stack and secure the top aprons (K) to your bench, with a scrap backer board underneath.



Drill a 7/32" hole through the pivot hole and a ¼" hole through the right guide hole. Match the depths to the hardware length.



Now, raise the top all the way. The location of the left guide hole marks the location for the "up" linchpin hole. Drill with a ¼" bit.



On a backer board, line up and stack the fence (L/L) on top of the cleat assembly (M/N). Clamp, drill, and repeat on the other end.

jigsaw the curves. Now, glue and clamp the face to the base.

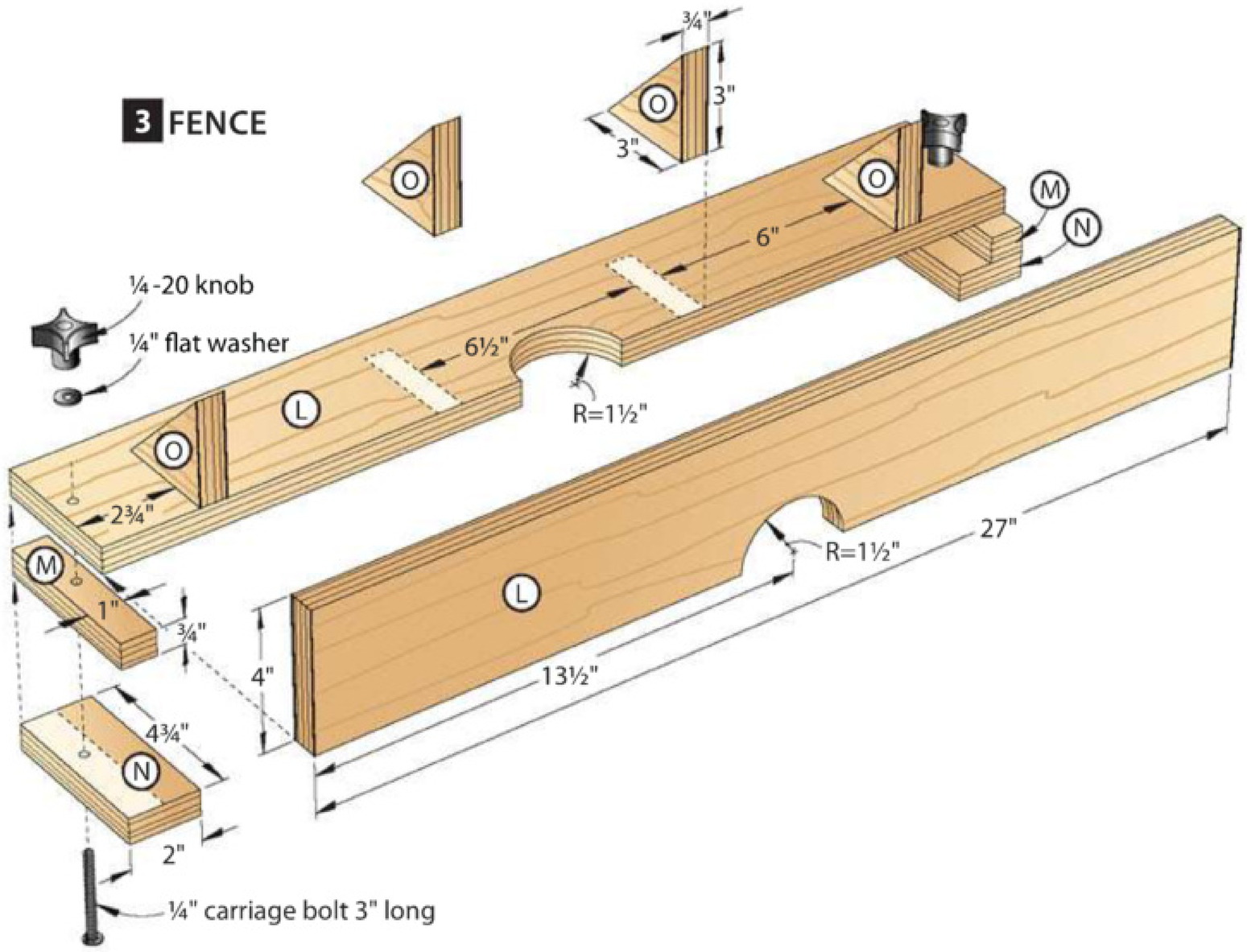
2 Cut the fence spacers (M) and fence cleats (N) to size. Glue and clamp the spacers to the cleats. After the glue dries, stack and clamp the fence assembly (L/L) onto the cleat assembly (M/N), and drill ¼" holes through the stacked plywood [**Drawing 3** and **Photo L**].

3 From a ¾×3×12" strip of plywood, cut the fence braces (O) [**Photo M**]. Glue and clamp the braces to the fence assembly [**Drawing 3**].

Devise some heavy-duty drawers

1 From ¾" plywood, cut two blanks 3 15/16×10" for the drawer fronts and backs (P). From one blank, cut two drawer backs to length and set aside. On the other blank, lay out the drawer-front finger pulls on each end [**Drawing 4**], and cut out the pulls [**Shop Tip**, *below right*] before cutting the fronts to length.

Quick Tip! ***Cutting the radius before cutting the blanks apart leaves you plenty of space for clamping without interfering with the jigsaw baseplate.***





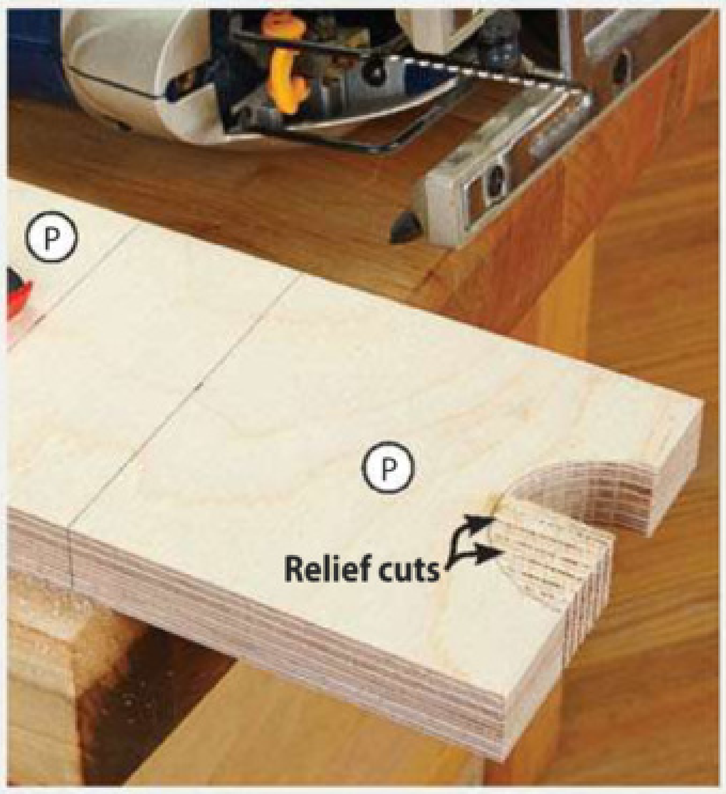
Set your miter gauge to 45° to cut a brace from either end of the strip. Reset to 90° to cut the remaining two braces.

SHOP TIP

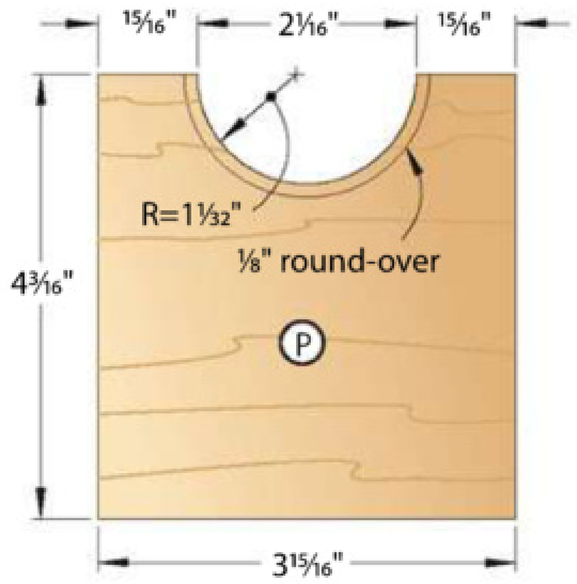
A trick for tackling tight jigsaw turns

Even with a fine-toothed wood blade (10 tpi or greater) in your jigsaw, cutting around tight curves can be a tricky proposition, causing the blade to bind, bend, and burn.

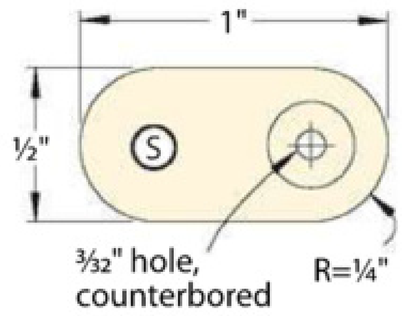
Try this trick: Before you start in on the curve, cut multiple straight relief cuts, *right*. Then cut the curve within 1/16" of the line. As you cut your way around the curve, the waste pieces fall away one by one, relieving pressure on the blade, and providing space to back the tool up should you need to change your angle of attack slightly. Sand to the line of the curve using a short section of sandpaper-wrapped PVC.



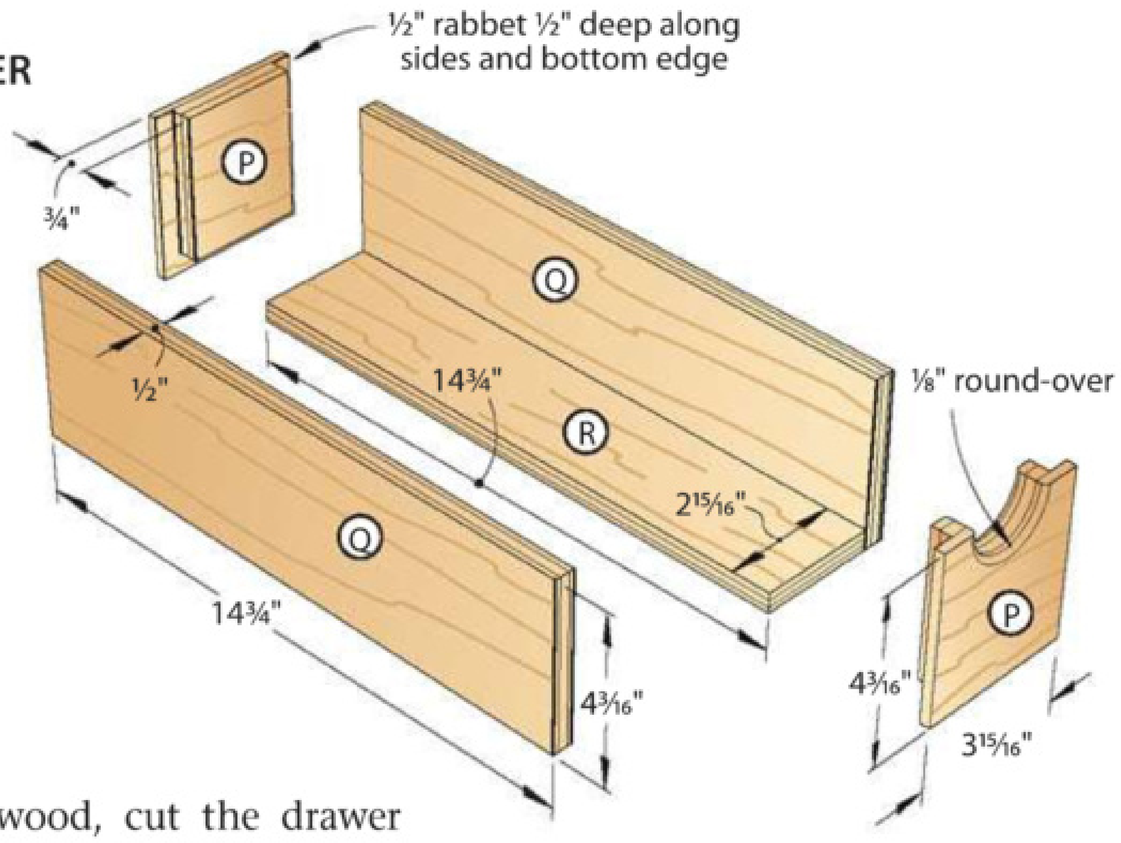
4 DRAWER FRONT



6 FULL-SIZE DRAWER CATCH (2 needed)



5 DRAWER



2 From ½" plywood, cut the drawer sides (Q) and bottoms (R) to size and set them aside.

3 Mount your router onto the underside of the top (A). (If the original faceplate screws don't reach, purchase longer machine screws of the same size and thread count.)

4 Chuck a ¾" rabbeting bit in the router. Attach the fence and position it to rout ½"-deep rabbets the same thickness as the drawer sides (Q). Rabbet three sides of the drawer fronts and backs (P) [**Drawing 5**]. Now, switch bits and rout ⅛" round-overs on the finger pulls of the drawer fronts.

5 Glue and clamp the drawers together [**Drawing 5**]. From scrap ¼" stock (we used plywood), cut the drawer catches (S) to size. Sand ¼" radii on the corners [**Drawing 6**] with a sanding block. Drill, counterbore, and attach the catches to the front edge of the center leg (B) [**Drawing 1**]. Now, insert the drawers, fill them to the brim with bits, and get ready for some routin'.

Produced by **Lucas Peters** with **John Olson**
Project design: **Kevin Boyle**
Illustrations: **Lorna Johnson**

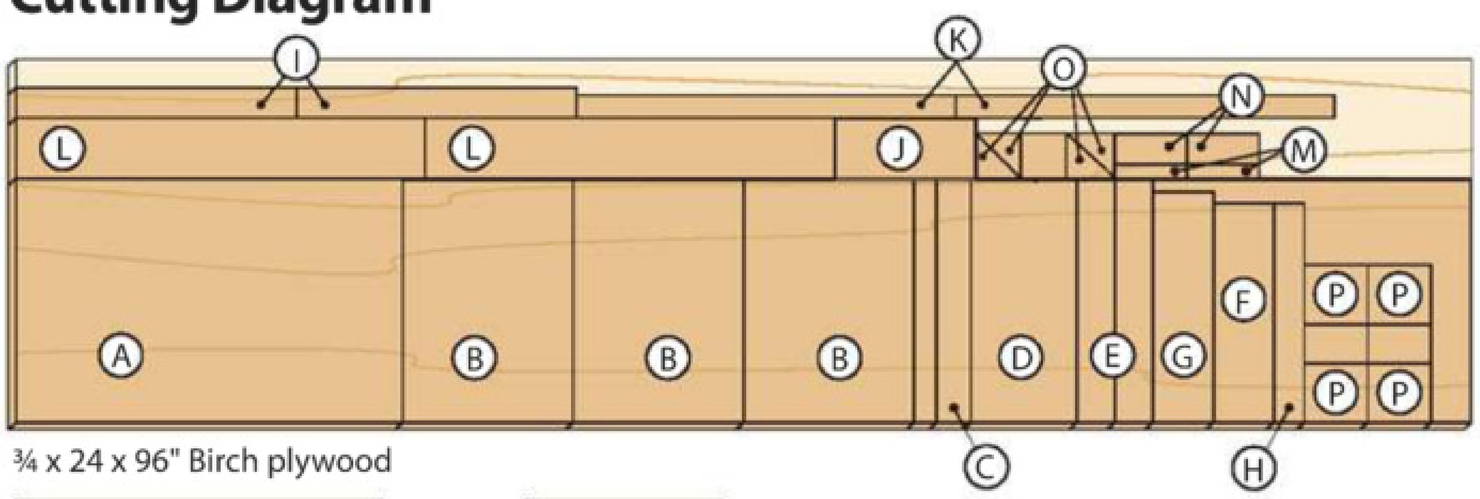
Materials List

Table		FINISHED SIZE T	W	L	Matl.	Qty.
A*	top	¾"	16⅛"	25"	B	1
B*	legs	¾"	16"	11¼"	B	3
C*	right foot	¾"	16"	2¼"	B	1
D*	left foot	¾"	16"	7"	B	1
E*	pivot cleats	¾"	16"	2½"	B	2
F*	upper drawer divider	¾"	14½"	4"	B	1
G*	lower drawer divider	¾"	15¼"	4"	B	1
H*	top cleat	¾"	14½"	2"	B	1
I	table aprons	¾"	2"	18½"	B	2
J	drawer-box back	¾"	4"	9¼"	B	1
K	top aprons	¾"	1½"	25"	B	2
Fence						
L	face/base	¾"	4"	27"	B	2
M	spacers	¾"	1"	4¾"	B	2
N	cleats	¾"	2"	4¾"	B	2
O*	braces	¾"	3"	3"	B	4
Drawers						
P*	drawer fronts/ backs	¾"	4 3⁄16"	3 15⁄16"	B	4
Q	drawer sides	½"	4 3⁄16"	14¾"	B	4
R	drawer bottoms	½"	2 15⁄16"	14¾"	B	2
S	drawer catches	¼"	½"	1"	B	2

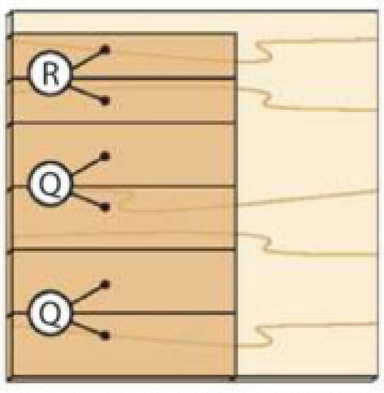
*Parts initially cut oversize. See the instructions.

Materials key: B–birch plywood.
Supplies: #6×1" flathead wood screws (2), #8×1½" flathead wood screws (20), ¼×1¼" lag screws (2), ¼" flat washers (6), ¼×1½" hexhead bolts (2), ¼-20×3" carriage bolts (2), ¼-20 star knobs (2).
Blade and bits: Drill/countersink bit; ¼" and 7⁄32" drill bits; ¾" rabbeting and ⅛" round-over router bits; 1½" holesaw.

Cutting Diagram



¾ x 24 x 96" Birch plywood



½ x 24 x 24" Birch plywood



¼ x 6 x 12" Birch plywood

More Resources

- For a video on safely handling sheet goods, go to **woodmagazine.com/sheetgoods**.
- For a free plan for modular, in-drawer router-bit storage, go to **woodmagazine.com/bitstorage**.

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11483556

SUPER COUPON!

2.5 HP 12" PLANER

CENTRAL MACHINERY

LOT NO. 95082

SAVE $90



$239.99

REG. PRICE $329.99

11491831

LIMIT 5 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 2/21/15. Limit one coupon per customer per day.

SUPER COUPON!

1/4" TRIM ROUTER

drillmaster

LOT NO. 44914/61626

SAVE 42%



Item 44914 shown

$19.99

REG. PRICE $34.99

11445898

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SUPER COUPON!

14" OSCILLATING SPINDLE SANDER

CENTRAL MACHINERY

LOT NO. 62146
69257/96088

SAVE $60

Item 69257 shown



$89.99

$129.99 REG. PRICE $149.99

11461626

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SUPER COUPON!

24" CLAMP AND CUT EDGE GUIDE

PITTSBURGH

LOT NO. 66126



SAVE 46%

$6.99

REG. PRICE $12.99

11477142

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SUPER COUPON!

CENTRAL MACHINERY

2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR

• 70 Gallon Capacity

SAVE $90

$159.99

$209.99 REG. PRICE $249.99

LOT NO. 97869/61790

Item 97869 shown



11489197

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SUPER COUPON!

LOT NO. 68784 69387 62270

SAVE $330

Item 68784 shown



"We Are Impressed With the Quality... The Price is Incredible" — Car Craft

44", 13 DRAWER INDUSTRIAL QUALITY ROLLER CABINET

NEW

- 2633 lb. Capacity
- Weighs 245 lbs.
- Super High Gloss Finish

$369.99

US★GENERAL REG. PRICE $699.99

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SUPER COUPON!

"The Perfect Compressor with Powerful, Quiet and Consistent Airflow... Plus we Love the Low Price" — Street Trucks

2.5 HP, 21 GALLON 125 PSI VERTICAL AIR COMPRESSOR

CENTRALPNEUMATIC

SAVE $70

LOT NO. 67847
61454/61693

Item 67847 shown



$149.99

REG. PRICE $219.99

11508792

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Space-saving flip-top tool bench

Like many others, I do my woodworking in the garage. But for some reason my wife expects to park her car in there, so keeping my benchtop tools readily accessible—yet quickly stowed away—had become a challenge. This bench keeps us both happy. It holds twice as many machines as I could pack on a typical worksurface, saves me from lifting and lugging them about, and rolls out of the way when the car rolls in.

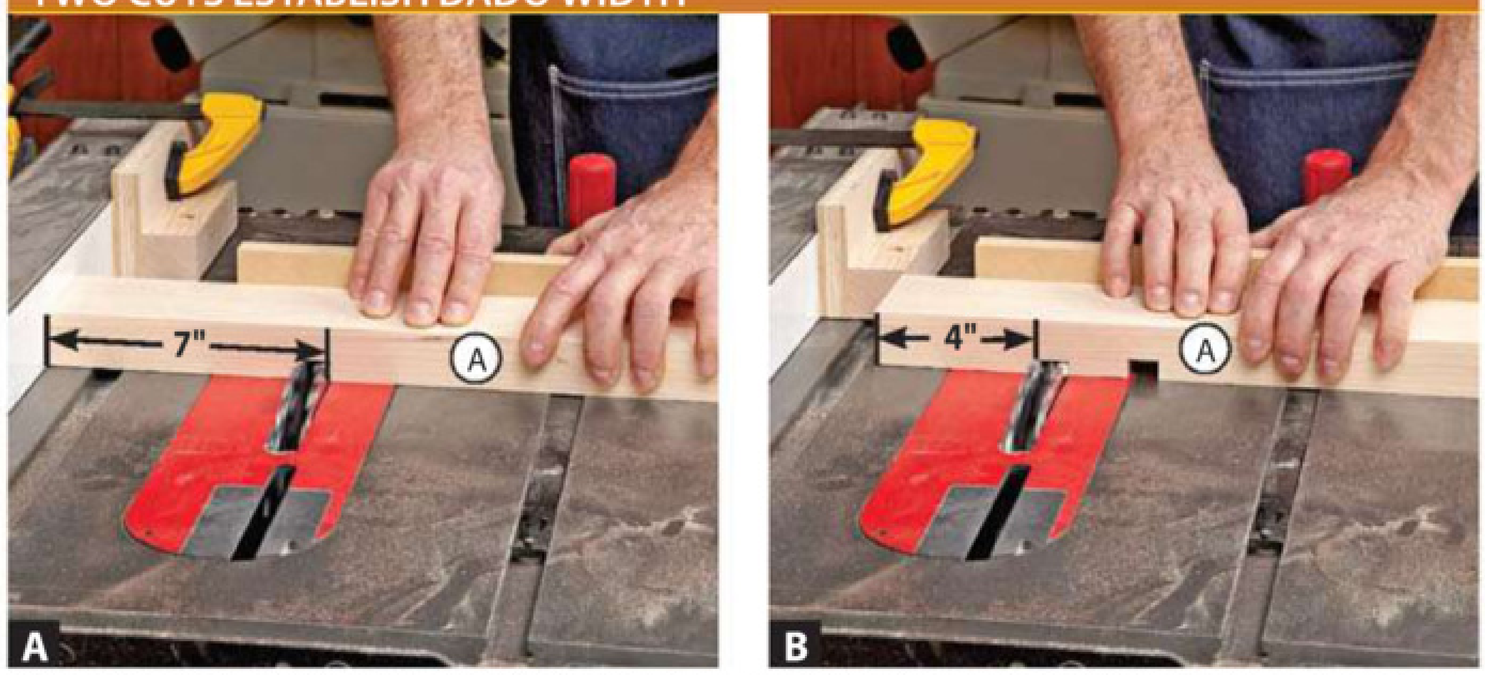
Lucas Peters
Digital Content Manager

Overall dimensions:
63"L × 30"D × 34"H
Materials cost: $200



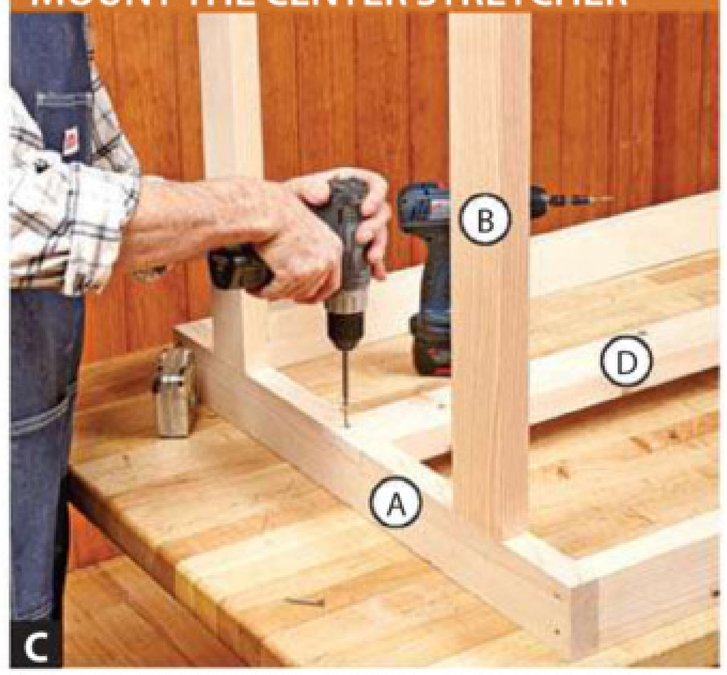
Big Ideas for Small Workshops 2014

TWO CUTS ESTABLISH DADO WIDTH



Set your fence 7" from the blade's outside edge. Make the first cut with the end rail (A) butted against the fence. Because the cut doesn't go fully through the workpiece, it's safe to use the miter gauge and fence in tandem. Without moving the fence, butt the end rail against the spacer block and make the second cut.

MOUNT THE CENTER STRETCHER



Place the center stretcher (D) so it spans the two ends (A/B), its rabbeted ends in the end rails' (A) dadoes. Drill pilot holes and drive the screws.

First, make the sides

1 Purchase five 8'-long 2×4s that are dry and straight as you can find, and mostly free of defects. Cut the three straightest ones to 64" long, and save the cutoffs. Cut six more pieces 31" long. Joint, plane, and rip these 12 pieces to 1⅜" thick and 3" wide. From this stock, cut the end rails (A), end stiles (B), side stretchers (C), center stretcher (D), and caster blocks (F) to length [**Materials List**]. Set the caster blocks aside for now.

2 Install a ¾" dado set in your tablesaw, and raise it to 11/16". Clamp a 2¼"-wide spacer block to your tablesaw's fence as shown in **Photo A**. To cut the dadoes in the end rails (A), where shown in **Drawing 1**, first cut their outside edges [**Photos A** and **B**]. Then, make additional passes to remove the waste material between the outside cuts.

3 Now, reposition the fence so the spacer block is 3" from the outside edge of the blade. Cut the rabbets in the ends of the end stiles (B) [**Drawing 1**].

4 Cut a centered 3"-wide dado in the top edge of the two bottom end rails (A) [**Drawing 1**]. Then, reposition the fence and spacer block and cut the rabbets on both ends of the center stretcher (D) [**Drawing 2**].

Assemble the base

1 Glue and clamp two end rails (A) and two end stiles (B) [**Drawing 1**], remembering to place the end rails with the center dado facing up on the bottom of the assembly. Repeat for the other end assembly and allow the glue to dry.

2 Bore the ¾", ¼", and ⅞" holes in the top end rails (A), where shown [**Drawing 1**]. Sand the end assemblies (A/B) to 150 grit.

3 Glue and screw the side stretchers (C) and center stretcher (D) [**Photo C**] to the ends (A/B) [**Drawing 2**].

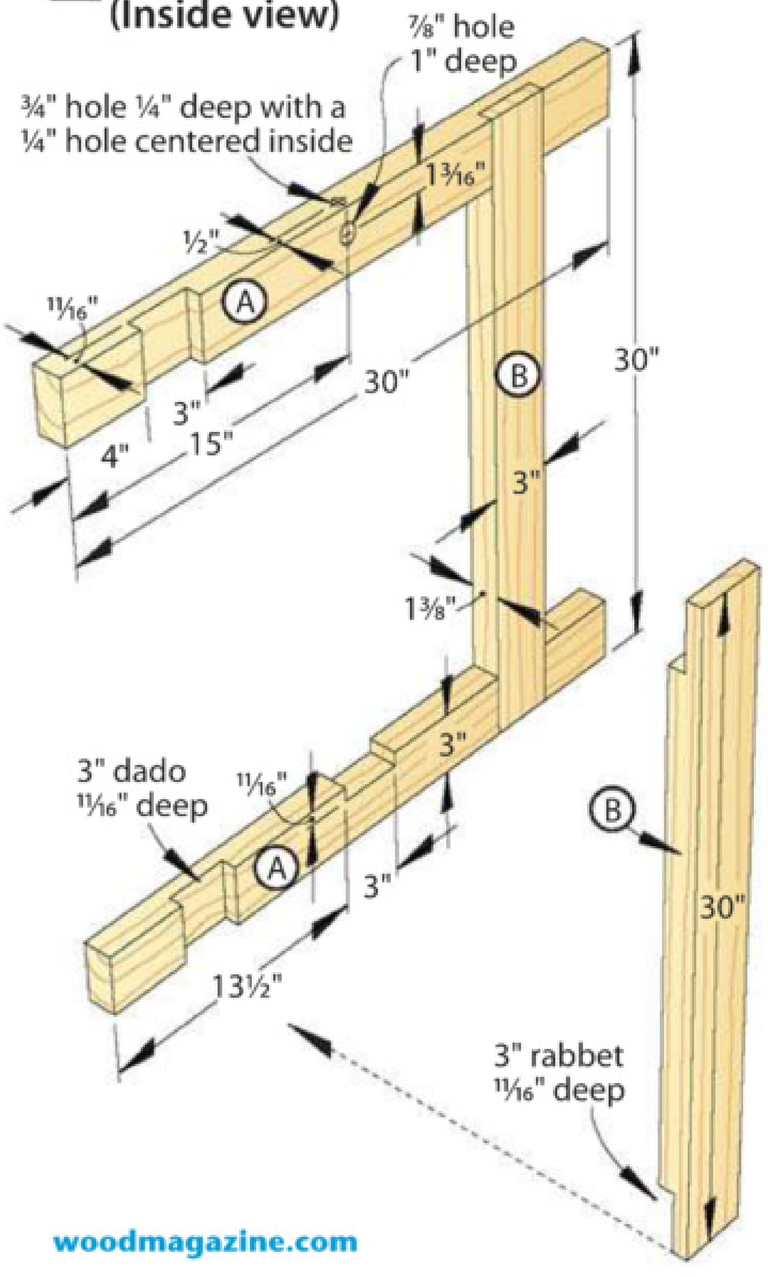
4 To get the best yield from two sheets of plywood, cut one base panel (E) to size from each sheet [**Materials List, Cutting Diagram**]. Lay out and cut 1⅜"-long, 3"-wide notches for the stiles [**Drawing 2**].

Quick Tip! *Use a 10-tpi wood-cutting blade in your jigsaw to minimize tear-out.*

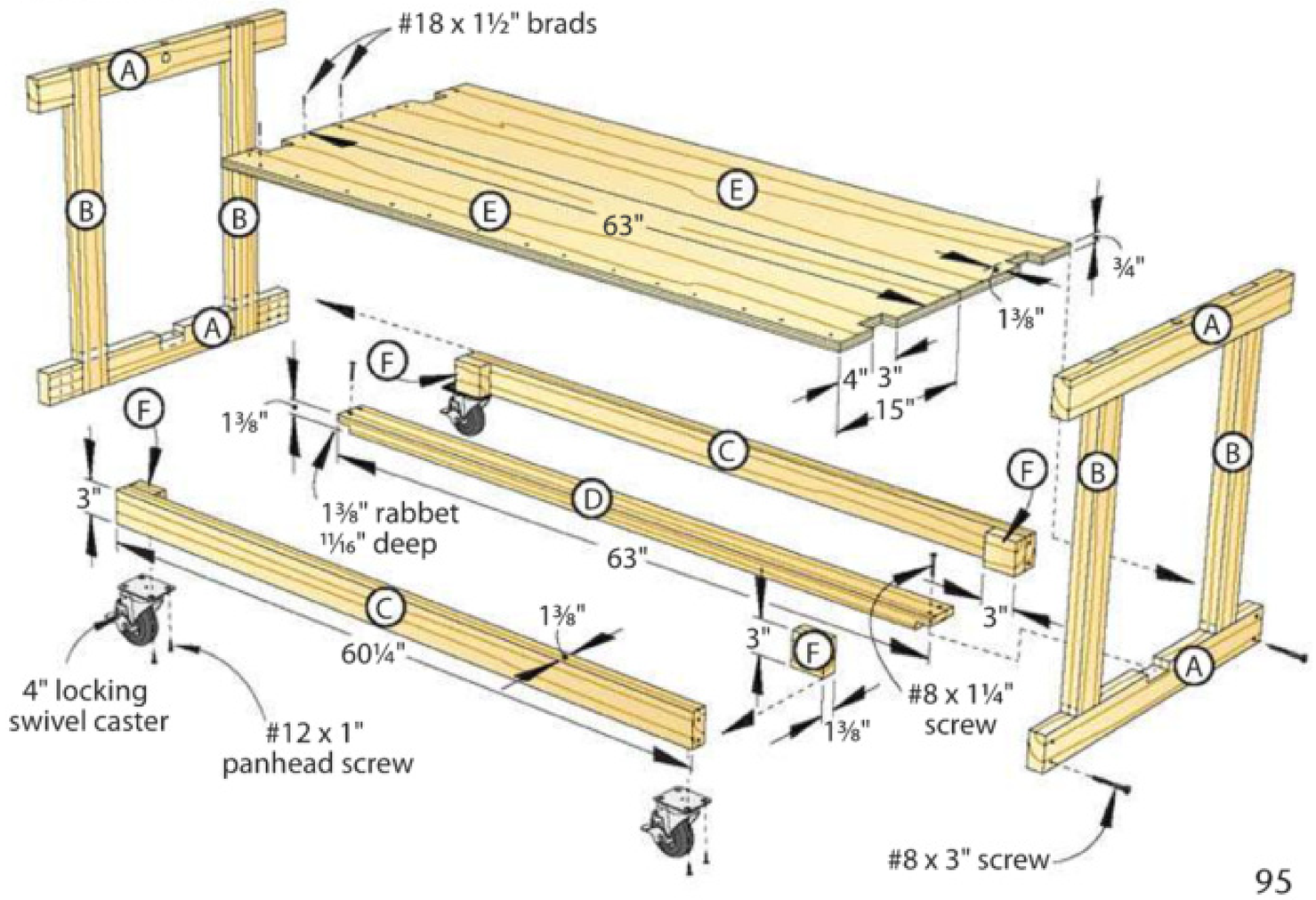
Mount the base panels [**Photo D**].

5 Retrieve the caster blocks (F) and glue them to the inside corners of the base [**Drawing 2**].

1 SIDE ASSEMBLY (Inside view)



2 BASE ASSEMBLY



COVER UP THE BASE



Check the base panels' (E) fit on the base stretchers (C, D) and rails (A) before running a bead of glue on their top edges and nailing the panels in place.

CAPTURE THE CENTER AXIS PIPE



Apply glue to the bottom of one of the spacers (H) and nail it in place. Repeat for the other side, keeping the spacers tight to the pipe.

DRILL HOLES IN THE PIPE ENDS



Clamp the assembly together to keep the pipe bottomed in each ⅞" hole. Drill the pipe through the ¼" hole in the end rails (A).

Build a spinning top

1 Cut the top panels (G), long spacers (H), and short spacers (I) to size [**Materials List**]. Lay out the location of the spacers on the inside face of a top panel [**Drawing 3**].

2 Situate two long spacers (H) on the layout lines found near the center of the top panel (G), and ¾" from both ends of the panel to leave room for the ends (J). Place a 62¼" length of ½" black pipe between the long spacers; then, glue and nail the spacers in place [**Photo E**].

3 Glue and nail the remaining two long spacers (H) flush with the outside edges of the top panel (G). Then, glue and nail the short spacers (I) in place [**Drawing 3**].

4 From 1½"-thick stock, cut the ends (J) to size [**Materials List**]. Rip the ¾" rabbets in two long edges of each end [**Drawing 3**]; then, drill centered ⅞" through holes where shown. Glue and nail the ends to the top assembly (G/H/I). Use the pipe ends to align the holes with the centered long spacers (H).

5 Remove the pipe. Apply glue to the top edges of the spacers (H, I) and ends (J). Lay the remaining top panel (G) on the spacers and nail it in place.

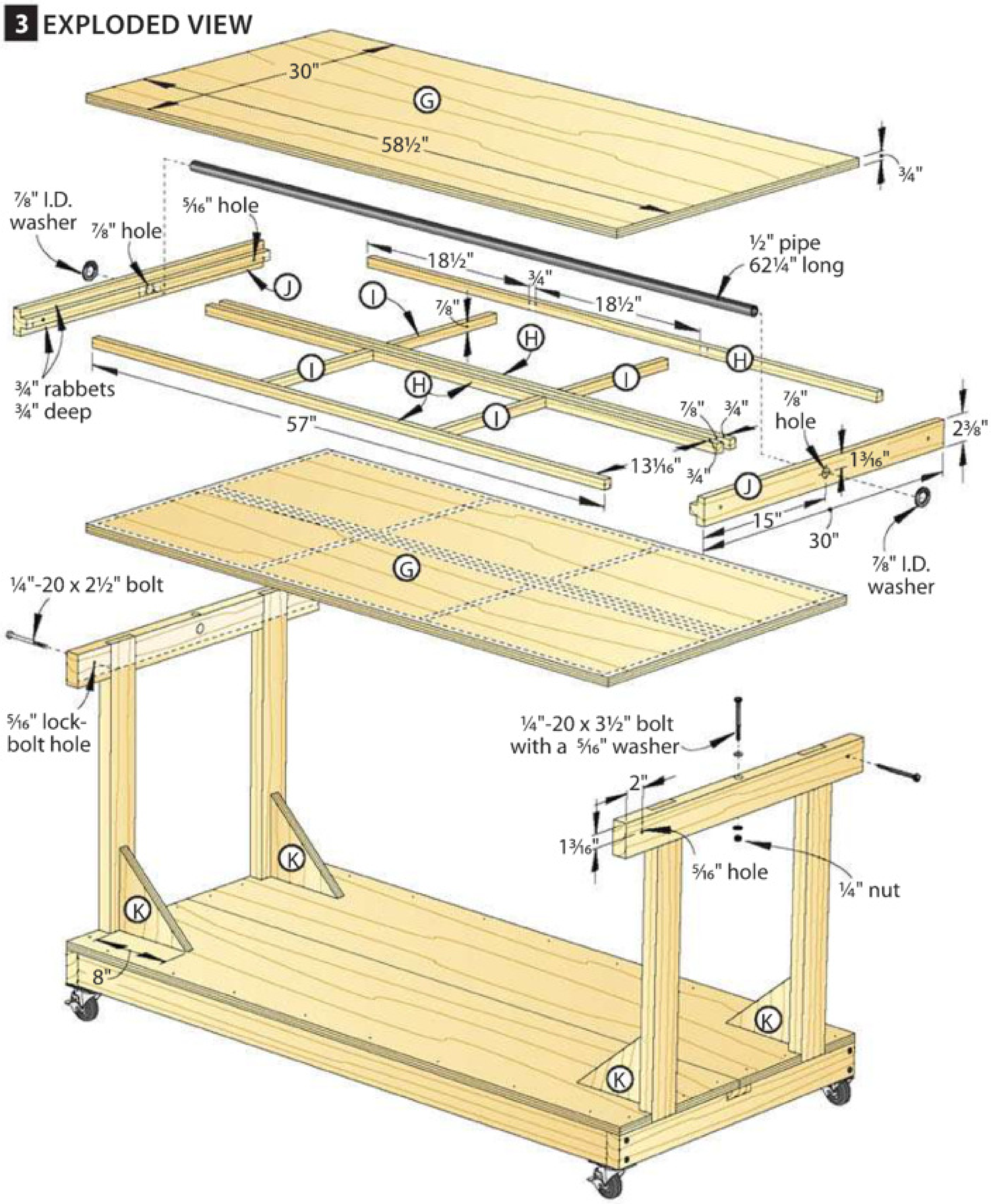
Now, put it all together

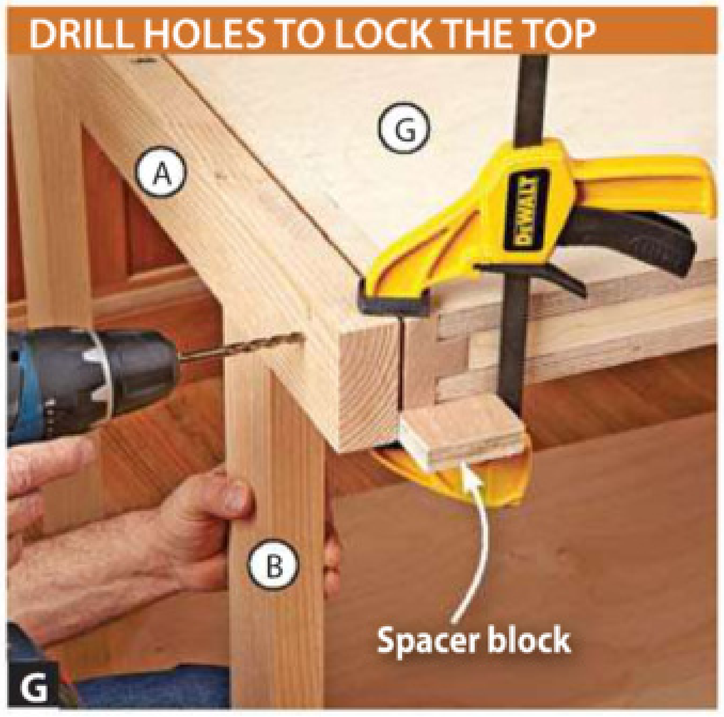
1 Slide the ½" black pipe into the ⅞" holes in the top end rails (A). (You may need to push the ends away from each other slightly to accomplish this.) Drill 17⁄64" holes through the pipe to accept a ¼" bolt [**Photo F**].

***Quick Tip!** Drill the first hole and drop in a bolt before drilling the pipe's other end. This ensures bolt-hole alignment.*

2 Remove the pipe from the base and slide it back through the top assembly (G–J). Place a ⅞" I.D. washer on each end of the pipe before inserting the top assembly between the top end rails (A). Secure the pipe with bolts through the top end rails. Mark and drill the lock-bolt holes [**Drawing 3, Photo G**].

3 EXPLODED VIEW





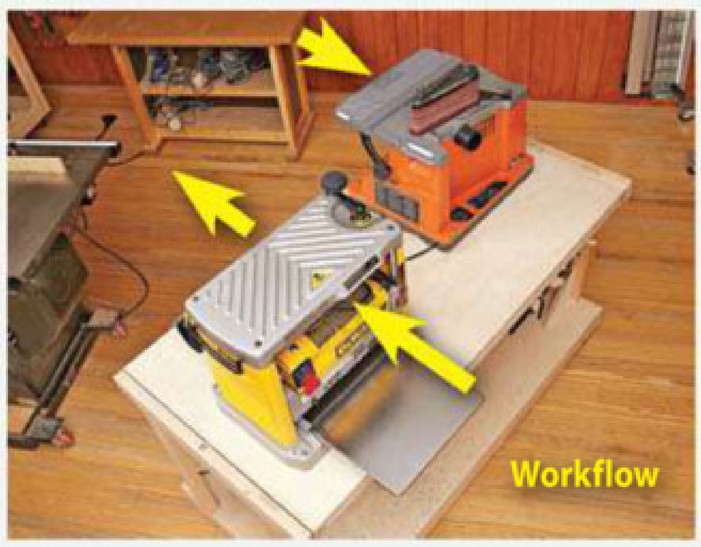
Drill four 5⁄16" holes through the upper end rails (A) for the lock bolts. Use a clamp and spacer block to keep the top (G–J) aligned with the end rails.

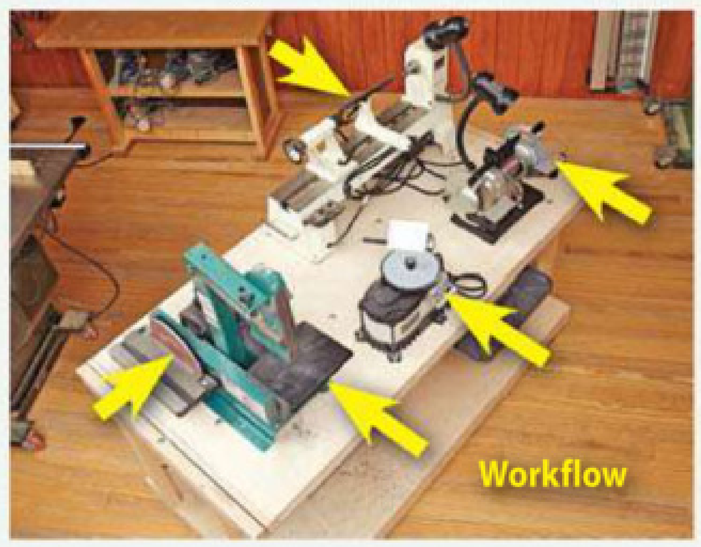
3 Cut the braces (K) to size and glue them in place [**Drawing 3**]. To keep them from moving as they dry, shoot a few brads or pins through them into the end stiles (B) and base panels (E). Mount a 4" locking caster on all four corners of the workbench. Then, secure benchtop tools to the bench as desired using through bolts for heavier tools and lag screws for lighter ones.

Produced by **Nate Granzow** with **Kevin Boyle**
Project design: **Lucas Peters**
Illustrations: **Lorna Johnson**

When setting up your bench, consider workflow

It's easy to get carried away when mounting tools to your flip-top tool bench: The more tools you can fit, the less clutter you'll have around your shop, right? But attaching too many tools may not leave adequate working room around each of them. Instead, lay your tools out on the bench, keeping workflow and spacing in mind. Some tools, such as jointers and planers, require additional space on both the infeed and outfeed side of the tool. Others, such as sanding wheels or sharpeners, can function near each other. Also consider weight distribution and balance; too many heavy tools on one side can make rotating the tabletop difficult. For instance, we mounted only a portable planer and oscillating spindle sander on one side because those two tools weigh about as much as the four tools on the opposite side.



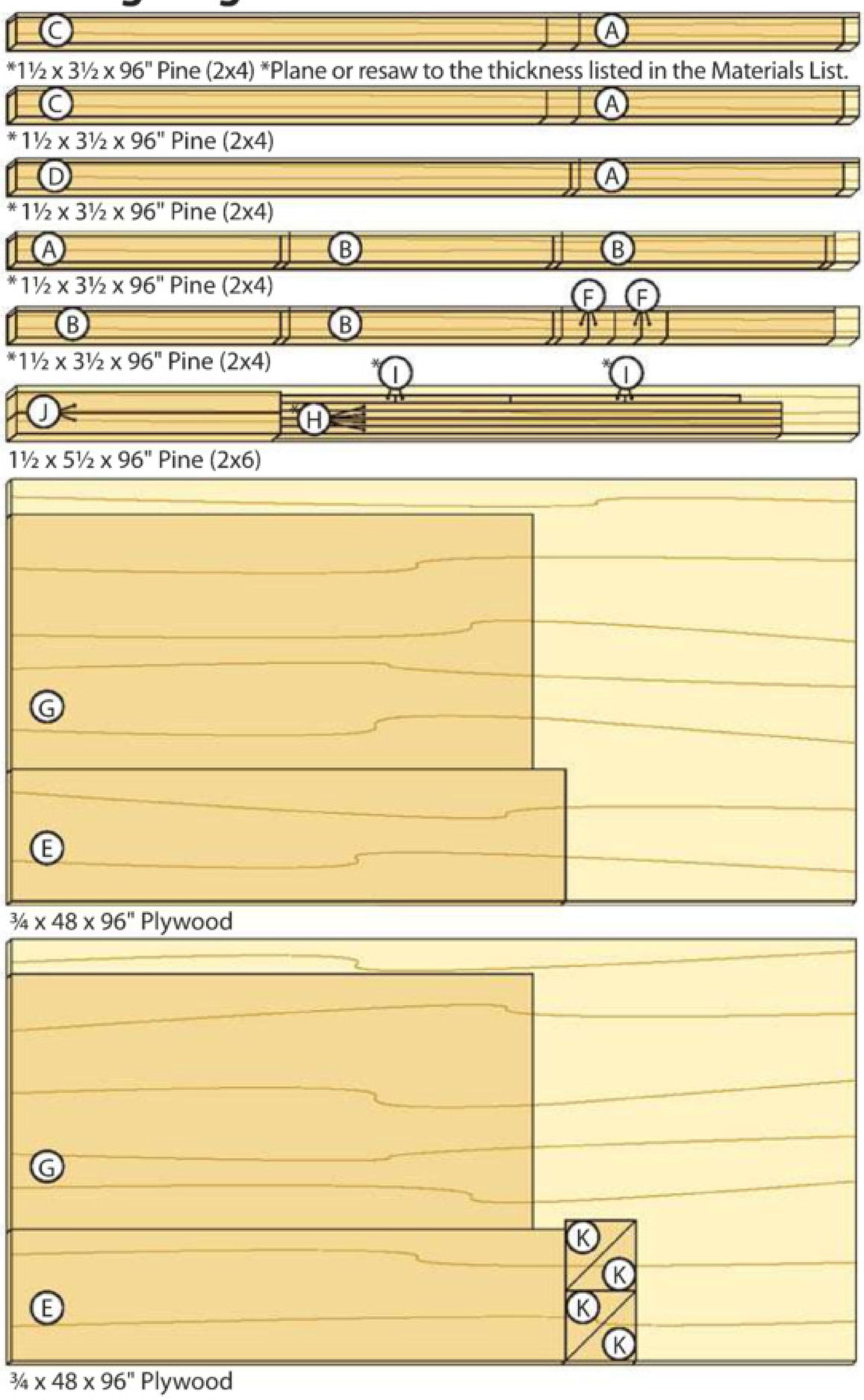


Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	end rails	1⅜"	3"	30"	P	4
B	end stiles	1⅜"	3"	30"	P	4
C	side stretchers	1⅜"	3"	60¼"	P	2
D	center stretcher	1⅜"	3"	63"	P	1
E	base panels	¾"	15"	63"	PLY	2
F	caster blocks	1⅜"	3"	3"	P	4
G	top panels	¾"	30"	58½"	PLY	2
H	long spacers	¾"	⅞"	57"	P	4
I	short spacers	¾"	⅞"	13 1⁄16"	P	4
J	ends	1½"	2⅜"	30"	P	2
K	braces	¾"	8"	8"	PLY	4

Materials key: P–pine, PLY–plywood.
Supplies: ½" black pipe 62¼" long, ¼"-20×2½" lock bolts (4), ¼"-20×3½" bolts (2), ⅞" I.D. washers (2), 5⁄16" washers (4), 4" locking swivel casters (4), ¼" nuts (2), #8×3" screws (8), #8×1¼" screws (4), #12×1" panhead screws (16), #18×1½" brads.
Blade and bits: Dado blade; ¼", 17⁄64", 5⁄16", ¾", ⅞" drill bits.

Cutting Diagram



More Resources

- Learn to select benchtop tools that work as hard as full-size ones here: **woodmagazine.com/benchtoptools**.
- For more space-saving shop plans, visit **woodmagazine.com/foldflat**.

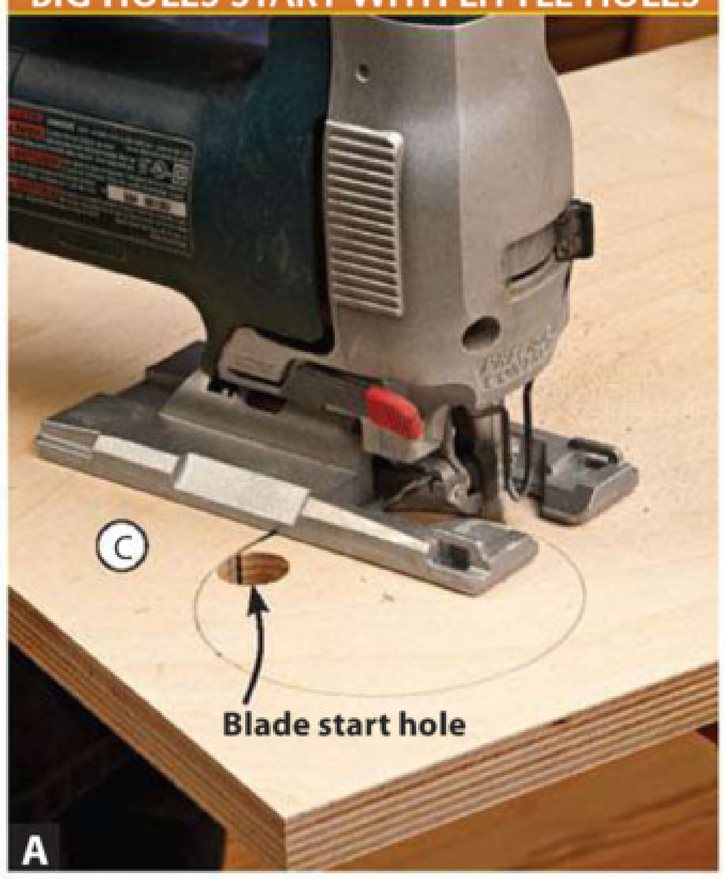
Dimensions:
49½"W × 31½"D × 39½"H
Approximate lumber cost: $340;
Dust collector and related items: $245

Dust-collecting tool stand

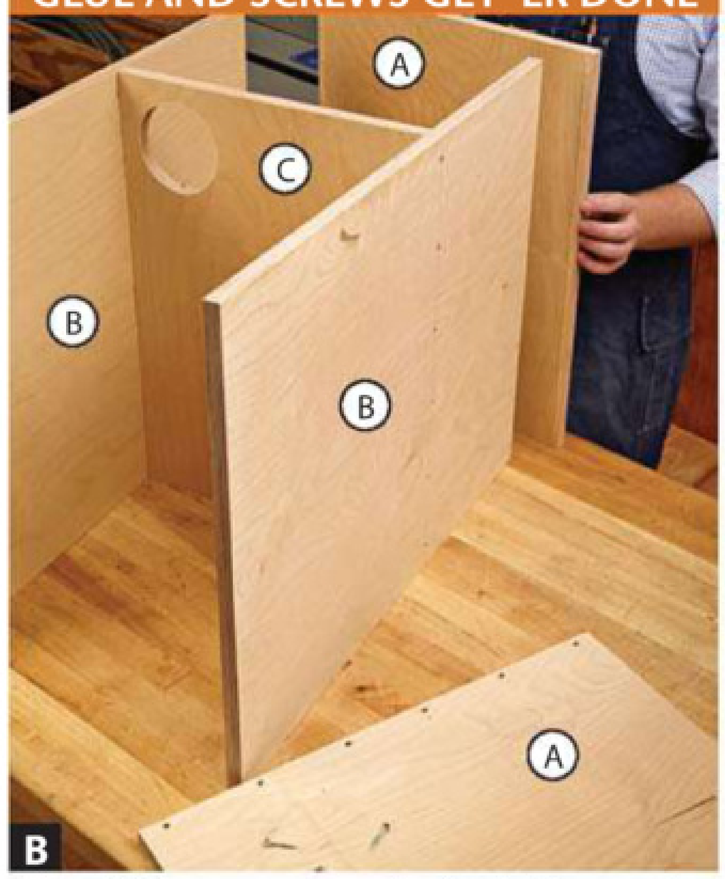


A debris separator, effective air filter, and mobile worksurface all rolled into one

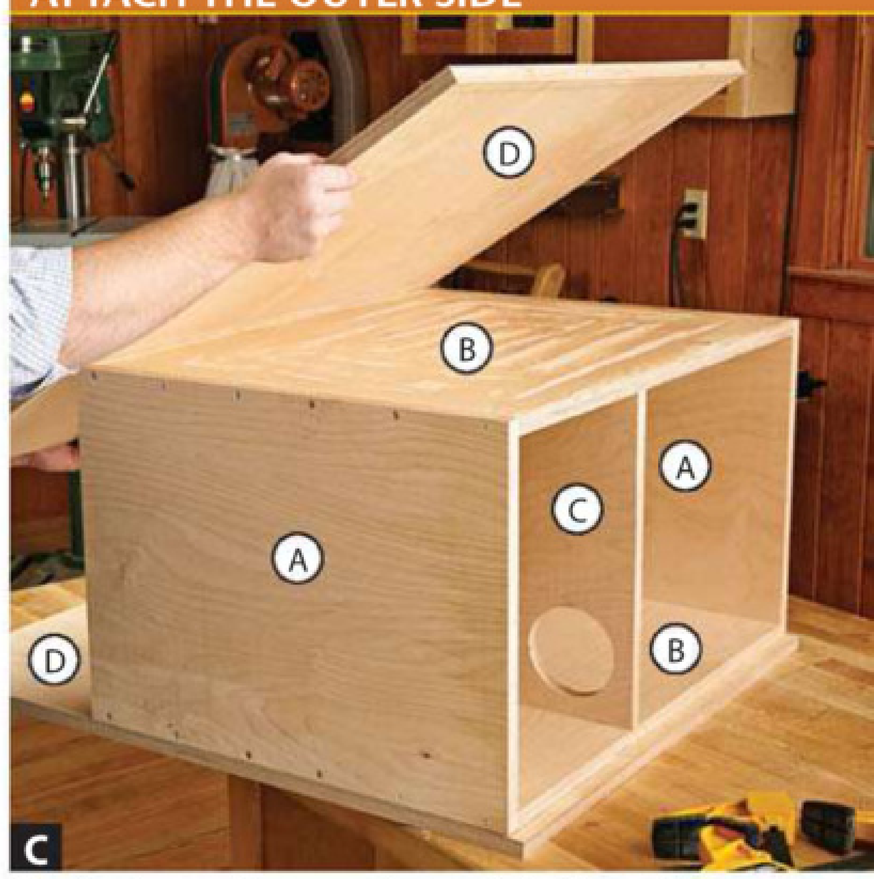
Invest a weekend in building this simple glued-and-screwed plywood cabinet outfitted with a low-dough dust-collection blower and you're ready to stop sawdust—from big chips to microscopic airborne particles—in its tracks. You need only run a flexible hose from the collector's 4" side port to any dust-spewing machine, be it nearby or sitting on its sturdy 49½ × 31½" worksurface. As shown in the **Separator Airflow Drawing** on the *next page*, nearly all of the debris settles in the cart's large drawer for convenient disposal; the airborne stuff settles in its small drawer after passing through the blower or gets trapped in the filters.



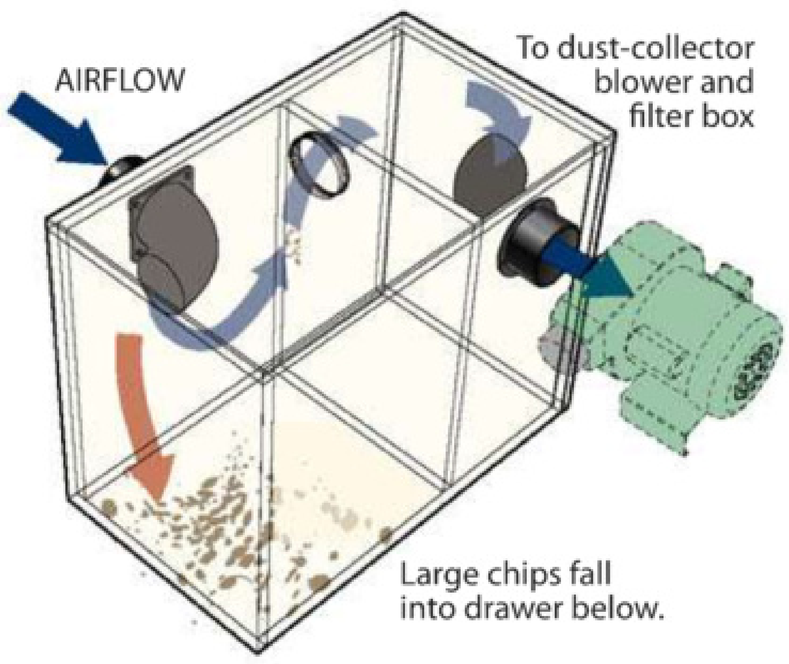
Mark the 4" hole in the baffle (C) with a compass, bore a ¾" blade start hole near its inside edge, and cut along the marked line.

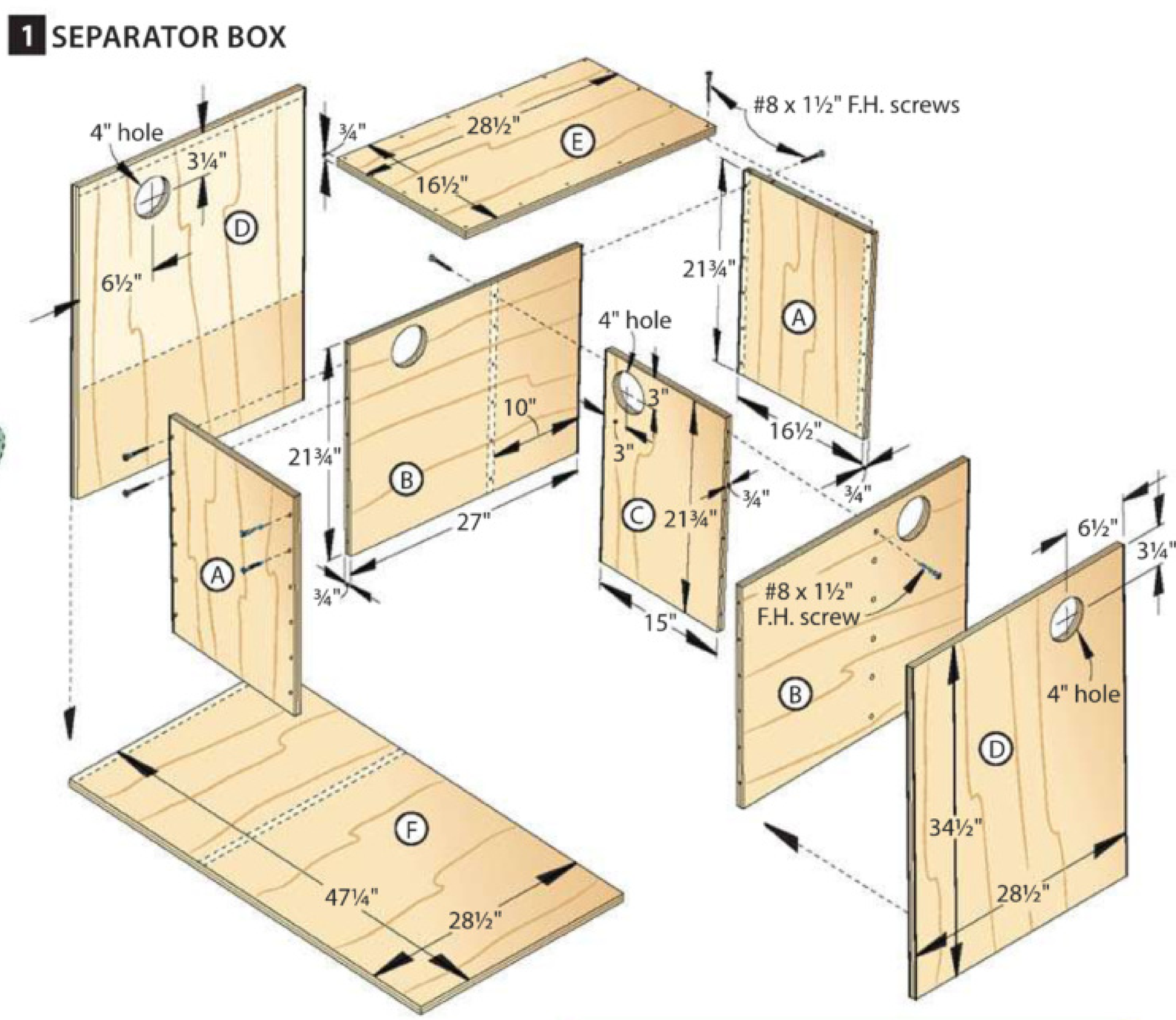


After drilling countersunk pilot holes, apply a bead of glue and screw together the separator box ends (A), inner sides (B), and baffle (C).



Apply glue to the outer faces of the inner sides (B). Position the outer sides (D) and clamp or weight the pieces until the glue has dried.





First, build the separator box

1 From ¾" plywood (we used Baltic birch but any good-quality plywood will do), cut to size the separator-box ends (A), inner sides (B), baffle (C), and outer sides (D) [**Materials List**, *page 103*; **Drawing 1**]. For efficient cutting from 4×8' sheets refer to the **Cutting Diagram** on *page 103*. Cut the 4" hole in the baffle [**Photo A**]. You will cut the other holes later.

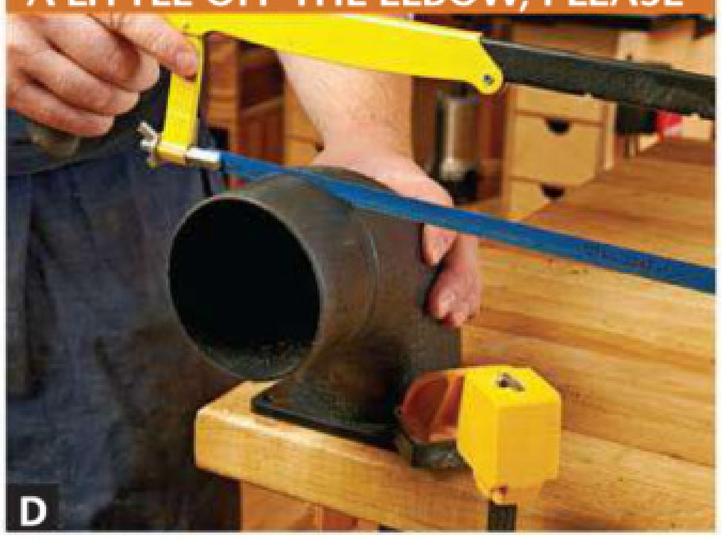
2 Dry-clamp parts A–C, ensuring they are square with each other [**Drawing 1**]. Drill countersunk pilot holes every 4" along the butted joints. Unclamp and assemble with glue and 1½" screws [**Photo B**].

3 Glue the outer sides (D) to the inner sides (B) [**Photo C**]. Align the long edges of the ends (A) and the outer sides (D) flush, with the top edges of the outer sides higher than the tops of the inner sides (B) by the thickness of your plywood. ***Note:*** *The dimensions in this project assume your plywood is exactly ¾" thick. But plywood thicknesses vary and your stock will most likely measure a bit under ¾". (Our Baltic birch ply measured 11/16" thick.) Keep that in mind as you cut your parts; measure for pieces that fit onto or into existing assemblies, and adjust those dimensions accordingly.*

4 Mark 4" holes on both outer sides (D) [**Drawing 1**]. Cut the holes as you did earlier through both the outer sides and inner sides (B).

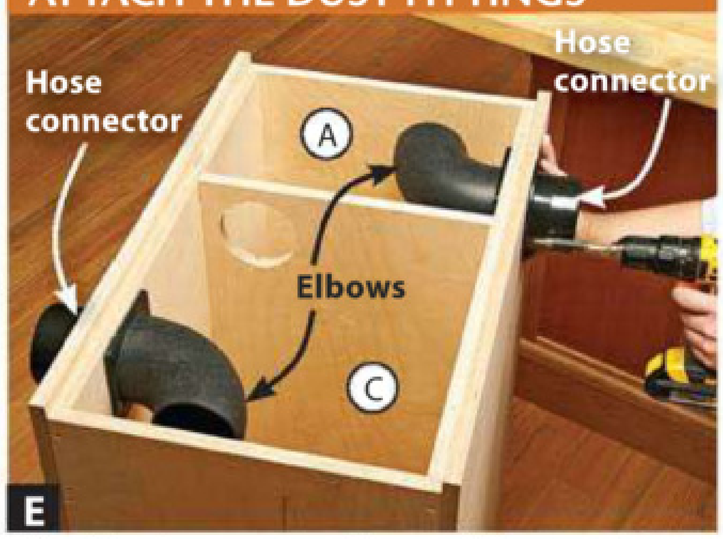
5 Cut the straight ends off two 4⅝"-flange plastic dust-collection elbows

A LITTLE OFF THE ELBOW, PLEASE



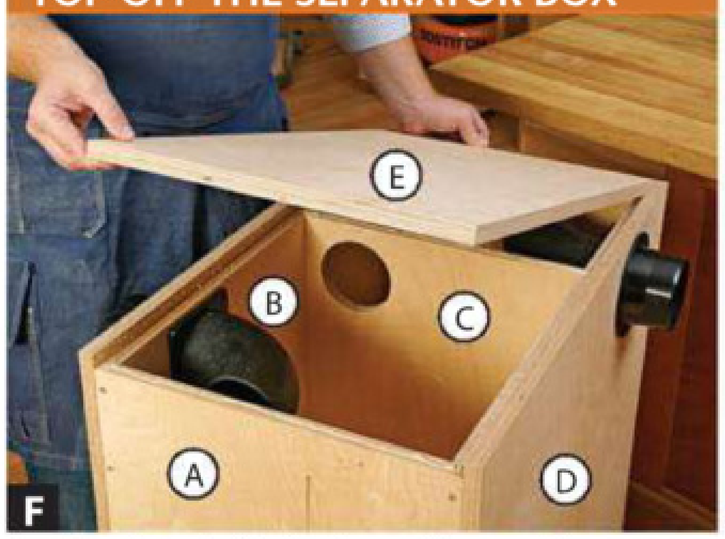
Clamp the flange of the elbow to your workbench to steady it. Then hacksaw off the straight portion of the unflanged end.

ATTACH THE DUST FITTINGS



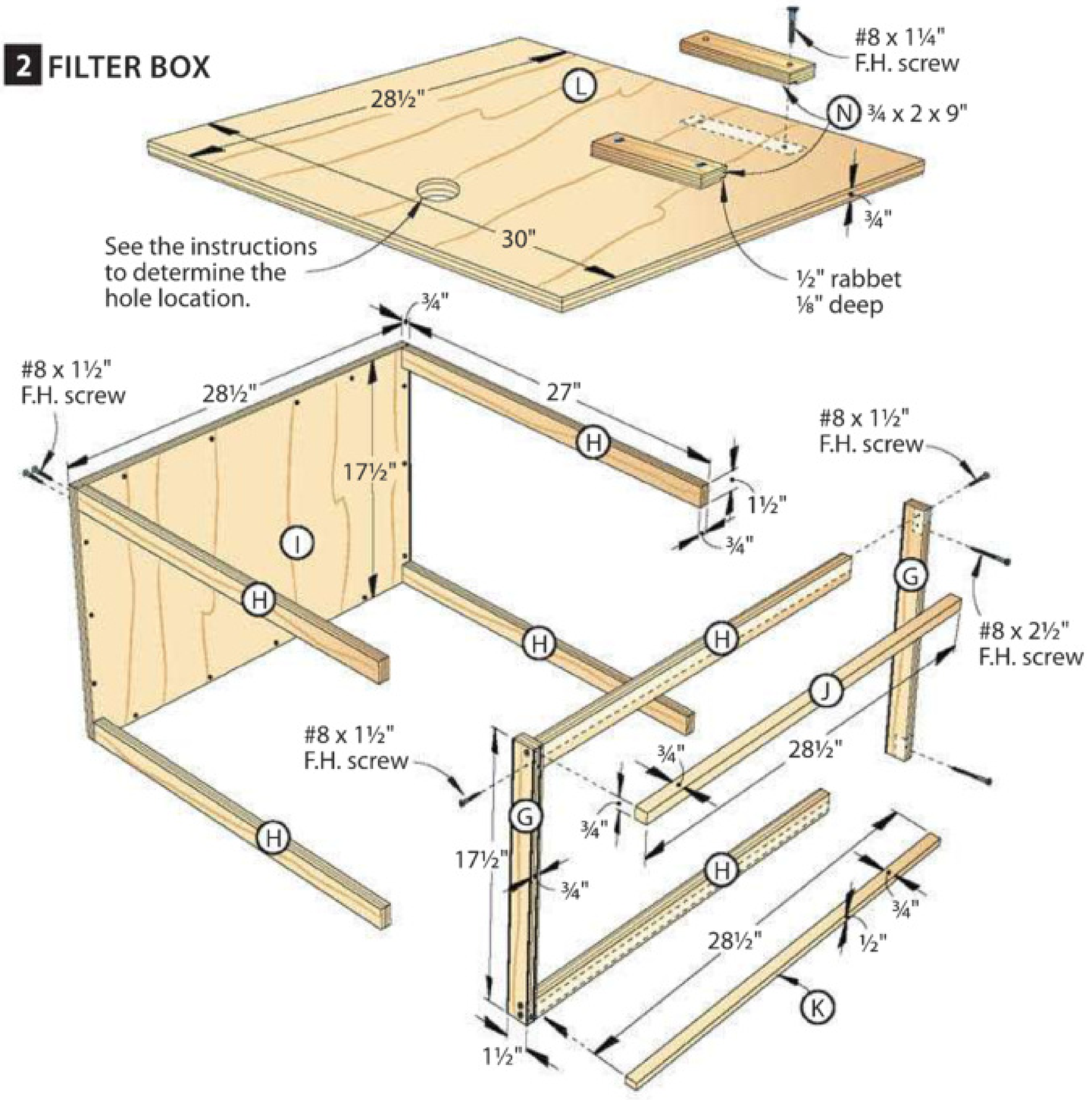
Align the hose connectors and flange elbows over the 4" holes in the outer sides (D) and attach the fittings with 1" screws.

TOP OFF THE SEPARATOR BOX



Apply a bead of glue to mating surfaces, align the separator-box top (E), and attach with countersunk 1½" screws.

2 FILTER BOX



(see **Sources** on *page 103*) [**Photo D**]. Attach the elbows and two 4" hose connectors [**Sources**] to the outer sides (D) [**Photo E**].

6 Cut the separator-box top (E) and glue and screw it in place [**Photo F**].

7 Cut the separator-box bottom (F) to size [**Drawing 1**] and attach it to the separator-box assembly (A–E) [**Photo G**].

Next, construct the filter box

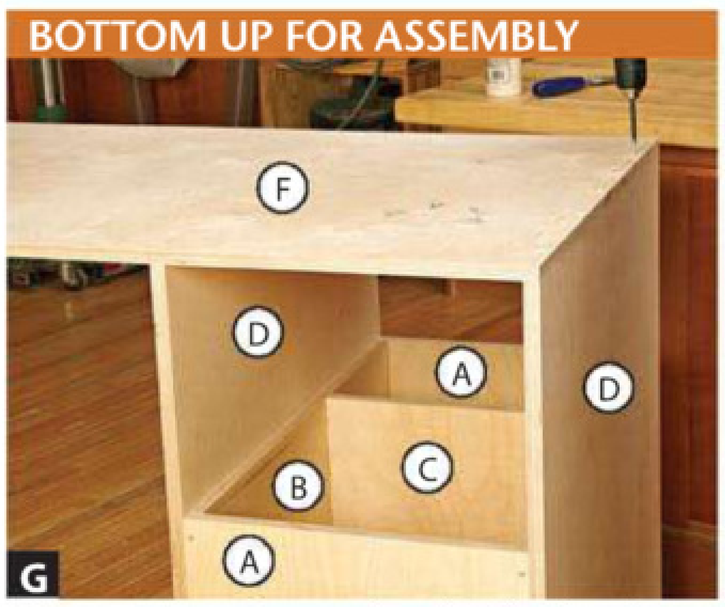
Note: *We sized this project to work with a Grizzly 1-hp, model G0710 dust collector [**Sources**] that stands about 13¾" tall. You may have to alter the height of the filter box to accommodate a different dust collector.*

1 Cut the vertical cleats (G), horizontal cleats (H), and back (I) [**Materials List, Drawing 2**]. Glue and screw together the filter-box assembly (G–I). Although 1½" screws work for joining most parts of this project, you'll need 2½" screws to reach through the edges of the vertical cleats and into the horizontal cleats.

2 Attach the filter-box assembly (G–I) to the separator box (A–F) [**Photo H**].

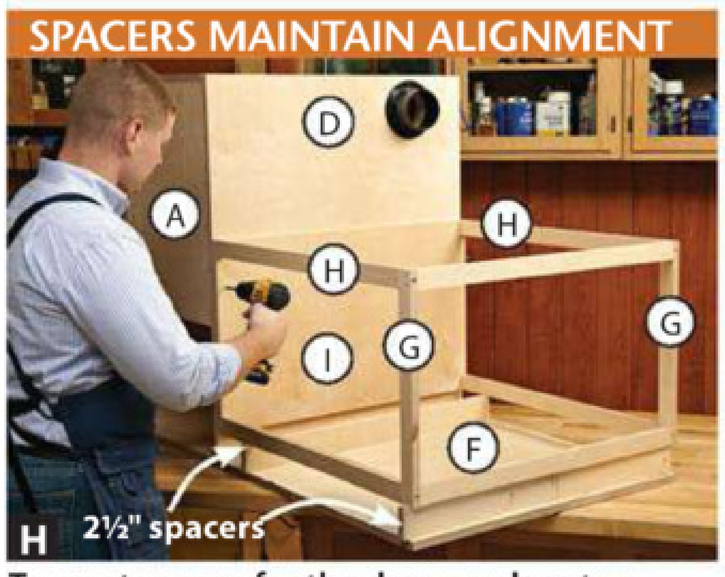
3 Cut the top spacer (J) and bottom-spacer (K) to size from ¾"-thick maple and the filter-box top (L) to size from ¾" plywood [**Drawing 2**]. Glue and clamp these pieces to the filter box assembly

BOTTOM UP FOR ASSEMBLY



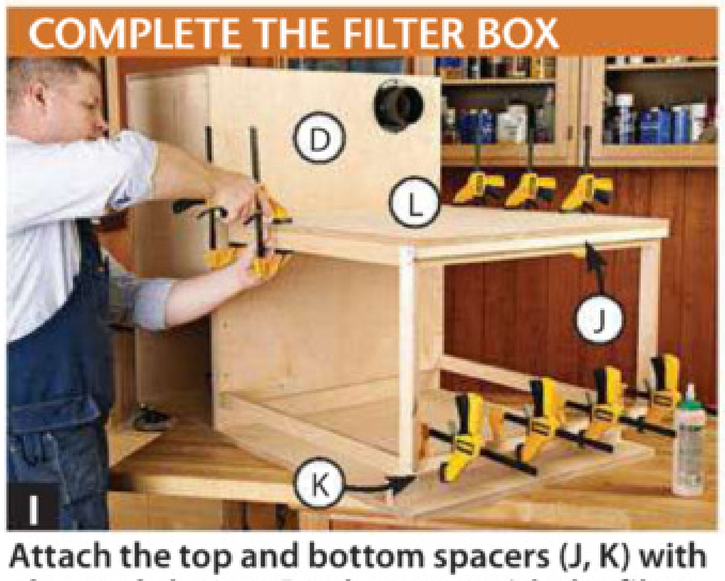
Flip over the separator box (A–E). Align the end of the separator-box bottom (F) with the outer sides (D) and join with glue and countersunk 1½" screws.

SPACERS MAINTAIN ALIGNMENT



To create space for the drawer, place two 2½"-tall scrapwood spacers beneath the filter box (G/H/I) to hold it in position as you attach it with 1½" screws.

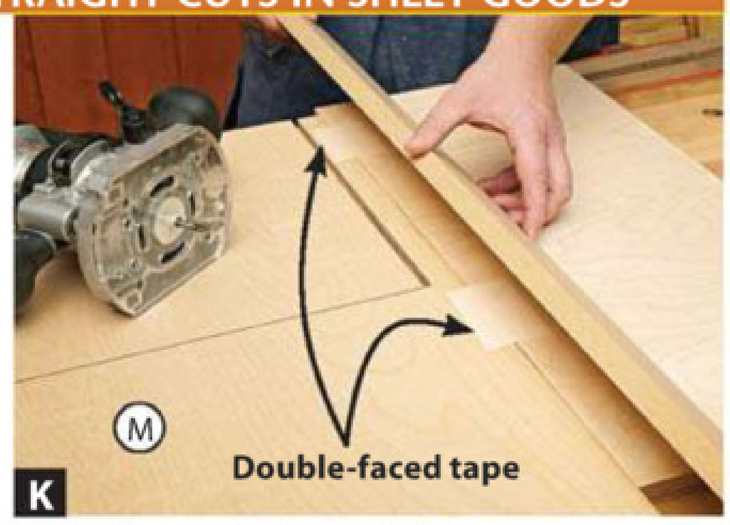
COMPLETE THE FILTER BOX



Attach the top and bottom spacers (J, K) with glue and clamps. Do the same with the filter-box top (L), clamping it on three sides.

YOUR ROUTER TO THE RESCUE ON STRAIGHT CUTS IN SHEET GOODS





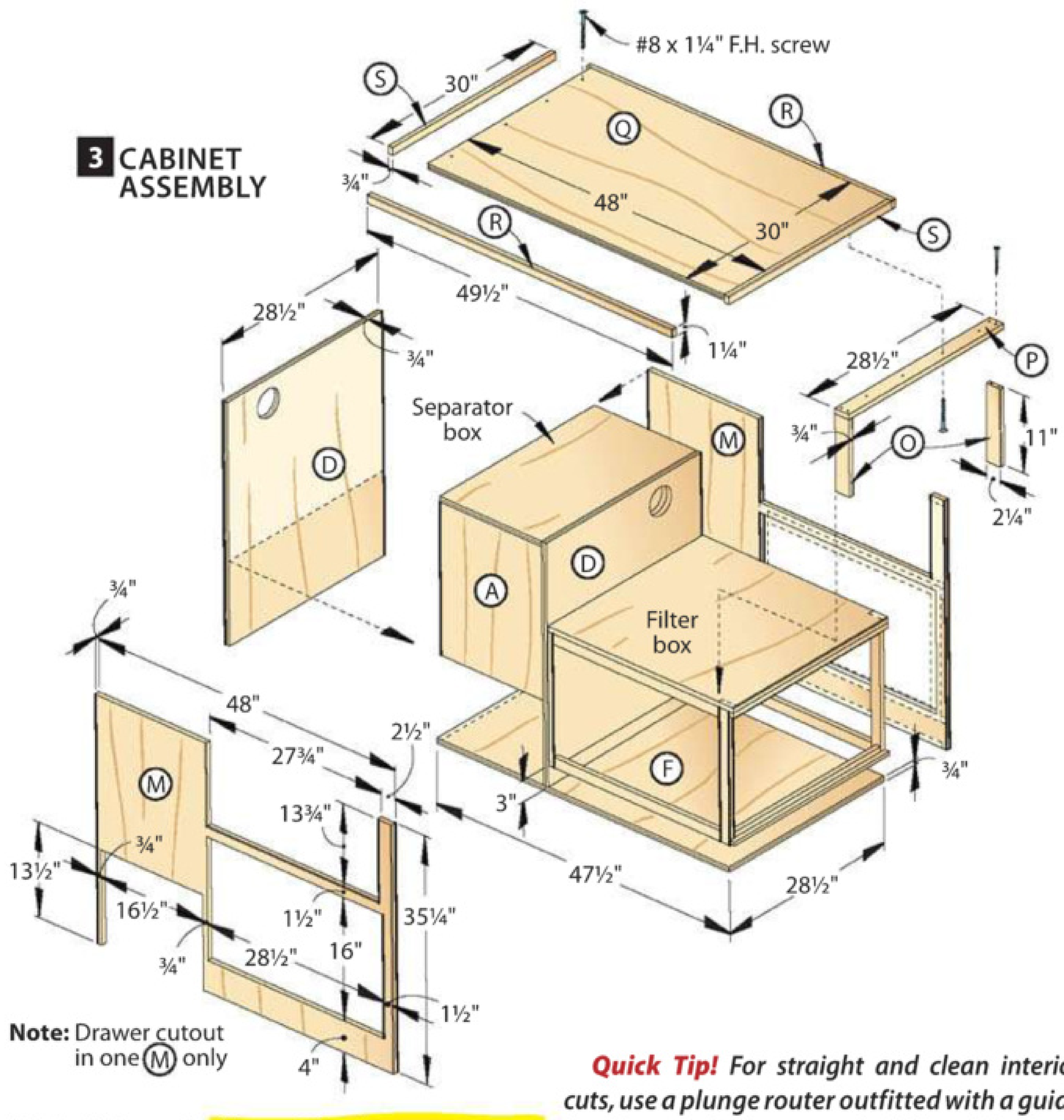
Place a sacrificial sheet (wood or extruded foam) under the cabinet sides (M) to protect your worksurface from the through cuts. For cuts near edges, support the straightedge and buttress the thin area of the workpiece with a plywood scrap of identical thickness.

THE SIDES SKIN THE STAND



Working on one side at a time, glue the cabinet sides (M) in place. The cabinet sides create recesses for the filters and help seal the separator box (A–F).

3 CABINET ASSEMBLY



Note: Drawer cutout in one (M) only

(G–I) [**Photo I**]. ***Note:*** *The bottom spacer rests ¼" above the bottom edge of the horizontal cleat (H) to create a stop for the drawer front added later.*

Add the sides, casters, dust collector, and top

1 Cut the cabinet sides (M) [**Drawing 3**]. The identically shaped sides mirror each other except that only one has a drawer cutout—something to keep in mind if one side of your plywood looks better than the other, and you want the good side facing out.

Quick Tip! *For straight and clean interior cuts, use a plunge router outfitted with a guide bushing and ¼" upcut spiral bit guided by a straightedge held in place with double-faced tape* [**Photos J and K**].

2 Glue and clamp the cabinet sides (M) to the separator/filter-box assembly (A–L) [**Photo L**].

Quick Tip! *Use a flush-trim bit in your router, if necessary, to trim the sides flush with other cabinet parts.*

3 Using ¼×1" lag screws with washers, attach 3" locking swivel casters to the corners of the bottom (F). If the points of the screws stick into the drawer openings you will need to file or grind them flush.

MOUNT THE DUST COLLECTOR



Screw down one end of each motor mount (N). Slide the blower's flanges under the motor mounts' rabbets and attach the other ends of the mounts.

4 Next, attach a 5×4" quick coupler [**Sources**] to the exhaust port on the dust-collector blower.

Quick Tip! *If the coupler fits loosely, adhere ¼" foam tape onto the exhaust for an airtight friction fit.*

Thread a 17" length of 4" dust collection hose [**Sources**] onto the quick coupler and attach a 4" connector to the opposite end of the hose using a 4" hose clamp. Run a 13" length of flexible hose between the connector on the separator box and the inlet of the dust-collector blower, securing both ends with 4" hose clamps. Position the blower so it rests entirely within the edges of the filter-box top (L). Bend the exhaust-port hose 90° and determine a mounting location for its connector. Cut a 4" hole at that location and attach the connector with 1" screws. Mark the location of the blower's mounting flanges; then remove the blower. Cut two rabbeted motor mounts (N) [**Drawing 2**], and secure the blower [**Photo M**].

5 Cut the two support stiles (O) and the support rail (P) to size [**Materials List,**





Staple along one long edge of the filter frame (BB/CC) first. Then, pull the filter fabric taut as you staple along the remaining edges. Trim off the extra material along all edges before gathering the corners and trimming those, too.

Drawing 3]. Glue the support stiles to the inside of the sides (M) and glue and screw the support rail atop the stiles.

6 Cut the top (Q), long edging (R), and short edging (S) [**Drawing 3**]. Glue the short edging to the top with one edge flush with the top surface. Using a handsaw, carefully trim the edging's ends flush with the top and attach the long edging. Trim that edging flush with the short edging. Set the top in place and secure one end with 1¼" screws driven from the bottom of the support rail (P). Secure the other end of the top with screws driven through the top and into the separator box (A–E).

Build and install the drawers

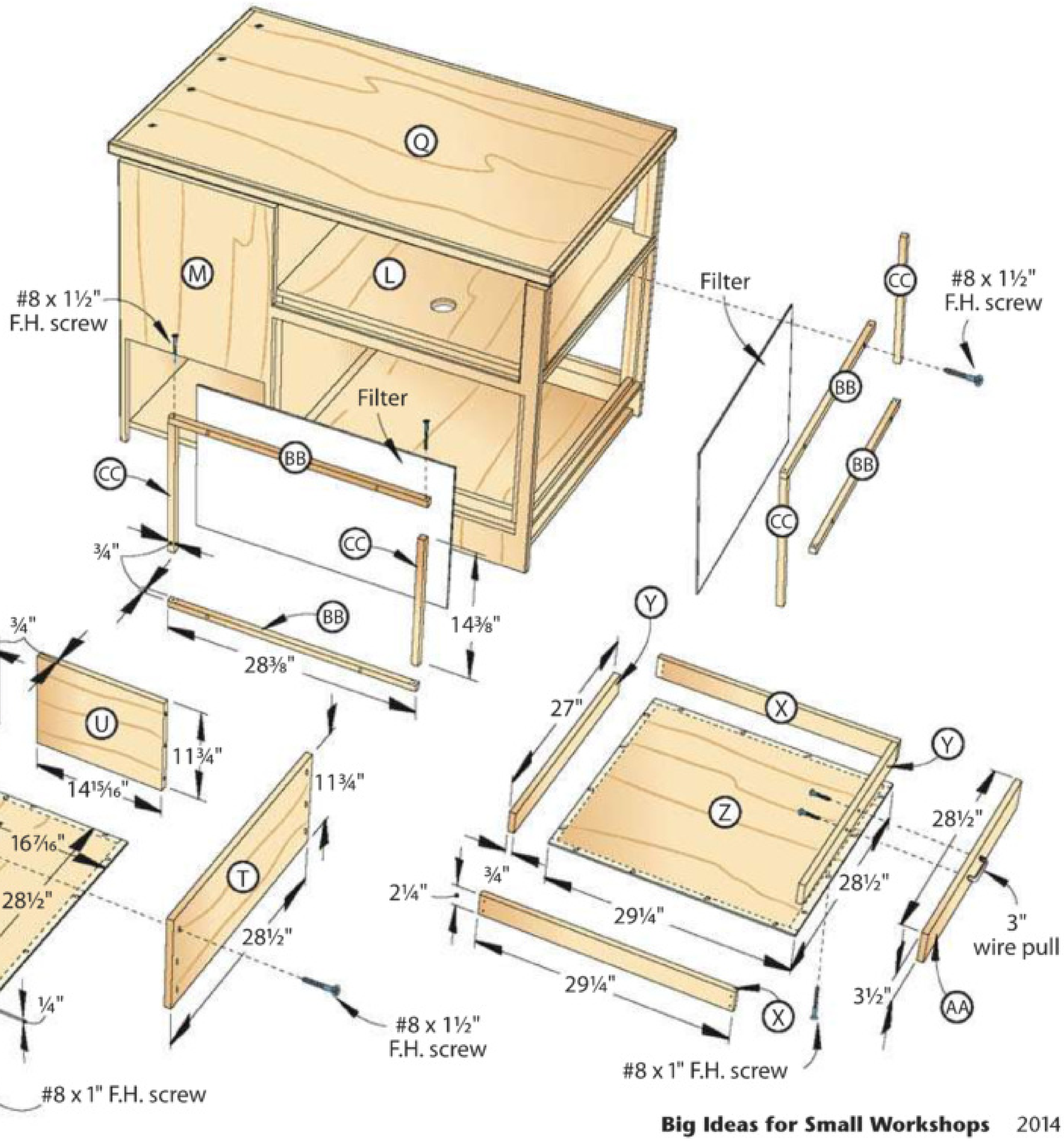
1 Cut the sides, fronts, backs, and bottoms for the separator drawer (T, U, V) and the filter drawer (X, Y, Z) [**Drawing 4**]. Temporarily assemble the drawer boxes using 1½" screws and attach the bottoms with 1" screws.

2 Test the fit of the drawer boxes (T–V; X–Z) in their openings. They should be snug to minimize air leaks, but slide easily. If necessary, disassemble the drawers and trim their parts. Once you're satisfied with the fit, assemble the drawer boxes with screws and glue.

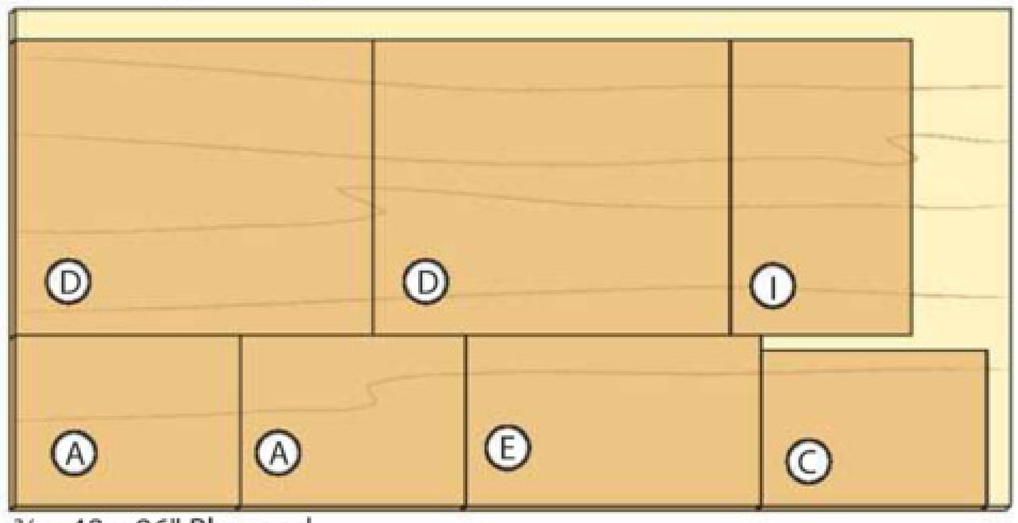
3 Slide the drawer boxes (T–V; X–Z) into their openings. Cut the false fronts (W, AA) to size, and check that they fit tightly with just a 1/16" gap at the top and sides.

4 Attach 3" wire pulls centered on both false fronts (W, AA); then remove the pulls. Apply double-faced tape to the fronts of the drawer boxes; then, align the false fronts in the openings, and press them onto the drawer-box fronts. Drive one screw through a hole for the wire pull, slide the drawers out, and remove the screw. Drill through the holes in the false fronts, and glue the false fronts to the drawers. Attach the wire pulls, using 2" machine screws to reach through the drawer front (U, Y) and false front.

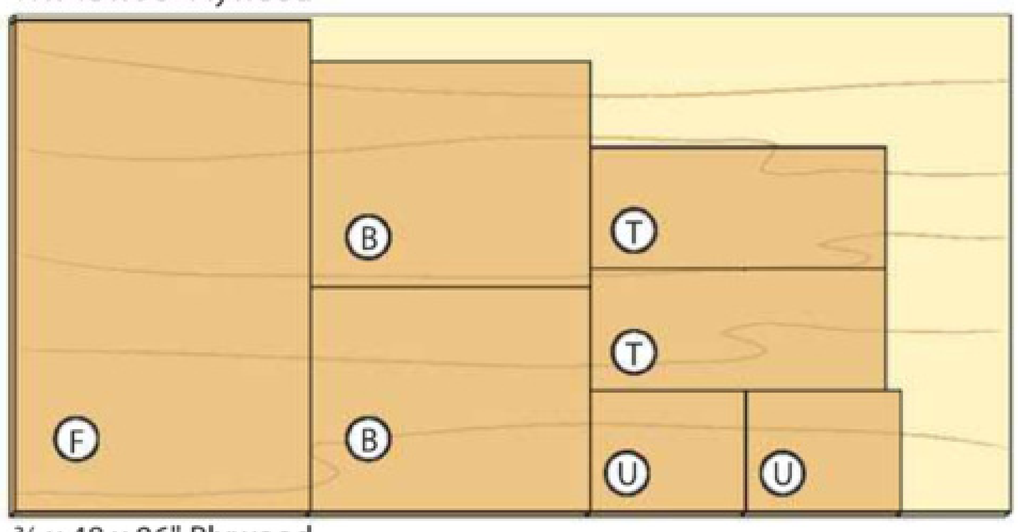
4 EXPLODED VIEW and FILTER FRAMES



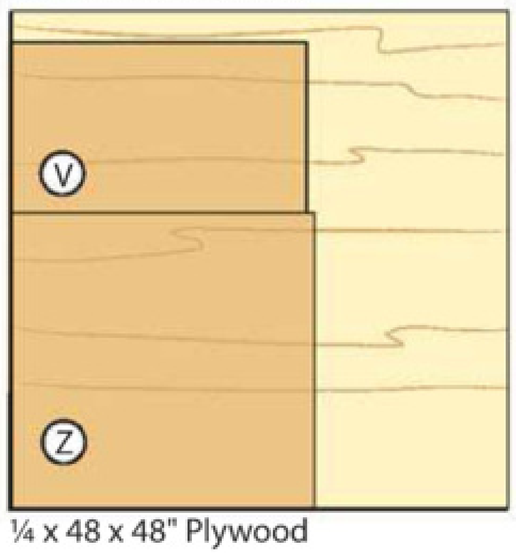
Cutting Diagram



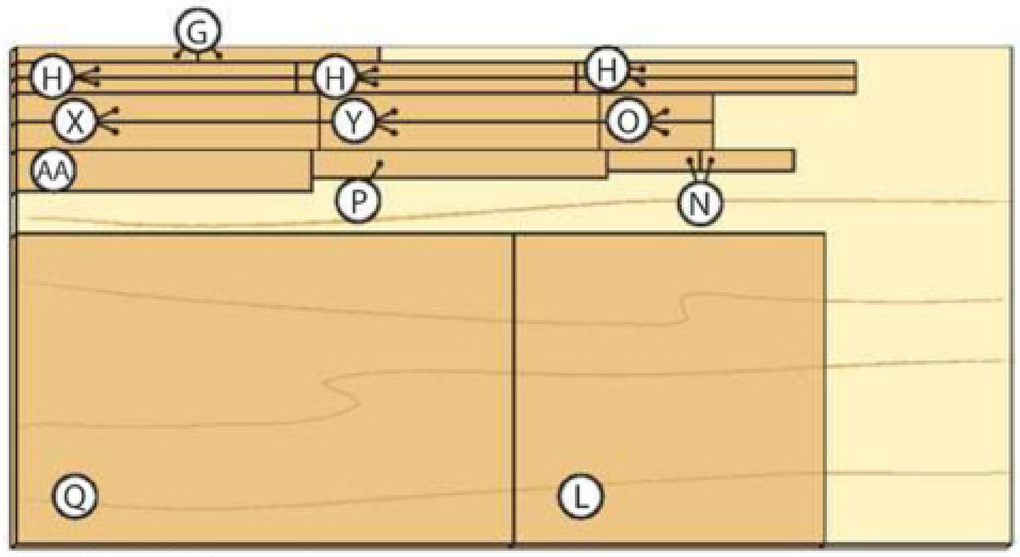
¾ x 48 x 96" Plywood



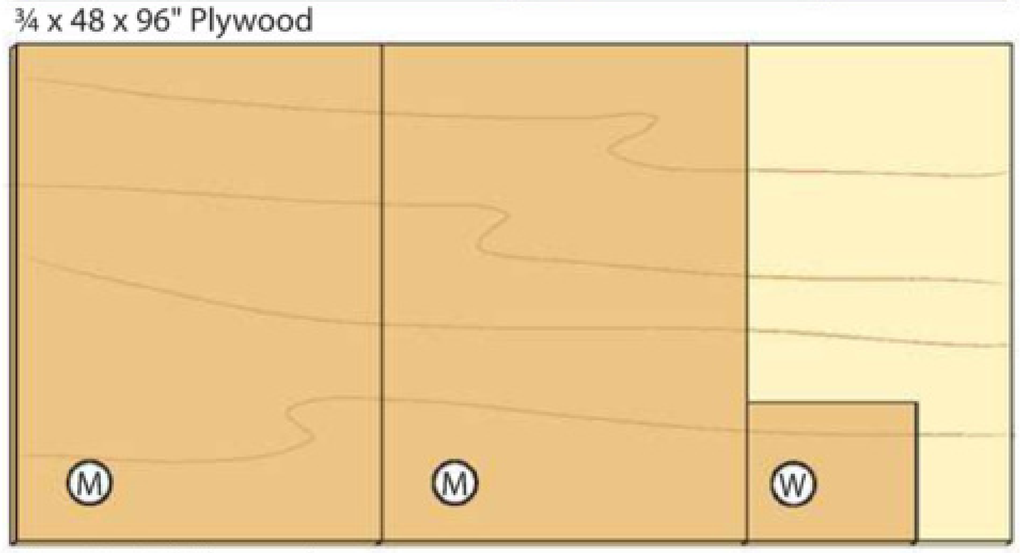
¾ x 48 x 96" Plywood



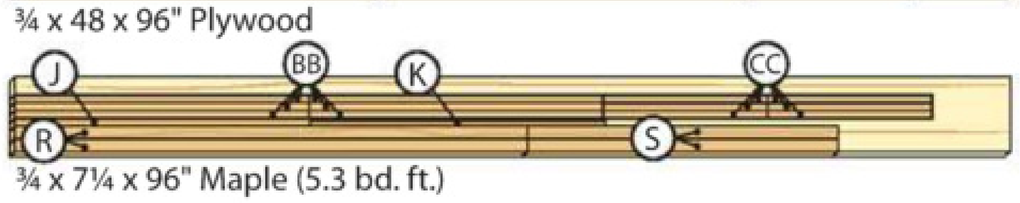
¼ x 48 x 48" Plywood



¾ x 48 x 96" Plywood



¾ x 48 x 96" Plywood



¾ x 7¼ x 96" Maple (5.3 bd. ft.)

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Separator box						
A	ends	¾"	16½"	21¾"	PL	2
B	inner sides	¾"	21¾"	27"	PL	2
C	baffle	¾"	15"	21¾"	PL	1
D	outer sides	¾"	28½"	34½"	PL	2
E	top	¾"	16½"	28½"	PL	1
F	bottom	¾"	47¼"	28½"	PL	1
Filter box						
G	vertical cleats	¾"	1½"	17½"	PL	2
H	horizontal cleats	¾"	1½"	27"	PL	6
I	back	¾"	28½"	17½"	PL	1
J	top spacer	¾"	¾"	28½"	M	1
K	bottom spacer	¾"	½"	28½"	M	1
L	top	¾"	30"	28½"	PL	1
Cabinet						
M	sides	¾"	48"	35¼"	PL	2
N	motor mounts	¾"	2"	9"*	PL	2
O	support stiles	¾"	2¼"	11"	PL	2
P	support rail	¾"	2¼"	28½"	PL	1
Q	top	¾"	30"	48"	PL	1
R	long edging	¾"	1¼"	49½"	M	2
S	short edging	¾"	1¼"	30"	M	2

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Separator drawer						
T	sides	¾"	11¾"	28½"	PL	2
U	front & back	¾"	11¾"	14 15/16"	PL	2
V	bottom	¼"	16 7/16"	28½"	PL	1
W	false front	¾"	16 7/16"	13 7/16"	PL	1
Filter drawer						
X	sides	¾"	2¼"	29¼"	PL	2
Y	front & back	¾"	2¼"	27"	PL	2
Z	bottom	¼"	28½"	29¼"	PL	1
AA	false front	¾"	3½"	28½"	PL	1
Filter frame						
BB	rails	¾"	¾"	28⅜"	M	6
CC	stiles	¾"	¾"	14⅜"	M	6

*Part length may vary depending on the size of your dust-collector blower.

Materials key: PL–plywood, M–maple.
Supplies: Double-faced tape, #8×1" flathead screws (52), #8×1¼" flathead screws (12), #8×1½" flathead screws (128), #8×2½" flathead screws (4), 3" wire pulls (2), #8-32×2" truss-head machine screws (4), 3" locking swivel casters (4), ¼×1" lag screws (16), ¼" washers (16), ½" staples.
Bits: ¾" drill bit; ¼" upcut spiral, flush-trim router bits.

Sources

Dust-collection fittings: 4⅝" flange elbows (2), no. D4223, $5.95 each; 4" connectors (3), no. D4262, $3.50 each; 5×4" quick coupler, no. D4233, $2.95; 4" hose clamps (4), no. W1022, $.50 each; Grizzly Industrial, 800-523-4777, grizzly.com.
Dust hose: 4"×10' clear flexible hose, no. D4206, $17.95, Grizzly Industrial.
Dust collector: Model G0710, $175, Grizzly Industrial.
Filter fabric: 36×82" 10-oz. polyester felt, singed one side, $25, woodmagazine.com/filter.

Add the filters and finishing touches

Quick Tip! *In Step 3 of this section you will need to drive staples into the filter frames to secure the fabric. If you rely on a hand stapler instead of a pneumatic stapler, build the frames from pine instead of maple.*

1 Cut six filter-frame rails (BB) and six filter-frame stiles (CC) [**Materials List**]. Glue and screw together three filter frames [**Drawing 4**]. Check to make sure they fit into their openings with ⅛" to spare all the way around.

2 Apply a durable finish to all surfaces. We applied three coats of a water-based polyurethane.

3 Cut three 21×32" pieces of filter fabric [**Sources**]. Staple those pieces to the filter frames [**Photos N, O**].

4 Place the filters within their openings with the fabric facing inward. Attach the frames with two countersunk 1½" screws driven through each frame rail (BB).

5 Attach a length of flexible hose to the connector on the outside of the separator box. Hook up the other end of the hose to any dust-belching machine in your shop and enjoy your new level of dust-collection efficiency.

Rolling tool cabinet

Don't settle for metal. Build a chest beautiful enough to pass for fine furniture.

Dimensions: 30½"W × 21"D × 50³⁄₁₆"H
Approximate materials cost: Lumber and plywood–$320. Hardware–$255.

The inspiration for this cabinet came from the steel mechanics' tool chests seen in so many garages. We took that basic design and classed it up to suit a woodworking shop.

For years to come, you'll gain satisfaction from tugging on the brass knobs and feeling the drawers—sized to hold everything from pencils and chisels to full-size routers—glide open effortlessly on full-extension slides. A lidded top tray provides quick access to frequently used tools and a place to set them while working. Casters hidden below the base allow you to roll everything wherever needed in your shop.

We joined the carcase with biscuits to simplify and speed up construction. And even though each drawer looks slightly taller than the one above it, we designed only three drawer-box sizes to minimize tool setups and reduce stacks of differently sized parts. Simple and strong lock-rabbet joints, cut entirely on the tablesaw with a ¼" dado blade, make drawer construction a snap.

John Olson, Design Editor

Put an edge on plywood parts

1 Using a circular saw guided by a straightedge, and following the **Cutting Diagram** on *page 110,* rip one 8'-long blank 18⅝" wide and another 18⅞" wide from a sheet of ¾" walnut plywood.

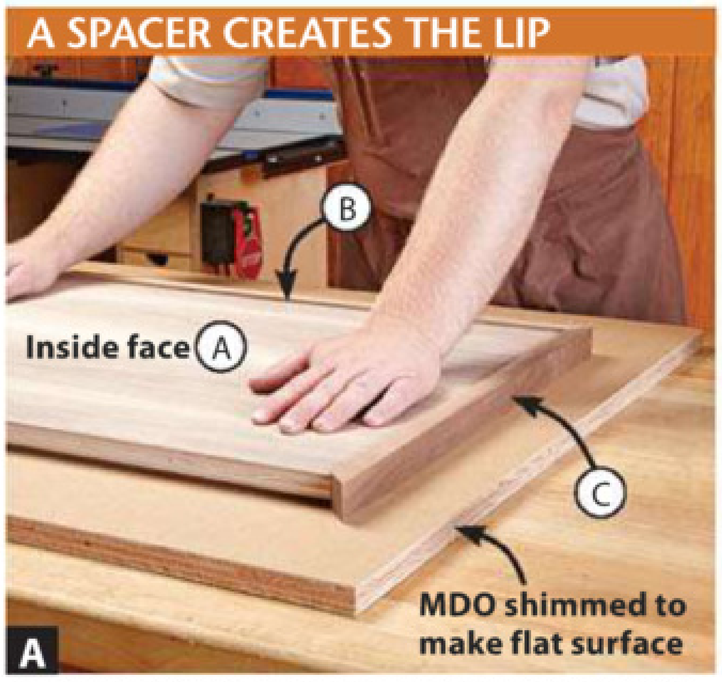
***Quick Tip!** To prevent chip-out, use a 60-tooth plywood blade, cut with the good face of the plywood down, and cover the cutline on the top face with painter's tape.*

Set the wider blank aside for the top/bottom panels (E), divider panel (J), and lid panel (GG).

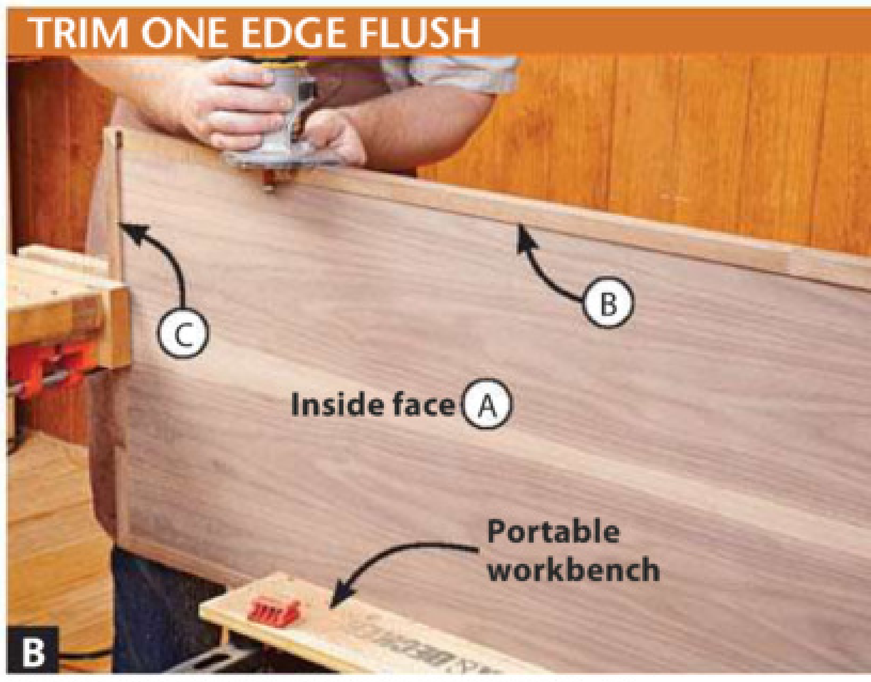
2 From the 18⅝"-wide blank, crosscut two side panels (A) to 41⅛" long, stack them with their factory edges flush, and, with your circular saw, crosscut them to finished length [**Drawing 1**]; then rip them to final width at the tablesaw. Finish-sand the outside faces of the side panels to 220 grit.

3 Cut the long panel edging (B) and the short panel edging (C) ⅛" wider and 1" longer than finished size [**Materials List,** *page 110*]. Cut the top/bottom panel edging (D) ⅛" wider than listed, but to finished length [**Drawing 2**].

4 Miter the long panel edging (B) and short panel edging (C) to fit around the side panels (A). Cut a piece of ¼" plywood to about 16×36" and lay a side panel on it, inside face up [**Photo A**]. Glue and clamp the long and short panel edging to the side panel. Install a flush-trim bit in your router and rout only the inside face of the edging [**Photo B**].

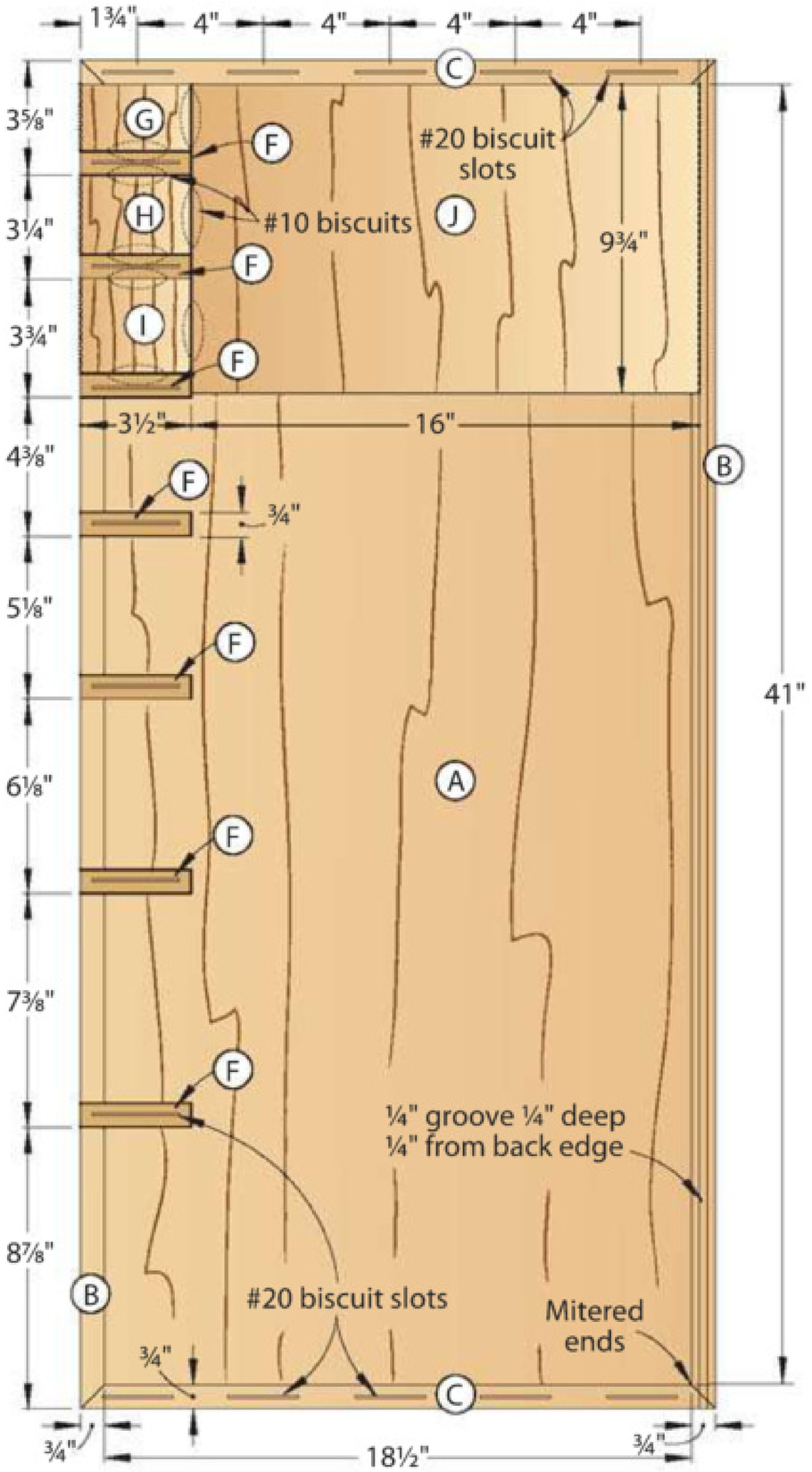


A scrap of ¼" plywood below the side panel (A) creates an even lip with the long and short panel edging (B, C) on the outside face of the panel.

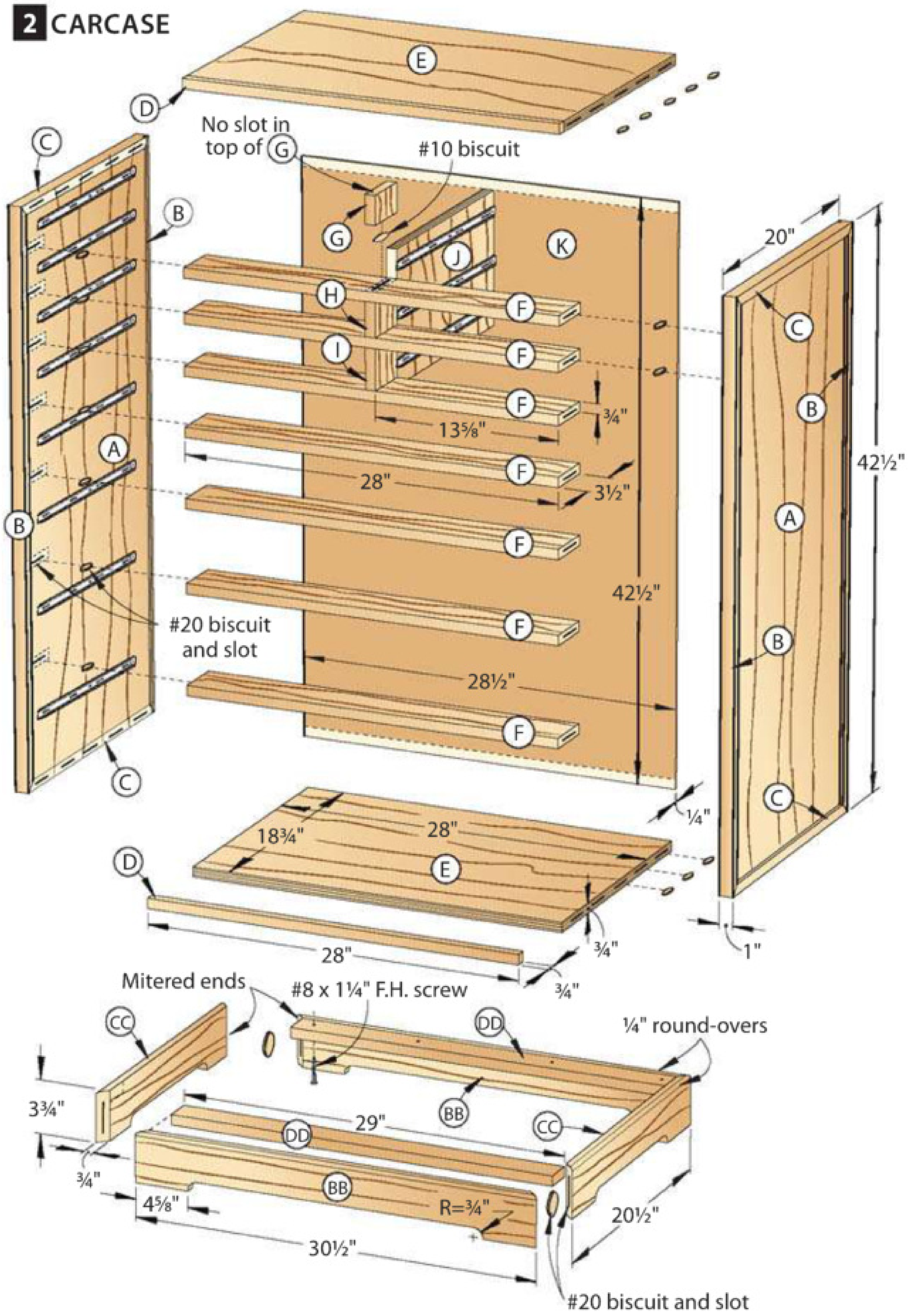


Support each side-panel assembly (A–C) on edge while routing the panel edging (B, C) flush with the inside faces of the side panels (A).

1 SIDE VIEW (Left side, inside face)



2 CARCASE

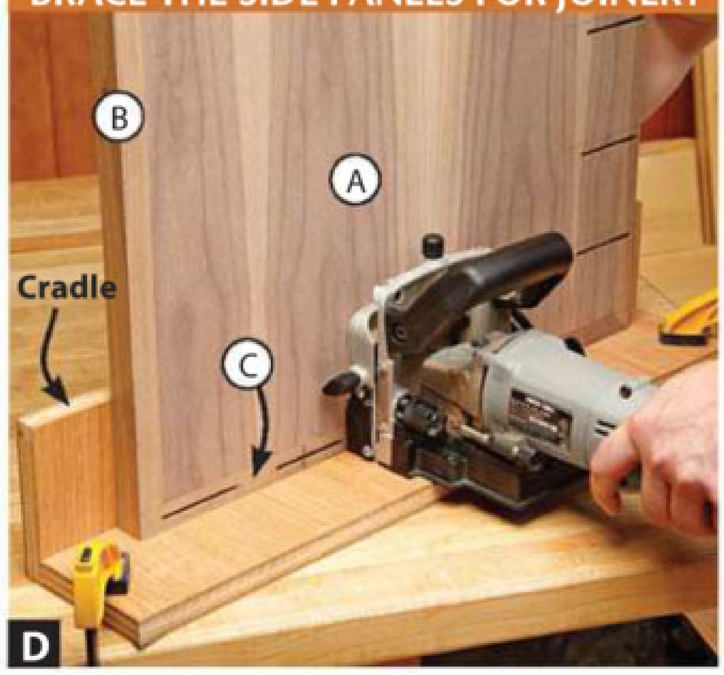


A T-SQUARE POSITIONS THE JOINER



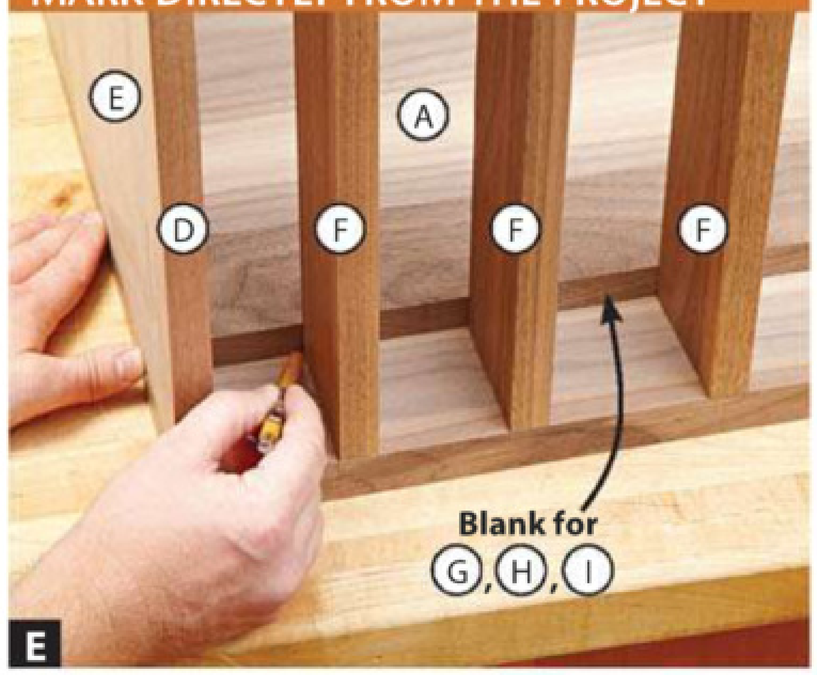
Press the base of the joiner against the T-square and align the mark on the center of the tool's fence with the mark 1¾" from the front edge. Cut the slot.

BRACE THE SIDE PANELS FOR JOINERY



The cradle supports the side assembly (A–C) and provides a flat surface for registering the biscuit joiner while cutting the slots.

MARK DIRECTLY FROM THE PROJECT



Mark along each face of the dividers (F) to determine the exact lengths of the top, middle, and bottom vertical dividers (G, H, I).

5 Cut the top and bottom panels (E) to size; then glue the top/bottom panel edging (D) to the panels [**Drawing 2**]. After the glue dries, flush-trim both faces of the edging and finish-sand the panel assemblies (D/E).

The biscuiting begins

Note: *Cut all biscuit slots on this project with the biscuit joiner fence folded up.*

1 On the inside face of each side assembly (A/B/C), lay out the bottom edge of each divider (F) [**Drawing 1**]. Mark an intersecting line on each layout line 1¾" from the front face of the long panel edging (B). Then lay out the five biscuit-slot locations on the short panel edging (C) and the mating locations on the top and bottom panels (D/E).

2 From 2×12" and 2×24" scraps of ¾" plywood, build a T-square like the one shown in **Photo C**. Clamp it along each layout line and set the biscuit joiner to cut slots ⅜" above the base of the tool. With the base of the joiner facing the bottom of the panel and resting against the edge of the T-square, cut #20 biscuit slots for the dividers (F). To cut the slots in the short panel edging (C) easily, make a cradle from scrap plywood [**Photo D**]. Cut the mating biscuit slots in the ends of the top and bottom panels (D/E).

3 Cut the dividers (F) to size [**Drawing 2**] and sand them to 150 grit. With their bottom faces down, cut #20 biscuit slots in each end of each divider. Place #20 biscuits in the slots and dry-fit a side assembly (A/B/C), the top panel (D/E), and the three top dividers.

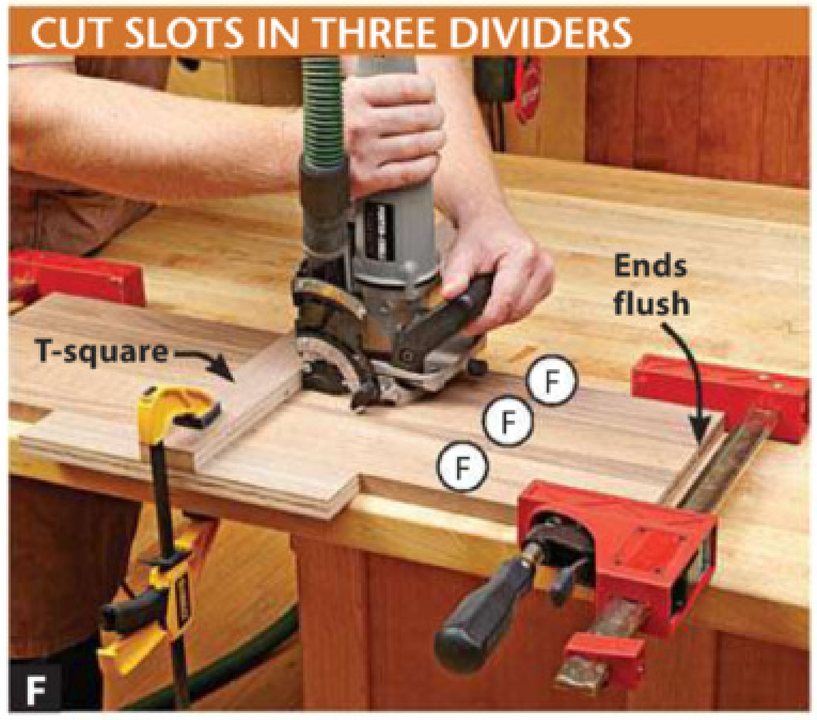
4 Cut a ¾×3½×12" blank for the top, middle, and bottom vertical dividers (G, H, I) and butt it against the top panel (D/E) and the rear edges of the dividers (F) [**Photo E**]. Mark the lengths of the top, middle, and bottom vertical dividers; then crosscut the vertical dividers to length. To locate the groove for the back panel (K), mark the rear edge of the top panel on the side assembly (A/B/C). Cut a ¼" groove ¼" deep along the mark [**Drawing 1**].

5 Cut #10 biscuit slots centered in the ends of the top, middle, and bottom vertical dividers (G, H, I) [**Drawing 1**; **Shop Tip** *below*]. ***Note:*** *Cut a slot in only the bottom end of the top vertical divider (G).*

6 Clamp three dividers (F) together with their ends flush [**Photo F**], and mark a line ⅜" to one side of the centerline. Align the T-square with this line and cut biscuit slots centered on the length of the dividers. Set one divider aside, transfer the line around to the opposite faces of the two remaining dividers, and cut slots on these faces.

7 Glue biscuits in the slots and clamp the vertical dividers (G, H, I) to the three dividers (F). Ensure the assembly is square and that the front edges are flush. After the glue dries, cut the divider panel (J) to length [**Drawing 1**]. Mark three locations for #10 biscuits on the front edge of the divider panel and the rear of the vertical dividers, and cut slots on these marks [**Shop Tip**, *opposite page*]. Then glue the divider panel in place.

CUT SLOTS IN THREE DIVIDERS



The T-square ensures that the biscuit slots for the vertical dividers (G, H, I) align across the centers of all three dividers (F).

8 Begin assembling the carcase by gluing the top panel (D/E) to a side panel (A/B/C). Glue the divider assembly (F–J) to the top and side panel [**Photo G**]. Then glue the remaining dividers (F) and bottom panel (D/E) to the side panel. Glue the

SHOP TIP

Secure short pieces to simplify slotting

To safely hold the vertical dividers (G, H, I), trap them in a jig made from scrap sheet goods. First, screw your biscuit joiner to a base and clamp the base to your bench. Clamp a fence on the base square to the face of the joiner. Keep your hands away from the cutter at the front of the tool by holding another scrap behind each divider as you cut the slots.



SHOP TIP

To cut slots, go over the edge

To support the divider assembly (F–I) when cutting the biscuit slots in the vertical dividers (G, H, I), extend two 3"-wide scraps past the edge of your bench. Clamp the divider assembly to the scraps and rest the biscuit joiner on the scrap when cutting the slots.



remaining side panel in place and check the assembly for square.

9 Measure for the back panel (K) [**Drawing 2**], cut it to size, and set it aside.

Build a bunch of drawers

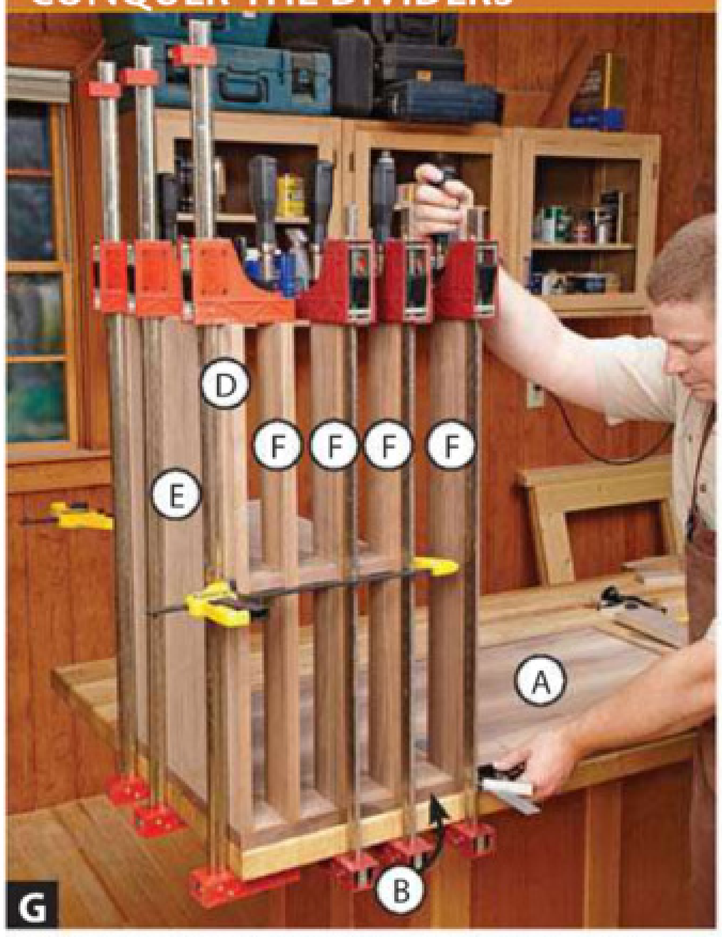
***Quick Tip!** Instead of planing down ¾"-thick stock for the ½"-thick drawer parts, maximize your yield by resawing and planing 6/4 stock.*

1 Cut the drawer fronts and backs (L, O, Q) and sides (M, P, R) to size [**Materials List**, **Drawings 3** and **4**]. To form the lock-rabbet joints, rout or cut a ¼" dado ¼" deep, ¼" from the end of each drawer side. Cut rabbets on each end of the drawer fronts and backs to create tongues that fit the dadoes in the sides. Next, cut a ¼"-deep groove in each piece to accept the plywood for the drawer bottoms (N, S); then cut the drawer bottoms to size. Finish-sand the inside faces of the drawer parts to 220 grit; then glue up the drawers.

2 Draw a line across each side panel (A) and the center panel (J) centered in each drawer opening. Center the cabinet half of a drawer slide on each line, using the T-square made earlier to position it, and secure each slide with two screws [**Photo H**].

3 Screw the drawer half of each drawer slide to the drawer sides (M, P, R), flush with the front end and centered on the width of the side. Test the fit and operation of the drawers in the carcase. Make any needed adjustments to the drawer slides; then drive the remaining screws into each half of the slides.

CONQUER THE DIVIDERS



G

Check each divider (F) as you clamp it in place to ensure that it lies flush and square with the front of the long panel edging (B).

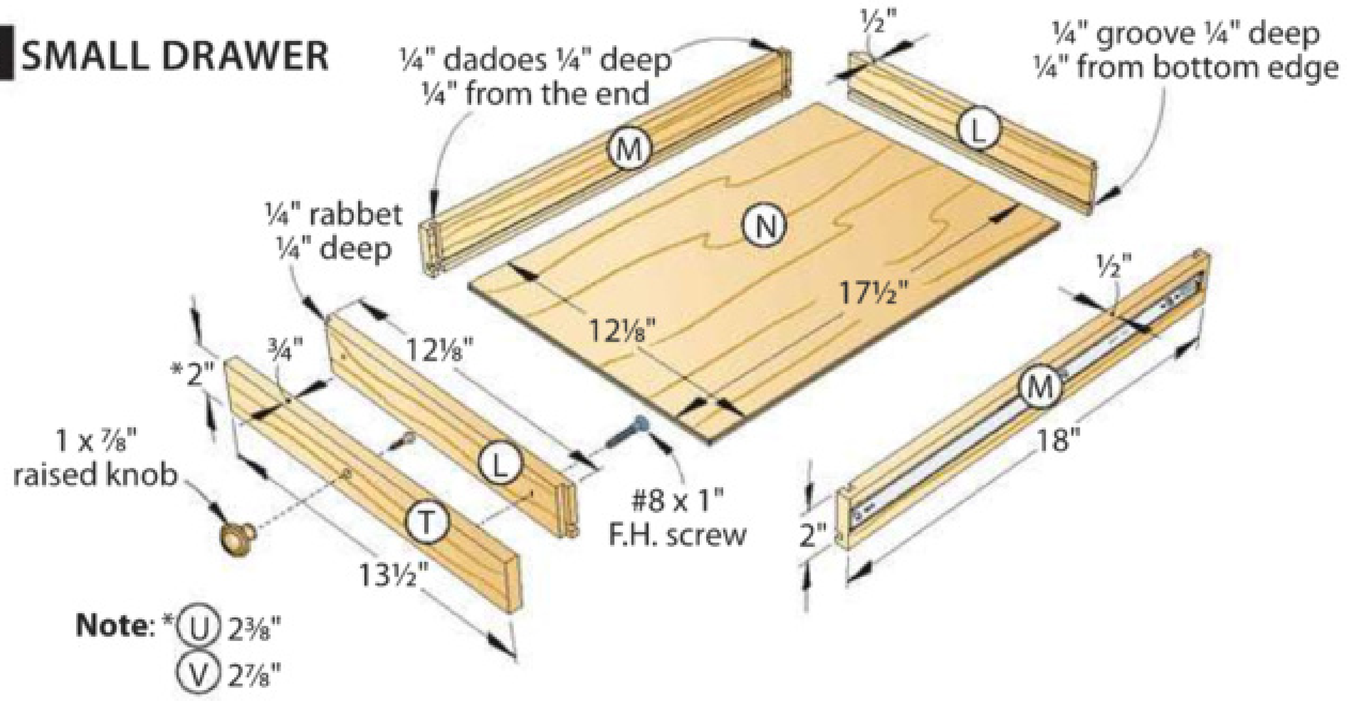
ALLOW FOR SLIDE ADJUSTMENTS



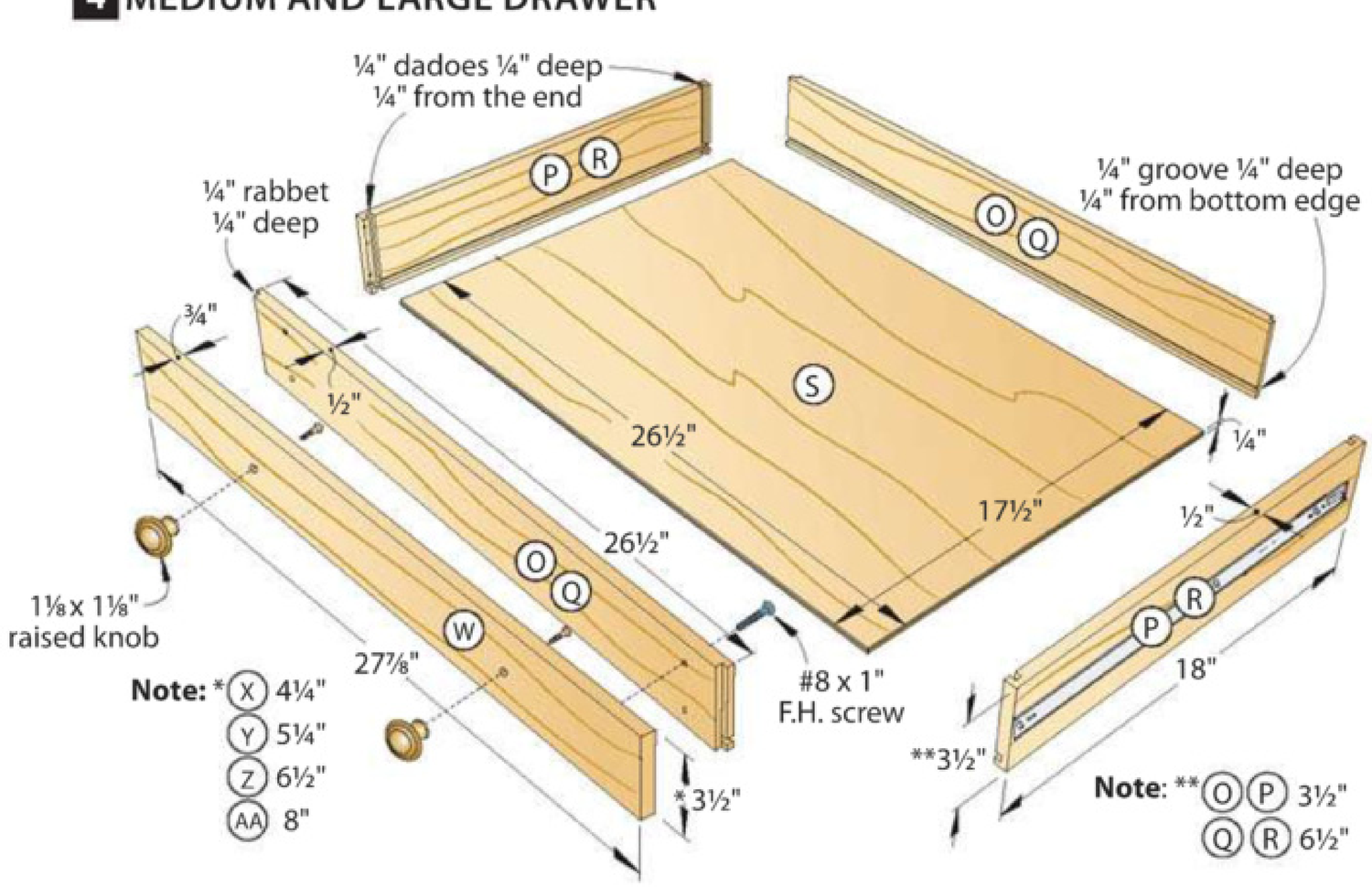
H

Drive only two screws, each into the elongated holes in the drawer slides, to allow for adjusting the drawer positions later.

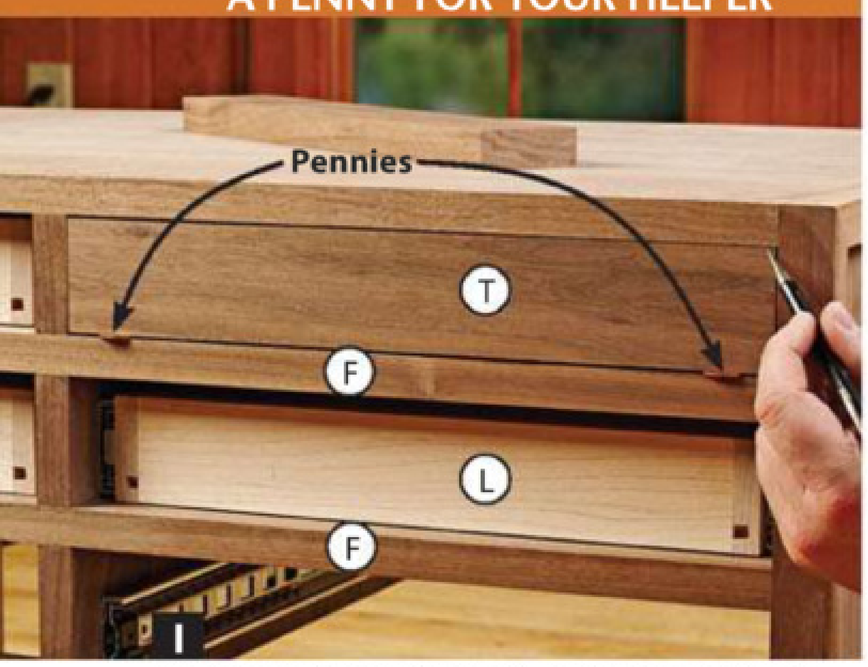
3 SMALL DRAWER



4 MEDIUM AND LARGE DRAWER



A PENNY FOR YOUR HELPER



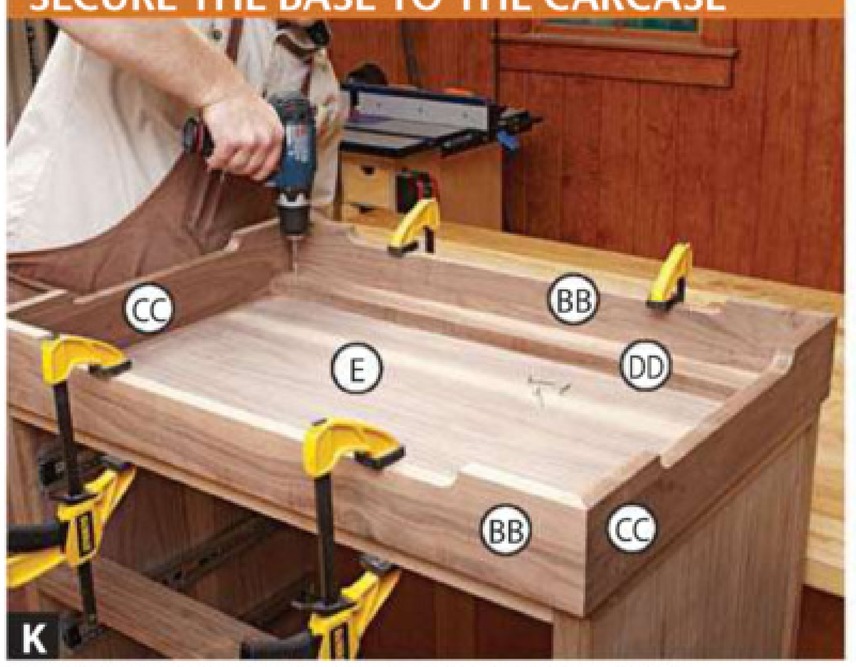
Rest each drawer face (T–AA) on pennies to create a 1/16" gap below; then mark any areas needing to be trimmed for a uniform gap all around.

ROUT A STRAIGHT EDGE



Align the edge of a 3/4" straight bit with the far side of a hole in a base trim (BB) piece. Lock the fence against the straightedge and rout away the waste.

SECURE THE BASE TO THE CARCASE



Turn the carcase upside down and center the base (BB–DD) on it. Apply glue to the base cleats (DD) and screw them to the bottom panel (E).

4 To allow 1/16" clearance all around, cut the drawer faces (T–AA) 1/8" narrower and shorter than their respective drawer openings. Dry-fit each drawer face in its opening, and scribe any areas that need trimming [**Photo I**].

***Quick Tip!** Label the back of each drawer face, and mark an arrow pointing up to help you realign the faces when reattaching them.*

5 In the back of each drawer face (T–AA), lay out and drill counterbores and shank holes for the machine screws that secure the knobs [**Drawings 3** and **4**]. Install the knobs. Affix a short strip of double-faced tape to the back of each drawer face and, again resting the drawer face on pennies, press it against its respective drawer. Gently pull out the drawer and face far enough to allow you to drive screws through the drawer fronts (L, O, Q) and into the faces.

6 Remove the drawers, detach the faces (T–AA), remove the double-faced tape and knobs, and finish-sand the drawer faces.

7 Retrieve the back panel (K). Apply a ribbon of glue into the grooves in the long panel edging (B), and slide the back panel in place [**Drawing 2**].

The base helps it roll

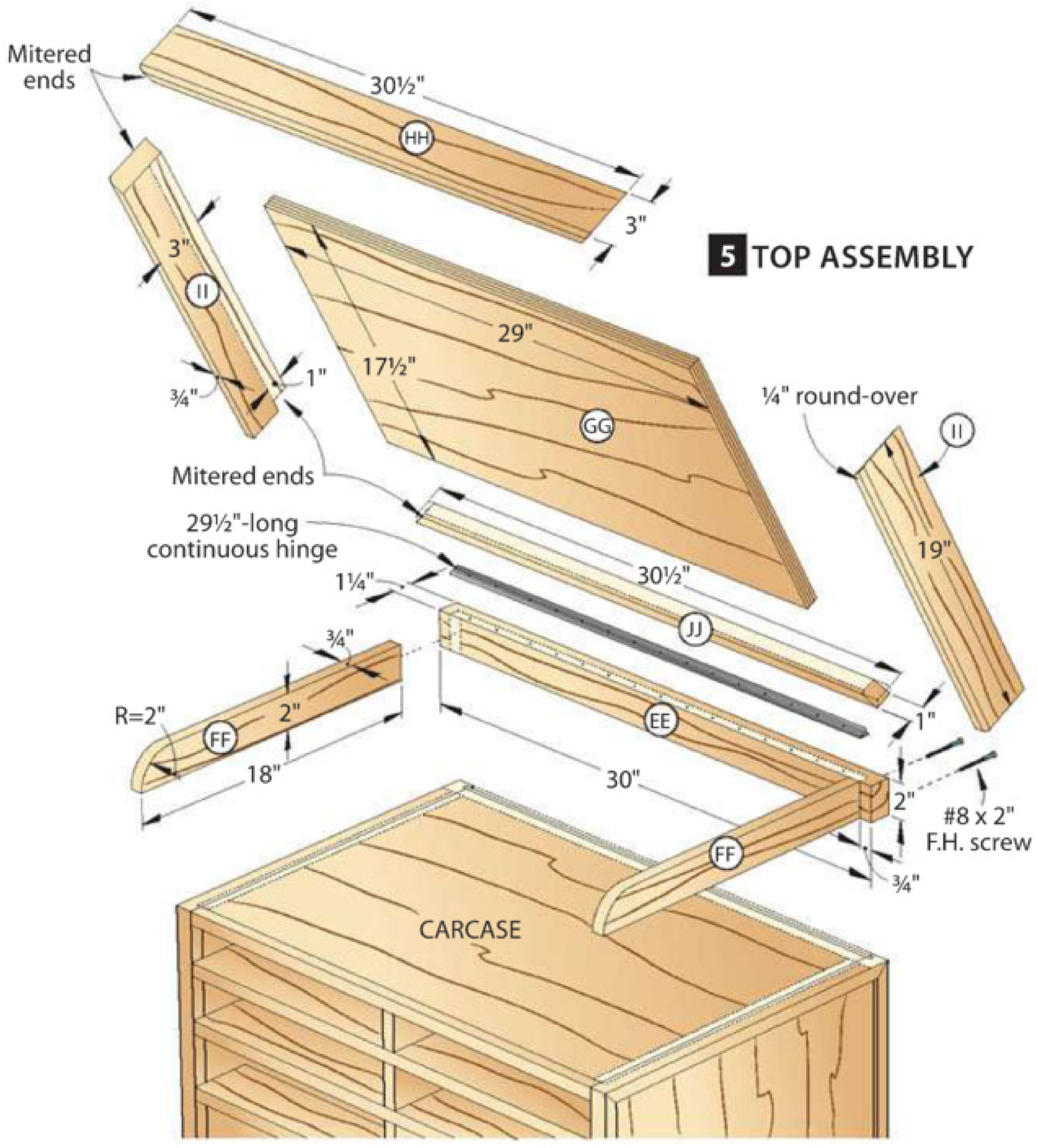
1 From 4"-wide stock, miter-cut the long base trim (BB) and short base trim (CC) to finished length [**Drawing 2**]. On the outside face of each piece, lay out a point 5 3/8" from each end and 3 3/4" from the top edge. Drill 1 1/2" holes centered on these marks, and connect the top edges of the holes with a straight line.

2 Rip the bottom edge of the long and short base trim (BB, CC) to bring the pieces to 3 3/4" wide. To remove the waste between the holes, bandsaw to within 1/8" of the line.

3 Complete the profile by mounting a 3/4" straight bit in your table-mounted router and raising it 3/8" above the table. Adhere a straight-edged scrap to the face of each base trim piece (BB, CC), flush with the bottom edge, and rout between the holes in each piece [**Photo J**]. Raise the bit to 13/16" and rout away the remaining waste on each piece.

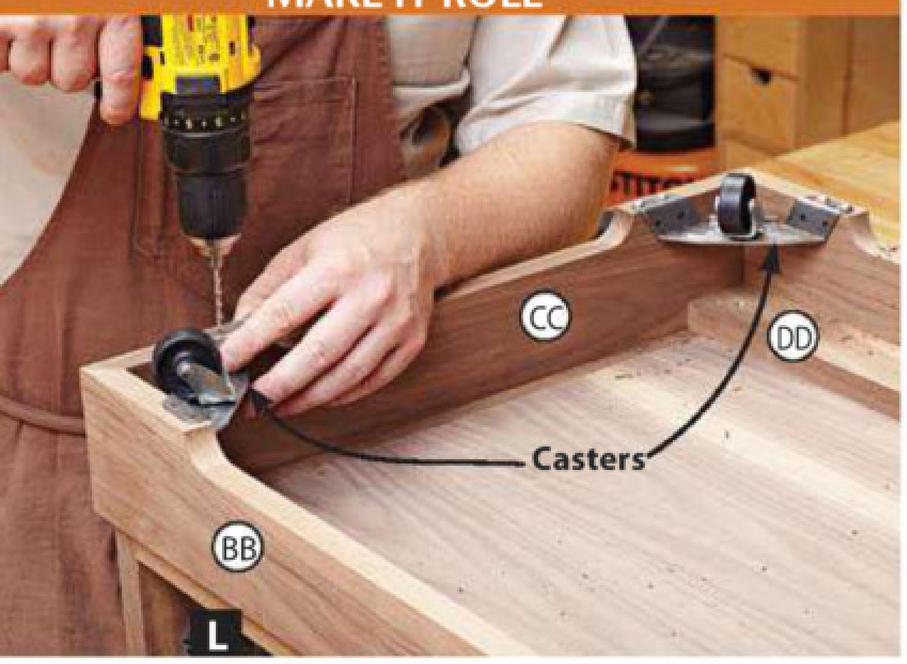
4 Switch to a 1/4" round-over bit in the router table, and round over the top outside edges of the long and short base trims (BB, CC). Cut #20 biscuit slots in the miters, and glue and clamp the base trim pieces together.

5 Cut the base cleats (DD) to size and glue them to the inside faces of the long base trim (BB) flush with the top edges of the trim.



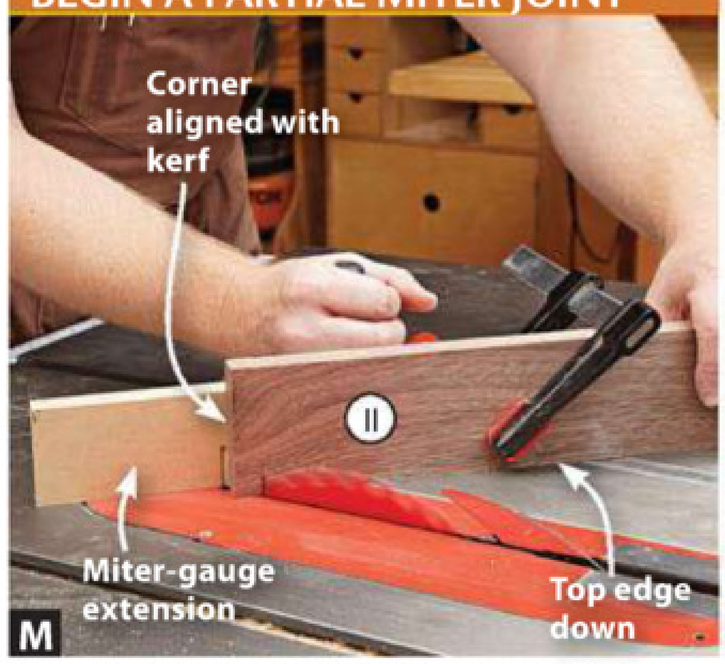
5 TOP ASSEMBLY

MAKE IT ROLL



Drill pilot holes for the screws through the holes in each caster; then secure a caster to each corner of the base trim (BB/CC).

BEGIN A PARTIAL MITER JOINT



Cut a kerf in each side lid trim (II) as deep as the width of the back lid trim (JJ). The kerf should exit right at the corner of the side lid trim.

COMPLETE THE PARTIAL MITER



Draw lines on the face and end of the side lid trim (II) to connect the ends of the kerf. Saw along the lines with a handsaw to remove the waste.

6 After the glue dries, glue and screw the base assembly (BB–DD) to the bottom panel (D/E) [**Photo K**]. Screw a caster [**Source**] to each corner [**Photo L**].

Put a lid on it

1 Laminate two pieces of ¾×2⅛×30⅛" walnut for the tray back (EE). After the glue dries, plane it to 1¼" thick and rip and crosscut it to 2×30". Cut the tray sides (FF) to size and shape the 2" radius at the front end [**Drawing 5**]. Glue and screw both tray sides to the tray back. After the glue dries, glue this assembly to the top panel (E) and short panel trim (C), flush at the back and centered from side to side.

2 Cut the lid panel (GG) to size [**Drawing 5**]. From ¾" stock, cut the front, side, and back lid trims (HH, II, JJ) ½" longer than listed. Miter-cut the front ends of the side lid trims (II), clamp them to the lid panel, and miter-cut the front lid trim (HH) to fit between them. Fit the back lid trim (JJ) against the back edge of the lid panel and mark the finished length of the side lid trim. Crosscut the side lid trim on the marks.

3 Set your tablesaw miter gauge to 45° and attach an extension to it. Raise the tablesaw blade to match the width of the back lid trim (JJ) and make a cut through the extension. Clamp a side lid trim (II) to the extension, top edge down, aligning the top outside corner with the near edge of the kerf in the extension, and cut a kerf [**Photo M**]. Reset the miter gauge to the opposite 45° setting and repeat this procedure for the remaining side lid trim.

4 With a handsaw, trim away the waste created by the kerf in the side lid trim (II) [**Photo N**]. Glue and clamp the front lid trim (HH) and side lid trim to the lid panel (GG); then glue the back lid trim (JJ) in place. After the glue dries, position the lid over the tray sides (FF) and screw a length of continuous hinge to the back lid trim and tray back (EE) [**Photo O, Drawing 5**]. Check that the lid opens and closes; then remove it from the hinge and rout a ¼" round-over along the outside bottom edge of the front and side lid trim.

5 Remove the continuous hinge. Apply a finish. We used the procedure described in **Bring out the beauty in walnut**, *below*.

ATTACH THE CONTINUOUS HINGE



Center the lid (GG–JJ) from side to side on top of the carcase. Press the side lid trim (II) against the tray back (EE) and screw the hinge in place.

6 Reattach the knobs, and screw the drawer faces (T–AA) to the drawers. Position the lid (GG–JJ), secure the continuous hinge, and your new cabinet is ready to house your tools.

Produced by **Craig Ruegsegger** with **John Olson**
Project design: **John Olson**
Illustrations: **Lorna Johnson**

Bring out the beauty in walnut

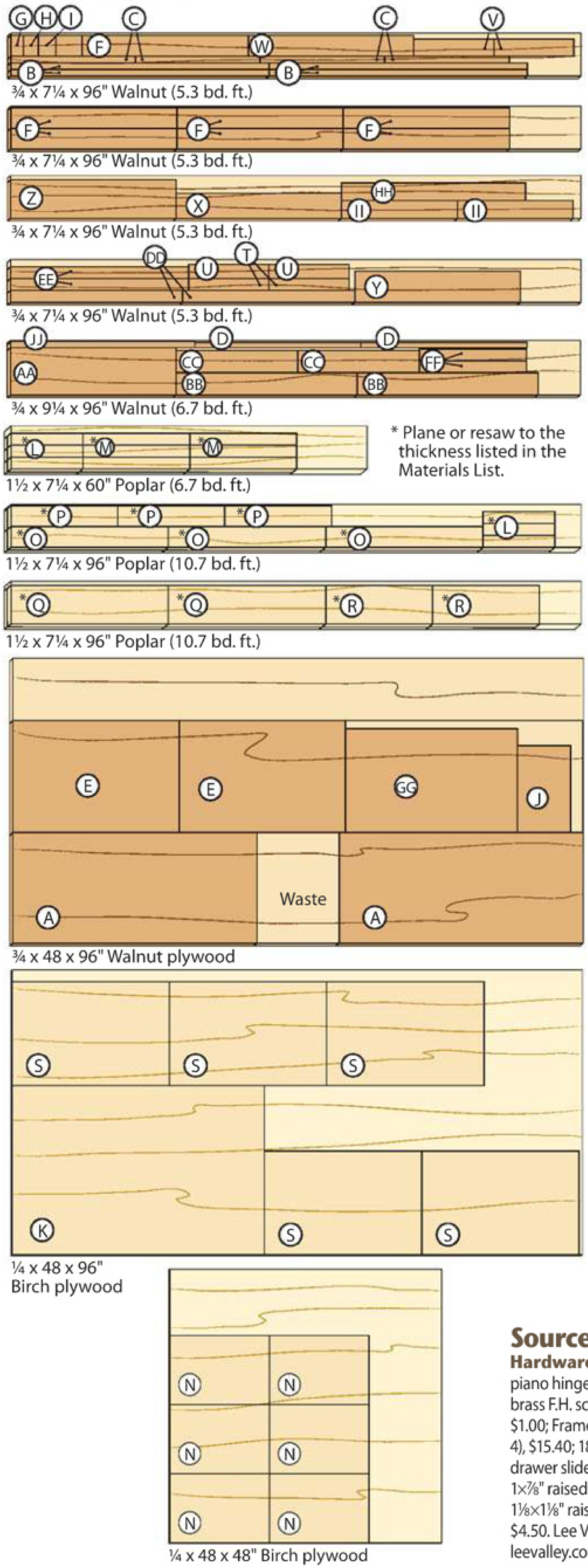
To more closely match walnut's light sapwood with its dark heartwood, we applied a coat of Lockwood water-based dye, no. 43 English Brown Mahogany, over all surfaces. To get a seamless result, apply the dye with a foam brush, and immediately wipe each pass with a moist rag to smear the wet edge and blend the line between adjacent passes, *right*. Start your strokes away from inside corners and edges where the dye may pool. Instead, use the rag to help work dye into those areas.

Water may raise the grain, making it feel fuzzy, so after the dye dries, sand lightly with 220-grit sandpaper. If needed, apply a second coat of dye to areas that remain too light, blending the edges with a rag.

The dye evened out the color variations in the walnut, but added a redder tone than we wanted, so we then applied a coat of Varathane stain no. 260 American Walnut for a browner hue. After the stain dried, we sprayed on three coats of a satin-finish, oil-based lacquer.



Cutting Diagram



* Plane or resaw to the thickness listed in the Materials List.

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Carcase						
A*	side panels	¾"	18½"	41"	WP	2
B*	long panel edging	¾"	1"	42½"	W	4
C*	short panel edging	¾"	1"	20"	W	4
D*	top/bottom panel edging	¾"	¾"	28"	W	2
E*	top/bottom panels	¾"	18¾"	28"	WP	2
F	dividers	¾"	3½"	28"	W	7
G	top vertical divider	¾"	3½"	2⅛"	W	1
H	middle vertical divider	¾"	3½"	2½"	W	1
I	bottom vertical divider	¾"	3½"	3"	W	1
J*	divider panel	¾"	16"	9¾"	WP	1
K	back panel	¼"	28½"	42½"	BP	1
Drawers						
L	small drawer fronts/backs	½"	2"	12⅛"	P	12
M	small drawer sides	½"	2"	18"	P	12
N	small drawer bottoms	¼"	12⅛"	17½"	BP	6
O	medium drawer fronts/backs	½"	3½"	26½"	P	6
P	medium drawer sides	½"	3½"	18"	P	6
Q	large drawer fronts/backs	½"	6½"	26½"	P	4
R	large drawer sides	½"	6½"	18"	P	4
S	medium/large drawer bottoms	¼"	17½"	26½"	BP	5
T	drawer 1** faces	¾"	2"	13½"	W	2
U	drawer 2** faces	¾"	2⅜"	13½"	W	2
V	drawer 3** faces	¾"	2⅞"	13½"	W	2
W	drawer 4** face	¾"	3½"	27⅞"	W	1
X	drawer 5** face	¾"	4¼"	27⅞"	W	1
Y	drawer 6** face	¾"	5¼"	27⅞"	W	1
Z	drawer 7** face	¾"	6½"	27⅞"	W	1
AA	drawer 8** face	¾"	8"	27⅞"	W	1
Base						
BB*	long base trim	¾"	3¾"	30½"	W	2
CC*	short base trim	¾"	3¾"	20½"	W	2
DD	base cleats	¾"	2"	29"	W	2
Lid						
EE*	tray back	1¼"	2"	30"	LW	1
FF	tray sides	¾"	2"	18"	W	2
GG*	lid panel	¾"	17½"	29"	WP	1
HH*	front lid trim	¾"	3"	30½"	W	1
II*	side lid trim	¾"	3"	19"	W	2
JJ*	back lid trim	¾"	1"	30½"	W	1

*Parts initially cut oversize. See the instructions.
**Drawer faces numbered from top to bottom.

Source

Hardware: 25×780mm brass-plate piano hinge no. 00D5225 (1), $7.20; #3×¾" brass F.H. screws [10 pk] no. 91Z0305X (2), $1.00; Frame casters, no. 00K2501 (set of 4), $15.40; 18" 100-lb. full-extension zinc drawer slides no. 02K3018 (11), $14.60; 1×⅞" raised knobs no. 02W3200 (6) $4.20; 1⅛×1⅛" raised knobs no. 02W3201 (10), $4.50. Lee Valley Hardware, 800-871-8158, leevalley.com.

Materials key: WP–walnut plywood, W–walnut, BP–birch plywood, P–poplar, LW–laminated walnut.

Supplies: Double-faced tape, #10 biscuits (8), #20 biscuits (38), #8×1" flathead screws (32), #8×1¼" flathead screws (8), #8×2" flathead screws (4).

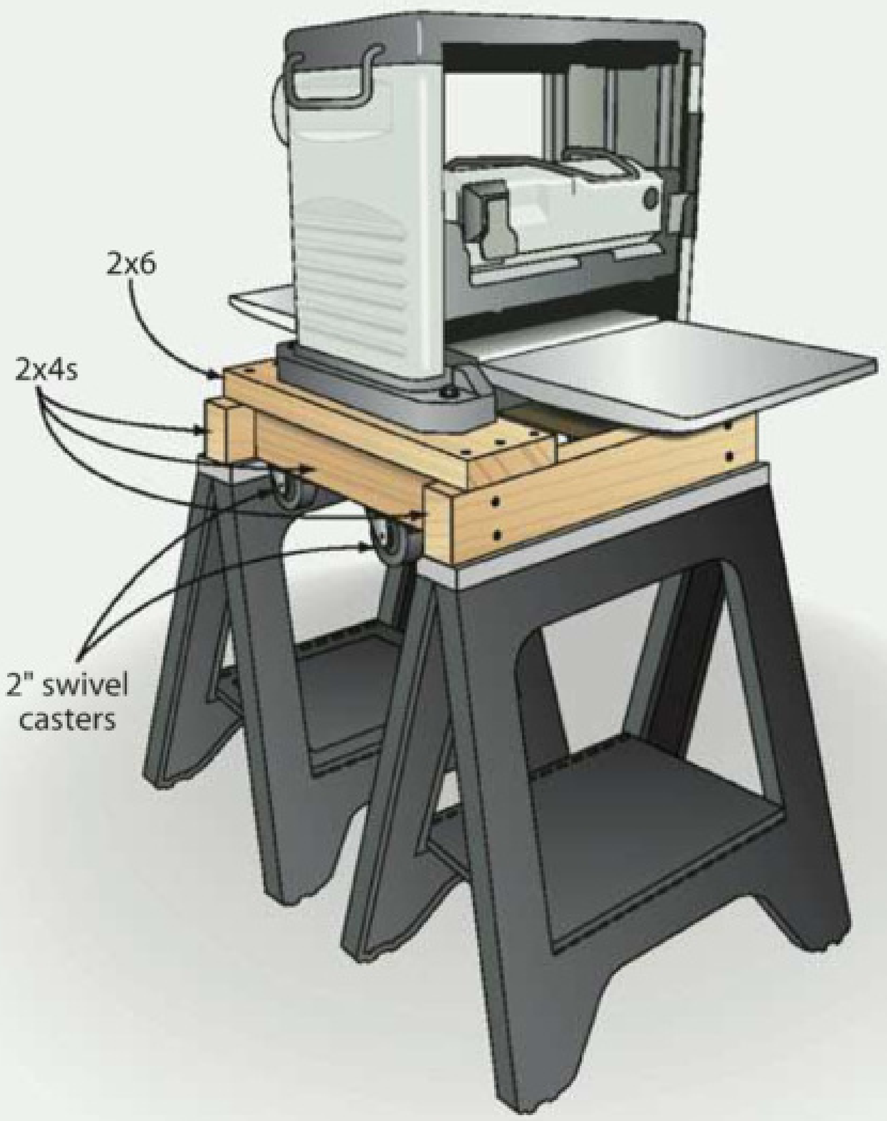
Blade and bits: Dado blade; 1/16", 3/32", 1½" drill bits; flush-trim, ¼" round-over, ¾" straight router bits.

Planer stand sets up quickly, rolls away for easy storage

With limited room in my shop, I needed to stow my planer out of the way, but in such a way as to make getting it out of storage and setting it up on a pair of sawhorses relatively painless.

So I built a frame from 2×4 and 2×6 lumber with 2" swivel casters, as shown, and mounted my planer to it. Because my folding sawhorses were designed to hold 2×4s as sacrificial top rails, the frame drops right in, keeping the planer secure during use. If your sawhorses don't have this feature, just clamp the frame in place for stability. When finished with the planer, set the frame on the floor and roll it smoothly into storage.

—Carl Byrns, Liverpool, N.Y.

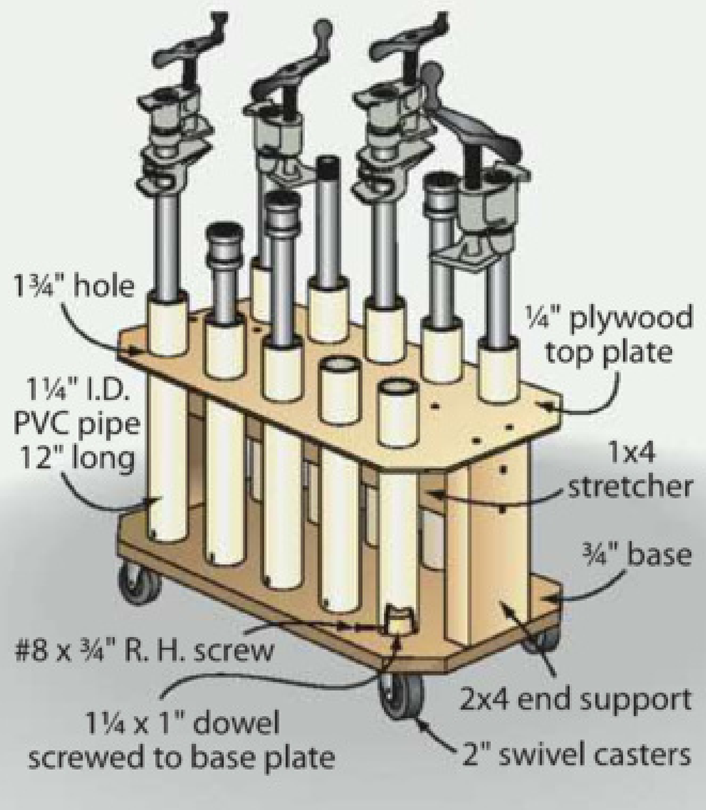


Clamp caddy rolls to work

I depend on my pipe clamps for most projects, which means I constantly have to move them around the shop (or trip over them). The simple caddy I built makes moving and storing those heavy clamps easy.

I built mine for 24" clamps, but you can resize all the parts to accommodate longer (or more) clamps. The lengths of 1¼" I.D. PVC pipe slide through the holes in the top and fit over 1¼×1" dowel attached to the base with screws. After securing the pipe to the dowel with screws and attaching casters, your pipe-clamp caddy will be ready to roll.

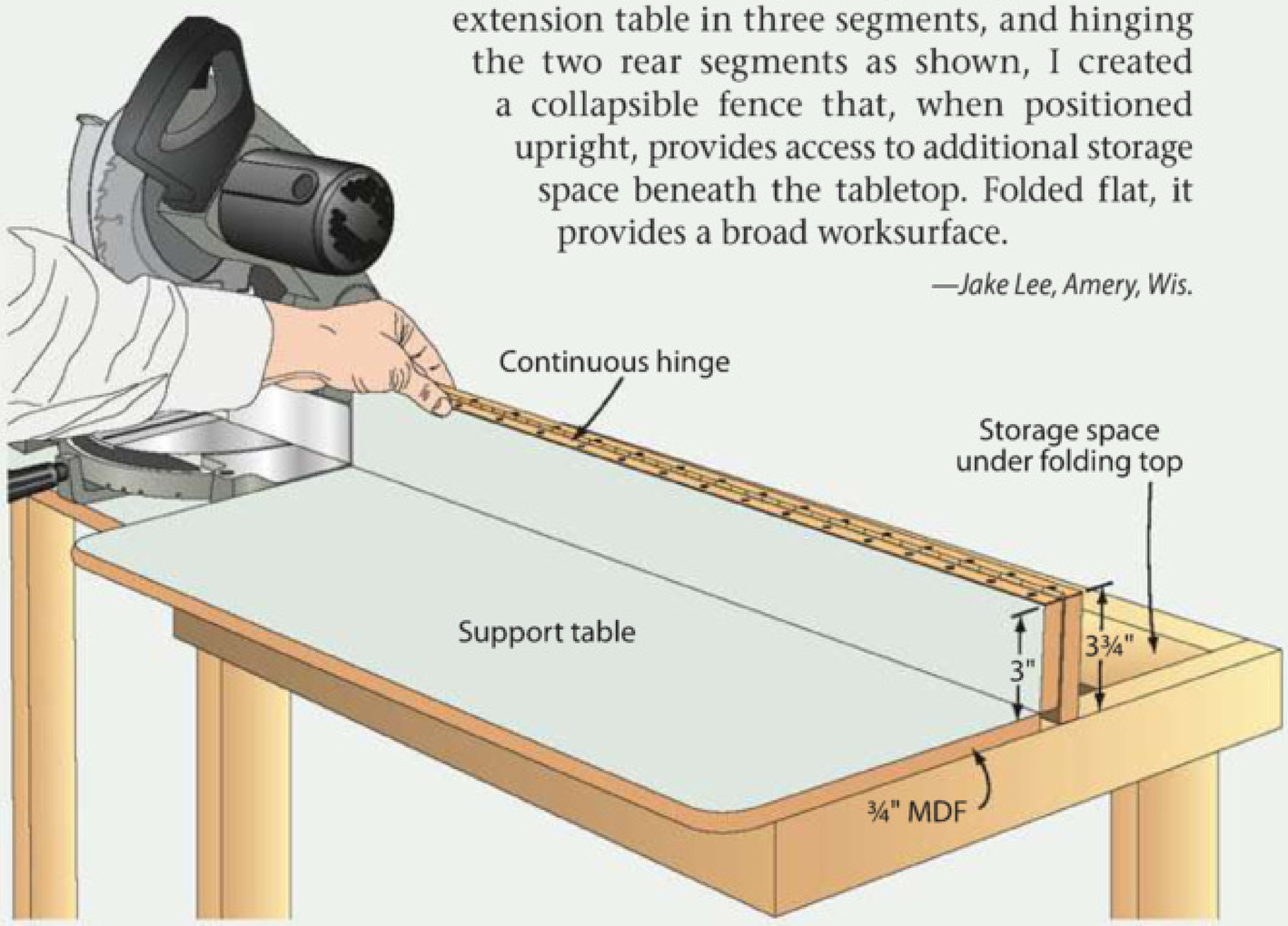
—John Fiorani, Winston-Salem, N.C.



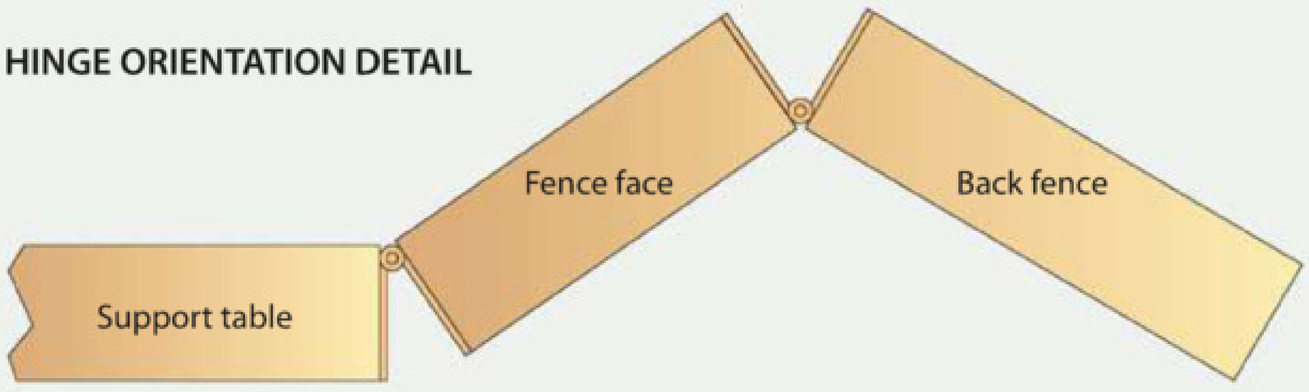
Support table pulls triple duty as support, fence, and storage

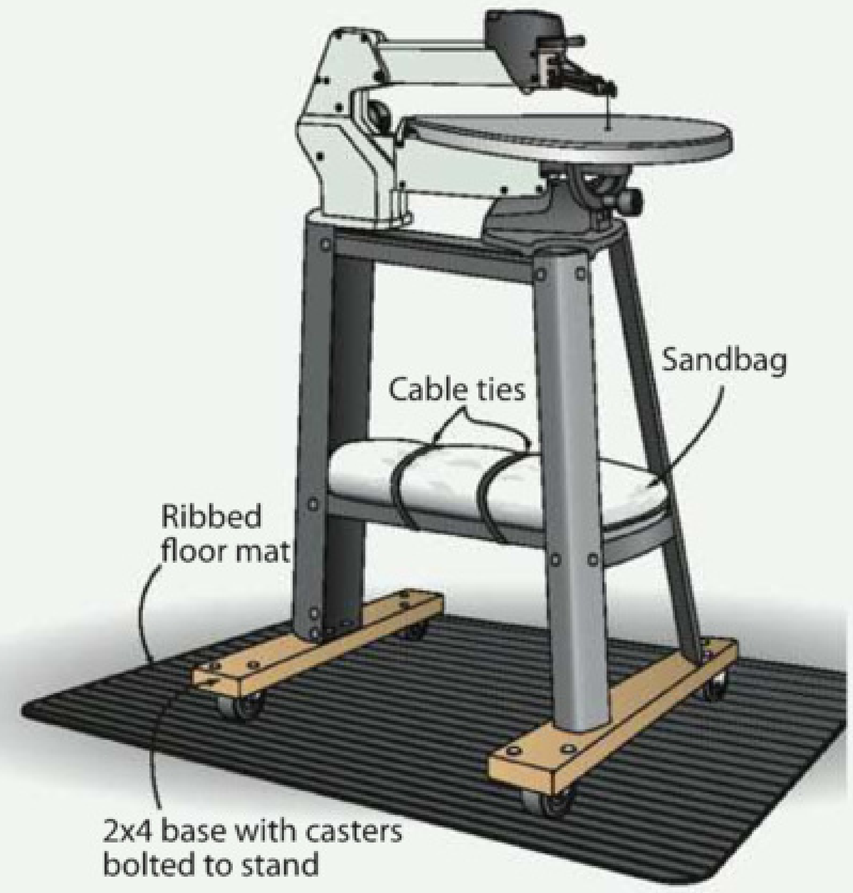
In my tiny shop, space efficiency is the name of the game. By building the top of my mitersaw's extension table in three segments, and hinging the two rear segments as shown, I created a collapsible fence that, when positioned upright, provides access to additional storage space beneath the tabletop. Folded flat, it provides a broad worksurface.

—Jake Lee, Amery, Wis.



HINGE ORIENTATION DETAIL





Sandbag and mat calm shaky mobile scrollsaw

I put my scrollsaw on casters to make it mobile, but then it seemed to vibrate more. It also had a tendency to roll away from me while pushing a workpiece through.

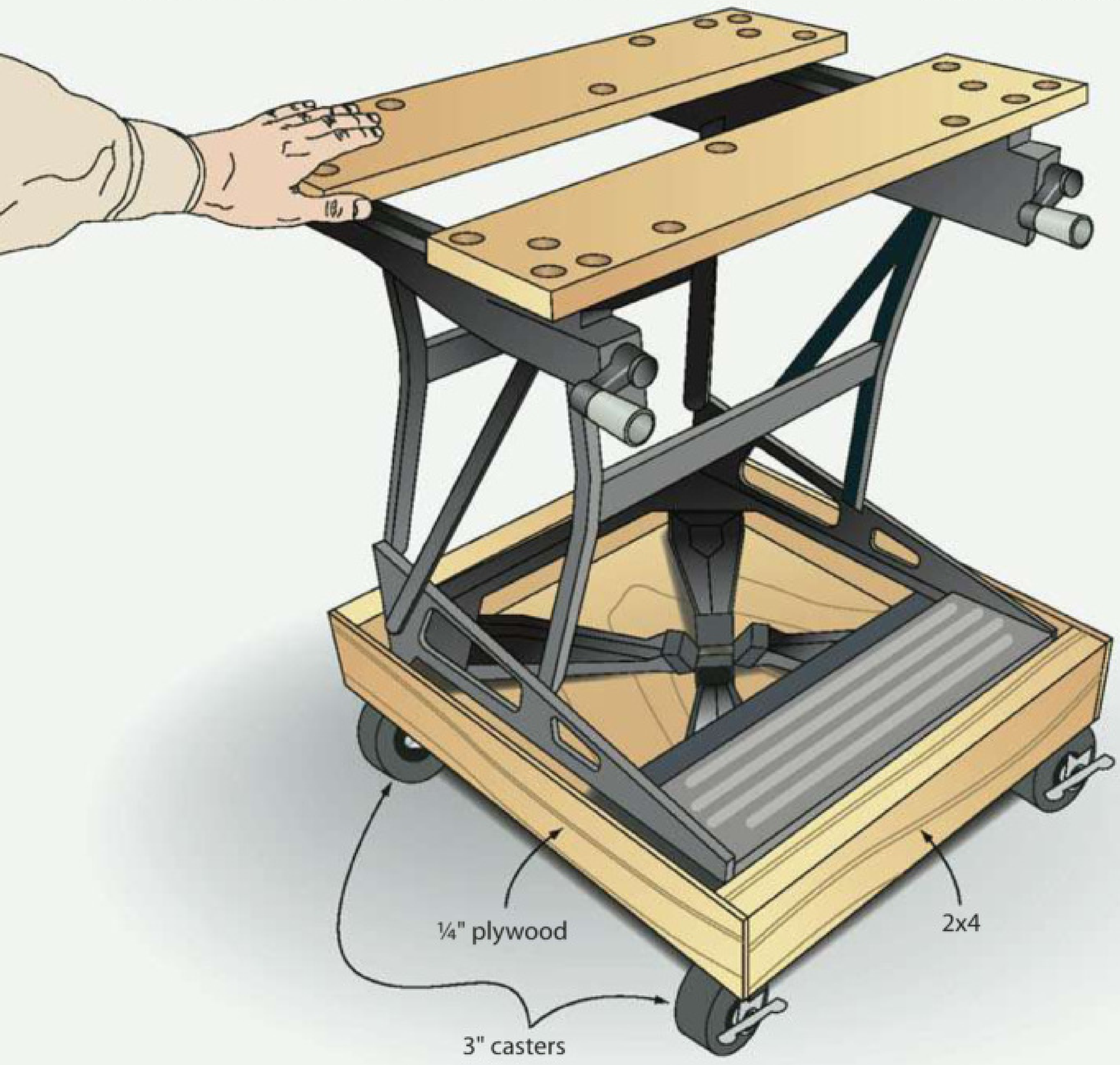
To dampen the vibrations, I strapped a sandbag onto the saw, as shown, using cable ties. When I need to use the saw, I roll it onto a floor mat. This further reduces vibration. Plus, the additional weight sinks the wheels into the mat so the saw doesn't wander during use. It works so well that it passes the "nickel test"—a nickel standing on edge on the tabletop doesn't fall over with the motor running!

—Dean Fiene, Runnells, Iowa

Knockdown workstation rolls to stow low

In my small shop, any tool that doesn't fit on a shelf gets casters added to help me make the most of the space I do have. But in the case of my collapsible workstation, there wasn't a good place to mount casters without interfering with the bench's folding function. So I built this base from 2×4s and ¼" plywood, mounting 3" locking casters under it. Now, after collapsing the bench, I simply roll it beneath other machines for storage.

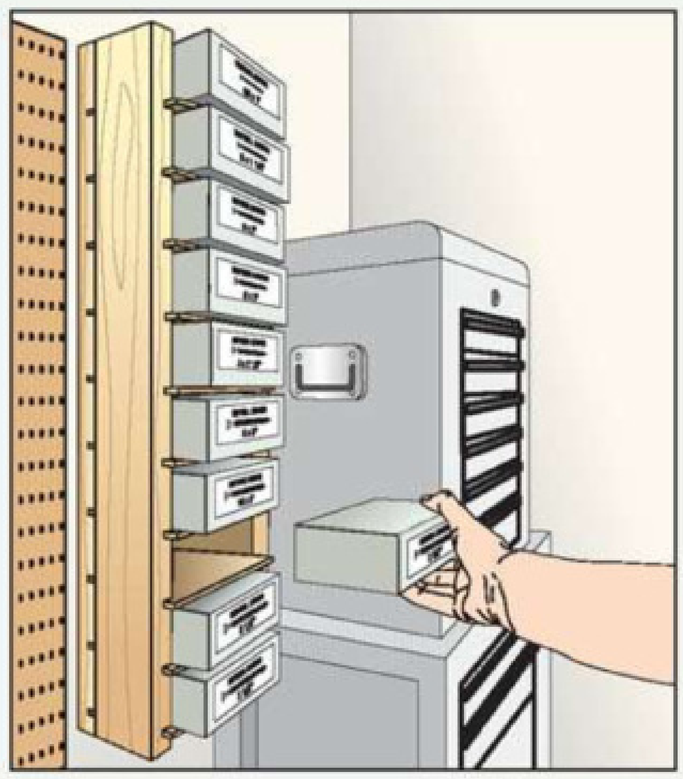
—Cory Hoehn, Jeffersonville, Ind.

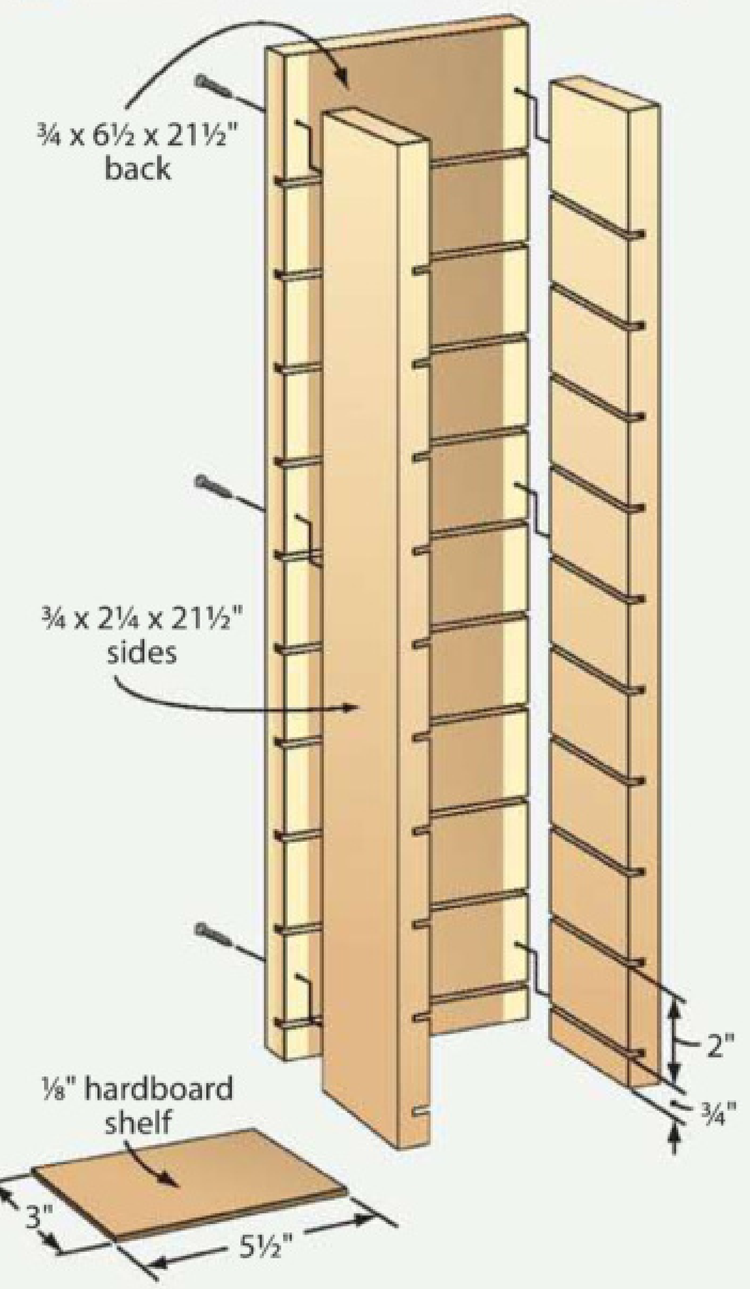


Simple, sturdy shelves store standard screw boxes

In the past, I've noticed that the small plastic storage bins you buy at home centers and hardware stores won't hold all the contents of a 1-lb box of some fasteners. However, I also noticed that those 1-lb boxes are almost always the same size, regardless of the fasteners inside. Even better, they already come in perfectly serviceable, prelabeled, storage containers. So instead of buying buckets of bins, I built these simple shelves and store the prelabeled boxes on them.

—Jeff Feuerstein, Neenah, Wis.





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