

Quick fix for clogged tub drains

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- Add bathroom storage
- Simple shelves for any room

November 2008

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TABLE OF CONTENTS

Features

NOVEMBER 2008 VOLUME 58, NO. 10, 493RD EDITION

34 Mosaic tile backsplash

Transform your kitchen in a weekend with easy-to-install tile sheets.

40 Space-saving workbench

A rock-solid bench with a rollout work surface and tons of storage space.

50 Air compressor station

An off-the-floor home for your compressor, air hose and nail guns.

54 Combination cabinet

Maximize limited wall space in your shop or garage with this clever storage cabinet.

58 Washing machine repairs

Save big bucks with simple tools and a little know-how.

64 Wall niche

Add attractive shelving in the bathroom or any room—without giving up elbow room.

70 Basic box shelves

The quickest way to build stylish shelving—or practical storage.

ON THE COVER

Quick fix for clogged tub drains	13
Dream workshop	40
Appliance repairs	58
Sawhorse tips	18
Latest and greatest shop tools	26
Sell your car for more	81
Tile backsplash	34
Add bathroom storage	64
Simple shelves for any room	70

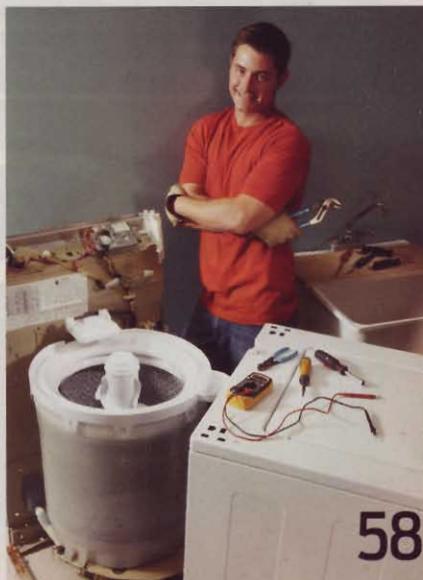
Cover Photo: BILL ZUEHLKE



40



50



58



70

TABLE OF CONTENTS

13 Home Care & Repair

How to winterize your grill, fish those clogs out of your tub drain, and steady a wobbly table.

18 Do's & Don'ts

A veteran carpenter shows you that sawhorses aren't just for sawing anymore.

26 New Tools & Gear

The king of miter saws, a revolutionary sander and lots more.

32 Remodel Resources

Cooktops that work like microwave ovens, versatile faucets, and outdoor heat for you patio partyers!

74 Instant Project

A hole-in-the-wall hideaway for valuables (or all your incriminating photos).

76 Question & Comment

Aging CO detectors, winter prep for air conditioners, and a thermostat controversy.

81 Car & Garage

Get more cash for your used car, cure rough idling in minutes, and exercise your 4WD.

86 Handy Hints®

Hang holiday lights the easy way, disguise your concrete repairs, and stop sock loss!

88 Shop Tips

Our chief editor shows off his home shop. (Now we know why he's never at his desk.)

99 Wordless Workshop™

An easy-to-build wine rack made from—you guessed it!—PVC.

100 Great Goofs®

Outta-whack lawn mowing and a pair of drilling and sawing boo-boos.

Departments



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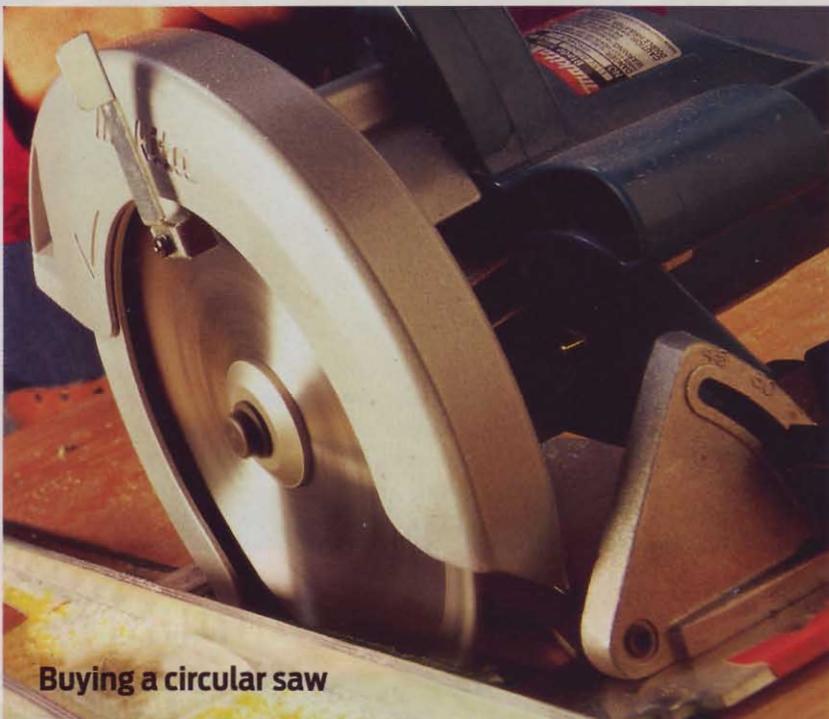
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Modular workbench



Buying a circular saw



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On the House

With the Carey Brothers
Tips of the Month



Move Furniture Easily

Next time you have furniture to move, try one of these tried-and-true techniques that are sure to leave you without an aching back or scratched flooring. Glue bunion pads on the feet of tables and chairs so they can be moved without scratching the finish on the floor. For heavy furniture, slip a piece of plush carpet, pile-side-down under the furniture legs. You'll protect the floor, and the furniture will slide easier. If you don't have bunion pads or extra carpet handy, slip heavy socks onto the legs or place each leg into a shoe made from the bottom half of a milk carton.

Drains that "Love" Insects

We have long have pondered what to do with tennis balls once they've lost their usefulness on the courts. Here's yet another of our many uses. This one keeps crawling insects from entering your home through drains set in concrete basement floors. Remove the cover and drop an old tennis ball in the neck flange. Replace the cover and it'll block the drain pipe until water enters. Then the ball will float, allowing the water to drain. It will re-settle into position over the pipe once it's gone. In tennis "love" means zero, which is exactly how many crawling basement insects you will have if you take our loving advice.

Carbon Monoxide Safety

It's tasteless, odorless, colorless and what's worse -- it's the number one cause of accidental poisoning deaths in America. It's carbon monoxide -- a highly poisonous gas, formed by the incomplete burning of fuel. It's produced by common home appliances, such as gas- or oil furnaces, clothes dryers, ranges, ovens, water heaters and fireplaces. While high levels of exposure to carbon monoxide can result in death, modest levels of exposure can cause flu-like symptoms which range from headaches, fatigue, nausea, dizzy spells, confusion and irritability. The good news is that if a home is properly vented and is free of malfunctioning appliances, carbon monoxide will most likely be safely vented to the outside. Like a smoke detector, a carbon monoxide detector is easy to install and can be a real life-saver.

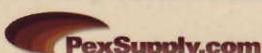
"Fall back" to do list

It's that time of the year again -- when we "fall back" and spend an hour resetting everything from alarm clocks to watches. And whenever you make time changes, you should also check batteries in flashlights, battery operated radios and smoke detectors. And you should check the batteries in all household safety systems like carbon monoxide detectors and back-up batteries in the burglar-alarm control panel. While you're at it, here are a few more things to do when the time changes -- reset your programmable thermostat and change the clocks on VCRs and the lawn sprinkler timer. And don't forget to change the furnace filter and the direction of ceiling fans.

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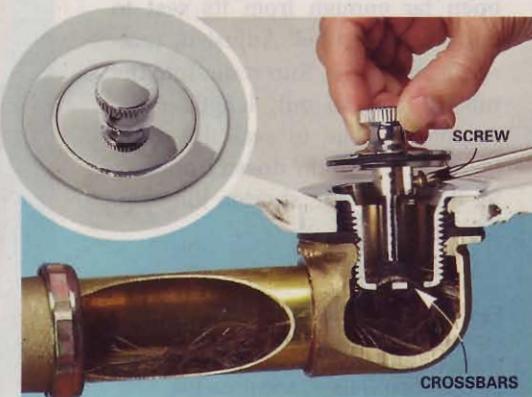


Unclog a tub drain in five minutes—without chemicals

About 80 percent of the time, you can fix slow-draining or clogged tub drains in five minutes, without chemicals and without a \$100 plumber bill. In most cases, you'll only need a screwdriver and a stiff wire or a bent coat hanger. The problem is usually just a sticky wad of hair that collects on the crossbars, a few inches under the stopper. All you need to do is figure out how to remove the stopper (that's almost always easy) and fish out the gunk. Bend a little hook on the end of the stiff wire with a needle-nose pliers and shove it through the clog—you'll nearly always extract the entire ugly mess. If hair is wrapped around the crossbars, slice through it with a utility knife and then grab it with the wire.

Follow our series of photos to determine which type of stopper you have and how to remove it. The most common type, a drop stopper (shown at right), has a setscrew located under the cap.

Drop stoppers



Lift the stopper and loosen the screw on the shaft slightly. Slide the stopper off the shaft.

Push/lock drain stoppers

These stoppers lock and seal when you press them down and release when you push down a second time. The way to remove them isn't so obvious. In most cases you have to hold the stem while unscrewing the cap as shown. With the cap off, you can sometimes fish out the hair from the crossbars. Otherwise simply remove the entire shaft by unscrewing it. You may have to adjust the screw tension on the stem when you reinstall everything to get a good seal.

Hold the stopper shaft tightly with a finger and unscrew the top.



Levered stoppers

Many tubs, certainly most older ones, have a stopper located inside the drain and overflow tube. Most of these have a lever on the overflow plate and a screen over the drain. The screen keeps most hair out of the drain, but some gets through and eventually forms a clog at the crossbars. Simply unscrew the screen for easy access to this clog and remove it as before. If the drain has an internal stopper, simply unscrew the overflow plate and pull the linkage and stopper up and out. Then clean the linkage and stopper and run water down the drain to flush it out.

Occasionally the linkage is out of adjustment and the stopper doesn't open far enough from its seat to allow a good flow. Adjust it, reinsert it and test it. Run water into the tub. If it leaks out, lengthen the stopper linkage to seal the drain better. If the drain doesn't open to let the water out, shorten the stopper linkage.

First remove the screen and clean the crossbars. Then unscrew the overflow plate, pull out the linkage, clean the stopper and linkage, and rinse the drainpipes. Readjust the linkage if necessary. Reinstall the assembly.



Quick fix for a wobbly table leg

Got a table leg, a swing set or just about any other item with chronically loose nuts and bolts? Here's a quick fix to keep metal threads tight once and for all (not for plastics) using color-coded Loctite Threadblocker products.

Loctite Threadblocker Blue 242 (\$6 at home centers) is great for locking together 1/4-in.- to 3/4-in.-diameter fasteners. Blue creates a strong hold but can be broken free to unscrew the fastener when necessary. Red Loctite 271

(\$6) is for larger fasteners and more permanent connections for swing sets, decks and ready-to-assemble furniture.

With either color, you just squeeze a little Loctite adhesive onto the threads and then tighten the fastener. The bond will set in 20 minutes and cure completely in 24 hours. The Loctite adhesive prevents fasteners from vibrating loose or rusting. It also does a good job of sealing metal plugs in water or air tanks.



Clean and dry the parts. Apply Loctite Threadblocker Blue to the fastener threads and reassemble the table.



1 Spray the burners and other metal parts with cooking oil. Wrap the burner unit in a plastic bag.



2 Tape a plastic bag over the grill's gas line opening to keep out spiders and insects.

Winterize your grill

If you live in a cold climate and you're not a winter griller, now's the time to pack away your grill before it's covered with a foot of snow. In addition to giving your grill a thorough cleaning to remove grease and food scraps, take these steps to help prevent any unpleasant surprises when you fire up your grill again next spring.

Shut off the gas at the LP tank and unfasten the burner and slip the gas tubes off the gas lines (check your owner's manual for how to do this on your model) and lift out the unit as a whole. Coat the burners and other metal parts with cooking oil to repel moisture that can build up over the winter and to prevent rust. Then wrap the burner unit in a plastic bag to keep spiders and

insects from nesting in the gas tubes during the winter (**Photo 1**). This is a common problem that can make for balky starts, uneven flames or even a one-alarm fire the next time you light your grill.

If you're storing your grill outside during the winter, just keep the propane tank connected (but shut off) and put a protective cover over the entire grill when you're done cleaning it. If you're storing the grill indoors, don't bring the tank inside, even into the garage or a storage shed. A small gas leak can cause a huge explosion if the tank is stored in an enclosed space. Instead, disconnect the tank and store it outside in an upright position away from dryer and furnace vents and children's play areas. Tape a plastic bag over the grill's gas line opening (**Photo 2**) to prevent insects from nesting.



DO'S & DON'TS

by Travis Larson
editors@thefamilyhandyman.com



Sawhorse Savvy

Sawhorses are used for sawing wood, right? Well, yes ... and no. The truth is that pros use sawhorses as a lot more than just unpaid cutting assistants. In fact, with a little creativity, sawhorses can be one of the most useful tools in your arsenal. We'll show a few of the best ways to get the most out of your "ponies."

Build a five-minute workbench

Do set up a semipermanent workstation when you're trimming or framing larger or longer-term projects. Screw 2x4s to the tops and a plywood platform to the 2x4s and you're ready to build. Let the 2x4s project a few inches beyond the plywood to make it easier for someone to help you pick up the whole works and move it around as needed. To keep the clutter out from underfoot, install a plywood shelf across the braces.



Instant scaffolding

Don't totter on stepladders to do work less than 10 ft. above the ground. Make a crude, but safe, scaffolding plank with plywood and 2x4s up to 8 ft. long. Be sure to add end blocks to keep the long 2x4s from folding up while you're working. Build longer planks if you want, but use 2x6s for lengths between 8 and 12 ft.



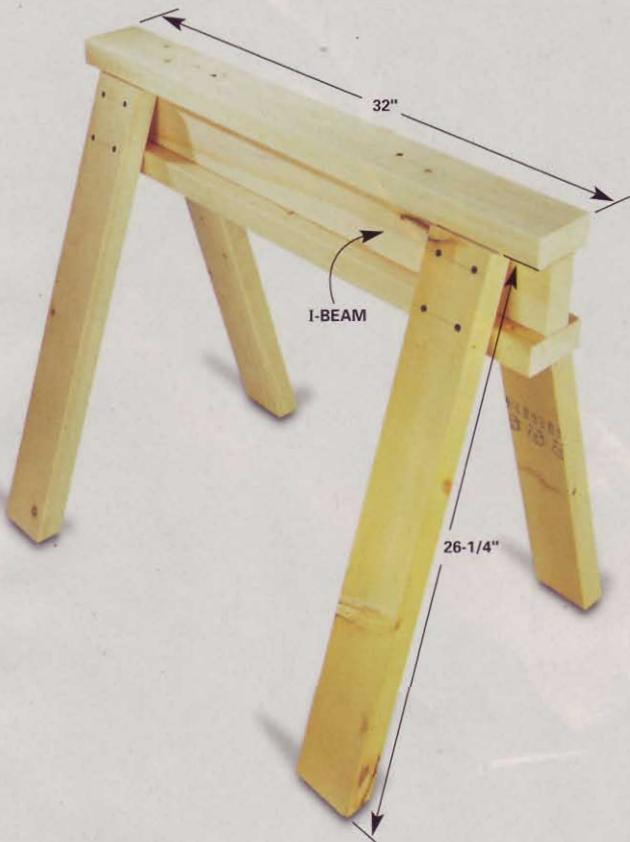
Wider caps are better

Don't cap metal sawhorses with 2x4s; 2x6s are a better choice. You'll get a larger working area and be able to clamp stuff to the overhanging sides (**photo below**). Anchor the 2x6s from the undersides with No. 12 3/4-in.-long screws. Don't use longer screws or you'll be breaking saw blade teeth every once in a while. If you want to hang your sawhorses up and out of the way, let the ends run a few inches too long and drill holes in them (**photo below**).



Wooden tops are made to wreck!

Don't be afraid to cut into your tops! Set your blade to cut 1/4 in. deeper than the thickness of the wood and cut right through the tops. They'll still last for years.



Simple homemade sawhorses

Need extra horses right now? You can make a pair by cutting five 8-ft. 2x4s into six 32-in. lengths and eight 26-1/4-in. lengths.

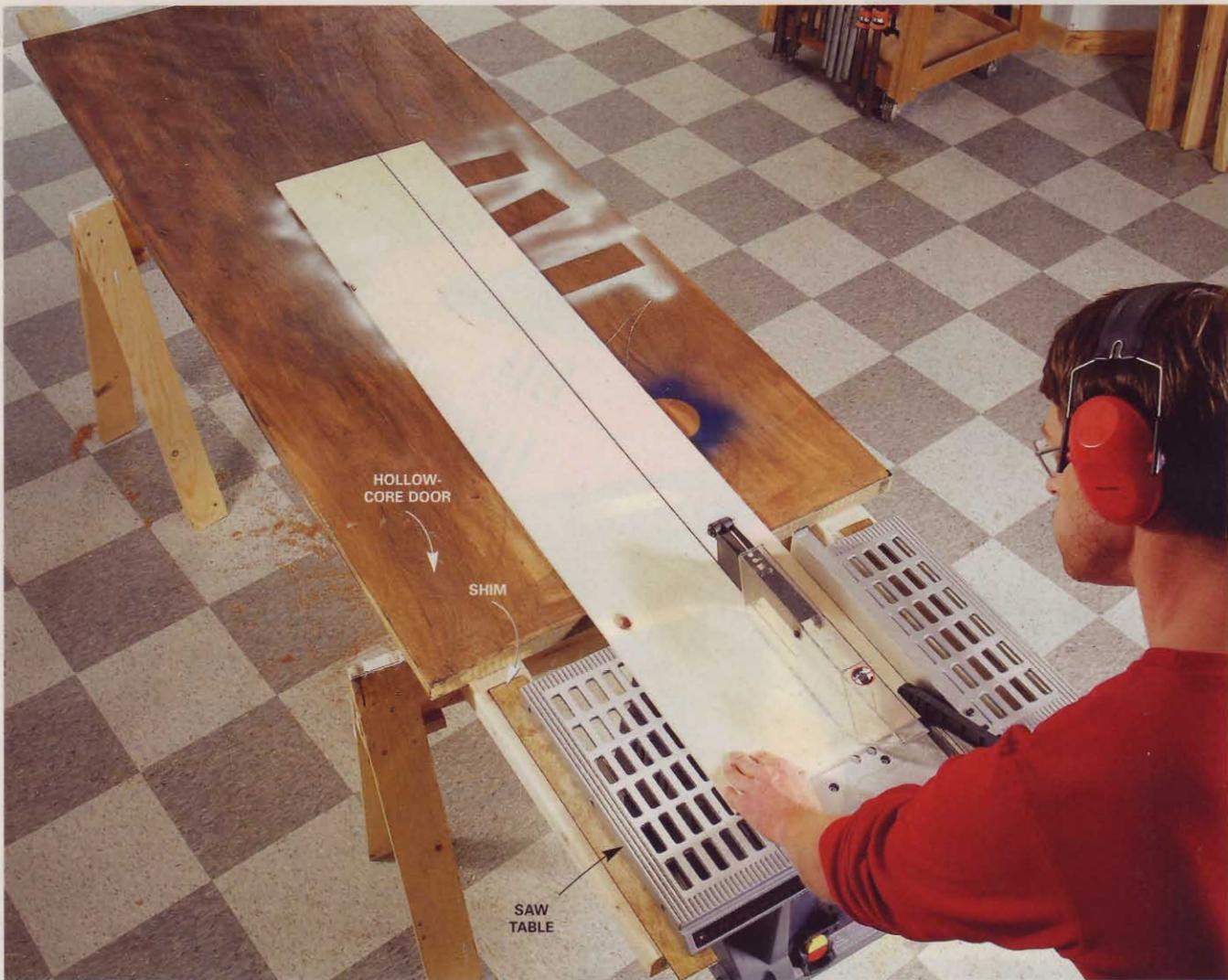
Screw the 32-in. pieces into I-beam shapes and, after you've drilled pilot holes, attach the legs to the I-beams with 3-in. screws. These screws, along with the upper edge of the I-beam, stabilize the legs.

Or customize the lengths and heights to suit your purpose. But you're on your own with the numbers!

Get yourself two sets

Don't settle for one pair of horses! You'll always need another set or at least *half* of another set. If, for example, you need a quick platform for cutting plywood, assemble two horses end to end with a third one in the middle, perpendicular to the first two. Make sure the cutting line is supported by the middle horse. Two sets of horses both the same height will always be the most useful.





Speed up painting

Do create a drying platform when you have to finish miles of siding or trim, cabinet doors or just about anything else. The platform is simple—just a couple of 2x4s spanning the sawhorses.

After each piece is finished, transfer it right to the platform. Start in the middle and work your way to each end. That'll keep the whole works from toppling over and causing a disaster.

Give your portable saw outfeed support

Do convert a portable table saw into a stationary saw by resting the saw table edges on two overhanging 2x4s. Adjust the placement of the boards so the saw is well supported but as far apart as possible so they won't interfere with the fence, and then screw them to the horses. To hold the saw in place, screw through the holes in the saw table (drill 'em if you have to) into the 2x4s. You can use a piece of plywood for outfeed support, shimming it so it's even with the table top. But the *best* outfeed support is a hollow-core door (damaged ones are \$20 or less at home centers!). A door is the perfect thickness for most saw tables (maybe a *little* shimming required), and it can do double duty as a lightweight portable workbench. 



Top-of-the-line miter saw

Milwaukee Tool's new 12-in. dual-bevel miter saws aren't cheap, but if you take carpentry seriously, the benefits are worth the cash. No fluff—just hard-core features that work. The miter angle digital readout lets you fine-tune miters to 0.1 degree. The integral dust channel performs well, and lights on both sides of the blade illuminate the workpiece. There's no laser guide, because company research showed it wasn't a popular feature with pros.



The 15-amp direct-drive motor has a "soft start," so it doesn't require extra power during start-up (which can blow a circuit), and the motor doesn't bog down when you cut tough lumber. The dual-bevel miter saw (No. 6950-20) is \$530, and the sliding saw version (shown; No. 6955-20) is \$700. Available at Home Depot, amazon.com and other retailers listed online.

Milwaukee Tool, (800) 729-3878.
milwaukeetool.com



This dual-bevel miter saw offers precision angle cutting, good dust collection and easy operation.



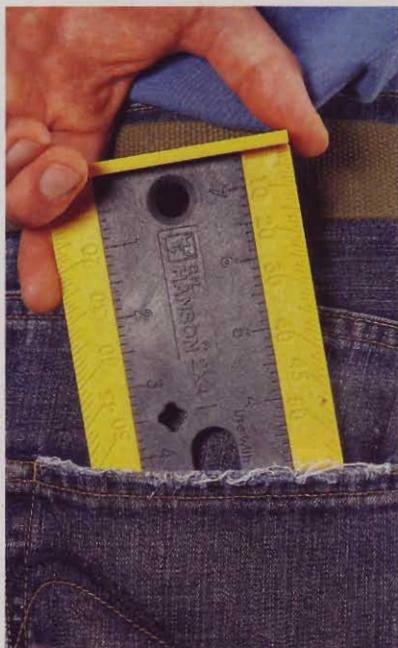
The Slide Square works like a traditional square to quickly mark 90-degree angles (above). A built-in scale lets you mark angled cuts (above right).

Back pocket square

It's hard to improve on a tool as simple, inexpensive and useful as the square, but C.H. Hanson found a way. The Slide Square does everything a traditional square does—lets you draw straight lines quickly and finds roof cuts, hips and valleys up to 90 degrees—and it also has calipers for easy measuring and a built-in jig for marking anchor bolt holes on sill plates (for new construction). Even better, it's compact enough to fit in your hip pocket. Buy it on the company's Web site (\$9) or amazon.com (\$10).

C.H. Hanson, (800) 827-3398.

chhanson.com



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Ask for it at Sears, Ace Hardware, Menard's, Amazon.com, or wherever you buy your tools.

The two sanding discs move in opposite directions to reduce vibration, making the tool more comfortable to use.

Double-action rotary sander

Craftsman's 5-in. Vibrafree random orbit sander (model No. 25927) has noticeably less vibration (the company says 68 percent less) than other sanders. The sander has two discs that work independently of each other, a system that balances the tool as it operates. It also reduces vibration, making it easier on your arm.

If you've done lots of sanding, you know that the outer edge of the disc wears faster than the middle. Well, since the hook-and-loop discs are replaced separately, you can replace the outer one by itself and get more milage from the inner disc.

The tool's dust collection system does a better than average job of collecting dust. According to Craftsman, the sander removes 40 percent more dust than other sanders. Buy the \$100 sander at Sears stores or sears.com.

Craftsman, craftsman.com



SKIL POWER TOOLS

Shopful of tools for under \$900

Skil's new line of benchtop tools lets you set up an entire workshop for \$120 or less per tool. They're not intended for serious woodworkers, but they're a great buy for weekend warriors who just can't justify investing in more expensive tools.

The line includes a 10-in. compound miter saw with a clamping system that holds wood securely in place during cuts, and a Universal Miter Saw Stand that's fast and easy to set up. Also included is a 10-in. table saw with a large aluminum tabletop to help rip wide sheets. Other tools included are a 16-in. scroll saw, a 9-in. band saw, a 10-in. drill press, a belt disc sander, and for \$49, a 6-in. bench grinder.

If you're looking for low-cost starter tools, this collection is tough to beat. The tools are available exclusively at Lowe's.

Skil, (877) 754-5999. skil.com

Multitool that really works

I'm typically leery of tools that try to do too many things because they end up doing everything poorly. The Rapid Shark (\$25) is an exception.

It's a wire cutter, stripper, crimper (spring loaded for easy one-hand operation) and utility



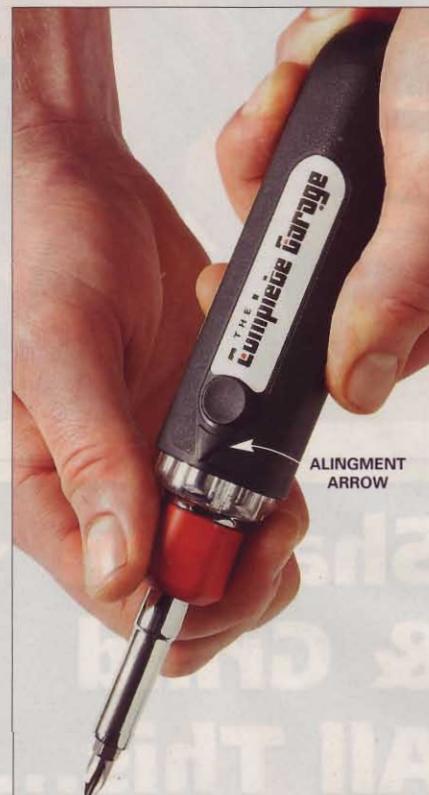
knife rolled into one. The utility

blade retracts so it's not a hazard when cutting or stripping wire, and the wire cutting/stripping jaws lock closed when you're blade-cutting so they're not in the way. The handle stores four blades (included) so you always have sharp blades onboard.

Changing blades is easy too—simply press the red button near the blade, then pull out the old one and slip in a new one—nothing to unscrew or take apart.

Buy it at Lowe's, Ace Hardware, Sears (winter holiday catalog) or amazon.com.

Rapid Tools, (905) 336-0553. rapidtools.net



Quick-change screwdriver

Screwdrivers with switchable tips have been around forever, but since the tips are manually removed and inserted, they have a nasty habit of disappearing. But the Auto Loader (\$35) keeps all of the bits loaded right onboard so you can easily change them without actually touching (or losing) them. Simply pull down on the handle, align the arrow on the handle with the tip you want, then push the handle forward to move the bit into place. Changing tips takes all of three seconds. The Auto Loader comes with six tips and is available at completegarage.com (search for "Auto Loader").

The Complete Garage, (866) 892-0200. completegarage.com



The chamber is loaded with six bits, which are just a twist away.



THERMADOR

Stay-cool induction cooktops

Magnetic induction cooktops are the most popular type of cooktop in Europe—and with good reason. They're nearly twice as energy efficient as gas and electric cooktops, they have the same instant control as gas, and they cook food faster and more evenly. (For a great explanation of induction cooking, visit theinduction-site.com.) According to Thermador, its line of award-winning induction cooktops are the fastest on the market thanks to the "PowerBoost" function that devotes extra energy to a specific

zone on the cooktop to quickly bring a pot of water to a boil. Its newest silver-mirrored models coordinate with other stainless steel kitchen appliances and include a raft of safety features: an anti-overflow system that sounds an alarm and shuts off the unit if liquids boil over, a heat indicator that warns when elements might still be warm to the touch, and automatic shutoffs if the elements are left on accidentally.

Induction cooktops do have a few downsides. Cookware must be made of steel, cast iron or other combination of

metals that will react with the magnetic field (if a magnet sticks to the bottom of the pan, you can use it). Your kitchen needs to be wired for 220 volts (which isn't likely if you're using gas). And this kind of cool doesn't come cheap. Thermador's 30-in. and 36-in. silver-mirrored models cost \$3,000 to \$3,600. The black ceramic models range from \$2,500 to \$3,300. For help locating a dealer, visit the Web site below or call (800) 656-9226.

For more information:

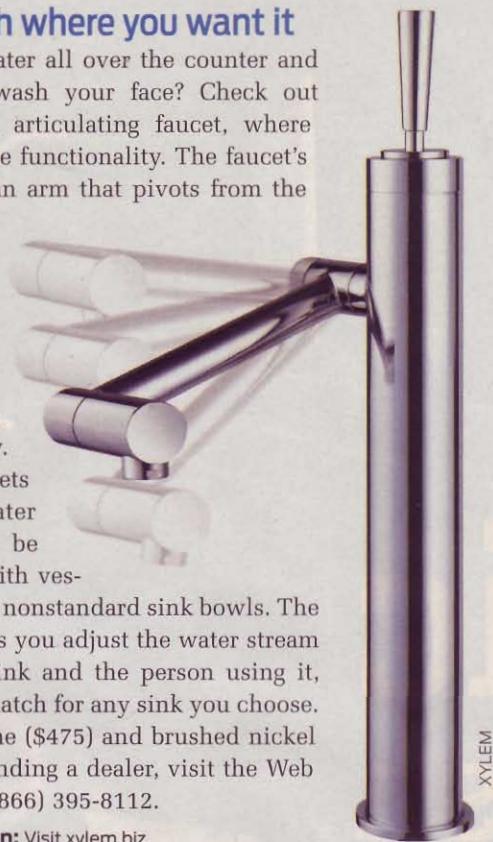
Visit thermador.com

Put the splash where you want it

Tired of getting water all over the counter and floor when you wash your face? Check out Xylem's Dual Art articulating faucet, where style meets extreme functionality. The faucet's spout is actually an arm that pivots from the faucet body to vary the height and angle of the water stream and is fixed in place with a hand-tightened, knurled setscrew.

Conventional faucets have a fixed water stream that can be awkward to use with vessel sinks and other nonstandard sink bowls. The Dual Art faucet lets you adjust the water stream to suit both the sink and the person using it, making it a good match for any sink you choose. Available in chrome (\$475) and brushed nickel (\$545). For help finding a dealer, visit the Web site below or call (866) 395-8112.

For more information: Visit xylem.biz



Lighten up with easy glass block inserts

Glass block doors can dramatically brighten a dark space, but they're heavy, expensive and difficult to work with. Hy-Lite acrylic block door inserts make bringing in daylight a breeze. Acrylic block weighs 70 percent less than glass and can be retrofitted into existing doors without reinforcement. The inserts come preassembled and include a paper template to mark the cutting lines in the existing door and step-by-step installation instructions. Available for both interior and exterior doors, the inserts fit frame-and-panel or flat hollow-core or solid doors, and you can use the company's online design tool to get exactly what you need. Prices vary according to the size and type of insert (an insert for a 32-in. x 80-in. interior door is \$523). Available at home centers or from hy-lite.com (800-655-9087).

For more information:
Visit hy-lite.com



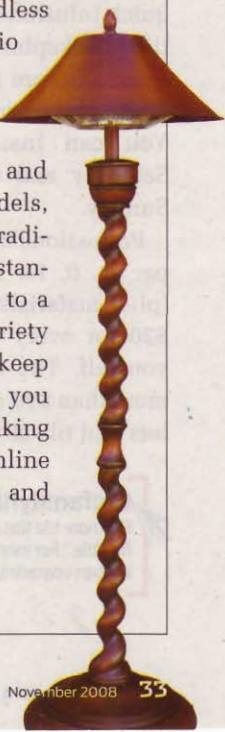
HY-LITE

Keep the chill off and the party on

Disguised as an upscale lamp, the Endless Summer indoor/outdoor electric patio heater keeps things toasty while you enjoy the changing seasons from your deck or screen porch.

Available in tabletop (\$180; **left photo**) and floor-standing (\$250; **shown at right**) models, the Endless Summer patio heater uses radiant heat technology that plugs into a standard electrical outlet and provides up to a 12-ft. circle of warmth. Offered in a variety of styles and finishes, this heater can keep you celebrating the season long after you should stop partying and get busy raking those leaves. Available at Lowe's and online retailers such as patioheatingplus.com and homedecorworld.com.

For more information:
Visit bluerhino.com, (800) 762-1142.



by Brett Martin
editors@thefamilyhandyman.com

Mosaic backsplash



A whole new look for under \$200

Nothing packs more style per square inch than mosaic tile. So if your kitchen's got the blahs, give it a quick infusion of pizzazz with a tile backsplash. Because the small tiles are mounted on 12 x 12-in. sheets, installation is fast. You can install the tile on Saturday and then grout it on Sunday.

Professionals charge about \$20 per sq. ft. for installing the tile (plus materials), so you'll save \$20 for every sheet you install yourself. The sheets cost \$8 to more than \$20 each at home centers and tile stores.

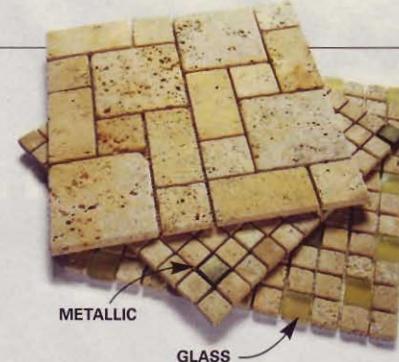
The total cost for our backsplash was about \$200. Our sheets cost \$10 apiece plus adhesive and grout. For an 8-ft. backsplash, you could save about \$45 by using a less expensive tile.

We chose slate tiles, which sometimes crumble when you cut them. Other types of mosaic tile, especially ceramic tiles, are easier to cut.

In this story, we'll show you how to install the tile sheets. You'll need basic tile tools, available at home centers and tile stores, including a 3/16-in. trowel (\$9) and a grout float (\$5). You'll also need mastic adhesive (\$11 for 1 gallon), grout (\$20 for the 17-lb. bag of premium grout we used) and grout sealer (\$10 for 1 qt.). You can rent a wet saw to cut the tiles (\$40 for four hours, or \$55 for the day).

thefamilyhandyman.com

For more tile tips and projects, search for "tile." For more simple and easy kitchen upgrades, search for "kitchen."



Mosaic tile sheets make it easy to achieve a great backsplash. Layout is a cinch—you can simply cut the mesh backing on the sheets to fit the tile along counters and cabinets. In fact, the hardest part of this or any other tiling project may be choosing the look—the tiles come in a variety of shapes and materials, and many sheets have glass or metallic tiles built in for accents. To add to your options, strips of 4 x 12-in. tiles are available for borders. So you can match the existing look of your kitchen—or try something new!





1 Mark a centerline between the upper cabinets so the tiles will be centered under the vent hood. Screw a ledger to the wall to support the tile.



2 Spread a thin layer of mastic adhesive on the wall, starting at the centerline. Spread just enough adhesive for two or three sheets at a time so the adhesive doesn't dry before you set the tile.

Prepare the walls

Before installing the tile, clean up any grease splatters on the wall (mastic won't adhere to grease). Wipe the stains with a sponge dipped in a mixture of water and mild dish-washing liquid (like Dawn). If you have a lot of stains or they won't come off, wipe on a paint deglosser with a lint-free cloth or abrasive pad so the mastic will adhere. Deglosser is available at paint centers and home centers for \$8 for 1 qt.

Then mask off the countertops and any upper cabinets that will have tile installed along the side. Leave a 1/4-in. gap between the wall and the tape for the tile (**Photo 1**). Cover the countertops with newspaper or a drop cloth.

Turn off power to the outlets in the wall and remove the cover plates. Make sure the power is off with a noncontact voltage detector (\$15 at home centers). Place outlet extenders (\$1.80 at home centers) in the outlet boxes. The National Electrical Code requires extenders when the boxes are more than 1/4 in. behind the wall surface. It's easier to put in extenders now and cut tile to fit around them than to add them later if the tile opening isn't big enough. Set the extenders in place as a guide for placing the tile. You'll remove them later for grouting.

On the wall that backs your range, measure down from the top of the countertop backsplash a distance that's equal to three or four full rows of tile (to avoid cutting the tile) and make a mark. Screw a scrap piece of wood (the ledger board) to the wall at the mark between the cabinets.

The area between the range and the vent hood is usually the largest space on the wall—and certainly the most seen by the cooks in the house—so it'll serve as your starting point for installing the tile. Make a centerline on the wall halfway between the cabinets and under the vent hood (**Photo 1**). Measure from the centerline to the cabinets. If you'll have to cut tile to fit, move the centerline slightly so you'll only have to cut the mesh backing (at least on one side).

Install and seal the tile

Using a 3/16-in. trowel, scoop some mastic adhesive out of the tub and put it on the wall (no technique involved here!). Spread the mastic along the centerline, cutting in along the ledger board, vent hood and upper cabinets (**Photo 2**). Then use broad strokes to fill in the middle. Hold the trowel at a 45-degree angle to the wall to spread the mastic thin—you should be able to see the layout lines where the points of the trowel touch the wall. Have a water bucket and sponge on hand to keep the trowel clean. Whenever the mastic starts to harden on the trowel, wipe it off with the wet sponge.

Place plastic tile spacers on the ledger board and countertop. This leaves a gap so the tiles don't sit directly on the countertop (you'll caulk the gap later).

Align the first tile sheet with the centerline, directly over the spacers. Press it onto the wall with your hand. If the sheet slides around and mastic comes through the joint lines, you're applying the mastic too thick (remove the sheet, scrape off some mastic and re-trowel). Scrape



3 Tap the tile into the mastic with a wood scrap and a rubber mallet. Stand back, look at the tiles and straighten any crooked ones.



4 Cut tile sheets to the nearest full row to fit around outlets, then fill the gaps with tiles cut on a wet saw.



5 Force grout into the joints with a float. Scrape off excess grout by moving the float diagonally across the tile.

out any mastic in the joints with a utility knife.

Eyeball a 1/16-in. joint between sheets of tile (you don't need spacers). After every two or three installed sheets, tap them into the mastic with a board and rubber mallet (**Photo 3**).

If tiles fall off the sheets, dab a little mastic on the back and stick them right back in place. The sheets aren't perfectly square, so you may need to move individual tiles to keep joints lined up. Move the tiles with your fingers or by sticking a utility knife blade in the joint and turning the blade. If an entire sheet is crooked, place a grout float over the tile and move the sheet. You'll have about 20 minutes after installing the tile to fine-tune it.

If you're lucky, you can fit the tile sheets under upper cabinets and around outlets by cutting the mesh backing with a utility knife. If not, you'll have to cut the tile with a wet saw. Nippers and grinders cause the slate tiles to shatter or crumble, although you can use these tools on ceramic tile.

Slice the backing to the nearest full row of tile, install the sheet around the outlet or next to the cabinet, then cut tiles with a wet saw to fill the gaps (**Photo 4**). Cut the tiles while they're attached to the sheet. Individual tiles are too small to cut (the blade can send them flying!).

Let the tile sit for at least 30 minutes, then apply a grout sealer if you're using natural stone (like slate) or unglazed quarry tile. The sealer keeps the grout from sticking to the tile (it's not needed for nonporous tiles such as ceramic). Pour the sealer on a sponge, then wipe on just enough to dampen the tiles.

Grout and clean the tile

Wait 24 hours after installing the tile to add the grout. We used a premium grout that has a consistent color and resists stains better than standard grout. Since the backsplash will be subject to splatters and stains from cooking and food prep, we recommend spending the extra money for a premium grout. You can find or special order it at home centers or tile stores. One brand is Prism (custombuildingproducts.com; 800-272-8786). Sanded grout will also work and will save you a few bucks.

Mix the grout with water until it reaches mashed potato consistency, then put

some on the wall with a grout float. Work the grout into the joints by moving the float diagonally over the tiles (**Photo 5**). Hold the grout at a 45-degree angle to the tile. Scrape off excess grout with the float after the joints are filled.

Ten minutes after grouting, wipe the grout off the surface of the tiles with a damp sponge. If the grout pulls out of the joints, wait another 10 minutes for it to harden. Continually rinse the sponge in a bucket of water and wipe the tiles until they're clean.

These slate tiles have a lot of crevices that retain grout. While most of the grout comes off the tiles with the wet sponge, some won't. Most pro installers leave some grout in slate and other rough-surface tile—it's just part of the deal with some types of natural stone. But if you want the tile completely clean, remove the grout from individual tiles with a toothbrush.

After cleaning the wall, use a utility knife to rake the grout out of the joints along the bottom of the backsplash and in the inside corners (**Photo 6**). These expansion joints allow the wall to move without cracking the grout.



6 Rake the grout out of the joints at inside corners and along the bottom with a utility knife so you can fill them with caulk. Keep the dull side of the blade along the countertop.

ension joints allow the wall to move without cracking the grout.

Two hours after grouting, wipe the haze off the tiles with microfiber cloths. Then caulk the expansion joints with latex caulk. Use a colored caulk that closely matches the grout.

After seven days, sponge on a grout sealer to protect the grout against stains.

That's it! Now every time your family and friends gather in your kitchen, they'll be impressed with your custom backsplash.



thefamilyhandyman.com November 2008 39



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Space-saving



Workbench

Tons of storage—plus extra work space



by Eric Smith
editors@thefamilyhandyman.com

A well organized workshop with accessible storage and plenty of work space makes any project easier, but finding that space in a small shop can be a challenge. This workbench goes a long way toward solving that problem by simply making the space you have work harder. By combining a rollout workbench with a large work table and deep drawer bases, you can almost double the available work surface, plus make it easier to get at tools and put them away when you're done.

You can build the whole project with a circular saw and a drill, but a table saw, brad nailer, miter saw and router will make it go faster. The cost for lumber and hardware for this project is about \$650 if you use maple plywood (as we did), or \$350 if you substitute standard BC-grade plywood. You can build the project in three to four days, with another day for applying finish.

Make your space work harder



Long, deep drawers let you organize small tools, parts and hardware.

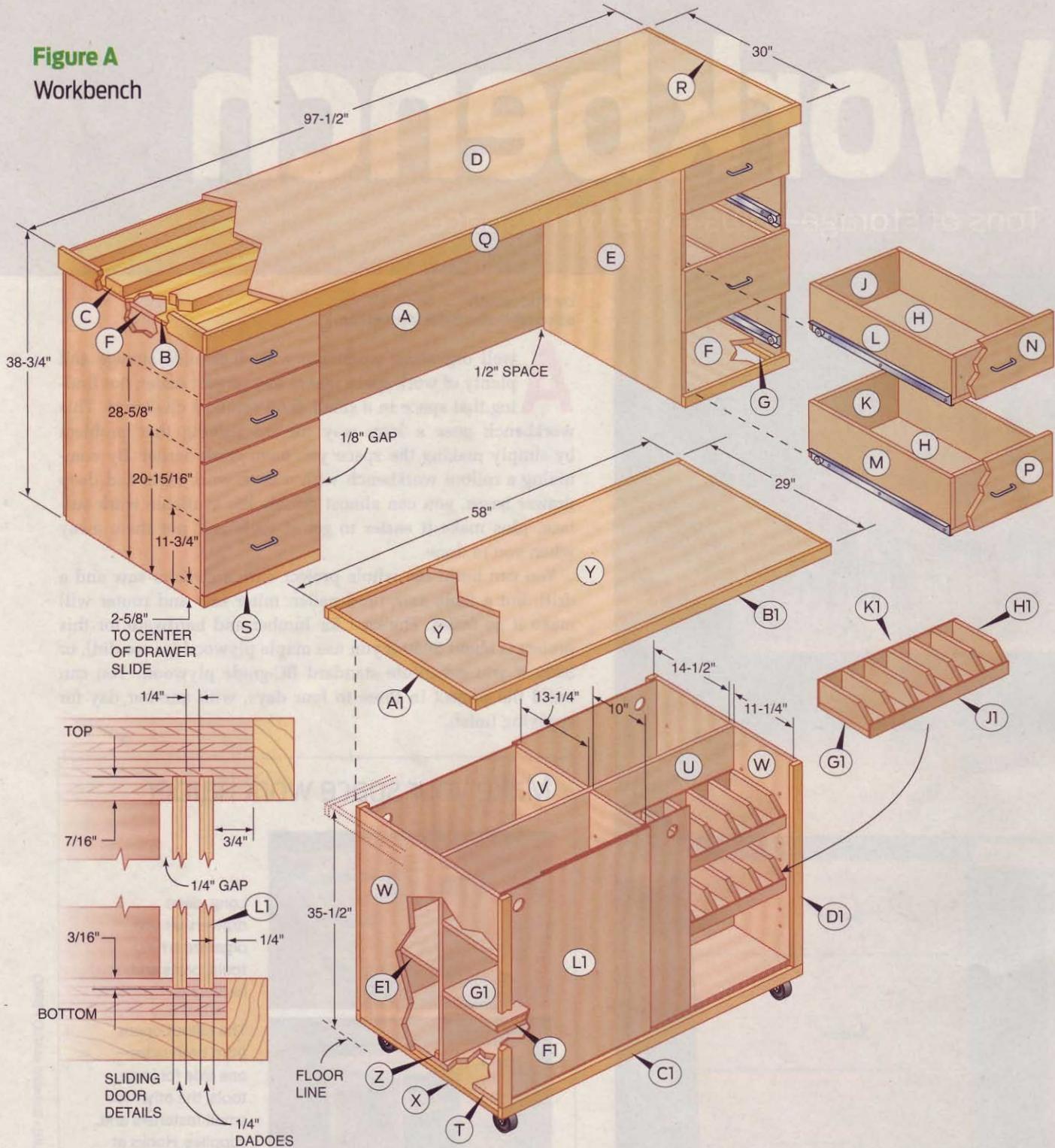


The rollout opens from both sides—one side for large tools, the other for small fasteners and supplies. Hooks at each end hold cords and hanging tools.



When you're done working, just tuck the rollout bench back under the fixed bench.

Figure A
Workbench



Cutting List: Fixed Workbench

KEY QTY. SIZE & DESCRIPTION

(all pieces are maple plywood unless noted)

	QTY	SIZE & DESCRIPTION		QTY	SIZE & DESCRIPTION
A	1	37-1/2" x 96" x 1/2" back	G	4	27-1/4" x 3/4" x 3/4" pine drawer cabinet cleats
B	1	28-3/4" x 96" x 1/2" BC plywood subtop	H	8	26" x 15-1/2" x 3/4" drawer box bases
C	4	2x4 x 96" studs	J	8	14" x 5-3/4" x 3/4" drawer box fronts and backs
D	1	29-1/4" x 96" x 3/4" top	K	8	14" x 7-1/4" x 3/4" drawer box fronts and backs
E	4	27-1/4" x 36" x 3/4" drawer cabinet sides	L	8	26" x 5-3/4" x 3/4" drawer box sides
F	4	27-1/4" x 16-1/2" x 3/4" drawer cabinet tops and bottoms	M	8	26" x 7-1/4" x 3/4" drawer box sides
			N	4	18" x 7-13/16" x 3/4" drawer faces (for small drawers)
			P	4	18" x 9" x 3/4" drawer faces (for large drawers)
			Q	1	97-1/2" x 2-3/4" x 3/4" clear pine front trim
			R	2	29-1/4" x 2-3/4" x 3/4" clear pine side trim
			S	2	18" x 1-1/2" x 3/4" clear pine base trim

Cutting List: Rollout Bench

KEY	QTY.	SIZE & DESCRIPTION
T	1	26-1/2" x 47-1/2" x 3/4" base
U	1	28-3/4" x 47-1/2" x 3/4" long center divider
V	1	28-3/4" x 24" x 3/4" short center divider
W	2	26-1/2" x 29-1/2" x 3/4" sides
X	2	26-1/2" x 3/4" x 5-1/2" pine wheel support
Y	2	27-1/2" x 56-1/2" x 3/4" top
Z	2	23-3/8" x 3/4" x 3/4" pine cleat
A1	2	27-1/2" x 1-1/2" x 3/4" clear pine trim
B1	2	58" x 1-1/2" x 3/4" clear pine trim
C1	2	49" x 1-1/2" x 3/4" clear pine base trim
D1	4	28-3/4" x 1-1/2" x 3/4" clear pine side trim
E1	4	13" x 23" x 3/4" plywood shelves
F1	.6	23" x 1/4" x 3/4" shelf edge
G1	4	9-1/2" x 23" x 3/4" plywood shelves
H1	14	3" x 9-1/2" x 3/4" shelf dividers
J1	2	1-3/4" x 23" x 1/4" shelf front
K1	2	3-3/4" x 23" x 1/4" shelf back
L1	4	23-15/16" x 29-1/8" x 1/4" plywood door

Cut all the plywood first

The most time-consuming part of building the workbenches is ripping all the plywood parts. If you're working by yourself on a table saw, you may want to make the long rip cuts with a circular saw and a saw guide (search "circular saw" at thefamilyhandyman.com for tips). Just make the shorter cuts on the table saw—it's difficult to muscle a 4 x 8-ft. sheet of plywood across a small saw bed without veering away from the fence. Label each piece as you cut it to save confusion later.

Assemble the bench

Attach the drawer slides to the drawer cabinet sides before you assemble the drawer bases (**Photo 1**). See **Figure A** for placement. We used inexpensive 24-in. self-closing drawer slides (\$7 per pair) that screw to the bottom edge of the drawer box. Side-mounted drawer slides require different placement.

Glue and clamp the drawer cabinet parts together, then predrill and screw them. Glue and nail the drawer cabinet cleats from the inside with 1-1/4-in. brad nails or screws.

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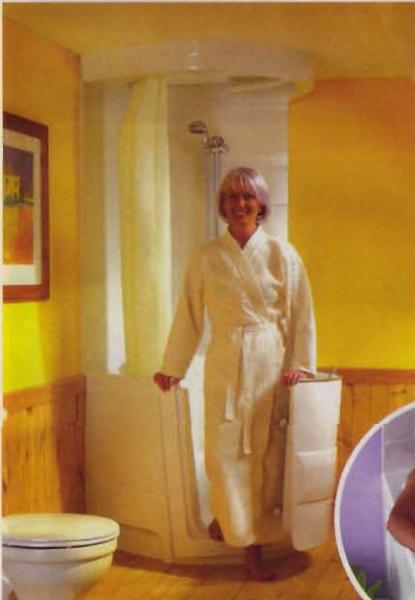
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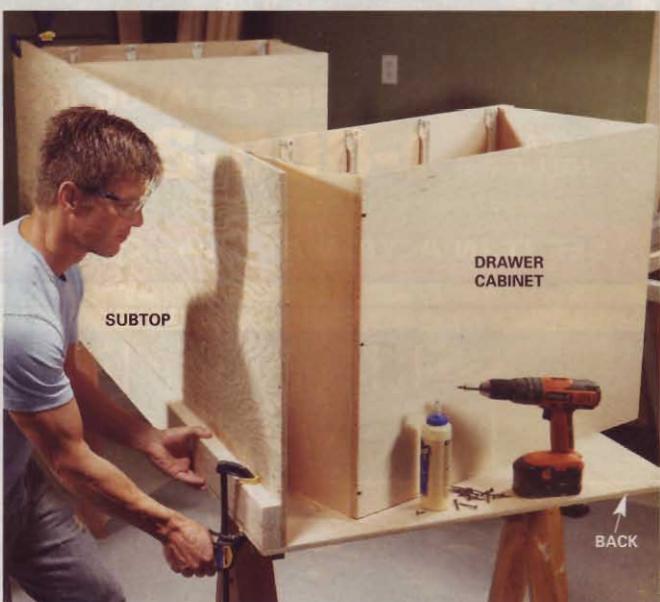
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SOURCE CODE 21118

1 Save time and trouble by mounting drawer slides before assembling the cabinets. Lay the cabinet sides back-to-back, mark the slide locations and screw them into place.



2 Join the back to the subtop with glue, screws and a 2x4, then glue and screw the drawer cabinets into place for a square, wobble-proof workbench.



3 Assemble a "sandwich" from 2x4s and plywood to form a super-stiff bench-top. Fasten 2x4s to the subtop, using clamps and a straightedge to hold the front edge flat. Then add the top layer of plywood.



Glue and screw a 2x4 to the edge of the plywood subtop, then clamp the subtop to the 1/2-in. plywood back. Attach both drawer cabinets (**Photo 2**), aligning them with the edges of the back and subtop—that will make the table square in both directions.

Tip the bench onto the floor and add the remaining 2x4s. Clamp the front 2x4 to a straightedge to keep the top flat, then glue and screw the 2x4s down. First screw them to the drawer cabinets with 2-1/2-in. screws (**Photo 3**), then finish by crawling under the bench and screwing the subtop to the 2x4s from underneath.

Finally, spread more glue on the 2x4s and set the plywood top into place. Fasten the top with finish nails, pushing down as you nail to make sure the plywood lies flat on the 2x4s. After the glue sets, the 2x4s and the plywood form a rigid structure, called a torsion box, that will resist bending or sagging.

Build simple drawers

Build the drawer boxes 1 in. narrower than the opening (or as specified for the drawer slides you use). Attach the other half of the drawer slides to the boxes and set them into the drawer cabinets.

Position and fasten the drawer faces, then open the drawers and screw the faces to the drawer boxes from the inside with 1-1/4-in. screws (**Photo 4**). Use 16d nails or shims to create 1/8-in. gaps between the drawer faces.

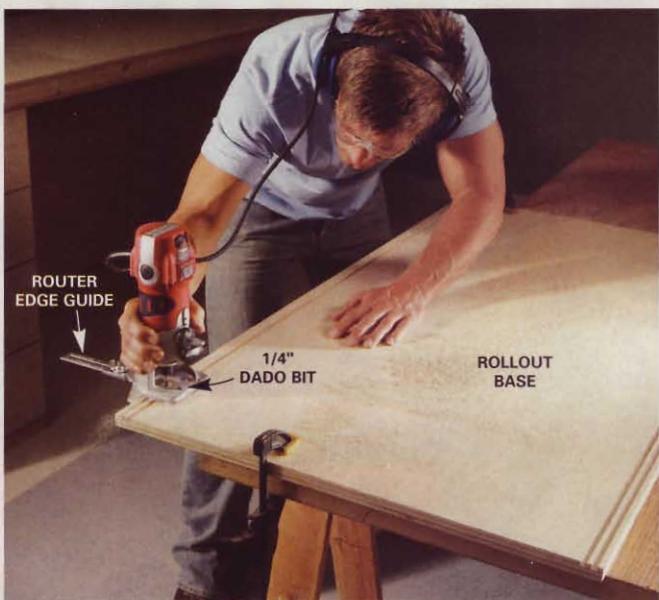
Build the rollout bench

Using a router or a table saw with a dado blade, cut 1/4-in.-wide tracks for the sliding doors (**Photo 5**). Use an edge guide (make sure it's fastened tight) or clamp a straightedge to the plywood as a guide for the router. Cut the dadoes in the base first, then align it with the top and mark the cuts (the top and base are different widths). Cut the tracks in the base 3/16 in. deep and the tracks in the top 7/16 in. deep to make it easy to insert the sliding doors. Make the deeper router cuts in two passes. To help the doors slide easily, wrap 120-grit sandpaper around a small piece of 1/4-in. plywood and rub it back and

4 Position the drawer faces perfectly without guesswork by drilling holes for the handles and driving temporary screws through the holes. Then open each drawer and drive permanent screws from the inside.



5 Cut matching tracks for sliding doors in the benchtop and base before assembly. Use a straightedge or router guide to make the tracks perfectly straight.



6 Leave the plywood dividers whole to create a sag-proof framework. Cut interlocking slots and then slide the dividers together and position them on the base.



forth in the door tracks to eliminate rough spots.

Center dividers make the bench strong

Glue and screw the 1x6 wheel supports (part X) to the edges of the base, then attach the casters with lag screws. Mark and drill matching shelf pin holes in the short center divider and the sides. Cut 3/4-in.-wide slots at the centers of the long and short dividers with the table saw (or circular saw) and jigsaw. Make the cuts 1/8 in. beyond the halfway marks so the two dividers will fit together easily and line up at the edges (**Photo 6**).

Position the dividers on the base as shown in **Figure A**, then lock them to the base with 3/4-in. cleats glued and nailed to the long divider. Set the sides into position on the 1x6 wheel supports and fasten them to the center divider and base with 1-1/2-in. brad nails (or screws if you don't mind seeing exposed screws).

Set the bottom layer of the benchtop into position, align the sides and the center divider, then tack everything into place with a few finish nails (**Photo 7**). Mark the centers of the dividers and sides, then predrill and screw the top down.

Spread glue over the top and fasten the second layer of the top with a finish nail at each corner. Then drive 1-1/4-in. screws up through the bottom layer into the top to lock the two layers together.

Turn the rollout bench over and screw the base to the dividers and sides (**Photo 8**).

Doors, shelves and trim

Cut the doors for the rollout bench the height of the opening plus 3/8 in. so they can fit up into the top track and then drop into the bottom track without falling out. Cut holes for handles with a 1-1/2-in. hole saw. Back the doors with scrap wood before cutting the holes so they don't splinter. Rub hard paraffin wax (\$5 at hardware stores) along the bottom edges of the doors (after finish is applied) to make them slide smoothly in the tracks.

PATIENT INFORMATION
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What is LOVAZA?

LOVAZA is a prescription medicine for adults called a lipid-regulating medicine. LOVAZA is made of omega-3 fatty acids. Omega-3 fatty acids are natural substances that your body needs. They are found naturally in some plants and in the oil of certain fish, such as salmon and mackerel.

LOVAZA is used along with a low-fat and low-cholesterol diet to lower very high triglycerides (fats) in your blood. Before taking LOVAZA, talk to your healthcare provider about how you can lower high blood fats by:

- losing weight, if you are overweight
- increasing physical exercise

Treatment with LOVAZA has not been shown to prevent heart attacks or strokes.

LOVAZA has not been studied in children under the age of 18 years.

What should I tell my doctor before taking LOVAZA?

Tell your doctor about all the medicines you take, including prescription and non-prescription medicine, vitamins, and herbal supplements. LOVAZA and certain other medicines can interact causing serious side effects. Especially tell your doctor if you take medicines:

- to reduce clotting – known as anticoagulants or blood thinners. These include aspirin, warfarin, coumarin and clopidogrel (PLAVIX).

Tell your doctor if you are **allergic to fish**.

LOVAZA may not be right for you.

Who should not take LOVAZA?

Do not take LOVAZA if you:

- are **allergic to LOVAZA or any of its ingredients**.

What are the possible side effects of LOVAZA?

- The most common side effects with LOVAZA are burping, infection, flu symptoms and upset stomach.

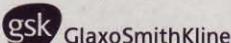
Talk to your doctor if you have side effects that bother you or that will not go away. You may report side effects to FDA at 1-800-FDA-1088.

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 June 2008



- 7** Mount the first layer of the benchtop, using masking tape markers to position it so you don't smear the glue. Then add the second layer of plywood to create a rock-solid surface.



- 8** Reinforce the cabinet by driving 1-5/8-in. screws through the base and wheel support into the dividers and sides.



- 9** Don't let the leftovers go to waste! Build storage bins to fit inside the rollout bench. Use smaller pieces to make boxes for odds and ends.



Add trim to both benches. Nail the upper and lower trim on the rollout bench to the outer edges only, to avoid nailing into the tracks. If desired, add 1/4-in. screen mold trim to finish the shelf edges. Sand all edges and rough spots on both workbenches.

Use the small pieces of leftover plywood to create bins on the shelves and storage containers for small parts and fasteners (Photo 9).

Finish the bench with either urethane varnish (durable but time-consuming to apply) or penetrating oil (goes on quickly but doesn't protect as well). Or leave it unfinished so you can accumulate a patina of marks and splatters from all the projects you make.

Materials List

(All materials are available from home centers or lumberyards)

ITEM	QTY.
3/4" maple plywood	7
1/2" maple plywood	1
1/2" BC-grade plywood	1
1/4" maple plywood	1
2x4 x 8'	4
1x6 x 6' pine	1
1x4 x 6' clear pine	1
1x4 x 10' clear pine	1
1x2 x 8' clear pine	5
3/4" x 3/4" x 8' pine (rip from 1x2)	2
1/4" x 3/4" x 8' screen mold for shelf edging	3
Wood glue	
1-1/4" drywall screws	
1-5/8" drywall screws	
2-1/2" drywall screws	
1-1/4" nails for pneumatic finish nailer	
3" locking casters	4
24" drawer slides	8 prs.
Adjustable shelf pins	
Drawer pulls	8
1/4" x 1-1/4" lag screws (for wheels)	16



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Compact Compressor Station

Save floor space and get organized with this sturdy compressor stand

by Jeff Gorton
editors@thefamilyhandyman.com



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Figure A
Compressor station

Overall dimensions:
25-1/2" wide
20-3/4" deep
30-1/4" tall

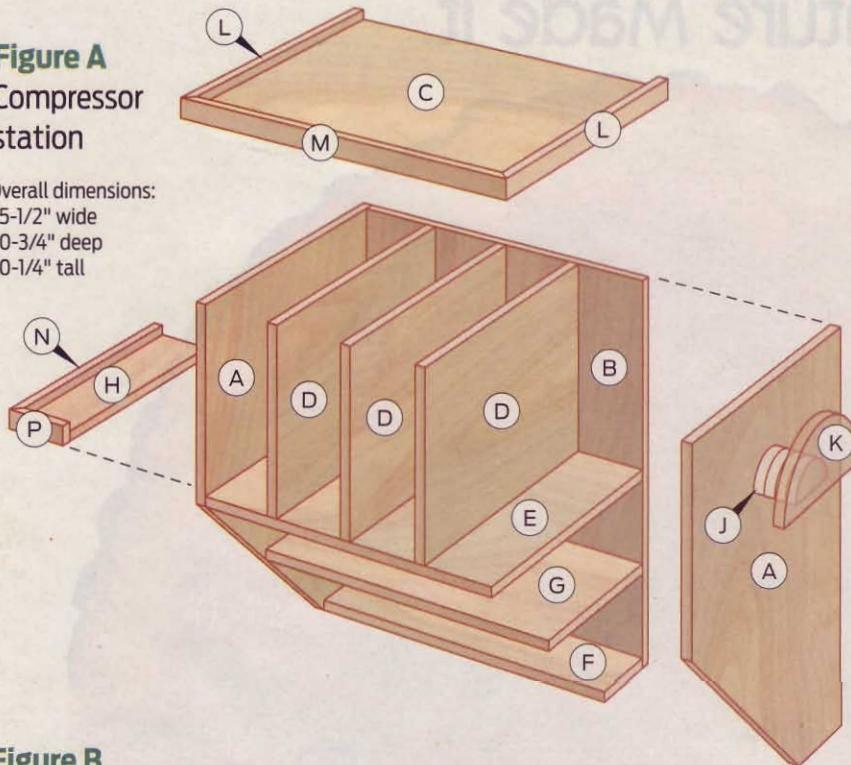
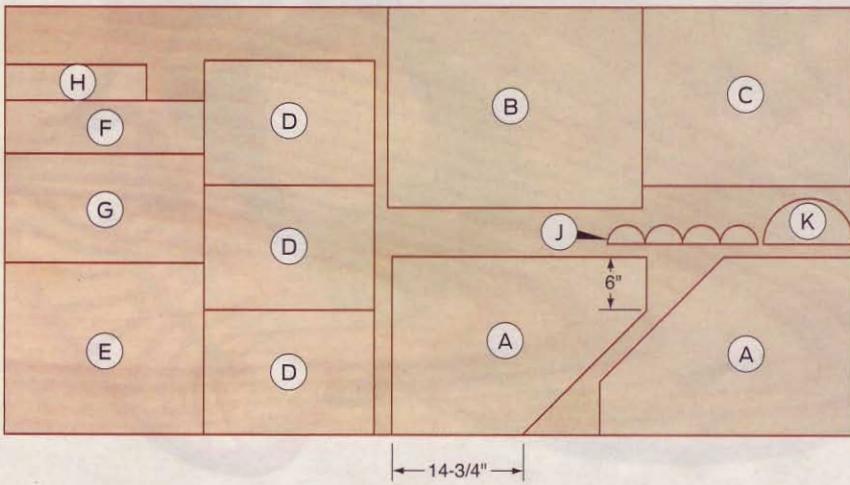


Figure B
Plywood cutting diagram



1 Cut the angled sides using a straightedge to guide your saw. Cut the rectangular pieces with a table saw or a circular saw and straightedge.



You can get your nail guns, fasteners, hose and accessories off your workbench and out of your way by building this wall-mounted compressor station. This easy project requires just one sheet of 3/4-in. plywood; about 8 ft. of 1x2 lumber; and only standard carpentry tools, plus a circular saw and a jigsaw. We used a table saw for most of the plywood cuts, and a miter saw for the trim, but a circular saw and straightedge will give good results too.

We spent about \$75 for birch plywood and birch 1x2 for this station, but you can cut the cost in half by using less expensive wood. Plan to spend about six to eight hours on this project.

Start by cutting out the plywood pieces according to **Figure B**. Use a table saw or a circular saw fitted with a sharp carbide-tooth blade to minimize splintering. If you're using a circular saw, clamp a straightedge or a saw guide to the plywood for straight, accurate cuts. **Photo 1** shows how to make the diagonal cuts for the sides.

Cutting List

KEY	QTY.	SIZE & DESCRIPTION
A	2	3/4" x 20" x 28-3/4" plywood
B	1	3/4" x 22-1/2" x 28-3/4" plywood
C	1	3/4" x 20" x 24" plywood
D	3	3/4" x 14" x 19-1/4" plywood
E	1	3/4" x 19-1/4" x 22-1/2" plywood
F	1	3/4" x 5-1/4" x 22-1/2" plywood
G	1	3/4" x 12-1/4" x 22-1/2" plywood
H	1	3/4" x 4" x 16" plywood
J	4	3/4" x 6-1/2" diameter half circles of plywood
K	1	3/4" x 10-1/4" diameter half circles of plywood
L	2	3/4" x 1-1/2" x 21" (miter to fit)
M	1	3/4" x 1-1/2" x 26" (miter to fit)
N	1	3/4" x 1-1/2" x 17" (miter to fit)
P	1	3/4" x 1-1/2" x 5" (miter to fit)

Materials List

ITEM	QTY.
4' x 8' x 3/4" plywood	1
1x2 x 8'	1
1/4" x 3/4" strips of wood (optional)	16'
1-5/8" screws	1 lb.
2" finish nails	1/2 lb.
Wood glue	

Build the hose holder by marking four half circles with a gallon paint can and a half circle with a 5-gallon bucket on a plywood strip. Cut out the parts with a jigsaw (**Photo 2**). Glue and clamp the four small half circles together. After the glue dries, use a belt sander to smooth the edges, then glue the half round block to the larger half circle.

Once the parts are cut, assembly is straightforward. Mark the centerline of the shelves (E, F and G) on the sides, and the centerline of the dividers (D) on the top (C) and upper shelf (E). Drill holes and countersinks for screws on the centerline of all shelves and dividers. Space screws about 1-1/2 in. from plywood ends and about 8 in. apart.

Start by driving 1-5/8-in. screws through the sides into the back and attaching the shelf and hose holder with screws. Then screw the top to the sides and back and add the dividers (**Photo 3**). We made the first space 6 in. wide and the three remaining spaces 4-3/4 in. wide to fit our nail guns. Adjust these dimensions to fit your own tools. Screw the wide shelf (E) to the dividers and then screw through the sides into the three shelves (E, F and G).

Finish the station by adding a 1x2 edge to the top and to the accessory shelf (**Photo 4**). Align the 1x2s with the plywood so they protrude 3/4 in. above the top and shelf to create a lip. Glue and nail the 1x2s to the plywood. For a more finished appearance, we covered the raw plywood edges with 1/4-in. strips of wood, but screen molding would work fine.

We brushed two coats of clear polyurethane on the station before hanging it on the wall. When you mount the station, be sure to locate wall studs and attach the station firmly to them with four 1/4-in. x 3-1/2-in. lag screws and washers. To reduce noise and compressor movement, cut a rubber mat or piece of carpet to fit under the compressor.

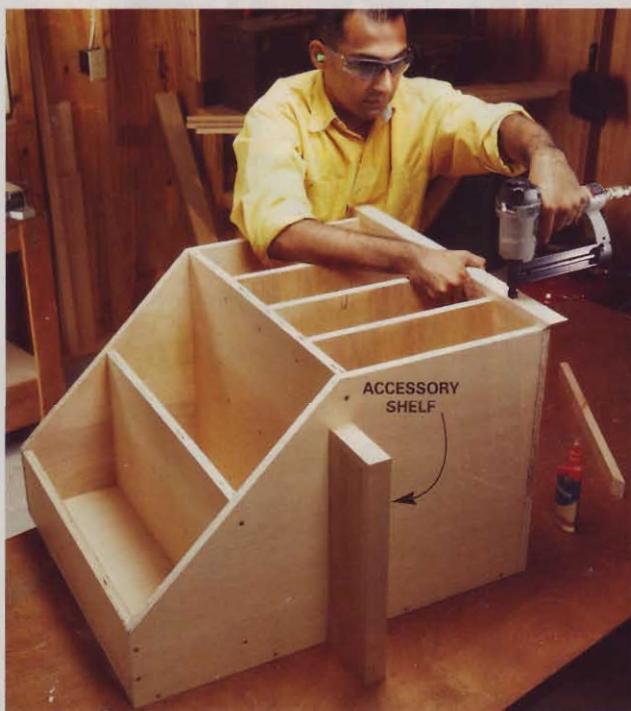
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2 Saw out the hose holder parts with a jigsaw. Trace around one half of a paint can and one half of a 5-gallon bucket to mark the pieces. Glue and screw the half circles together to make the hose holder.



3 Position the dividers with temporary spacers. This eliminates the need for measuring and marking and makes alignment much easier. Use the same spacers again when you install the shelf below the dividers.



4 Wrap the top of the station with a sturdy lip to prevent the compressor from "walking" off. Use both glue and nails for a strong connection.

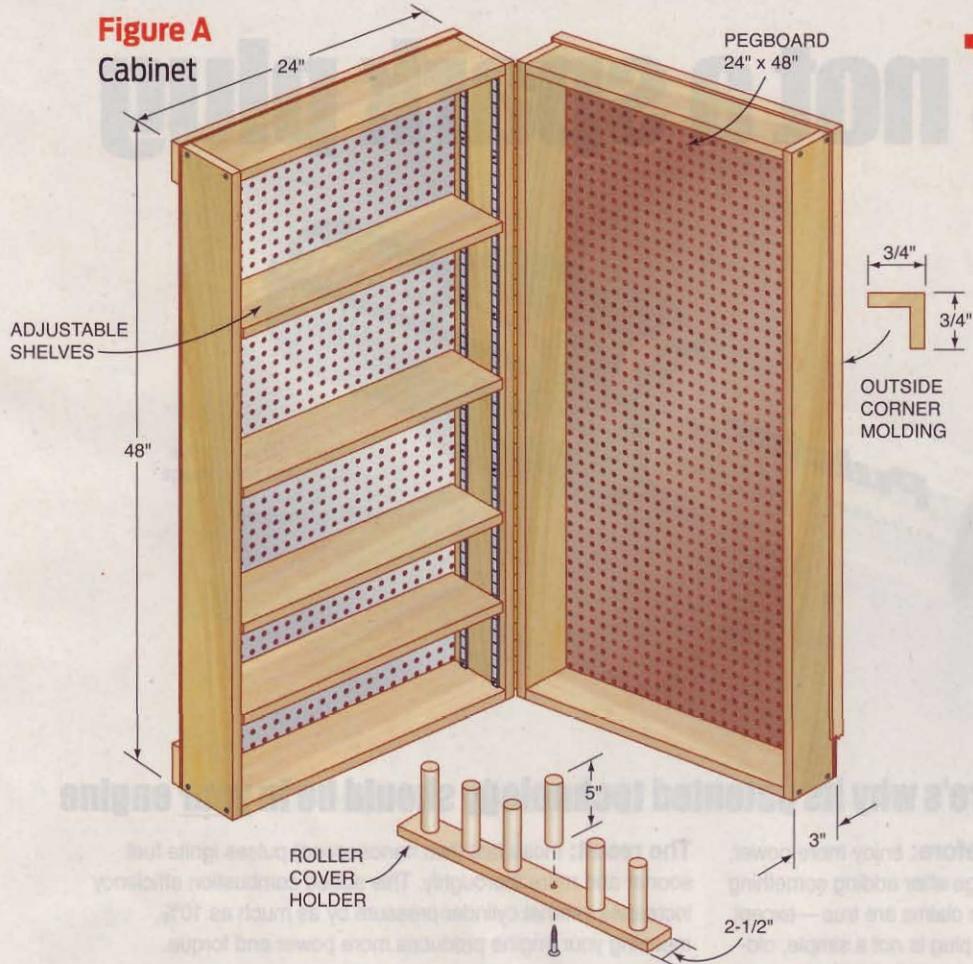
Combination Cabinet

Get hanging storage
and shelving with
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by Jeff Gorton
editors@thefamilyhandyman.com

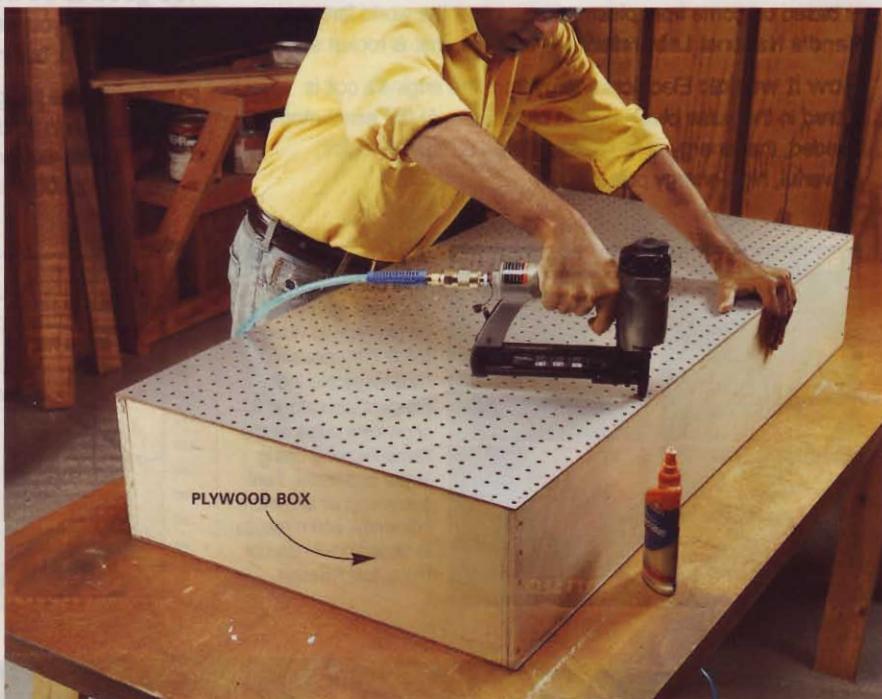
Figure A**Materials List**

ITEM	QTY.
4' x 4' x 3/4" plywood	1
2' x 4' pegboard	2
3/4" outside corner molding	14'
1-5/8" screws	24
1-1/2"-wide x 48" continuous hinge	1
48" metal shelf standards	4
Shelf clips	16
Small hook latch	1
1" brads	1 lb.
Wood glue	

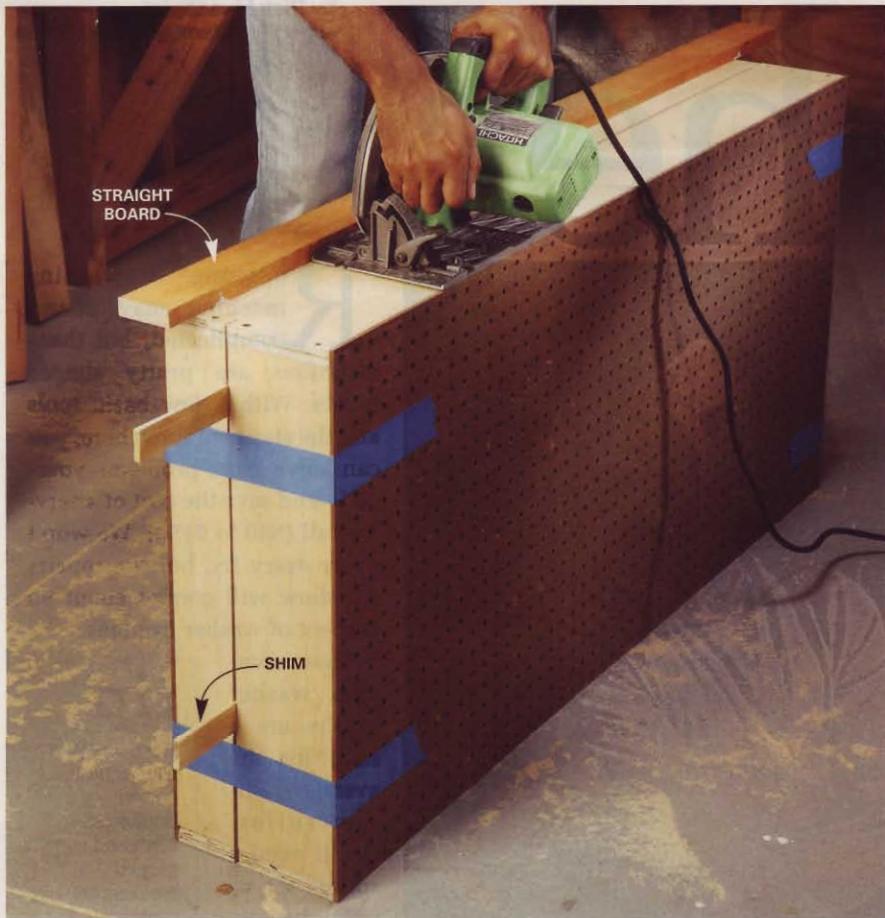
You'll also need 3 ft. of closet rod if you want to add the roller cover holder.

We designed this wall cabinet with painting supplies in mind, but you can use it to store just about anything, including hand tools and small boxes of fasteners and hardware. We simplified the construction by using a build-a-box-and-cut-it-in-half technique and then face-mounting a full-length continuous hinge. It couldn't be easier. And the result is a sturdy, practical wall-hung cabinet.

Materials for one of these cabinets cost us about \$55, but you could reduce the price per cabinet by buying 4 x 8-ft. sheets of pegboard and plywood and building several cabinets instead. Start by cutting 8-in. strips of plywood and screwing them together to form a 2-ft. by 4-ft. box. Place screws accurately as shown in **Figure A** to avoid hitting them when you cut the box in two (**Photo 2**). Also be sure to orient the pegboard so the good side faces out on the front and in on the back. Be careful to cut the pegboard



1 Build a simple box and cover both sides with pegboard. Remember to face the good side of the back pegboard to the inside of the box.



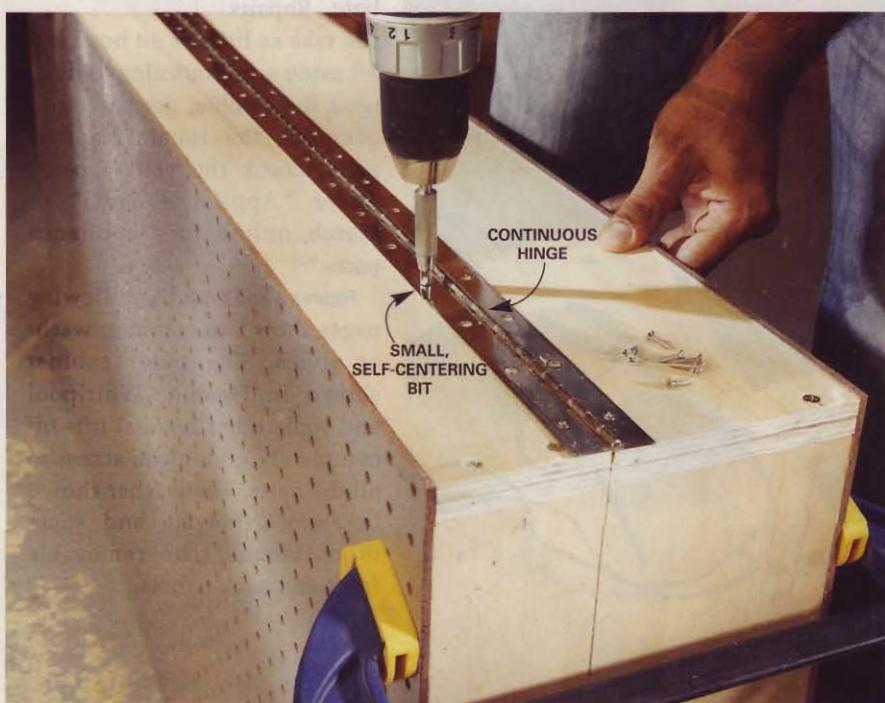
2 Cut the box in two using a guide board for a perfectly straight cut. Before the final cut, use shims and tape to hold the box together.

pieces perfectly square and with straight sides so you can use them as a guide for straightening the box sides and squaring the box as you nail on the pegboard (**Photo 1**).

To cut the box into two pieces, begin by tacking a straight board to the box sides as a saw guide. Position the guide so the cut runs 3 in. from the front edge of the box and falls between the screws. Set the saw blade to cut 7/8 in. deep. Align the guide carefully on each side so the cuts meet in the corners. Before you make the final cut, use shims and tape to hold the cabinet together, and keep them on until the cut is complete (**Photo 2**). **Figure A** shows the cabinet dimensions and details as well as the rack we added to hold paint roller covers. Screw two 3-in.-wide strips of 3/4-in. plywood to the back of the cabinet. These provide a stronger hanging surface, and they space the cabinet from the wall to allow the use of pegboard hooks on the cabinet back. Mount the cabinet by driving 1/4-in. by 3-in. lag screws through the hanging strip into wall studs.



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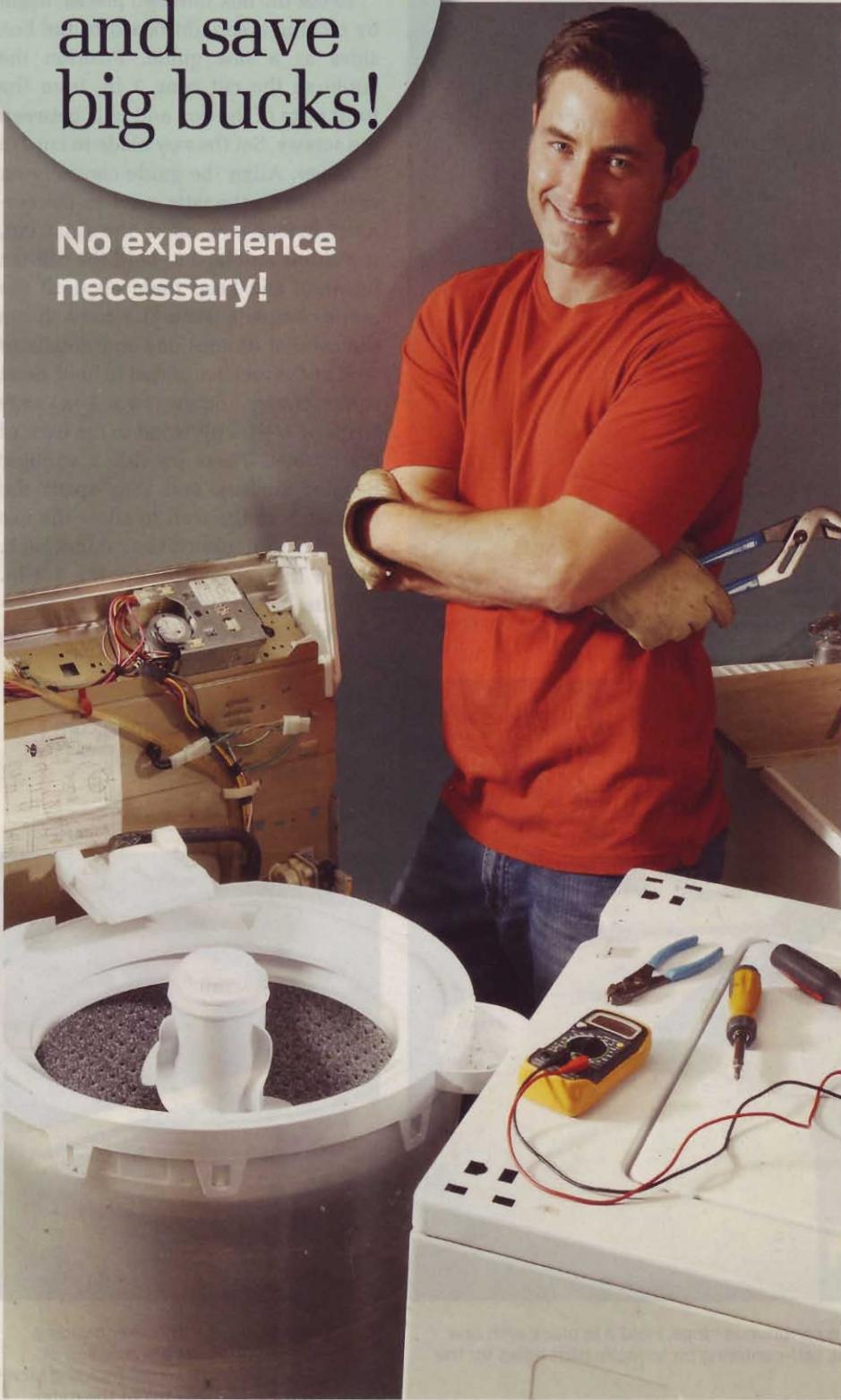
3 Mount the door on the cabinet with a continuous hinge. Hold it in place with one screw on each end. Then use a small, self-centering bit to make pilot holes for the remaining screws.



4 Trim the door with corner molding. Mark the inside of the molding at cabinet corners and turn the molding face down on the miter saw to cut the miter.

Fix your washer and save big bucks!

No experience
necessary!



by Rick Muscoplat
editors@thefamilyhandyman.com

Repairing a washing machine may sound complicated, but these machines are pretty simple inside. With a few basic tools and the steps we show here, you can solve most problems yourself—and save the cost of a service call (\$80 to \$150). We won't cover every fix, but the repairs we show will correct about 90 percent of washer troubles.

These common washer repairs are a snap for the average do-it-yourselfer. You'll need a socket set or nut drivers, screwdrivers and a flashlight. Repairs can take as little as an hour, but set aside a full morning to diagnose the trouble, get parts and complete the repair. To find parts, check the yellow pages under "Appliance Parts" or search online for "appliance parts."

Figures A and B on the following pages show two common washer styles. The outer cabinet shown in **Figure A** (Whirlpool and some other brands) lifts off completely, giving you access to all the parts. The washer shown in **Figure B** (Maytag and some other brands) has removable front and back panels.

CAUTION

Unplug your washer before you begin any testing or repairs.

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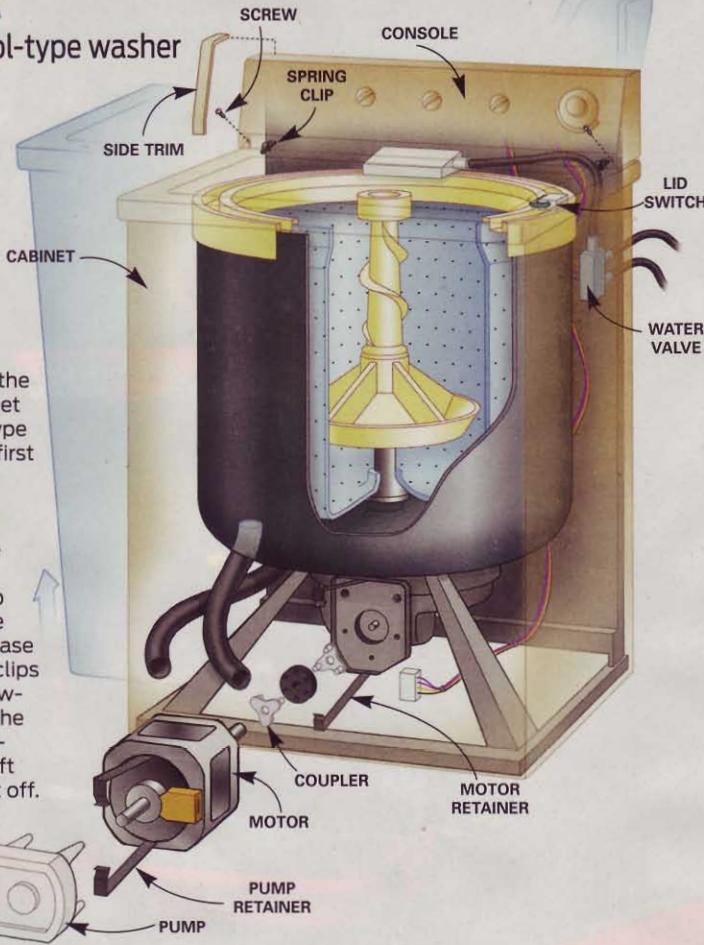
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Figure A
Whirlpool-type washer

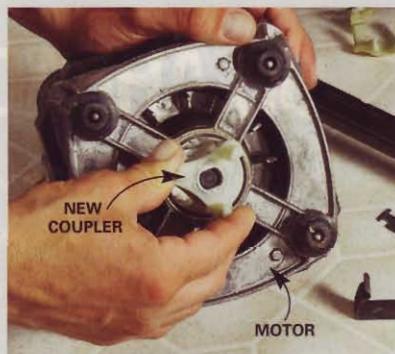


Grinding noise

If you own a Whirlpool direct-drive washer (the water hoses attach to the left side when viewed from the back), you've probably got a broken coupler—a common failure caused by overloading the machine. It's an easy and inexpensive fix (\$22; see Photos 1 and 2).



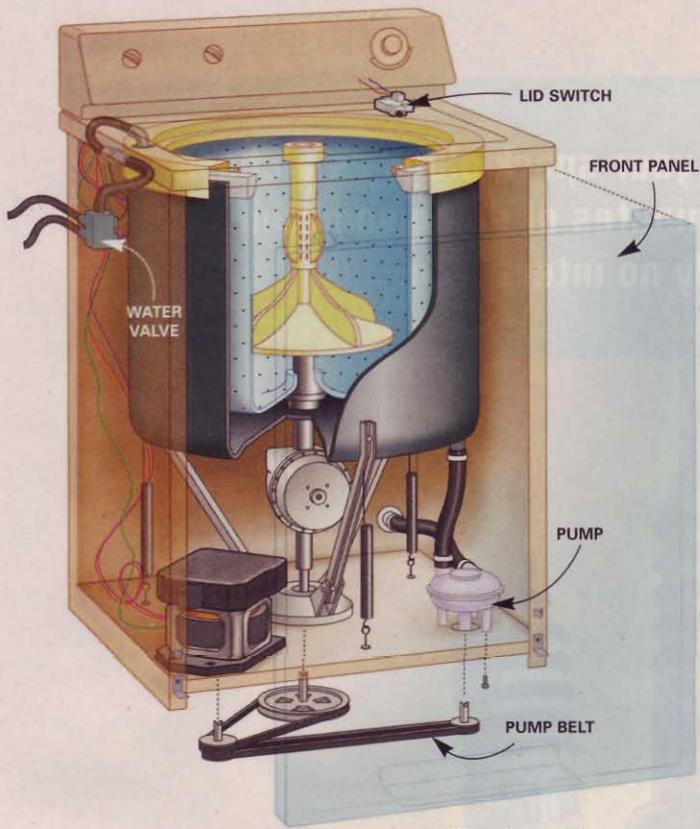
1 Pop the snap retainers with a screwdriver and pull the pump off the motor shaft. Then disconnect the electrical connectors from the motor.



2 Pop the bottom retainer off the motor and prop up the motor while you pop the top retainer (it's heavy). Pry the broken coupler pieces off the motor and transmission. Tap the new coupler into place with a wooden block.

Figure B

Maytag-type washer

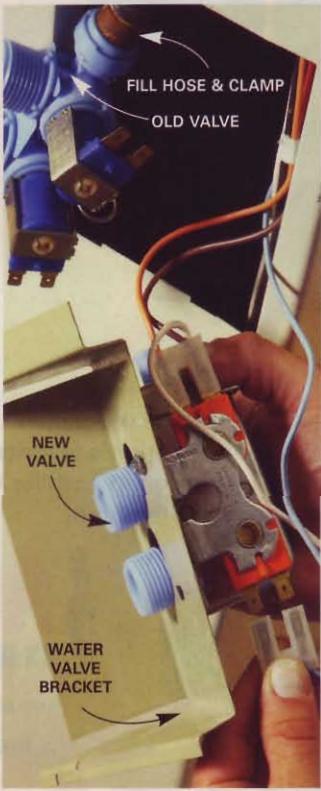


To remove the front panel on this type of washer, yank the bottom of the panel outward (you may have to first remove screws). Pull the panel down and out.

Slow fill or no fill

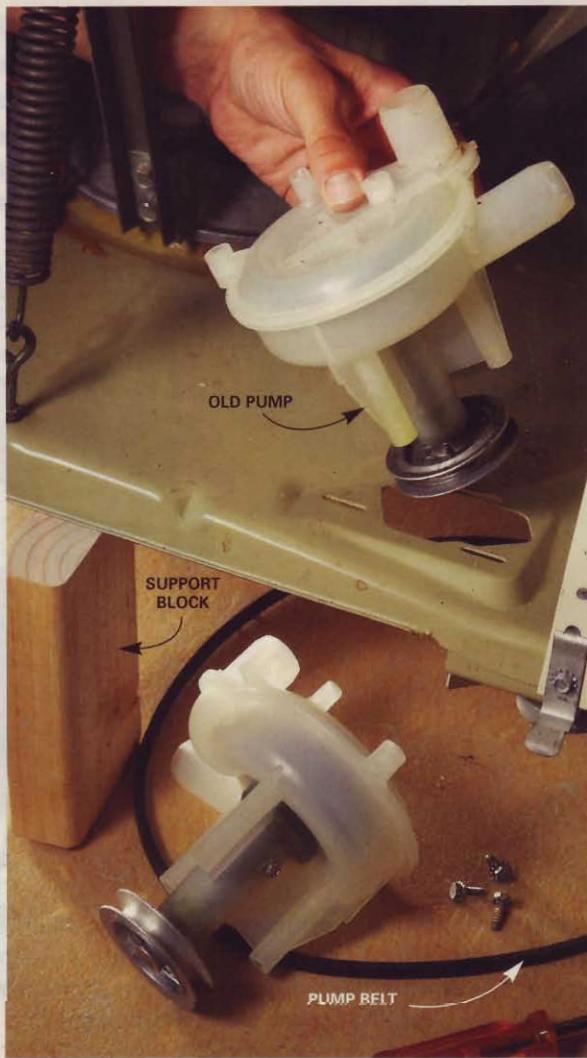
If your washing machine fills slowly or won't fill at all, try cleaning the inlet screens on the water valve. To see how, go to thefamilyhandyman.com and search for "inlet screen." If that doesn't help, replace the entire water valve assembly (\$35).

Remove the water valve bracket and mount the new valve. Transfer the electrical connectors to the Hot/Cold portions of the new valve. Then transfer the fill hose by compressing the spring clamp.



Draining problems

When clothing or jewelry gets stuck in the hose to the pump or in the pump itself, the machine won't drain and you might hear squealing or grinding or smell burning rubber. First remove the hose that goes from the tub to the pump (drain the water into a bowl) and check for stuck socks (yes, that's where they go). Then run a coat hanger through the tube and pull out the stuck objects. Next check the pump for broken blades by shaking it. Rotate the pump shaft to make sure it spins freely. Replace the pump if you find any damage (\$55 for Maytag; \$44 for Whirlpool). If you see any burned or melted sections on the belts, replace them (\$35 a set). Maytag belts are specially designed, so don't substitute an ordinary "V" belt.



Tip the machine back and support it with blocks. Remove the pump belt and the three pump retaining screws. Tilt the pump forward and lift it out of the opening.



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For more money-saving fixes, go to our Web site and search for "appliance repair."

Won't agitate or spin?

If the machine fills with water and then just sits there, suspect a broken lid switch. To test the switch, you'll need a continuity tester (\$8) or a multimeter (\$15). If you don't know how to use a multimeter, go to thefamilyhandyman.com and search for "continuity." Remove the wires connected to the switch and touch the tester's probes to the switch's connectors. As you open and close the lid, readings should alternate between continuity and no continuity. If not, replace the switch (\$33).

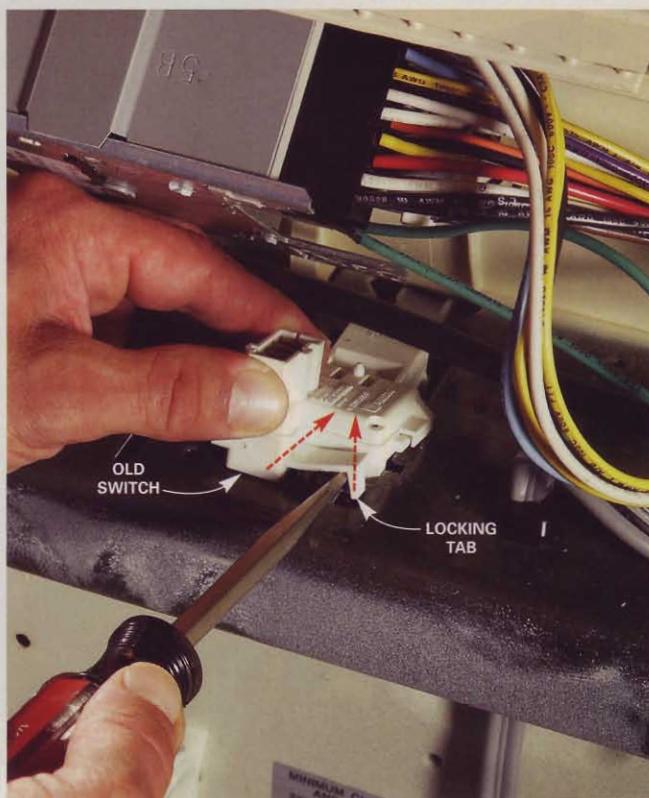
tip

Never drop a washing machine's lid! Slamming the lid eventually wrecks the lid switch.

To replace the switch on a Whirlpool-type washer (**Figure A**), just remove the two screws and screw in the new one. To get at the switch on a Maytag-type washer (**Figure B**), you'll have to unscrew the access panel behind the console and replace the switch as shown here. Remember to raise the lid before you remove the old switch.

screw in the new one. To get at the switch on a Maytag-type washer (**Figure B**), you'll have to unscrew the access panel behind the console and replace the switch as shown here. Remember to raise the lid before you remove the old switch.

Remove the lid switch on a Maytag-type washer by prying up the locking tab and sliding the switch forward. To install the new switch, just set it in the slot and pull it backward.



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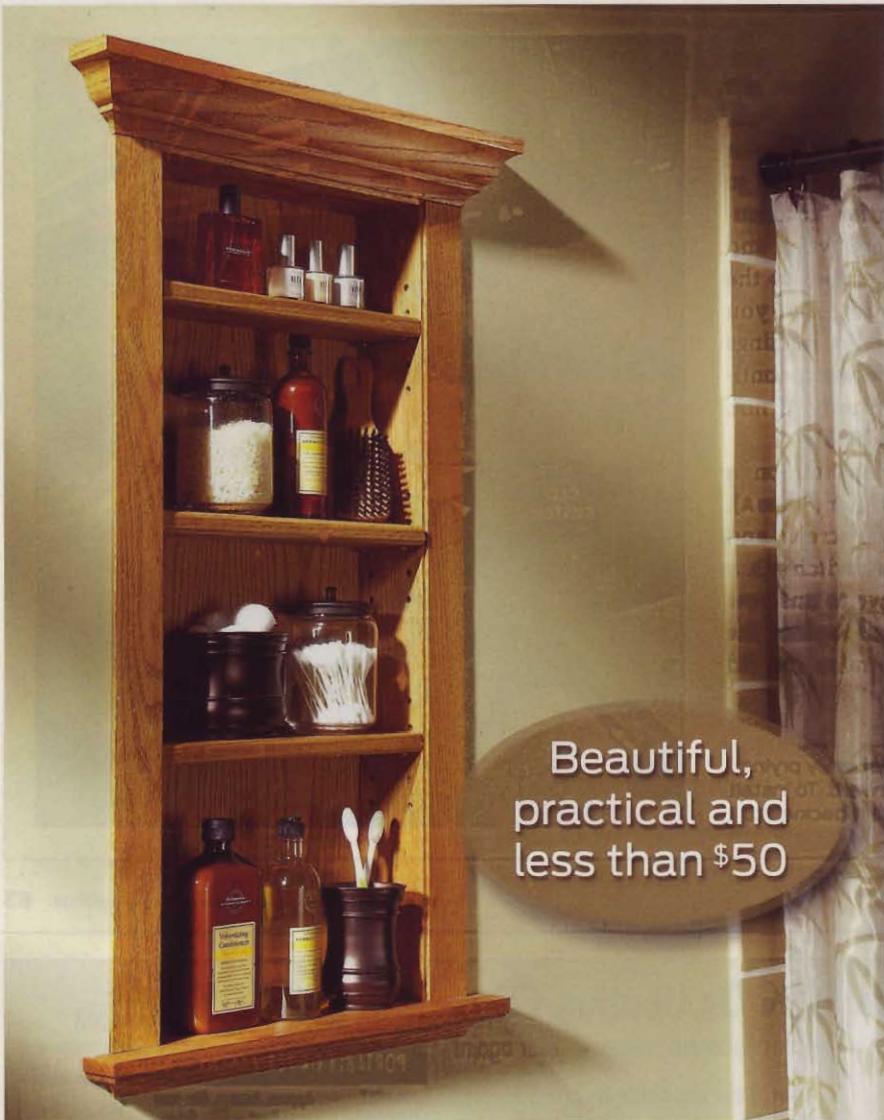
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Space-saving wall niche

by Brett Martin
editors@thefamilyhandyman.com

If you need to carve out more storage space in your bathroom, we've got the project for you. Bathrooms are notoriously cramped, so we designed this cabinet to fit inside a wall, where it won't take up valuable space. We kept the width slightly narrower than the 14-1/2-in. stud space, so the cabinet will fit even if the studs are a little off

center or bowed. We installed our cabinet in a bathroom, but it will work in any unobstructed wall cavity (more on that later).

In this story, we'll show you how to build and install the cabinet. You can complete the project in just one weekend: Build and stain (or paint) it on Saturday, then stick it in the wall on Sunday.

Tools and materials

Everything you need for this project is available at home centers. We used oak, which kept the cost to about \$48. You'd pay \$135 to more than \$500 to buy a cabinet like this in a store.

To complete the project, you'll need a miter saw, a circular saw or table saw, and a drywall saw (\$6). A brad nailer will make nailing fast and easy, but it's not absolutely necessary (you can hand-nail instead). You'll also need a router with a 1/4-in. round-over bit (\$16) and a 1/4-in. Roman ogee bit (\$16) to rout the shelves and sill nose.

Where to put the cabinet

We installed our cabinet next to the shower. This cabinet often fits nicely behind the bathroom door if there's no other available space. But in most cases, it won't work over the toilet because there's a vent pipe in the wall. Also avoid exterior walls because they're filled with insulation.

When choosing a location, check *both* sides of the wall for obstructions. A light switch or showerhead on the other side of the wall means the wall contains electrical cable or plumbing pipes. Some electronic stud finders can identify metal pipes and electrical cable in walls (but they're not 100 percent reliable).



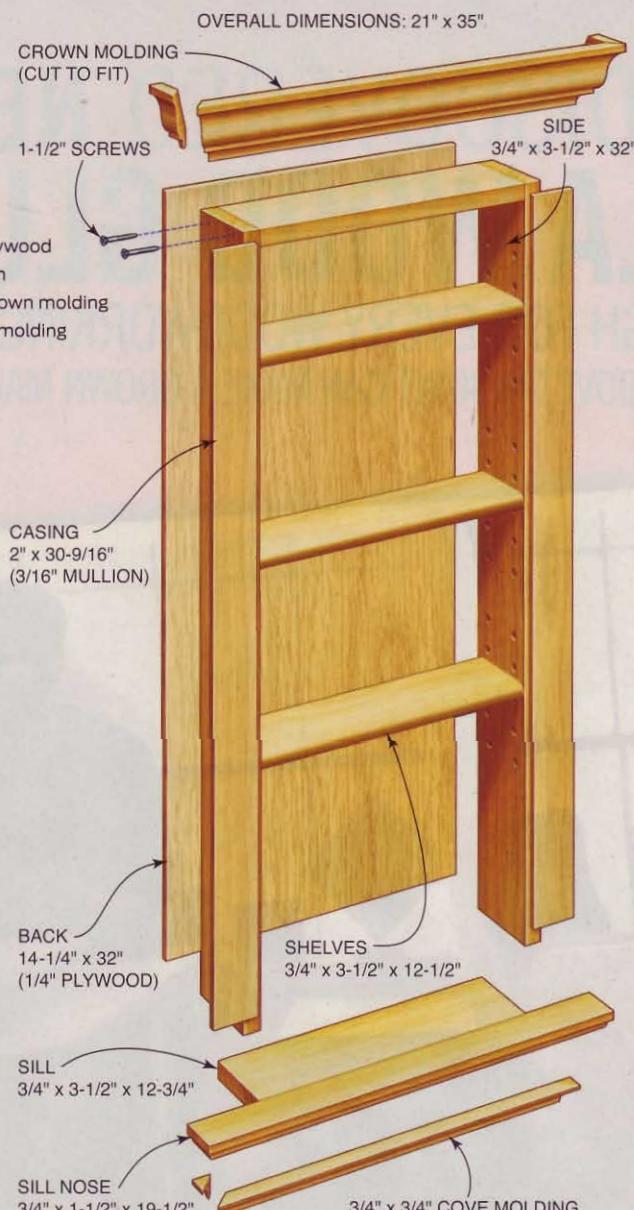
The cabinet fits between studs inside the wall, so it'll work in even the tiniest bathroom. Unlike a wall-hung shelf, the cabinet lets you gain storage space without sacrificing elbow room.

Figure A

Wall niche

Materials List

- (2) 1x4 x 96" oak
- (1) 1x2 x 24" oak
- (1) 1 1/4" x 24" x 48" oak plywood
- (1) 3/16" x 2" x 72" mullion
- (1) 11/16" x 3-1/4" x 36" crown molding
- (1) 3/4" x 3/4" x 36" cove molding
- (12) shelf brackets



1 Tack the cabinet box together quickly with a brad nailer. Then add screws for rock-solid corners. Glue the sill nose to the sill before assembling the cabinet.

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For other storage projects for every room in the house, search for "storage projects."

You could also choose a different room. The cabinet can store—or display—anything you like in the hallway, bedrooms or family room.

Cut, rout and drill the pieces

Get started by cutting all the pieces to size (refer to **Figure A**). Then run a router with a Roman ogee bit along the bottom front and both bottom sides of the sill nose. Use a round-over bit to rout the top and bottom front of the shelves.

Apply wood glue along the front edge of the sill, center the sill nose over it, then clamp the pieces together until the glue dries. Use a damp cloth to wipe away any glue that oozes out. If the sill and sill nose surfaces aren't flush, sand the pieces flat with 80-grit sandpaper.

Lay out the sides for the shelf bracket holes, following **Figure A**. Drill the holes 3/4 in. from the edges and spaced 1 in. apart. Use a 1/4-in. drill bit (or whatever bit size is required for your brackets). You only need to drill the holes 3/8 in. deep (wrap tape 3/8 in. from the end of the drill bit to mark the depth), although it's OK to drill all the way through the sides since the other side will be hidden inside the wall.

After drilling the holes, sand off the pencil lines remaining on the sides with 120-grit sandpaper.

Assemble the cabinet

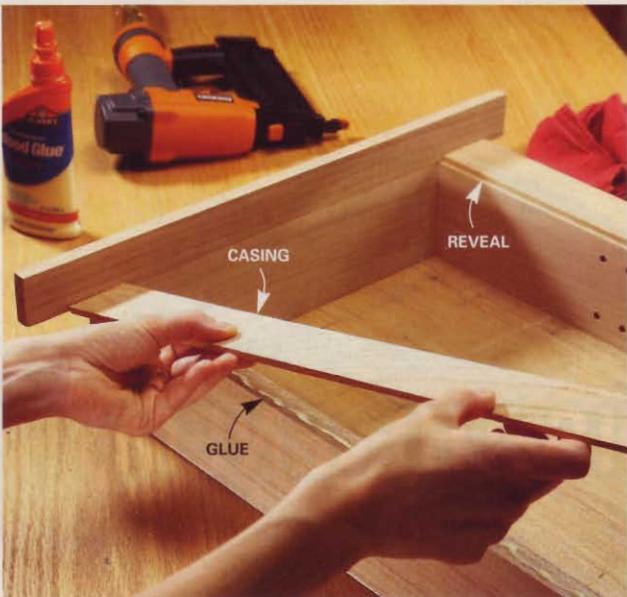
Use wood glue and 1-1/4-in. brad nails to assemble the cabinet frame (**Photo 1**), following **Figure A**. Then drill two 1/8-in. pilot holes in each corner and drive 1-1/2-in. screws to hold the corners together.

Run a thin bead of glue along the back of the entire frame, then set the back panel over it. Use the back panel to square the frame, then tack the panel into place with 5/8-in. brad nails.

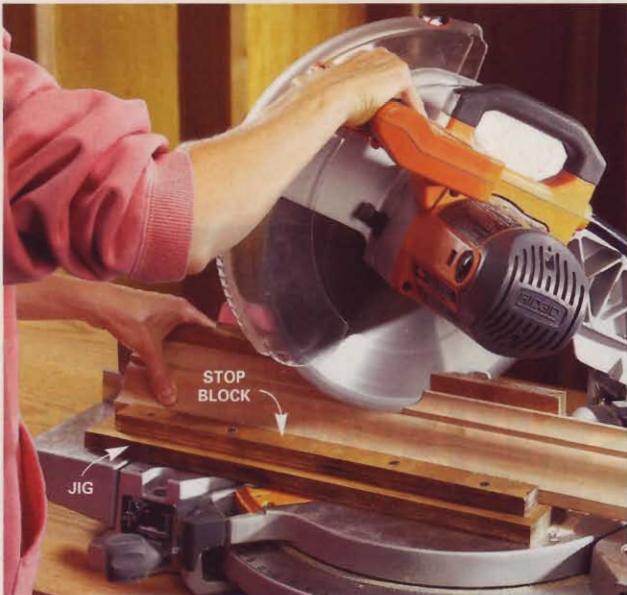
Lay the cabinet on its back and fasten the casing (**Photo 2**). Three 5/8-in. nails will hold the casing until the glue dries.

Precision cuts are required for the molding corners to fit tightly. Measure along the bottom edge of the molding when you make the cuts (the top measurements will vary depending on the type of molding).

2 Add casing to the box using as few nails as possible. Three nails will hold the casing tight while the glue dries.



3 Cut the crown molding using a simple homemade jig. The jig holds the crown upside down as you make the cuts.



4 Glue the crown corners together without nails or clamps. Just hold each return tightly in place for about 60 seconds. Set the completed crown aside for 20 minutes, then attach it to the cabinet.



To get accurate cuts, build a simple jig to hold the molding in place during cuts. Screw or nail wood scraps together at a 90-degree angle. Set the crown molding upside down in the jig so the flat part on the back (the part that sits against the cabinet after installation) is flush against the vertical part of the jig. Fasten a stop block to the horizontal part of the jig along the top of the molding. Screw or hot-glue the jig to the fence on your miter saw so it won't move.

Set the crown molding upside down in the jig and cut it (Photo 3). If the molding moves in the jig even a tiny bit during the cut, recut the molding or the corners won't fit tightly together. To cut the molding returns (sides), use the jig to make the angle cuts, then cut the 90-degree angles.

Nailing the mitered corners together won't work—the molding will crack or move as you nail it. Instead, simply glue the corners (Photo 4). Cut the cove molding for the bottom of the cabinet in the miter saw (without using the jig). Glue the cove molding pieces together.

Glue and tack the assembled crown and cove moldings to the cabinet with 5/8-in. brad nails.

Apply a finish and stick the cabinet in the wall

Sand the entire cabinet with 120-grit sandpaper and wipe away the dust with a clean cloth. Then brush on a finish. We used Minwax Golden Oak stain followed by two coats of Minwax Fast-Drying Polyurethane.

Then get the wall ready. Using a drywall saw, cut a small inspection hole in the wall where the cabinet will go. Shine a light in the opening and use a small mirror to look for obstructions in the wall. If you find electrical cable or plumbing pipe, patch the hole and move over a stud space.

Make an outline on the wall (between two studs) 1/4 in. larger than the cabinet back (so it'll fit easily) and cut out the drywall with a drywall saw. Be careful not to cut into the drywall on the other side of the wall.

Finally, put the cabinet into the wall, level it, then nail through the stiles into the studs with 2-1/2-in. finish nails.

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Super-simple box shelves

Build a bunch for less than \$100

Not only do these storage boxes look nice, but they're easy to build—just fasten together four sides and put on the back. This is one of those rare woodworking projects that combines high style, low cost and super-simple construction.

Built from standard oak or birch plywood, these 12 x 12-in. boxes will cost about \$35 for eight. If you use standard plywood, you'll have to patch voids in the edges with wood filler or cover the edges with edge banding (go to thefamilyhandyman.com and search for "edge banding"). To avoid that extra work, we used Baltic birch plywood, which has better-looking, void-free edges. Baltic birch costs about \$85 for a 3/4-in. x 60-in. x 60-in. sheet, which will give you five boxes. If your home center doesn't stock Baltic birch, look for it at a hardwood specialty store (check under "Hardwood Suppliers" in the yellow pages to find a source). Use standard 1/4-in. plywood for the backs even if you use Baltic birch for the sides.



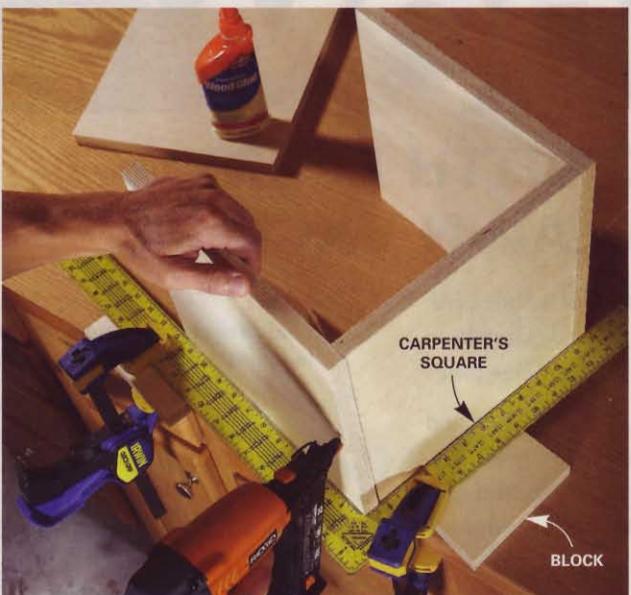
Elegant or practical

The boxes work equally well in a formal setting and a utilitarian room, like the laundry or garage. They offer an unlimited number of uses and arrangements.

1 Cut the box parts straight and square with a homemade cross-cut guide. Stack two layers of plywood strips to cut perfectly matching parts fast.



2 Build perfectly square boxes by assembling them against a carpenter's square. Drive three nails per corner to hold them together until the glue dries.



3 Center the back panel over the box, leaving a small gap along each side. Glue and nail the panel into place. The back panel keeps the box square.



Time and tools

You can build a dozen or more boxes in a few hours. Spend Saturday assembling the boxes and applying the finish, then hang them or fasten them together on Sunday. To complete the project, you'll need a table saw to rip the plywood sheets and a circular saw to crosscut the top, back and sides. We'll show you how to make perfectly straight crosscuts using a guide. You'll also need a brad nailer to nail the boxes together.

Cut the pieces to size

Get started by ripping the 3/4-in. plywood sheets into 11-1/4-in.-wide strips on a table saw. Cut out any dents and dings along the edges. It's important that these pieces be exactly the same width so the boxes will be aligned when they're stacked together. Also rip the 1/4-in. plywood sheet into 11-1/2-in.-wide strips.

Crosscut the box tops, bottoms, sides and back panels to length following **Figure A**, p. 73. Make the crosscuts with a circular saw and a guide (**Photo 1**). For more information on making and using the guide, see our Oct. '08 issue, p. 66.

Assemble the boxes

Placing adjacent sides in a carpenter's square ensures crisp 90-degree angles when you fasten the corners together. Set the square over wood blocks and clamp it to your work surface. Set one side and the top or bottom in the square, apply wood glue along the edge, and nail the corner together with 1-1/2-in. brad nails (**Photo 2**).

Fasten the remaining corners the same way. Leave the box in the carpenter's square to keep the corners square, then add the back panel (**Photo 3**). The back panels are 1/2 in. smaller than the overall box size to leave a 1/4-in. gap along each edge. This makes the edges less conspicuous when the boxes are installed.

Apply a finish

Once your boxes are fully assembled, it's time to apply a finish. Sand the boxes with 120-grit sandpaper to smooth out any rough spots, then wipe away the dust with a clean cloth.

If you want to paint the boxes, first prime them with a latex primer. Foam

thefamilyhandyman.com
For other organizing projects and tips,
search for "organizing" or "shelf."

Figure A Modular boxes

Materials List

3/4" x 48" x 96" plywood, one sheet per eight 12" x 12" boxes or five 12" x 24" boxes
1/4" x 48" x 96" plywood, one sheet

rollers work great for applying smooth coats of primer and paint. Brush on the primer in the corners, then roll the rest. Let the primer dry, lightly sand the boxes with 120-grit sandpaper, then apply the paint.

For our stained shelves, we applied two coats of stain—Minwax Golden Oak followed by Minwax Ebony—and two coats of a water-based polyurethane.

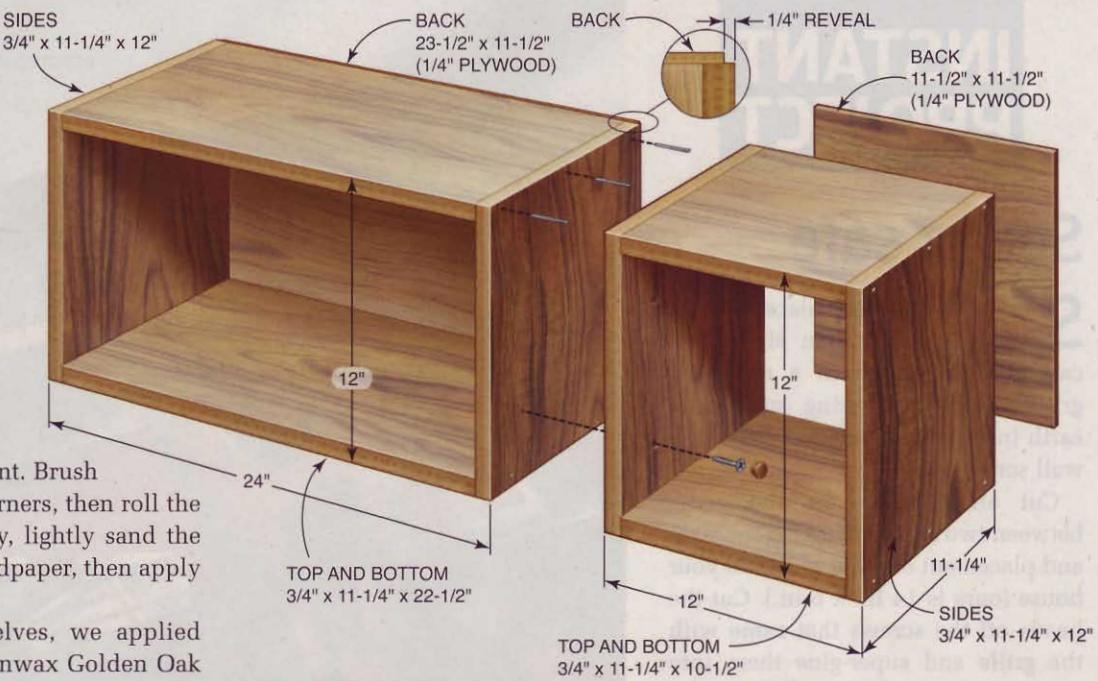
Hang the boxes

Once the finish is dry, you can screw the boxes together or hang them on a wall. Be sure to hang the boxes with the side pieces overlapping the top and bottom, as shown in **Figure A**. This keeps the corner nails horizontal and makes the box stronger. Still, the boxes are not designed to hold a lot of weight. Countersinking the screw head and filling the hole with a 3/8-in. screw hole button hides the fastener. Screw hole buttons are available at home centers.

To fasten boxes together, first clamp them so they're perfectly flush. Then drill a 3/8-in.-diameter, 3/16-in.-deep countersink hole with a brad point drill bit (\$3). The brad point won't tear or chip the veneer. Then drill 1/8-in. pilot holes in the countersink holes using a standard bit.

Drive a 1-in. wood screw into the pilot hole, countersinking the head. Dab paint or stain on the screw hole button and plug the hole (**Photo 4**).

To hang a box where there's a stud, drill two 1/8-in. pilot holes. Then spray-paint the heads of 2-1/2-in. screws and drive them into the stud at the pilot holes (there's no alternative to leaving the heads exposed). If there's not a stud available, use self-drilling anchors, such as EZ Anchors. Drill pilot holes through the box into the wall, remove the box and drive the anchors into the wall at the marks. Then fasten the box to the wall using the screws included with the anchors.



4 Drive two screws near the front. Hide screw heads with wooden "buttons" after screwing boxes together.



5 Arrange the boxes any way you like. Spaces between boxes can form compartments too.

INSTANT PROJECT

Secret safe

Sometimes the best place to hide valuables is in plain sight. You can make a safe from a return-air grille in minutes using small rare earth (neodymium) magnets and drywall screws.

Cut an opening for the grille between two studs, matching the style and placement of other grilles in your house (ours is 14 in. x 6 in.). Cut the heads off the screws that came with the grille and super-glue them into the screw holes.

Mark the outline of the grille with masking tape, then screw 1-5/8-in. drywall screws 1/4 in. in from each corner. Put magnets in the corners of the grille, then turn the screws in or out until the grille stays flush against the wall. The rare earth magnets are strong enough to hold the grille firmly, as long as they contact the screws.

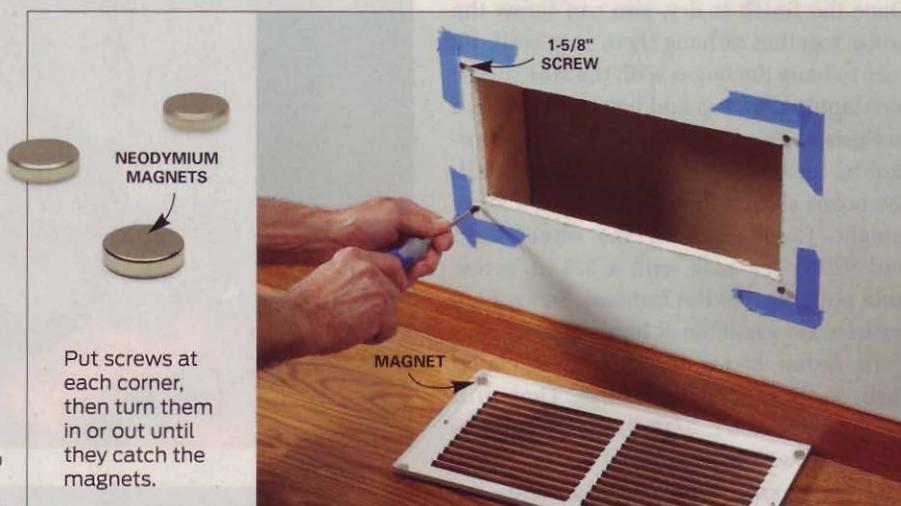
Trust us—this setup works a whole lot better than stuffing cash under a mattress.

Buyer's Guide

Neodymium magnets (3/8 in. or 1/2 in. diameter x 1/8 in. thick) are available at kjmagnetics.com (888-746-7556), unitednuclear.com and other Internet suppliers. Return air grilles are sold at hardware stores and home centers.

Caution: Don't handle neodymium magnets if you wear a pacemaker. For more safety information, see the "Neo Mag Safety" link at kjmagnetics.com.

by Eric Smith
editors@thefamilyhandyman.com



From the outside, an ordinary return vent...



from the inside, a diversified retirement fund!



QUESTION & COMMENT

by Rick Muscoplat
editors@thefamilyhandyman.com



Check the back of your detector for either a build date or an expiration date. If there's no date or it's more than seven years old, replace it now.

QUESTION

Time to replace your carbon monoxide detectors?

I read a news article that said smoke detectors should be replaced every 10 years. But it didn't say anything about carbon monoxide detectors. Do they need to be replaced too? If so, how often?

Phil Cawley, via e-mail

Maybe. CO detectors only have a five-to-seven-year life. Listing a build date or an expiration date on the label is a fairly new phenomenon. If there's no date on yours and you can't remember when you bought it, you're probably due for a new one.

Here are two key things to look for when you buy replacements. First, pick a detector with a "fuel-cell electrochemical" sensor. This type is far more sensitive to CO and less prone to false alarms than models from just 10 years ago. There are other types of sensors on the market (metal oxide and gel cell) that offer longer life. But humidity and temperature changes can reduce their accuracy. When it comes to detecting carbon monoxide, we recommend



Install a combination combustible gas/CO detector in areas heated by natural gas space heaters.



Locate digital-display wall-mounted detectors at eye level so you can monitor the CO levels.



Install wall-mounted detectors anywhere on the wall, but at least 15 in. below the ceiling.

accuracy over detector life span. Second, experts recommend choosing a model with a digital readout and a "peak level" memory retention feature. That's helpful to emergency personnel if they suspect CO poisoning. If you have small children, consider buying a talking CO detector. A voice warning is more effective than a horn at waking children.

Since carbon monoxide is roughly the same weight as air, it neither rises toward the ceiling nor sinks to the floor. So detectors that don't have a digital display can be mounted anywhere as long as they're at least 15 in. below ceilings.

Just make sure you install one on each level of your home. Locate them in hallways near bedrooms but at least 15 ft. away from fuel-burning appliances.

COMMENT

Tips for building a wheelchair ramp

If you have a parent or other relative who uses a wheelchair or a scooter, consider building him or her a wheelchair ramp. A properly designed and built ramp allows those with mobility problems to come and go as they please, enabling much greater independence. It's a do-it-yourself project, but because every home is different, you'll have to design the ramp to fit the location. Here are a few guidelines to follow.

Most important, design the ramp to comply with the Americans With Disabilities Act (ADA). The ADA recommends a maximum rise in slope of 1 in. for each 16-in. run length (1:16). If you have the space, use a more gradual 1:20 slope (the less slope the better). Limit the total rise in any one section to 30 in. If you need to build a ramp that switchbacks to fit the site, make sure you include a level landing of at least 60 by 60 in. That may seem like a large landing area, but wheelchair users need that extra space to negotiate a sharp turn. Prevent accidents by adding nonslip traction strips to the surface of the ramp, or add sand to the paint. Mount handrails 34 to 38 in. above the ramp surface.

Get your plans approved by your local building inspector. For more detailed ADA specifications, search the Internet for "ADA ramp guidelines."

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QUESTION

Save money with a high-tech thermostat

I have two quotes for a new two-stage furnace. One contractor recommends a two-stage programmable thermostat to get the maximum efficiency out of the new equipment. The other contractor says I can use my old, single-stage programmable thermostat. Who's right?

Tom Boyle, via e-mail

They may both be right, depending on the brand they're installing.

Most new high-efficiency furnaces 92 percent or greater have two-stage burners. A two-stage furnace fires up the first-stage burner and in most conditions stops there. However, on very cold days or if you're manually boosting the temperature, the furnace will switch on the "afterburners," or the second-stage burners. Second-stage operation really kicks out the heat, but sends energy efficiency right down the drain.

Furnace manufacturers use two methods to limit second-stage operation. High-end furnaces incorporate an internal sensor that monitors the return air temperature. If the first-stage burners are on and the temperature of the return air falls, the second-stage burners fire up. Less expensive models use a simple timer to control the second stage. So if the house doesn't reach the

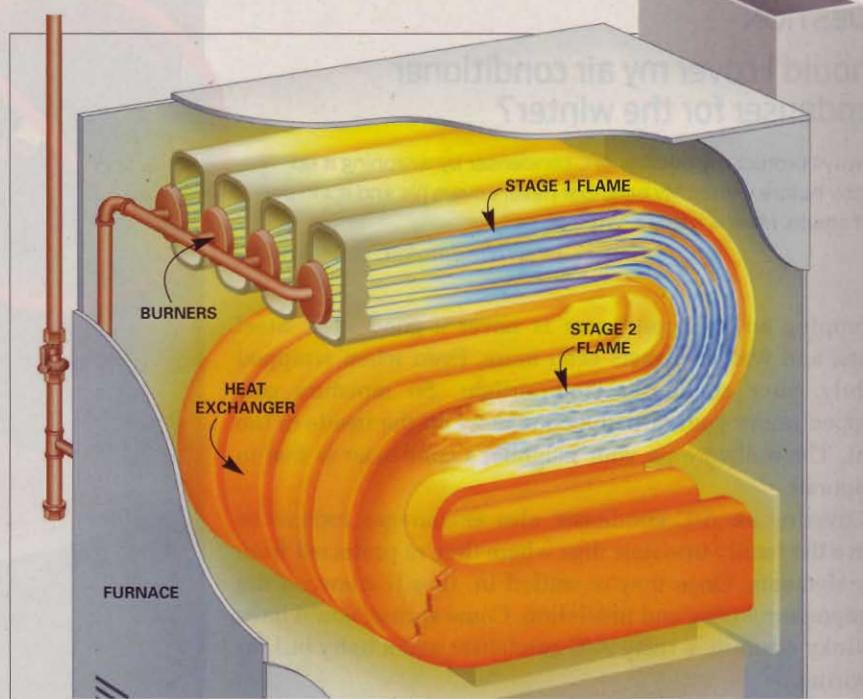


Figure A
Two-stage furnace

A two-stage thermostat increases efficiency by running the first-stage burners as long as possible. If the first-stage burners cannot maintain a 6- to 8-degree temperature rise in the house, the thermostat fires up the second-stage burners. Timer-controlled furnaces waste energy by firing up the second-stage burners after 10 minutes, even if that heat isn't needed.

set temperature within 10 minutes, the timer automatically fires up the second stage. Unfortunately, it keeps the second stage running until the thermostat reaches the set temperature.

Here's how a programmable two-

stage thermostat works. As the thermostat comes out of setback mode, it looks for a temperature increase of 6 to 8 degrees per hour. It "learns" how long it takes the system to reach the set point. Then it adjusts the start-up time on each consecutive day so the house is warm when you wake up—*without firing up the second stage*. The thermostat only kicks in the second stage if the furnace can't maintain 6 to 8 degrees per hour.

A two-stage thermostat may need more wires than your current programmable thermostat. So you may have to fish an additional four-strand cable from the furnace room to the thermostat location.

TO SUM IT UP:

- If you plan to keep your home at a constant temperature, you don't need a two-stage thermostat.
- If you want to vary the temperature of your home during the day or night, a programmable two-stage thermostat is the way to go.



Run an additional 18-5 thermostat cable up to the new two-stage thermostat. Connect the second-stage wire to the W-2 terminal. Use the additional wires for a humidifier, an outdoor temperature sensor or a fresh air ventilator.



OR, you can eliminate the need for extra wires by installing a digital programmable two-stage thermostat. Connect it to three existing thermostat wires and mount the switching module near the furnace.

QUESTION

Should I cover my air conditioner condenser for the winter?

I always protect my outside A/C condenser by wrapping it up tightly before winter. My neighbor never covers his and it's in perfect shape. Mine is rusting. What gives?

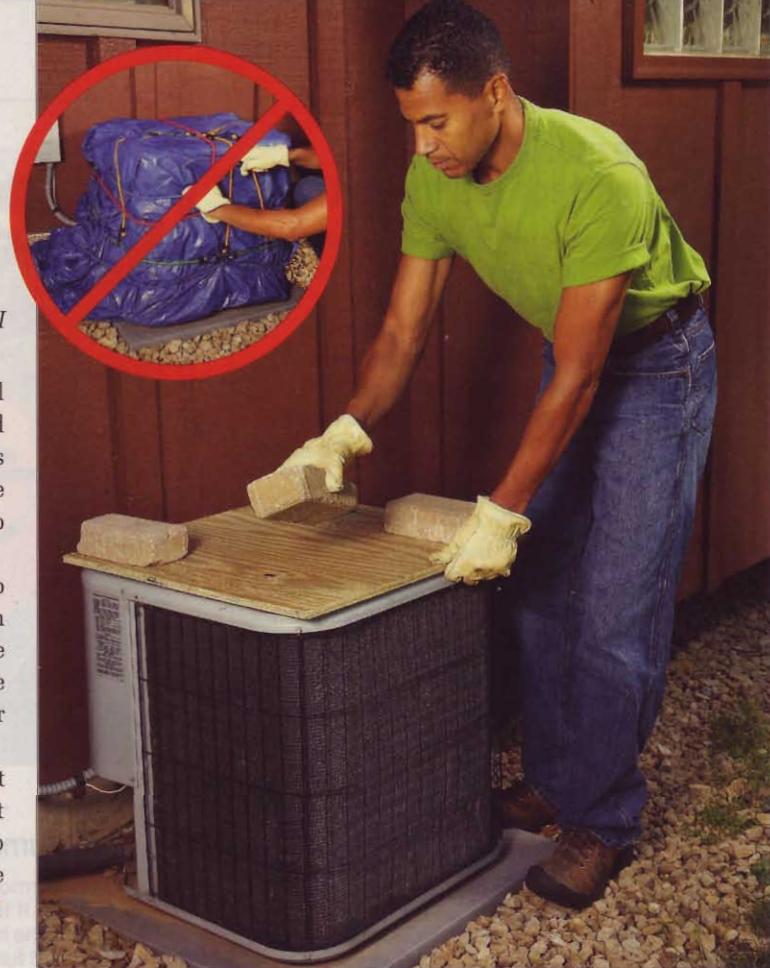
Jerry Hinderaker, Bay City, MI

Wrapping an A/C condenser is never a good idea. Steel rusts, and wet steel rusts even more. Even when wrapped tightly, your condenser isn't airtight. So moisture gets trapped under your tarp and condenses on the inside of the unit. The moisture on your neighbor's condenser is free to evaporate.

Covering an A/C condenser also encourages rodents to move the family into new digs where they're protected from the elements. Once they're settled in, they'll gnaw on the compressor wiring and insulation. Come spring, you'll have a stinky cleanup, a rusty A/C condenser and a hefty bill for rewiring.

If you want to protect the unit from falling icicles, just place a piece of plywood over the fan guard and weight it down with bricks. If you want to protect the metal and keep it looking good, give your condenser a coat of car wax before the snow flies.

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Make more money when you sell your car

You're thinking about buying a hybrid. The numbers will work, but only if you sell your car yourself and pocket the difference between retail and trade-in. So how do you get the most for your car?

We interviewed several people who *only* buy used cars from private parties. They shared their "turnoffs" and the selling techniques that impress them the most. Here are their best recommendations:

Catch up on routine maintenance

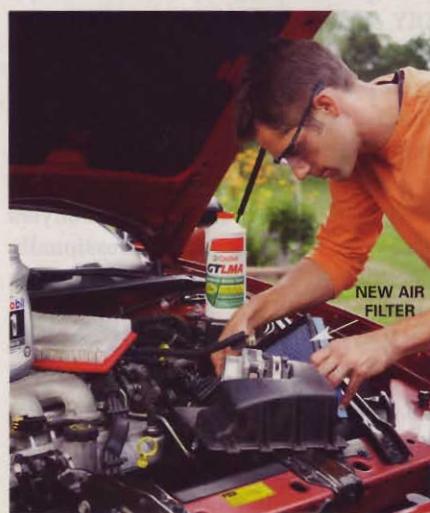
Savvy buyers check fluids (engine oil, coolant, transmission fluid, brake fluid, power steering fluid) to see if

they're clean and topped off. They also check for worn belts and burned-out bulbs. Every small problem you fix before you list the vehicle is one less buyer obstacle when it comes time to negotiate the price.

Detail the car

Buyers equate a dirty car with one that hasn't been maintained properly. That's an instant turnoff. Detailing means cleaning every nook, cranny and surface of the entire car. Do-it-yourself detailing sounds simple. But trust us, it's a lot of work and it will take you an entire day. And even then it won't look spotless. Plus, the cleaning supplies can cost you up to \$85,

Sell your car faster by including high-quality photos in your Internet ad. Park the car in the shade and shoot the exterior, interior and the trunk.



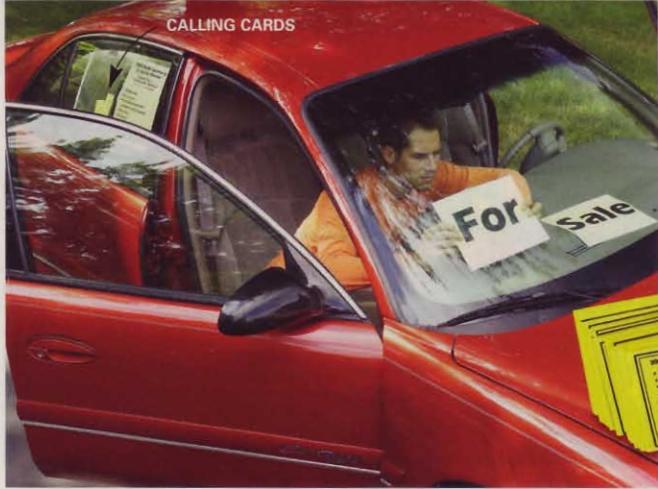
Top off all fluids. Replace worn belts and the air filter if it's dirty.



Go through the entire car and purge it of personal items.



Save time and money by hiring a professional detailer. Tell buyers that a professional did the work—it's a selling point.



Make your own drive-by signage and include calling cards. Highlight your maintenance records, and if you're the original owner, emphasize that, too.



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Avoid cheesy signs

Drive-by advertising is a great way to sell your car, but don't rely on cheap store-bought "For Sale" signs. Make your own on your computer and tape it to the inside of a side window. Then print "calling cards" with the make, model, year and mileage, price, phone number and selling features. Never force buyers to call for the price—they won't make the call. Put the cards in a plastic page protector and tape it to the outside of the window.

Try to answer all phone calls in person rather than letting them go to voice mail—prospective buyers won't leave a message. Then encourage callers to see the car in person. If you follow these steps, you'll have cash in your hands in no time!

not including the cost to rent a carpet/upholstery shampooer. All in all, DIY detailing is a losing proposition.

So what to do? Start by removing all your personal items (that is, junk) from the console, glove box and trunk—including the spare tire area. Then hire a professional detailer! That should cost \$135 to \$150. Tell potential buyers that you had the car professionally detailed—it's a selling point.

Organize your records

If you've saved all your service records, great! Use them to prove you've diligently maintained the car. But it's a mistake to think you can impress potential buyers by handing them a fistful of service receipts. They'll be overwhelmed by the num-

ber of receipts and think you're selling a lemon. Instead, enter all the maintenance and repair items separately on a single sheet of paper, listing them by date and mileage. Then staple it to the receipts.

Advertise as a private party

Small dealers often fix "salvaged" or "auctioned" cars and sell them in the classifieds by posing as private sellers. Differentiate yourself from the "dealers in disguise" by flaunting your private seller status. If you're the original owner, put that at the top of the ad as well: "Private party/Original owner." Place a free ad on an Internet car-selling site. Make sure you include plenty of high-quality photos so buyers can see the condition of your vehicle.

Cleaning a throttle body

If your car runs rough when idling, the cause just might be a dirty throttle body. The throttle body controls the amount of air the engine takes in, and when it gets dirty, the engine can't idle smoothly. So before you take the car into the shop, consider taking 10 minutes and cleaning it yourself with a spray can of throttle body cleaner and paper towels. You just might save a bunch of money and there's a good chance you'll cure the problem.

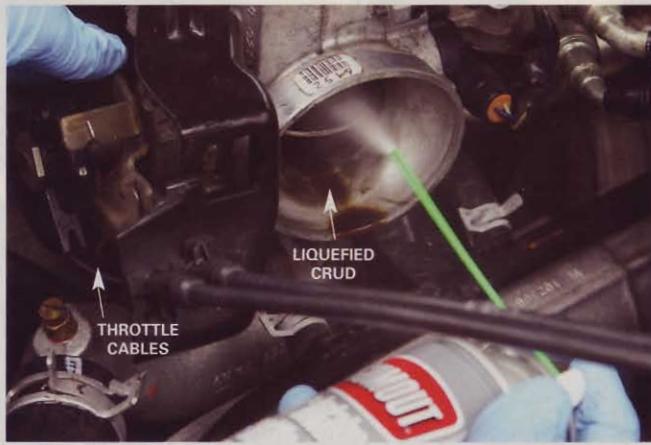
Here's how the throttle body gets dirty. When an engine shuts down, hot exhaust gases and unburned fuel float to the top of the engine. As the vapors bake from the engine heat, they form black sooty carbon deposits inside the throttle body.

Follow the plastic duct from the air filter housing up to the throttle body. Remove the duct and locate the throttle cables and rotating mechanism. Rotate the throttle mechanism and spray the cleaning solvent around the inside of the throttle body. Give it a moment to work and then wipe out the crud.

1 Disconnect the air duct from the throttle body. Disconnect and mark any electrical connectors or vacuum lines you remove.



2 Locate the throttle cables and rotate the throttle plate. Spray throttle body cleaner around the inside of the throttle body.



3 Shoot compressed air into the throttle body to dry the spray solvent. Reinstall the ductwork and attach the vacuum lines and electrical connectors.



Don't let your 4WD wither away!

It's important to operate your 4WD (four-wheel drive) even when you don't need it. Functioning like a "backup system," it's a completely separate drive train that sits unused until the moment you need extra traction in snow or mud. When you shift into 4WD, all the components—the drive shaft, differential, axles, locking hubs, bearings, seals and motors—have to spring into action. Left unused, many of them can rust, get gummed up or lose their lubrication. If you're like most other drivers, you only engage your 4WD once or twice a year. This sporadic use may set you up for some expensive repairs.

The best way to "exercise" your 4WD is to engage it in an empty parking lot in snowy, rainy or icy conditions. The slick pavement allows the wheels to slip (as they would in snow and mud), and driving it in a parking lot will force you to make lots of turns at low speeds. That's good for the gears in the differential. Drive for a few minutes in both 4-low and 4-high before shifting back into 2WD. A short period of exercise once a month will spread the lubrication to all the moving parts, and keep the seals flexible—and give you the assurance that your 4WD will be there whenever you need it.

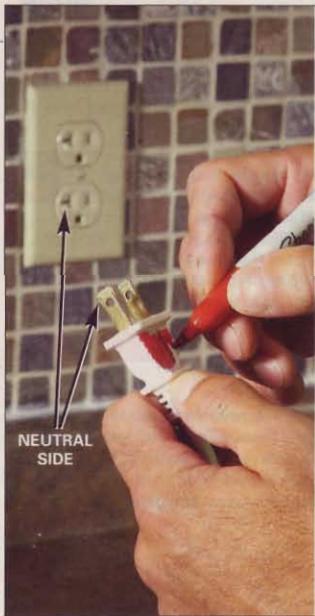
Finally, make sure you're up to date on maintenance for your 4WD system. For do-it-yourself instructions, see our Sept. '08 issue, p. 78.



Holiday light hangers

Instead of poking nails into aluminum soffits and fascia when you're hanging holiday lights, clip the wires to the bottom lip of the fascia with clothespins.

Mike Suppa



Polarized plug marker

Most plugs are polarized—the wider neutral blade has to fit into the larger outlet hole or the plug won't go in. That means if you don't look closely at the plug, you only have a 50/50 chance of success. However, if you mark one side of the plug to indicate which side goes up (or down), you'll get it right every time.

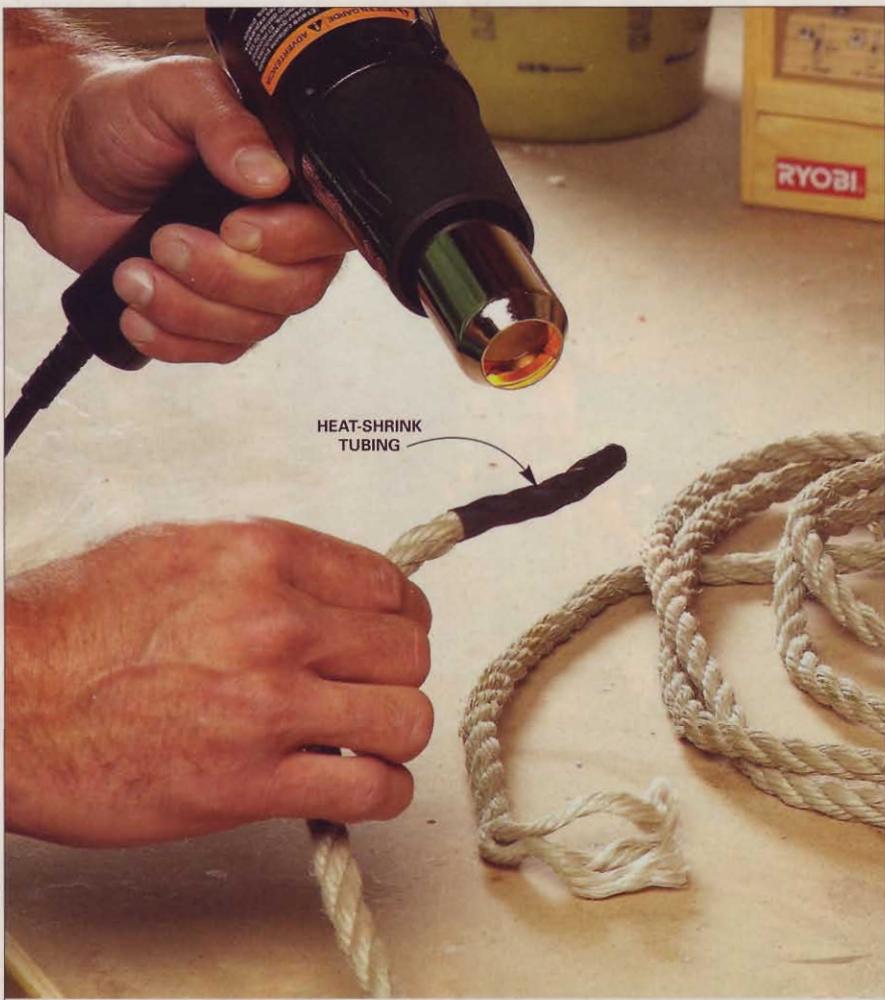
David Vermeesch



Stop sock loss!

Tired of digging out socks from that dark, grungy gap between the washer and the dryer? Just fill the gap by wedging a short length of foam pipe insulation between the machines or between the wall and the dryer. Use the size for 3/4-in. or 1-in. pipe.

Camila Fabrizio Strohmeyer



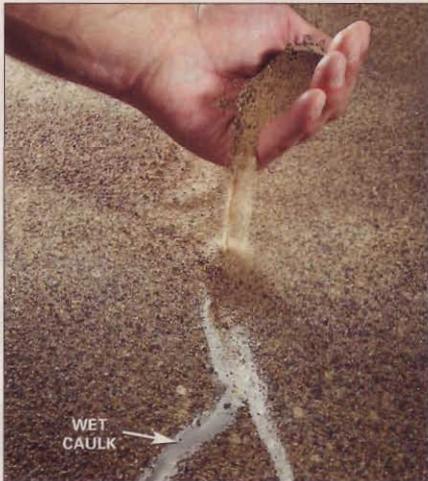
HEAT-SHRINK
TUBING

Stop ropes from unraveling

Quickly and permanently repair fraying rope ends by covering them with the heat-shrink tubing used to seal splices in electrical wiring. Buy tubing with a slightly larger diameter than the rope, slip it over a freshly trimmed rope end, then heat it with a heat gun (or a hair dryer set on the highest temperature) until it shrinks tightly around the rope.

You can find heat-shrink tubing for \$2 a package in the electrical section of home centers and hardware stores.

Doran Maxwell



Hide concrete repairs

The easiest way to repair a crack in concrete is to caulk it, but the repairs stand out like a neon light even with special concrete repair caulk. However, if you sprinkle ordinary play sand on the wet caulk, the patch will blend in much better. Sprinkle on the sand immediately after caulking, before it skins over, then brush off the excess after the caulk dries.

Bob Molgren

Better bucket storage

Stacked 5-gallon buckets fit together so tightly that it's almost impossible to pull them apart. Prevent the problem by placing a large pop bottle (with top on) or milk jug between each pair of buckets. You can still nest the buckets together, but they won't stick together anymore.

David Woda



2-LITER BOTTLE

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SHOP TIPS

by Bruce Wiebe
shoptips@thefamilyhandyman.com



Tips from the chief

Our third voyage in search of tips from the shop of a professional woodworker took us to Ken Collier's basement shop. Ken spent 10 years as a custom furniture designer and builder before adding "Editor in Chief" of *The Family Handyman* to his résumé. Ken has massaged the narrow basement below his three-story home into a place where a table saw, band saw, drill press, planer, lathe and sliding miter saw all dwell with workbenches and oodles of storage drawers and tool cabinets. Check out Ken's woodworking tips and improve your shop's operation and efficiency without denting your budget.

Overhead rag roost

Here's a hint that will take some of the frustration out of finishing. Ken says, "This just might be my favorite shop tip—at least certainly the most used. I made a little nest for the disposable paper rag box in the ceiling joists, just above the area where I do all my finishing. Anytime I need a rag, I reach up and grab one. Perfect!"



Art Direction MARCIA ROEPKE • Photography TOM FENENGA



Handscrew lamp

Those inexpensive adjustable lamps are great in the shop, but the clamp they come with is pretty flimsy. So Ken pulled off the lamp and looked around. "Lo and behold," he says, "it fit like a glove on the threaded rod sticking out of a handscrew. Now I use that lamp everywhere in the shop!"

Reduce, reuse, recycle

If you use a lot of paint thinner to clean brushes, check out Ken's method of getting the most out of it. He labeled one empty can "Slop" and pours from it into a brush cleaning can. When he's through, he pours the used thinner back into the can and the finish settles on the bottom. He's sure that his slop can is one-third solids on the bottom, but the stuff on top is clear and reusable.



Better sanding block

To keep the sandpaper from tearing on the edges of his 2-1/2 x 5-in. wooden sanding blocks (custom-made to fit quarter sheets), Ken glued a layer of cork on the bottom.

"Now the paper doesn't tear, and even better, I can press down hard on scratches. My fingers hold the paper on the sides of the block just fine, so there's no need to tape it," he says. You can buy a roll of cork for \$5 at home centers.

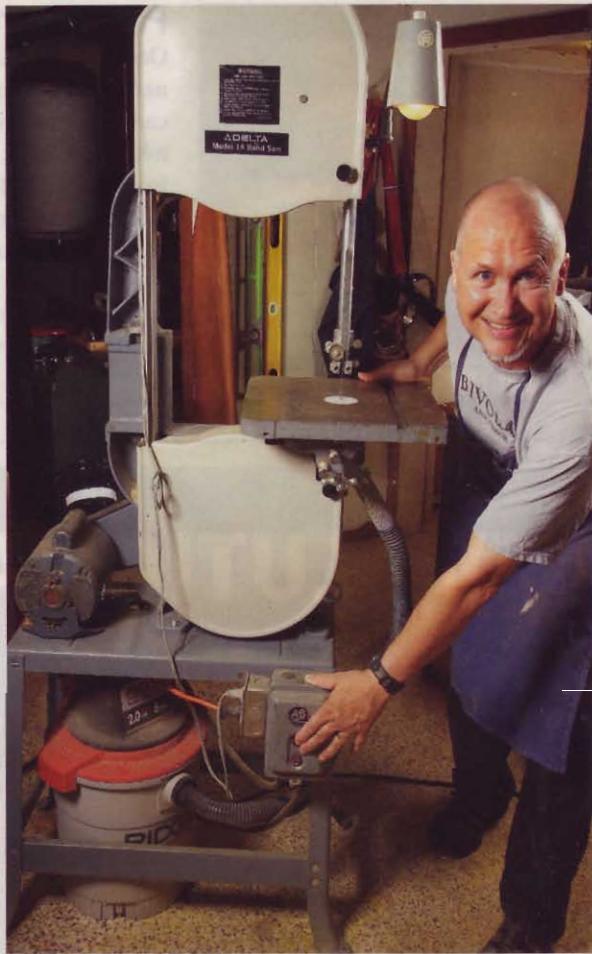
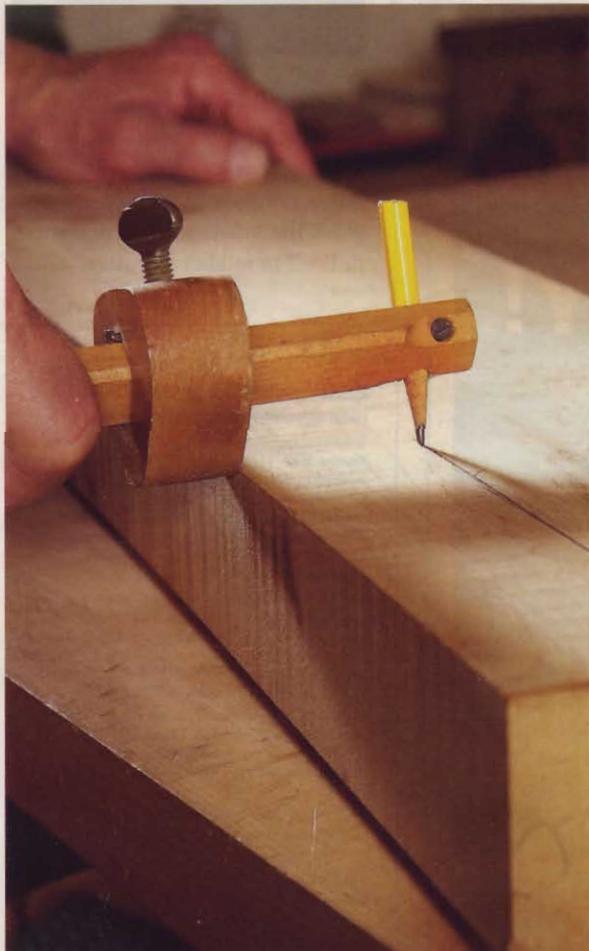


Router table fingerboard

Ken's router table fingerboard works a lot better than an ordinary featherboard because it presses the work-piece against the router fence all the way through the cut. To make one, cut 45-degree kerfs 1 in. deep along the edge of a 3/4-in. by 3-in. board. Space them every 3 to 4 in. (Use your table saw and miter gauge for this step.) Plane down some 3/4-in.-wide wood until it fits snug in the slots, cut them to 3-1/2 in. wide and tap the "fingers" into the slots. For really chatterproof profiles, make a second fingerboard and clamp it on the fence to hold the wood down as you pass it over the router.

Improved marking gauge

Marking gauges come with a little metal pin that scratches a line on the wood, but it's hard to see the fine line when you're working. So Ken drilled out the pinhole and stuck in a pencil. Now it works great for tracing cutting lines on rough boards and laying out screw hole positions along cabinet edges.



Ready-to-go band saw

Do you fumble around hooking up the vacuum for dust collecting and then strain your eyes in the dim light trying to follow the cutting line? Not Ken. He stuck a dedicated shop vacuum under his saw and mounted a flexible light on the saw, then wired both into the saw's on-off switch. "I press one button and I'm ready to go," he says.



Finishing standoffs

"I made these little standoffs so I could flip over a project I'm finishing and brush or roll the other side," Ken says. "It's also a lot easier to finish the edges. They're just 2-in. square scraps of 3/4-in. plywood with a 1-1/2-in. drywall screw stuck in the center. They're very stable and the screw's sharp tip doesn't leave a mark, so you can let the project dry right on the standoffs."



Private hardware store

One day Ken tamed all the miscellaneous hardware that had piled up in cans and jars and in the back of cabinets. He built various-size boxes from 3/4-in. MDF and 1/4-in. plywood and labeled them while sorting the stuff. The payoff? "Now I've got a mini hardware store in that cabinet and can go right to the S-hooks or a length of chain when I need one!"



Laminate labels

Ken labels his cabinet drawers with pieces of plastic laminate and a permanent marker. He hot-glues the labels so they're easy to pull off to relabel a drawer.



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	Average	Single Issue
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Mail subscriptions	1,079,384	1,080,535
Paid distribution—sales through dealers and carriers, street vendors and counter sales	67,262	85,000
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Free or nominal-rate distribution	52,016	57,941
Total distribution	1,198,662	1,223,476
Copies not distributed	123,909	86,282
Total	1,322,571	1,309,758
Percent paid and/or requested circulation	96%	95%

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Laurie Levesque, Circulation Director

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GREAT GOOFS

Outta-whack lawn mowing

While I was out of town, my wife decided to help out by mowing the lawn. That night, as we talked on the phone, she mentioned that the mower engine had died about a dozen times. I thought that was unusual since it's a new mower and I'd never had any trouble with it.

When I got home, I knew what the problem was as soon as I pulled into the driveway. An inspection of the mower confirmed it. I always kept the wheels at the highest setting. While my wife was mowing, she had hit a landscaping stone in the yard, knocking the left rear wheel down to its lowest setting. This caused the blade to drag through the dirt on one side, repeatedly killing the engine. Every pass of the mower gave the lawn a nice "cultivated" look.

— Mike Sams, Jr.

A shower in a tub

My handy husband was tearing out our old fiberglass tub/shower combination to remodel our bathroom. He proudly brought out his trusty reciprocating saw and went to work. All of a sudden, the steady buzz of the blade cutting

through fiberglass was replaced by his favorite naughty word, followed by a cry for help. He'd sawed straight through a water pipe and water was spraying everywhere. Our remodeled bathroom is extra deluxe now that it has some brand new pipes.

— Jean R. Wright

from our readers
greatgoofs@thefamilyhandyman.com



A real house warming

After viewing dozens of homes, my son and his fiancée found just the right house. A day after the closing, my wife and I decided to surprise them with a housewarming gift—we'd install light strips on the underside of the upper kitchen cabinets. I planned to pull a cable for the dimmer switch up through the wall from the basement. When I started drilling, I heard a loud "pop," the kitchen lights flickered and then went dark, and then I heard the dreaded "sizzling" sound. I ran to the basement and turned off the circuit breaker.

But the sizzling continued and sparks were spouting out of the cable that connected to the electric meter. I had drilled through the cable. We managed to put out the ensuing fire before the fire department arrived with two puffers and a ladder truck. Our housewarming gift turned out to be a real—and expensive—house warming!

— John Markey, aka Sparky Markey



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Got your own do-it-yourself mistake?

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