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Stuff We Love

Our favorite DIY tools, materials + gear. By Mike Berner



A work light that shows true colors

The Hybrid LED Color Range Work Light from Ryobi features variable color temperature, allowing you to adjust the light quality to your work space. It improves color perception—a big benefit for painting—and it reduces eye strain from working in bright white light. The ability to warm up the light as well as dim it can keep you working comfortably longer.

The work light features 360-degree light head rotation and includes a tripod mount. It's cordless, but it can also be plugged into an extension cord.

This light is available at Home Depot for \$80 without a battery. It's part of Ryobi's 18-volt ONE+ System, so you won't need the battery if you've already invested in the system.

POCKET SQUARE

I keep three essentials in my shop apron: a pencil, a tape measure and a small combination square. A 4- or 6-in. square can handle 90 percent of my shop needs: making layout marks, checking assemblies for square and setting up tools. A little square doesn't create much extra bulk in my apron, and at less than \$10, it doesn't break the bank either.

BRAD HOLDEN, ASSOCIATE EDITOR



at the bed anchors to keep your materials from sliding around, but ratchets end up getting tangled in the strapping, and in tight quarters ratcheting can be difficult.

If you place the Cam Jam XT aluminum cord tightener between the anchors and wrap the cord around the lumber, pulling the cord through will engage the cam and secure your material. The Cam Jam cord tighteners make this process easy and take up less storage space than my ratchet straps. They cost about \$8 each at Home Depot, Walmart and online.

Hauling lumber is a cinch

Making trips from the lumberyard often requires driving with boards and sheet goods hanging out over the tailgate of a 6-ft. pickup bed. You could use a ratchet strap





A clever solution for sealing big gaps

InstaTrim is part trim, part caulk and part weather sealant. And for some situations, it's a true problem solver.

InstaTrim is a V-shape strip of 1/2-in.-wide plastic, backed by a bead of adhesive caulk. To install it, remove the peel-off tape, position the strip, then press it into place. The self-centering "wings" along the edges flex to create a tight seal. Since InstaTrim goes on dry, it can be painted immediately. It's perfect for sealing moderately large gaps (up to 1/4 in.) and leaving a clean, smooth bead. It's ideal for sealing wall and floor gaps around tubs, for covering gaps around toilet bases and sealing windows and doors.

For good results, you have to first remove all existing silicone caulk, especially in bathrooms and other wet environments.

InstaTrim is available in six colors and costs about \$20 for a kit containing two 10-ft. lengths. It's available at instatrim.com, other online sources and some stores.

SPIKE CARLSEN, CONTRIBUTING EDITOR



LOCK WASHER IN A BOTTLE

Still using lock washers? Get a grip—pick up some thread adhesive instead. It's been around a long time, but amazingly, pro mechanics are still the biggest users. All DIYers tighten nuts and bolts, right?

Thread adhesives are better than any mechanical locking system for two reasons. First, the liquid plastic fills all the gaps between the threads so the threads stay locked together. And second, the plastic seals the metal against corrosion. There are many formulas for all kinds of tasks, but the most common are the red and blue Loctite thread adhesives—red for permanent bolts and blue for removable ones. (Loctite is the dominant brand; Devcon is another.) The red and blue types cost about \$6 for a 6-ml tube.

TRAVIS LARSON, SENIOR EDITOR



Favorite oscillating tool

An oscillating multitool is the kind of tool that goes unused for months and then saves the day in some oddball situation. For me, that usually means cutting metal or wood in tight quarters. Over the past couple years, I've tried a dozen oscillating tools. The Rockwell Sonicrafter F80 is unique in letting you select the oscillating angle: The blade makes short swings when you need precision, wide swings when you want to get aggressive. It also packs more power than most (4.2 amps). The Sonicrafter F80 accepts blades of any brand and costs about \$120 online.

GARY WENTZ, EDITOR-IN-CHIEF

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Dog Food Scoop

It's true that the tops of plastic jugs make good funnels. But if you keep the cap on and angle the cut, they also make handy scoops for everything from potting soil to pet food. I used a half-gallon jug for this scoop.

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DRYER-LINT FIRE STARTER

To build a fire properly, you need to have tinder (easy-lighting material), kindling (finger-size sticks) and fuel (logs). We all have a ready supply of tinder: dryer lint. To make fire starters, I stuff empty toilet paper tubes with dryer lint. My lint “logs” light quickly and burn long enough to ignite the kindling. And I don’t have to resort to lighter fluid!

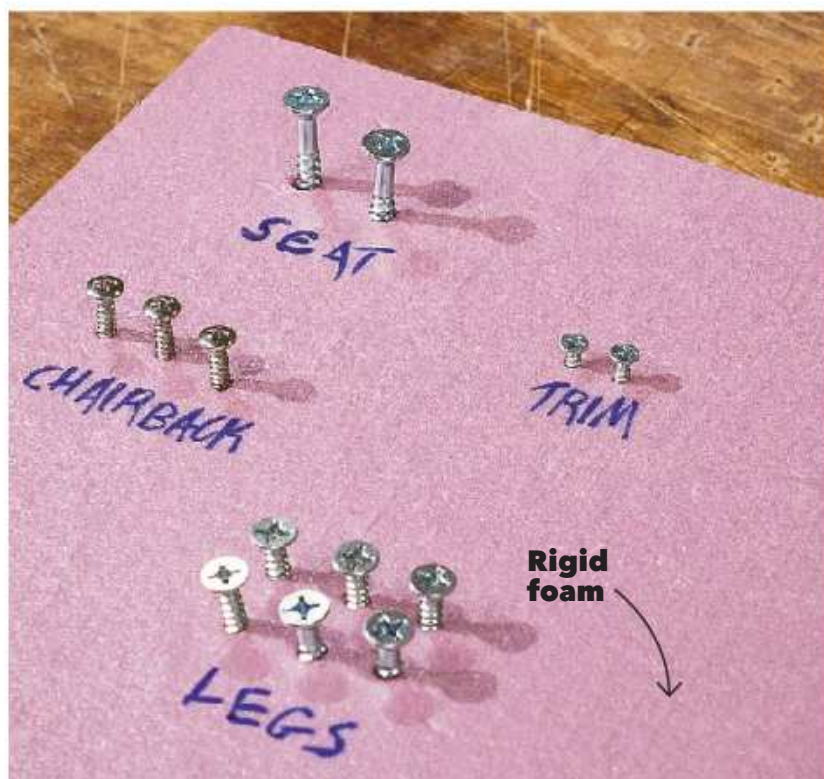
RYAN FRANZA



SANDPAPER TEARING BLADE

Cutting sandpaper will dull scissors and utility knife blades in no time. Here’s a better technique: Fasten a hacksaw blade to the edge of your workbench. Slip a washer behind the blade at each of the mounting holes so a sheet of sandpaper can easily slide in behind the blade. I fold the paper to the finished size I want, then cut along the fold.

DARRELL NOVACEK



SCREW ORGANIZER

When you disassemble a piece of furniture that needs to be repaired or moved to a new home, poke the screws and nails into a piece of rigid foam. Group similar fasteners together or arrange them in the order they were removed. Use a pen or marker to label the groups or make notes that will be helpful for reassembly.

J. KRECH

INSTANT HARDWARE PATINA

I've found that gun bluing (\$10 for 3 oz. at sporting goods stores) gives off-the-shelf hardware an attractive, aged patina. Simply dip nuts, bolts, washers or other hardware into a cup of gun bluing. When the hardware turns black, rinse it with water and dry it with a paper towel. Be sure to wear rubber gloves and eye protection.

BRAD HOLDEN, ASSOCIATE EDITOR



REINFORCE YOUR PHONE CORD

Phone cords tend to wear out where the cord enters the plug end. To reinforce my cords, I slide a bit of heat-shrink tubing over the weak spot. Hold the cord with pliers and wave a lighter under the tubing. The tubing shrinks around the cord and plug end, making the junction more durable.

CHRIS HANSON

Get organized!



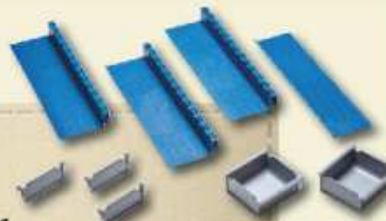
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DIY Essentials

Our best tips for getting your project done right. By Brad Holden

Home Center LUMBER

Home centers carry more lumber species (both hardwood and softwood) than they used to, but the selection is still hit-or-miss. Stores even within the same company might stock more species than another, so you'll need to check around. Traditional lumberyards or specialty hardwood stores carry the best lumber and far more options for thicknesses and species. But with these tips, you may find everything you need at a home center.



Hardwood



Hardwood vs. softwood

These are confusing terms, as they really don't refer to the actual hardness of the wood. Balsa, for example, is a hardwood, but you could practically cut it with your fingernail. The term "hardwood" simply indicates that the wood comes from a deciduous tree, the type that loses its leaves in the fall. "Softwood" refers to conifers, which are generally trees with needles, like pine, spruce, fir and cedar. The vast majority of home construction is done with fast-growing softwoods.

Softwood



What you'll find at home centers

(The prices listed are for an 8-ft. 1x6.)

STANDARD PINE (\$4)

Eastern white pine is the most widely used wood for home construction. Knots and resin are common. Doesn't take stain evenly.

SELECT PINE (\$10)

Same as standard pine but completely knot free. Nice for paint or natural finish.

CEDAR (\$12)

Western red cedar is lightweight and rot resistant, making it popular for outdoor furniture. Knots and splits are common.



Hickory

Philippine Mahogany

Hard Maple

Red Oak

Yellow Poplar

POPLAR (\$13)

Yellow poplar is generally light-colored, with hues ranging from yellow to green to purple. Excellent for painted woodwork because grain doesn't show through.

RED OAK (\$17)

Red oak is the most ubiquitous cabinet wood of the last 75 years. It's strong, durable and takes finish well.

Less common

CHERRY (\$40, not shown)

Black cherry is a "medium hard" hardwood. It's easy to work with hand or power tools and takes a finish well, turning darker as it ages. Used for high-end cabinetry and furniture.

ASPEN (\$12)

Aspen is a soft, lightweight hardwood with subtle grain. It's excellent as a base for paint or as a secondary wood (see p. 16).

RED ALDER (\$21)

Red alder is a soft, lightweight hardwood. Its reddish brown color and grain texture make it resemble cherry. Stable and easy to work, it's a good choice as either a primary or secondary wood (see p. 16).

MAHOGANY (\$24)

Philippine mahogany is a soft hardwood. Typically has uniform grain and texture. The home center variety is less showy than African mahogany, but it's a stable, easily worked primary or secondary wood.

HICKORY (\$25)

Hickory, a tough hardwood with pronounced grain, is well suited for tool handles and baseball bats. It's hard to work with hand tools but finishes beautifully.

MAPLE (\$26)

Hard maple is durable and fine textured. It's a popular choice for cabinetry and furniture. Doesn't take stain evenly.

SPECIAL ORDER

Some home centers will special-order a wide variety of species for you. We don't recommend this unless it's your only option. You won't see the exact boards you're getting until they arrive, and unless they're somehow unusable, you won't be able to reject them.

Nonstandard boards

If you're serious about woodworking, you'll want a jointer and planer in your shop eventually. But if you don't have these tools yet, know that many home centers carry hardwood thicknesses other than nominal 1-by (3/4 in. actual). You can regularly find thicknesses ranging from 1/4 in. to 1-1/2 in.

If you need wide stock, you'll also find large 1-in. or 1-1/4-in. edge-glued panels in one or two species. This is a better option than buying really wide boards, which are prone to cupping. Solid wood stair treads are another handy option.

Cut out defects

Construction lumber tends to have a lot of knots. When you're shopping, be aware of your project's part sizes. Often, you can buy an inexpensive board and cut around the defects.

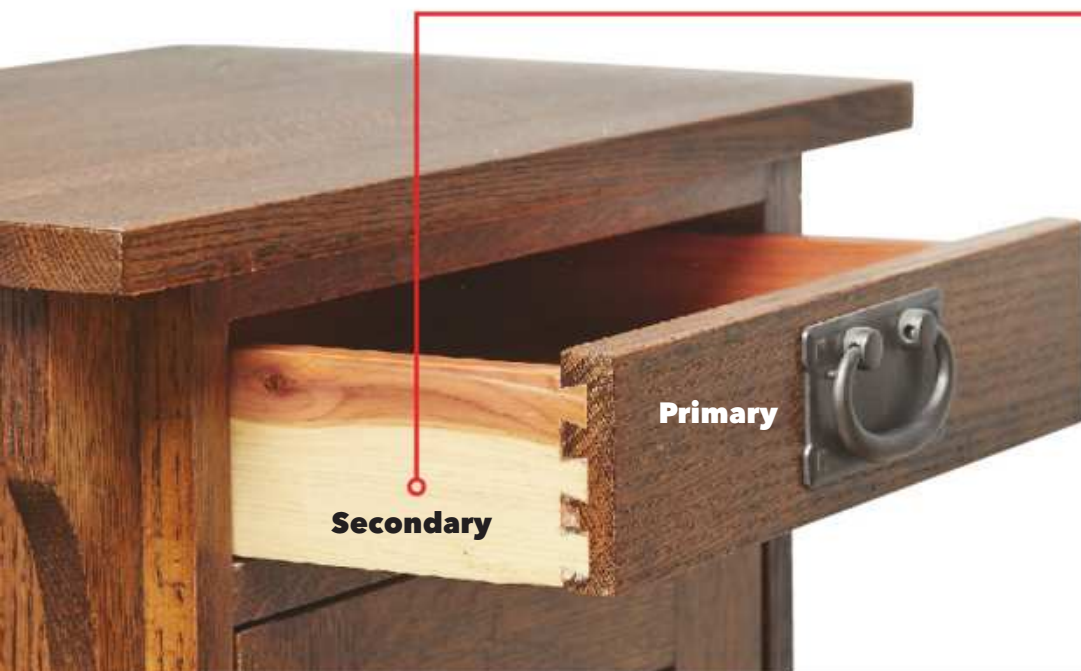
Primary and secondary boards

If you look at antique furniture, you'll notice that a beautiful quarter-sawn oak dresser, for example, uses expensive wood for parts that show and cheaper woods for parts that don't. So take a page from the old masters and use the showy stuff only where it counts.



Buy extra

After you've figured out how much lumber you need for a project, add 10 to 20 percent. This allows for the inevitable mistakes, as well as trimming off split ends of boards and cutting around defects.





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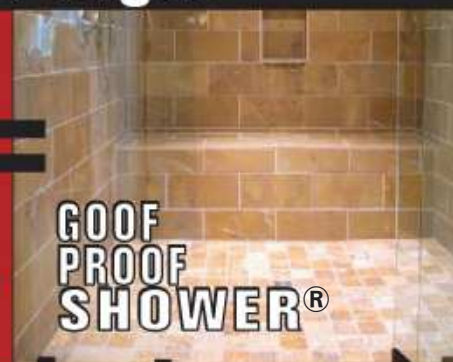
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Use the outer edges

The way a board is cut from a log affects its stability. Quarter-sawn boards are the most stable; they don't "move" as much with changes in humidity. Home centers don't carry quarter-sawn lumber; it's too expensive. But when you're sorting through the piles, look at the end grain. Sometimes you'll find growth rings running perpendicular to the board's face on the outer edges. This is essentially quarter-sawn lumber. You can rip these edges free of the less stable center.



Match grain

Even though you may be buying only one species, look closely and choose matching grains and colors, especially for glue-ups. These boards are all red oak, but one of them is very different and would look hideous glued up in this panel. Even stained, their colors would be different.



Buy the width you need

Hoping to save some money by ripping wide boards into narrower pieces? When you rip wide boards, internal stresses change, and they'll likely warp a bit. This means restraightening an edge between rips. You'll need a jointer or other straightening method for this. Instead, find the straightest boards you can that are closest to the width you need. Ripping off 1/4 in. is far less likely to cause a board to warp.



Inspect boards

Sight down the edge of a board to see how flat and straight a board is. Chances are you won't find perfect boards, only better and worse. Use the best boards for larger/longer project parts. Cut smaller parts from less perfect boards. As you cut these boards into shorter lengths, their imperfections will be less pronounced. Reject boards that twist along their length.



Look for gems

Home centers don't stock premium lumber like quarter-sawn oak and curly maple. But sometimes they have it by accident, and the people who are looking for precious lumber aren't shopping at the home center; they go to a lumberyard. So keep your eyes open. This lovely piece of quarter-sawn oak was mixed right in with the common stuff!



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DIY ESSENTIALS

Lumberyards & online ordering

If you're looking for a larger selection of hardwoods—and typically nicer lumber—go to a local lumberyard. You can find one by searching for “hardwood lumber” online. Buying lumber online is another good option. Reputable online lumber sellers provide photos, dimensions and descriptions of the actual boards you're buying.

WORKING WITH ROUGH-SAWN BOARDS

Serious woodworkers prefer to buy rough-sawn wood and then flatten and machine those boards down to their desired thicknesses and widths. The advantage is that the boards have warped to their final shape, so when they're flattened, they stay perfectly flat, straight and stable. However, that calls for two specialty tools, a jointer and a planer. To learn about this process, go to familyhandyman.com and search for “how to plane rough lumber.”



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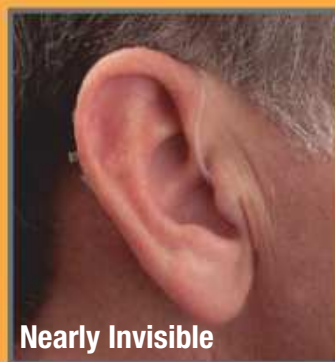
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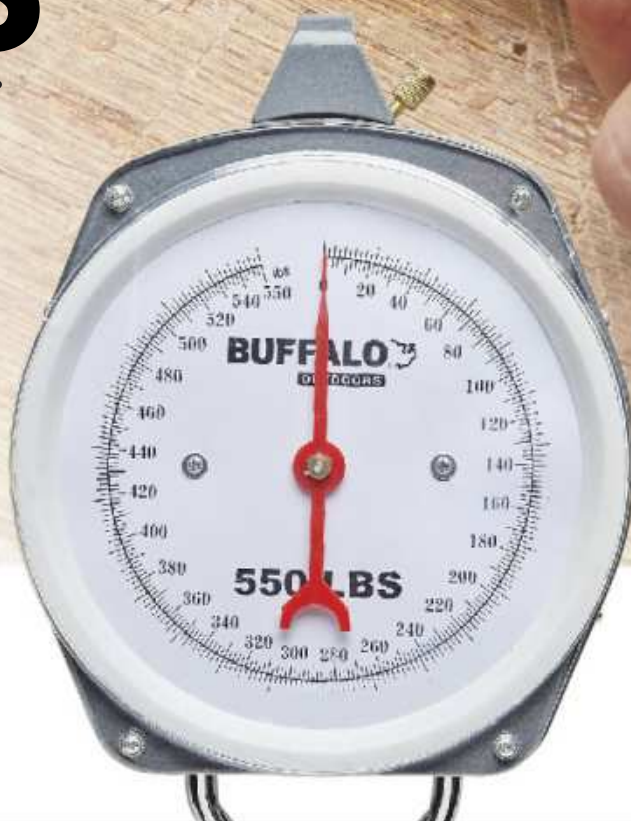
Expert advice from the job site. By Brad Holden

4 SIMPLE JOINERY OPTIONS

Make strong, long-lasting joints without years of practice or a big budget

Traditional hand-cut joinery requires skill and a great deal of practice to master. But are those fancy joints necessary? Nah. I still use mortise-and-tenons or dovetails when a project calls for it. But for most projects, I just need joinery that's strong and simple.

My go-to methods include pocket screws, dowels, biscuits and the Beadlock system. There's no reason to have all of them in your arsenal. Most serious woodworkers choose one or two, become proficient and use them for virtually all joinery. These four methods are strong enough for typical joinery, and they're all affordable.



PRESSURE'S ON!
We put these joints to the test! See p. 32 to find out how they held up.

POCKET SCREWS

You can get a basic pocket hole kit for about \$30. You'll need a supply of different lengths of special self-drilling washer-head screws (coarse threads for softwoods, fine threads for hardwoods).

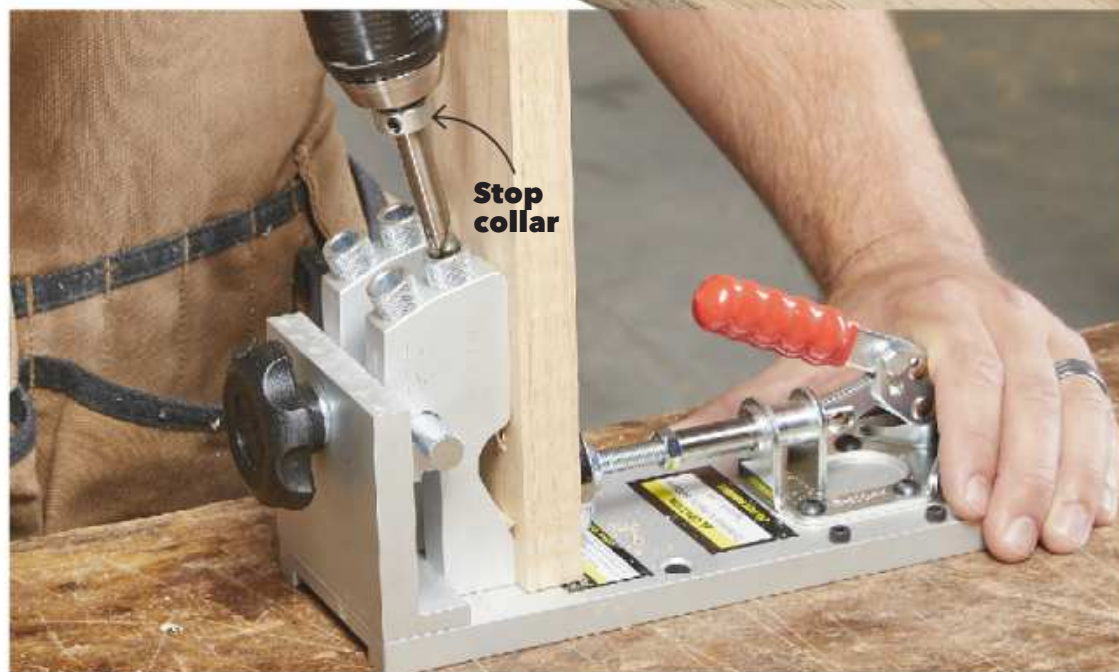
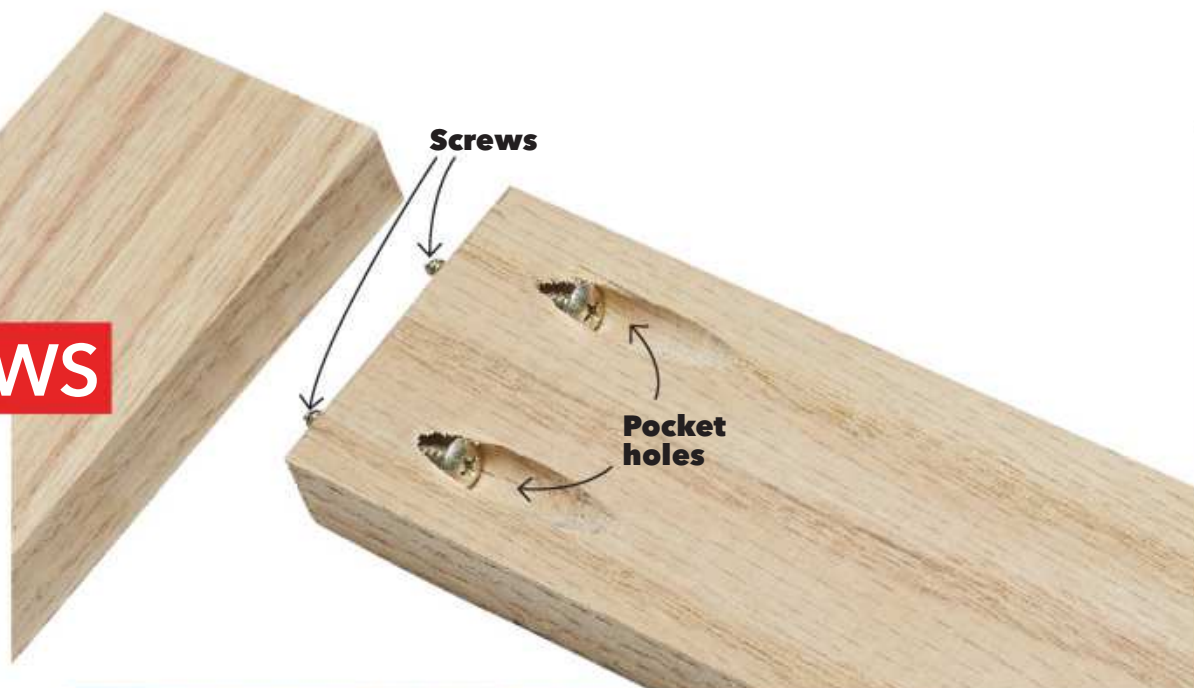
You likely already have a drill/driver, which is the only necessary tool. That's a big plus—it saves you money as well as space in your shop. Once you've become a convert, you can pick up more clamps, accessories and jigs to really step up your production. The only downside to pocket screws is that without special clamps, they don't automatically align parts during assembly.

PROS

- Fast
- No large clamps required
- Benchtop or portable

CONS

- Visible holes
- Parts alignment not automatic



1. DRILL THE HOLES

Clamp your workpiece in the jig and drill the steeply angled holes. This unusual jig has two pairs of holes: one pair for thinner stock and one pair for thicker. It costs about \$65 at harborfreight.com. The included drill bit bores a flat-bottom hole with a short pilot hole at the center to guide the screw into the adjoining part. A stop collar regulates the hole depth.



2. DRIVE THE SCREWS

Apply glue, clamp the parts into alignment and drive the screws. Some pocket hole jigs are portable; you can clamp them onto a workpiece that's too large to put on your workbench.

POCKET SCREW TIPS

Search for "pocket screws" at familyhandyman.com

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DOWELS

A solid, easy-to-use doweling jig will set you back about \$70. As with the pocket hole method, the only tool you'll need is a drill. Then you'll also need a supply of dowels. The dowels for joinery are different from the standard dowel rods found at hardware stores. Joinery dowels are grooved to keep glue from getting trapped in the bottom of the hole and preventing the parts from pulling together.

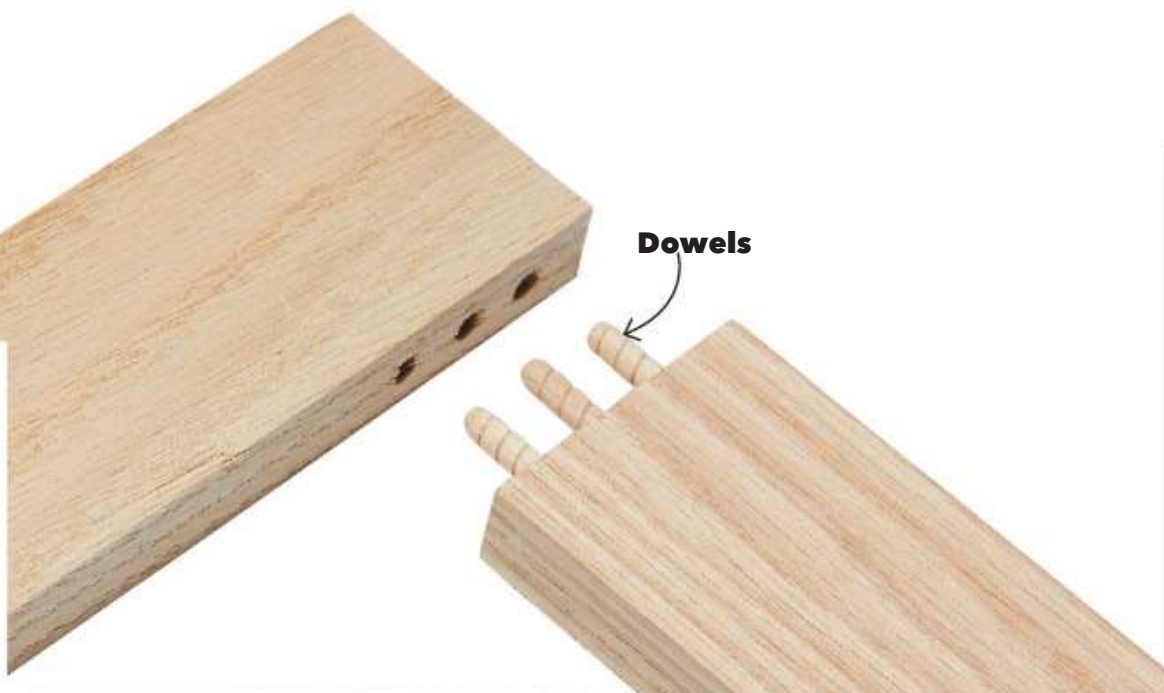
Unlike pocket screws, dowels align the parts and make both sides of the joint look the same (that is, no exposed screws). That's good when both sides will be visible.

PROS

- Automatic alignment in both directions
- Mating dowel holes can be positioned anywhere using dowel centers (below)

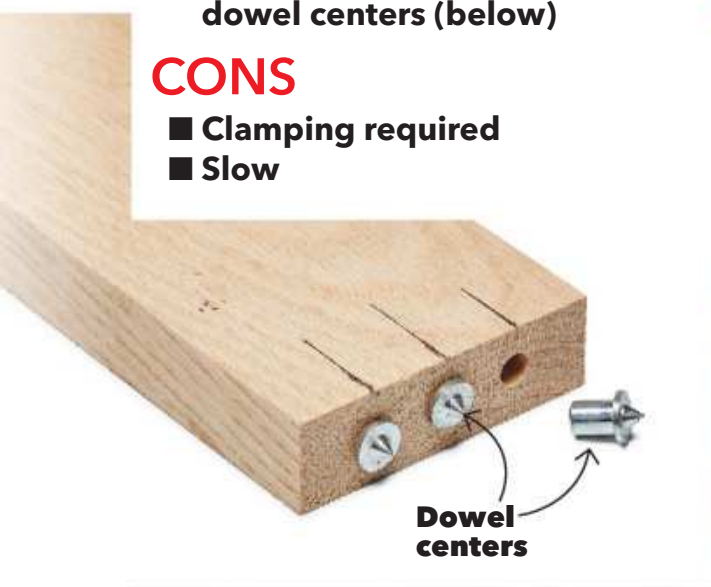
CONS

- Clamping required
- Slow



1. DRILL THE HOLES

The Dowl-It jig I use is self-centering, with an integrated clamping mechanism. You can buy the latest version for about \$70 online. Mark the hole locations on both parts, clamp the jig into place and drill the hole.



2. INSERT THE DOWELS

Apply glue to the dowels and mating parts. Press the joint together and clamp. You can use shims with this jig to drill holes for offset parts. When necessary, use dowel centers to mark the starting points for drilling into the adjoining part.

ULTIMATE DOWEL JIG GUIDE

Search for "dowel jig" at constructionprotips.com

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BISCUITS

A plate (aka biscuit) joiner runs anywhere from \$70 to \$700. The \$700 variety is really nice, but it's not necessary for an amateur woodworker. A modestly priced model works just fine. A plate joiner cuts a semicircular slot in adjoining parts to accept a plate/biscuit, which is then glued into place. Biscuits come in different sizes to accommodate various part dimensions.

PROS

- Fast
- Easy to use
- Easy to offset parts
- Effective dust collection
- Automatic alignment in one direction

CONS

- Clamping required
- Parts can slide during clamping



1. CUT THE SLOTS

Mark joint centerlines on adjoining parts. Set the plate joiner to the desired cutting height, and set the cutting depth to match the biscuit size you're using. Line up the guide mark on the joiner's fence with your mark and plunge the cut. The latest version of this Ryobi plate joiner costs about \$100 at homedepot.com.



2. INSERT THE BISCUITS

Apply glue to the mating surfaces and in the slots. Insert the biscuit, press the joint together and clamp.

BISCUIT TIPS GALORE

Search for "biscuit" at familyhandyman.com

BEADLOCK

A Beadlock jig facilitates drilling mortises in adjoining parts, again using only a drill. A basic Beadlock kit like the one shown is \$30 at rockler.com. This is one of many “loose tenon” systems. Instead of the tenon’s being cut from one of the adjoining parts, precut tenon stock is glued into a mortise in both parts.

Beadlock mortises are just a series of overlapping holes, and the tenon stock looks like a stack of dowels. You can buy tenon stock, or you can buy router bits to make your own tenon stock. But you’ll need a router table for that, and it’s a bit fussy.

PROS

- Easy to use
- Automatic alignment in both directions
- Extremely strong

CONS

- Slow
- Clamping required

Mortise

Tenon stock



1. DRILL THE MORTISES

Mark the joint centerline on both parts, position the jig using its alignment guide and then clamp the jig into place. Drill the first set of holes, slide the drilling block to its second position and drill the second set of holes. Repeat the process on the mating part.



2. INSERT THE TENONS

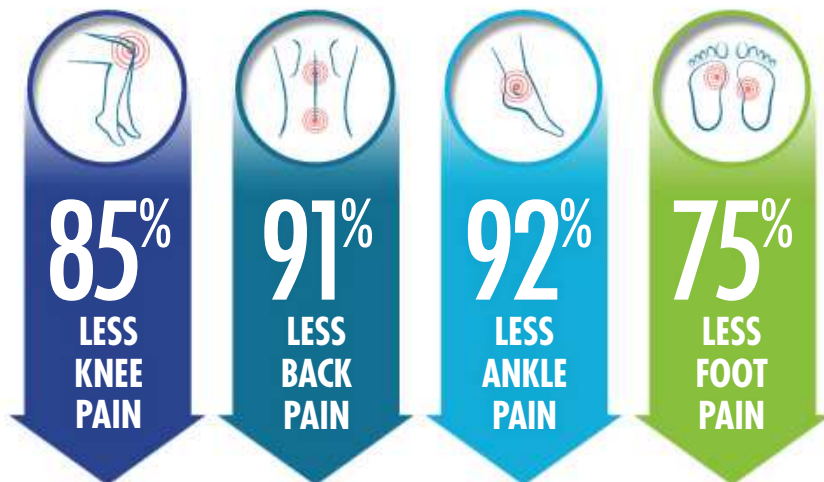
Apply glue to the mating parts and the Beadlock tenon. Press the joint together and clamp.

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JOINT STRENGTH TEST

We made 24-in. x 24-in. L-joints from red oak for all four of these joinery methods. Then we applied increasing tension with a turnbuckle and measured the failure point with a scale.

While admittedly not very scientific, the results were surprising. And it's always fun to break things!



BREAKING POINT OUR JOINTS FAILED AT THE FOLLOWING STRESS LEVELS:



POCKET SCREWS

The pocket screw joint is the only one that didn't break at the glue joint. The wood broke instead!

DOWELS, BISCUITS AND BEADLOCK

While the Beadlock joint was the strongest, these three joints eventually failed the same way: The glue joint broke and the wood pulled free of its reinforcement.

BOTTOM LINE STRENGTH IS NOT THE MAIN CONSIDERATION

All of these methods are plenty strong for typical woodworking uses. Unless the joint has to be especially strong, choose your method on the basis of speed or convenience rather than on strength.

MEET THE EXPERT

Brad Holden, an associate editor at *Family Handyman*, has been building cabinets and furniture for 30 years. In that time, he has absorbed so many slivers and ingested so much sawdust that he's practically made of wood.



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POT & PAN PULLOUT

A solution to stooping, searching
and stacking **By Spike Carlsen**



The only time our pots and pans were truly organized was when they were new in the box—since then, it's been "every pan for itself." Pots and pans are difficult to organize; if you stack them up, it's a hassle getting to the bottom ones. If you spread them out, they take up tons of valuable cabinet space.

This pot and pan pullout makes your pans easy to access and organize and—depending on your cookware—may even give you a place to stash your lids. It only takes a couple of hours, a couple of boards and a couple of drawer slides. Note: This accessory is designed to support everyday pots and pans, not extremely heavy objects or kids doing pull-ups.

WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 to 3 hours	\$25	Beginner

TOOLS Drill, jigsaw, router (optional), basic hand tools



1. MEASURE THE CABINET

Measure the depth of the cabinet from the back to the inside of the face frame. This measurement determines the overall length of the H-frame.



2. BUILD THE H-FRAME

Screw the cross arms to the support slat. Predrill holes and countersink screw heads to prevent splitting.



3. MOUNT THE DRAWER SLIDES

Screw the slides into place with the back ends even with the back of the H-frame.



4. SCREW THE SLIDES TO THE CARRIER

Cut the carrier to length, round the end and bore a finger hole, and then soften the edges with sandpaper or a router. Align the carrier with the back end of the slides.



5. ADD THE HOOKS

Secure the hooks to the carrier. Fiddle around with your pots and pans beforehand to determine the most efficient spacing.



6. INSTALL IT!

Position the bottom of the cross arm even with the top of the cabinet opening and attach it with screws. Then secure the back end at the same elevation, using temporary braces to prop it up.

How to build it

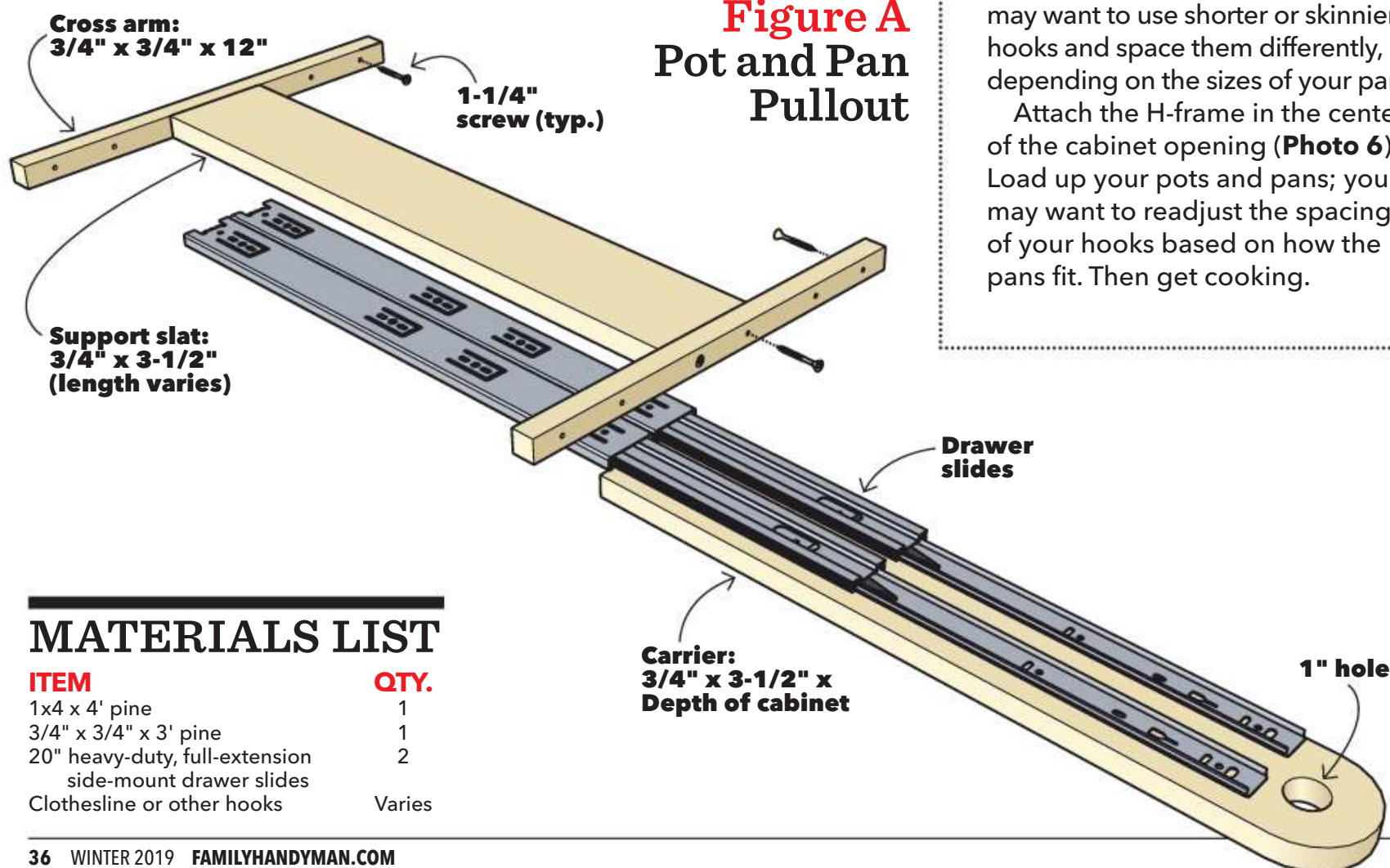
Empty your cabinet and measure the depth of the cabinet (**Photo 1**). Build the H-shape frame (**Photo 2**). The frame needs to be the same length as the inside depth of the cabinet, in our case 23 in. We cut our 1x4 support slat 21-1/2 in. long (two 3/4-in.-thick arms plus the 21-1/2-in. slat equals 23 in.). Predrill screw holes in the cross arms and bore countersink holes to accommodate the heads.

Screw on the two slides (**Photo 3**). Cut the carrier the same length as the depth of your cabinet. Flip the assembly over and attach the carrier as shown in **Photo 4**.

Install the hooks (**Photo 5**); we used beefy "clothesline hooks." You may want to use shorter or skinnier hooks and space them differently, depending on the sizes of your pans.

Attach the H-frame in the center of the cabinet opening (**Photo 6**). Load up your pots and pans; you may want to readjust the spacing of your hooks based on how the pans fit. Then get cooking.

Figure A
Pot and Pan Pullout



MATERIALS LIST

ITEM	QTY.
1x4 x 4' pine	1
3/4" x 3/4" x 3' pine	1
20" heavy-duty, full-extension side-mount drawer slides	2
Clothesline or other hooks	Varies

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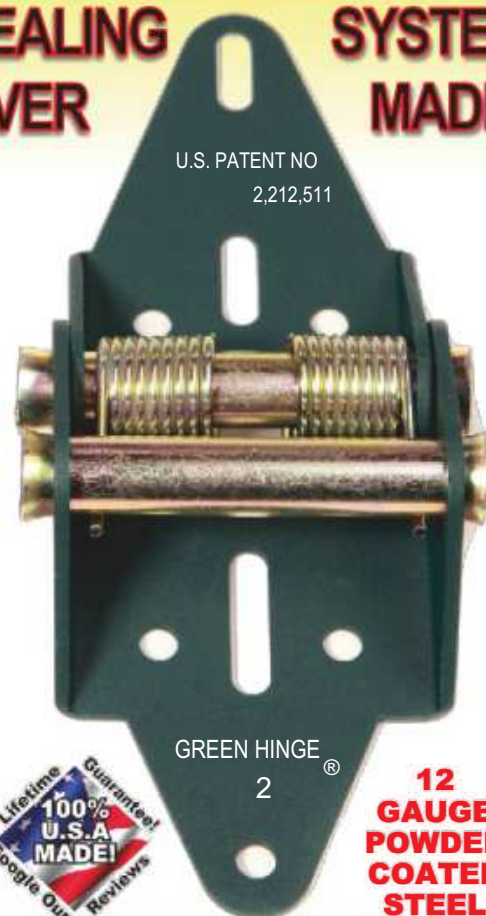
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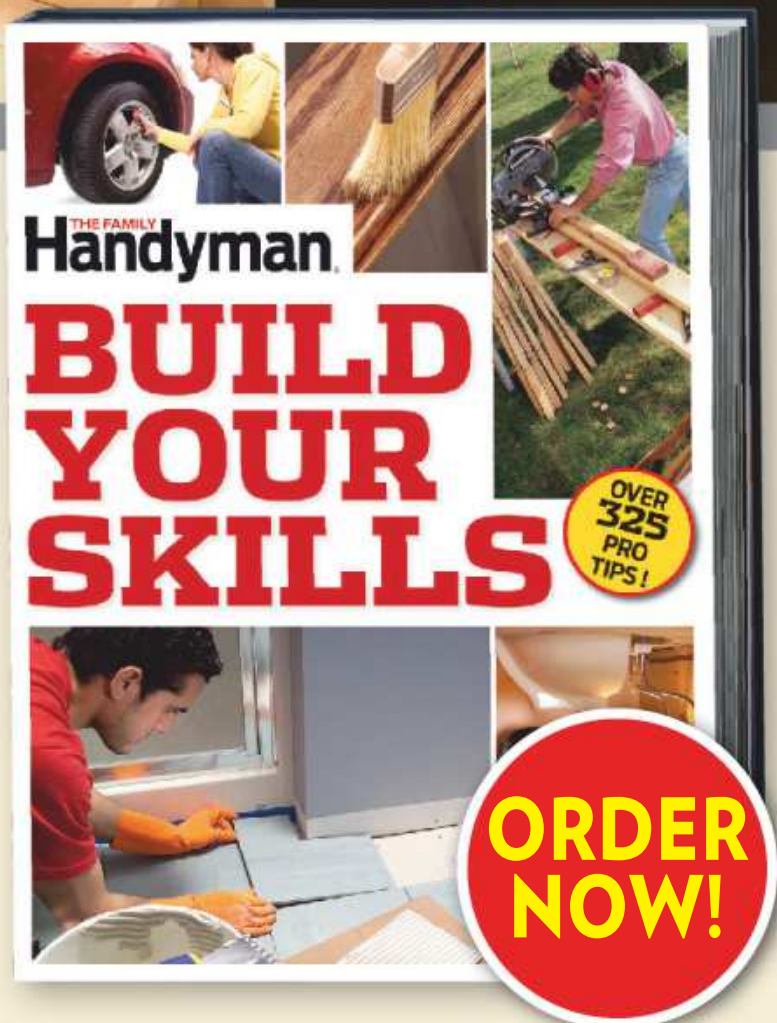
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CABINET DIVIDERS

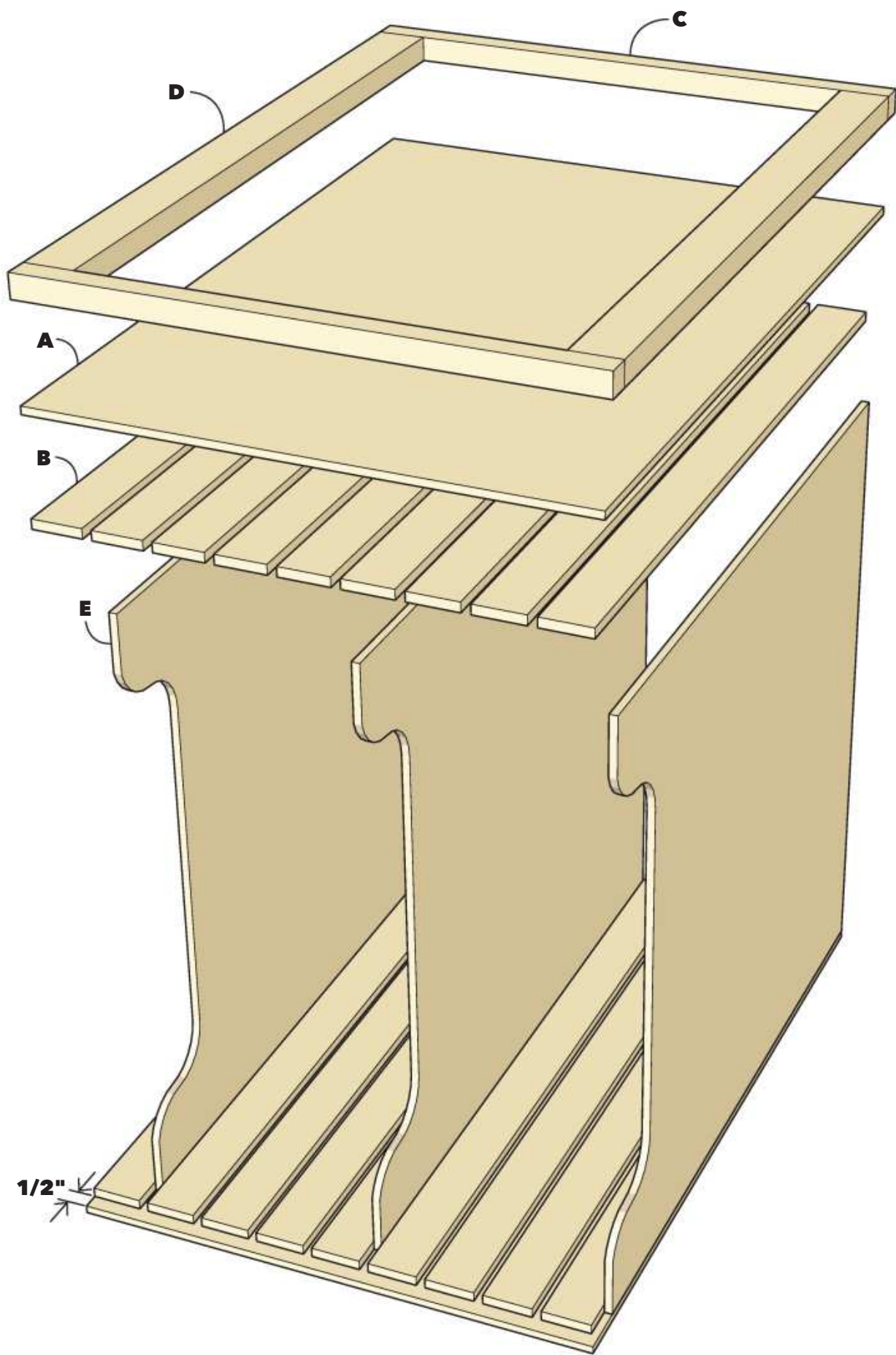
Adjustable slots organize cookware for space-efficient storage

By Spike Carlsen

Cookie sheets, cutting boards, cooling racks, serving trays, pizza peels... Most of us have a disorderly pile of large, flat cookware—and the thing we need is always at the bottom of the stack. This simple system of dividers brings order to the chaos. It requires minimal skills and materials and goes together fast, which allows you to spend more time cooking and less time searching and sorting.



Figure A Cabinet Dividers



WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 to 4 hours	\$40	Beginner

TOOLS Circular saw or table saw, drill, brad nailer (or hammer and nails), basic hand tools

How to build it

Measure the width and depth of your cabinet (**Photo 1**), then cut two 1/4-in. plywood panels (A) to fit. If you have a double-wide cabinet (like ours), cut the plywood so it extends at least halfway beyond the vertical center stile. **Tip:** If you have a double cabinet, you can cut the plywood extra wide, install the divider strips, then cut the plywood to final width so you wind up with full-width divider strips on both ends.

Cut the slats (B) 1/2 in. shorter than the plywood and use a sander or sandpaper to lightly round the ends. Glue and nail the divider slats into place (**Photo 2**), using a scrap piece of 1/4-in. plywood and an old credit card as spacers; this extra wiggle room will allow you to slide the divider panels in and out more easily. To prevent brad nails from poking through the plywood, adjust the depth setting of your nailer and drive brads at a slight angle.

Build the top frame (C and D) the exact size of your plywood panels (**Photo 3**) and predrill the mounting holes on each end. Install this frame with the bottom edge even with the top of the cabinet opening (**Photo 4**). Screw the front in place first. Before screwing the back, make sure it's at exactly the same height as the front.

Attach the panels (A) to the bottom of the cabinet (**Photo 5**) and to the upper frame. Measure between the panels to determine the height of the dividers (E). Cut one divider panel to size (**Photo 6**) then "test slide" it through several of the openings. If all the openings are equal, use your first divider panel as a template for cutting out the remaining ones (**Photo 6**). We created a 2-in. indent on the end of the divider panels to allow easier access to the trays and other items stored between them.

CUTTING LIST

KEY	QTY.	MATERIAL	PART
A	2	1/4" plywood*	Top/bottom panels
B	10-20**	3/8" x 1-1/2"	Slats (mull strip)*
C	2	3/4" x 3/4" pine*	Frame front/back
D	2	3/4" x 1-1/2" pine*	Frame sides
E	4-6**	1/4" plywood*	Divider panels

Notes:
* Dimensions determined by cabinet width and length
** Quantity determined by cabinet width

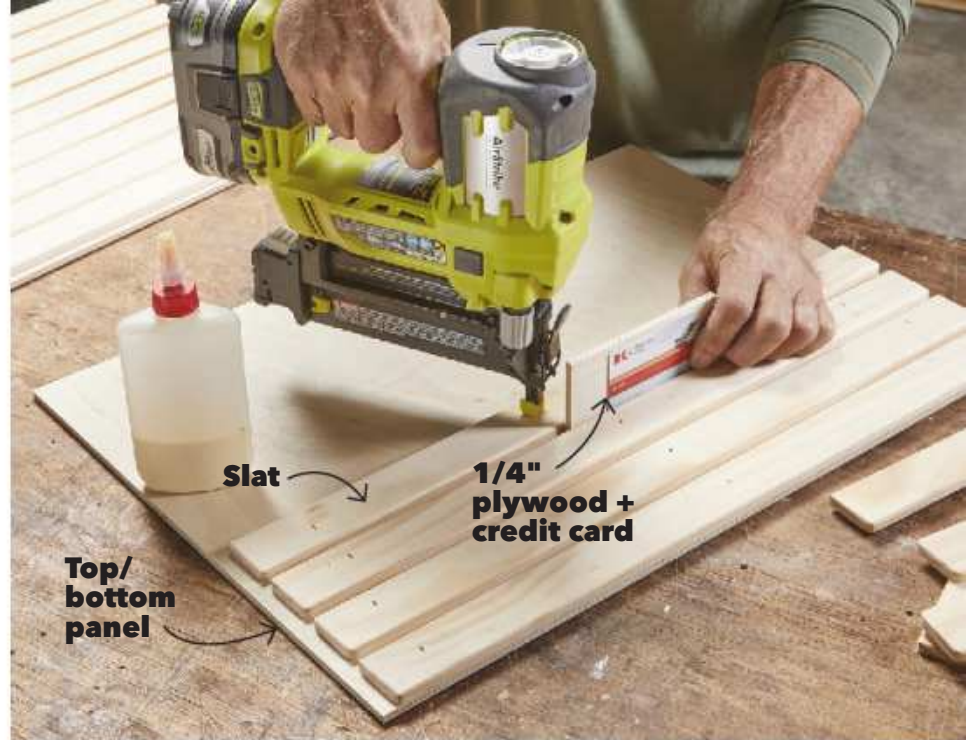
MATERIALS LIST

ITEM	QTY.
1/4" x 4' x 8' AC or better plywood	1
3/4" x 3/4" x 4' pine	1
3/4" x 1-1/2" x 4' pine	1
3/8" x 1-1/2" x 8' mull strip, available in the trim aisle at home centers	Varies



1. MEASURE INSIDE

Measure the width and depth inside the cabinet. Subtract 1/8 in. from those measurements and cut the top and bottom panels to that size.



2. TACK THE SLATS TO THE PANELS

Fasten the slats with glue and 1/2-in. brads. Space the slats with a scrap of 1/4-in. plywood and a credit card.



3. ASSEMBLE THE TOP FRAME

Build a frame the exact dimensions of the top/bottom panels. This frame provides a mounting surface for the top panel.



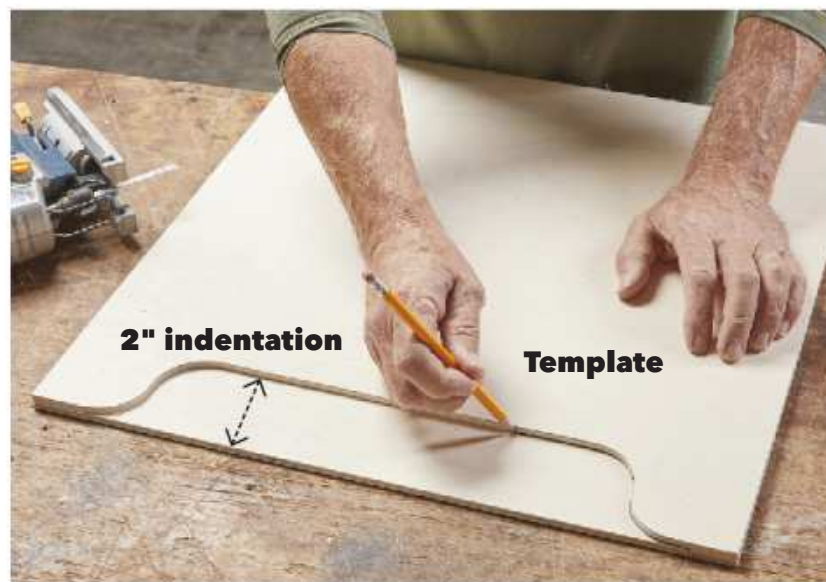
4. INSTALL THE TOP FRAME

Screw the frame to the cabinet, making the bottom edge flush with the top of the cabinet opening. Have the frame propped up with a couple braces cut from scrap wood while you work.



5. INSTALL THE TOP AND BOTTOM PANELS

Secure the panels to the cabinet bottom and to the upper frame using nails or screws.



6. MEASURE, CUT AND INSTALL THE DIVIDER PANELS

Cut one panel to size, then test-fit it in several of the openings. Use that panel as a template for making the remaining divider panels.

Great Gifts for DIYers

Whether you're shopping for others or making up a wish list for yourself, help is right here. These gift ideas, big and small, come from the best source we know of: our own workshops, job sites and hands-on experience.



Space-saving hose

\$30

Garden hoses always used to be a hassle to lug around and to store at my farm. GrowGreen hoses have been the answer to both problems. Thanks to the lightweight material, the hoses expand with water pressure and retract when empty. A 25-ft. hose retracts to less than 10 ft. long. When the job's done, I spray the water out of them and toss them into a bucket.

ANNE OF ALL TRADES does it all, from farming and carpentry to fine woodworking and metal forging. She shares woodworking plans along with her journey at anneofalltrades.com.



\$35

Comfortable dust mask

Standard masks just aren't comfortable for long periods of time. They tend to get sweaty, so I end up taking them off—and they certainly don't work when they're not on your face. The RZ Dust Mask is made of light mesh fabric and has a pair of straps that keep it in place, comfortably. Beneath the mask is a replaceable filter. The discharge valve lets your breath go out instead of up, so it doesn't fog your protective eyewear.

TAMAR HANNAH loves transforming rough lumber into unique conversation pieces. She creates project plans and shares them on her website, 3x3custom.com.





A costly caulk gun—and worth it

\$30

It's hard to appreciate the value of a good caulk gun until you've tried one. And this Albion B12 is the best I've ever used. The beefy trigger means less hand strain with stubborn adhesives and provides excellent flow control for a neat bead. And since this tool is built like a tank, I expect it will outlast me. Some builders also like the rotating cradle. But I couldn't avoid turning it upside down, which allowed the caulk tube to fall out. No problem: I simply locked up the swiveling mechanism with glue.

|| **GARY WENTZ, EDITOR-IN-CHIEF**



\$20

Tough attachment for tight spots

For driving or drilling in the tightest spaces, a right-angle attachment is a lifesaver. The Milescraft Drive90PLUS is my favorite because it's tough enough to use with my impact driver. And that makes driving screws easier. Other right-angle attachments are only rated for 250 in.-lbs., while this one can handle up to 1,500 in.-lbs.

|| **JEREMIAH JAMES, LEAD CARPENTER**



\$8*

Better glue bottle

The FastCap Glu-Bot glue bottle makes nearly every aspect of using wood glue a whole lot easier and neater. The wide base prevents tip-over spills and the cap is stored right on top of the bottle, so you should never lose it. It comes with a wide-blade tip and a pointed tip that can be swapped in seconds. But the best part is that you don't have to wait for the glue to reach the nozzle. Just hold the bottle upright and squeeze to force the glue to the nozzle. (This is especially great for vertical glue-ups.) When you release the bottle, glue is sucked back out of the nozzle, which minimizes the mess.

**depending on size*

AARON MASSEY is an all-around DIY guy with a passion for building stuff and making videos. He shares tutorials and plans at mrfixitdiy.com.



Magnetic helper

\$80

The Magswitch Workholding System is awesome. It's built around releasable magnets that solidly lock onto table saws or other machines—as long as they have an iron table. To release the magnets, just turn the knobs. This starter kit comes with a base, two switchable magnets and a reversible feather board. There are lots of other attachments available, or you can use your imagination and come up with your own jigs.

|| **MIKE BERNER, ASSOCIATE EDITOR**



GET MORE

See more DIY gear and reviews at fhmag.com/stuffwelove



\$30

Accurate table saw setup

If you've ever set your table saw to make a 45-degree bevel cut for a box or picture frame and ended up with gapping miters because the markings on your machine were half a degree off, you need this Wixey Digital Angle Gauge. Just set it on your table, zero out the display and then stick the magnetic base onto the blade and adjust the bevel. The digital readout will tell you the angle of your blade down to one-tenth of a degree.



TAMAR HANNAH has more tool advice at 3x3custom.com.

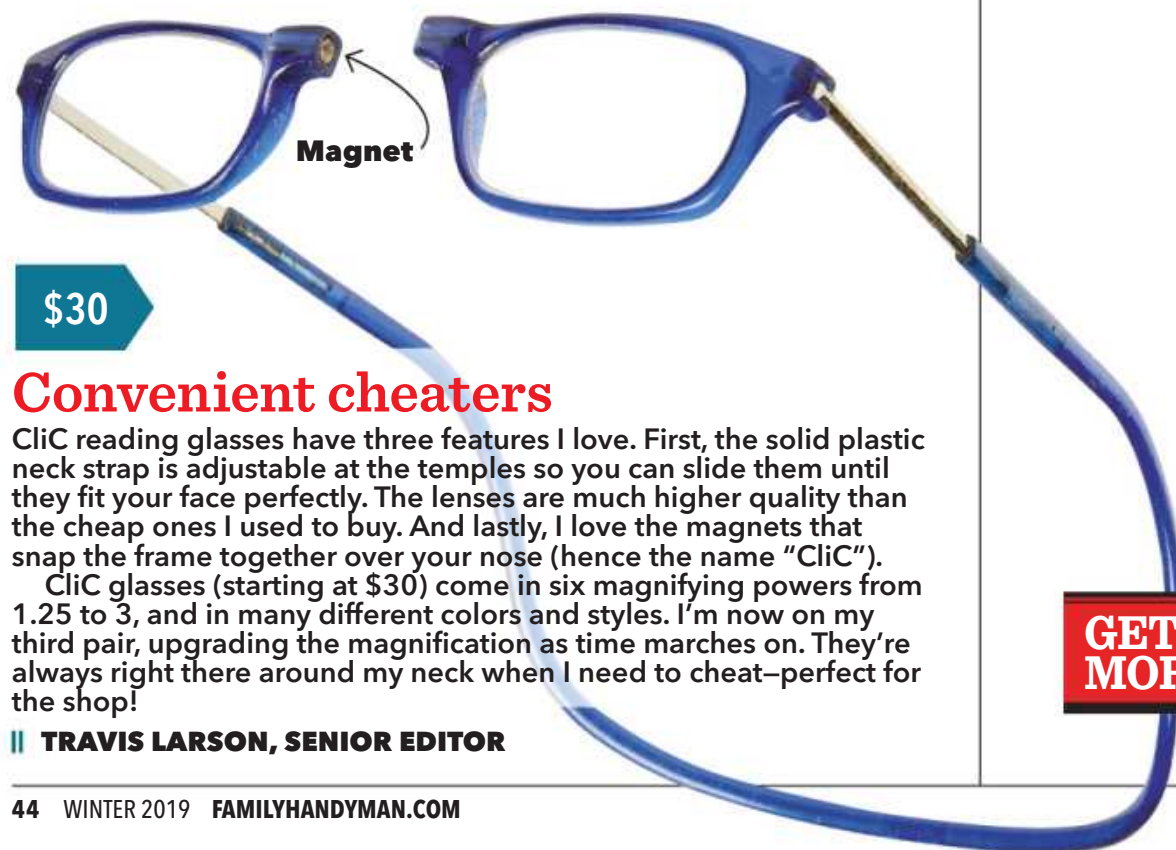


\$23

Projects for kids

I've designed and built tons of kids' furniture in recent years—and with eight growing grandkids, I've learned to do it fast and easy. My book, *Building Unique and Useful Kids' Furniture*, shares those lessons and guides you through each project with clear instructions and photos. It's available online and in stores Dec. 1. Get more info—and lots of photos—at spikecarlsen.com.

SPIKE CARLSEN, CONTRIBUTING EDITOR



\$30

Convenient cheaters

CliC reading glasses have three features I love. First, the solid plastic neck strap is adjustable at the temples so you can slide them until they fit your face perfectly. The lenses are much higher quality than the cheap ones I used to buy. And lastly, I love the magnets that snap the frame together over your nose (hence the name "CliC").

CliC glasses (starting at \$30) come in six magnifying powers from 1.25 to 3, and in many different colors and styles. I'm now on my third pair, upgrading the magnification as time marches on. They're always right there around my neck when I need to cheat—perfect for the shop!

TRAVIS LARSON, SENIOR EDITOR

\$46

Japanese hammer

Twenty years ago, I took a chance on this odd-looking framing hammer (below right). Glad I did. Besides the perfect balance and feel, it has some nice extras. The steep claw angle gives ample leverage for pulling nails, and the claws are pointed so I can dig out sunken nails. A magnetic nail slot lets me start a nail where I can't reach high enough to hold the nail. My wood-handled version costs \$67 at japanwoodworker.com; the Ohsho Claw Hammer Middium on the left is about \$46 at amazon.com.

BRAD HOLDEN, ASSOCIATE EDITOR



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\$11

Shears for your garden or shop

When summer finally rolls around again, I'll be in my garden every day, pruning, harvesting and maintaining the crops. My Chinese garden shears make pruning thicker stems and harvesting veggies a breeze. They're part of the SE SC616 three-piece set I found online. I use small shears to clip herbs, and I keep a larger pair in my shop for trimming leather or other tough material.

|| ANNE OF ALL TRADES



\$160

Terrific for tires

Why lug around a heavy compressor and hose just to fill tires? All you really need is a battery-powered inflator. There are many versions available, some costing less than \$40. My favorite is the more expensive Milwaukee 2475 Compact Inflator (shown above), which automatically shuts off when the tire is at the correct pressure.

|| MARK PETERSEN, SENIOR EDITOR

A GIFT THAT LASTS FOREVER

Almost every week I hear from someone who built their DIY skills using *Family Handyman* as a guide—skills that bring a lifetime of satisfaction, savings and independence. If you want to give a skill-building gift, now's a great time. If you order and pay for a gift subscription online, you can give a second gift FREE! Go to familyhandyman.com/givetoday.

GARY WENTZ,
EDITOR-IN-CHIEF



\$180

Constant companion

My Triton SuperJaws XXL Portable Clamping System is by far the most versatile tool in my shop. I use it on every single project. It's a reliable third hand or a clamp when I'm doing a glue-up. When I need a quick work surface, I clamp a scrap of plywood between the jaws. The system folds up for compact storage, but mine is in use constantly and never gets put away.

APRIL WILKERSON builds what she needs rather than buying or hiring out. She sells plans and chronicles all kinds of projects—carpentry, woodworking, welding and more—at wilkerdos.com.

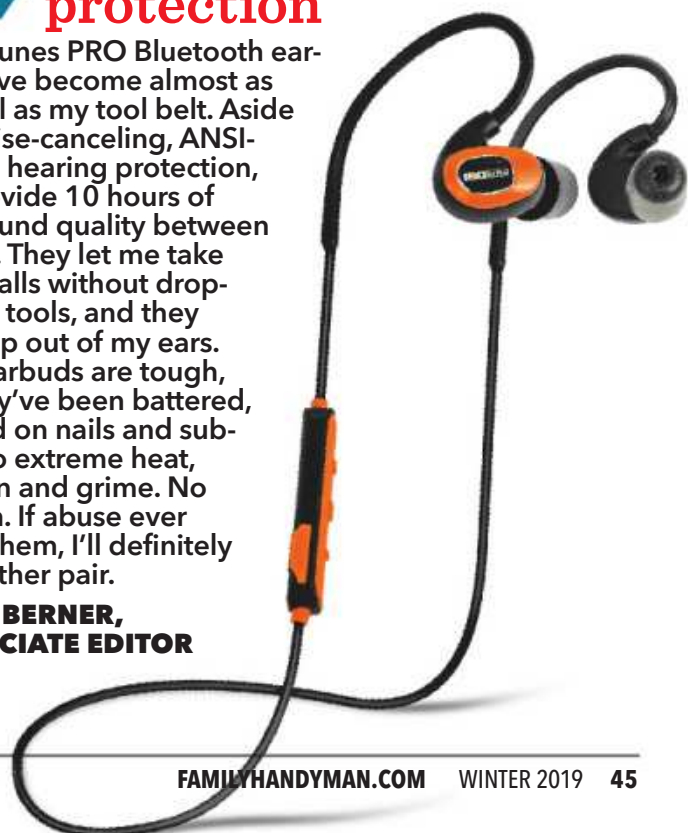


\$90

Perfect hearing protection

My ISOtunes PRO Bluetooth earbuds have become almost as essential as my tool belt. Aside from noise-canceling, ANSI-certified hearing protection, they provide 10 hours of great sound quality between charges. They let me take phone calls without dropping my tools, and they never slip out of my ears. These earbuds are tough, too. They've been battered, snagged on nails and subjected to extreme heat, cold, rain and grime. No problem. If abuse ever wrecks them, I'll definitely buy another pair.

MIKE BERNER,
ASSOCIATE EDITOR





STOP LEAKS

UNDER THE SINK

Whether your pipes need total replacement or just tightening, here's how to put an end to the leaks

By Gary Wentz

Before you can stop a leak, you have to find its source. That can be tricky. Water that escapes your pipes can travel a long way before it drops onto your cabinet's floor.

Here's how a drip detective tracks the source of a leak: Fill both bowls of the sink with luke-warm water, not cold. (Cold water can cause beads of condensation to form on the pipes, making it impossible to find the leak.) Then get under the sink with a trouble light. Dry off all the pipes and examine the seals around the basket strainers. If you don't see any droplets forming, remove both sink stoppers and watch for telltale dribbles. Joints are the most likely source of leaks, but old metal pipes can develop pinhole leaks anywhere, especially in the trap.

If you can't find any leaks in the drain system, check the water supply lines that serve the faucet. Finally, check for "splash leaks," spots where water seeps under the sink rim or faucet base. To find these leaks, use a rag to dribble water around the faucet and sink rim, then get underneath and look for drips.

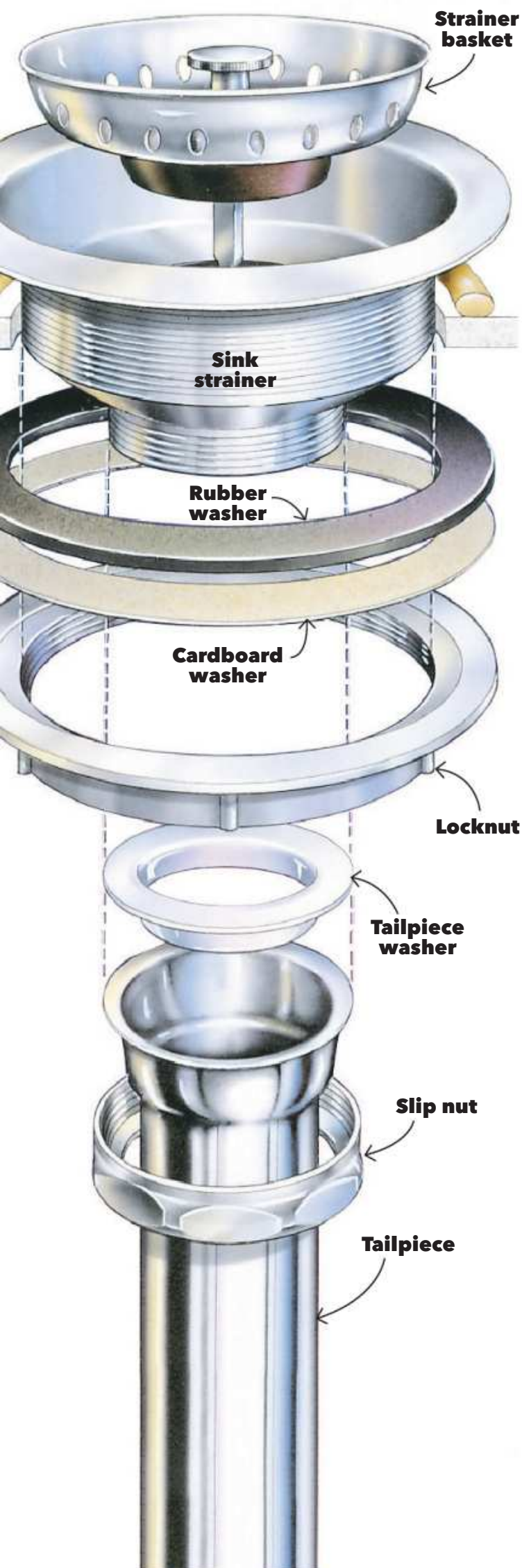


Loosen slip nuts, then straighten crooked pipes. Retighten metal nuts with slip-joint pliers. With plastic nuts, hand-tighten first. If that doesn't stop the leak, gently snug up the nuts with pliers.

1. Straighten pipes and tighten nuts

The washers that seal pipe joints won't hold water unless one section runs straight into the other. The "ground" joint on the trap has no washer, but it too will leak if it's misaligned (see p. 51). Eyeball the leaking joint to check its alignment. If it's crooked, simply loosen the nut, straighten the pipe and retighten. Since the whole assembly is interconnected, you might misalign one joint while straightening another. Don't be surprised if you end up loosening and tightening several joints to straighten just one.

If a joint is aligned but leaks anyway, tighten the slip nut. Use two slip-joint pliers on metal pipes: one to hold the pipe, the other to tighten the nut. If you have old metal pipe, you might find that it has worn thin and collapses when you put a pair of pliers on it. With plastic pipe, hand-tighten first. If that doesn't stop the leak, use pliers. But be gentle; plastic threads are easy to strip.



Basket Strainer Assembly

2. Reseal a leaky strainer

The primary seal around a basket strainer is plumber's putty, which doesn't last forever. Over the years it can harden, shrink or crack. Sometimes you can stop a leak by tightening the locknut. But in many cases, the only cure is a new dose of putty.

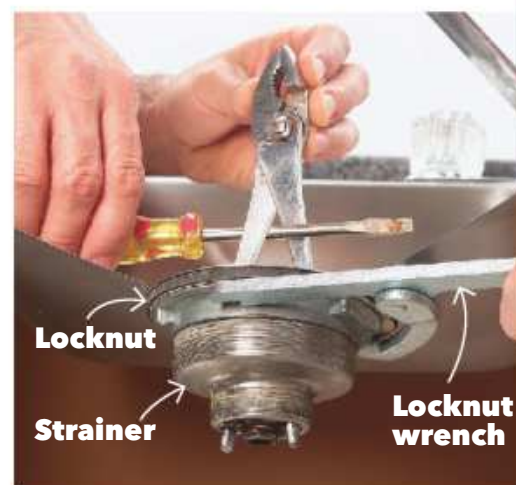
Photos 1 - 4 below show you how. You can reuse the old strainer if all the parts are in good shape, but it usually makes sense to replace it. Expect to spend at least \$15—cheaper strainers are less reliable. Since you have to take apart most of the drain assembly to get at a leaking strainer (**Photo 1**), consider replacing the drain lines if they're old (see p. 50).

The hardest part of this job is unscrewing the old locknut, which is often welded in place by mineral deposits or corrosion. A special wrench designed just for locknuts, called a "spud wrench" or "locknut wrench" (**Photo 2**), costs about \$15. Big slip-joint pliers (\$25) with a 3-1/2-in. jaw opening will work too, plus you can use them for other jobs. Whatever tool you use, you might find that the locknut won't budge. In that case, a single cut with a hacksaw blade is the only solution (**Photo 3**). It's almost impossible to do this without cutting into the strainer threads, so plan on buying a new strainer.

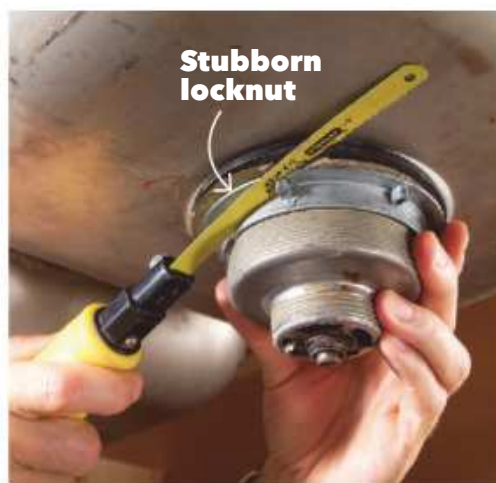
With the locknut removed, pull out the strainer and scrape old putty off the sink with a plastic putty knife. Installing a new strainer is simple (**Photo 4**). Just remember that the rubber washer goes on before the cardboard washer. Tighten the strainer using the same method you used to remove it.



1 Disassemble the drain assembly so you can remove the leaky strainer. Turn slip nuts counterclockwise, using a second set of pliers if necessary to keep the pipes from turning.



2 Turn the locknut counterclockwise to remove the strainer. Have a helper stick the handles of the pliers into the strainer holes and keep the strainer from turning using a screwdriver.



3 Cut the locknut with a hacksaw if you can't unscrew it. Cut at a sharp diagonal angle and be careful not to cut into the sink.



4 Encircle the drain opening with plumber's putty or waterproof caulk. Install the rubber washer and the cardboard washer and tighten the locknut using the same method you used to remove the old one.

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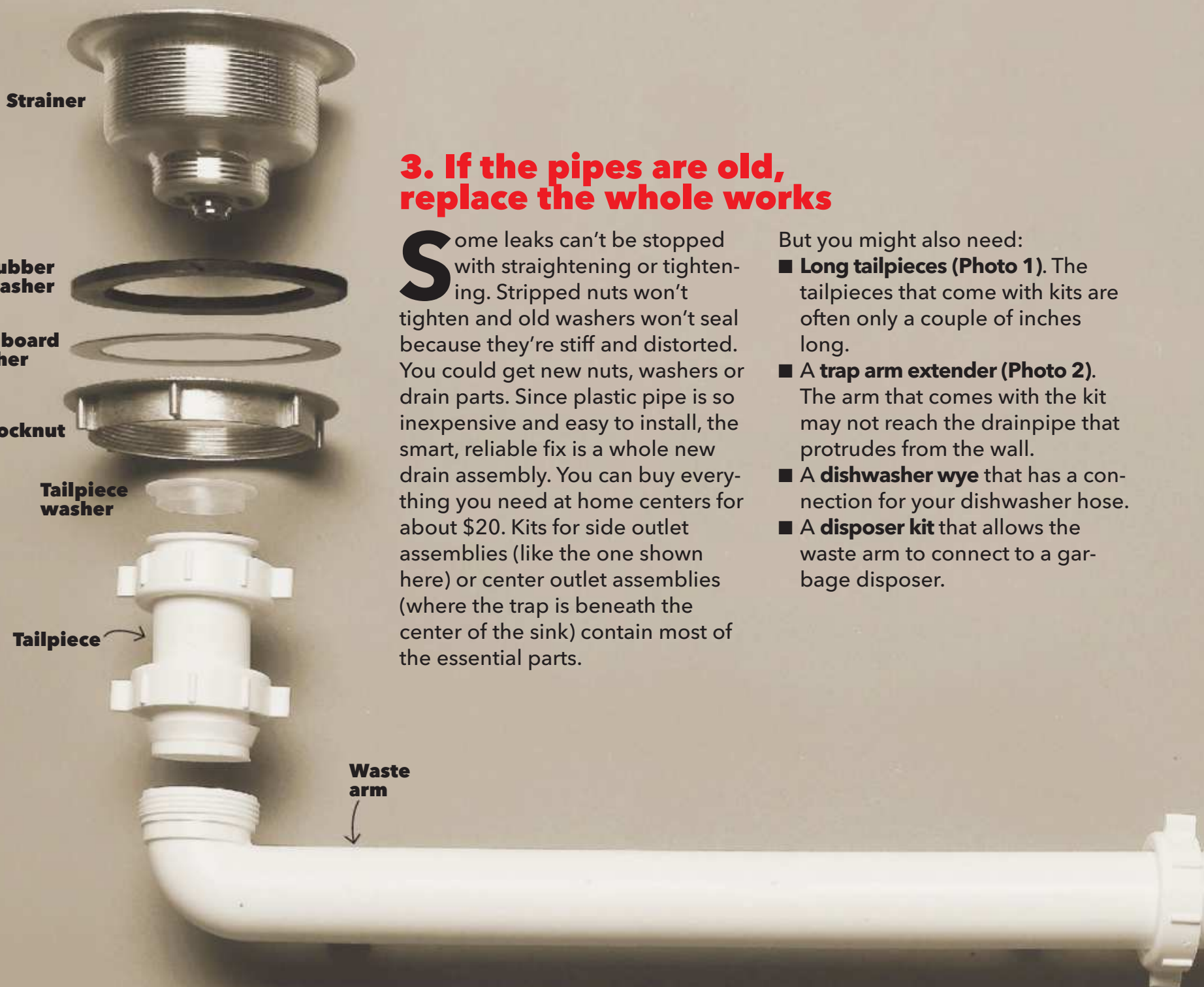


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3. If the pipes are old, replace the whole works

Some leaks can't be stopped with straightening or tightening. Stripped nuts won't tighten and old washers won't seal because they're stiff and distorted. You could get new nuts, washers or drain parts. Since plastic pipe is so inexpensive and easy to install, the smart, reliable fix is a whole new drain assembly. You can buy everything you need at home centers for about \$20. Kits for side outlet assemblies (like the one shown here) or center outlet assemblies (where the trap is beneath the center of the sink) contain most of the essential parts.

But you might also need:

- **Long tailpieces (Photo 1).** The tailpieces that come with kits are often only a couple of inches long.
- **A trap arm extender (Photo 2).** The arm that comes with the kit may not reach the drainpipe that protrudes from the wall.
- **A dishwasher wye** that has a connection for your dishwasher hose.
- **A disposer kit** that allows the waste arm to connect to a garbage disposer.



1 Attach the tailpiece to the basket strainer, but don't fully tighten it yet; you'll have to remove and cut it later.



2 Slide the trap arm into the adapter. Then attach the trap and slide the arm in or out to position the trap directly under the tailpiece. You may need to cut the arm or add an extender.



3 Hold the waste tee alongside the tailpiece about 1-1/2 in. below the top of the trap. Mark the tailpiece 1/2 in. below the top of the tee. Cut both tailpieces to the same length and install them.



TIPS FOR SUCCESS:

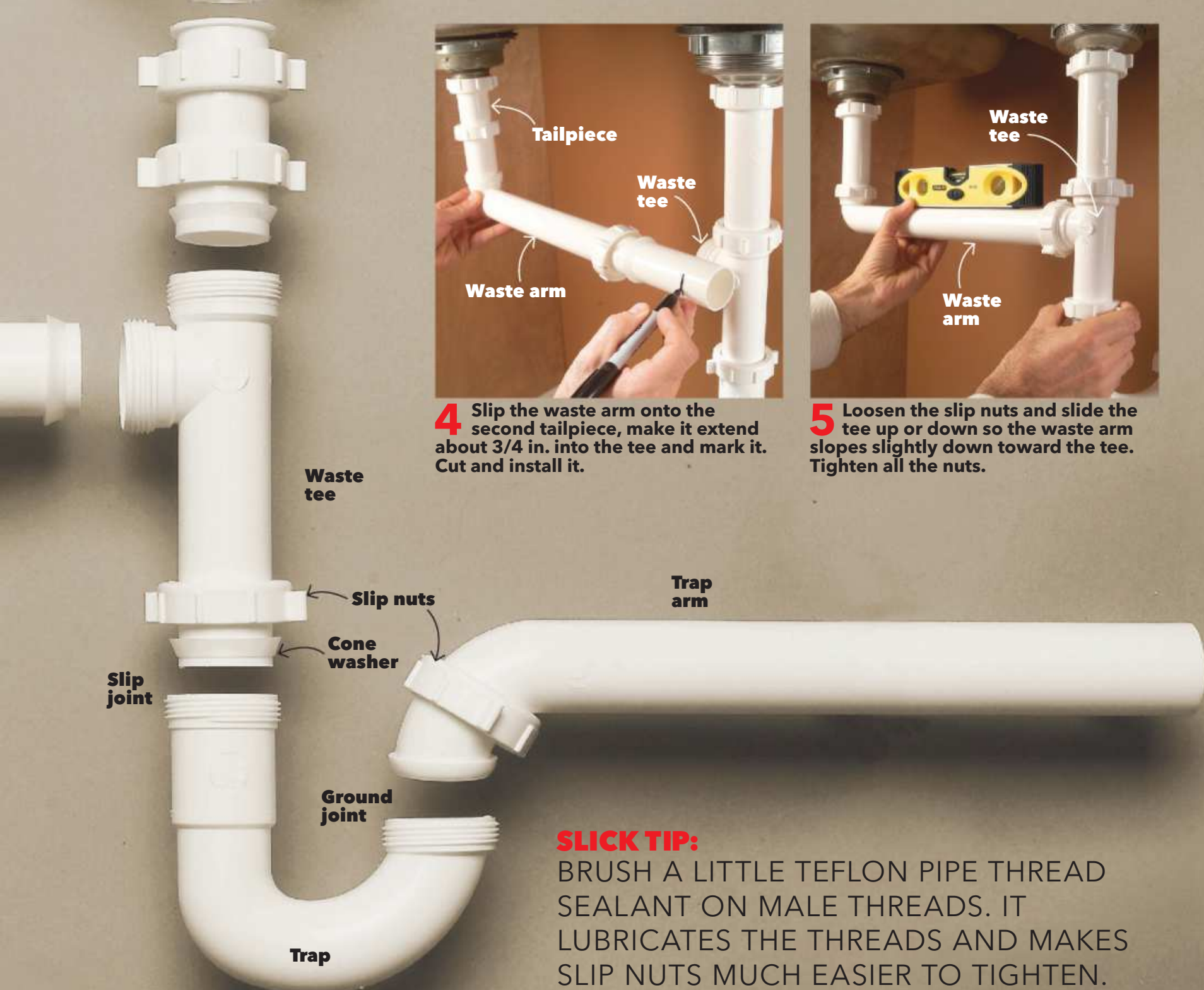
- You'll have to cut a few pipes: both tailpieces, the waste arm and maybe the trap arm. A fine-tooth hacksaw works best.
- When in doubt, mark and cut pipes a bit long. Better to cut twice than cut too short and make an extra trip to the hardware store.
- Don't forget to insert tailpiece washers (**Photo 1**). Other joints require cone washers. The only joint without a washer is the ground joint at the trap.
- Connect everything loosely until the whole assembly is complete. Then tighten all the slip nuts.
- Hand-tighten the slip nuts. If any joints leak when you test the new assembly, tighten them slightly with slip-joint pliers.
- Lastly, check for leaks. To see how, search for "finish a plumbing job" at familyhandyman.com.



4 Slip the waste arm onto the second tailpiece, make it extend about 3/4 in. into the tee and mark it. Cut and install it.



5 Loosen the slip nuts and slide the tee up or down so the waste arm slopes slightly down toward the tee. Tighten all the nuts.



SLICK TIP:

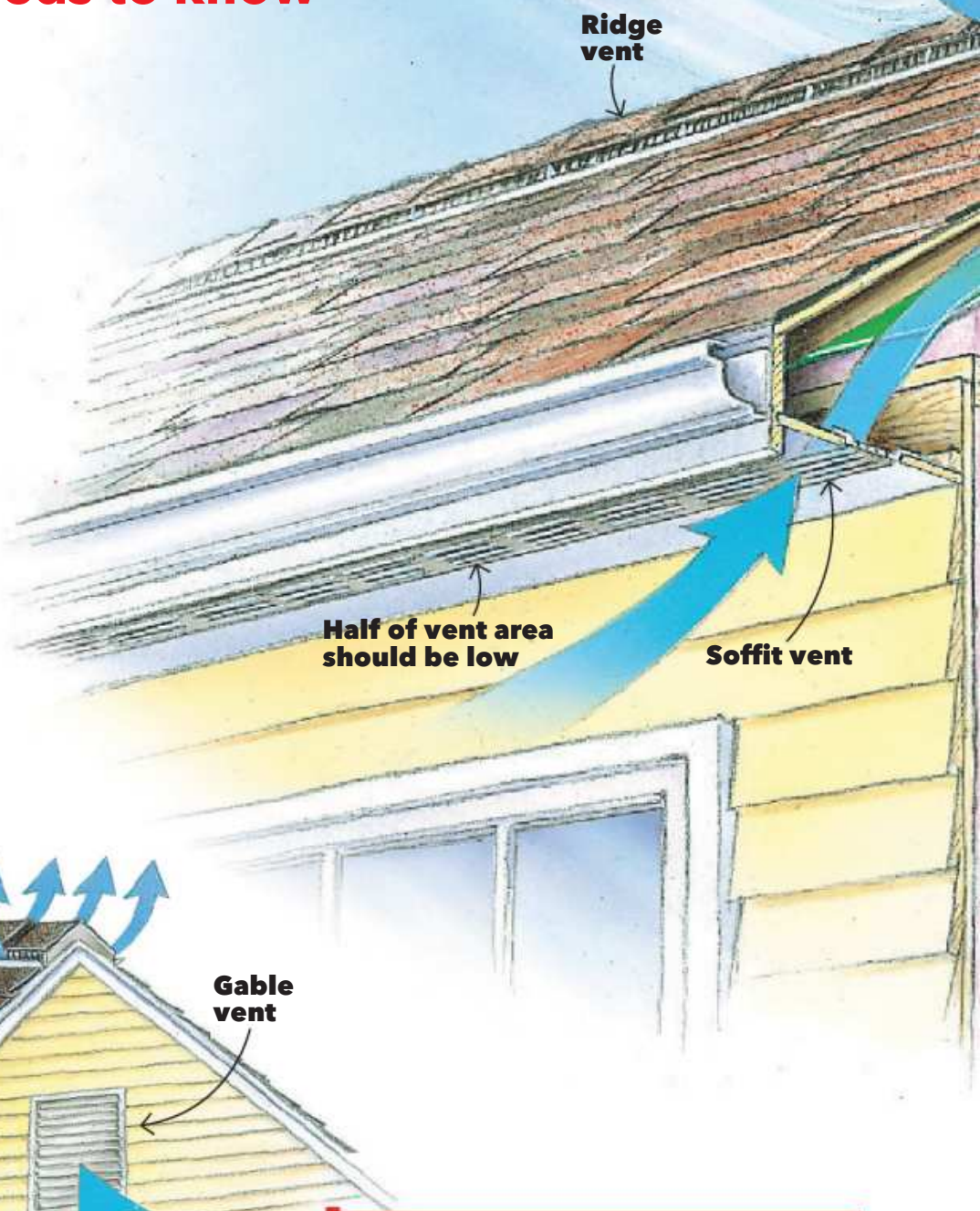
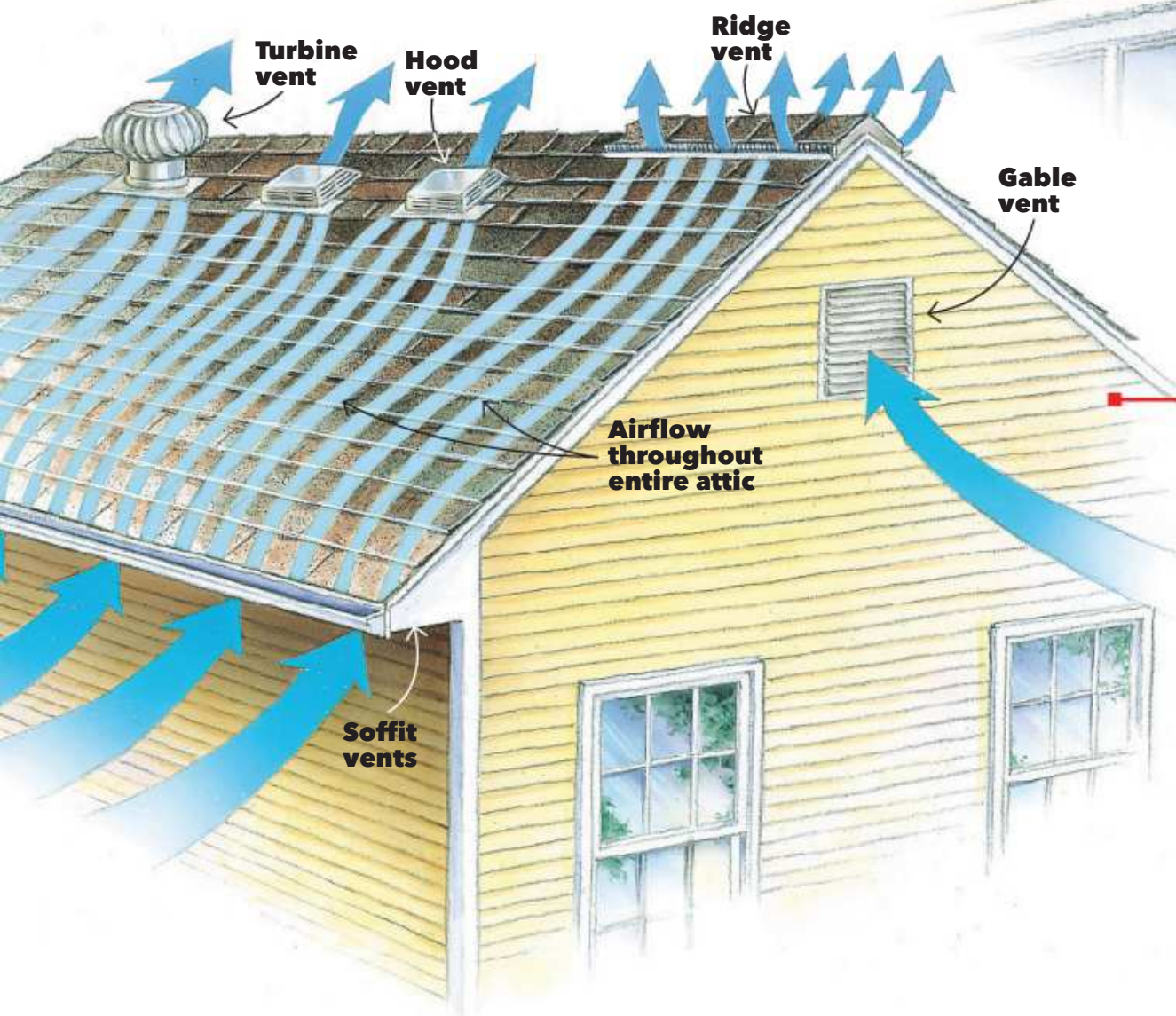
BRUSH A LITTLE TEFLON PIPE THREAD SEALANT ON MALE THREADS. IT LUBRICATES THE THREADS AND MAKES SLIP NUTS MUCH EASIER TO TIGHTEN. CHECK THE LABEL TO MAKE SURE THE SEALANT IS SAFE FOR PLASTIC.

ROOF VENTING BASICS

What every homeowner needs to know

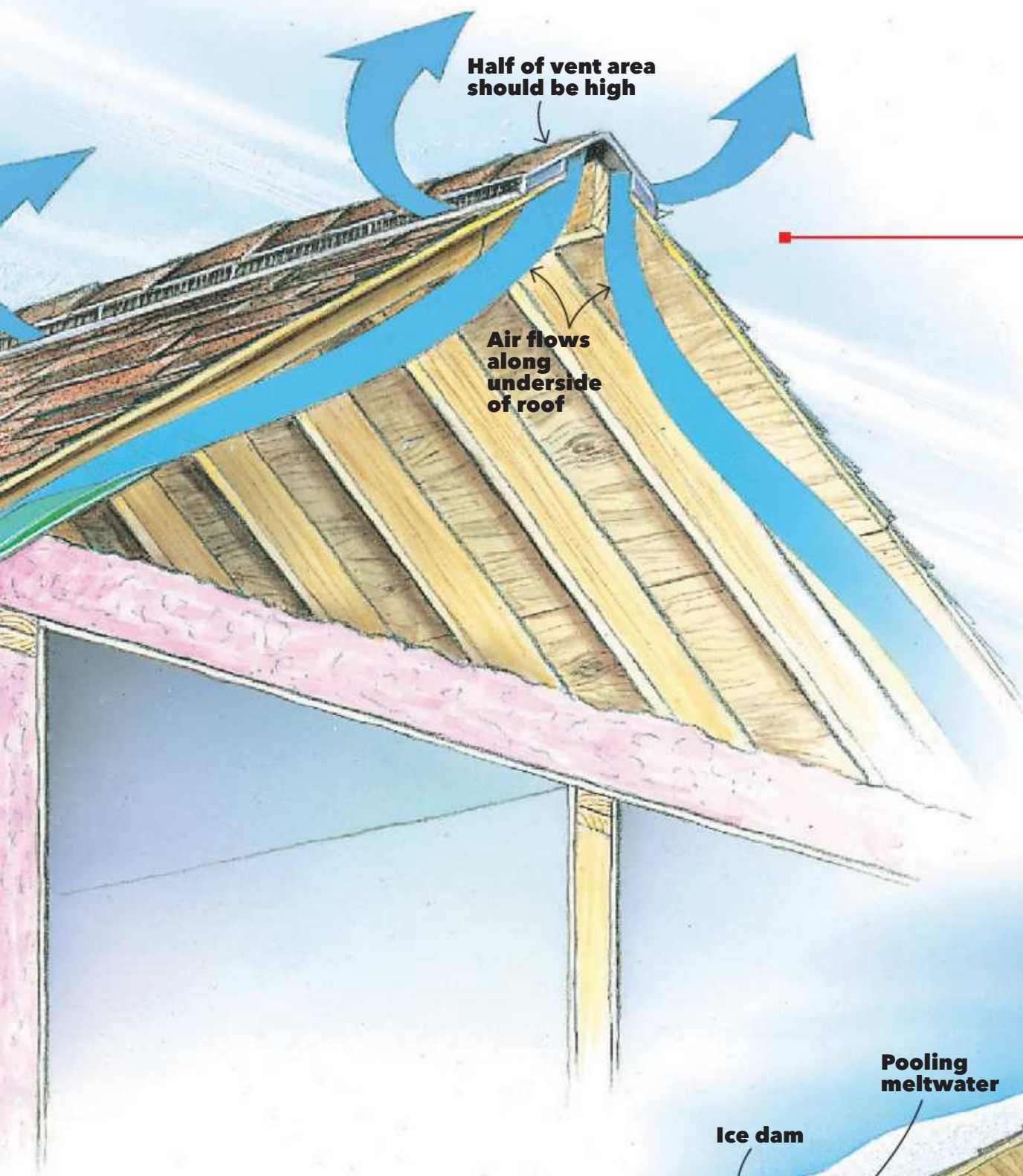
By Gary Wentz

If you've never given roof ventilation a moment's thought, you're not alone. Even builders didn't think about it much until the 1950s. But eliminating warm, moist air from the attic is critical to the health of your house. A basic understanding of roof venting can help you solve big problems—or avoid them altogether.



Paths to good venting

For intake air, soffit vents are best. Air can passively exit through ridge vents or hood vents. Turbine vents harness the wind to suck air out of the attic. Electric-powered vents are the ultimate air movers but aren't necessary in most situations. Gable vents can help by allowing air in or out, but they don't usually help the air flow evenly throughout the attic.



It's all about airflow

Roof ventilation is based on the simple fact that warm air rises. In summer, the sun heats air in the attic. In winter, heat from your home warms attic air. In either season, good venting occurs when cool air can enter the attic near the eaves and exit near the peak. Ideally, half of the vent area should be low and half high.

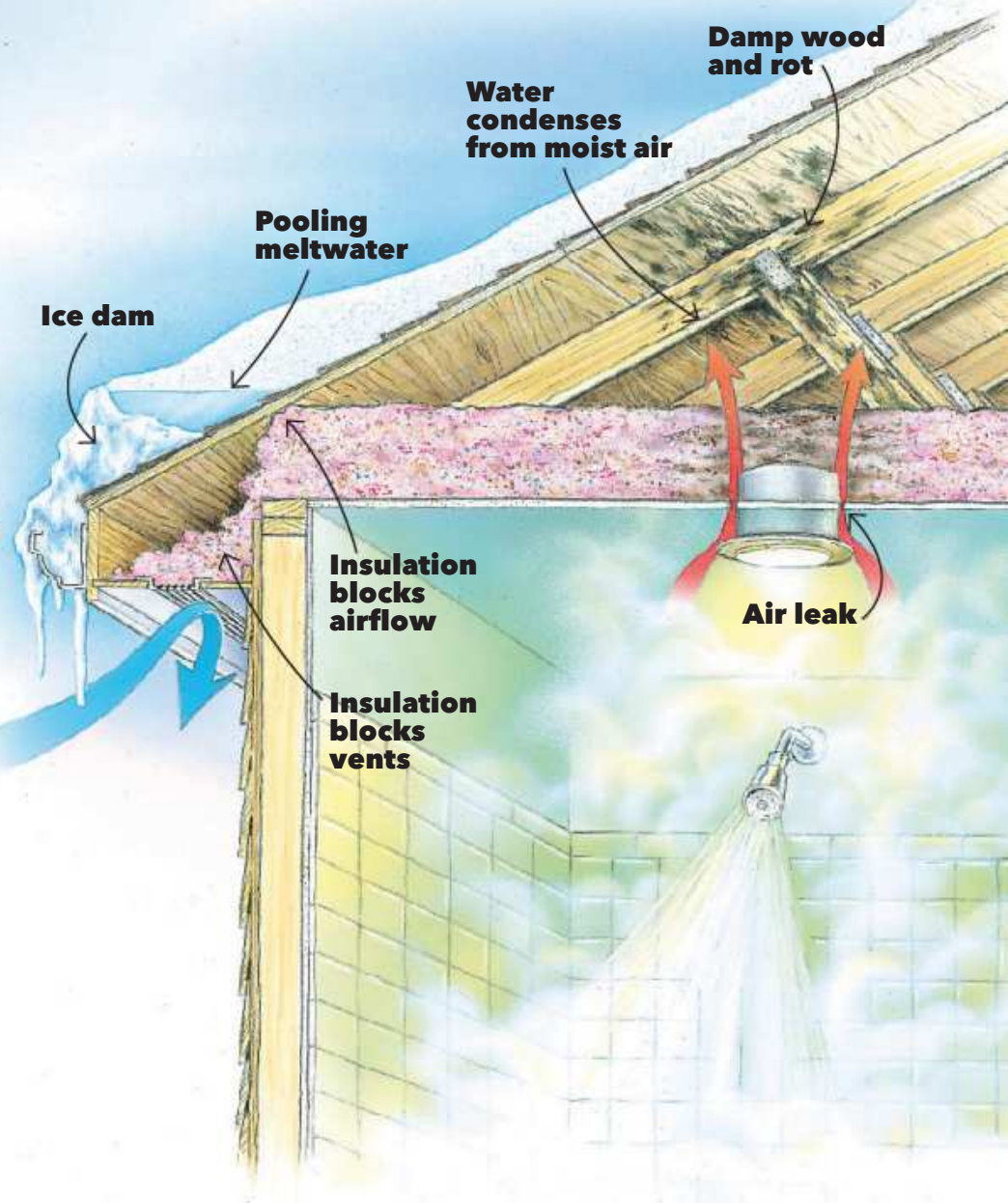
Bad ventilation, big problems

MOISTURE DAMAGE:

Most ceilings aren't perfectly sealed, so warm, humid air leaks into the attic. Then condensation forms on the roof framing and sheathing. That moisture supports rot, which can cause serious structural damage to your home. The water can also drip onto the ceiling, causing further damage.

ICE DAMS:

A poorly vented attic gets warm enough to melt snow on the roof while the eaves remain cold. Then, when the meltwater reaches the eaves, it freezes and forms a dam. More meltwater puddles behind the dam and seeps through the shingles.



More roof venting basics

■ SPY ON THE NEIGHBORS

If your roof is bare while neighboring roofs are still snow-covered, it could be a sign of trouble. While your roof may just be warmer because of its design or its more extensive southern exposure, it could also mean that you have poor ventilation or inadequate insulation.

■ CUT COOLING COSTS?

Attics get super-heated by sunshine, and some of that heat is radiated to rooms below. So it's reasonable to think that better ventilation would lessen the radiated heat and reduce the load on your cooling system. But most studies find only minor savings with improved ventilation.

Adding attic insulation is usually much more effective.

■ WHAT ABOUT 'HOT ROOFS'?

A "hot roof" has insulation directly under the roof sheathing and doesn't require ventilation. With careful design and installation, a hot roof can be trouble-free.

■ COOLER SHINGLES LAST LONGER

Heat slowly degrades asphalt shingles. Ventilation helps to keep them cooler, extending the life of the roof. However, the effect of ventilation on shingle life depends on many factors, especially climate; venting matters most in hot, sunny regions. Most shingle manufacturers void their warranties if roof venting standards aren't met.

■ HOW MUCH IS ENOUGH?

Building codes generally require 1 sq. ft. of vent area for every 300 sq. ft. of attic floor. That assumes half of the vent area is high on the roof and half is low (in or near the eaves). Otherwise, doubling the vent area is required (1 per 150 sq. ft.) These are minimum requirements; there's no such thing as too much ventilation.



■ VENTS GET PLUGGED

Soffit vents often get plugged by debris, cobwebs or stray insulation. You can clear them with a compressor and an air nozzle or a leaf blower. Wear eye protection!



VOCAB: NFVA

"Net free vent area" is the amount of open space in a roof vent, a measurement usually given in square inches and listed on the vent. A typical hood-style vent, for example, might be labeled "NFVA: 50 sq. in."

AHEAD OF THE CURVE



Not shown
actual size.

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Elegant **KEEPSAKE BOX**

**SHOW OFF TREASURED WOOD—
AND LOCK OTHER TREASURES INSIDE***
BY BRAD HOLDEN



Small boxes like these allow you to showcase the beautiful details of a piece of wood. It could be an unusual color, a highly figured pattern or just an eye-pleasing wave of grain. You could splurge on an exotic species or simply use choice leftovers from another project. I made the box in this article from mahogany scraps that were too small for most projects but way too nice for the fireplace.



*** TO SEE HOW THE
INGENIOUS SECRET LOCK
WORKS, FLIP TO P. 62.**

SHOWCASE THE WOOD

Splurge! Consider bird's-eye maple, burl walnut or some exotic species you've never even heard of before. Wood-database.com is a great source for images and working properties of various wood species.



CUT PARTS CONSECUTIVELY

Try to cut all your parts in order from a single board. When you assemble your box—particularly one with mitered corners—the grain will look seamless as it wraps around the corners.



SELECT THE BEST

Cut out cardboard windows, sized to each of your box parts. Position the windows on your boards to find the most attractive section of grain for each piece.



1. PREP THE SIDES AND ENDS Cut each side as a single piece, including one end each, to finished width and rough length. The end pieces will be cut off later.



2. GROOVE THE SIDES AND ENDS Mill the grooves for the top and bottom. Both grooves are the same distance from their respective edges. Plane the bottom to fit the groove.



3. MITER THE CORNERS Cut the miters on the ends and sides, trimming each piece to final length. Then rip the short end to finished height.



4. ASSEMBLE THE BOX Lay out the box parts in a line, with tape at the corners. Glue the miters, slip in the bottom, and then fold the box together. Reset each piece of tape, stretching them to pull the corners tight.

Make the parts

This box is made from 1/2-in.-thick material. Most home centers carry 1/2-in. boards in a few common species like oak and poplar. If you want more choices and don't own a planer, shop online (rockler.com is one good source).

Since the ends (B and C) are so short, leave each end and side (A) as a single board for now (**Photo 1**). Then cut them free after milling the

grooves, leaving extra length.

Mark the outside face of the side/end boards. Keep that side facing up as you cut the grooves. The easiest way to cut these grooves is with a dado set. Make one pass for the bottom groove, spin the board and make one pass for the top groove (**Photo 2**). To cut these grooves with a regular blade, you'll just need to make several passes to get the right dimension.

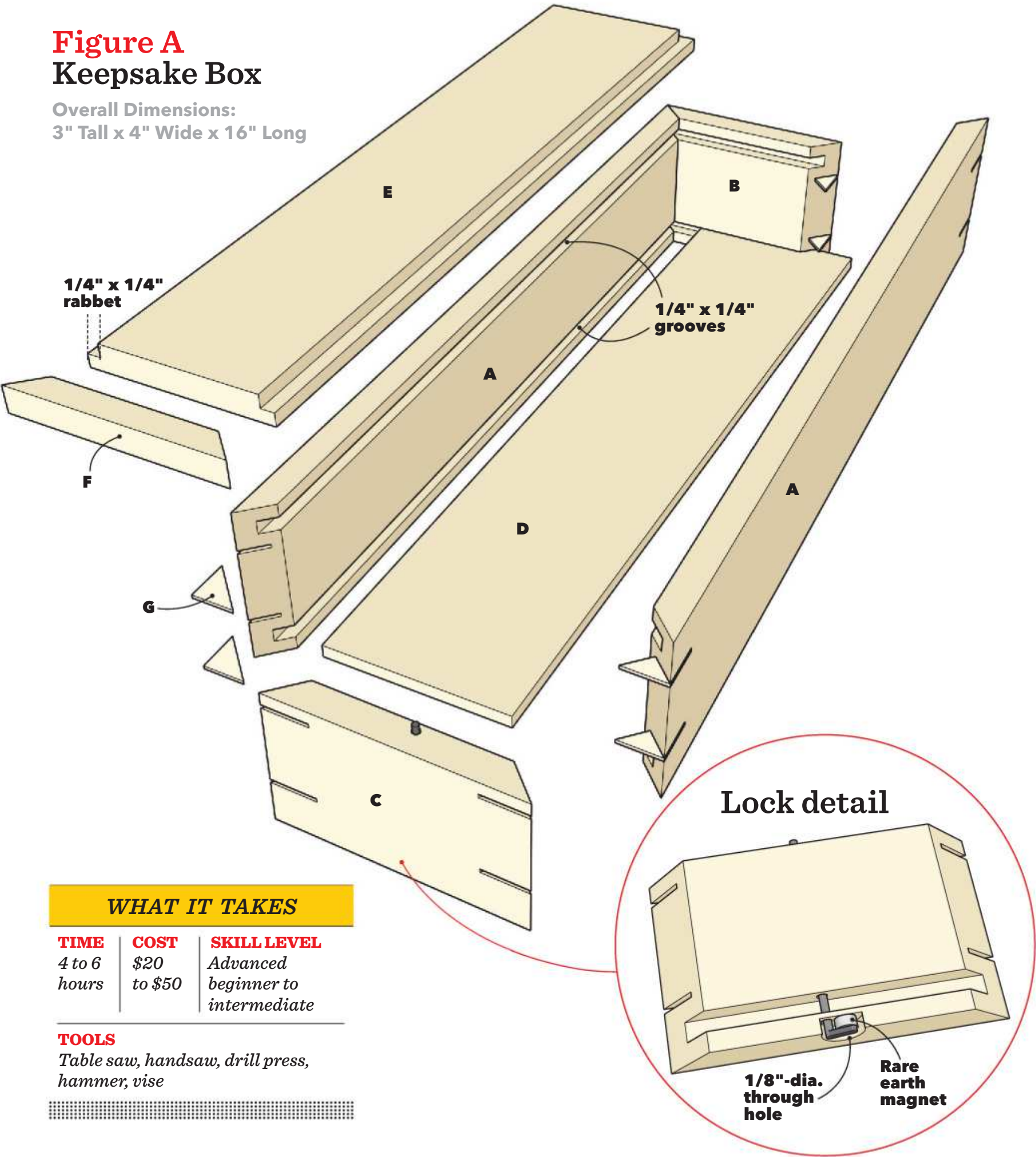
Cut the bottom (D) oversize for now, and then plane it to proper thickness. It should be just thin enough to fit in the groove easily without being loose.

Attach a long, straight fence to your miter gauge. If you have two miter gauges, attach the fence to both of them so they work like a sled. Tilt the blade to 45 degrees, cut a miter on a piece of scrap, then verify that the angle is

Figure A

Keepsake Box

Overall Dimensions:
3" Tall x 4" Wide x 16" Long



WHAT IT TAKES

TIME	COST	SKILL LEVEL
4 to 6 hours	\$20 to \$50	Advanced beginner to intermediate

TOOLS
Table saw, handsaw, drill press, hammer, vise

accurate and the cut is straight. Make any necessary adjustments, then cut the miters on the sides and ends (**Photo 3**). Rip the short end to final height.

Cut the lid (E) and bottom to final dimensions. To get exact dimensions, dry-assemble the box using tape to hold the corners together. Measure the interior width and add 7/16 in. to get the width for the lid and bottom. Measure the interior length

Cutting List

KEY	QTY.	SIZE & DESCRIPTION
A	2	1/2" x 3" x 16" (sides)
B	1	1/2" x 3" x 4" (tall end)
C	1	1/2" x 2-15/32" x 4" (short end)
D	1	1/4" x 3-7/16" x 15-1/2" (bottom)
E	1	1/2" x 3-7/16" x 15-1/4" (lid)
F	1	1/2" x 1/2" x 4" (lid end)
G	1	1/16" x 3/4" x 24" (corner keys)

All grooves and rabbets are 1/4" x 1/4"

Materials List

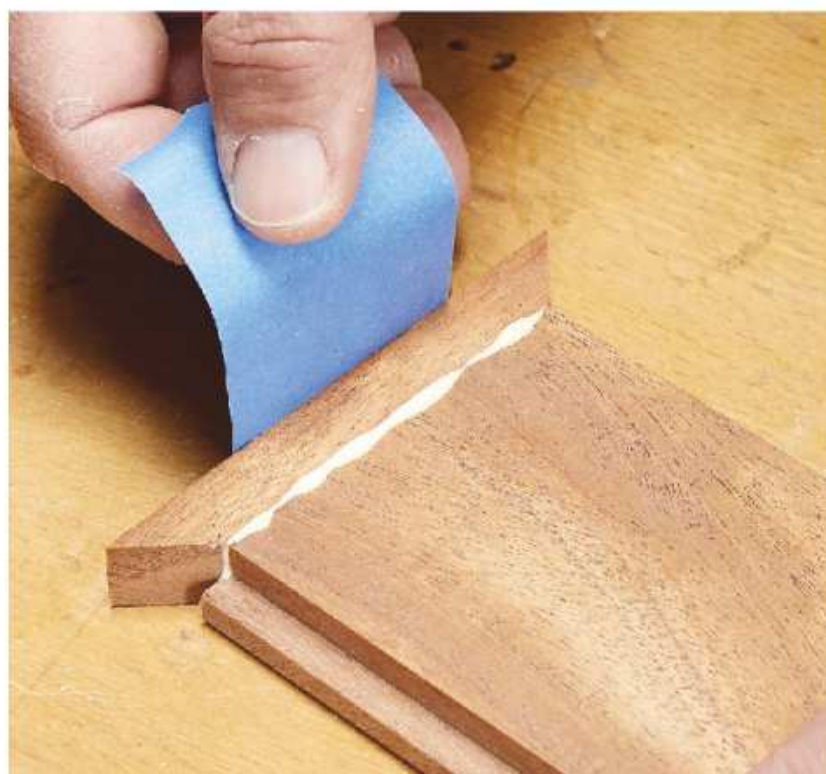
ITEM	QTY.
1/2" x 4" lumber	6'
1/4" x 4" lumber	16"
1/16" x 1" key stock	12"
16d nail	1
1/4" x 1/8" rare earth magnet	1



Sacrificial board

5. RABBET THE LID

Rabbet both sides and one end of the lid, using a dado set with a sacrificial board to protect the fence.



6. FIT THE LID

Adjust the lid as needed so that it slides smoothly in the grooves, and then attach the mitered lid end using glue and tape.



7. KERF THE CORNERS

Lay out and cut the kerfs for the corner keys. Painter's tape marks a clear stopping point for the kerf ends.



8. WIDEN THE KERFS

Widen the kerfs with a thicker blade, such as a fine-tooth reciprocating saw blade.

of the box and add $7/16$ in. for the length of the bottom. The lid length is the interior dimension plus $3/16$ in.

Assemble the box

It's difficult to sand inside the box after assembly, so sand all the interior surfaces up to 180-grit before assembly. Lay out the box parts in a line and glue the miters. Slide the bottom into its groove and fold the box together, stretching the tape across the corners (**Photo 4**). Wipe off any excess glue inside the box

with a slightly damp rag. This will raise the grain a bit, but you can lightly sand those spots after the glue dries. Let the glue dry for at least an hour.

Rabbet the lid

While the box is drying, pop in your dado set again. Clamp a sacrificial board to your saw's fence so you can slide the fence right up against the blade. Rabbet both edges and one end of the lid (**Photo 5**), testing the fit in a

grooved offcut. The finished, visible surface of the lid should be equal to the inside width of the box minus about $1/16$ in.

Slide the lid into its grooves. If it's too tight, thin the rabbeted edges using a sanding block until the lid slides home smoothly. Once you're satisfied with the fit, cut the lid end (F) and glue it on (**Photo 6**).

Key the corners

The corner keys (G) are optional. They're mainly decorative, but



9. CUT KEY STOCK

Rip key stock from the outer edge of a wide board. It might take a few attempts to get the thickness just right.



10. INSTALL THE KEYS

Cut the keys with a fine-tooth handsaw or utility knife. Glue the keys and slip one key into each kerf.



11. FINISH UP

Trim the keys flush, and then sand and finish the box.

they do add some strength. If you choose to use them, lay them out on the box corners however you like. Clamp the box in a vise and make a single cut on each line with a handsaw (**Photo 7**). I wanted my keys to be a little bit thicker than my handsaw's kerf, so I widened the kerfs using a fine-tooth reciprocating saw blade (**Photo 8**).

Rip the key stock from the outer edge of a wide board (**Photo 9**). You might have to try a few times

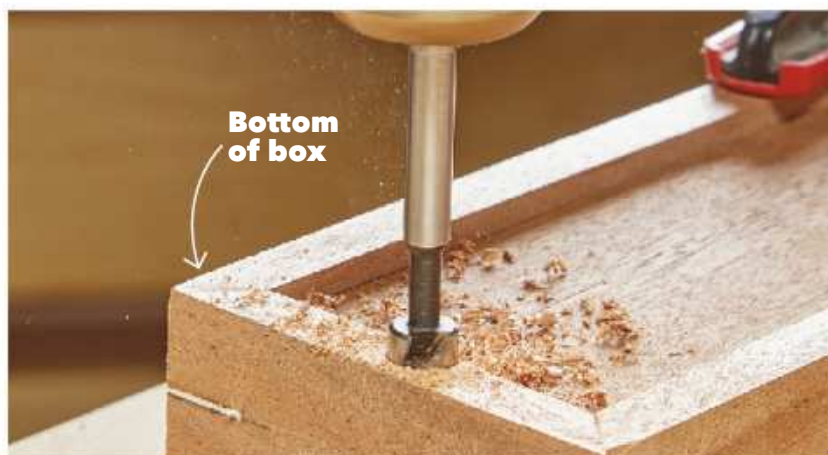
to get the thickness just right. The key stock should be just thick enough to slide in easily without wiggling in the kerf; if you have to force it, it's too thick. Cut the key stock into short sections just long enough to fill the saw kerfs, using a fine-tooth handsaw or utility knife. Apply glue to each key and then slip them into the kerfs (**Photo 10**). Let them dry for at least an hour, then trim and sand them flush (**Photo 11**). Finish-sand the whole box to 180-grit.

Apply finish

To get a rich, satin sheen on my box, I applied three coats of tung oil, allowing each coat to dry overnight and doing a light 400-grit sanding between coats. Finally, I applied paste wax with "0000" steel wool. Wipe the wax off immediately for a satin finish, or let it dry first for a glossier finish. If the lid doesn't slide as freely after finishing, lightly sand the underside of the edges. Rubbing the edges with a candle also helps.

ADD A HIDDEN LOCK

Everyone loves a good secret. To add this hidden lock to your box, you'll need a 16d nail and a 1/4-in. rare earth magnet (available at home centers for less than \$1 each). A drill press is highly recommended.



1. MAKE A RECESS

Drill a recess in the bottom edge of the box's short end using a Forstner or brad point bit, so the bottom of the recess is flat.



3. INSTALL THE MAGNET

Glue the magnet in the recess, opposite the nail hole.



5. DRILL INTO THE LID

Slide the lid into place and drill into it through the nail hole to mark the spot. Remove the lid and drill halfway through, using a tape flag as a stop. Cut the nail to length. It should contact the magnet and engage the hole in the lid. File any sharp edges.



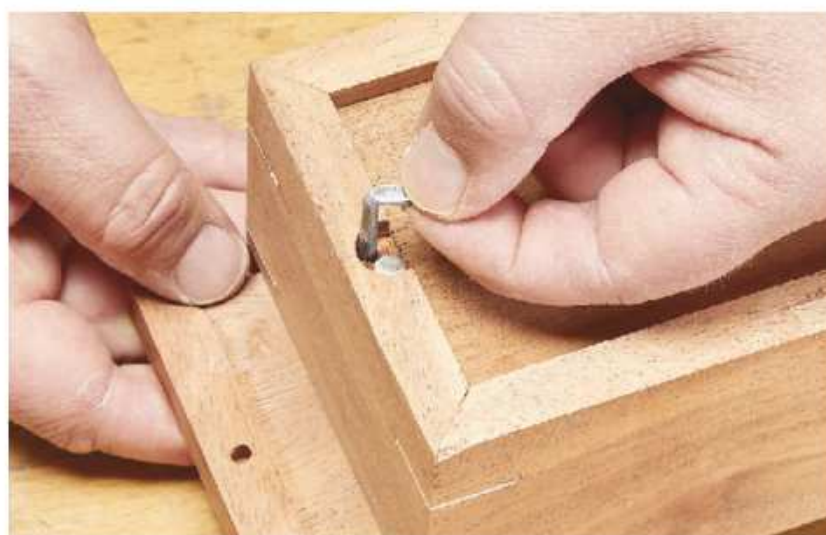
2. DRILL THE NAIL PASSAGE

Drill the hole for the 16d nail all the way through the short end, offset to one side of the recess.



4. BEND THE NAIL

Cut off the nail's head and grip it in a vise with about 3/8 in. protruding. Hammer the nail over, creating a "foot." Hammer the foot until it's flat.



6. LOCK THE BOX

To engage the lock, slide the nail through the hole and pivot the foot onto the magnet. To disengage it, pivot the foot off the magnet and slide the nail out.

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*Based on the change in gold's price from September 6, 2001 (\$272/oz.) to September 6, 2011 (\$1,923.70/oz.) ©2018 U.S. Money Reserve. The markets for coins are unregulated. Prices can rise or fall and carry some risks. The company is not affiliated with the U.S. Government and the U.S. Mint. Past performance of the coin or the market cannot predict future performance. Prices may be more or less based on current market conditions. Special offer is strictly limited to only one lifetime purchase of 10 below- or at-cost coins (regardless of price paid) per household, plus shipping and insurance (\$15-\$35). Price not valid for precious metals dealers. All calls recorded for quality assurance. 1/10-oz. coins enlarged to show detail. Offer void where prohibited. Offer valid for up to 30 days or while supplies last. Coin dates our choice.



Bluetooth **BOX-JOINT SPEAKER**



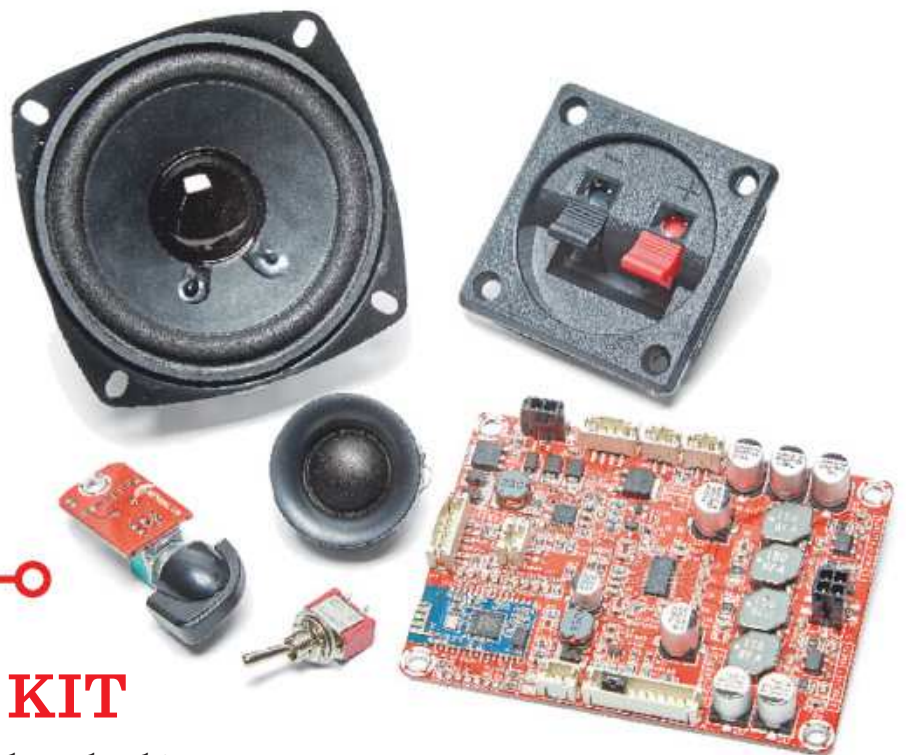
BUILD A GIFT AND LEARN A NEW TECHNIQUE
BY MIKE BERNER

Sure, a store-bought speaker can sound good, but how attractive is a plastic box? Here's a hand-built heirloom speaker that really turns up the volume on looks. Making a speaker yourself allows you to mix and match hardwoods. This one, made of elm and maple, is constructed with box joints, making it as fun to build as it is to give.



BOX JOINTS

With our easy-to-build jig, a pair of miter gauges and a table saw, you'll be able to add box joints to your woodworking repertoire. Getting the jig adjusted will take a few tries and a bit of patience, but once it's dialed in, you'll be set up to cut box joints forever. The best part is that you can reuse the jig for other projects.



WHAT IT TAKES

TIME	COST	SKILL LEVEL
1 day	\$155	Intermediate

TOOLS Table saw, trim router, dado blade, soldering iron, drill press, hole saw, miter gauges, orbital sander

BUY A KIT

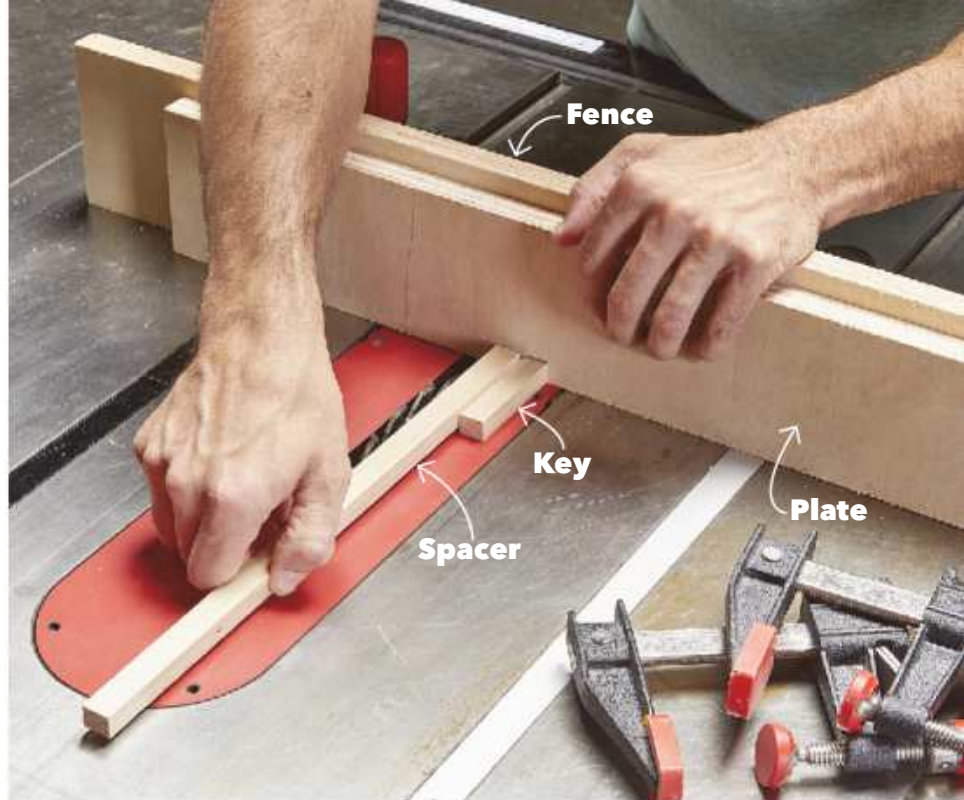
You'll find several speaker kits available online. KMAkits.com sells a few ranging in price from \$60 to more than \$200. This is its Fawn Bluetooth kit (\$130), which features easy connections. Most of the

connections are made with plugs; only the component terminals require soldering. A beginner with a \$5 soldering iron can get the job done.



1. SET UP THE DADO BLADE

Set the dado blade height a hair taller than the thickness of your material. The dado width should be 1/2 in. to match the width of the key stock.



2. POSITION THE KEY

Use the leftover 1/2-in. x 1/2-in. stock to position the key away from the blade. The widths of the blade, the spacer and the key must be equal. Clamp the plate to the fence.

Miter Gauge Sled & Box-Joint Jig

SETUP TIPS

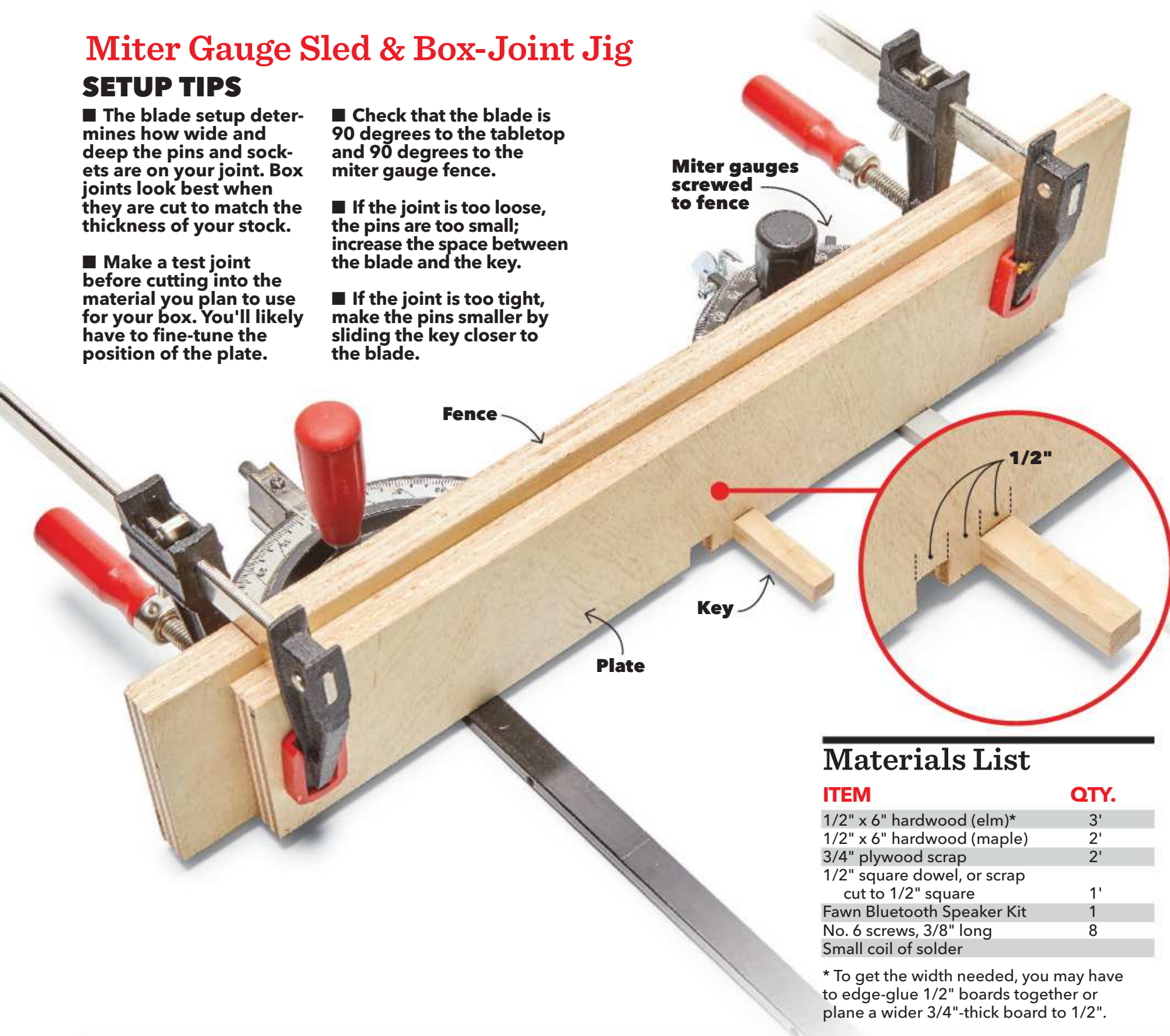
■ The blade setup determines how wide and deep the pins and sockets are on your joint. Box joints look best when they are cut to match the thickness of your stock.

■ Make a test joint before cutting into the material you plan to use for your box. You'll likely have to fine-tune the position of the plate.

■ Check that the blade is 90 degrees to the tabletop and 90 degrees to the miter gauge fence.

■ If the joint is too loose, the pins are too small; increase the space between the blade and the key.

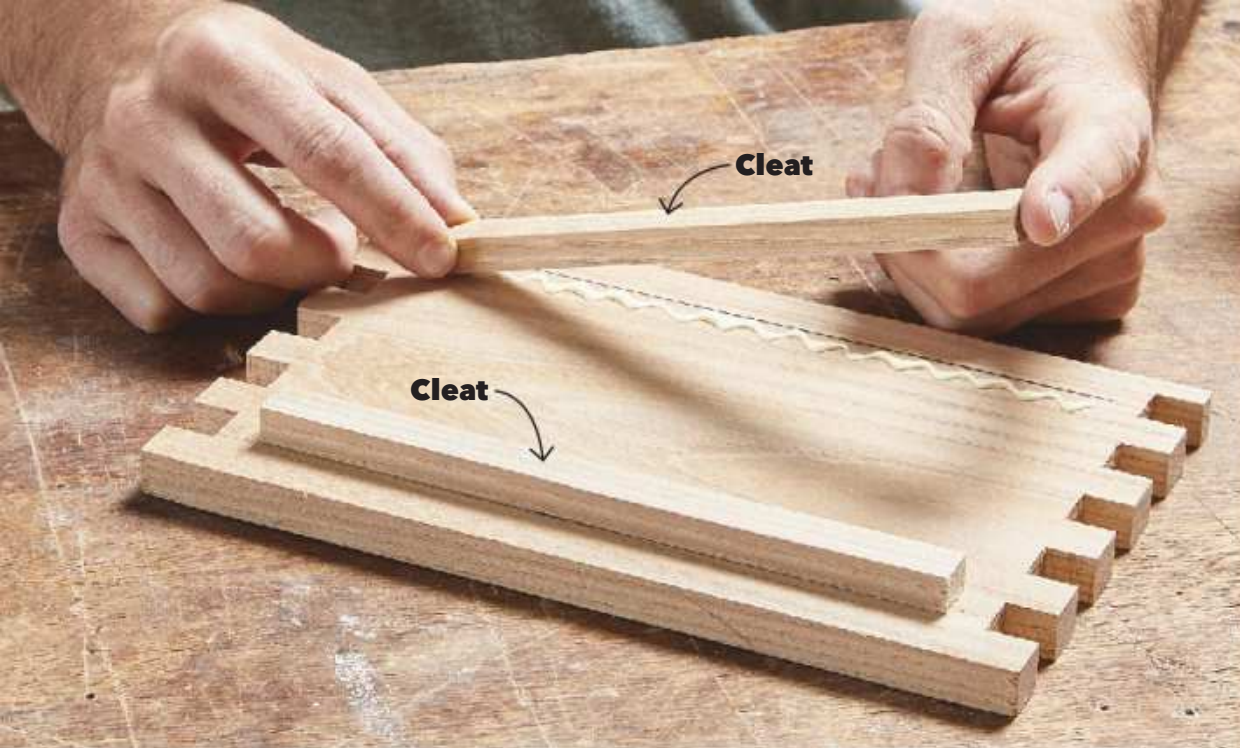
■ If the joint is too tight, make the pins smaller by sliding the key closer to the blade.



Materials List

ITEM	QTY.
1/2" x 6" hardwood (elm)*	3'
1/2" x 6" hardwood (maple)	2'
3/4" plywood scrap	2'
1/2" square dowel, or scrap cut to 1/2" square	1'
Fawn Bluetooth Speaker Kit	1
No. 6 screws, 3/8" long	8
Small coil of solder	

* To get the width needed, you may have to edge-glue 1/2" boards together or plane a wider 3/4"-thick board to 1/2".



6. GLUE CLEATS TO ATTACH THE PANELS

Scribe a line $\frac{5}{8}$ in. in from the edges of the panels and glue the eight cleats along the inside of these lines.



7. GLUE AND CLAMP

Apply glue to all surfaces in the sockets, fit the parts together and clamp tight.



8. BORE HOLES FOR THE COMPONENTS

For larger holes, you'll need to use a hole saw at the drill press. Drill partway through one side, then finish the hole from the other side to avoid major chipping.

Building the box jig

To cut box joints, start by building a jig for your table saw. First, cut all your parts to size, including trimming the $\frac{1}{2}$ -in. square key stock, and then change your table saw blade to a $\frac{1}{2}$ -in. dado stack (**Photo 1**). With the miter gauges in the miter slots, fasten the fence through the back of the miter gauges with $1\frac{1}{4}$ -in. screws to make a sled. Clamp the plate flat against the fence and push this setup through the dado blade. Unclamp the plate and glue a 3-in. length of $\frac{1}{2}$ -in. square stock into the cut you just made. Create a space between the key and the blade using the remainder of the $\frac{1}{2}$ -in. stock; this makes the pins and sockets the same size (**Photo 2**). Clamp the plate to the fence.

Making the cuts

With the jig adjusted, make a test joint to check the fit. Your goal is to get the fit nice and snug. If the joint is loose, the pins are too small (slide the key away from the blade). If they don't fit, they're too big (slide the key toward the blade). For the first cut, push the edge of a top/bottom part (**A**) flat to the table and against the key and make a pass (**Photo 3**). Make a reference mark on the front and back of this pin to help set up the cuts for the sides. For the rest of the cuts, fit the socket over the key, hold it in place and make each pass slowly (**Photo 4**).

Cutting sockets for the sides

To cut the sides (**B**), flip the first board so the reference pin is between the blade and the key. Push the edges together and make a cut (**Photo 5**). Make the rest of the cuts, and then flip the boards end over end to make mirrored edges on every board.

Glue up the box

Attach two cleats (**C**) to the inside of each part to fasten the front and rear panels (**Photo 6**). These are

glued 5/8 in. in from both the front and the back of the enclosure. Be sure the joints fit together correctly, then apply glue to all surfaces of the sockets and clamp them tight (**Photo 7**). Check the diagonal measurements of the box from corner to corner to ensure that it's square.

Make room for the components

Lay out the components on the front (**D**) and back (**E**) panels, mark their centers and drill the appropriate-sized holes following the kit instructions (**Photo 8**). Some of the components require material from the back of the panels to be removed in order to fit. Use a Forstner bit to remove enough material from the back (without going through) to allow the components to be fastened with a nut on the front side of the panel.

Rout a chamfer on the speaker openings

Set up a router with a 45-degree chamfer bit. Start with a shallow cut, then adjust the depth, cutting deeper and deeper until you're happy with how it looks (**Photo 9**). Make sure the screws that fasten the speaker to the panel won't poke through the area that's been chamfered. When all your cuts are made, sand and finish the assembled enclosure and panels, then fasten the components.

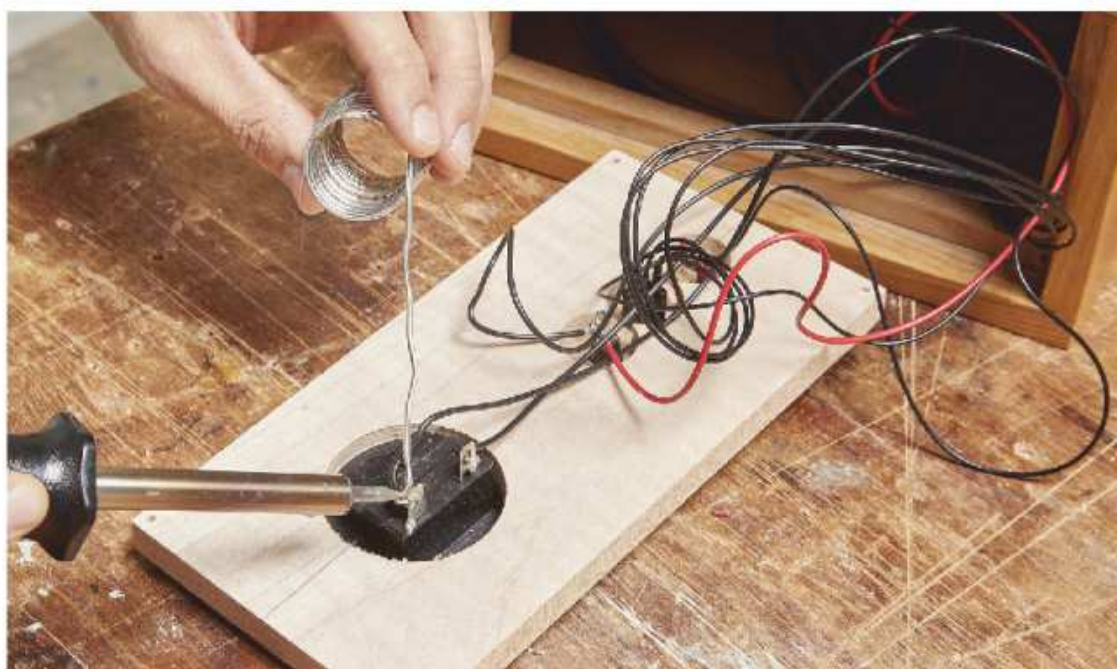
Final assembly

Install the components on the front and back panels and solder the wires to the terminals according to the instructions in your kit (**Photo 10**). Use hot glue to fasten the amp board to the inside of the box, then plug all the components into the board. Feed all the wires into the box and screw the rear panel to the cleats, being sure to use pilot holes. Apply glue to the cleats and set the front panel into the box while feeding the rest of the wires through (**Photo 11**).



9. CHAMFER THE SPEAKER HOLES

Make shallow passes with a 45-degree chamfer bit. Be aware of the thickness of the surface where screws will attach the speaker, to avoid screws poking through.



10. CONNECT THE SPEAKER COMPONENTS

Install the components onto the front and back panels and solder necessary wires to their terminals.



11. INSTALL THE FRONT AND BACK PANELS

Glue the front panel onto the front cleats and drill pilot holes into the back panel to screw it to the back cleats.

Masterpiece **CUTTING BOARD**



AN EYE-CATCHING PROJECT— MADE FROM SCRAPS!

BY GARY WENTZ

This cutting board dazzles the eye, but making it is easy: Just cut strips of wood and glue them together. I used walnut and maple scraps cut at increments of 1/8 in., but the variations are endless. I made four versions of this design and got smarter with each—and I've shared my lessons on the following pages.

**WATCH THE
PROCESS**

April Wilkerson's cutting board is the inspiration for this project. To see how April made hers, watch the video at wilkerdos.com.



**KEEP IT SIMPLE
OR GET FANCY**

This design works well as a basic rectangle. Or you can dress up your cutting board with curves. A juice groove contains messes and adds visual pizzazz.

EASIER THAN IT SEEMS

Cut two strips of each width—one from maple, one from walnut. The strips differ by increments of 1/8 in., so the widths are: 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1-1/8 and 1-1/4 in.





TIPS FOR FLAT, TIGHT RESULTS

START WITH LONG STRIPS: Before cutting strips, cut your boards at *least* 1 in. longer than the final length of the cutting board. That way, you won't have to align the ends perfectly during glue-up. Trim off the imperfect ends after glue-up.

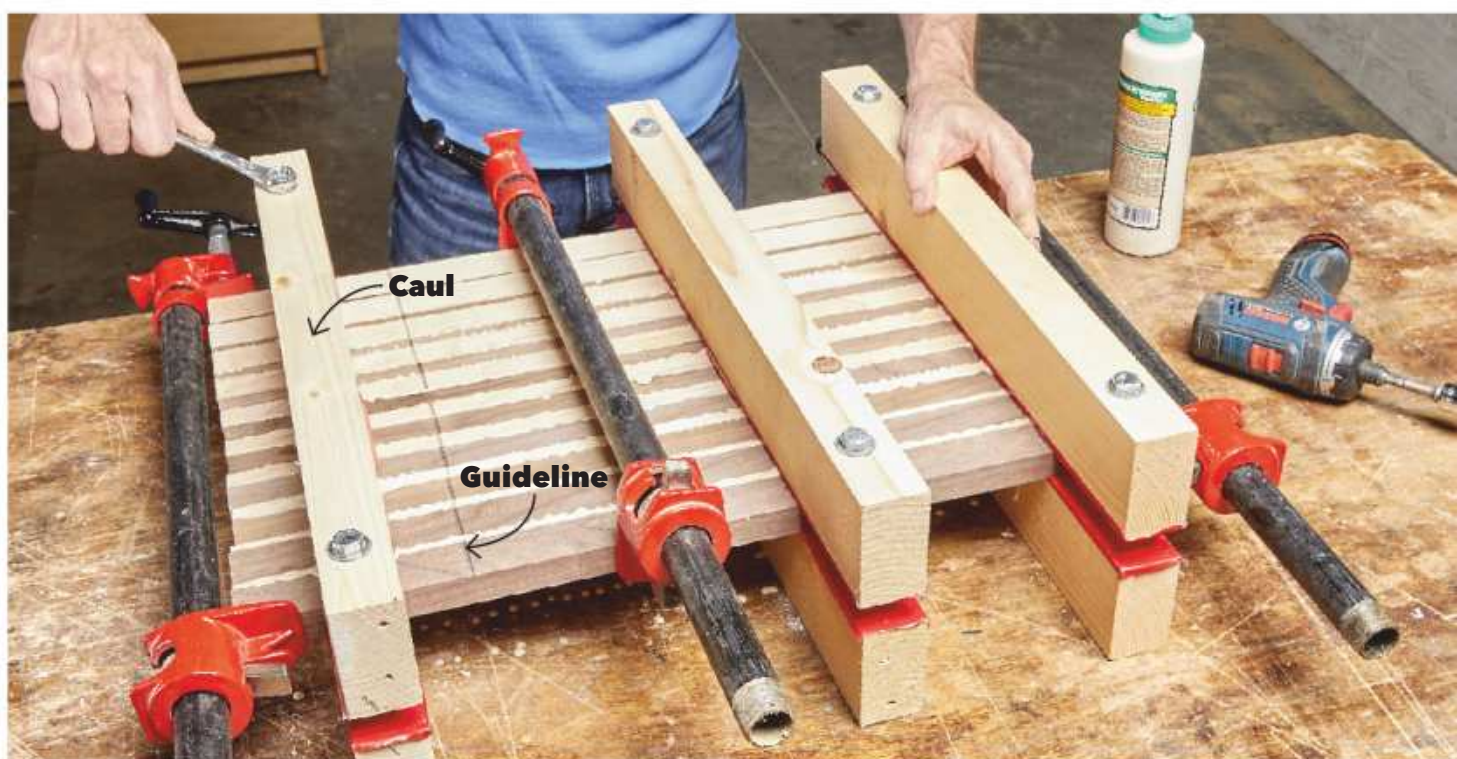
TUNE UP YOUR TABLE SAW: Clean, precise cuts are critical. Grab a square and make sure the blade is square to the table-top. Also check that the fence is perfectly parallel to the blade. Your owner's manual will show you how. This is a good time to install a fresh, sharp ripping blade too.

LAY OUT THE STRIPS: Arrange the strips with their best faces up. Then mark a guideline across them. During glue-up, that line will help you keep them arranged correctly (see photo, right). Also check the overall width of the combined strips.

DO A DRY RUN: Once you start to spread glue, you have to work fast. So first clamp and caulk the cutting board *without* glue. This dress rehearsal will reveal problems like a misfit joint or alert you to the need for another clamp.

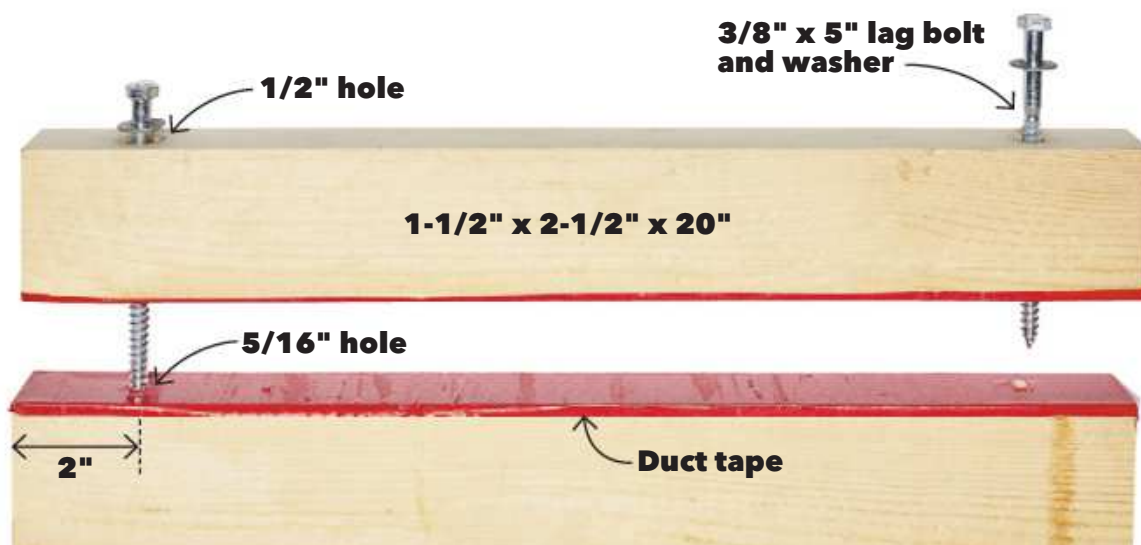
RIP THIN STRIPS SAFELY

Cutting thin strips with just the fence is dangerous and leads to bad cuts. This simple jig will keep your fingers far from the blade and will prevent strips from getting trapped along the fence. It's exactly 5 in. wide, so you get 1/4-in. strips, for example, by setting the fence set at 5-1/4 in. I used it to cut all the strips that were thinner than 1 in. and then cut wider strips against the fence using a push stick.



CAULS KEEP IT FLAT

To guarantee a flat glue-up, I cut three pairs of cauls from a 2x6 and taped the edges to keep glue from sticking. I set the strips on the lower cauls, applied a generous bead of glue to both sides of every other strip and lightly tightened the upper cauls. I added clamps, applying only light pressure at first. Then I gradually tightened down both the cauls and clamps, alternating between them.



DRESS IT UP



EASE THE EDGES: Dull the sharp edges with sandpaper or a router. I used a 1/8-in. round-over bit.

FINISH IT WITH OIL: Oil finishes are best for this project because they're easy to renew. When the finish wears, just wipe on a fresh coat of oil. There are oils intended for cutting boards, but I used mineral oil from the drug-store (after sanding the entire cutting board with 80- and 120-grit).

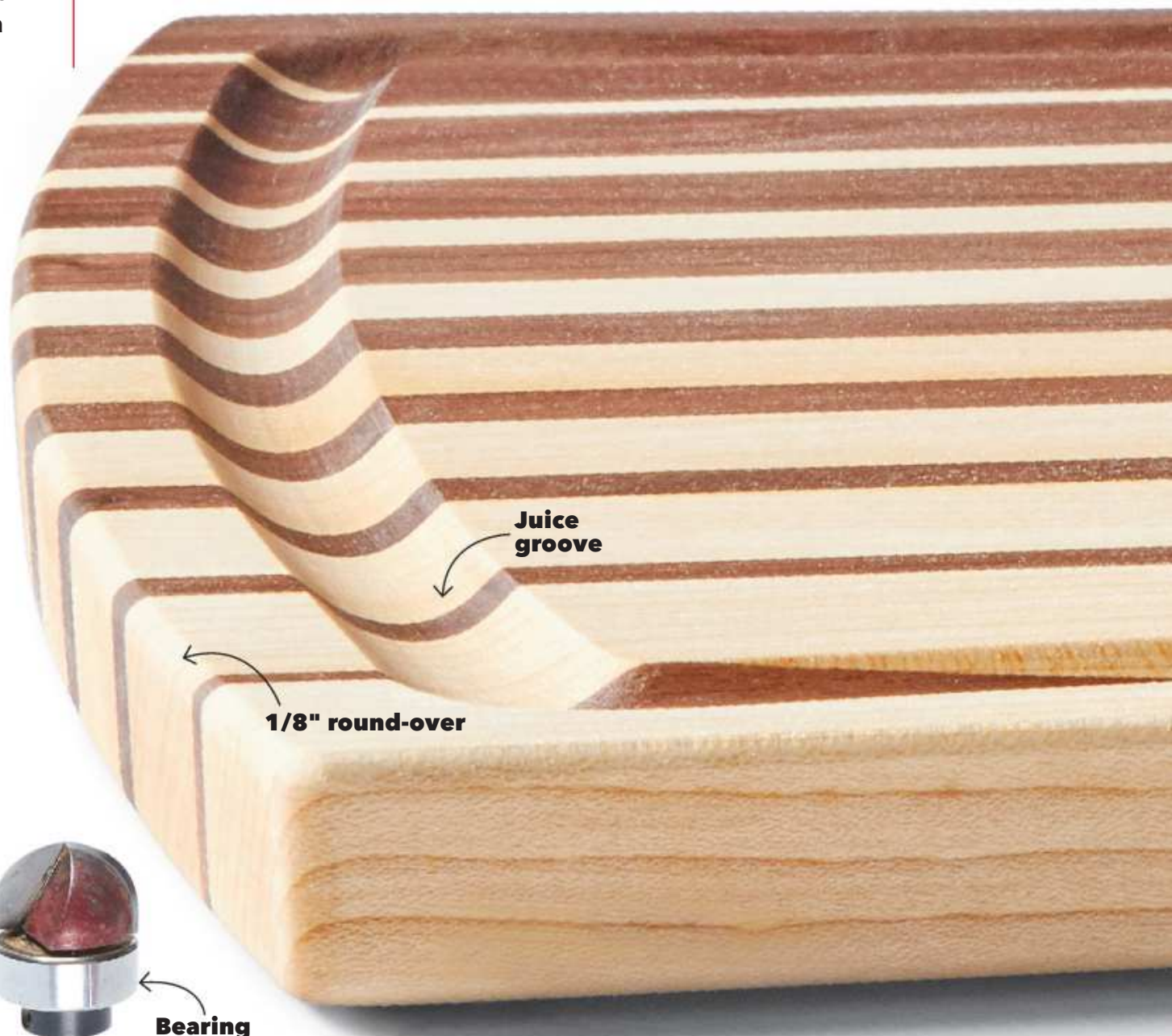
MATERIALS

- 3/4-in.-thick boards at least 22 in. long and a total width of at least 8-1/4 in. for each species. The cost for walnut and maple is about \$20 per cutting board.
- 2x6 x 6 ft. of pine (for cauls)
- Six 3/8-in. x 5-in. lag screws and washers
- 1/8-in. MDF (for templates)
- Waterproof wood glue such as Elmer's Wood Glue Max or Titebond III
- Sanding supplies
- Mineral oil, duct tape, double-sided tape.



ADD PERFECT CURVES

Mark curves onto the cutting board by tracing around a template made from 1/8-in. MDF. Rough-cut the shape with a band saw or jigsaw, keeping the blade about 1/8 in. from the line. Then fasten the template to the cutting board with double-sided tape. A pattern bit guided by the template produces perfect curves. I glued a scrap of 1/4-in. plywood to the underside of this template and to the juice groove template. That elevates the template and allows the bearing to make full contact with it.



CUT A JUICE GROOVE

I cut a juice groove using a template (2-1/4 in. smaller than the one shown above) and a 3/4-in. core box router bit with a bearing (\$40). A smaller bit would also work. Most core box bits don't include a bearing, so you may need to add one or mount a rub collar on your router base.

HomeCare+Repair

Fix it, maintain it, improve it. By Brad Holden

The Case for the Compact Router

My full-size routers have been gathering a lot of dust since I purchased a compact router for trimming plastic laminate. Compact routers only accept 1/4-in.-shank bits, which limits the size bits you can use. But my compact router can handle about 75 percent of my routing tasks: light edge profiles, shallow dadoes and rabbets, round-overs and chamfers. One-handed operation is a nice bonus.

If you're new to routers, a compact router is a good introduction. They're less intimidating than their full-size siblings. You can grab a basic compact router for as little as \$30. Or, you can spend about \$200 for an entire kit that includes various bases and attachments.

GARY WENTZ, EDITOR-IN-CHIEF



BASIC KIT: \$30



COMPLETE KIT: \$200

BROUGHT TO YOU BY **TROY-BILT**

SNOW BLOWER SMARTS

A shear pin is a specially designed bolt that connects the auger assembly to the drive shaft on a snow blower. Its purpose is to break before the auger, drive shaft or gears get damaged when you plow into a rock, stick or other object buried in the snow. Here's how to avoid blowing a shear pin in the first place, and what to do if it happens.

■ **Police your driveway:** Just before the snow flies, inspect areas where you clear snow. Pick up sticks, rocks, garden hoses and anything that can get drawn into the auger.

■ **Pick up your newspapers:** Water-soaked frozen newspapers are the No. 1 shear pin killer. Don't let them lie around to become buried in the snow.

■ **Beware of frozen slush in car wheel wells:** Slush from the road builds up in wheel wells and falls off in big chunks. These frozen chunks are like rocks, and they'll easily take out a shear pin. Shovel them out of the driveway before starting the snow blower.

■ **Don't substitute bolts for shear pins;** regular steel bolts aren't designed to break. They won't break, leaving the auger and gear-box to take the hit.

■ **Buy an extra set:** Take a shear pin from your blower to the hardware store and buy a few matching ones. That'll save you a trip in the middle of a blizzard. (Snow blowers can

have more than one pin.)

■ **Drive out broken pins:** Broken pins sometimes get stuck inside the drive shaft. If so, just drive them out with a pin punch.

TRAVIS LARSON, SENIOR EDITOR

Get more great outdoor and yard advice at lawncare.familyhandyman.com



Li-ion Battery Recycling

I'm a little embarrassed to admit that in all the years I've been using battery-powered tools, I've never noticed the fine print on the batteries. On virtually every tool battery, there's a number to call to find out where to take it for recycling: (800) 822-8837.

I can finally exhume my old, dead tool batteries from their crypt (a cardboard box in the garage) and responsibly dispose of them! The prehistoric nicad variety can be recycled as well. Some home centers offer battery recycling; just drop them off on your next trip.

BRAD HOLDEN, ASSOCIATE EDITOR

WHICH FINISHES ARE FOOD-SAFE?

The short answer is, all of them. Some finishes used to contain lead as a drier, but that was banned years ago. The key is to allow finishes to fully cure, which takes up to 30 days. There are essentially two types of finish: oil, which penetrates the wood, and film forming, which lies on top of the wood.

If your wooden bowl or cutting board gets rough treatment with knives and utensils, use an oil finish like tung, mineral, linseed, or even an edible oil, such as olive or walnut oil. Just refresh the finish as needed with another coat of oil. Film finishes develop cracks with heavy use. These cracks allow water to get into the wood but don't allow easy escape, and refinishing involves sanding the whole piece back to bare wood. If your item isn't used for cutting, a film finish is fine.

**BRAD HOLDEN,
ASSOCIATE EDITOR**



Easy Front-Load Washer Fix

Our washing machine stopped pumping out water during the discharge cycle and shut itself down. Instead of calling an appliance repair service, I took off the front access panel to poke around a bit. Seeing the big, obvious PVC cleanout plug, I unscrewed it to see what it was all about.

Holy smokes! About a gallon of water poured out before I pulled out what appeared to be a filter drawer. Inside were \$2.52 in change, a clothing tag, a house key, three bobby pins, a golf tee, wadded pieces of paper, a jean rivet, a couple of nuts and a washer, plus some unidentifiable debris. I cleaned the drawer and put everything back, and the washer now works perfectly. If your washer stops working, give this a try. If this solves the problem, you've probably saved about \$100 for a service call, not to mention the embarrassment of watching the repair technician pull off the same easy operation.

**TRAVIS LARSON,
SENIOR EDITOR**

Car + Garage

Expert advice on repair, maintenance and gear. By Rick Muscoplat

5 things to check before a road trip

Prevent travel disasters

Whether you're headed south for a beach vacation or to Grandma's for the holidays, you'd better do a quick check of your car's health first. Some discoveries can help you prevent "towable" events; others are safety issues. It would be best to run through this five-minute checklist a week before departure so you'll have time to get the car repaired if a mechanic is needed.

MEET THE EXPERT

Rick Muscoplat has decades of automotive repair experience and a great website: ricksfreeautorepairadvice.com.



PHOTO CREDITS: S_PHOTO/SHUTTERSTOCK





1. Check for fluid leaks

Small leaks can turn into gushers once you leave town, and that can be costly. The most common sources: the radiator, engine oil pan, transmission oil pan and hoses, power steering hoses, steering rack, and heater and radiator hoses. Use a flashlight to check for leaks. Note the color of the fluid and trace the fluid trails back to their source.



2. Check and top off all fluids

With the engine off, check power steering fluid, brake fluid, coolant, windshield washer fluid and engine oil. Most automatic transmissions must be checked with the engine hot and running and the gearshift in "park." Check your owner's manual to confirm. Look for the power steering fluid level to reach the "cold" mark on the dipstick. If it's low, check your owner's manual and buy the right fluid for your vehicle.



3. Check the condition of all belts

Broken belts are one of the most common reasons for roadside assistance calls. Replacement belts are easy to locate and replace in a city. But the belt for your car may be tough to find in rural areas if you break down. Twist the belt slightly to expose cracks or glazing. Replace any belt that is cracked, worn or delaminating.



Expert advice



Six-point socket



12-point socket

Six-point vs. 12-point sockets

Q My gearhead neighbor keeps telling me I should quit using my 12-point sockets and buy a set of six-points. Is this really necessary?

JEFF ALBRIGHT, COLUMBIA, MO

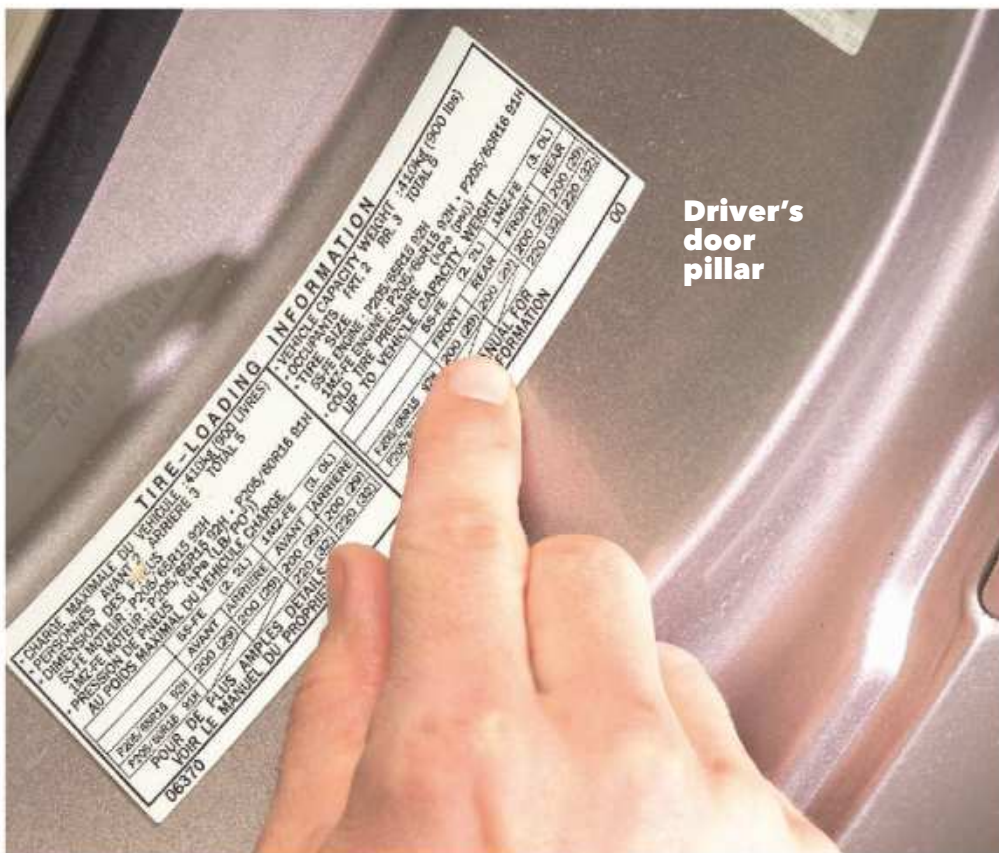
A It's true that 12-point sockets are fine for most lightweight repairs, but heavy wrenching calls for a six-point socket. A six-point socket is much less likely to slip off a stubborn fastener or round over the corners.

Here's why: (1) Six-point sockets have thicker walls, so they're less likely to flex. (2) A six-point socket is designed to contact the head of a fastener well away from the corners so contact is made on the thickest part of the socket and the flattest part of the fastener. This dramatically reduces the likelihood of slippage and rounding over of the corners. And (3), the edges of a socket are angled back a few degrees to allow the socket to slide easily over a fastener. The angle on a six-point socket is less than on its 12-point counterpart, again providing more contact area inside the socket.

One last point. Most high-quality sockets are chrome plated to prevent rusting and make cleanup easy. However, after years of use, the chrome finish can flake off. Don't use a socket if the chrome is peeling. The chrome will be as sharp as a razor blade. Any reputable tool company will replace one of its tools that has peeling chrome.

4. Check all exterior lights

They're easy to check and inexpensive to replace. Bulb numbers and replacement procedures are listed in your owner's manual. Turn the key to the "accessories" position (there's no need to start the engine). Operate the turn signals, brake lights and backup lights, and check for reflections in your rearview mirror. Perform the same checks on the front turn signal lights, headlights, high beams and running lights.



Driver's door pillar

5. Check the tire pressure

Low air pressure causes tires to use more gas, wear faster and run hotter. Hot tires are more prone to blowout during extended highway drives. Check them all (including the spare) before you leave town. Look for the correct air pressure on the decal located on either the driver's door or the door pillar. If the decal is missing, check your owner's manual. Always make sure the tires are cold when you check tire pressure.

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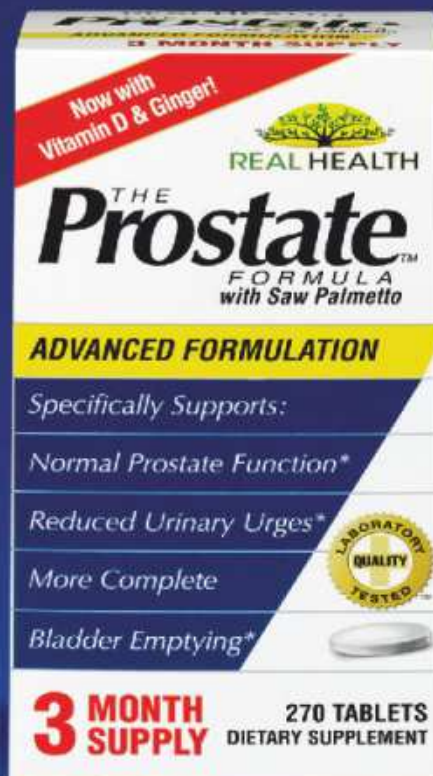
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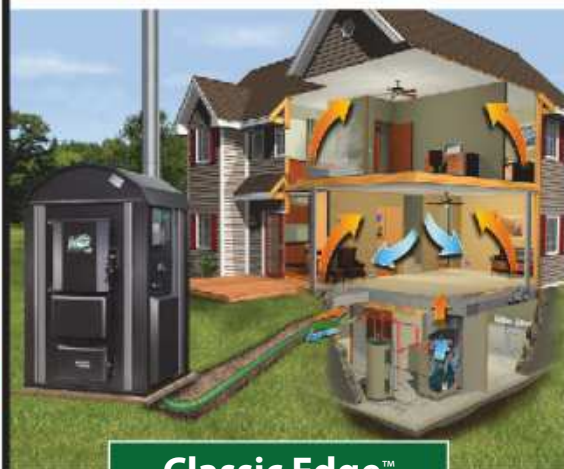
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WHAT'S **WRONG** WITH THIS PICTURE?

We'll show you the problem—and the fix. By Brad Holden



A NO-FLOW FAUCET

Bath on the rocks

This might look like an icicle, but actually it's mineral deposits that have created the stalactite you see. The faucet has been dripping for a very long time, leaving behind the mineral buildup. Just imagine what's going on inside the pipes!

THE RIGHT WAY

This is why water softeners were invented. The resin bed in the softener attracts and holds the minerals. When the softener recycles, a salt bath removes the minerals and sends them down the drain.



Thanks to our friends at Structure Tech Home Inspections for sharing these photos. For more home inspection insights, visit structuretech1.com/blog



IT FAILS IN COMPARISON

5-gallon solution

Yes, even bar sinks are covered by the plumbing code. Hopefully, this homeowner sees this as a short-term fix. It's really not permissible to substitute a bucket for a code-compliant drain.



THE RIGHT WAY:

Every sink should have a complete P-trap plumbed in between the sink and the waste line to prevent sewer gas from finding its way into your living space.



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WHAT'S WRONG



CLEVER COVER-UP

Escutcheon double play

Whoever did this was very resourceful. The hole in the tile is too big to cover with a standard escutcheon and impossible to fix without major tile work. So why not slip a "hinged flange" escutcheon behind the shower faucet? Looks better than that hole, right?



NO SHARING ALLOWED

Dryer vent follies

It's unwise to have two dryers share one exhaust vent. The problem is that if only one dryer is running, the exhaust can easily travel back down the other vent pipe, into the other dryer and into your living space. Piping this humid air into your home is an invitation for mold. Even worse, if you have gas dryers, you're adding carbon monoxide to your living space.

THE RIGHT WAY:

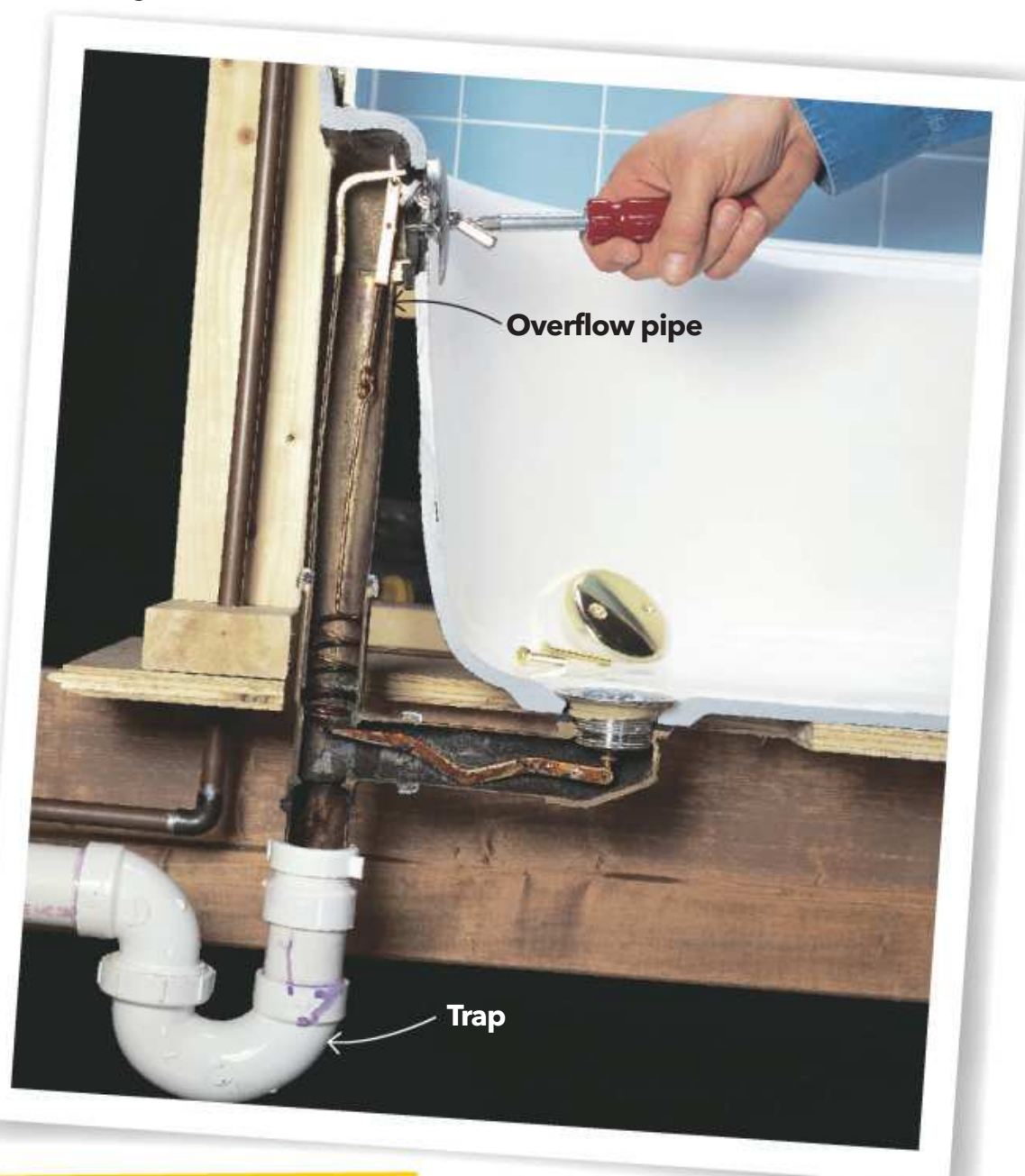
Doing it right is simple. Each dryer should have its own vent leading to its own vent hood outside the house.



WHERE TO BEGIN??

TUB DRAIN 101

- A. Flexible drains are horrible. They collect debris and will fail long before solid plastic parts.
- B. Without a trap, sewer gas will find its way into the house.
- C. The tub overflow isn't connected to the drain line. Guess where all that water goes when the tub overflows?



THE RIGHT WAY:

A properly drained tub has the overflow pipe connected to the drain line and then to the trap.

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FAMILY HANDYMAN® ISSN: 0014-7230, USPS: 515-930. Vol. 68, No. 8, 591st Edition. Published 8 times per year: March, April, May, June, July/August, September, October/November, December/January/February by Home Service Publications, Inc., 1610 N. Second St., Suite 102, Milwaukee, WI 53212. We may also occasionally publish extra issues and special issues (which count as two in a subscription). Periodicals postage paid at Milwaukee, WI, and at additional mailing offices. **POSTMASTER:** Send address changes to customercare@familyhandyman.com, visit familyhandyman.com/customercare or write to *Family Handyman* Customer Care, PO Box 6099, Harlan, IA 51593-1599. **SUBSCRIPTIONS:** In the U.S.A., its territories and possessions, \$24 for one year (8 issues). For countries outside the U.S.A., subscriptions are \$28.97 per year in American currency. Canadian GST registration number R123771891. CPM agreement number 40065693. **Printed in the U.S.A.** Copyright ©2019 Home Service Publications, Inc. All rights reserved. Unauthorized reproduction, in any manner, is prohibited. *Family Handyman*, Handy Hints, Great Goofs and Build It Fix It Live It! are registered trademarks of Trusted Media Brands, Inc. Wordless Workshop, Workshop Tips and  are trademarks of Trusted Media Brands, Inc. **SUBSCRIBERS:** If the U.S. Postal Service alerts us that your magazine is undeliverable, we have no further obligation unless we receive a new address within one year. **CONSUMER INFORMATION:** *Family Handyman* may share information about you with third parties for the purpose of offering products and services that may interest you. If you would rather not receive such offers via postal mail, please write to: *Family Handyman* Customer Mailing List, PO Box 3122, Harlan, IA 51593-0188. You can also visit www.tmbi.com/preference-center to manage your preferences and opt out of receiving such offers via email. Please see our Privacy Policy at www.tmbi.com/privacy-policy.

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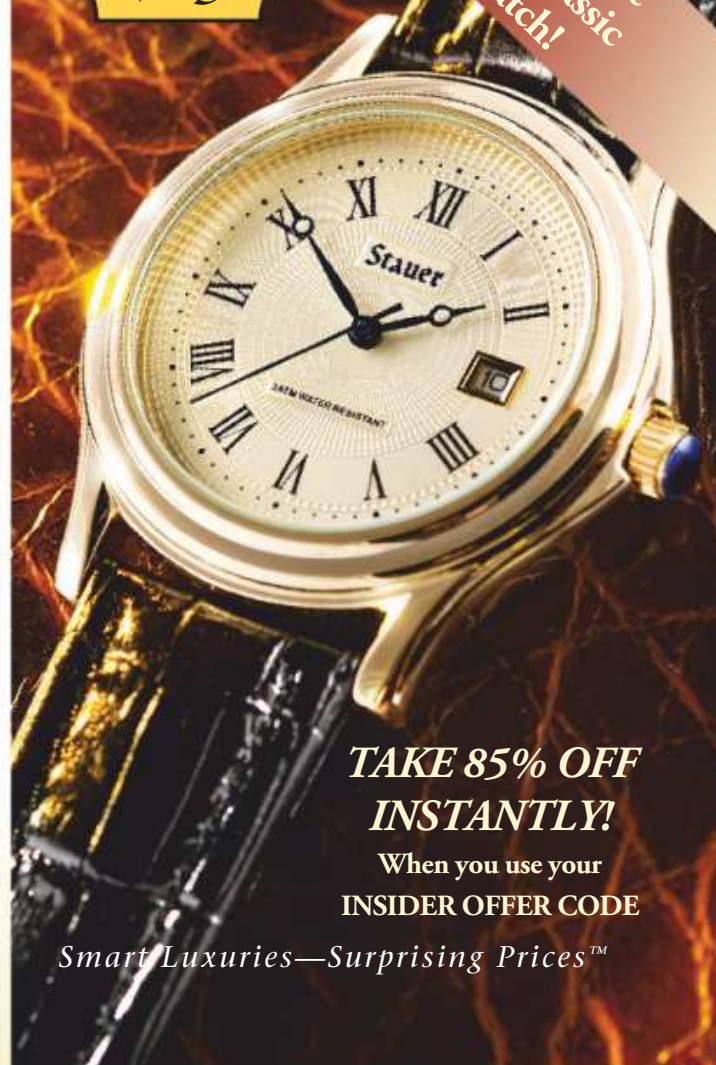
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Statement of ownership, management, and circulation

Statement required by the Act of August 12, 1970, Section 3685, Title 39, United States Code, showing the ownership, management and circulation of THE FAMILY HANDYMAN (USPS 013-271) published eight times per year (March, April, May, June, July/August, September, October/November, December/January/February) at 1610 N. 2nd St., Suite 102, Milwaukee, WI 53212-3906, as filed on Sept. 30, 2018. Annual subscription price: \$24.

The names and addresses of the publisher, editor and managing editor are: Vice President, Integrated Sales, John Dyckman, 750 Third Ave., New York, New York County, NY 10017; Editor, Gary Wentz, 2915 Commers Drive, Suite 700, Eagan, Dakota County, MN 55121; Managing Editor, Donna Bierbach, 2915 Commers Drive, Suite 700, Eagan, Dakota County, MN 55121.

The owner is Home Service Publications, Inc., 750 Third Ave., New York, NY 10017.

Known bondholder: WRC Media, 750 Third Ave., New York, NY 10017.

The Family Handyman

Issue date for circulation data: October 2018

Average number of copies of each issue during preceding 12 months, and of the single issue published nearest to filing date, respectively, is as follows:

	Average	Single Issue
Total number of copies printed (net press run)	1,240,863	1,212,441
Mail subscriptions	1,091,315	1,065,439
Paid distribution—sales through dealers and carriers, street vendors and counter sales	35,052	30,325
Total paid distribution	1,126,367	1,095,764
Free or nominal-rate distribution	38,369	56,191
Total distribution	1,164,736	1,151,955
Copies not distributed	76,127	60,486
Total	1,240,863	1,212,441

Percent paid and/or requested circulation 96.71% 95.12%

Paid electronic copies 71,964 71,613
Total paid print copies 1,198,331 1,167,377
Total print distribution 1,236,700 1,223,568
Percent paid 96.90% 95.41%

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Laughs and lessons from our readers



SEWER WITH A SECRET

We bought our home six years ago and have had problems with the sewer backing up. After having the sewer line snaked, jetted and scoped, we learned that the back-flow valve cap had broken off and likely become lodged in the line. We hired someone with a backhoe to dig up the line, but we couldn't find the broken cap. Puzzled, we again called the company that scoped it to locate the lodged cap.

Meanwhile, the backhoe operator asked my husband if he'd checked the cleanout drain. "Cleanout drain?" my husband repeated, turning pale. Sure enough, under a piece of carpet in the basement was the drain, and inside it was the broken cap. Then we went upstairs to take a good, long look at our dug-up backyard. It was like buying a price tag with no clothing attached.

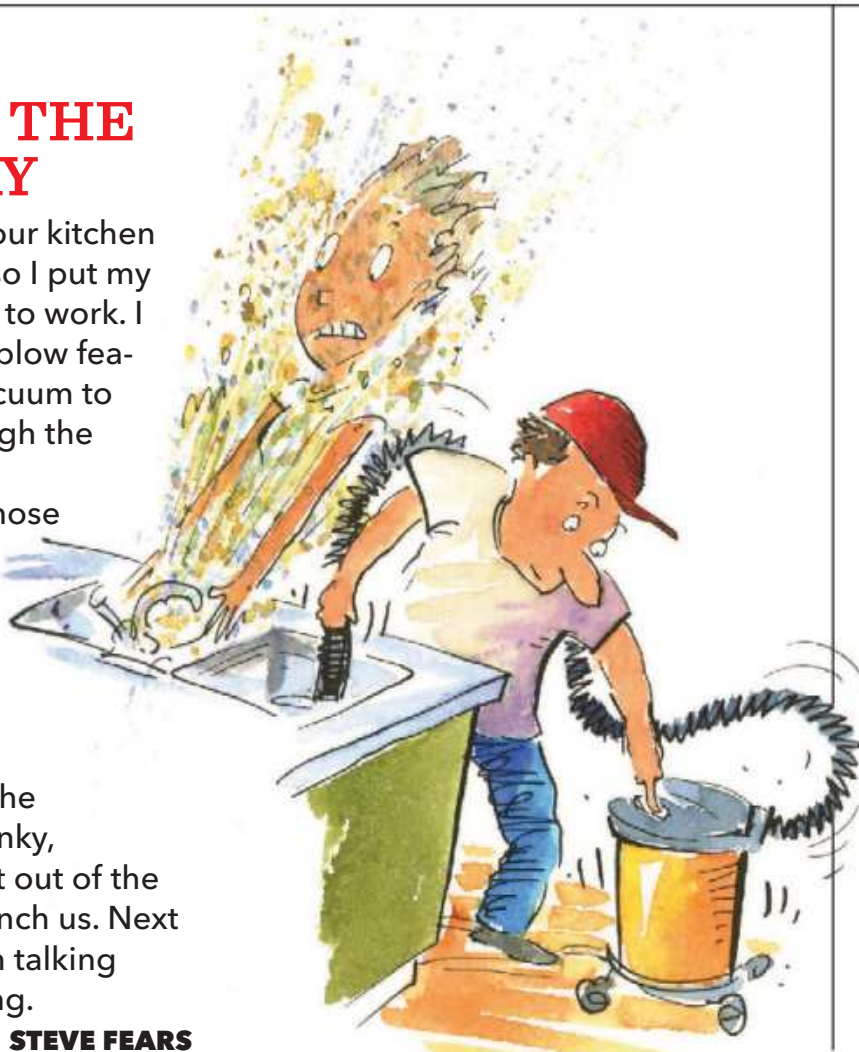
KATIE HEIN

LESSON LEARNED THE SLIMY WAY

The double sink in our kitchen was draining slow, so I put my handyman prowess to work. I planned to use the blow feature on my shop vacuum to push the clog through the drain line.

As I inserted the hose into the drain, my wife asked, "Don't you think we should cover the other drain?" But it was too late. I'd already flipped on the vacuum, causing stinky, slimy water to shoot out of the other drain and drench us. Next time I'll let her finish talking before I start working.

STEVE FEARS



TROUBLE AFOOT

On a cold night last winter, my wife was using the microwave. I heard the timer ding and then a loud "Oh, shoot!" Since her feet were cold, she had decided to warm up her slippers in the microwave. Sadly, she cooked them on high for three minutes. What came out looked like a scene from "The Blob." Not only had her slippers been nuked, but every time we used the microwave after that, the food came out tasting like burnt slippers. It was a tough call, but I threw out the microwave and kept the wife.

MIKE SAMS JR.

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