

Advanced drywall tips + Weekend woodworking bench

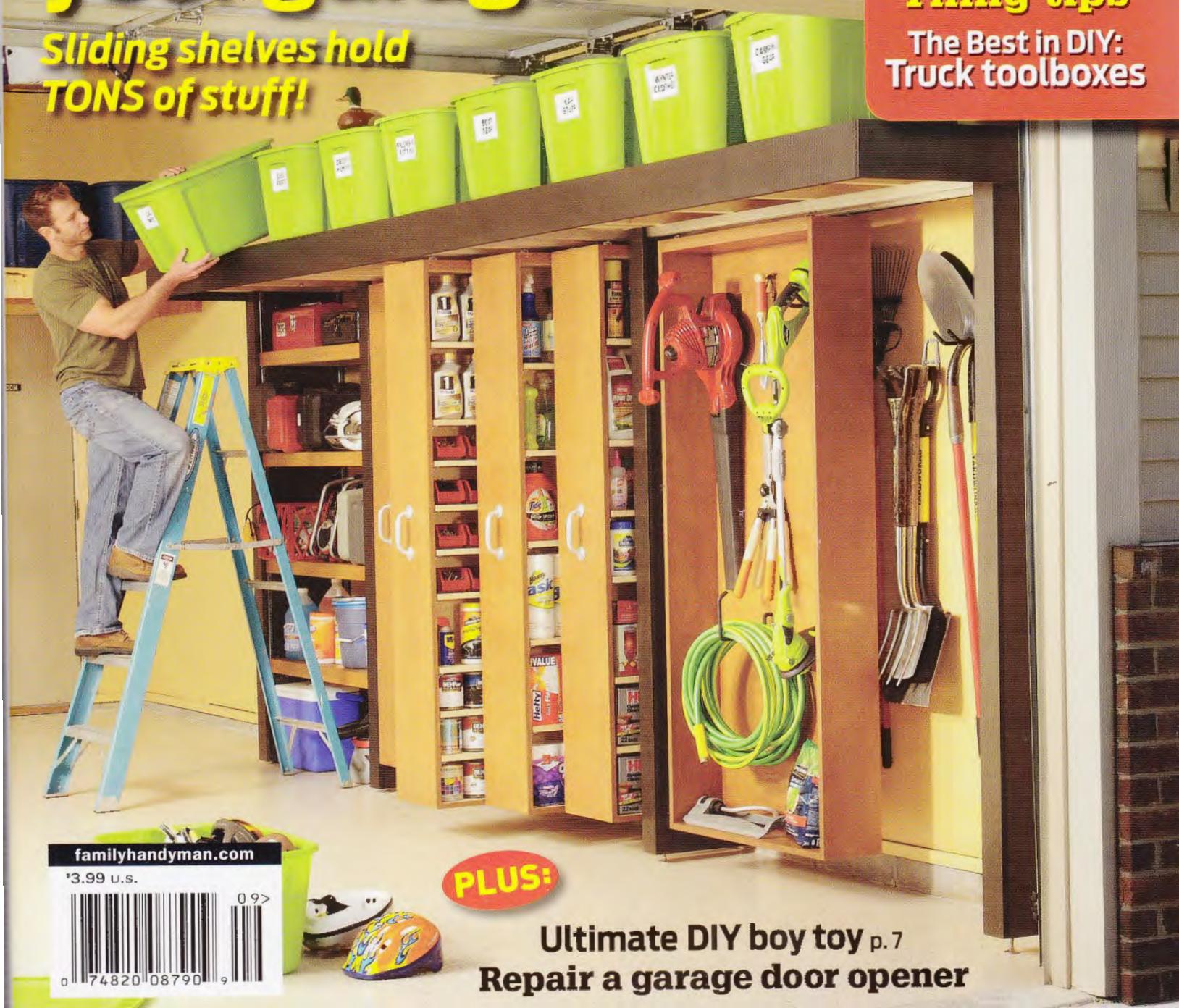
# THE FAMILY Handyman®

#1 in DIY Home Improvement

September 2011

## Super-organize your garage!

*Sliding shelves hold  
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Magnificent  
Man caves  
Tried & true  
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PLUS:

Ultimate DIY boy toy p. 7  
Repair a garage door opener

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Cover Photo TOM FENENGA

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### GOT A DIY QUESTION?

Finding answers is easy at [familyhandyman.com](http://familyhandyman.com). Just use the search box at the top of the page to get expert step-by-step help with your project. Or register on the site and join our DIY Forum, where you can ask questions or give advice.

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#1 in DIY Home Improvement since 1951

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# THE STUFF WE LOVE

Tools & Gear, DIY and Beyond

editors@thefamilyhandyman.com

## The ultimate big-boy toy

There's no way around it—this testosterone-pumping, marriage-wrecking machine is cool! It's a utility vehicle made by Bobcat. If you're not familiar with utility vehicles (UVs), think 4x4 pickup/ATV/dune buggy/tractor/go-cart all rolled into one. Other folks make UVs too,

but Bobcat's UVs have a unique set of features.

Several models are available; shown is the 3400, gas version, 4-WD, which sells for \$12,000. So it ain't cheap, but then again, neither is a bass boat. And who can put a price on their fun ... I mean, tools?

The 32-hp rated, fuel-injected engine gets it up to 30 mph in high range. It has a low range too, for when you need stump-pulling torque. The cargo box measures 36 x 52 in., with a whopping 1,100-lb. capacity. The rear wheels have limited slip, so both kick in when one begins to

spin. And the front wheel drive engages too when the little beast needs it.

It's easy to justify four wheels of fun—tell the love of your life it'll help you get your work done.

Go to [bobcat.com/utility\\_machines](http://bobcat.com/utility_machines) to learn about the entire UV collection and find a dealer.



### See it in action!

[familyhandyman.com](http://familyhandyman.com)

Watch a video of Travis Larson and his new best friend—the Bobcat 3400. Go to [familyhandyman.com/Bobcat3400](http://familyhandyman.com/Bobcat3400).

Continued on p. 11



## Notebook work light

Picture a work light that's the size of a notebook computer and folds up like one too. Picture 80 LED lights illuminating your task for two hours before needing a recharge. You've just pictured the Mighty-D-Light by Cooper Lighting. Once the battery's dead, plug it into the wall or your car's cigarette lighter. The beauty of the design is that you can unfold it and bend it to aim the light exactly where you need it. Or use the built-in magnet to stick it to any steel surface, such as the hood of your car. It's a heck of a light for \$43, from [amazon.com](http://amazon.com).



## 'Olfa good' knives

Snap-blade knives are a good idea if you do work that requires lots of blade changes. But have you ever tried a snap-blade utility knife and ended up throwing it away? I have. No doubt it was a cheap Olfa knockoff.

Olfa knives are super-sturdy and have been the go-to cutting tool for paper hangers and painters for years. And they can sub for a standard utility knife for other trades and tasks too. So give one of these knives a shot. No more changing blades; just snap off the dull one and you're ready for more cutting. You can buy the knives (\$8 to \$20) or find a dealer at [olfa.com/UtilityKnives.aspx](http://olfa.com/UtilityKnives.aspx).



## Future-proof dimmer switch

Your old dimmer switch may have served you well for years, but it probably won't in the near future. Here's why: The bulbs that will replace Edison's incandescents—halogens, CFLs, LEDs—each work best with a slightly different dimmer circuitry. And chances are, the bulbs you choose in the future won't be a good match for your existing dimmer. At a low dimmer setting, your lights may flicker, go completely dark or not turn on at all.

Lutron's C-L line of dimmers will eliminate—or at least minimize—those future frustrations. The dial hidden behind the cover plate adjusts the dimmer to suit various versions of incandescent, halogen, CFL and LED bulbs. When you switch to a new type or brand of bulb, you simply remove the cover plate and turn the dial until you find the setting that works best.

At \$15 to \$45, Lutron C-L dimmers cost about the same as other dimmers. So if you're installing a new dimmer or you've already had trouble, choosing a dimmer from the C-L line is a smart move. To learn more and see available styles and a list of bulbs that work best with the C-L dimmer, go to [lutron.com](http://lutron.com).

Gary Wentz



## World's smallest flashlight

Peel off the backer and stick a Thumb-Lite to just about anything! It'll be right there when you need it. Bright LED light with a replaceable battery for \$4 from thumb-lite.com. Any questions?



## Gotta drill holes in tile?

If you have to drill holes for pipes in ceramic, granite or marble tile, go to Home Depot and buy a Brutus 1-3/8-in. tile hole saw (model No. 10569; \$21). Put a self-stick gasket on the bottom (it comes with six), stick the guide to the tile, splash in a little water and drill away. In about 30 seconds, you'll have a perfect hole. The water keeps the diamond-embedded drill bit cool and eliminates any dust so you can drill the hole right in the bathroom where you're working. I've drilled six holes with this thing—it's fabulous.

Travis Larson

## Faster basement finishing

Got a foundation to finish? You probably know the drill. Choose between 2x4 walls filled with fiberglass or the hassle of 2x2 furring strips and foam. Here's an easier, faster alternative. Order a basement's worth of InSoFast insulation panels. The 2 x 4-ft. expanded polystyrene panels are 2 in. thick and have tongue-and-groove edges that lock together. Vertical plastic strips function both as a gluing strip on the back and as an anchor for drywall on the front. Channels on the back are for draining any condensation and routing electrical cables. You'll get a respectable R-value of 8.5 without fooling with concrete screws, framing, fiberglass and all that other messy business. Expect to pay about \$1.50 per sq. ft. including shipping; less for bigger orders. Check out the product and get a quote at InSoFast.com.

## Magic potion

Been stung or bitten by a fire ant, bee, wasp, mosquito or bedbug? Rub on a little Stops the Sting! and you can greatly reduce the itching, burning and swelling. I tried it on a wasp sting and it stopped the pain. This isn't snake oil! Don't believe it? Go to stopsthesting.com and watch the video of a news reporter sticking her hands in a bee colony. And while you're there, buy a tube or two for \$5 each.

Vern Johnson





### Cageless roller frame

Purdy Corp. has a great new roller frame that uses a dog bone-shaped foam pad instead of a wire cage to hold the sleeve on. That's a better idea because: (a) It keeps the sleeve from slipping off while you paint, (b) it doesn't thump and skip as you roll, and (c) you get one of the best-constructed handles in the biz. Find one for about \$12 at Sherwin-Williams and other stores. The same design is available for the mini roller (\$6 to \$7), which will handle 4-1/2- and 6-1/2-in. sleeve sizes. Learn more and find a dealer at [purdycorp.com](http://purdycorp.com).



### Oil stains on granite

If you have oil stains on your granite countertops that are impossible to remove, it's time to try DuPont StoneTech Professional Oil Stain Remover. It's pricey, but it works. Smear it over the stain and let it set for two to three days to extract the oil, then just wipe up the powder. It's tough to find at retail stores, but you can get a pint can for \$25 at amazon. That's enough to take care of oil stains for years.

PURDY

### Squeegee knives

Unless you're a pro, drywall taping is hard, especially butt joints.

Here's a way to cheat. Go to a paint store and pick up a "squeegee" (or "knockdown") knife for about \$25. (Or search either term to find one online.) Slather the mud over the joint relatively evenly with a wide putty knife and drag the squeegee over the joint. With very little practice, your joints will look every bit as good as a pro's.



### The baddest wheelbarrow on the block

Your neighbors will have wheelbarrow envy when they see you with this wide-tired beauty. Take a rock-solid Jackson contractor wheelbarrow and stick a wide turf tire on it and you've got the ultimate heavy-load hauler. The wide tire won't sink into the lawn, and it's super stable. You won't find one at the local home center, though. You'll have to go where landscaping contractors shop. For buying information, go to [jacksonprofessional.com](http://jacksonprofessional.com) (800-807-2589). Prices vary, but expect to pay \$150 to \$226.





### Better vision for driving and boating

Until you try Aquapel, you won't believe it. Wipe it on your windshield—or any other window for that matter—and water rolls right off the glass. Even with the wipers going full blast, you can see dramatically better, especially at night. It's not a wax- or silicone-based coating like similar products. Instead it contains a fluoropolymer that bonds to the glass to create a durable water repellent. You nautical types with wiperless windshields should really pay attention. Apply it and you'll actually be able to see through the windshield on rainy days—much safer boating!

One \$10 applicator will handle one windshield for six months of visual bliss. Check it out, find a dealer or order it at [aquapel.com](http://aquapel.com).

# NO MESS

The world's only no-mess duct tape holds tough, yet removes without residue for up to 6 months.

Exclusive 3M technologies make it happen.

BECAUSE MESS IS A HASSLE.



Scotch®  
Tough Duct Tape  
**NO RESIDUE**

Regular  
Duct Tape





## For serial furniture rearrangers

It's a good thing I'm not blind, because my wife rearranges the furniture constantly. She loves her EZ Moves slides, plastic slides that you put under furniture legs to make it easy to move couches and other furniture around. But guess who has to lift the furniture to slip under those slides? So I got her an EZ Moves Furniture Lifter to lever the furniture up from the floor. It makes lifting heavy furniture easy, no matter your size. At [getezmoves.com](http://getezmoves.com), you can get a kit with two sets of slides and two lifters for \$20 plus \$16 (yikes!) for shipping.

Travis Larson

16 September 2011 [familyhandyman.com](http://familyhandyman.com)



## Schluter®-KERDI-BOARD

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Whether you work with mosaics or large-format tiles, an absolutely flat, level, plumb, square substrate is essential for creating a perfect tile covering.

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- Build a tile-ready surface without wood or cement board
- No additional surface preparation required
- Cuts with a utility knife

### Ideal for wet areas

- Waterproof, vapor retardant and dimensionally stable

### Easy to transport and work with

- Lightweight (contains no cement or fiberglass)
- Printed gridlines for precise cutting
- Suitable for use on any kind of structure
- 7 thicknesses available



# HANDY HINTS®

## Fishing rod storage

Here's a smart way to make your garage doors do double duty—store your fishing rods on them! Make some simple fishing pole racks out of plywood and screw them to the ribs of the door. Then slide your rods onto the racks. The rods stay secure in the holders whether the door is open or shut.

Max Hansen



## Utility sink shelf

To make paint cleanup easier, we cut a section of leftover wire shelving and set it over the front of our utility sink. It's the perfect place to dry sponges, foam brushes and roller covers. We hang the paintbrushes from S-hooks so they can drip right into the sink. When we're done with the shelf, we hang it over the side of the tub so it's right at hand for our next painting project.

Rick and June Coon



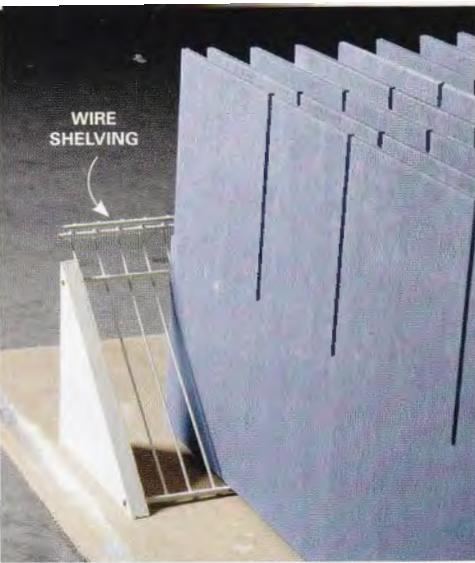
## I.D. cables with bread tags

The little plastic tags used to close bread bags are handy for identifying the cables on your computer components. Just write the name of the device on the tag and slip it around the cable. No more wondering which cable belongs to which device.

Art Desgroseilliers



For more great Handy Hints, subscribe to our free e-mail DIY Tips & Hints newsletter! Go to [familyhandyman.com/](http://familyhandyman.com/) Sign-up-for-free-DIY-Newsletters.



## Easy-access tarps

Storing tarps can be a hassle. Big tarps are heavy, and smaller tarps get wedged behind or underneath things. A simple solution is to store them between your garage rafters or basement floor joists. Cut two rebar sections and cover them with plastic conduit cut short enough to roll freely

between the joists. Mount the rebar to the framing using plumbing straps. The rolling conduit lets you slide your folded tarps easily up into the joist cavity and down again whenever you need them.

**Darren Douglas**



## Homemade drying rack

I had about 30 fiber cement siding panels to paint, but I didn't have a lot of room in my shop for them to dry. I solved the problem by attaching a piece of wire shelving to some plywood supports. The entire 160 sq. ft. of panels took up only 12 sq. ft. of floor space and dried very nicely. I used the same idea with some deck boards. Since the boards were thicker, I removed every other wire so they'd get enough airflow to dry properly. It worked great!

**Fred Steinhaus**



**Get \$100 for your Handy Hint!**  
See p. 4 for details.



## Ladder tool and screw holder

Here's a clever way to keep screws and tools handy when you're up on a ladder. Screw a magnetic tool holder or knife rack (available at home centers for \$10) to the top of your ladder. You don't have to worry about losing screws or knocking your screwdriver to the floor. Everything you need stays right where you put it.

**Terry Wiley**

**Get \$100 for your Handy Hint!**

See p. 4 for details.



### Swinging trash

The wastebasket under our bathroom sink was anything but convenient. You had to pull the basket halfway out to throw anything away (which my husband wouldn't do, so his trash ended up on the floor of the cabinet). I solved the problem by screwing wire shelf anchor clips to the inside of the door and hooking the lip of the wastebasket right on the hooks. Now it's easy to use and there's no more trash on the cabinet floor!

Jan Hodson



Editor ELISA BERNICK • Art Direction BECKY PFLUGER • Photography TOM FENENGAR

### Quick cord and plug I.D.

When I work on projects around the house, I often have to use a couple of different power tools and switch from one to the other on the same extension cord. With non-grounded plugs, figuring out which way the plug should be connected was slowing me down. So I started color-coding the wide neutral slot on extension ends and wide neutral prongs on my cords. No more fumbling around.

Mike Lambeth



### Pain-free wall prep

One of my least favorite paint prep tasks is washing down the walls and ceiling. This step is especially important in kitchens and bathrooms where grease and soap residue can build up. I use a sponge mop to clean the ceiling and high on the walls. It not only saves my back, but it beats going up and down the ladder with a dripping sponge and helps me move around the room a lot faster. This works great for cleaning up sanding dust from drywall taping too.

Peter Olson



# man caves

**As a DIYer, you've worked hard to make your home a civilized place. But you also need a space to shift evolution into reverse, devolve a little and get in touch with your inner Neanderthal. A man cave can be a bar, a workshop, a place to watch sports, a game room or all of the above. With these tips and ideas from our readers, your cave can evolve into whatever you want it to be.**

by Gary Wentz  
editors@thefamilyhandyman.com

# TIKI HUT

Rob and Eileen Stanek used to do a lot of island hopping (before kids), so Rob decided to bring some of the Caribbean to their backyard, and the Stanek Tiki Club was born. The thatched roof



Rob Stanek

looks tropical, but there's a standard roof underneath: 2x4 framing, plywood sheathing and a layer of roofing felt. The woven thatch sections are simply stapled to the sheathing. In Rob's rainy climate, the thatch lasts about two years and costs about \$400 to replace. If you'd like your own tiki hut, start with some online browsing. Search for "thatch rolls" to see a variety of options.



**The Stanek Tiki Club is open to members only, but anyone can become a member.**

“ ”

# STEEL CAVE



Brian Gartrell's basement is part pool hall, part sports bar and part Muhammad Ali shrine. Brian met Ali a few times through a mutual friend, and the walls are decorated with cards, photos, even a pair of autographed boxing trunks from the all-time greatest boxer.

But we think the coolest element in this man cave is the galvanized steel wainscot. Brian covered the studs with drywall above and 1/2-in. plywood below. Then he covered the plywood with corrugated, galvanized steel to create high-style, low-maintenance wainscoting. The steel was inexpensive, about \$1 per linear foot (special ordered and precut at a home center). And because both the steel and the plywood behind it are screwed on, Brian can open the walls to run cables—a handy feature, since the cave has three TVs and a sound system.



Brian Gartrell

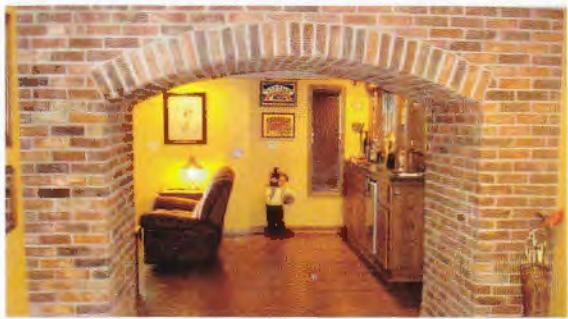
# BASEMENT BREWERY

Bill Bensing is a home brewer who wanted to give his basement the feel of an old-world brewery. That meant brick walls and an archway, all made from thin brick.



Bill Bensing

It was much like a tile project. He stuck the 1/2-in.-thick bricks to a bed of thin-set, then filled the joints with mortar using a grout bag. At about \$7 per sq. ft., thin brick costs about twice as much as regular brick, but it's a lot easier to work with, and nobody can tell the difference. Aside from brickwork, Bill's cave includes a full bar, a workshop, a weight room and a bathroom, so the rest of the house isn't really necessary.



# BASEBALL BAR



Jack Begg spent years planning and pondering before he finally built his baseball-themed man cave. And all that thinking led to some ingenious ideas: He ordered a load of unfinished wood bats online and cut them in half lengthwise for the chair rail and decorative columns on the bar.

Uncut bats form the stair railings (not shown). Jack also found the carpet online. The individual carpet "tiles" are lightly glued down and easy to replace if one gets damaged or stained. With a little online browsing (search for "sports team carpet tile"), you can find the logo of any pro team and many colleges. But team spirit isn't cheap: Expect to spend about \$40 per sq. yd. Jack's wife, Lisa, painstakingly painted the walls to match the pinstriped uniforms of their favorite team. Hard to guess which team that might be.



**Jack Begg**

clip 'n' save

# How to make a Kegerator

A fridge is nice for preserving food, but in just an hour, you can turn it into something *really* useful: a magical beer machine!

## START WITH THE KEG

The size of the keg determines the size of the fridge you'll need. The most common kegs (8 and 16 gallons) are about 16 in. in diameter and 14 or 23 in. tall. You might also find slimmer kegs with diameters of 9 to 12 in. and heights about 12 in. Expect to spend at least \$45 to \$90 for an 8-gallon keg. But don't worry about money; good beer is priceless.

## THE FRIDGE

If you can get skinny kegs, you can use a mini fridge. But typical 8- or 16-gallon kegs require a full-size fridge. In most fridges, the back wall juts in at the bottom, so you can't set the keg on the fridge floor. It has to go on the bottom shelf, which just isn't strong enough. A slab of melamine (plastic-coated particleboard) works well to support it.

## THE PLUMBING

Complete kits start at about \$150. Depending on the kit you choose, you'll have to drill a hole in the fridge door, side or top. Boring the hole with a hole saw and then making the plumbing connections can be done in just a few minutes.

## WHERE TO GET IT

Tons of kegerator kits are available online. We bought ours from beveragefactory.com (\$150, plus \$21 for the stainless steel drip tray). Our kit included the CO<sub>2</sub> cylinder (many kits don't). Filling costs about \$20 at an industrial gas supplier or a welding supplier.

## NO NEED TO MAKE YOUR OWN!

Companies like Haier ([haieramerica.com](http://haieramerica.com)) make ready-to-use kegerators complete with taps and built-in drip trays. Elmira ([elmirastoveworks.com](http://elmirastoveworks.com)) offers a 1950s retro kegerator fridge that includes everything but the keg.



## How it works

A bottle of CO<sub>2</sub> pressurizes the keg. So when you open the tap, beer flows out and life is good. The regulator lets you adjust the pressure and tells you when the bottle needs a refill.

# THE MULTIPURPOSE MAN CAVE



Gary  
Bickler

Some man caves are workshops, some are bars, and some places are for sports and socializing. Gary Bickler's garage is all those things. And more.

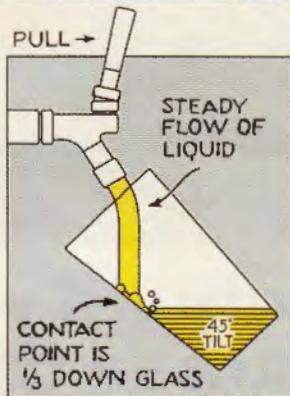
It began as a "beer can museum." After 20 years in storage, Gary's 3,000 collectible cans were finally

on display. Over time, the museum morphed into other things: It's a relaxing spa, an exercise gym, a home theater (two big-screen TVs), a heated indoor playground for the grandkids, and above all, a gathering spot for friends and family. Somehw, Gary even finds space for the usual garage functions like DIY projects and parking cars.

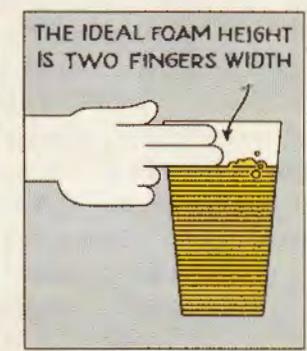


**"Sitting in a hot tub and watching a Twins game—it's awesome."**

## HOW TO POUR THE PERFECT BEER



When the glass is about half full, tilt it up to create foam.



### Show us your man cave

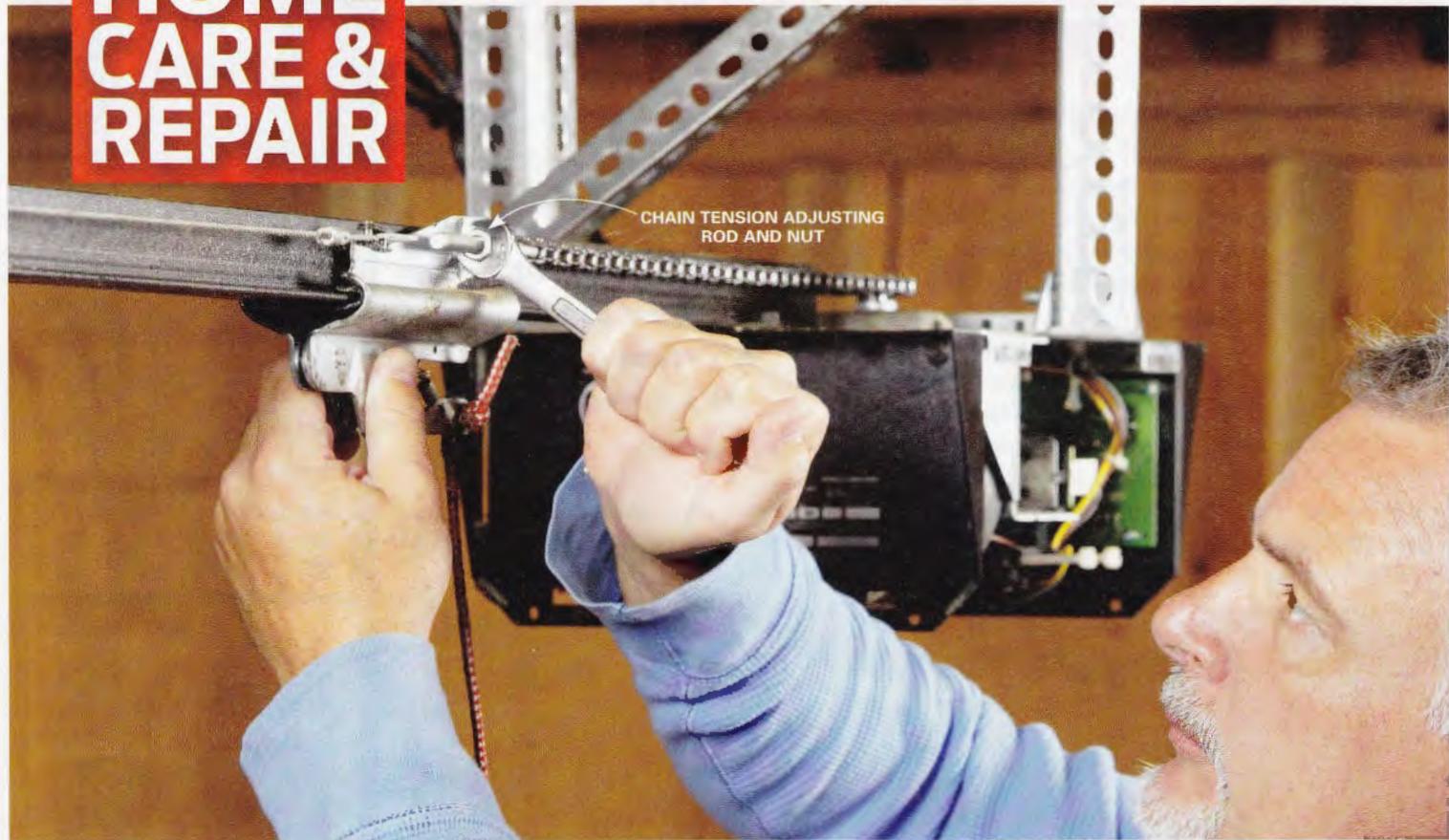
Put down those potato chips, snap a few photos and send them to [editors@thefamilyhandyman.com](mailto:editors@thefamilyhandyman.com). If we feature your cave in the magazine, we will donate \$100 to your man cave maintenance fund. See p. 4 for contributor guidelines.

TOM FENENGA

Illustration MICHAEL NEWHOUSE

# HOME CARE & REPAIR

by Rick Muscoplat  
editors@thefamilyhandyman.com



## Rebuild your garage door opener

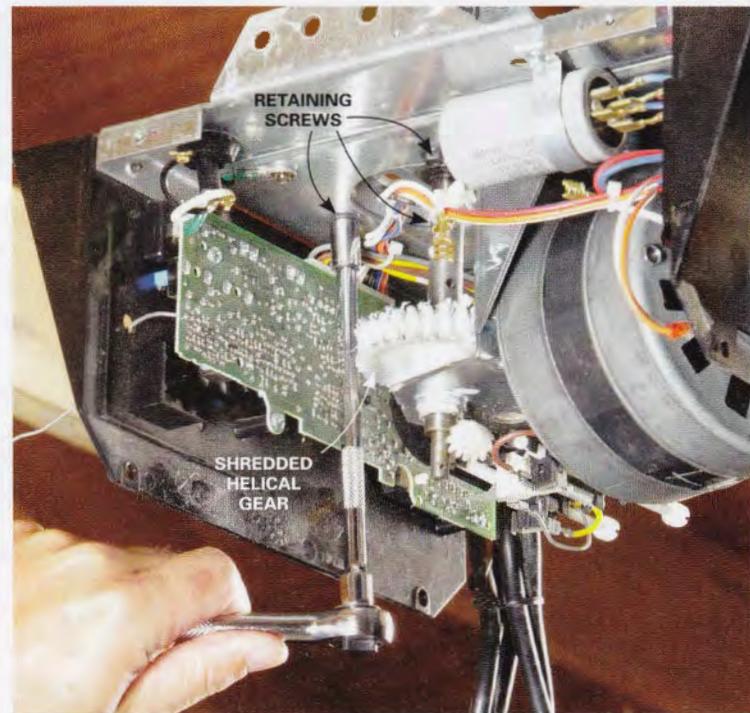
If you press the garage door opener button and hear either a humming or a grinding sound, but the door won't open, you may think you need a new opener. And you might. But before you give up on the old unit, pop off the cover and check for stripped gears. That's a common problem and one that you can fix yourself for less than about \$25.

You'll have to get a replacement gear kit (two new gears, grease and washers), which may take some running around. But once you have the kit in hand, you can do the repair in about two hours. You'll need a 2x4, a small drift punch, a standard 1/4-in. drive socket set, hex wrenches, a circular saw, a drill and a hammer. I'll show you how to remove and replace the gears without damaging the shafts.

Start by unplugging the opener. Then remove the retaining screws for the metal cover and put it aside. Shine a flashlight directly at the gear set. If you see chewed-up teeth, you've nailed the problem. If the gears are in good shape, you've got a more serious problem and your best bet may be to just replace the entire unit. To find a replacement gear kit, write down the make, model and serial number of your opener (you'll find it on a label on the back of the opener). Then call a garage door opener repair company. It'll probably charge a bit more than an Internet site, but at least you'll have the parts right away and be up and running the same day.

### 1 REMOVE THE CHAIN

Unscrew the outer nut on the chain tensioning rod. If necessary, use pliers to prevent the chain from turning. Then slip on a pair of gloves and remove the greasy chain from the sprocket at the top of the opener.



### 2 REMOVE THE HELICAL GEAR ASSEMBLY

Unscrew the hex-head screws that hold the helical gear assembly in place. Save the screws for reassembly. Then lift the entire assembly (sprocket, plate, shaft and helical gear) up and out of the top of the unit.

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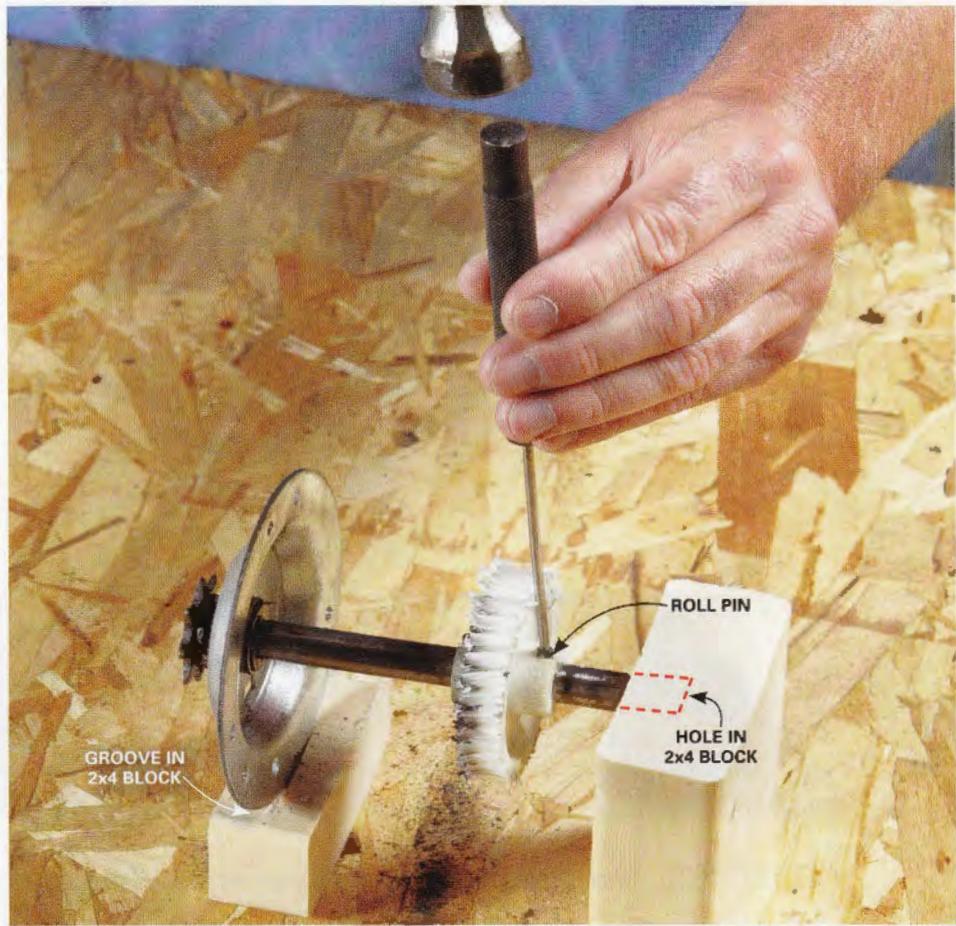
For more information,  
email us at  
[info@neoperl.com](mailto:info@neoperl.com)



\*Average annual savings of \$3.25 for water and \$12.00 for electricity (hot water production).

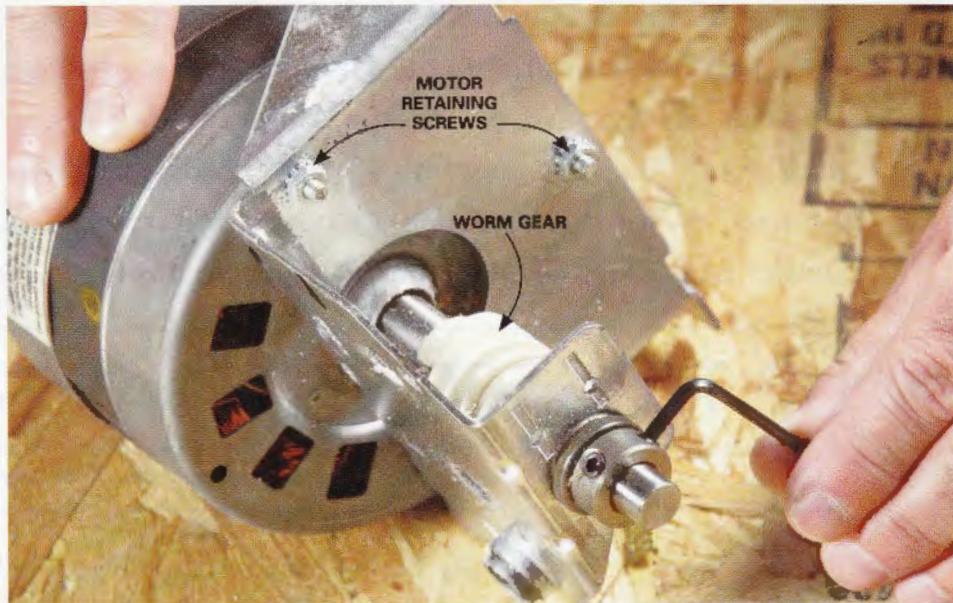
## Getting out the gear shafts

Use a combination wrench to loosen and remove the chain (**Photo 1**). Next, use a 1/4-in. drive socket, extension and ratchet to remove the helical gear assembly retaining screws (**Photo 2**). Take a digital photo of the wiring connections from the motor or label them with masking tape. Disconnect the motor wires and remove the entire motor assembly. Move the helical gear assembly and the motor assembly to your workbench.



### 3 REMOVE THE HELICAL GEAR FROM THE SHAFT

Support both ends of the helical gear assembly with the two jigs. Hold a small drift punch over the roll pin and tap the pin out of the shaft with a small hammer.



### 4 REMOVE THE WORM GEAR

Loosen the collar setscrews with a hex wrench and slide the worm gear off the shaft. Then remove the motor retaining screws.

## Remove the helical and worm gears

Cut a shallow groove into a 2x4 with a circular saw. Then slice off about a 3-in. section to make a jig to hold the helical gear assembly circular plate (**Photo 3**). Place the plate in the groove, hold the gear assembly level and mark the end of the shaft on another 2x4. Drill a hole in the wood and insert the end of the shaft. Then remove the roll pin (**Photo 3**). Slide the old gear off the shaft and replace it with the new gear. Reinstall the roll pin using the same jigs.

Next, remove the retaining collar and thrust washers on the end of the motor shaft (**Photo 4**). Pull the motor out of the chassis and slide the worm gear off the shaft (the roll pin stays in place on this shaft). Slide on the new worm gear with the notched end facing the roll pin.

Reassemble the motor assembly and place it back in the opener. Then install the helical gear assembly. Coat the gear teeth with new grease. Reattach the chain and tighten it to the proper tension (see your owner's manual). Test your repair with the garage door disconnected from the opener trolley.

## Secrets of step flashing revealed!

**Q**

I see some roofs installed with one long piece of L-shaped flashing under the shingles and behind the siding. The flashing is sealed with roofing cement. Is that a proper way to install flashing?



### Step flashing

Step flashing redirects the water back onto the shingle. Even if one piece of step flashing fails, the flashing and shingle below it start the process over again.

**A** Well, it's one way to install a roof, but it's not the correct way. It may seem as if a single piece of flashing would offer more protection than many pieces of step flashing. But it doesn't work that way. Once even a small section of roofing cement fails, you'll have a leak. Each additional rain adds more water, and before you know it, you've got rotted wood.

Step flashing offers far better protection from leaks, because even if a single piece of step flashing fails, the water just hits the next lower piece. That flashing directs the water onto the shingle and the water drains down the roof.

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## Fix a swollen sink base bottom

Let's face it—it's easy to get water on the floor of your sink base cabinet. We'll never understand why cabinet-makers use particleboard for the base, but they do. And once it starts swelling, your only option is to replace it. But you don't have to cut out the entire bottom. Here's an easier way to install a new sink base bottom.

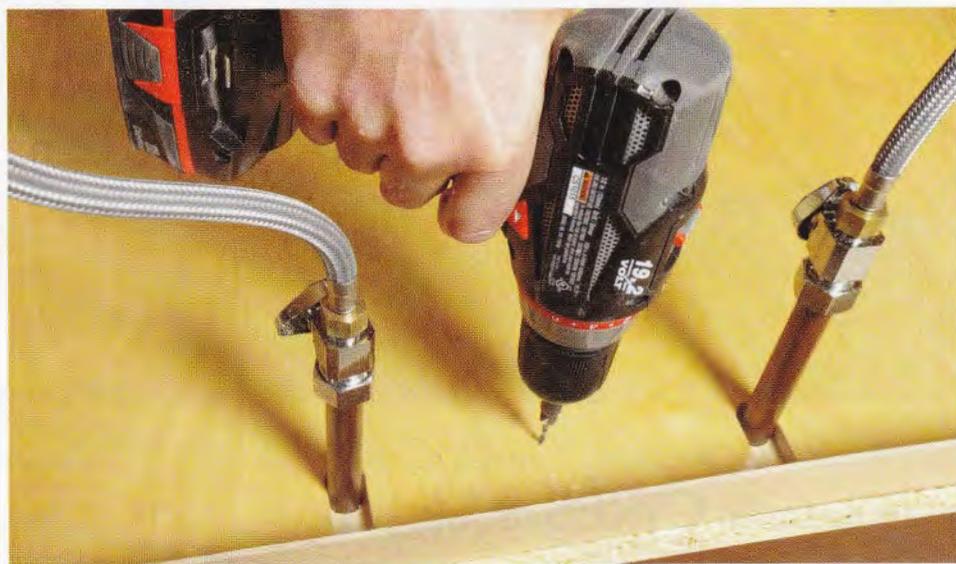
Remove the drain lines (and garbage disposer, if there is one) to get maneuvering room. Then trace a cutting line about 3 in. in from all four

edges. Then cut out the middle section of the swollen sink base with a jigsaw (**Photo 1**). Next, cut a piece of 1/2-in. plywood to the interior size of the sink base. Cut slots for the water supply tubes. Then seal the edges and face of the plywood with urethane varnish. Then install the new plywood floor and fasten it to the old floor (**Photo 2**). Caulk around the edges and pipes to prevent water from seeping under the new floor. Then reattach the P-trap and garbage disposer.



### 1 REMOVE THE MIDDLE SECTION

Drill a 3/4-in. hole in each corner of the traced cutout line. Then run your jigsaw along the line. Remove the old, swollen floor.



### 2 DROP IN THE NEW FLOOR AND SCREW IT INTO PLACE

Predrill holes around the perimeter using a countersink bit. Then install brass-colored drywall screws.

## Slip-proof wood steps

Before winter hits, apply a coat of paint and traction grit on slippery wood steps. Sand and aluminum oxide grit are cheap, but both require constant stirring. And they show up as dark specks as soon as the paint starts to wear. Instead, try polymeric plastic grit (such as Seal-Krete Clear Grip, \$9 per bag), available at home centers and bigpaint-store.com. Polymeric grit stays suspended in the paint as you apply it, and because it's clear plastic, it won't show up as dark specks as the paint wears.

If you want grit that's easier on bare feet, add rubber grit to the paint (such as Soft Sand Traction Grit; \$20 per pint from softsandrubber.com). Use the broadcast method shown to apply it.



### SPRINKLE THE GRIT ON WET PAINT

Apply a fresh coat of paint to the steps. Then immediately sprinkle a generous coating of rubber grit to the surface. Allow it to dry. Then add a second coat to seal the grit.

## Heard on the Forum



Forum member "KenP"

was trying to remove his over-the-stove microwave oven. He'd already removed the retaining screws from the cabinet above, but the microwave wouldn't budge.

The microwave oven is likely held in place by a latch. After you remove the retaining screws, remove the plastic trim piece at the top edge of the microwave. Find the latch release lever (like the hood latch release on a car) and pull it while holding on to the microwave. Once the microwave breaks free, rotate it toward you. Then unhook it from the bottom lip of the wall plate.

*Continued on p. 39*

## How to add capacity to an electrical box

**Q**I want to replace my light switch with one of those multibutton fan/light switches, but it won't fit in the box unless I jam it in. Is that safe?

**A**No. Even though the current "box fill" may meet code, it's not safe to jam the new device in. You have two options: Add a plastic surface-mount extender box (like Leviton No. 6197-W; \$6 from amazon.com; **Photo 1**), or remove the old 12.5-cu.-in. box and replace it with a flush-mount 20-cu.-in. box that's 7/8 in. deeper (like Carlon No. B120R Old Work Electrical Box, \$2; **Photo 2**).



### 1 THE EASY BUT LESS ELEGANT WAY

Remove the old switch (power off) and screw the extender box on top of the old box. Then install the new switch and cover plate on the extension box.



### 2 THE HARDER BUT MORE ATTRACTIVE OPTION

Disconnect the old switch and label all the wires (power off). Saw out the old box, remove the wires and set in a deep remodeling box. Reconnect the wires and install the new switch.

### What are the possible side effects of PRADAXA?

PRADAXA can cause serious side effects.

- See "What is the most important information I should know about PRADAXA?"
- Allergic Reactions. In some people, PRADAXA can cause symptoms of an allergic reaction, including hives, rash, and itching. Tell your doctor or get medical help right away if you get any of the following symptoms of a serious allergic reaction with PRADAXA:
  - chest pain or chest tightness
  - swelling of your face or tongue
  - trouble breathing or wheezing
  - feeling dizzy or faint

Common side effects of PRADAXA include:

- indigestion, upset stomach, or burning
- stomach pain

Tell your doctor if you have any side effect that bothers you or that does not go away.

These are not all of the possible side effects of PRADAXA. For more information, ask your doctor or pharmacist.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

### How should I store PRADAXA?

- Store PRADAXA at room temperature between 59°F to 86°F (15°C to 30°C). After opening the bottle, use PRADAXA within 30 days. Safely throw away any unused PRADAXA after 30 days.
- Store PRADAXA in the original package to keep it dry. Keep the bottle tightly closed.

### Keep PRADAXA and all medicines out of the reach of children. General information about PRADAXA

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use PRADAXA for a condition for which it was not prescribed. Do not give your PRADAXA to other people, even if they have the same symptoms. It may harm them.

This Medication Guide summarizes the most important information about PRADAXA. If you would like more information, talk with your doctor. You can ask your pharmacist or doctor for information about PRADAXA that is written for health professionals.

For more information, go to [www.PRADAXA.com](http://www.PRADAXA.com) or call 1-800-542-6257 or (TTY) 1-800-459-9906.

### What are the ingredients in PRADAXA?

Active ingredient: dabigatran etexilate mesylate

Inactive ingredients: acacia, dimethicone, hypromellose, hydroxypropyl cellulose, talc, and tartaric acid. The capsule shell is composed of carrageenan, FD&C Blue No. 2, FD&C Yellow No. 6, hypromellose, potassium chloride, titanium dioxide, and black edible ink.

Distributed by:  
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# tile without trouble

Easier installation,  
less frustration

In theory, setting tile is easy. You just stick tiles to the wall or floor and fill the gaps with grout. But in the real world, tile jobs are full of frustrations. This collection of tips—collected from pros and DIYers—may not eliminate all your tile troubles, but it will help you avoid the most common headaches.

## Mix it **smooth**

After all the prep and layout work, you're finally ready to set tile and see some results. The last thing you want to do is stop and wait. But giving the thin-set time to absorb water, or "slake," is the key to a smooth, chunk-free mix. A chunky mix will drive you crazy when you try to comb the thin-set onto the wall or floor. After slaking, remix and add a smidgen of water if needed. Play the same waiting game when you mix up the grout later.



**FOR A SMOOTH MIX, WAIT**  
Mix up the thin-set or grout, then let it stand for about 10 minutes. That allows dry chunks time to absorb water before you do the final mixing.

## Start with a flat floor

Tiling a wavy floor is a nightmare. You push and pry to get each tile flush with its neighbors and you still end up with "lippage" (edges that protrude above adjoining tiles, usually at corners). So before you tile, check the floor with a 4-ft. straightedge. If you find low spots more than 1/4 in. deep, screed thin-set over them to create a flat surface.

For really bad floors, self-leveling compound (also called "self-leveling underlayment") is a life-saver. You just mix the powder with water and pour to create a flat, smooth surface. A perfect tile base doesn't come cheap, though—expect to pay about \$2 per sq. ft. Some products require metal or plastic lath; some don't.

Self-leveling compound is almost goof-proof, but there are two big pitfalls. First, it will slowly seep into the tiniest crack or hole, leaving a crater in the surface. So before you put down the lath, grab a caulk gun and fill every little gap—even small nail holes.



BILL ZUEHLKE / RAMON MORENO

### POUR A PERFECT FLOOR

Self-leveling compound gives you a flat, smooth base for tile. It's also a fast way to embed in-floor heating mats or cables.

## Remove the baseboard

You can leave base trim in place, lay tile along it and caulk the gap. But that "shortcut" will look second rate and cost you hours of fussy measuring and cutting. With baseboards gone, your cuts don't have to be precise or perfect; the baseboard will hide chipped edges and small mistakes. If you're just dead-set against pulling off baseboards, consider adding base shoe molding along the bottom of the baseboard after you set the tile.



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### GIVE YOURSELF SOME WIGGLE ROOM

With baseboards removed, measurements and cuts don't have to be precise. That means faster work and fewer miscut tiles on the scrap pile.

## Set against guide boards

The usual way to position the first rows of tile is to snap chalk lines. But there are two problems with that method: First, chalk lines are hard to see if you've slopped thin-set over them. Second, the first row of tile can move as you set the next row. Guide boards solve both problems. Position the boards the same way you would position layout lines and screw them to the floor. Be sure to choose perfectly straight boards or cut strips of plywood. Also, wrap the edge of the guide with duct tape so the thin-set won't stick to it.



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### BOARDS ARE BETTER THAN LINES

Unlike chalk lines, guide boards don't get lost under thin-set or allow tiles to shift as you set other tiles.

# Get a straight start on walls

The obvious way to tile a wall is to start at the bottom and work your way up. And that works fine if the base of the wall (usually the floor or bathtub) is perfectly flat and level. If not, the tile will simply amplify the imperfections; you'll end up with misaligned tiles and grout lines that vary in width.

To get a straight, level start, position a ledger on the wall, leaving a gap below—about 1/2 in. less than a full tile. The ledger shown here is a length of steel angle held in place by wood blocks screwed to the wall. A strip of plywood or a perfectly straight board will do the job too.



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## SET TILES ON A LEDGER

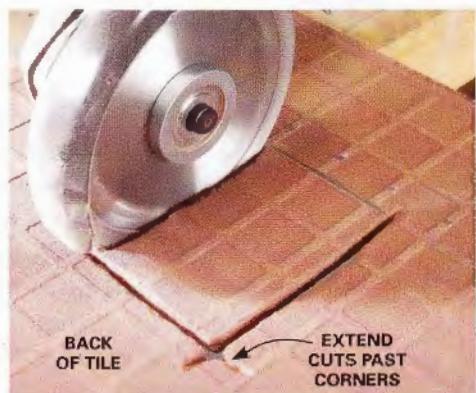
Fasten a straight ledger to the wall to support the tiles. Remove the ledger later and trim tiles to fill the gap below.

# Tackle tough cuts with a grinder

A grinder isn't the best tool for cutting tile. It whips up a nasty dust storm and often leaves jagged or chipped edges. Plus, it's just plain slower than a tile cutter or wet saw. But equipped with a diamond blade, a grinder will cut curves and make enclosed cuts that those other tools can't. Choose a "dry-cut" blade (\$25) and do the cutting outdoors.

## CUT OUTLET HOLES

Outline the light switch or outlet box on the face of the tile. Cut as much as you can, then finish the cut from the back, where you can overcut the corners slightly.



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# Clean up right away!

When you're done setting the tile, stand back for a minute to admire it. Then get back to work. First, drop your mucky tools in a bucket of cold water. That will slow—but not stop—the hardening of the thin-set. Next, inspect all the joints for thin-set that has squeezed out between tiles and clean it out before it hardens. Also look for thin-set smudges on the face of the tile. If a smudge has hardened and won't wipe off easily, wet it and scrub with a synthetic abrasive pad (the kind you use to scour cookware). Use minimal elbow grease; if you rub really hard, it's possible to dull polished stone or even glazed tile. Now go clean up those tools.



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## CLEAN OUT THE SQUEEZE-OUT

Plow excess thin-set out of joints with a utility knife, a pencil or a tile spacer. Whatever you use, do it now, not later.

# Slow down the drying

Pros like to finish the job fast and will sometimes use fast-setting thin-set. For the rest of us mortals, slower is better, and even the standard products sometimes harden or dry out too fast. Here are two ways to give yourself extra working time: First dampen the backer board or concrete with a sponge before you spread the thin-set. A damp surface won't immediately suck moisture out of the thin-set. Second, mix the thin-set with latex additive rather than water (\$25 for 2 gallons). Latex additive dries slower than water and boosts adhesion in both thin-set and grout. It also makes grout more stain-resistant. (A few latex additives are designed to speed the hardening process; check the label.) If thin-set or grout begins to harden before you can use it, just toss it. Don't add water and remix. That's a recipe for weak bonding and trouble later.

## familyhandyman.com

- Tile layout is tough, but it's critical for a good-looking job. Search for "tile layout" and get some help.
- Install the ultimate tile feature: a stunning mosaic medallion. Search for "tile medallion."
- Got a tile project in mind? Whatever it is, we can help. Just search for "tile" to get expert advice.

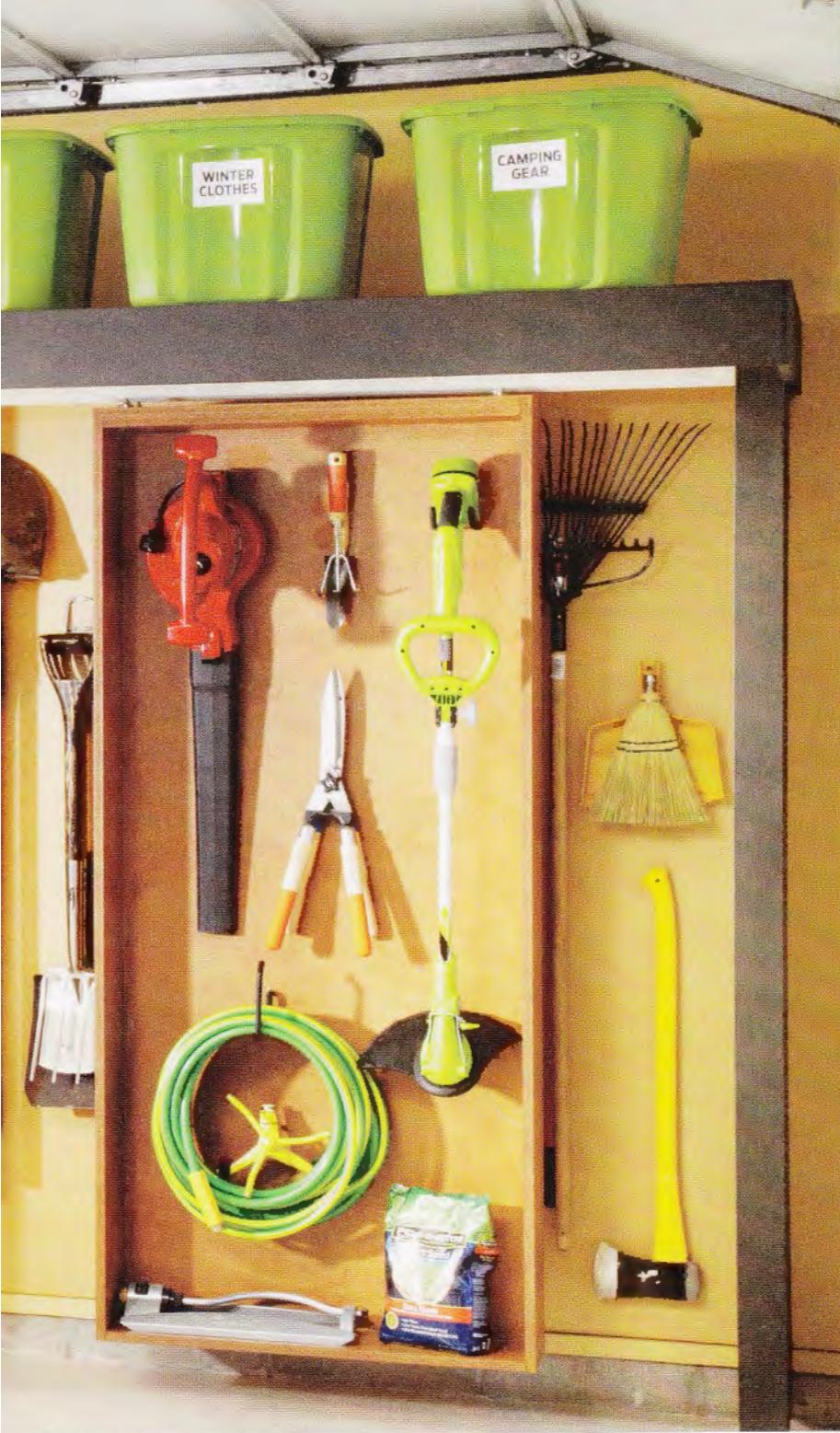




# Space-saving Garage Storage

Let's face it. No matter how big your garage is, there never seems to be enough room to store everything. But by making ultra-efficient use of the narrow area on the sidewall of your garage, this storage project can help.

The heart of the system is a series of double-sided rollout shelves that allow easy access to everything that can be stored in a narrow space. With these rollouts, you don't have to store your paint cans, nails, screws and other stuff



## Sliding storage = more convenience, more space



The rollout shelves provide better access and make small stuff easier to find. They're versatile, too. You can set the divider wherever you want to create different-depth shelves.

The bypass unit adds 50 percent more storage for long-handled tools and all sorts of items that take up too much wall space. You simply slide it to either side to access the stuff behind.

four layers deep and then shuffle everything around to find what you're looking for. When the shelves are pulled out, everything is in full view and easily accessible. Plus, the garage looks neat and tidy when the shelves are pushed back in.

Don't worry if you've also got some large items to store. The 16-ft.-long top shelf is 32 in. deep to hold big storage containers, and there's a 3-ft.-wide section of 16-in.-deep shelves for medium-

size items. The storage unit is 16 ft. long, 84 in. tall and 16 in. deep.

The cost of the materials for this project is about \$800. If you want to save some money and don't require as much narrow storage space, just reduce the number of rollout shelves. Each rollout, including hardware, costs about \$75.

Expect to spend three or



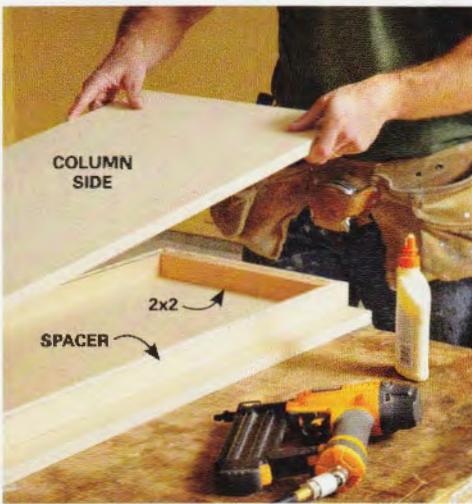
### Check this out!

This bypass door hardware is the key to smooth-gliding rollouts



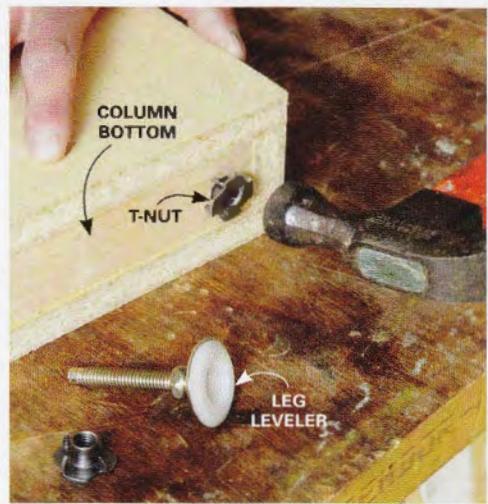
### 1 MARK THE WALL

Make a level line to indicate the bottom edge of the top shelf, and then mark the location of all four columns. Draw plumb lines to mark the edge of the 2x2 cleats.



### 2 ASSEMBLE THE COLUMNS

Wood glue creates a strong bond on particleboard and makes a strong assembly. Use brads to hold the parts together until the glue sets.



### 3 INSTALL LEG LEVELERS

Garage floors tend to be damp and unlevel. Adjustable leg levelers on the bottom of each column keep the columns dry and adjust to sloping floors.



### 4 INSTALL THE COLUMNS

Slip the columns over cleats mounted to the wall. It's easy to adjust the height and plumb the face of the column before screwing it to the cleat.



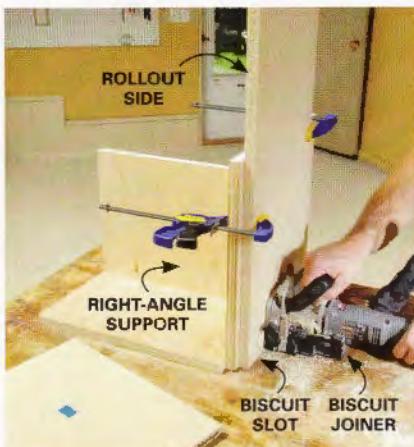
## 5 ATTACH THE TRACKS TO THE SHELF FRAME

To avoid working overhead later, screw the tracks to the shelf before you install it. Use the dimensions in **Figure B**, p. 54, to lay out the track locations.



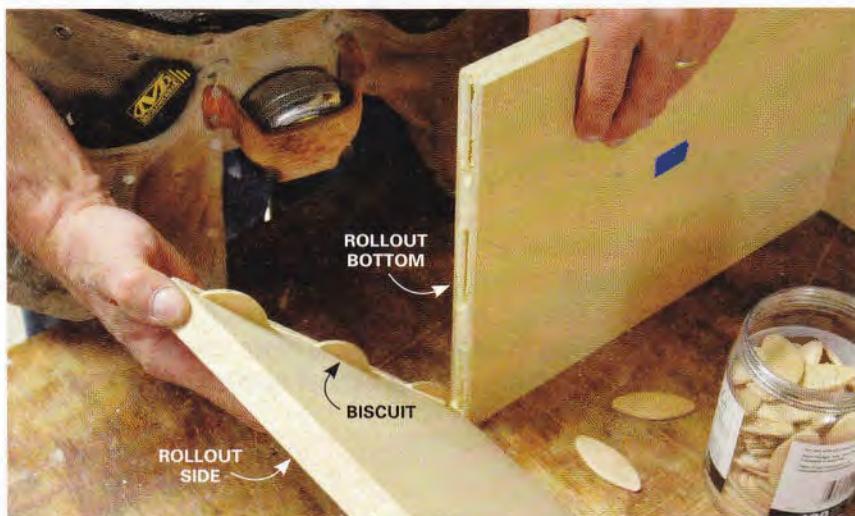
## 6 SET THE FRAME ON THE COLUMNS

Align the ends of the shelf with the outside edges of the columns and screw it to the studs.



## 7 CUT BISCUIT SLOTS IN THE ROLLOUT PARTS

Cut three biscuit slots on the face of the sides and matching slots on the ends of the top and bottom. The right angle support allows us to use the workbench top to support the biscuit joiner.



## 8 ASSEMBLE THE ROLLOUTS

Join the sides to the top and bottom of the rollouts with biscuits and wood glue. Clamp the parts together until the glue sets.

Next, use a level to see if the garage floor slopes. Measure 81 in. up from the highest point on the floor and mark the wall. Draw a 16-ft. level line across the wall from this point. We used a laser level to establish level reference points on each end of a 16-ft. line, and measured up from these points to mark the endpoint of the horizontal layout line. Then we snapped a chalk line between these points to indicate the bottom edge of the shelf and the top of the columns. You could also use a line level or step a 4-ft. level across the wall to mark the level line.

If your garage floor slopes more than 1-1/2 in. from one end of the unit to the other, you'll have to build some of the columns a little taller. Check this out by measuring down from the level line at each end. Finally, using **Figure B** as a guide, carefully mark the location of the wall cleats that anchor each column, and draw plumb lines down from each mark (**Photo 1**). Now you're ready to build the columns and wide shelf.

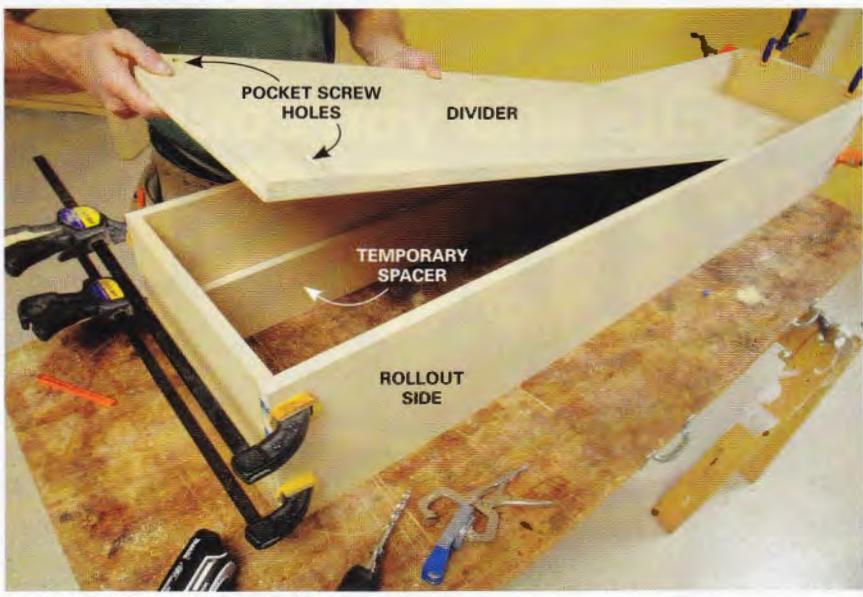
## Assemble the columns and shelf

Cut out the parts according to the Cutting List on p. 94. Then build the columns. **Photo 2** shows how to assemble the columns using wood glue and finish nails. Let the glue set. Then install the leg levelers (**Photo 3**). Mount the cleats on the wall at each of the column locations. Use toggle-type hollow wall anchors to anchor the cleats if there aren't any studs to screw into. We used Toggler Snaptoggle anchors, which are easier and faster to install than standard toggle bolts.

Mount the columns by slipping them over the cleats and driving screws through the sides into the cleats (**Photo 4**). We had to notch the bottoms of the columns to fit around the protruding foundation block. If you have a similar situation and the block is more than 6 in. above the floor, make sure to either shorten the rollout shelves or make them narrower so they don't run into the protruding foundation.

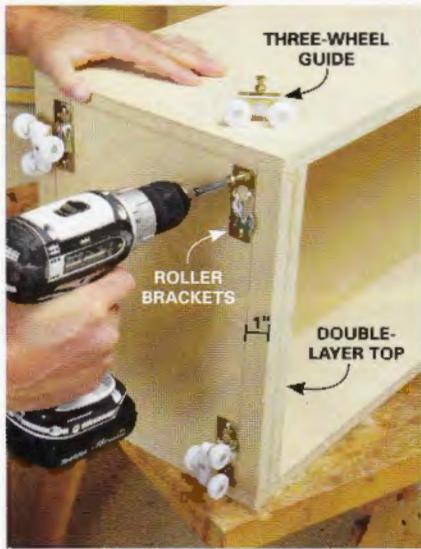
Adjust the leg levelers until the tops of the columns are even with the horizontal line. Then set a level against the front edge to make sure the column is plumb. You can slide narrow shims between the wall and the back edge of the column if necessary to plumb the column. When the column is plumb and the top is even with the level line, drive screws through the side and into the cleats. The next step is to build and install the horizontal shelf.

Screw 2x4s together to make the top shelf using **Figure B** as a guide. It's easier to attach the aluminum tracks to the shelf before you lift it onto the columns (**Photo 5**). Use **Figure B** as a guide for marking the track locations. Cut the tracks to 32 in. with a hacksaw. Then drill holes for the



### 9 INSTALL THE ROLLOUT DIVIDER

Use spacers to support the divider while you screw or nail it to the sides of the shelf. Vary the size of the spacers to create different-width shelves.



### 10 MOUNT THE ROLLERS

Adjustable rollers allow you to fine-tune the rollout shelves after they're installed. Each pair of rollers is rated for 125 lbs., for a total weight limit of 250 lbs. per rollout.

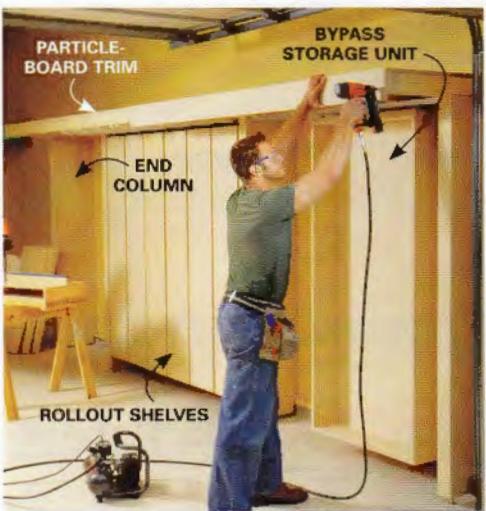


### 11 INSTALL THE ROLLOUTS ON THE TRACKS

Slide the rollers into the tracks to hang the rollout shelf. It's easy if you pile up some scraps to support the heavy rollout while you align the rollers.

### 12 ADD THE FINISHING TOUCHES

Finish up by nailing strips of particleboard over the front edge of the top shelf and the face of the columns. You can stain or paint the particleboard or just brush a coat or two of polyurethane over it.



mounting screws. Attach the tracks with 2-in. pan head or washer head screws.

Mark the stud locations on the wall. Then lift the shelf onto the columns and screw it to the studs with 4-in. structural screws or lag screws (**Photo 6**). Screw 3/4-in. particleboard to the top of the shelf frame. Check with a framing square to make sure the columns are at a right angle to the wall before you toe-screw the front of the columns to the shelf frame.

## Build the rollout shelves and bypass

**Photo 7** shows how we used a biscuit joiner to slot the sides of the rollouts. For more information on this "bench reference" biscuit joining method, go to [familyhandyman.com](http://familyhandyman.com) and enter "biscuit joints" in the search box. Mark the orientation of the parts by putting a piece of masking tape on the side facing you. When you assemble the parts, face the tape to the inside of the rollout. Glue and clamp the sides to the top and bottom (**Photo 8**). Glue a second layer of particleboard to the top for extra strength and to allow for the 1-1/2-in. roller mounting screws. **Photo 9** shows how to support the center divider with spacers while you attach it with pocket screws. If you don't have a pocket screw jig, just drive finish nails through the front and back of the rollout to secure the divider. You can adjust the position of the divider to accommodate your items. We moved one off-center to allow for 7-in.-deep shelves and built another unit with full-depth shelves. Use the same method to build the large bypass unit.

Finish the rollouts by attaching the roller mounting brackets (**Photo 10**) and the metal shelf standards. Draw lines 1 in. from the edge as guides for the brackets. Drill pilot holes and attach the brackets with 1-1/2-in. screws. Position the shelf standards about 3/8 in. from the front and back of the cabinet. We used 1/2-in. No. 4 flat head screws to attach the standards, but you can also use the small nails usually included.

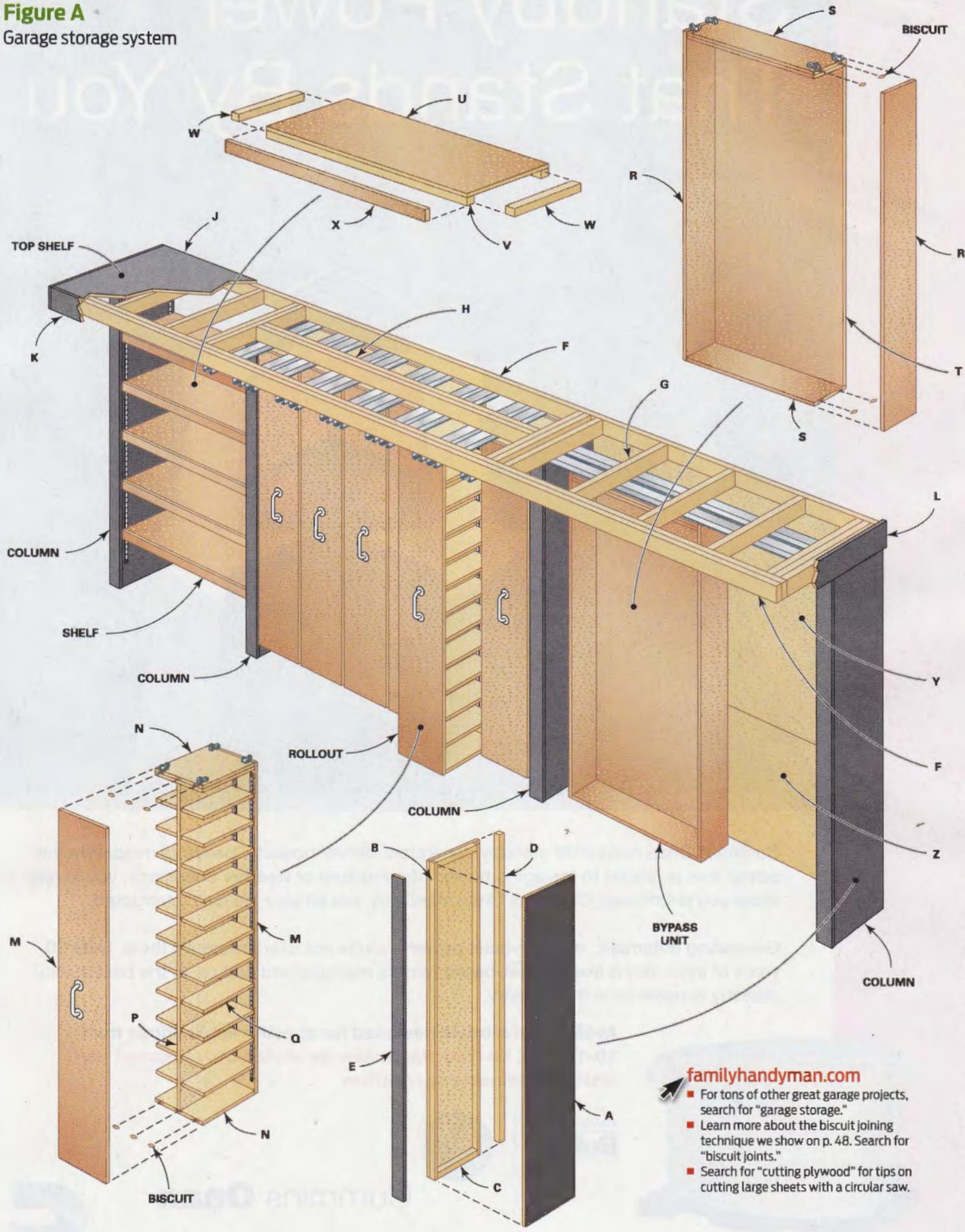
## Mount the rollouts and bypass

We used different techniques to hang the rollout shelves and the bypass unit. For the rollouts, it's simpler to connect the rollers to the top of the shelf first and then slide the wheels into the tracks (**Photo 11**). For the bypass unit, install the rollers in the track before you mount it, and then hang the bypass by sliding the rollers into the mounting brackets.

To prevent the rollers on the rollout shelves from bumping into the face trim, screw 1-1/2-in.-square blocks of particleboard to the outside end of each of the rollout shelf tracks. After all the rollouts are hung, adjust the rollers until the spaces between rollouts are even and the faces are flush when they're pushed in. Use the small wrench included with the rollers to turn the adjusting bolt located just below the rollers.

**Figure A**

Garage storage system

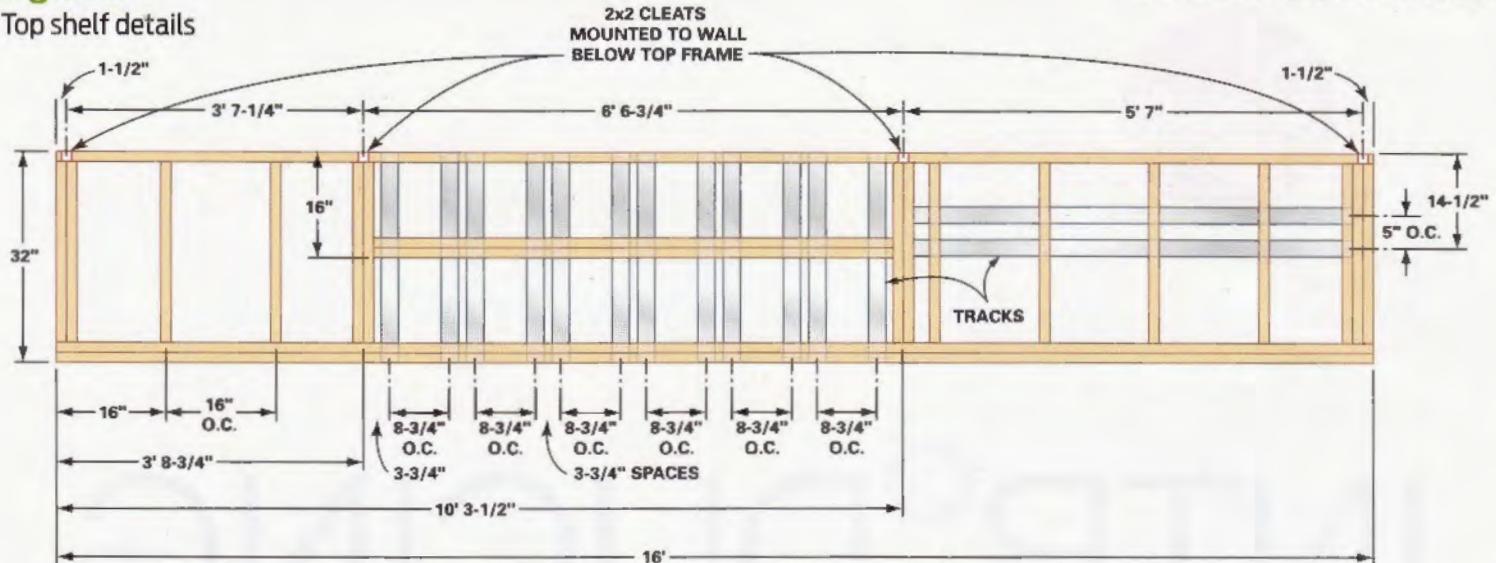


**familyhandyman.com**

- For tons of other great garage projects, search for "garage storage."
- Learn more about the biscuit joining technique we show on p. 48. Search for "biscuit joints."
- Search for "cutting plywood" for tips on cutting large sheets with a circular saw.

## Figure B

Top shelf details



## Finish up with trim boards

Complete the project by nailing strips of particleboard trim to the face of the columns and to the face of the top shelf (**Photo 12**). Two 8-ft. trim pieces will just cover the front edge. Then overlap the side pieces at each end. We also screwed sheets of particleboard to the

wall behind the bypass unit to provide an attachment surface for hooks and other hanging hardware. We stained the columns and trim black, and the face of the rollouts and the bypass unit with Cabot Early American stain. When the stain was dry, we brushed

two coats of Minwax Oil-Modified Polyurethane finish over the whole works to provide a little sheen and extra protection. If you plan to stain and finish the storage unit, consider doing it before you assemble the parts. It'll save you a lot of time and effort.

**54** September 2011 [familyhandyman.com](http://familyhandyman.com)

*Continued on p. 94*

# Breakthrough!

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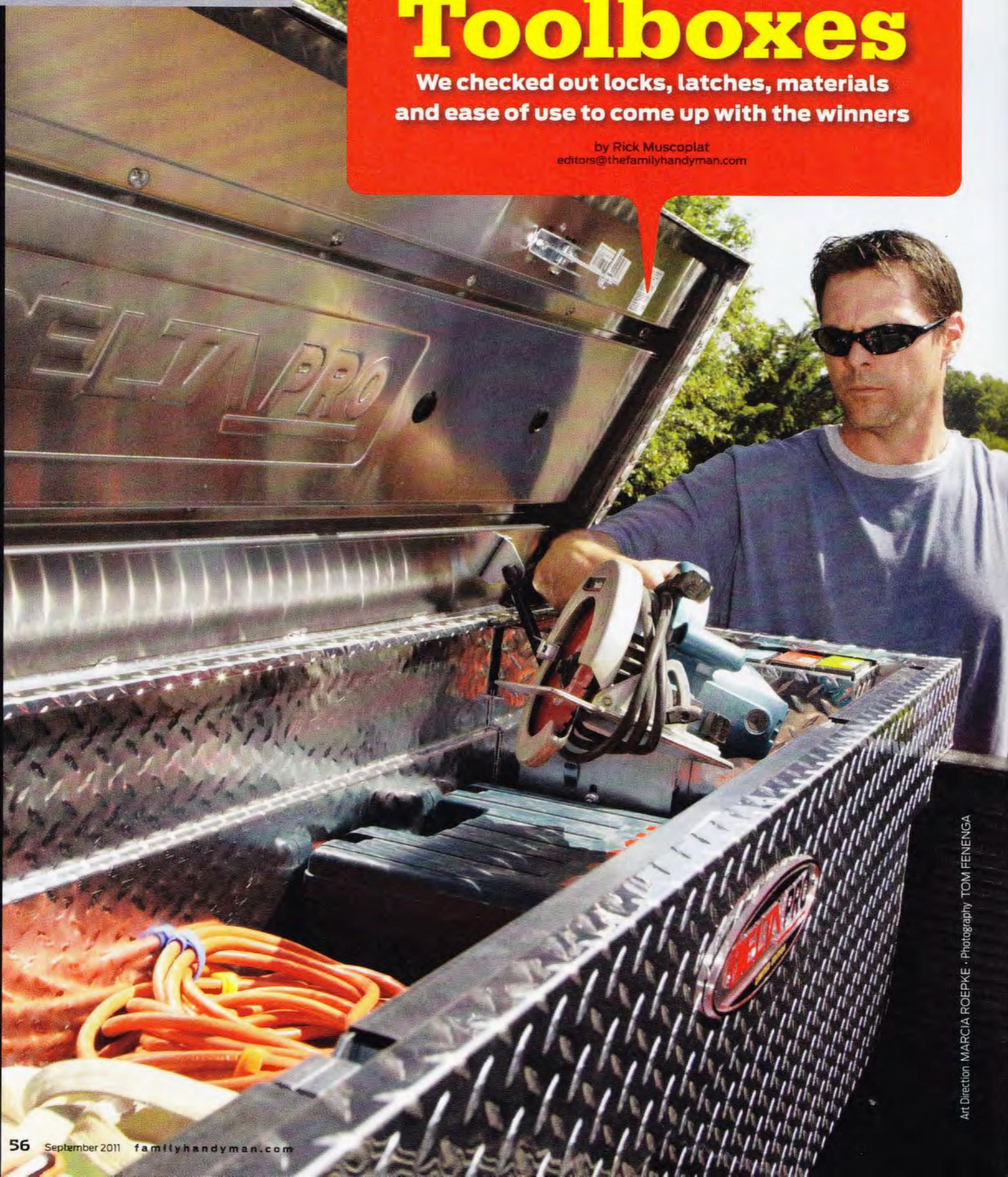
2011

# Best in DIY

## Best Truck Toolboxes

We checked out locks, latches, materials and ease of use to come up with the winners

by Rick Muscoplat  
[editors@thefamilyhandyman.com](mailto:editors@thefamilyhandyman.com)



Art Direction MARCIA ROEPKE • Photography TOM FENINGA

# How to choose a box

Most contractors would sooner give up their favorite brew than surrender their truck-bed toolbox. But you don't have to be a contractor to justify owning one. In fact, with some models ringing in at just under \$300, you too can clear out your cab and carry your gear in a weather-tight toolbox. We chose five widely available

boxes and put them on trial. We examined their stats and inspected them inside and out. We also slammed them and used and abused them to judge their real-world toughness. We limited our testing to full-size boxes, but all the same factors apply to boxes for smaller trucks.

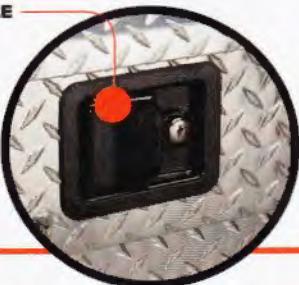
## Key toolbox features



GASKETS  
FOAM



LOCK  
PADDLE



PUSH-BUTTON



PUSH-BUTTON



ALUMINUM  
STEEL  
STRUCTURAL FOAM PLASTIC



a guy, his dog,  
his truck and his  
toolbox...

## The material question

Nothing beats a steel box for strength and “break-in” security. But beware if you live in a northern or coastal area with road salt or salt spray. Once the paint scratches, you’ll be fighting a never-ending battle against rust. That’s why aluminum is so popular—it doesn’t rust.

An aluminum box weighs almost 50 lbs. less than a comparable steel unit. So it’s easier to remove when you need the full bed.

Of course, if you just want an inexpensive box to store things like jumper cables and tie-downs, you could opt for a plastic box.

## Door styles

**Single-lid vs. gull wing doors.** Gull wing doors are great if you need to grab small tools and parts from truck side. But they’re really difficult to work with if you’re loading longer or heavier items like a chop saw stand.

## Latches

**Push-button vs. paddle style.** Push-button latches are easier to operate from truck side, but they’re also more expensive. You can open a paddle latch from truck side too, but opening an “upward-pull” paddle handle can be difficult from the side of the truck.

## Gaskets

**Foam vs. formed gaskets.** Foam deteriorates over time, and that changes how well the box seals and latches. Hollow-formed rubber gaskets last longer and don’t require latch adjustment. But they cost more.

## A chest might be best

Cross boxes are popular. But if your truck has a tonneau cover or you’re considering adding one, a chest box is the only style that’ll fit under the cover. And since a chest box sits at or near the height of the bed rail, it doesn’t obscure your vision through the cab’s rear window. This style box bolts to the bed floor, so you won’t be able to slide sheet goods or lumber under it. On the plus side, a chest box generally holds more tools than a cross box.



## Answer the security question first

If you’ll keep valuables in your toolbox, your best choice is a top-of-the-line box (\$700) with strong latches, a reinforced lid and beefy sidewalls. But if you just want to protect your tools from the elements, you have lots of choices.

## Then check for weather resistance

Most toolboxes do a pretty good job of sealing out rainwater. But you’ll need better hinges and latches and high-quality weather stripping to keep out blowing snow and sand.

## Then consider convenience

Any box can hold your tools. But it’s the ease of opening and closing that makes you love it or hate it. We’re lumping all the operational factors like opening and closing and lock and latch performance into the (subjective) convenience category. Here’s how we rated convenience:

- A quality lock should operate smoothly. If we had to exert extra force to operate the lock, or saw the need for periodic adjustment, we lowered the convenience rating.
- Gas lifts should open the lid quickly. If they needed help or felt weak, we lowered the rating.
- Closing force: If we had to push hard to latch the lid, we lowered the rating.

## Next, pick your style

Toolboxes come in two main styles: cross box (also called a saddle box) and chest (see right). We’re focusing on cross boxes because they’re the most popular and the easiest to install. Plus, you can slide sheet goods under it and access your tools from the side of the truck.

# Toolbox Tossdown



## Best Pro Grade Box

Weather Guard No. 117-0-02 Extra-Wide Aluminum Saddle Box

### SPECS

PRICE: \$700

CAPACITY: 15.3 cu. ft.

WARRANTY: Lifetime



This is a great box in every way. We loved the solid feel of the lid and latching hardware. The push-button has a smooth "machined" feel and depresses easily. The lid seals with a triple-ribbed formed rubber gasket. The gas lifts are heavy duty and protected by aluminum shields. The anchor rings on the front of the box are a great feature. The mounting brackets are much easier to use than standard J-hooks.

### MOUNTING BRACKET:

The custom-designed mounting brackets won't tear up your hands when you reach into the side pockets.



## Delta Champion No. 351-002 Black Aluminum Cross Box

### SPECS

PRICE: \$333

CAPACITY: 9.2 cu. ft.

WARRANTY: One year



This is a basic toolbox with a three-layer, foam-filled rigid lid and reinforced body sidewalls. So it's a bit sturdier than other consumer-priced boxes. However, you sacrifice capacity to get the added strength. The latches and gas lifts work smoothly and the top closes with a solid feel.



## Kobalt Deep Hawkbill Truck Box

### SPECS

**PRICE:** \$268 at Lowe's

**CAPACITY:** 13.23 cu. ft.

**WARRANTY:** Limited lifetime

A consumer-grade box with pull-lever latches and an adjustable strike. This medium-security box is well built and includes a lifetime warranty—which is a real plus. However, it doesn't come with mounting hardware, so pick up some J-hooks, nuts and washers (about \$2) before you leave the store. If you don't need a high-security box, this one offers reasonable storage capacity for a reasonable price.



## Best Value

### Husky Full-Size Deepwell Cross-Bed Truck Box, No. HSKALF591BK

### SPECS

**PRICE:** \$269 at Home Depot

**CAPACITY:** 16.25 cu. ft.

**WARRANTY:** Three years

A consumer-grade box with paddle latches and an adjustable strike. Sure, the aluminum is thin, making it a low-security box. But if you need lots of space, this box provides the most capacity of any box in this price range.



## Delta 203000 DI Structural Foam

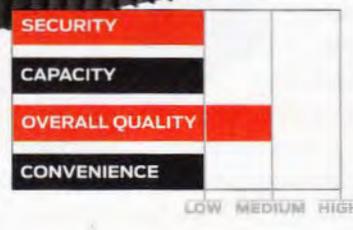
### SPECS

**PRICE:** \$325

**CAPACITY:** 8 cu. ft.

**WARRANTY:** One year

This all-plastic box is equipped with gull wing doors for side access. The push-button locks and spring-loaded lid are consumer grade. The plastic latch doesn't give us much confidence against break-ins. But if you're looking for a lightweight box to store nonvaluables like jumper cables and tie-downs, this one fits the bill.



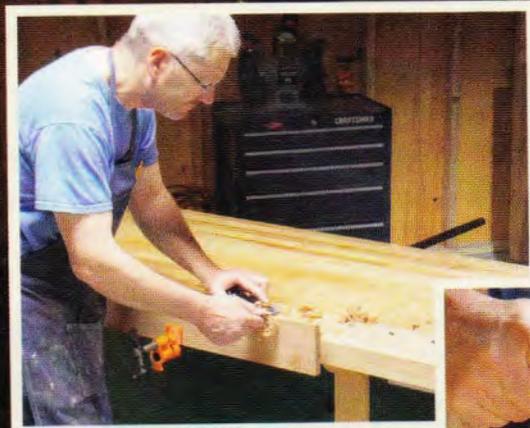
# Bomb-Proof Woodworking Bench

World-class workbench  
in a weekend

by Dave Munkittrick  
[editors@thefamilyhandyman.com](mailto:editors@thefamilyhandyman.com)

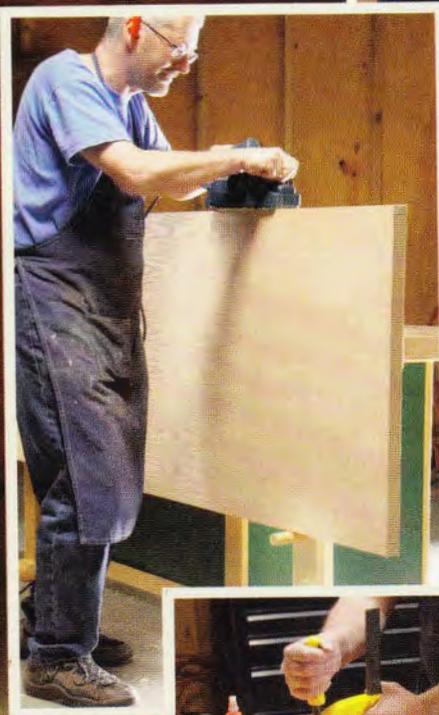


# IT DOES IT ALL!



**<< HOLD LONG STOCK! >>**  
Clamp one end in the face vise; hold the other end with a pipe clamp under the bench top.

**POUND AWAY! >>**  
The 2-1/4-in.-thick solid maple top will never flinch.



**<< SECURE BIG STUFF! >>**  
An easy-to-build bench jack supports large work.



**KEEP IT FLAT! >>**  
A dead-flat top keeps your glue-ups flat and true.



**<< HOLD STOCK! >>**  
The centuries-old bench dog design secures work for machining.

**If** you're looking for a "real" woodworking bench but don't want to spend a year and a thousand bucks building one, here's a great design for you. It'll grow with you as your skills improve; it's flat and solid enough to help you do your best work; and it's sturdy enough that you can proudly pass it on to your grandchildren. One weekend and the simplest of tools are all you need to build it.



## Meet Dave Munkittrick

Dave gave up his career as a commercial pilot to become a woodworker. He's been building furniture and cabinets for 20 years, out of a converted pig barn on his farm in Wisconsin.

## 3 top options

We used a ready-made, prefinished maple slab from Grizzly Industrial. The 2-1/4-in.-thick top cost \$385 plus shipping. It's very flat and stable. You could also use a 1-3/4-in.-thick Grizzly top (\$250).

You can make a top from three sheets of 3/4-in. plywood. Cut them oversize, then glue and screw two of them together and then add the third. Use plenty of screws; they can be removed after the glue is dry. This top probably won't be perfectly flat. Cost: \$100.

Use a solid-core exterior door. You can find them wherever recycled building materials are available or buy one at a home center. If you add 1/2-in. plywood as a wear surface, you'll have a 2-1/4-in.-thick top. It should be very flat and stable. Cost: \$20 to \$50.

## Time-tested features

This bench includes the signature features of a traditional woodworking bench: a thick, flat top designed to take a pounding; a tail vise and a face vise, mounted one at each end, for securing stock; and an overhanging top that allows you to clamp stock to the edges.

I eliminated the traditional tool tray because it's more of a housekeeping hassle than an effective place to keep tools. Leaving it off gives you a larger work surface. And since most of us are short on workshop space, I added a cabinet base for storage. The sliding doors are a cinch to make and mount, and they keep the contents free of sawdust.

The base is made from inexpensive 2x4s and plywood. The torsion box legs provide incredibly strong support and a place to mount trays and hooks to hold bench brushes, electrical cords and tools.

## What it costs

You can spend as little as \$250 if you mount only one vise (you can add the second later) and you make the top yourself (see "3 Top Options" at left). If you go all out like I did with two vises and a massive solid maple top, your cost will be closer to \$800. The 2-1/4-in.-thick maple top I used comes prefinished from Grizzly Industrial. It cost \$385 plus shipping. All you have to do is drill the dog holes, mount the vises and you're done. Grizzly also sells 1-3/4-in.-thick tops for \$250, but if you go this route, you'll need to put spacer blocks under the vises so they fit properly. You can buy unplaned maple for about half the cost of these tops, but you'll face many hours of surfacing, gluing and finishing—and getting the top dead-flat is tough, even for an expert.

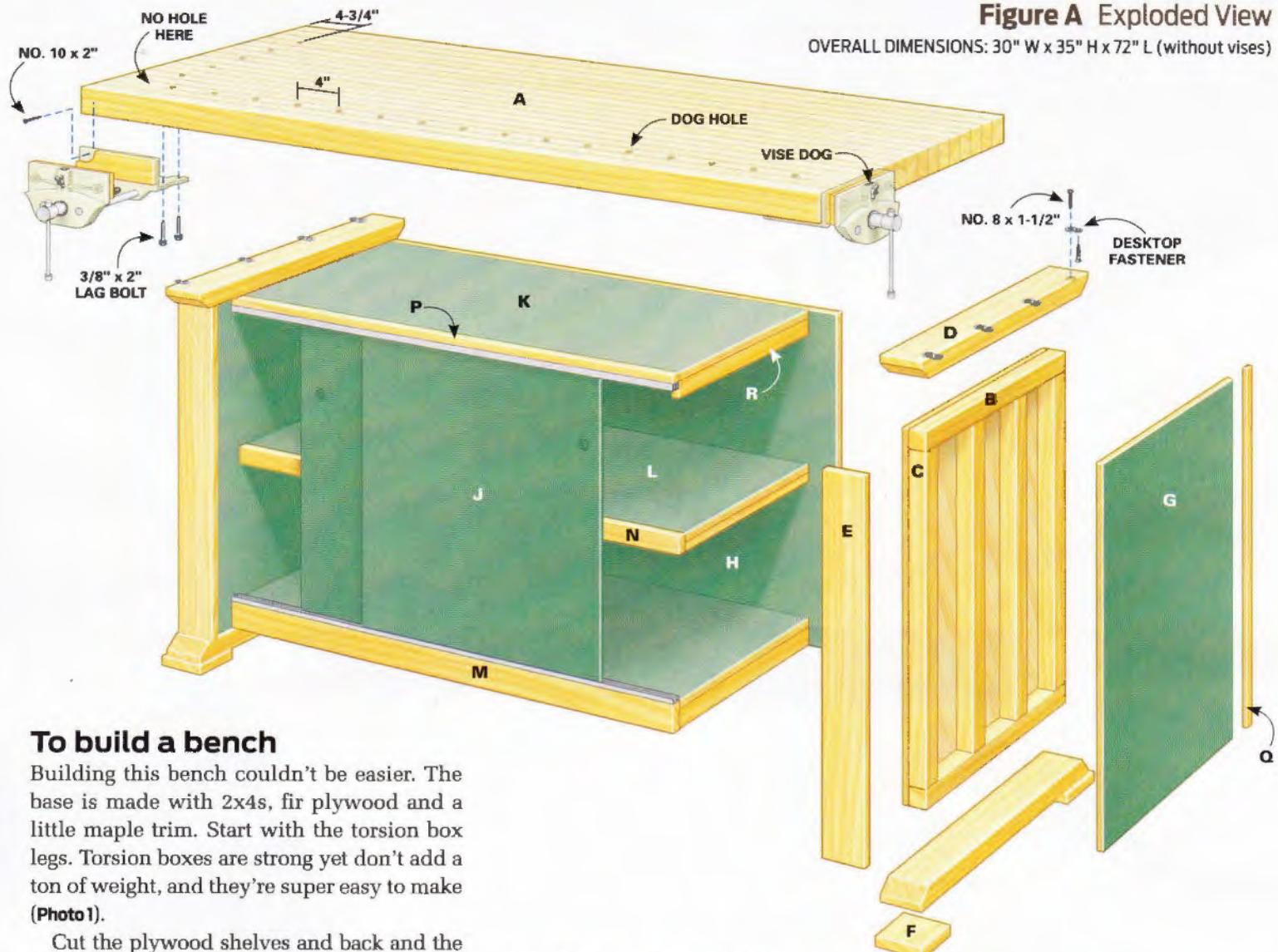


### 1 BUILD THE TORSION BOX LEGS

Assemble a 2x2 frame with screws. Be sure the joints are flush. Run a heavy bead of wood glue, then screw or nail the plywood skin so all edges are flush.

**Figure A** Exploded View

OVERALL DIMENSIONS: 30" W x 35" H x 72" L (without vises)



## To build a bench

Building this bench couldn't be easier. The base is made with 2x4s, fir plywood and a little maple trim. Start with the torsion box legs. Torsion boxes are strong yet don't add a ton of weight, and they're super easy to make (**Photo 1**).

Cut the plywood shelves and back and the shelf cleats (K, L, H, R). Screw the base together to check the fit. Disassemble the bench and paint the pieces. It's a lot easier to paint all the plywood pieces before final assembly. After the paint's dry, attach the shelves to the legs. Cut the 2x4 supports (D). Add the feet to the bottom supports and attach them to the legs with screws. Turn the base upright and attach the back (**Photo 2**). Add the top supports and the maple trim (M, N, P, Q). The trim piece Q is glued and nailed to the exposed edge of the back. Then secure the door tracks in the cabinet opening to complete the base (**Photo 3**). Cut the doors to fit.

Now turn your attention to the top. No matter what top you use (see "3 Top Options," p. 66), the following steps are the same. Set the top on a pair of sawhorses and lay out the bench dog holes. Use a guide to drill the holes so they're square to the top (**Photo 4**). We spaced the holes on 4-in. centers, 4-3/4 in. from the edges. Skip one hole in the front left corner, where it would interfere with the vise.

## Workbench Parts List

Part	Qty.	Dimension	Material	Description
A	1	2-1/4" x 30" x 72"	Maple	Top
B	4	1-1/2" x 1-1/2" x 23-1/2"	2x2	Torsion box rails
C	8	1-1/2" x 1-1/2" x 26"	2x2	Torsion box stiles
D	4	1-1/2" x 3-1/2" x 28"	2x4	Top/bottom support
E	2	3/4" x 3" x 29"	Maple/pine	Front trim
F	4	3/4" x 4" x 4"	Maple/pine	Feet
G	4	1/2" x 23-1/2" x 29"	Plywood	Torsion box sides
H	1	1/2" x 29" x 48"	Plywood	Back
J	2	1/4" x 22" x 25-1/2"	Plywood	Doors
K	2	3/4" x 20-1/4" x 43"	Plywood	Top/bottom shelf
L	1	3/4" x 19-1/4" x 43"	Plywood	Middle shelf
M	1	3/4" x 2-1/4" x 43"	Maple/pine	Bottom shelf trim
N	1	3/4" x 1" x 43"	Maple/pine	Middle shelf trim
P	1	3/4" x 3/4" x 43"	Maple/pine	Top shelf trim
Q	2	1/4" x 3/4" x 29"	Maple/pine	Side trim
R	6	3/4" x 1-1/2" x 19"	1x2	Shelf cleats

## Materials List

- 2-1/4" x 30" x 72" maple top, \$385
- 5 bd. ft. of maple, \$20
- Sheet of 3/4" plywood, \$38
- 1-1/2 sheets of 1/2" plywood, \$45
- 1/2 sheet of 1/4" plywood, \$12
- Three 8' 2x4s, \$8
- Two 9" bench vises, \$160 plus shipping
- Two packs of desktop fasteners, \$8

### SOURCES:

- Grizzly Industrial**, grizzly.com, (800) 523-4777.
- 2-1/4" x 30" x 72" maple top, part No. T21250, \$385 plus shipping.
- Shop Fox Quick-Release Vise, 9" Jaw**, part No. G9851, \$80 plus shipping.
- Rockler Hardware**, rockler.com, (800) 279-4441. Desktop fasteners, part No. 21650, \$4 per pack of 8.

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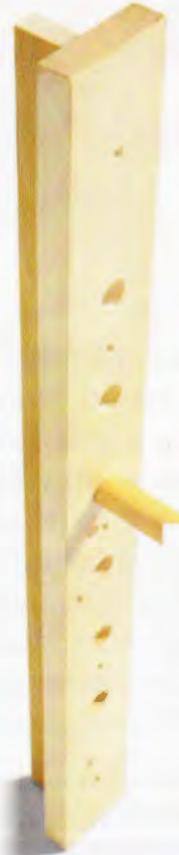
Flip the top over and mount the vises (**Photo 5**). Line up the metal dog on the vise with the dog holes in the top. To protect wood that will be held in the vise, make wooden faces and attach them to the vise jaws. Use a soft wood such as basswood or pine.

Mount figure-eight or other tabletop fasteners to the top supports. They may need to rest in a shallow hole in the support. These will allow the top to expand and contract without cracking. Get someone to help you set the top onto the base, then secure with screws through the fasteners. That's it. Your bench is ready for your first furniture project!

## DIY Accessories

### Bench jack

The purpose of a bench jack is to support long, wide stock such as a door. To make a jack, screw together a couple of pieces of 3-in. x 36-in. pine or plywood to form a "T." Drill 3/4-in. holes in the face of the jack. Clamp the bench jack in the tail vise, and insert a dowel at the desired height (**see photo**, p. 65).



### Bench dogs

Bench dogs work with the vise to hold stock on the bench surface (**see photo**, p. 65). They're easy to make. Drill a 1-in.-deep hole in 1-1/2-in. x 1-1/2-in. blocks of hardwood, then epoxy 3/4-in. dowel stock into the holes. To accommodate different stock thicknesses, cut the block to 1/4-in., 1/2-in., 3/4-in., 1-in. and 1-1/2-in. heights.

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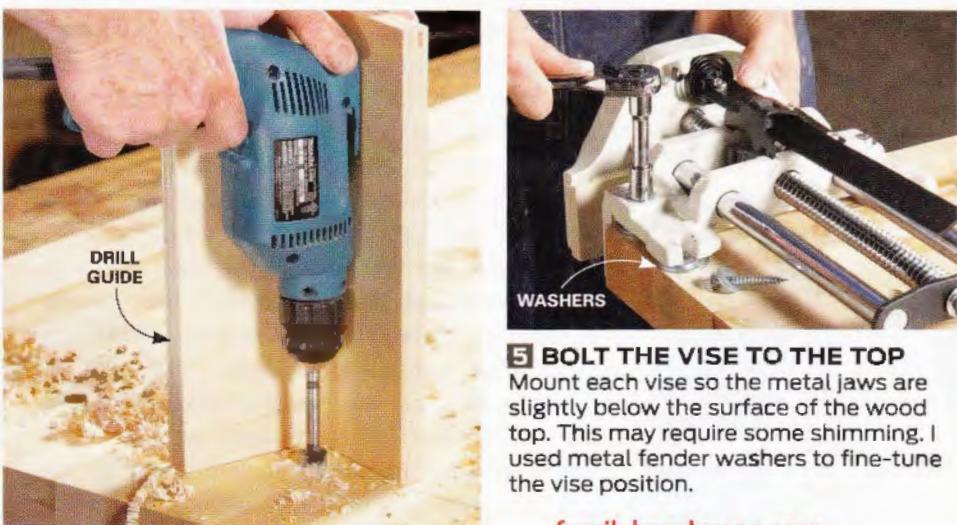
## 2 ATTACH THE BACK

Screw the back to the shelves and legs. It's best to paint the plywood surfaces before final assembly.



## 3 MOUNT THE DOOR TRACKS

Apply a bead of construction adhesive and clamp the door tracks in place. Cut the bottom track about 1/2 in. shorter than the opening. Center the track to leave gaps at each end so the door motion sweeps out accumulated sawdust.



## 5 BOLT THE VISE TO THE TOP

Mount each vise so the metal jaws are slightly below the surface of the wood top. This may require some shimming. I used metal fender washers to fine-tune the vise position.

[familyhandyman.com](http://familyhandyman.com)

- To check out our entire collection of workbenches and upgrades, search for "workbench."
- Get your workshop organized! Search for "shop storage."

## 4 DRILL THE BENCH DOG HOLES

Fit a corded drill with a 3/4-in. drill bit and drill the dog holes. A drill guide made from a couple of plywood scraps attached at 90 degrees ensures perpendicular holes.

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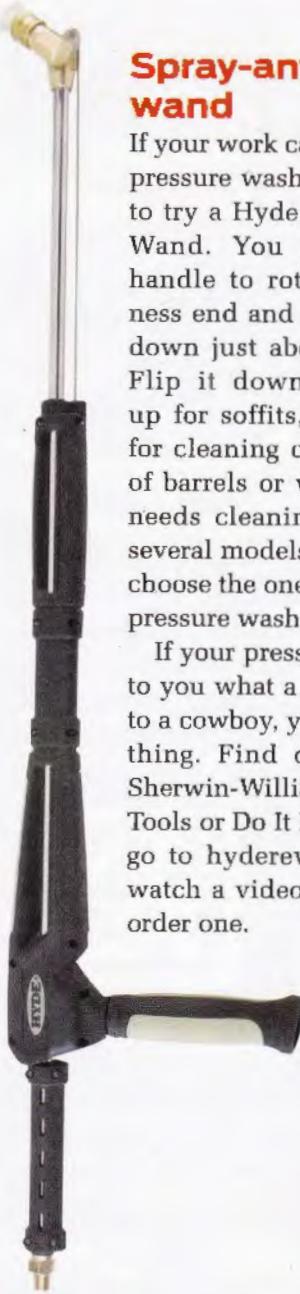
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# Pro Tools & Gear

by Travis Larson  
editors@thefamilyhandyman.com



## Spray-anywhere wand

If your work calls for a lot of pressure washing, you have to try a Hyde Pivot Nozzle Wand. You just twist a handle to rotate the business end and you can hose down just about anything. Flip it down for gutters, up for soffits, or sideways for cleaning out the inside of barrels or whatever else needs cleaning. There are several models (\$30 to \$60); choose the one that fits your pressure washer.

If your pressure washer is to you what a six-shooter is to a cowboy, you'll love this thing. Find one at select Sherwin-Williams, Northern Tools or Do It Best stores, or go to hyderewards.com to watch a video about it and order one.

## Kneel for a living?

So exactly how many knee pads have you gone through over the years? When it's time for replacements, forget the home center and go to Tommy Lesosky, the Wizard of Knee Pads! He's been making nothing but knee pads for the last 25 years and makes 25 percent of all the pads sold. Tommyco knee pads have cushions, surfaces and shapes specially designed for different trades. Install vinyl flooring? Kneel on lots of broken glass and nails? Lay tile for a living? Or maybe carpet? Doesn't matter—you'll find a pair just for you. They're all built for durability, comfort and pain-free James Brown-style knee drops. Prices range from \$30 to \$70. Go to kneepads.com and start shopping.



## One great stepladder

Like most builders, I've always stuck with standard ladders. (Gimmicks are for suckers, right?) I had put the Little Giant into the gimmick category—until I actually tried it. Now I know it's sturdy and can do things a conventional stepladder can't. Take the 300-lb.-rated Type 1A Select Step Model 5-8: You can extend it anywhere between 5 and 8 ft., so it can function as a 5-, 6-, 7- and 8-ft. ladder. Shorten the back side and you can work from stairs. The wide base makes it immensely more stable than a conventional ladder. The handy, well-designed shelf can be placed in different locations. And you can fold the back side to 90 degrees to let you work right against walls. If all that's not enough for you, it comes in at \$230—not much more than a high-end conventional stepladder. Check it out at [littlegiantladder.com](http://littlegiantladder.com). You can order one while you're there.



by Mark Petersen  
editors@thefamilyhandyman.com



**H**anging drywall is not all that complicated, but there is a right and a wrong way to do it. Here are some tips to save time and money, make taping easier and earn the confidence of your customer.

# Pro Tips for **Hanging Drywall**

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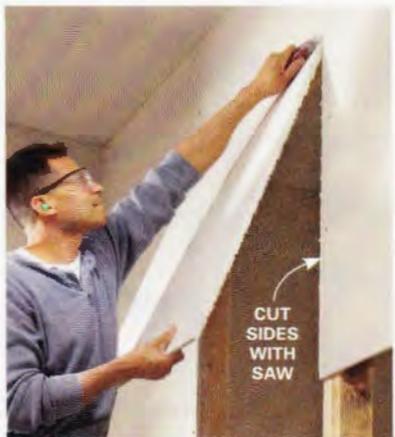
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CORNER BEAD WILL COVER

Cut outside corners flush with the framing

It's tempting to cut the first piece of an outside corner flush with the framing and run the perpendicular piece flush with the first. Don't do it! If you run the first piece just a little too long, the second piece will flare out. If you cut the second piece a bit too long, it will have to be shaved down to accommodate the corner bead. A good-quality metal corner bead will cover a gap and hold up as well as a perfectly flush corner—without the fuss.

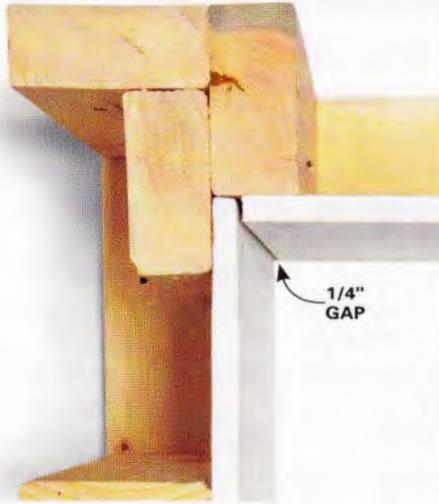


**CUT SIDES WITH SAW**  
**Hang it, then cut it**

You can save time and be guaranteed a perfect fit if you cut out the door opening after you hang the sheet. Once the sheet is up, score the back of the piece, pull the scrap forward and finish it off by cutting the paper on the front side.

## Inside corners: Measure exact, then subtract

When you're working in a smaller area like a closet and have to cut a piece that's going to fit between two perpendicular walls, don't try to cut exactly. Precision is a worthy goal, but you're not building a piano. All the inside corners are going to receive mud and tape anyway. If the piece is too big and you try to force it into place (which you will do), besides scraping up the drywall on an adjacent wall, you're more than likely going to damage the piece you're trying to install.



## Master the basics

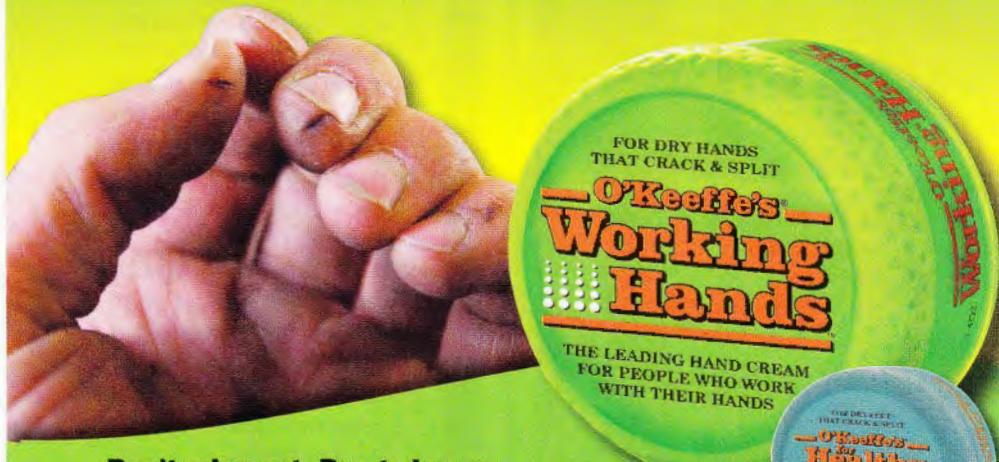
Even pros sometimes forget a few of the basics of good drywall installation. Here are some that we think are important to know:

- Think ahead when you deliver the drywall. For example, don't bury the sheets for the ceiling behind the ones for the walls. Stack all the sheets so the finished side is facing out. Place the drywall throughout the job site where it is most handy and won't be in the way. Order 12-ft.-long sheets whenever possible. Order 54-in.-wide sheets for 9-ft. walls. Consider having your drywall delivered; it costs about \$1 more per sheet.

*Continued on p. 78*

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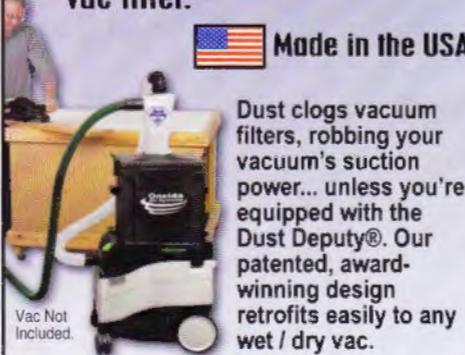
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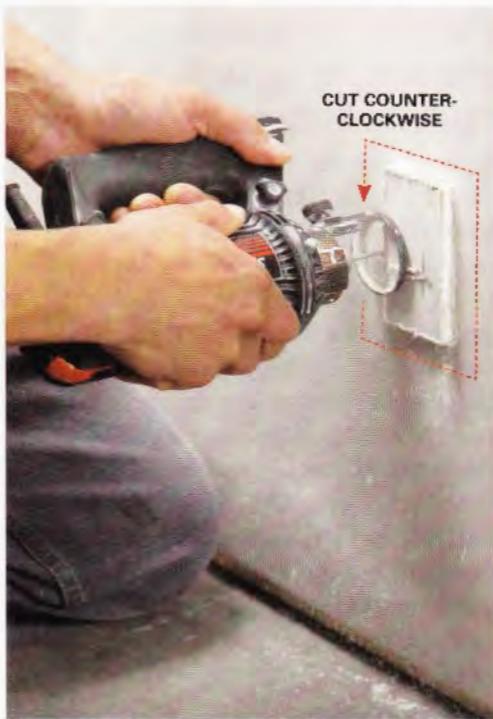
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Continued from p. 77

### Master the basics...

- Most manufacturers now offer a stiffer, 1/2-in. drywall that can be used on ceilings in certain situations. Half-inch is considerably easier to hang than 5/8-in., but make sure the drywall you use conforms to the fire code in your area.
- If you use a chalk line to mark your pieces before you cut them, use blue chalk. Red, orange or any other color is likely to bleed through the finish.
- If you write down measurements or mark the stud lines with a pencil, do it very, very lightly. Even modest pressure on drywall with a pencil will show up on your finished walls.
- In our neck of the woods, screws need to be spaced no more than 12 in. on ceilings and 16 in. on walls. Nails require 8-in. spacing on ceilings and 7-in. on walls. Technically, the fastening schedule code is whatever the manufacturer requires. That information can usually be found online.
- Don't overtighten the screws. If a screw breaks the paper, its holding power has been compromised. And don't undertighten the screws or your taper will curse your name while finishing your job.
- Leave about a 1/2-in. gap between the drywall and the floor. You don't want drywall to wick up moisture from concrete or from an inevitable spill in an upper level room. In addition, a gap at the floor makes it easier for carpet to be tucked under the trim.
- On a long wall, it's not always possible to steer clear of seams located directly over a window or door, but a seam that's in line with the horizontal edge of a window or door should be avoided at all costs. It's sure to crack.



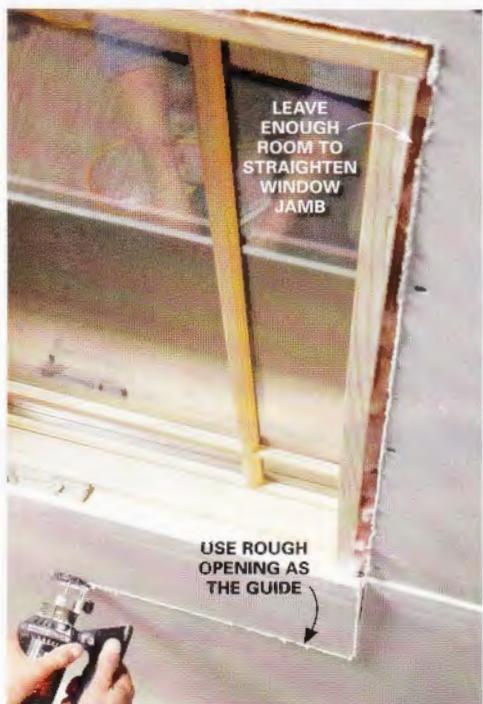
### Spiral saws— a hanger's best friend

Spiral saws save time and money if they're used properly. Here are a few tips for getting the most out of this important drywall tool:

- Make sure you're using a sharp bit, and have extra bits handy because they will break.
- Don't insert the bit too far into the spiral saw. About 1/8 in. of the bit's shank should be exposed. This allows the bit to flex and reduces the chance of breaking.
- Make sure the bit is adjusted to the proper depth. If the bit extends too far, you may cut right through an electrical box or nip a wire inside it. If the bit doesn't extend far enough, the tip of the bit may hop right over an electrical box or recessed light and head off in the wrong direction.
- Cut in the proper direction. Go clockwise when cutting freehand. When cutting around an electrical box or recessed light, move the spiral saw in a counterclockwise direction. The spinning motion of the bit should pull toward the object that's being cut around.
- Never overtighten the drywall or drive screws too close to the cutting area. The pressure will crack and tear the drywall as you're finishing the cut.

## Don't hang drywall too close to door jambs

Window and door jambs are not always straight. Often, the jamb has to be adjusted when you install the casing. This can't be done if the drywall is cut too close to the jamb. When you're using a spiral saw, guide it with the wood that makes up the rough opening, not the window jamb itself.



## Use heavy boxes and watch out for the wires

If you have any control over which electrical boxes are going to be used on the job, buy the ones made from hard plastic. A spiral saw can cut right through boxes made from soft plastic (usually blue) sending the saw off on an unfortunate path.

Make sure wires are tucked in far enough so the spiral saw won't cut them. Fishing new wire can be an expensive inconvenience, but cutting a live wire could be worse.

## Gaps mean extra work

All tear-outs and gaps that won't be completely covered by a cover plate have to be taped and feathered out—more work. So use your spiral saw carefully (and see the tip above about heavy plastic electrical boxes!). If a gap around an electrical box is just filled with mud and the cover plate is overtightened, the mud will crack and crumble out of the gap. The areas around outlets are particularly vulnerable because of the pressure of plugging in and unplugging electrical cords.



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## Back-beveling gives you wiggle room

Even in a world of spiral saws and screw guns, two classic tools—handsaws and key-hole saws—are still essential on any job site. One advantage of hand-sawing is the ability to create a back bevel. This allows for a little more leeway when you're sliding a piece into place, because if you need to trim, you won't have to remove as much material.

## Avoid a large gap at the floor

When you're dealing with a wall that is a few inches over 8 ft., two sheets of 4-ft. drywall will leave you with a large gap at the floor. While most base trim will cover that gap, the tapered edge on the bottom sheet will have to be filled with mud or it will show above the trim line, and that's a lot of extra work (and bending over!) for the taper. Instead of leaving a gap at the bottom, leave a gap in the center of the wall, and fill it with 3/8-in. drywall. The thinner drywall is a snap to tape over smoothly. Your taper will thank you.



✓ Yes



✓ Yes



✓ Yes



✗ No



✓ Yes



✓ Yes



✓ Yes



✓ Yes

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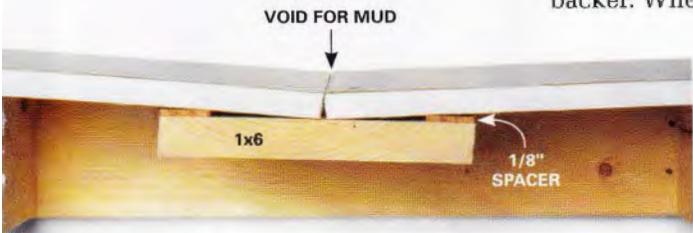
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## What butt joint?

A butt joint in drywall will result in a raised layer of tape and mud because the edges aren't tapered. A good taper can minimize the ridge over a butt joint, but it's hard to eliminate it altogether. If you're installing drywall by yourself or installing in a space where it's impossible to deliver 12-ft. sheets, butt joints are going to be unavoidable. And if you're dealing with wall sconces or areas where raking light means a truly flat wall is imperative, a butt joint backer may be the answer.



A butt joint backer is basically a 4-ft.-long, 5- or 6-in.-wide board with 1/16-in. to 1/8-in. spacers added along the edges. You can purchase them at a drywall supply store or make your own. You could use an inexpensive 1x6 pine board and either glue or staple strips of ripped-down wood to the outside edges.

Installing the backer is easy. First, install the sheet of drywall, making sure the end doesn't land on a stud. Next, attach the butt joint backer to the back of that piece. Finally, fasten the second piece of drywall to the backer. When installed properly, the

butt joint backer will cause the ends of each piece to suck in, resulting in a recess similar to the recess created by two tapered edges. □



THE PRO SECTION

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## Turn your truck into a generator

No matter how good your battery-powered saw or drill is, sometimes you need a plug-in tool to get the job done. Don't have an AC receptacle nearby? Well, if you have a truck, you already have most of the makings of a rolling AC generator. Just install an AC inverter and you'll have about 1,800 watts at your fingertips. The basic setup runs about \$450, and the upscale version (with auxiliary battery and isolator relay) about \$700. The installation takes just a few hours and requires only a drill and hand tools.

### Component shopping

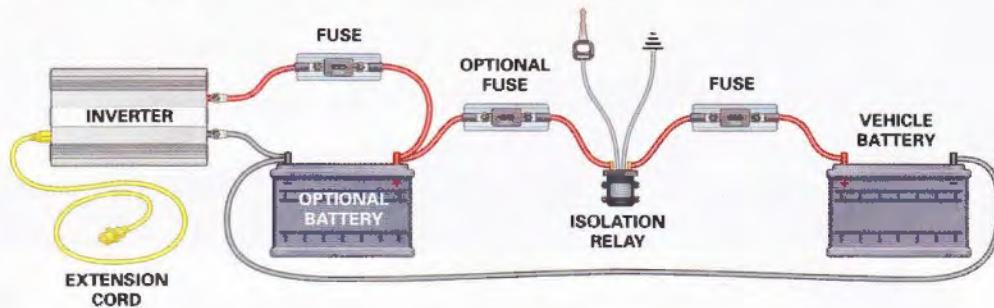
AC inverters come in two styles: modified and pure sine wave. A modified sine wave inverter (such as the AIMS No. PWRINV1800W; \$189 from theinverterstore.com) is less expensive and works great with power tools. For "cleaner" power to run a computer, TV or portable tool battery charger, buy a pure sine wave inverter. Be sure it has built-in overload, over-temperature, over-and-under voltage and fault protection, as well as neutral isolation.

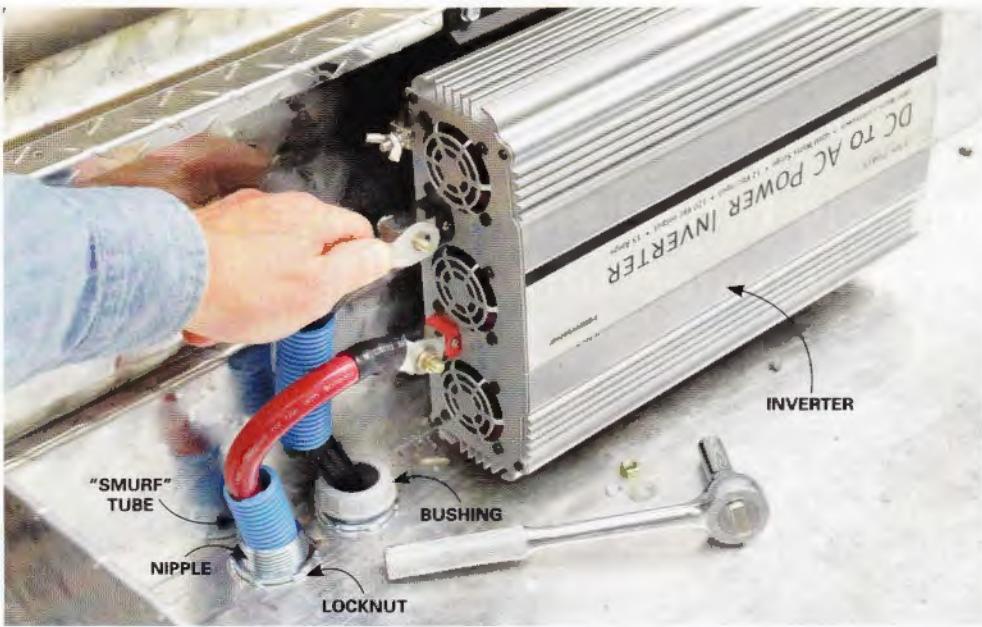
You'll also need one 200-amp fuse block/fuse kit (two if you add a second battery and three if you add a battery isolator). Order separate lengths of 1/0 cable for the positive and negative connections. Adding a 100Ah valve regulated lead acid (VRLA) absorbed glass mat (AGM) battery is optional. It adds about \$200 to the cost, but it helps prevent alternator overheating and helps maintain the voltage under heavy loads. Add an isolation relay (\$60) at the same time to prevent draining your main battery.



**Figure A** The complete system layout

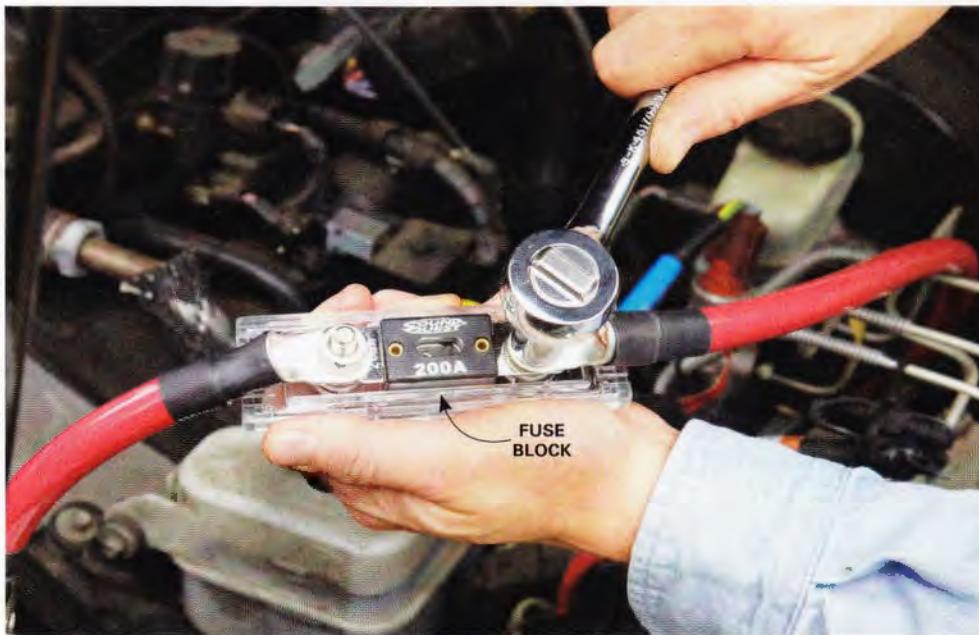
Locate one fuse block between the main battery and the relay. Mount a second one after the relay. Install the third one between the auxiliary battery and the inverter.





### 1 THREAD THE CABLES AND CONNECT

Pop 1-in. chase nipples into the holes in the bed and the box and spin on locknuts. Then push the "smurf" tube and cable through the nipples and connect them to the inverter.



### 2 SECURE THE FUSE BLOCK

Clamp the cable ring terminals under the serrated washers and install the fuse. Then tighten the nut and install the protective cover.

## Select a mounting location

Inverters create a lot of heat, so mount yours in a spot with adequate airflow like your truck bed toolbox or on the floor behind the driver's seat. Open the toolbox lid or the cab door when the inverter's in use.

## Run the cabling

Every vehicle is different, so I can't give you a "one-size-fits-all" wire routing scheme. But the most important rule is to keep both cables away from the engine block, pulleys, steering components, and the exhaust manifold and pipes. And run a separate negative cable from the inverter back to the main battery. To protect the cables under the vehicle, run them (especially the positive cable) inside flexible plastic 3/4-in. conduit. (This Carlon Flex-Plus Blue product, nicknamed "smurf" conduit by electricians, is available in 10-ft. lengths in the electrical department at home centers.) Then drill two 1-in. holes in the truck bed and two in the toolbox and install electrical fittings (**Photo 1**). Next, mount the inverter.

Mount the optional battery isolation relay under the hood and connect the trigger wire to a switch-powered "hot" wire. Install the optional auxiliary battery close to the inverter. See **Figure A** for the complete wiring diagram.

## Finish the job at the battery

Connect the positive cable to a fuse block before attaching it to the battery (**Photo 2**). Finish the job by connecting the negative cable to the battery.

### ASK THE MECHANIC

#### Octane woes

**Q** I put 87 octane in a vehicle that requires 93 octane. My buddy told me the computer is smart enough to compensate and I shouldn't worry. But now my "Check Engine" light is on and I'm really worried. What should I do?



**A** Your buddy was partially right. The computer is smart enough to detect the pre-ignition knock caused by the lower octane. To compensate, the computer retards the ignition timing. But sometimes that's not enough to prevent misfires and you can end up with a "Check Engine" light.

There's an easy fix, though. Just zip on down to the auto parts store and buy a few bottles of octane booster. Follow the directions on the label for the correct amount to add to your tank. Then drive the beast and refill with 93 octane when you reach a half tank. The "Check Engine" light should go out by itself and the computer should return your engine to normal soon thereafter.

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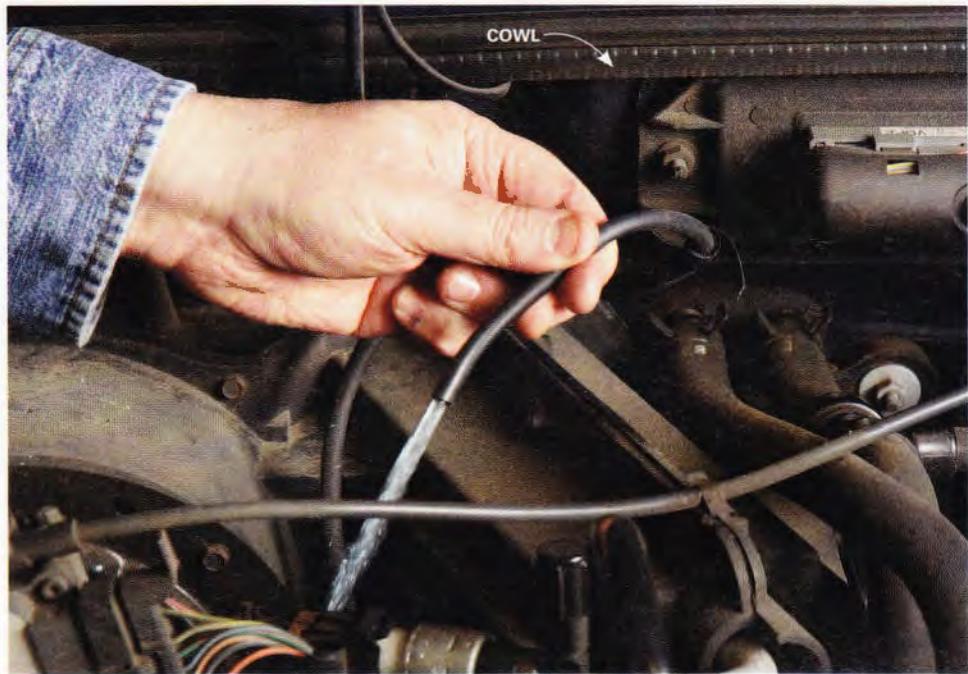
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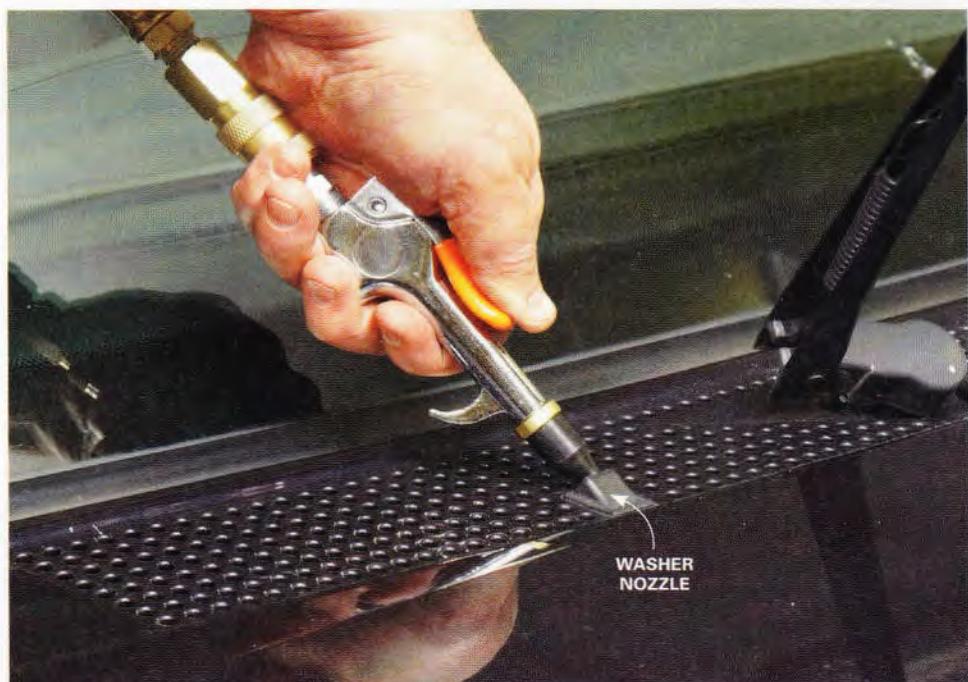
## Troubleshoot windshield washers

If you press the button for windshield juice and nothing comes out, you probably have a clogged nozzle. Start your diagnosis by making sure there's fluid in the reservoir. If so, check for fluid flow at the tee near the cowl (**Photo 1**). If that checks out, leave the tubing off the tee and clear out the nozzle with a compressed air gun (**Photo 2**). However, if you couldn't get fluid flow at the tee, you probably need a new pump (search for "windshield washer" at familyhandyman.com).



### 1 CHECK PUMP OPERATION

Follow the washer tubing from the reservoir to the tee. Disconnect the tubing and have a friend press the washer button. A strong stream of washer fluid indicates a good pump but a clogged nozzle.



### 2 BLOW OUT THE NOZZLE

Press a rubber-tipped compressed air gun against the nozzle opening and blow air backward through the nozzle (tubing still disconnected at the cowl). Then reconnect the tubing and try the washers again.



#### POP, SNAP AND LOAD

Lift up the front and rear vertical supports. Then fold out the horizontal bars and lock them together—instant cargo rack.



#### Cargo rack pops up when you need it

Want a cargo rack but hate having it in the way when it's not needed? The Invis-A-Rack (\$700 from [invisarack.com](http://invisarack.com)) mounts on your truck-bed side rails with clamps (**photo below**). To set it up, just pull up both sets of front and rear vertical bars and lock them in place (**photo left**). The whole operation takes about 60 seconds. Then load it up with ladders, lumber, a canoe or a small boat. The rack holds up to 500 lbs.—enough to handle just about any project.

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## THE 5 MINUTE PERFORMANCE UPGRADE

Does your car feel a little less peppy now than the day you bought it? It may not be just your perception – your car's engine may actually be delivering less power. According to a recent EPA study, a clogged air filter can rob your car of as much as 6-11% of its horsepower. At K&N, we have developed a High-Flow Air Filter™ that not only gets back the horsepower you have lost along the way, but in some cases, it adds a few extra horses compared with a new disposable paper air filter. Best of all, unlike disposable air filters, once a K&N® O/E Replacement Air Filter gets dirty, it can simply be cleaned and reinstalled, so it is the last air filter your car will ever need.



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## Things to lube before the snow flies

Cold weather is right around the corner, and now's the time to lube locks, latches, hinges, window channels and weather stripping. You can lube your entire vehicle in less than 20 minutes. All you need is dry Teflon spray, spray lithium grease, a rag and glass cleaner.

Start with the window channels (**Photo 1**). Proper lube can prevent binding and freezing and save you the cost of a busted regulator (\$400, installed). Then shoot the door and trunk/hatch lock cylinders (**Photo 2**). Next coat all the weather stripping (**Photo 3**). Finish the job by lubing the hood, truck or tailgate latches (**Photo 4**).



### 1 LUBE WINDOW CHANNELS

Lower the window glass and shoot dry Teflon spray down the front, rear and top window channels on each door. Soak the channels. Then run the window up and down several times to spread the lube. Finally, raise the window and clean off overspray with glass cleaner.



### 2 LUBE THE LOCKS

Use the spray straw to force the lock "door" open. Then inject a quick shot of dry Teflon spray into the lock cylinder. Insert your key and rotate the lock to spread the lube.



### 3 COAT WEATHER STRIPPING

Spray all the weather stripping with dry Teflon spray. Then spread it with a cloth.



### 4 GREASE THE LATCHES AND HINGES

Spray the hood and tailgate latches with lithium grease. Then spray the door hinges. Operate the latches and doors several times to spread the grease.

## 2011 Mazda Tribute SUV: Rigid construction, smooth ride and good looks

Looking for a peppy SUV for the family at a reasonable price? The 2011 Mazda Tribute seats five adults comfortably and provides 67.2 cu. ft. of storage space with the rear seats down. The base model 2.5-liter four-cylinder engine delivers 23/28 mpg and puts out 171 hp. Need more horses to haul the, uh, horses? Just move up to the 3.0-liter V-6 240-hp engine (19/25 mpg).

If you drive in slippery conditions, consider adding Mazda's exclusive all-

wheel-drive Active Torque Control Coupling (ATCC). Many mechanical or hydraulic AWD systems respond to wheel slippage. But Mazda's computer-controlled ATCC system predicts traction changes and prevents the wheels from slipping.

in the first place. Upgrade to 4WD (\$3,795) and automatically get ATCC in the deal—a very worthwhile addition.

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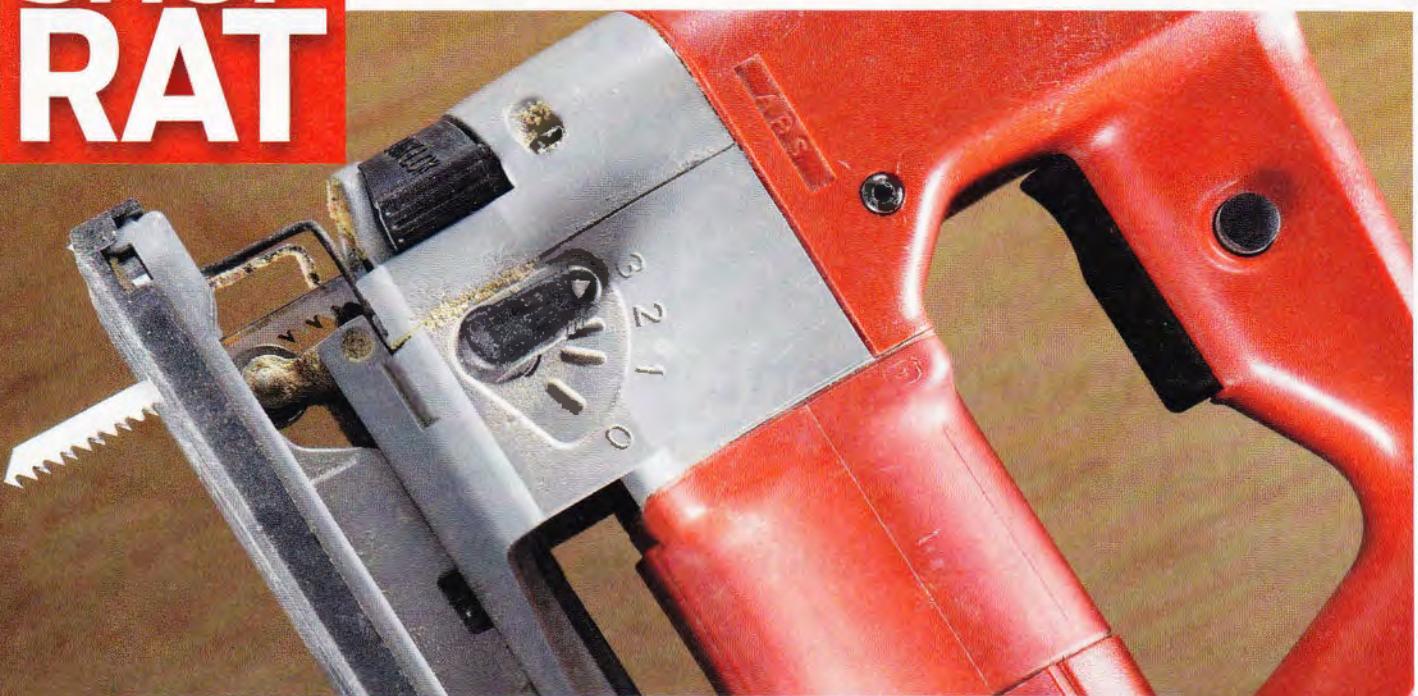
### Fluids tip

Brake and power steering fluids are not interchangeable. And if you accidentally pour in the wrong fluid, it can cost you a bundle—upward of \$800 to repair a brake system and even more for power steering.

If you add your own fluids, here's a tip to reduce the opportunity for screwups. Wrap duct tape over the printed label on your bottles of power steering and brake fluid. Then draw a large steering wheel icon for the power steering fluid and a brake pedal for the brake fluid.

# SHOP RAT

by Travis Larson  
shoprat@thefamilyhandyman.com

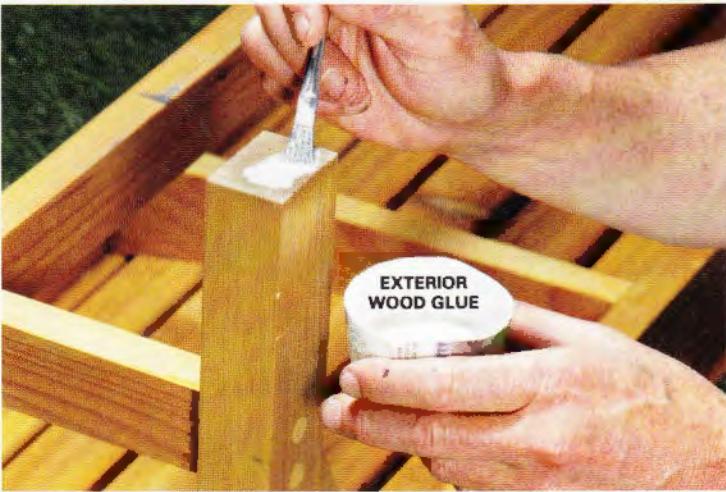


## Backward jigsaw

The other day I was cutting an opening for an electrical outlet in the cabinet back directly below a breakfast bar. The cutout was so close to the counter that I couldn't run the saw upside down without the saw body hitting the counter. Ordinarily I'd finish the side cuts by nibbling away with the saw held horizontally. Then I got the brilliant idea of putting the blade in backward and pulling the saw toward the floor. It worked perfectly! Wish I'd thought of it 30 years ago. This is only for small jobs, though. The blade teeth ride against the guide wheel, so they wear down rather quickly.



Art Direction MARCIA ROEPKE • Photography TOM FENEGA



## Long-lasting outdoor furniture

Any wood resting on the ground will rot, especially if it's end grain. That's because water wicks up into the same channels the tree used to transport water. So whenever I build outdoor furniture, I do two things: First I seal the end grain with Titebond III (or any other waterproof woodworking glue). And if the legs are resting on masonry, I pound in plastic furniture buttons (\$3 per set at home centers). That keeps the wood slightly elevated so it won't be sitting in puddles. 



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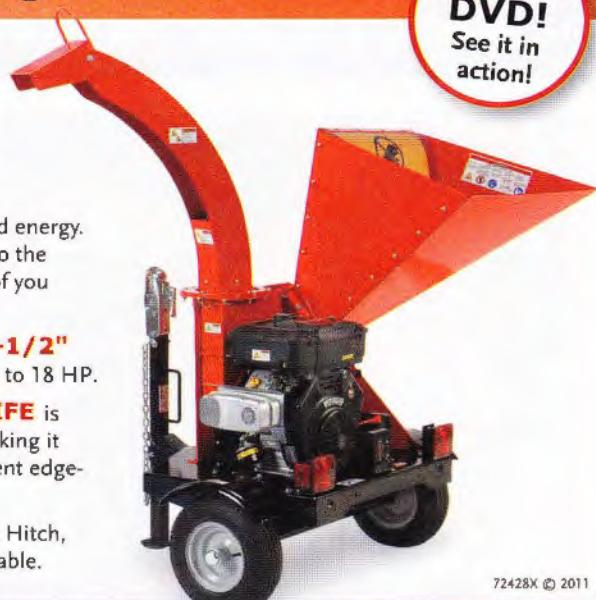
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Continued from p. 54

## Cutting List

### KEY QTY. SIZE & DESCRIPTION

#### Columns

A	8	15-1/4" x 80" x 3/4" particleboard sides
B	8	1-1/2" x 80" x 3/4" particleboard spacers
C	8	1-1/2" x 12-1/4" x 1-1/2" particleboard spacers
D	4	1-1/2" x 1-1/2" x 80" spf (spruce, pine, fir)
E	4	3-1/8" x 80" x 3/4" particleboard face trim

#### Top shelf

F	3	2x4 x 16' spf
G	15	2x4 x 27-1/2" spf
H	2	2x4 x 75-3/4" spf
J	2	32" x 96" x 3/4" particleboard top
K	2	5-3/4" x 96" x 3/4" particleboard face trim
L	2	5-3/4" x 32-3/4" x 3/4" particleboard end trim

#### Rollouts (all particleboard)

M	12	11-3/4" x 74-1/2" x 3/4" sides
N	18	11-3/4" x 14-1/2" x 3/4" tops and bottoms
P	6	14-1/2" x 72-1/4" x 3/4" divider
Q	132*	5-1/2" x 14" x 3/4" shelves

\* Adjust to your needs. This includes 22 shelves for each rollout.

#### Bypass unit (all particleboard)

R	2	8" x 74-1/2" x 3/4" sides
S	3	8" x 30-1/2" x 3/4" tops and bottoms

T	1	30-1/2" x 72-1/4" x 3/4" back
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#### Shelves

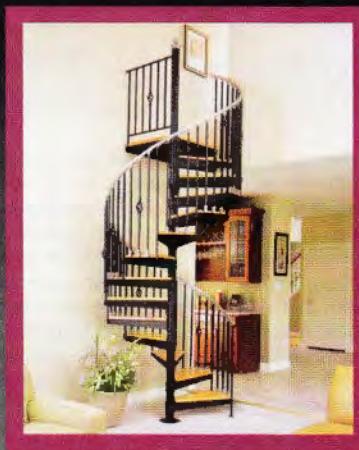
U	5	14-1/2" x 39-3/4" x 3/4" particleboard tops
V	10	2x2 x 39-3/4" spf top and back frame
W	10	2x2 x 11-1/2" spf side frames
X	5	2-1/4" x 39-3/4" x 3/4" particleboard face trim
Y	1	64" x 48" x 3/4" particleboard
Z	1	64" x 28" x 3/4" particleboard

## Materials List

ITEM	QTY.
2x4 x 16' spf (spruce, pine, fir)	6
4' x 8' x 3/4" particleboard	15
Johnson No. 1120 three-wheel hanger* (part of No. 1500 pocket door hardware set)	28
Johnson No. 100-0096 96" track*	3
Johnson No. 100-0072 72" track*	2
* Parts numbers for johnsonhardware.com	
KV0255 ZC 72 shelf standards**	28
KV0256 ZC shelf supports**	548
SC4X12F ZC No. 4 x 1/2" flat head screws**	200
SCT3816 T-Nut**	4
LA38 212 Leg Leveler**	4
** Parts numbers for wwwhardware.com	

#### Wood glue

No. 20 biscuit	72
1-1/4" pocket screws	56
4" structural screws or lag screws	24
3" screws (to toe-screw columns to frames)	4
1-1/2" finish nails or nail gun pins	
Handles	



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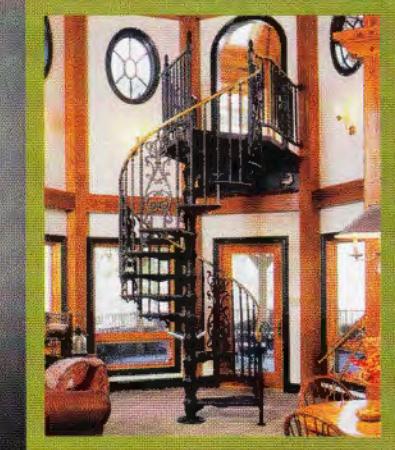
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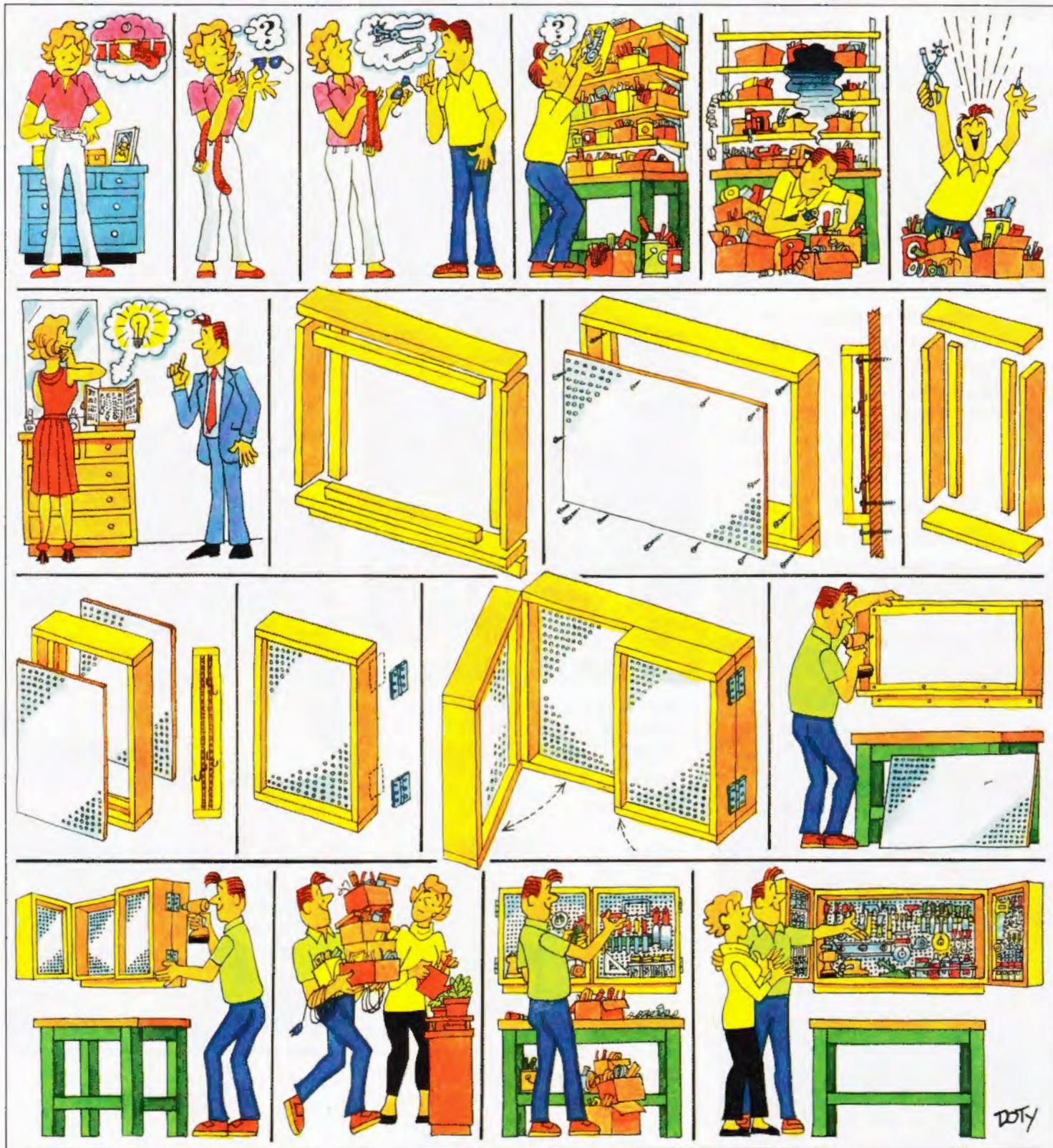


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## Pegboard tool locker



Our thanks go to Bob Boucher, Middleville, MI, for this idea.

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# GREAT GOOFS®

from our readers  
greatgoofs@thefamilyhandyman.com

## The bathroom is occupied

To save a few bucks, I decided to cut down one of our trees myself. I easily removed all the lower branches with my pole saw and then had the brilliant idea of taking the saw upstairs and hanging out the second-story bathroom window to remove the upper branches. All went well until the last (pretty large) remaining limb. I planned the cut so that the branch would fall into the "safe and open space" in the yard. Unfortunately, the nearly 12-ft. limb had other ideas. I narrowly avoided being skewered as it crashed through the window opening and came to rest a few inches from the doorway. People do a variety of things in their bathrooms—but how many have cut firewood while standing in the bathtub?

Greg Ruvolo



## Plaster—it's what's for dinner

My parents were turning the attic space directly over the dining room into an extra bedroom. That space had no flooring, which was one of the first jobs they tackled. One evening, they set out our dinner and went upstairs to work while we ate. Suddenly we heard a scream and a crash and saw Mom's foot come through the ceiling! She'd forgotten all about the lack of flooring and stepped right through the ceiling. She wasn't hurt, but the soup that night was pretty crunchy due to the plaster dust and all.

Ellen Samuel

## A date to remember

After our second date, Joe offered to fix my microwave oven, which was installed above my stove. He climbed up a ladder to take a look and asked me for a flashlight. I gave him the only flashlight with working batteries, a gigantic industrial metal one, and then I left him alone. I figured everything was going fine until I heard a crash and the words, "Oh, shoot!" (Not quite.) The flashlight had rolled out of the cupboard above the microwave and smashed onto my glass-top stove, shattering it into smithereens. Long story short, I married him anyway and got a great husband (New England's Best DIY Handyman) and a shiny new stove.

Sue Selvidio-Stanley

Do you have your own tale to tell about romance and home improvement? Send an e-mail to [greatgoofs@thefamilyhandyman.com](mailto:greatgoofs@thefamilyhandyman.com).

**Got your own do-it-yourself mistake?  
Get \$100 for your Great Goof!  
See Contributor Guidelines on p. 4.**