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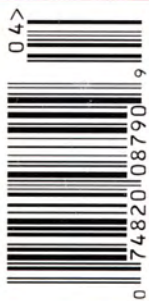
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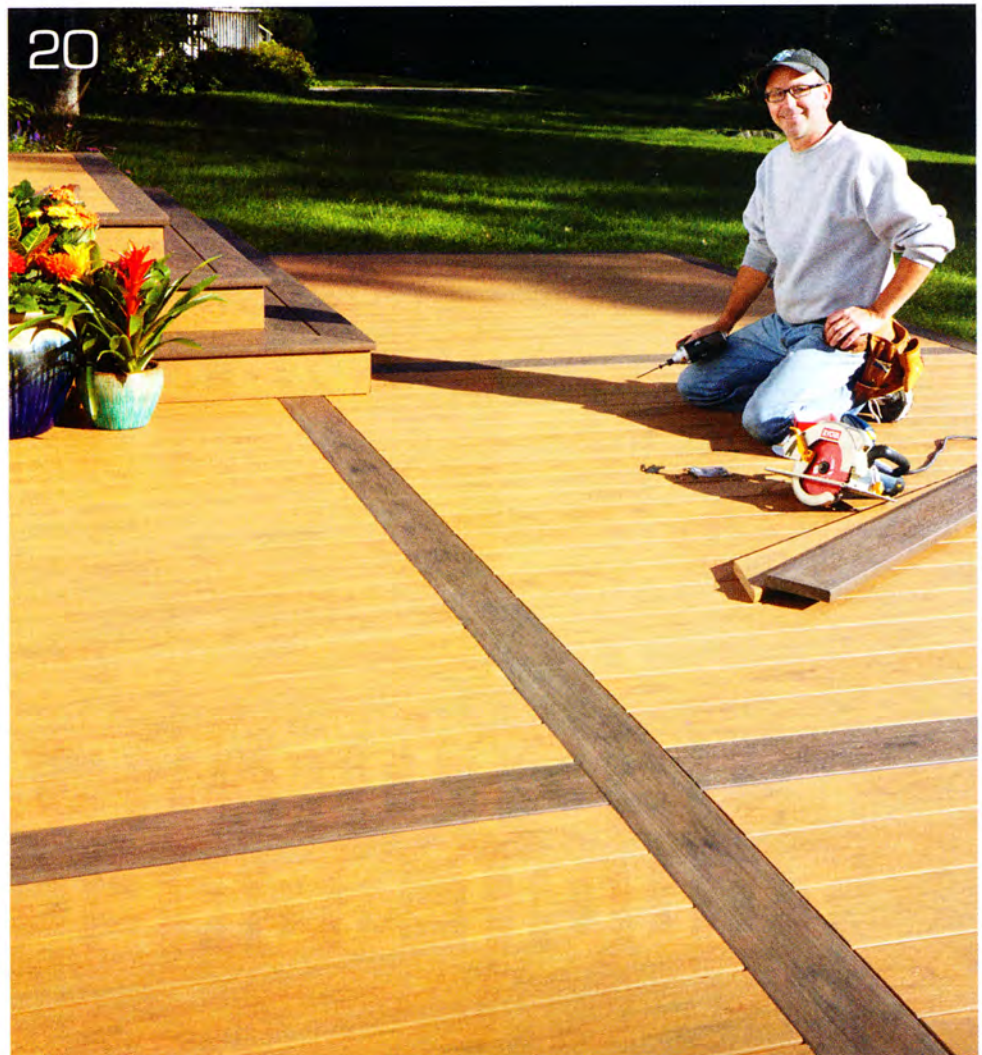
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## GOT A DIY QUESTION?

Finding answers is easy at 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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We pay \$100 for Handy Hints®, Great Goofs® and Wordless Workshop™ submissions that we publish. Please include a photo of yourself from the shoulders up. Submit your original contribution, along with photos or sketches, by e-mail to: [DIYer@thefamilyhandyman.com](mailto:DIYer@thefamilyhandyman.com), [handyhints@thefamilyhandyman.com](mailto:handyhints@thefamilyhandyman.com), [greatgoofs@thefamilyhandyman.com](mailto:greatgoofs@thefamilyhandyman.com), [wordless@thefamilyhandyman.com](mailto:wordless@thefamilyhandyman.com)

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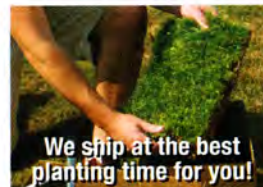
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# STUFF we love

BY TRAVIS LARSON

editors@thefamilyhandyman.com



## BE A STONEMASON—NO SPECIAL SKILLS REQUIRED!

If you love the look of stone but don't have the bucks to hire it installed by a pro or the skill (or courage) to install it yourself, check out Boral's Versetta Stone panelized stone veneer.

Believe it or not, there's no mortar involved. The key is a tongue-and-groove interlocking system with a concealed flange that anchors each 8-in. x 36-in. panel to the wall with screws or nails. The panels are made of lightweight aggregate materials but look like real stone. Use the panels anywhere inside or out. They can be attached to masonry, studs or 1/2-in. sheathing. Outside use also requires moisture barrier and a few more steps to deal with moisture.

Cutting is simple with a circular saw and a diamond blade or any saw designed for cutting masonry. You'll have to calculate the number of special "universal corners" for inside or outside corners and, of course, how many panels you'll need. Go to [boral.com](http://boral.com) for help with that as well with finding a supplier. Expect to pay \$12 to \$15 per sq. ft.

UNIVERSAL  
CORNER



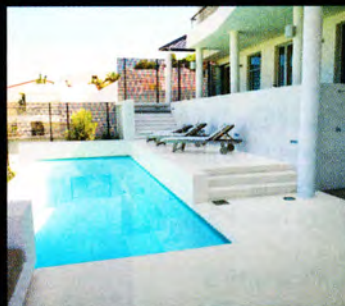
# Fernandina Beach had a deck problem, Rust-Oleum Restore had a solution.



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





## Keep your tootsies toasty

To save money, I keep the temp in my shop down low when I'm not in it and crank up the heat when I am. But even when the air temperature hits 70 degrees F, the concrete floor is still Minnesota-cold. I tried a space heater under my bench, but it broiled my shins and still left me with cold feet. So I recently bought a foot-warming mat, and now my feet stay toasty warm. Plus, it uses a fraction of the electricity and is a lot safer than a space heater. Cozy Products makes the mat. I bought mine at amazon.com for \$40 plus shipping (search for "foot warmer mat"). The folks at Cozy suggest putting a chunk of cardboard underneath it if you use it on flooring that could fade from the heat, like carpet or wood.

**Mark Petersen, Contributing Editor**



## DIY WORK WEAR

### Protect your brainpan

Nobody is a fan of hard hats. They're just not very comfortable, and they tend to fall off unless you're standing completely upright.

For those jobs where a hard hat isn't required but there's still some danger of whacking your noggin, try a bump cap instead. It doesn't provide as much protection as a hard hat, but it's not nearly as cumbersome, and it fits just like a baseball cap.

Bump caps can protect your melon when you're climbing around a cramped attic, working in a tight crawl space, or whenever you're near a clumsy coworker who has a bad habit of dropping tools while working off a ladder.

The Skullerz Bump Cap shown here is made by Ergodyne (ergodyne.com). You can buy one at coopersafety.com. It will cost you \$20, or \$35 for one with an LED light.

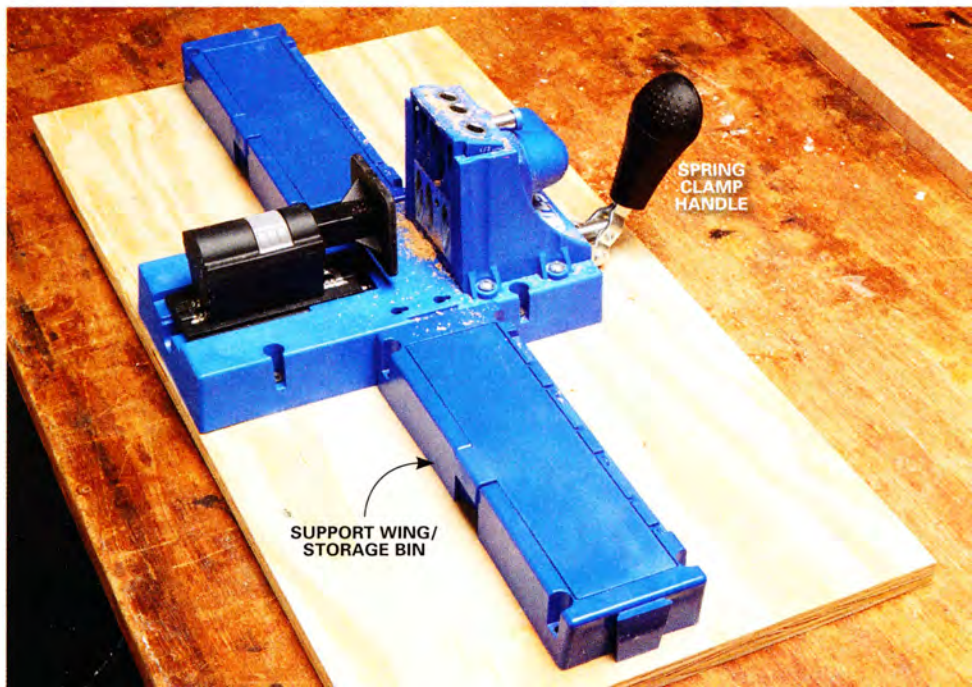
## Premier pocket hole jig

A little while ago, I dropped my old pocket hole jig and broke it. This turned out to be a blessing because I went out and picked up Kreg's new K5 jig. Wow, what a difference!

Working with this new jig is like working with a altogether different tool—a much better tool. The spring clamp adjusts to any thickness of wood in seconds. The wings that support larger components also double as storage bins. The setting block makes adjusting the stop collar on the drill bit super easy.

I thought the dust collection port was a little hokey at first, but it really does save a lot of time since I don't have to remove the bit and blow away wood shavings several times for every hole. It even inspired me to take on projects that I wouldn't have attempted with my old jig. I bought the K5 at Rockler (rockler.com) for \$140.

**Mark Petersen, Contributing Editor**







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**David Radtke,**  
Contributing Editor



## BIG-TIME BACK SAVER

I have only one son left at home, which means I'm running out of helpers to move heavy objects, so I got myself a hydraulic lift table on wheels. I initially bought the table to help me get large projects from my workbench down to the floor, but I didn't know how handy it would be. I've used it for loading stuff into the back of my truck and moving heavy tools, like planers, from lower shelves up to my workbench. I've even used it to raise and lower projects for ease of painting.

My only complaint is that the table only reaches 29 in. while my workbench is 34 in. I bought mine at a Northern Tool & Equipment store for \$190 (northerntool.com). The table can handle 500 lbs. and has saved my back numerous times. It was a lot cheaper than raising three boys.

**Mark Petersen, Contributing Editor**



## PRO TOOLS & GEAR

### Practical job site power strip

The Stanley 32050 FatMax Power Claw is a clever power strip built into a clamp. It can grab on to a stud, rafter, sawhorse or ladder. Hang it wherever you need power. This strip works great at keeping extension cord connections off the ground. That's convenient, but it makes even more sense if you're working outside on a wet surface.

The Power Claw has three grounded outlets and a 15-amp breaker. Buy one at amazon.com for \$27. There's also a 13-amp version available for \$20, but spend the extra money to avoid nuisance trips.





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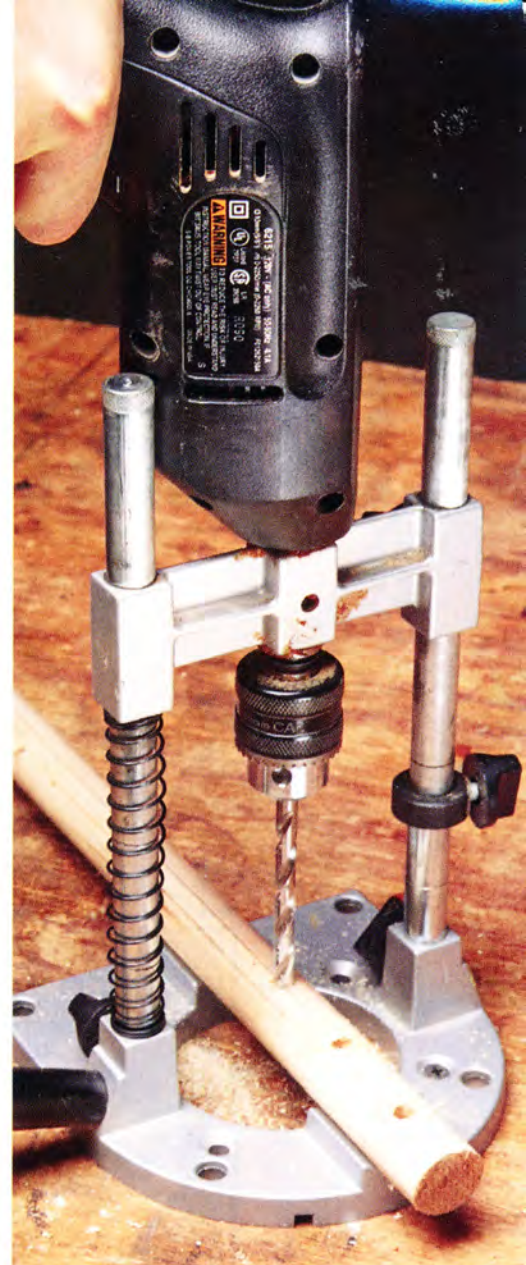
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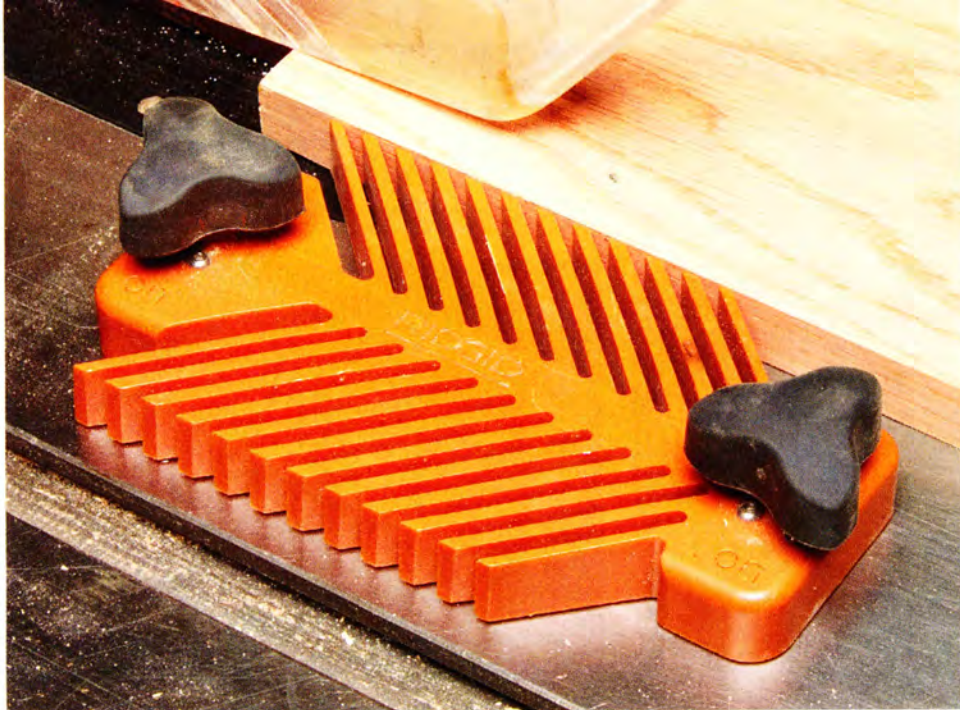


## WORLD'S SMALLEST DRILL PRESS

Don't get any ideas about using this tool for heavy-duty drill jobs. But this little drill guide is ideal for on-site tasks like drilling perfectly straight holes in stair treads for balusters, drilling into pipe or dowels, and controlling the uniform depth for a series of holes for railings.

You can move it around on larger work like stair treads or screw it to a temporary base and then bring smaller work to it. And it's not a huge investment—only \$30. You use your own 3/8-in. or 1/4-in. drill that attaches to the guide. The one shown is an older Wolfcraft 4525404 that sells for \$30 at amazon.com. But go to amazon and search for "drill guide jig" and you'll find several other versions to choose from.





## ONE GREAT FEATHERBOARD

Keeping firm pressure against the fence while ripping a board on a table saw is the key to getting a straight cut. Before I got the Ridgid MagSwitch magnetic featherboard, I was clamping a homemade featherboard to the edge of the table. Trouble is, the setup was cumbersome, and I usually had to fuss over getting it set right—a little too much pressure, not enough ... you know what I mean.

Using this magnetic featherboard is like the opposite of fuss. It's so simple to position, lock and unlock that it's a pleasure to use, so I use it more often—and get better cuts. Magnets hold it really tight to a cast iron saw table, and a turn of the knobs quickly releases the grip. I bought it for \$32 at Home Depot and have zero regrets. I love it.

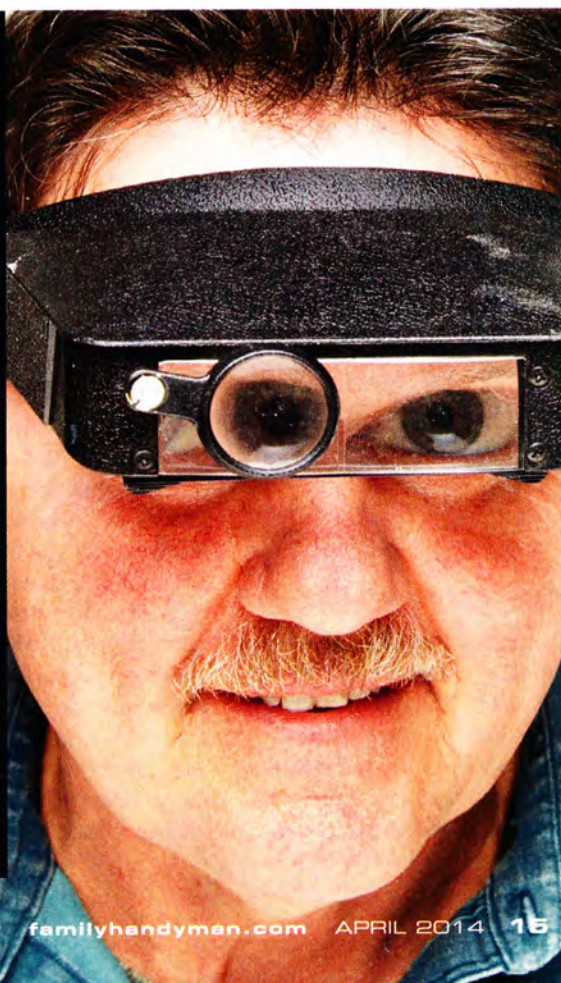
David Radtke, Contributing Editor

## High-power cheaters

I get slivers like teenagers get pimples. Sometimes I don't even realize it until the next day when they start to fester. With my aging eyes (I'm over 40++), it's not so easy anymore to wrestle with that sliver and get the tweezers even close to it. This visor magnifier changes the whole playing field. Now I can zero in on the sliver and see way more of my face than I want to.

Of course, from time to time there are other things that come up that you can do with this magnifier, like changing watch batteries, fixing small electronics and jewelry repair. At \$6 you can't go wrong. It's available at [widgetsupply.com](http://widgetsupply.com) (No. XWTI-42C).

David Radtke,  
Contributing Editor



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# Handy HINTS®

FROM OUR READERS

handyhints@thefamilyhandyman.com



## JAR CLEANING WITH BBs

I've gone to auctions for years and have collected lots of antique jars and bottles. Often they've been stained inside, and they used to be really tough to get clean. Not anymore! I just put a little soapy water in the bottle and add a few tablespoons of BBs. After a bit of soaking and several shakes, the bottles come clean. I've also used the same method to clean peanut butter and jam jars. By rinsing and drying the BBs afterward, I can reuse them. Just remember to keep them out of the sink and away from small children and pets!

Connie DeHaven



## A trim for flux brushes

I use flux brushes for all sorts of tasks, from glue spreading to touch-up painting. I find that the bristles are too long, making them too soft to push glue or paint. They work a lot better if you cut off about 1/4 in. of the bristles. If you trim the bristles at an angle, you can also make a nice cut-in brush for small parts.

Dan Doshan



## LADDER CADDY

When I was hanging suspended grid for ceiling tiles, I was constantly switching between two drills—one to drill pilot holes, the other to drive screws. Tired of changing back and forth and running up and down the ladder, I thought there must be a better way. I found a scrap of 3/4-in. plywood (10 in. x 24 in.) and cut an opening in it to fit over the stepladder (7 in. x 14 in.) and cutouts to hold my drill and my driver. I wedged a scrap piece of 2x4 between the ladder top and the holder to stabilize it when one tool was in use. This seat-of-the-pants solution saved me a lot of time and labor. I now use it for a variety of ladder-related tasks.

Ron Brewer





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- 1 ELIQUIS reduced the risk of stroke better than warfarin.
- 2 ELIQUIS had less major bleeding than warfarin.
- 3 Unlike warfarin, there's no routine blood testing.

ELIQUIS and other blood thinners increase the risk of bleeding which can be serious, and rarely may lead to death.

Ask your doctor if ELIQUIS is right for you.

ELIQUIS is a prescription medicine used to reduce the risk of stroke and blood clots in people who have atrial fibrillation, a type of irregular heartbeat, not caused by a heart valve problem.

### IMPORTANT SAFETY INFORMATION:

■ **Do not stop taking ELIQUIS without talking to the doctor who prescribed it for you. Stopping ELIQUIS increases your risk of having a stroke.** ELIQUIS may need to be stopped, prior to surgery or a medical or dental procedure. Your doctor will tell you when you should stop taking ELIQUIS and when you may start taking it again. If you have to stop taking ELIQUIS, your doctor may prescribe another medicine to help prevent a blood clot from forming.

■ **ELIQUIS can cause bleeding which can be serious, and rarely may lead to death.**

■ **You may have a higher risk of bleeding if you take ELIQUIS and take other medicines that increase your risk of bleeding, such as aspirin, NSAIDs, warfarin (COUMADIN®), heparin, SSRIs or SNRIs, and other blood thinners. Tell your doctor about all medicines, vitamins and supplements you take.** While taking ELIQUIS, you may bruise more easily and it may take longer than usual for any bleeding to stop.

■ **Get medical help right away if you have any of these signs or symptoms of bleeding:**

- unexpected bleeding, or bleeding that lasts a long time, such as unusual bleeding from the gums; nosebleeds that happen often, or menstrual or vaginal bleeding that is heavier than normal
- bleeding that is severe or you cannot control
- red, pink, or brown urine; red or black stools (looks like tar)
- coughing up or vomiting blood or vomit that looks like coffee grounds
- unexpected pain, swelling, or joint pain; headaches, feeling dizzy or weak

■ **ELIQUIS is not for patients with artificial heart valves.**

■ **Before you take ELIQUIS, tell your doctor if you have:** kidney or liver problems, any other medical condition, or ever had bleeding problems.

Tell your doctor if you are pregnant or breastfeeding, or plan to become pregnant or breastfeed.

■ **Do not take ELIQUIS if you** currently have certain types of abnormal bleeding or have had a serious allergic reaction to ELIQUIS. A reaction to ELIQUIS can cause hives, rash, itching, and possibly trouble breathing. Get medical help right away if you have sudden chest pain or chest tightness, have sudden swelling of your face or tongue, have trouble breathing, wheezing, or feeling dizzy or faint.

*You are encouraged to report negative side effects of prescription drugs to the FDA. Visit [www.fda.gov/medwatch](http://www.fda.gov/medwatch), or call 1-800-FDA-1088.*

Please see additional Important Product Information on the adjacent page.

Individual results may vary.

Visit [ELIQUIS.COM](http://ELIQUIS.COM)  
or call 1-855-ELIQUIS

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432US13BR01723-02-01 09/13

**Eliquis®**  
(apixaban) tablets 5mg





# IMPORTANT FACTS

*Eliquis*® / RX ONLY  
(apixaban) tablets

The information below does not take the place of talking with your healthcare professional. Only your healthcare professional knows the specifics of your condition and how ELIQUIS® may fit into your overall therapy. Talk to your healthcare professional if you have any questions about ELIQUIS (pronounced ELL eh kwiss).

## What is the most important information I should know about ELIQUIS (apixaban)?

**Do not stop taking ELIQUIS without talking to the doctor who prescribed it for you.**

**Stopping ELIQUIS increases your risk of having a stroke.** ELIQUIS may need to be stopped, prior to surgery or a medical or dental procedure. Your doctor will tell you when you should stop taking ELIQUIS and when you may start taking it again. If you have to stop taking ELIQUIS, your doctor may prescribe another medicine to help prevent a blood clot from forming.

**ELIQUIS can cause bleeding** which can be serious, and rarely may lead to death. This is because ELIQUIS is a blood thinner medicine that reduces blood clotting.

**You may have a higher risk of bleeding if you take ELIQUIS and** take other medicines that increase your risk of bleeding, such as aspirin, nonsteroidal anti-inflammatory drugs (called NSAIDs), warfarin (COUMADIN®), heparin, selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs), and other medicines to help prevent or treat blood clots.

Tell your doctor if you take any of these medicines. Ask your doctor or pharmacist if you are not sure if your medicine is one listed above.

## While taking ELIQUIS:

- you may bruise more easily
- it may take longer than usual for any bleeding to stop

**Call your doctor or get medical help right away if you have any of these signs or symptoms of bleeding when taking ELIQUIS:**

- unexpected bleeding, or bleeding that lasts a long time, such as:
  - unusual bleeding from the gums
  - nosebleeds that happen often
  - menstrual bleeding or vaginal bleeding that is heavier than normal
- bleeding that is severe or you cannot control
- red, pink, or brown urine
- red or black stools (looks like tar)
- cough up blood or blood clots

- vomit blood or your vomit looks like coffee grounds
- unexpected pain, swelling, or joint pain
- headaches, feeling dizzy or weak

**ELIQUIS (apixaban) is not for patients with artificial heart valves.**

## What is ELIQUIS?

ELIQUIS is a prescription medicine used to reduce the risk of stroke and blood clots in people who have atrial fibrillation.

It is not known if ELIQUIS is safe and effective in children.

## Who should not take ELIQUIS?

**Do not take ELIQUIS if you:**

- currently have certain types of abnormal bleeding
- have had a serious allergic reaction to ELIQUIS. Ask your doctor if you are not sure

## What should I tell my doctor before taking ELIQUIS?

**Before you take ELIQUIS, tell your doctor if you:**

- have kidney or liver problems
- have any other medical condition
- have ever had bleeding problems
- are pregnant or plan to become pregnant. It is not known if ELIQUIS will harm your unborn baby
- are breastfeeding or plan to breastfeed. It is not known if ELIQUIS passes into your breast milk. You and your doctor should decide if you will take ELIQUIS or breastfeed. You should not do both

Tell all of your doctors and dentists that you are taking ELIQUIS. They should talk to the doctor who prescribed ELIQUIS for you, before you have **any** surgery, medical or dental procedure.

**Tell your doctor about all the medicines you take, including** prescription and over-the-counter medicines, vitamins, and herbal supplements. Some of your other medicines may affect the way ELIQUIS works. Certain medicines may increase your risk of bleeding or stroke when taken with ELIQUIS.

## How should I take ELIQUIS (apixaban)?

**Take ELIQUIS exactly as prescribed by your doctor.** Take ELIQUIS twice every day with or without food, and do not change your dose or stop taking it unless your doctor tells you to. If you miss a dose of ELIQUIS, take it as soon as you remember, and do not take more than one dose at the same time. **Do not run out of ELIQUIS. Refill your prescription before you run out. Stopping ELIQUIS may increase your risk of having a stroke.**

## What are the possible side effects of ELIQUIS?

- See “What is the most important information I should know about ELIQUIS?”
- ELIQUIS can cause a skin rash or severe allergic reaction. Call your doctor or get medical help right away if you have any of the following symptoms:
  - chest pain or tightness
  - swelling of your face or tongue
  - trouble breathing or wheezing
  - feeling dizzy or faint

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 ELIQUIS. 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.

This is a brief summary of the most important information about ELIQUIS. For more information, talk with your doctor or pharmacist, call 1-855-ELIQUIS (1-855-354-7847), or go to [www.ELIQUIS.com](http://www.ELIQUIS.com).

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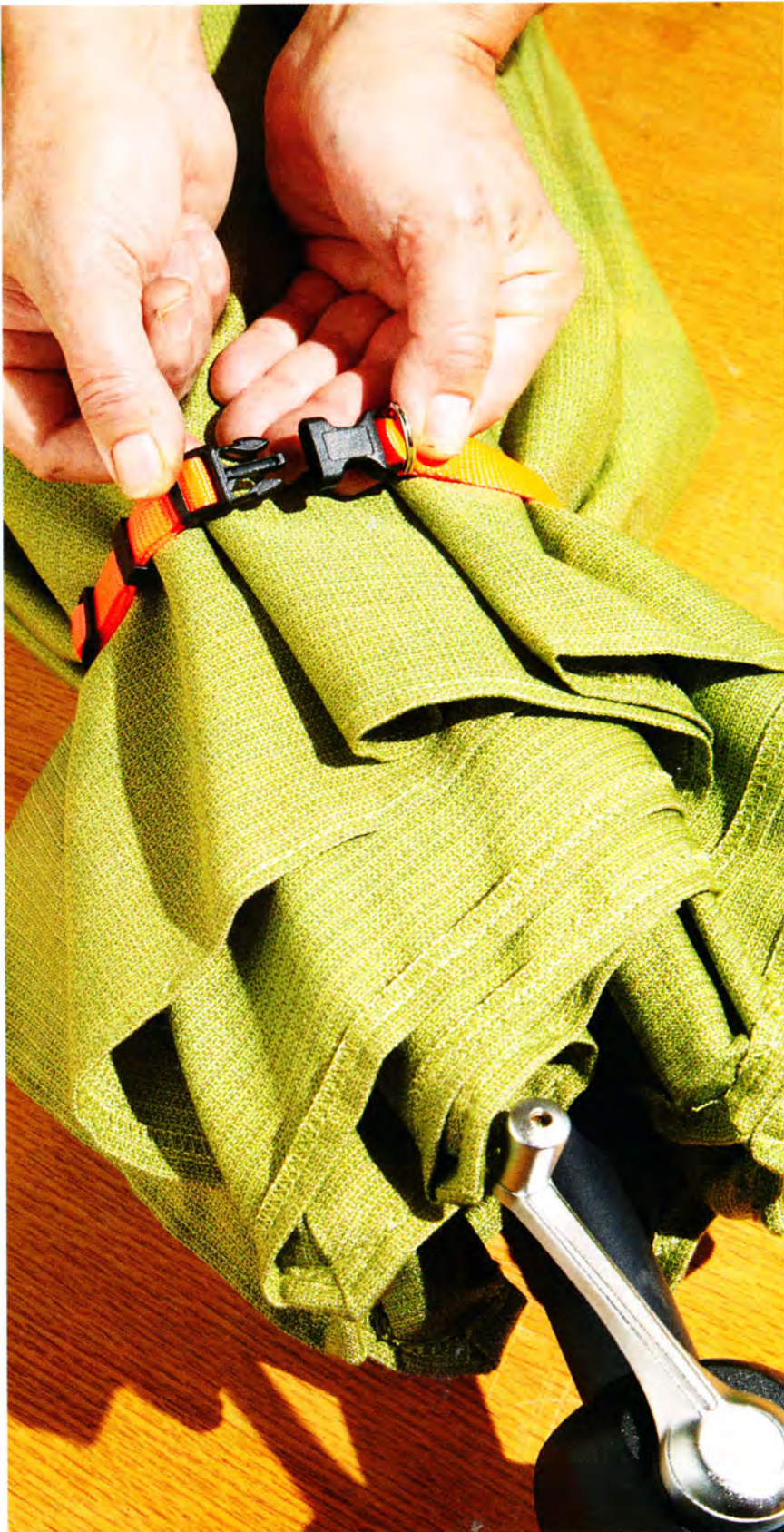




## SOFTEN OLD MASKING TAPE

I'm surely not the only one who has grabbed an old roll of masking tape and spent the next 15 minutes trying to peel off even an inch or two before it tore jaggedly on the roll. To end this frustration, I put the roll in the microwave for about 10 seconds. It softens the adhesive just enough to peel the tape nicely off the roll.

**Charles Crowley**



## Stay-closed patio umbrella

One day I was playing with my dog on the backyard patio and saw the table umbrella being tossed and partially opened as the wind picked up. Thinking fast, I removed the dog's quick-release collar and wrapped it around the umbrella. Perfect fit! Later in the day when the wind had subsided, I gave the collar back to my dog and got a shiny new one for the umbrella for about \$4 at a local pet store.

**Richard Stith**



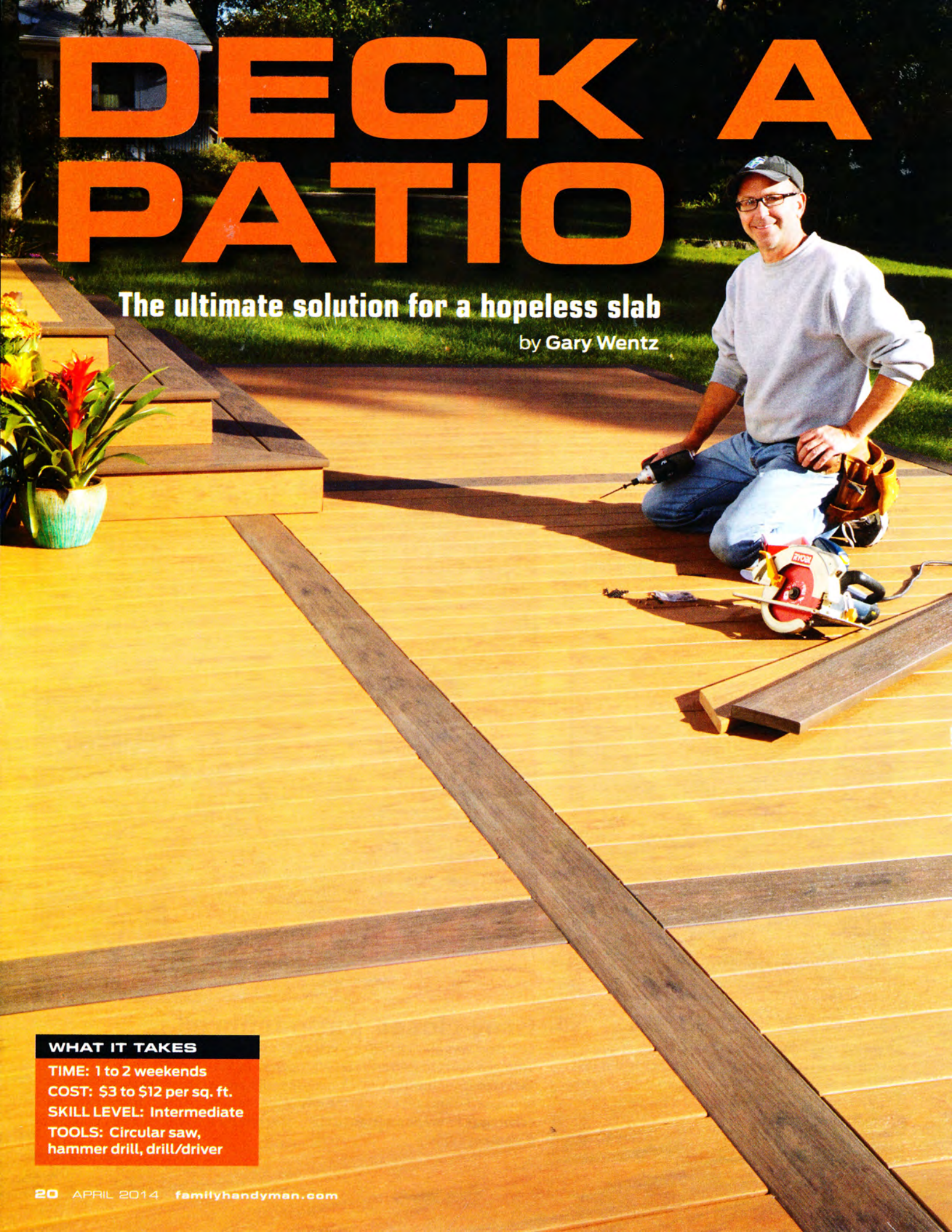
## PARTS SORTER

I wasn't playing with my old Frisbee disc much anymore, so I decided to use it for sorting through small screws and parts in the shop. I cut a notch in the rim to make it easy to pour the contents back into the original container.

**Gary Lundin**



# DECK A PATIO



**The ultimate solution for a hopeless slab**

by Gary Wentz

## WHAT IT TAKES

**TIME:** 1 to 2 weekends

**COST:** \$3 to \$12 per sq. ft.

**SKILL LEVEL:** Intermediate

**TOOLS:** Circular saw,  
hammer drill, drill/driver



Before!

## WILL IT WORK ON YOUR PATIO?

Even if your patio is in terrible shape, you can deck over it. Cracks, craters and seasonal movement along cracks are no problem. But beware of these three situations:

- If an area is badly cracked and sinks noticeably year after year, any decking you put over it will also sink and develop a low spot. In most cases, settling concrete stops sinking eventually, so delay this project until it does.
- This project raises the level of your patio by 2-1/2 to 3-1/2 in. (depending on the thickness of your decking and whether or not you put spacers under the sleepers). So any door thresholds adjoining the patio must be at least that far above the concrete. If not, this project won't work for you. If you live in a climate where the ground freezes, allow an extra 1/2 in. so that seasonal "frost heave" can raise the slab without damaging the threshold.
- Stairs connected to the patio can complicate this project. To keep step heights equal, you'll have to raise the treads by the same distance you raise the patio (2-1/2 to 3-1/2 in.). On concrete steps, that's a straightforward job: You can treat them just like the patio, screwing sleepers to the treads and risers and decking over them.

This was the ultimate bad patio: severely cracked and cratered, some areas raised by frost, others sunken after 50 years of settling. Originally, it was tiled, then the tile was chiseled off and the pockmarked surface got a coat of paint.

A slab with this much damage can't be fixed. But it can be covered up—and this article will show you how. The results look just like a deck, but getting them is much easier and less expensive than building a deck from scratch. In most cases, this project is also less expensive than a new patio installed by a contractor. Local contractors estimated costs of \$7 to \$10 per sq. ft. to remove this patio and pour a new slab. You could probably replace your patio yourself for less than the cost of this project, but DIY demolition and concrete pours are big, back-breaking jobs.

### Time, money and tools

Covering a patio with decking typically takes a weekend or two. This patio took much more time—five long days. That's partly because it's a big one (14 x 28 ft.). The grid pattern formed with different-colored decking also added a few hours

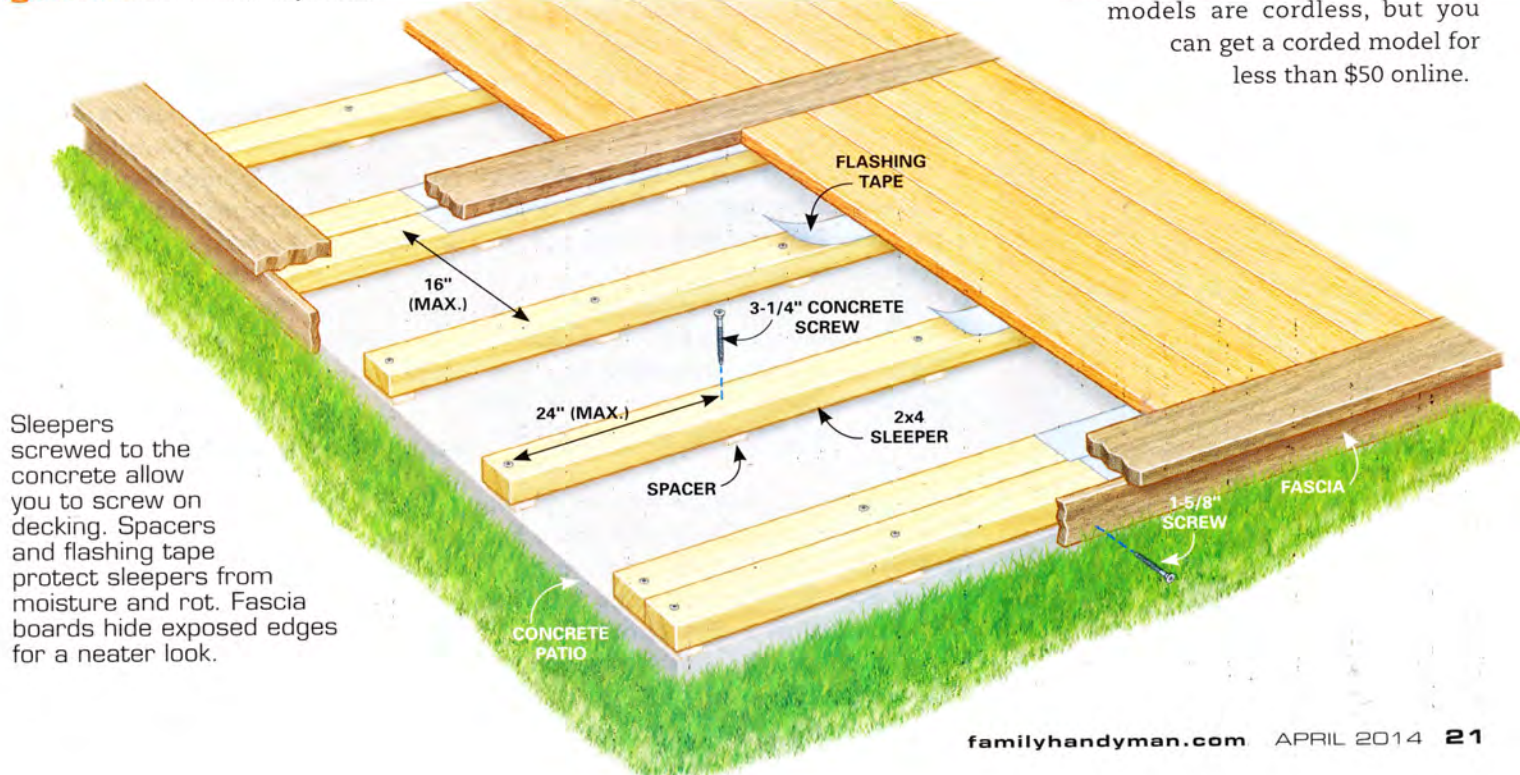
to the job. But the biggest time factor was the unevenness of the patio surface. All those ridges and sunken spots meant hours of tedious shimmying under the sleepers to form a flat surface for the decking (see **Photo 3**).

The cost of this project depends mostly on the decking you choose. Decking ranges from about \$1.50 per sq. ft. for treated wood to more than \$10 per sq. ft. for a top-grade manufactured product. The other materials for this project add up to about \$1.50 per sq. ft., so your total cost could be anywhere

from \$3 to \$12 per sq. ft. For looks and durability, we chose AZEK XLM decking (\$7 to \$9 per sq. ft.), which is made from PVC. We used Harvest Bronze, with Walnut Grove as the accent color.

Aside from standard carpentry tools, you'll need a hammer drill for this project. You can get a hammer drill for less than \$50 that will do the job. But consider spending \$100 or more. Even a very small patio will require more than 50 holes, and a more powerful drill will make that chore a lot easier. Also consider buying an impact driver. Impact drivers pack a lot more torque than standard drills or drivers and will drive concrete screws much better. Most models are cordless, but you can get a corded model for less than \$50 online.

Figure A Deck over a patio



Sleepers screwed to the concrete allow you to screw on decking. Spacers and flashing tape protect sleepers from moisture and rot. Fascia boards hide exposed edges for a neater look.





SELF-LEVELING  
COMPOUND

## SOLVE WATER PROBLEMS FIRST

This corner of the patio had settled by more than 2 in. over the years. That meant a big reservoir after rain—and water in the basement. So we filled the reservoir with exterior-grade self-leveling compound. After the first batch hardened, we poured on a thin coat and gave it a slight slope so water would run away from the house.

Self-leveling compound hardens fast, so you can get on with the project. But it's also expensive (\$30 per bag). If you're not in a rush, you can get similar results for less than one-third the cost with concrete topping mix such as Sakrete Top 'n Bond or Quikrete Sand/Topping Mix.

We also took a couple of other water-fighting steps. To prevent water from seeping down along the foundation, we caulked the gap between the patio and the house. At the other end of the patio, a corner of the slab had sunk slightly below the level of the soil and rainwater pooled there. To correct that, we shaved off the sod with a spade, dug out a couple of inches of soil and replaced the sod.

## Plan the layout

The layout of your sleepers will depend on the layout of your decking. If you want a standard decking design—all the deck boards running one direction—all you need are rows of parallel sleepers. If you want a more complicated decking pattern, like the one shown here, you'll need doubled sleepers to support any boards that run perpendicular to the others (see **Figure A**). We also installed sleepers to support the steps we later added to the concrete stoop (see **Photo 1**).

## Lay the sleepers

The sleepers don't have to be level—they can follow the slope of your patio. But they do need to form a flat plane. If your patio is in good shape, you'll get a flat plane automatically. If your patio has ridges and sunken areas, you'll spend lots of time fussing with shims.

To preview the situation, lay a straight board across the patio in a few spots. Look for the highest hump in the patio and fasten your first sleeper there. Then work outward from the high spot, adding sleepers and checking for flatness along each sleeper and across them. Add shims to raise low spots.

Screwing down sleepers with concrete screws (**Photo 2**) is simple, but there are some things to keep in mind:

- Screws should penetrate the concrete by at least 1 in., so 3-1/4-in. screws are perfect. In low spots, where we had to stack up shims, we switched to 3-3/4-in. screws.
- As you drill, dust compresses around the drill bit. That slows you down, strains your drill and overheats the bit. To clear the dust, pull the bit completely out of the hole once or twice while drilling each hole.
- Drill the holes 1/4 to 1/2 in. deeper than the screw will reach. Extra depth provides a space for dust and grit, so screws are easier to drive.
- Have extra drill bits on hand. As a bit wears, it doesn't just drill more slowly; it also bores a slightly smaller hole and screws become harder to drive. We replaced each bit after about 40 holes.

When all the sleepers are screwed down, take a few minutes to double-check for flatness. Set a 4-ft. straightedge on each sleeper, both across it and along it. If you find spots that are 1/16 in. or more out-of-plane, back out the screw and add or remove shims (**Photo 3**).

## WHY USE SPACERS?

You could lay your sleepers directly on the concrete, but we bought a 1/2-in.-thick PVC trim board and cut spacer blocks from it. Here's why:

- Spacers let you run sleepers parallel to the house so decking can run perpendicular to the house (if that's what you prefer). A patio typically slopes away from the house so that water runs off. If you run sleepers parallel to the house and set them directly on the concrete, each sleeper will block runoff. But with spacers, water can run under the sleepers.
- Spacers allow for longer decking screws. We wanted to use Cortez screws, which come with cover plugs made from the same material as the decking. They're easy to use and almost invisible. But they're 2-3/4 in. long; that's too long to sink into our decking if we use sleepers only.
- Spacers let the sleepers dry out. If kept damp, common grades of treated wood will eventually rot. Spacers keep the sleepers off the damp concrete so they can dry.

## Install the decking

Before decking, we covered the sleepers with flashing tape. Without it, water soaks the tops of the sleepers and the decking prevents the wood from drying. Common grades of treated lumber will rot if kept permanently damp, and flashing tape is the best insurance against that.

Installing deck boards over sleepers is just like installing them over standard deck framing (**Photo 4**). We began with the darker "accent" boards, screwing them into place temporarily to act as guides for the "field" boards. When we reached the end of the deck, we removed the center divider board and cut it to final length. Then we removed and mitered the border boards and trimmed the sleepers to final length.

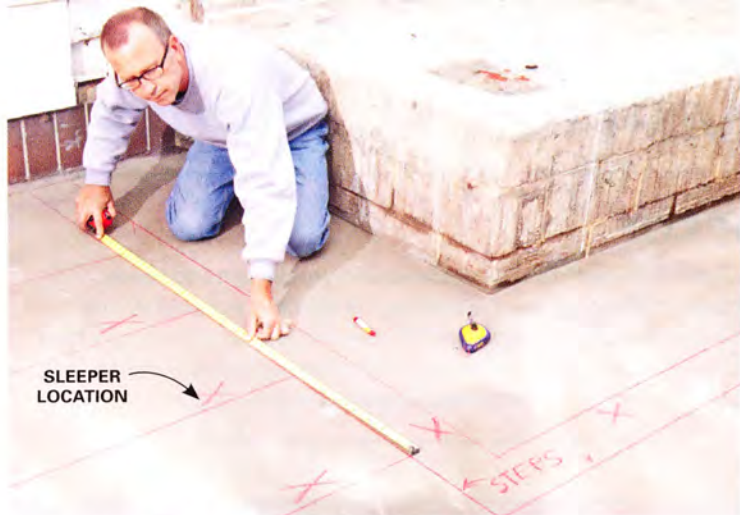
To cover the ends of the sleepers, we used a deck "fascia" board made from 1/2-in.-thick PVC. We cut the fascia into strips and screwed them to the sleepers.

## MATERIALS LIST

Aside from the decking, here's an estimate of what you'll need to cover 100 sq. ft. of patio. Exact quantities depend on the shape of your patio and the layout of the decking.

- 90 linear ft. of treated 2x4
- 90 linear ft. of flashing tape
- Sixty 3/16" x 3-1/4" concrete screws
- 1/2"-thick PVC trim or deck fascia (for spacers), plastic shims, 3/16-in. masonry drill bits (minimum drilling depth of 3-1/2 in.)





SLEEPER LOCATION

## 1 START WITH A LAYOUT

Mark the sleeper locations on the patio. Don't forget about extra sleepers to support stairs or railings.



SPACER

## 2 PREDRILL FOR CONCRETE SCREWS

Drill through sleepers, spacers and into the concrete with a hammer drill, then drive in concrete screws. Overhang the sleepers along one edge of the patio and trim them to exact length later.



STRAIGHT-EDGE

PLASTIC SHIM

## 3 SCREW DOWN AND FLATTEN THE SLEEPERS

Check for flatness with a straightedge. Raise low spots with shims. At high spots, skip the spacer; stack up shims instead.



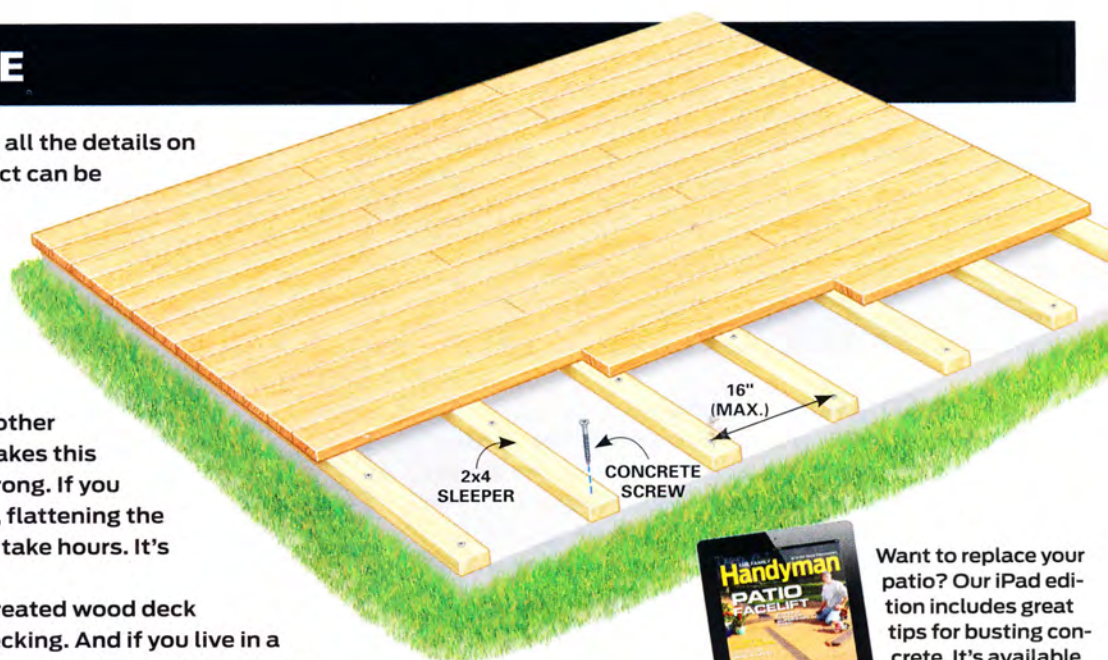
## 4 LAY THE DECKING

Install the deck boards just as you would on a standard deck. When you reach the end of the patio, position the last board, mark the overhanging sleepers and trim off the excess.

## KEEPING IT SIMPLE

If you're a beginning DIYer, don't let all the details on our deck scare you away. Your project can be a whole lot easier if you choose a simple decking design like the one at right. With all the deck boards running in the same direction, all you need are sleepers centered 16 in. apart. You won't need to do the careful measuring required by our design, or make angled miters and other fussy cuts. A simple deck design makes this project almost impossible to get wrong. If you have a badly uneven patio like ours, flattening the sleepers with shims (Photo 3) may take hours. It's tedious but not complicated.

You can slash the cost by using treated wood deck boards instead of manufactured decking. And if you live in a drier climate where the sleepers won't stay damp, you can skip the spacers and flashing tape.



2x4 SLEEPER

CONCRETE SCREW

16" (MAX.)



Want to replace your patio? Our iPad edition includes great tips for busting concrete. It's available at the App Store.



# MORE WAYS TO IMPROVE A PATIO

Whether your patio is in bad shape or just bland, there are many ways to revive it. But before you weigh your options, there's one thing to consider...

## The *crack* factor

Cracks in your patio drastically limit your options. That's because cracks tend to move. Some grow wider over time, while others shrink and widen as the soil freezes and thaws. Some become uneven as one side of the crack sinks. Any movement happens so slowly that it's hard to detect. But if you know—or even think—that you have moving cracks, you have to choose a patio upgrade that can “float” over moving cracks without becoming damaged.

## Cover-ups for a *cracked* patio

Along with the deck project shown on the previous pages, here are some other projects that can withstand moving cracks:

### Bury it under pavers

A concrete slab provides a firm, stable base for pavers. Cover the patio with a thin layer of sand, lay pavers over it, and the results look like a standard paver patio. It's a fairly simple project and the cost is reasonable (\$3 to \$6 per sq. ft.), but expect a weekend or two of hard labor. For complete step-by-step instructions, go to [familyhandyman.com](http://familyhandyman.com) and search for “cover patio.”



### Hide it under a rug

The quickest way to hide damaged concrete—or just add color—is with an outdoor area rug. They're available in a huge range of colors, designs and prices (\$50 to \$600). The largest rugs are typically 9 x 12 ft. That may not cover your entire patio, but just covering most of an ugly patio makes a huge difference. Shop online or visit a store that handles patio accessories.

### Snap-together tiles

Interlocking plastic tiles simply snap together; no need to fasten them to the patio. Some versions are plastic only. Others are topped with wood, ceramic or stone. (Ceramic or stone tiles require a flat surface—they may crack if installed over ridges or depressions.) To browse online, search for “deck tile” or “patio tile.” Plastic-only tiles start at less than \$3 per sq. ft. Wood, ceramic or stone versions typically cost \$8 to \$15.





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# Projects for a *crack-free* patio

If your patio isn't cracked, you could choose any of the options above or one of these:

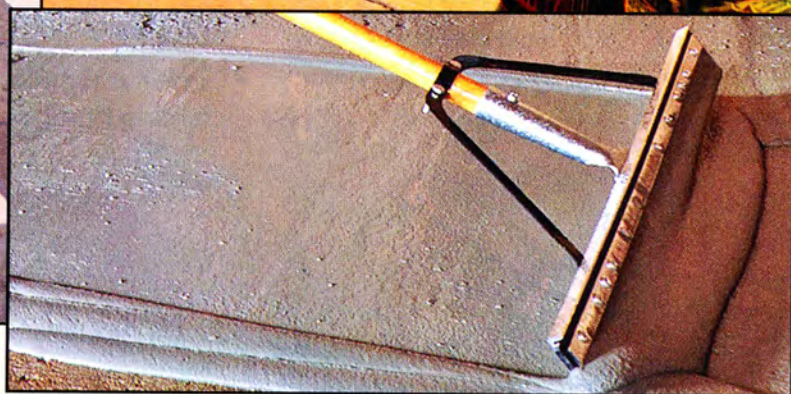
## Stain it

A coat of stain followed by a coat of sealer transforms a patio in a weekend for less than \$1 per sq. ft. But there are downsides: You'll have to reseal every one to three years and may eventually have to restain it. Also, stain won't hide damage, and any repairs will likely show through the stain. To see how to apply stain in multicolor patterns, go to [familyhandyman.com](http://familyhandyman.com) and search for "stain patio."



## Tile it

A concrete patio is a great foundation for tile. And tile is a great way to turn a bland patio into a showpiece. The cost depends mostly on the tile you choose; the project could cost \$4 per sq. ft. or three times that. Freezing water can destroy outdoor tile. So if you live in a climate that freezes, pay extra attention to the details. For the complete story, go to [familyhandyman.com](http://familyhandyman.com) and search for "tile patio."



## Resurface it

With a coat of resurfacer, you can make an old patio look like new concrete in a day for less than \$1 per sq. ft. Just mix the cement-based powder with water and spread it over the patio. You can repair cracks and resurface over them, but the cracks may return. Quikrete Concrete Resurfacer and Sakrete Flo-Coat are two common brands.



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# KEN'S FAVORITE SHOP TIPS



by **Ken Collier**

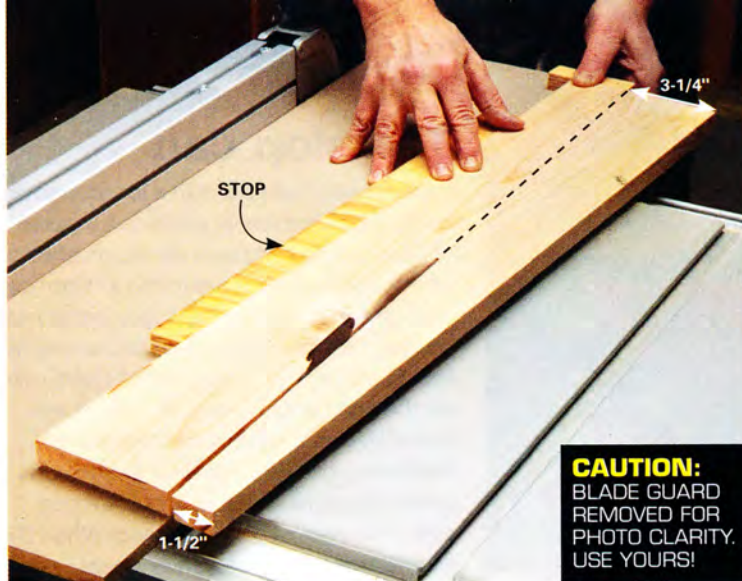
[editors@thefamilyhandyman.com](mailto:editors@thefamilyhandyman.com)

I was a cabinetmaker when I started working for The Family Handyman. That was almost 30 years ago, so I've seen a lot of shop tips come and go. Some of them I've used once or twice and then forgotten. Others I've used so often that they've become essential parts of the way I work in the shop. Here are a few of my favorites.

## MEET THE PRO

Ken Collier is Editor in Chief of The Family Handyman and a longtime woodworker.





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## Quick table legs

If you need to build a quick table, here's a great way to make the legs. I've used this design to make tables for our cabin, and utility tables for the shop and yard. Each leg is made from a 1x6, ripped to make two tapered pieces. Glue and nail (or screw) the two pieces together, sand as much as you feel is necessary, and you're done. The taper jig is quick to make, but it works only for this particular taper.



## Fail-safe drill stop

I used to use a metal drill stop (you know the kind—a little ring that goes over the bit and tightens with a setscrew). Then one time while I was drilling dozens of shelf support holes, the setscrew slipped and I drilled a hole right through the side of an expensive cabinet! Now I use a wooden stop. It just takes a minute to make out of scrap, and you can fine-tune the depth of the hole by readjusting the bit in the chuck of the drill. Your bit will never, ever drill too deep.



## Finishing stand-offs

These simple little contraptions are immensely useful for staining and finishing. Make them from scrap, but be careful to countersink all the screws to the same depth so their points all protrude the same length. For many projects, you can stain or finish both sides at once. The little mark left by the screw tip won't be detectable.



## Overhead rag storage

My shop is in my basement, so I end up storing all sorts of things in the ceiling. One of the handiest is a box of paper shop towels. A box of 200 towels from Scott costs about \$15 and fits neatly between the floor joists above my workbench. Just reach up and pull one down to wipe up errant glue or stain.



## Plastic laminate labels

I use scraps of plastic laminate for drawer labels. Round the corners, smooth the edges and attach them with hot-melt glue. You can write on the labels with pencil or marker, and erase them with a little solvent.





## Shop-made parts boxes

Have you priced those plastic parts bins? Too expensive for me! So years ago I started making my own out of scrap. The trick is to keep them modular. I make the front, back and bottom from 3/4- or 1/2-in. material, and the sides from 1/4-in. plywood. Nailed and glued together, they're plenty tough. Mine are 12 in. front to back (to fit in old kitchen upper cabinets), 3 in. tall, and either 3-1/2 in. or 7 in. wide. Save up some scrap and you can make a couple dozen in an hour or so.

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## The slop can

I use polyurethane varnish a lot, so cleaning out brushes in mineral spirits is a regular chore. I use tin cans to rinse the brushes, and pour the used solvent into a "slop" can. The varnish solids settle to the bottom and congeal, leaving pretty clean solvent at the top. That recycled mineral spirits gets used for the first couple rinses of a brush, followed by one final rinse of fresh solvent. Eventually the slop can fills up with congealed goop, at which point I use a can opener to remove the entire top. When the goop hardens, into the trash it goes.



## Test-fitting dowel joints

When you make dowel joints, it can be difficult to test the fit of the joint, because the dowels often fit so tight the joint is hard to disassemble. Here's what to do: Simply cut a couple of saw kerfs in the test dowels, and they'll be easy to remove.



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## Bright lights for final inspection

I learned the hard way that the room where cabinets end up is usually much brighter than a workshop, making flaws much easier to see. So when I'm ready for finishing, I go over the whole piece with a trouble light flat against the surface, looking for flaws. A light coat of mineral spirits helps reveal any glue stains.

## Cabinetmaker's triangle

This marking system is the quickest way to avoid mixing up parts during assembly. It's easy, once you get the hang of it, and goes back to the old days of hand woodworking. I use it all the time. It's particularly useful for indicating the layout of door parts or the order of boards that are being edge-glued. The photos tell it all.



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✓Yes



✓Yes



xNo



✓Yes



✓Yes



✓Yes



✓Yes



✓Yes

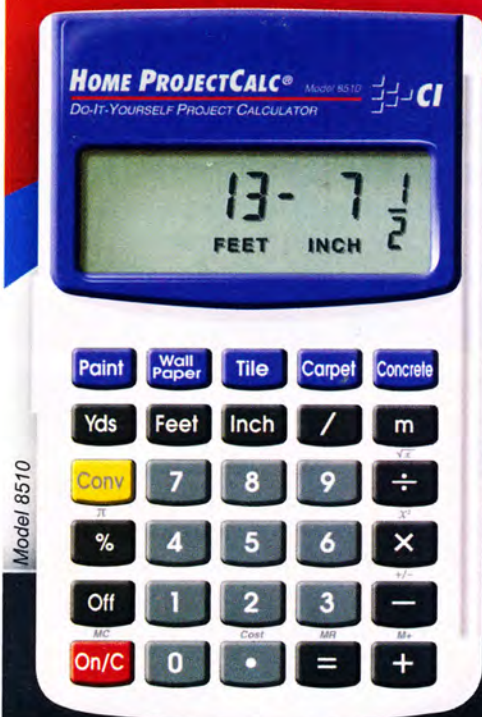
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**1** Fold in half



**2** Fold in half again



**3** Tear halfway along crease



**4** Fold one half inside the other

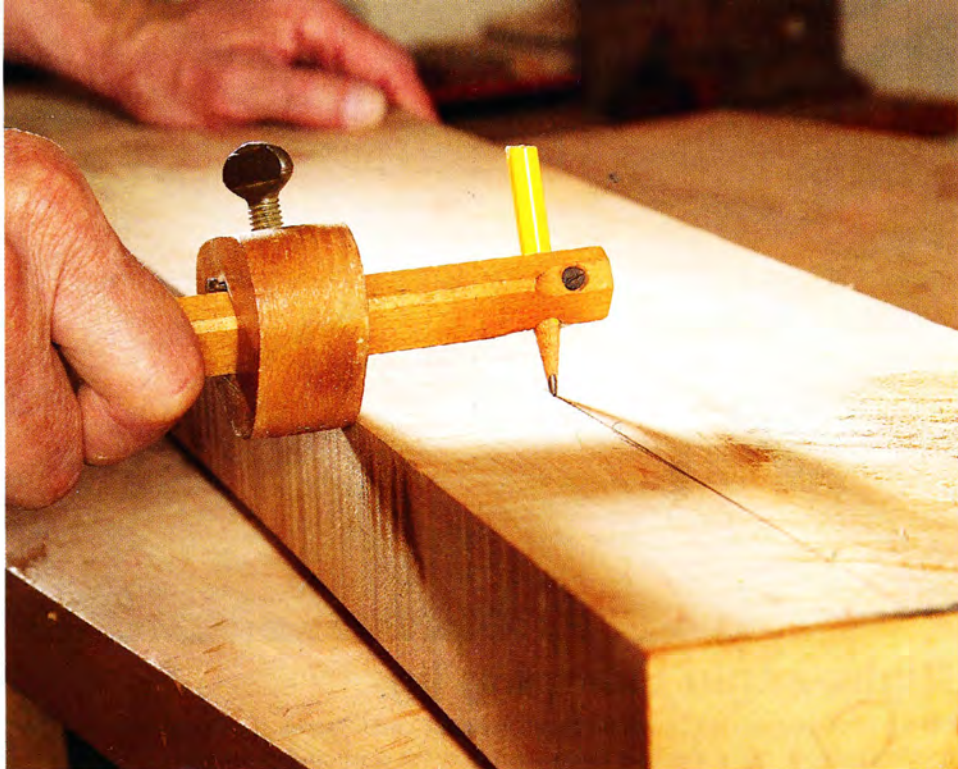


**5** Sand

## Fold sandpaper into a pad

For sanding edges and curves by hand, this sandpaper trick can't be beat. Take a quarter sheet of sandpaper and fold it as shown above. It makes a firm but flexible pad, and the inner surfaces don't wear against each other. When the two outer surfaces are used up, simply refold to expose the two inner surfaces. Slick, huh?





## Marking gauge with pencil

This is one of my favorite and most-used tools: a marking gauge (\$15) with a hole drilled in it to accept a pencil. I use it when I want to align screws, drawer pulls or other hardware that doesn't require a high level of precision. It's an exceptionally useful tool.



## Multipurpose T-bars

These are wonderfully simple versatile shop aids. Most of the time I use them to raise a project off the bench for clamping, but sometimes I'll clamp or even screw parts to them to keep things flat. I made mine from 5-in.-wide strips, with a double thickness on the upright. A little masking tape on the top edge makes them easy on finished surfaces and keeps glue from sticking.



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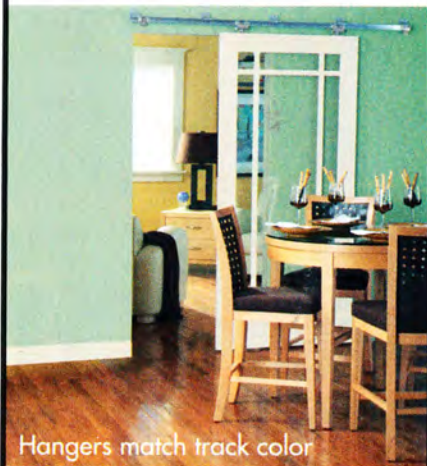
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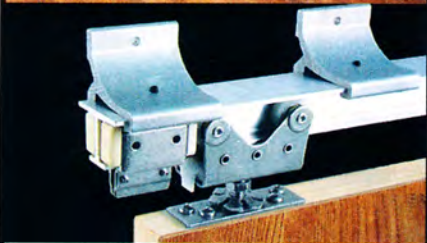
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## Right-angle clamping jig

Here's a little helper that you can make in about two minutes. It's like a third hand for holding cabinet parts together for assembly, or for clamping miter joints.

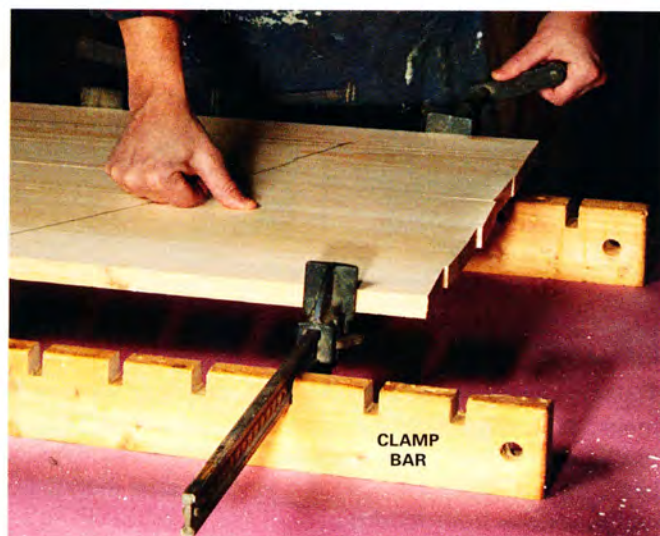
## Hand countersink

One of my handiest tools is this countersink with a handle. It's made from a bit designed for an old-fashioned hand drill, but you could make a similar one from a power-drill countersink. Besides making a quick countersink, this tool will quickly remove splinters from the edges of a hole. And when I make dowel joints, I use it to chamfer the edges of the dowel holes so excess glue doesn't squirt out.

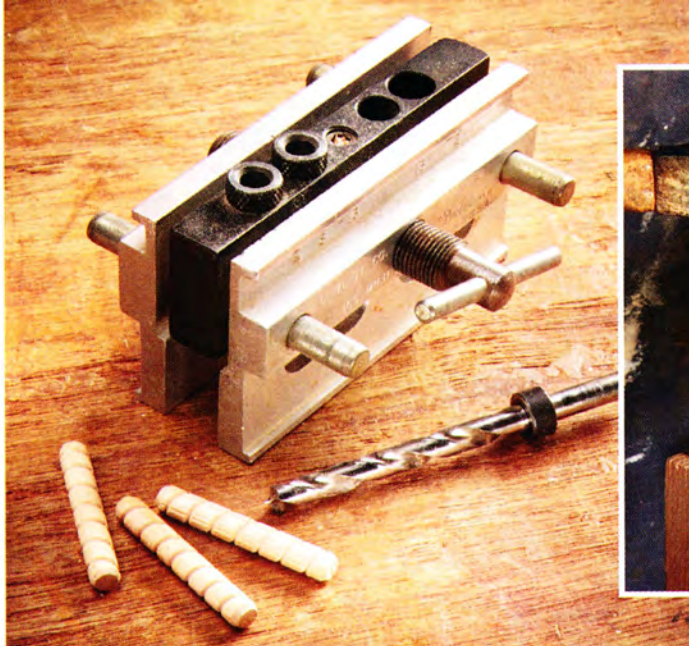


## Clamp holders

Anything that gives you more control when gluing is a good thing. These simple-to-build clamp bars, made of 2x4s, will keep clamps from tipping, and can be set up on a couple of sawhorses to free up space on your bench. Screw the two 2x4s together so you can cut the notches on both at the same time.







## Dowel joints are DIY-friendly

I'm a fan of old-fashioned dowel joints, especially if you use a self-centering dowel jig like this classic model from Dowl-it (\$55), which does two holes at a time. Dowel joints are especially handy for making a quick pair of doors, windows, and mirror frames and many other little projects. Use dowels made for joints, a stop on your drill bit to control depth, and a 1-in.-thick block to help you pound in the dowels to a consistent depth. I spread glue inside the hole, not on the dowel itself.



## T-square router fence

If you need to cut dados or grooves across the sides of a cabinet, this tool is the way to go. Build the T-square for one particular router and one particular bit, and test it on a scrap. Once the "head" of the T-square has been cut, you can use that cut to perfectly position the rest of the cuts.

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# ADD AN OUTDOOR OUTLET



## 5 ways to get power where you need it

Wiring a new outdoor outlet isn't complicated. But getting wire to the right spot—without tearing into walls—can be a huge challenge. In this article, we'll help you choose the best strategies for locating and powering your new outlet. We won't go into depth about how to mount the outlet box or connect the wiring. For this information, go to [familyhandyman.com](http://familyhandyman.com) and search for "outlet." There you'll find instructions for adding an outdoor outlet to your wall or a post in your yard as well as detailed wiring diagrams.

We'll show you some of the different wiring techniques you can use to provide power to your new outlet and tell you the pros and cons of each. As with any electrical project, before starting, make sure to talk to your local electrical inspector to find out what permits and inspections are required.

**Jeff Gorton**  
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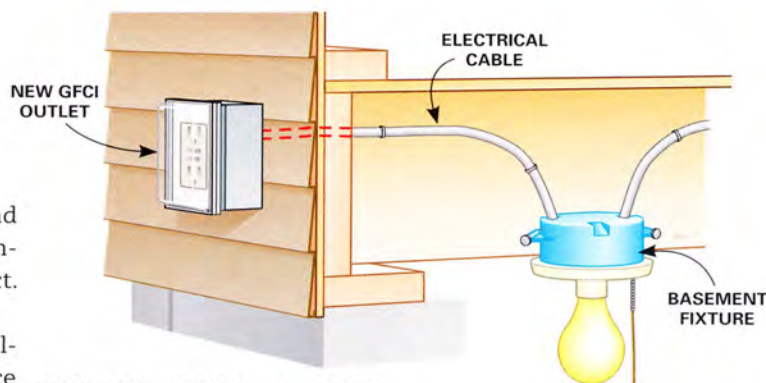


## STRATEGY 1

### RUN CABLE FROM THE BASEMENT OR CRAWL SPACE

The rim joist is the wide board that rests on the foundation and supports the exterior walls. If your basement ceiling is unfinished, installing an outlet on the rim joist is a simple project. But there are a few things to watch out for.

If you want to put the outlet on the rim joist that runs parallel to the floor joists, make sure you can reach into the space from the basement. Sometimes the joists are too close together to allow easy access. If you want to add the outlet to the rim joist that runs perpendicular to the floor joists, make sure the outlet is near the center of a joist space so you aren't drilling into the end of a floor joist. Use a long 1/8-in. drill bit or a section of stiff clothes hanger to drill a locator hole in your desired spot. Then you can see from inside whether the spot you've chosen is easily accessible. You'll probably have to remove insulation, and in older houses even pry out concrete or rubble, to

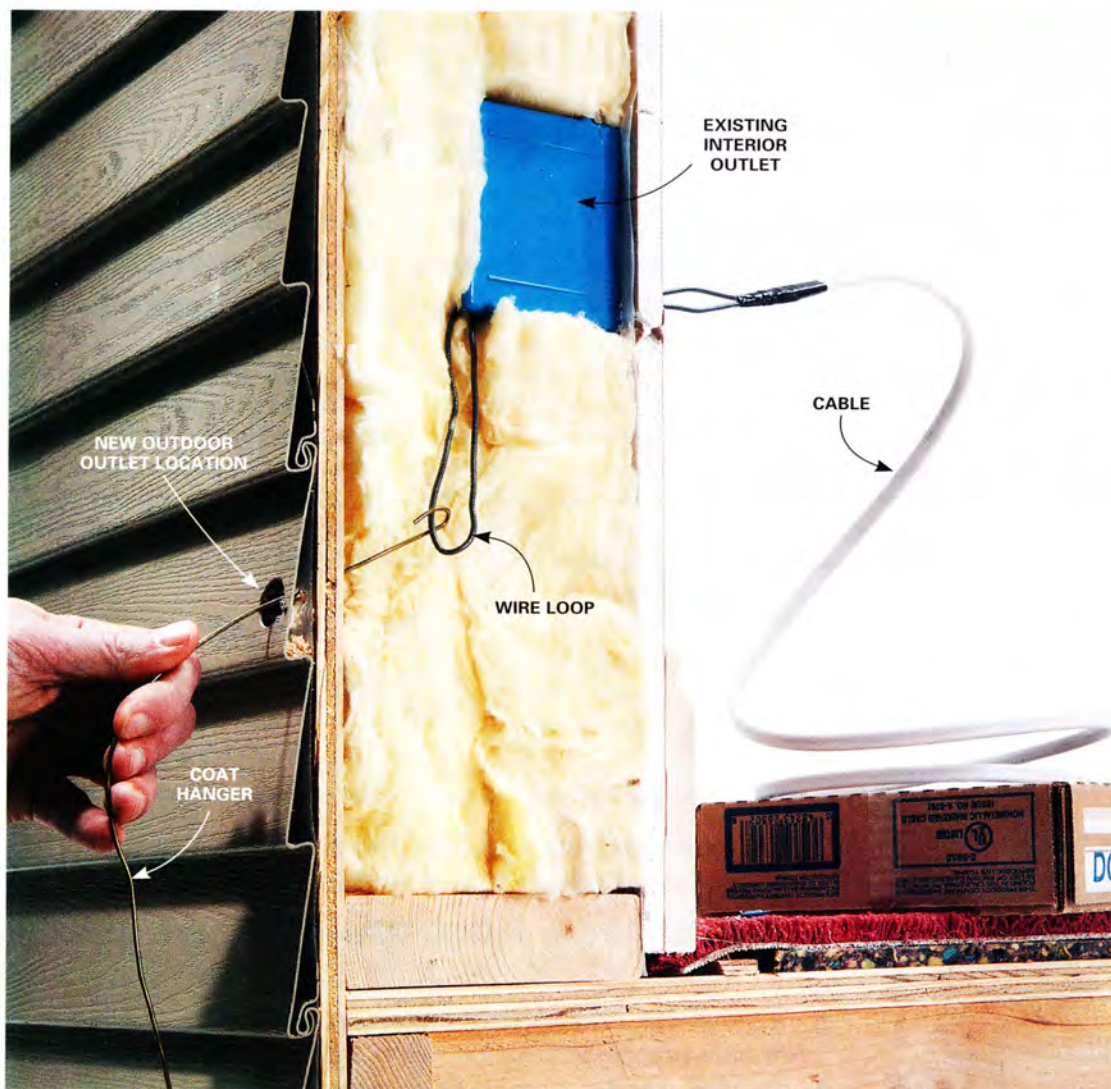


#### THROUGH THE RIM JOIST

If you have a crawl space or an unfinished basement, this is the best way to go. It's easy and your choice of power source and outlet location is unlimited.

get good access to the rim joist near the new outlet.

From the rim joist, it's usually easy to run the new cable to the circuit breaker panel or to an existing basement lighting circuit. If the circuit is in an unfinished basement or crawl space, you don't have to add AFCI protection.



#### THROUGH THE WALL

You can run wiring from an interior outlet without tearing up walls. But your options are limited with this approach: Your exterior outlet has to be within a few inches of an existing interior outlet.

## STRATEGY 2

### CONNECT TO AN INTERIOR OUTLET

This option is one of the easiest, especially if you don't have an unfinished basement or crawl space. You simply find a spot on the outside of your house that lines up with an outlet on the inside. Then you can fish new wires from the interior outlet to the one outside. But keep in mind that you may have to add AFCI protection if it doesn't exist. Ask your electrical inspector to be sure. There's an article at [familyhandyman.com](http://familyhandyman.com) that provides detailed how-to information for adding an outdoor outlet using this technique. Search for "outdoor outlet."



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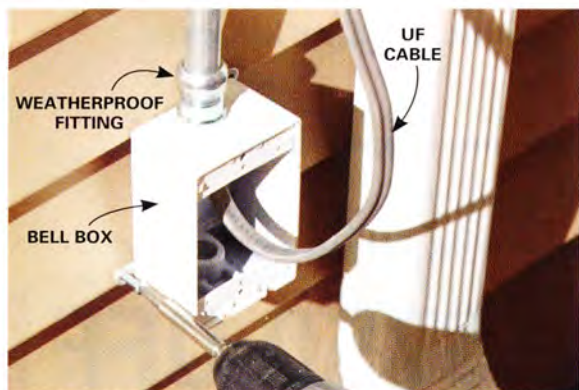
### STRATEGY 3

## RUN A CABLE FROM THE ATTIC

If you don't have a basement or crawl space, this is a good option for getting power to an exterior outlet without fishing wires through the wall. Basically, you run UF cable through a hole in the soffit and through the attic to your power source, leaving enough cable to reach the new outdoor outlet plus an extra foot. Then you slide the conduit, with bushing, over the cable until the conduit extends a few inches into the soffit. To finish, connect the box to the conduit, add straps and wire the new outlet. Insulation and the cramped space can make getting wire through the attic a nasty job. Consider this option as a last resort.

Here are a few tips for running the cable:

- Choose a spot for the outlet that's alongside a downspout or exterior trim where the vertical conduit will be less conspicuous.
- Use UF (underground feeder) cable, not regular NM (nonmetallic).
- Connect the conduit to the Bell box with a weatherproof compression fitting, not a setscrew-type conduit connector.
- Install a bushing on the top of the conduit sleeve to protect the cable from the sharp edge of the conduit.



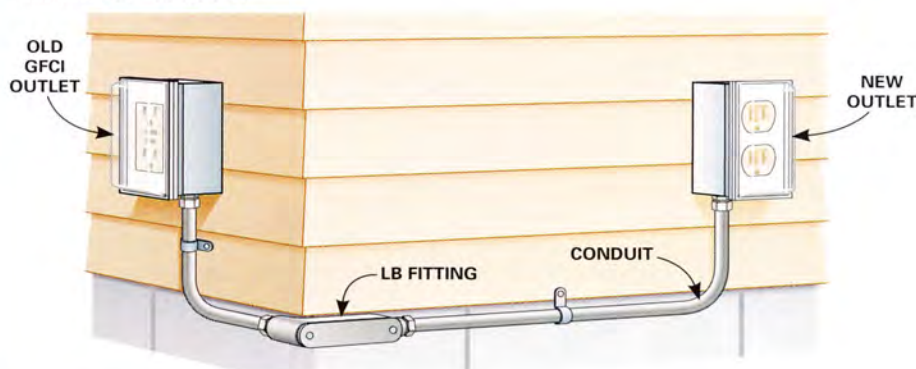
### DOWN FROM THE ATTIC

If other options aren't available, you can run UF cable through the attic and down through a sleeve on the wall to your new outlet.

### STRATEGY 4

## RUN CONDUIT FROM AN EXISTING OUTLET

If you have an existing exterior outlet and don't mind the look of surface-mounted conduit, this is a good option for adding an outlet. If your existing outlet is surface mounted, you can simply remove one of the knockouts in the weatherproof box and connect your conduit with a weatherproof fitting. But if your outlet is recessed, you'll have to add a weatherproof box extension to allow for a conduit connection. Use an LB fitting to turn a corner with conduit. For more information on working with metal or plastic conduit, go to [familyhandyman.com](http://familyhandyman.com) and search for "conduit."



### TAP INTO ANOTHER OUTLET

Extending conduit from an existing outlet is a great way to add another outlet without running new cable through walls, basements or attics. You can run the conduit under a course of siding or near the ground to make it less conspicuous.

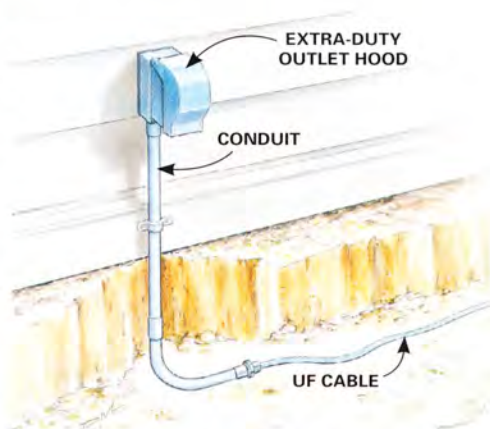
### STRATEGY 5

## RUN UNDERGROUND CABLE FROM AN EXISTING OUTLET

This option is similar to No. 4 above, but rather than run the conduit on the surface of your house, you can run it underground to the new outlet. You also have options for handling the underground wiring, depending on how deep you want to dig. The easiest method doesn't require running conduit underground. Instead it uses UF cable buried 12 in. deep.

There are a few caveats, though. The cable must be protected by a GFCI. If the existing outlet isn't GFCI protected, simply replace it with a GFCI outlet. Also, you must protect the cable with a plastic or metal conduit

sleeve from the outlet boxes to a depth of 12 in. below the surface of the ground. You can use this same method to run wiring to a post in your yard (go to [familyhandyman.com](http://familyhandyman.com) and search for "outdoor outlet").



### RUN POWER UNDERGROUND

If you don't want to run exposed conduit, you can run power underground instead. A 12-in.-deep trench is all you need for UF cable.





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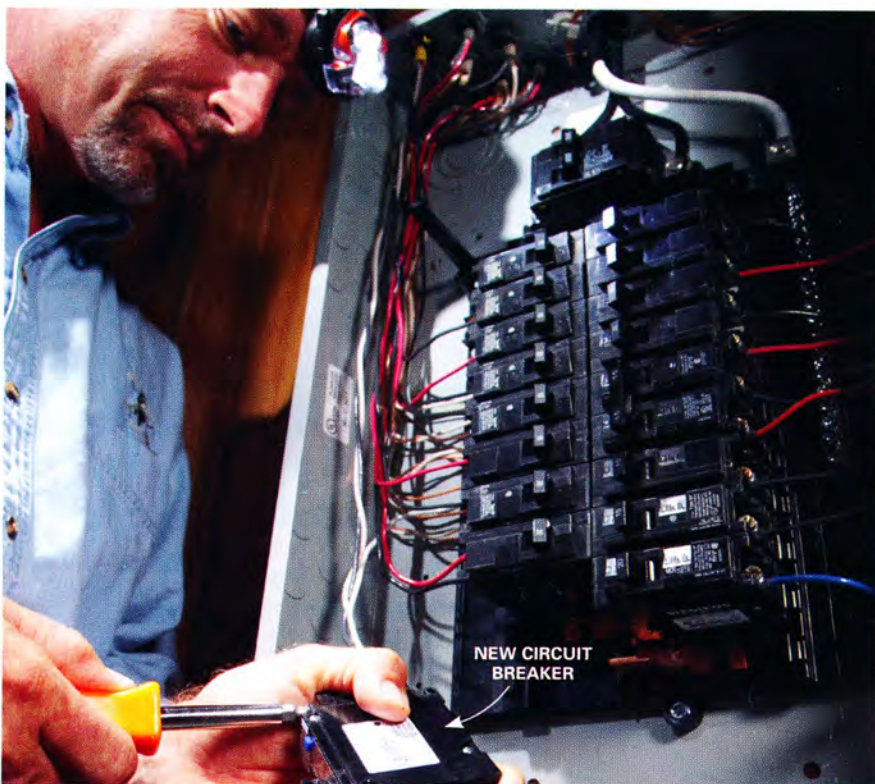
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## WHERE TO GET POWER

### Consider a new circuit

It may seem like overkill to run a whole new circuit to power just one outlet, but a new circuit has several advantages. First, you can be sure that the entire capacity of the circuit is available at the outlet. If you're planning to operate power tools or lawn equipment, this is a big advantage. In fact, for the additional cost of 12-gauge wire, you can run a 20-amp circuit with plenty of power for practically any tool you want to use. With a new circuit, you don't need to calculate the load on the circuit or worry about overcrowding an existing box.

Of course, a new circuit requires running a new cable all the way from your outdoor outlet to the electrical panel, which may be difficult in some situations. And when you get to the main electrical panel, you'll have to connect the wires for the new circuit to a new circuit breaker in the box, a job best left to a licensed electrician unless you're an experienced DIYer. If you choose this option, go to [familyhandyman.com](http://familyhandyman.com) and search for "add a new circuit" for instructions.



### ADD A CIRCUIT

Running a cable from your new outlet to the circuit breaker box and connecting it to a new circuit breaker is a good alternative to connecting to an existing circuit.

### Connecting to an existing circuit

Using an existing circuit to provide power to your new outlet is a logical choice, but there are several things to consider. First, the National Electrical Code requires that any new outlets in living areas be protected by an AFCI (arc fault circuit interrupter). Interpretation and enforcement of this code is largely up to the local electrical inspector or code authority, so check with your inspector before connecting to any existing circuits. You may be able to simply add an AFCI-protected outlet, or you may have to add an AFCI circuit breaker.

Second, to avoid overloading the circuit, you should calculate the load on the circuit before adding an outlet to it. To find out how, search for "electrical overloads" at [familyhandyman.com](http://familyhandyman.com). And finally, make sure to calculate the capacity of the box you intend to connect to. To learn more, see the story "How to Install Dimmer Switches" at [familyhandyman.com](http://familyhandyman.com). You may have to add a larger electrical box to accommodate all the wires.



## OUTLETS AND BOXES

### Buy the right outlet

When you shop for an exterior outlet, first make sure it's a GFCI protected outlet like the one shown here. Then look for the labels WR (weather resistant) and TR (tamper resistant).



### Three types of boxes:

#### STANDARD OUTLET BOXES

A standard plastic or metal box cut into the wall is a good option if you want to avoid a surface-mounted box. Finish the job by installing an in-use cover to protect receptacles from water while cords are plugged in.



#### BOXES WITH BUILT-IN COVERS

For a sleeker look, install a box with the in-use cover built in, like this InBox by Arlington Industries. There are many variations of this box to fit different situations. If your home center doesn't have them, you can buy one online. We purchased our Arlington InBox at amazon.com.



#### WEATHER-PROOF SURFACE-MOUNT BOXES

One advantage of a surface-mount box like this is that you only need to drill a hole for the cable or conduit to enter through the back. Plus, this type of box easily accommodates surface-mount conduit.



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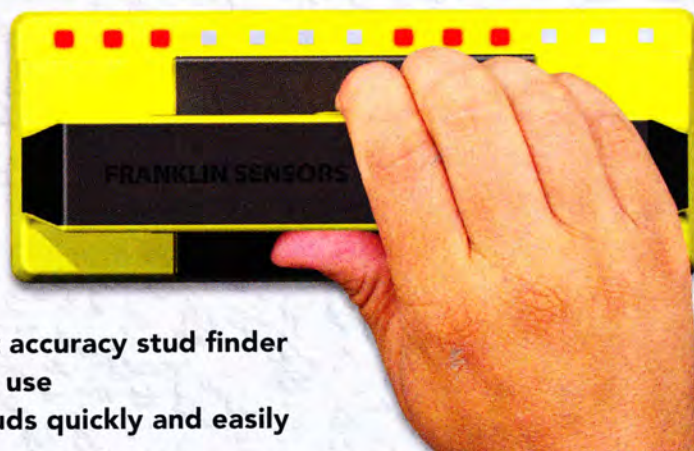
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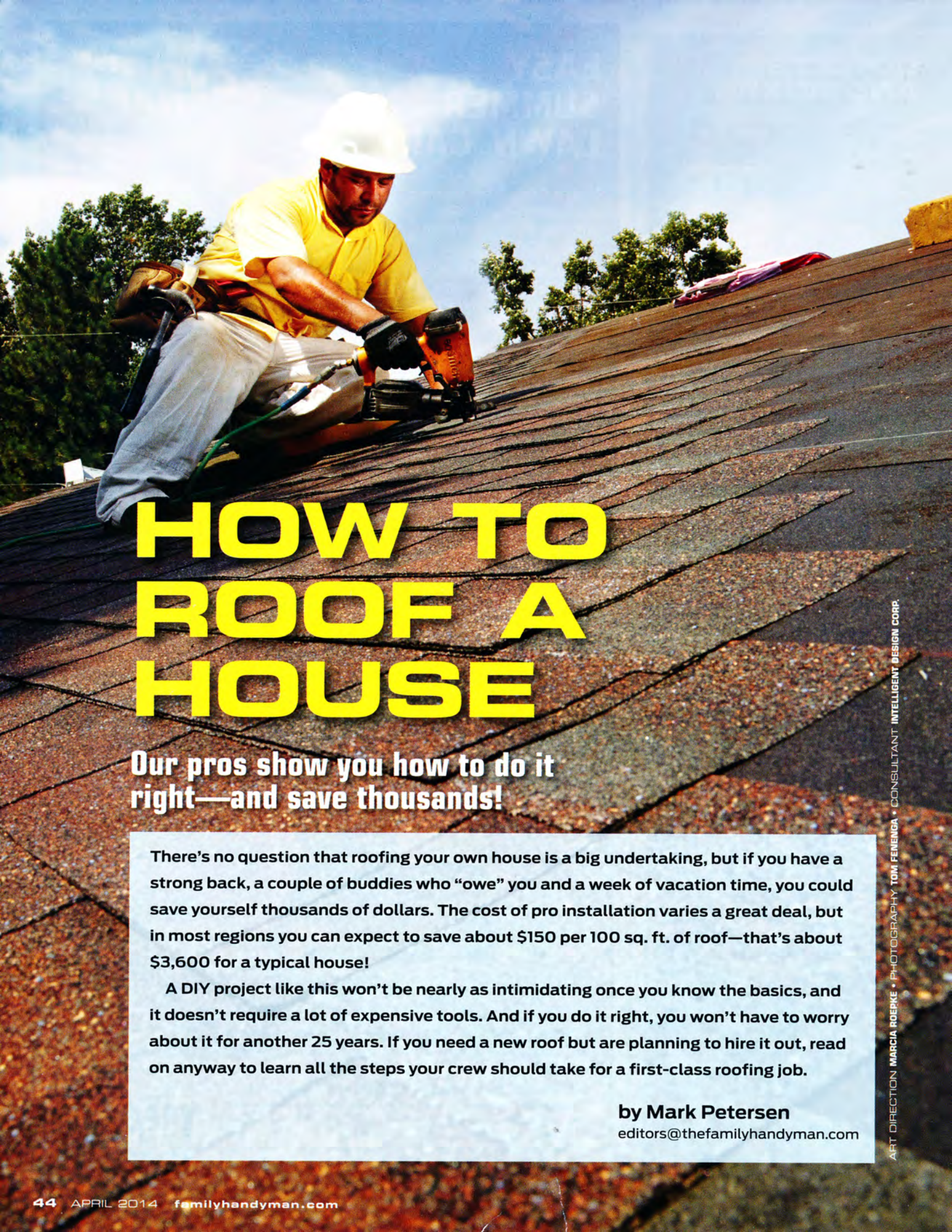
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A construction worker wearing a yellow shirt, white hard hat, and safety harness is kneeling on a roof covered in asphalt shingles. He is using a pneumatic nail gun to secure the shingles. The background shows a clear blue sky and some green trees.

# HOW TO ROOF A HOUSE

**Our pros show you how to do it right—and save thousands!**

There's no question that roofing your own house is a big undertaking, but if you have a strong back, a couple of buddies who "owe" you and a week of vacation time, you could save yourself thousands of dollars. The cost of pro installation varies a great deal, but in most regions you can expect to save about \$150 per 100 sq. ft. of roof—that's about \$3,600 for a typical house!

A DIY project like this won't be nearly as intimidating once you know the basics, and it doesn't require a lot of expensive tools. And if you do it right, you won't have to worry about it for another 25 years. If you need a new roof but are planning to hire it out, read on anyway to learn all the steps your crew should take for a first-class roofing job.

**by Mark Petersen**  
editors@thefamilyhandyman.com





## 1 STICK ON THE UNDERLAYMENT

Protect the roof against ice dams and windblown rain with self-stick ice-and-water underlayment. Peel off the top half of the plastic backing as you unroll the underlayment.



## 2 PEEL OFF THE BOTTOM BACKING

Make sure the underlayment lies smooth before you nail the top edge. Then pull off the lower half of the backing.



## 3 ADD THE SECOND COURSE OF UNDERLAYMENT

Install the second course just like the first, using the guidelines on the underlayment to get the correct overlap.

## WHAT IT TAKES

**COST:** \$150 to \$175 per 100 sq. ft. for materials

**TIME:** Four days for a crew of three to do a simple roof

**SKILL LEVEL:** Intermediate

**TOOLS:** Ladder, hammer, staple tacker, chalk line, tin snips, utility knife with hook blades, caulking gun, roofing gun, air compressor, scaffolding for steep roofs

It's been awhile, but I've worked on dozens of roofs in my carpentry career. I thought I knew all there was to know. But after recently spending a day with a full-time professional roofing crew, I learned that a lot has changed since my last job ... and all for the better! Metal flashing techniques have improved. Self-stick underlayment is more widely used. And more attention is paid to proper attic ventilation. I also have to admit that these guys are a heck of a lot faster than I ever was.

## Can you do it yourself?

Make no bones about it—roofing is hard work. There's no hiding from the elements. You can't be afraid of heights and you need to be pretty fit. Before committing to this project, try this: Get out a ladder and climb up onto your roof. If you can't walk around on it comfortably, hire a pro. If you passed this first test, go to the lumberyard or home center and throw a bundle of shingles onto your shoulder. Imagine yourself carrying that load up a ladder ... many, many times.

If you're still feeling positive at this point, why not give it a shot? You can skip a lot of heavy lifting by having your roofing supplier hoist the shingles onto the roof. Be sure you spread the load evenly across the length of the roof's peak. However, don't have the shingles delivered to the roof if you have two layers of old shingles yet to tear off—it could be too much weight for your trusses.

## Tear off the old

It's impossible to properly install new flashing and underlayment if you don't tear off the old roof beforehand. When tearing off the existing shingles, be sure to remove all the old nails or pound them flat. Protruding nails will tear holes in your new shingles. If you have movable items near your house and you're worried they might get damaged, relocate them. Invest in a few large tarps to protect your plants and landscaping and to



catch the thousands of nails that will rain down off the roof. It can be downright impossible to remove old self-stick ice-and-water underlayment, but it's OK if you have to leave it in place. And if at all possible, have the rented trash bin parked close to the house so you can toss in the old shingles right from the roof. For more information, search for "roof tear off" at [familyhandyman.com](http://familyhandyman.com).

## Install the drip edge

Metal drip edge isn't usually required (check with a local building official), but it gives roof edges a nice finished look, prevents shingles from curling over the edge, and keeps water from running directly down your fascia boards.

Before you install the underlayment, fasten the drip edge that covers the fascia on the eaves. The whole length of the fascia is probably not perfectly straight, so don't snap a line; just hold the drip edge snug against the fascia and fasten it through the top into the decking with roofing nails. Nail it every couple of feet.

Install the drip edge on the gable ends of the roof after you finish installing your underlayment. Start at the bottom side of the gable, and overlap the sections of drip edge a few inches as you work your way up the roof (see **Figure A**, p. 47). Use a tin snips to cut the drip edge to size.

## Roll out the self-stick underlayment

When an ice dam forms on a roof (usually caused by poor attic insulation/ventilation), ice and water can work their way up under the shingles and leak back into the house. Also, strong winds can blow rainwater under shingles. Self-stick roofing underlayment (often called "ice-and-water" underlayment) can prevent this because it sticks to the roof decking to seal out water. It also seals around nails, which keeps water from leaking through nail holes.

Rolls of self-stick underlayment have a plastic backing so the material won't stick to itself. The backing is separated down the middle. Line up the lower edge of the roll with the outside of the drip edge. Peel back part of the uppermost backing on the roll, and nail the top corner of the underlayment to the decking. Start pulling the roll across the decking using the backing, making sure the material is lying as flat and as straight as possible as you pull.



### 4 ROLL ON THE FELT PAPER

Cover the roof above the underlayment with roofing felt paper. To start each course, drive a dozen staples grouped close together. Then unroll the felt and straighten out the row before you add more staples.



### 5 DON'T SKIMP ON STAPLES

Place staples no more than 12 in. apart. Paper with too few staples will tear out under your feet and could cause a fall.

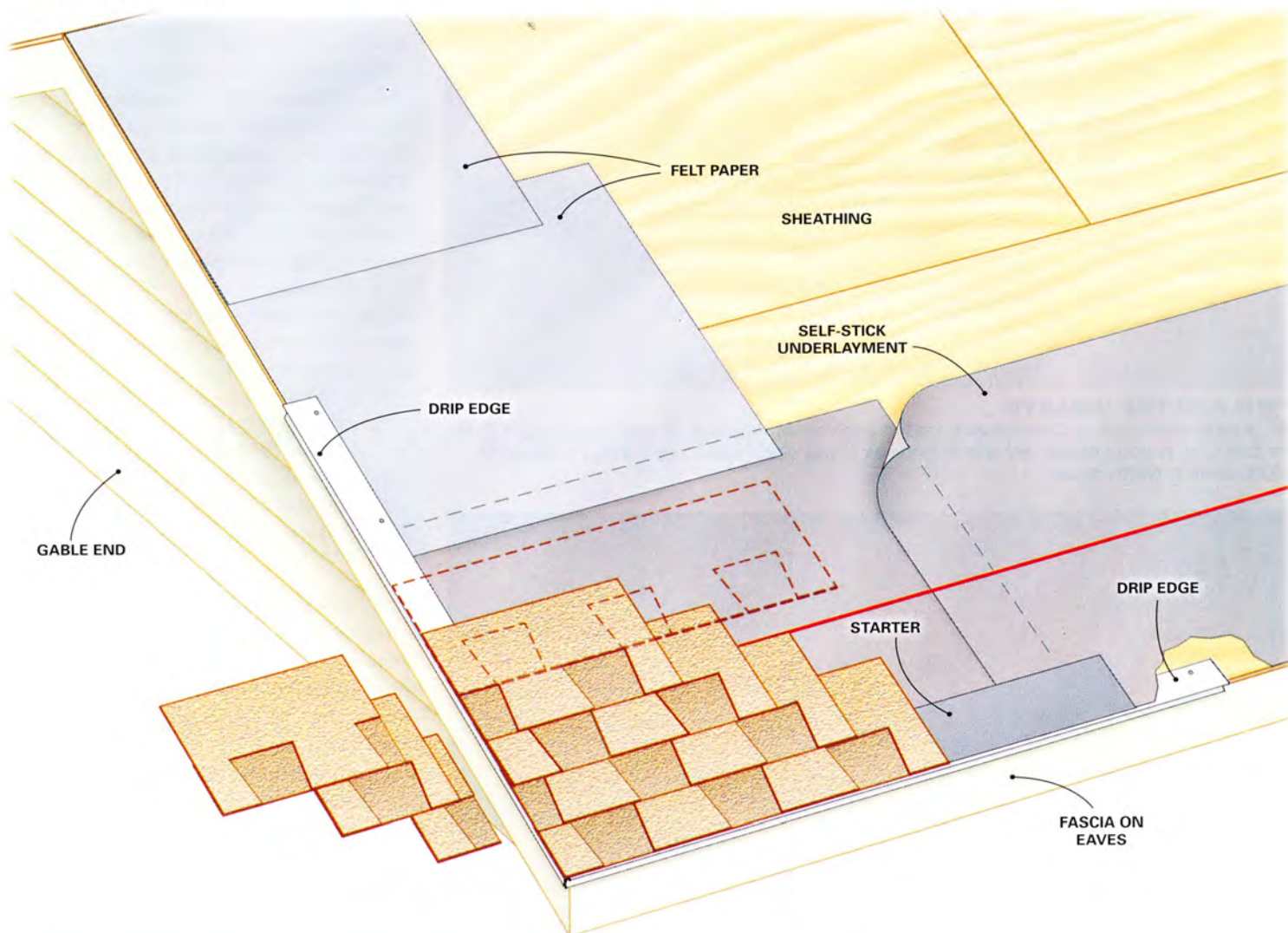


### 6 OVERLAP THE RIDGE

Run the felt paper over the peak and overlap it onto the other side. Do the same when you reach the peak from the other side of the roof.



**Figure A**  
Roofing overview

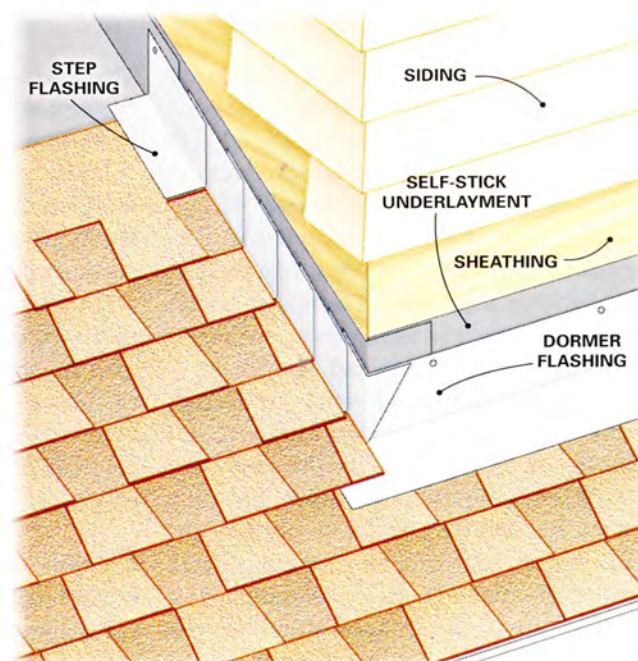


## Stay safe

When it comes to roofs, even the best safety equipment is no substitute for common sense and good judgment. Here are some tips for working safely on a roof:

- Leave steep and/or high roof work to the pros. No amount of money you could save is worth the risk of death or a lifelong disability from a fall.
- A fall protection kit (harness, rope and hook) costs \$100 at home centers.
- Wet roofs are slippery. Wear shoes with soft rubber soles for extra traction.
- Keep the roof swept clean of dirt and debris.
- Everyone on the ground should wear a hard hat—even the most careful worker can drop a tool off the roof.
- Always look and call out before tossing anything down.
- Carefully position ropes and extension cords so they're not underfoot.
- Check the weight rating on your ladder—it needs to hold you plus 80 lbs.
- Extend the top of the ladder at least 3 ft. above the roof edge so you'll have something to hang on to as you step onto and off the roof.
- Never step on any of the ladder rungs above the roof.
- Set up scaffolding to install the drip edge and first few courses.

**Figure B**  
Step and dormer flashing







## 7 FLASH THE VALLEYS

Install self-stick underlayment under the metal flashing. If you need more than one flashing in your valley, lay them both in place and make sure they're straight before nailing them down.



## 8 FOLD FLASHING OVER THE PEAK

Cut the flashing back to the peak along each crease. Then fold the flashing over the peak and cover the cut ends with self-stick underlayment.

You'll be able to roll out long sections at a time if you have a low-pitched roof, but the underlayment may slip off the eaves on steeper roofs, so roll out no more than 10 ft. there (**Photo 1**). It's important to make sure all your underlayment lies flat before you fasten it to the decking. Ripples and lumps can telegraph through the shingles and may be noticeable from the ground.

On warm days, self-stick underlayment will stick to clean decking without any fasteners. Fasten it to the roof with staples or nails on colder days, but only fasten the top part of the underlayment until you go back and peel off the bottom half of the plastic backing (**Photo 2**). The higher the temperature outside, the stickier the adhesive on the rolls gets.

This ice-and-water underlayment is tricky to work with on super-hot days; keep that in mind when you plan your project.

Many severe climate areas require self-stick underlayment to be installed at least 2 ft. in from exterior walls. This means you'll need two rows if you have 2-ft. eaves. Any two sections of underlayment on the same row should overlap a minimum of 6 in., and each course should cover at least 2 in. of the one below it (**Photo 3**). These rules can vary, so always consult your local building official.

## Cover the roof with felt paper

Felt paper, also called tar paper or builder's paper, helps shed water that gets

## RENT OR BUY?

Unless your roof is tiny, you're going to want to get your hands on a pneumatic roofing nailer. Prices range from \$100 to \$300. Renting one costs about \$35 a day or \$90 a week, so if you own a compressor, you might as well buy rather than rent. A compressor rents for about the same as the nailer. If you don't own a compressor and know you're going to finish your house in less than a week, then renting is probably the way to go.

If you do buy a roofing nailer and you know you'll only use it for one job, a cheaper model will work just fine. It just won't be as durable as the high-end models the pros use. But don't tell anyone you bought it. If the word spreads that you're a roofing gun owner, you run the risk of being recruited by a whole bunch of friends and neighbors to help work on their roofs.

under the shingles, protects the asphalt shingles from the resins in the wood decking, increases a roof's fire rating and helps keep your house dry if it rains during the job. Most roofing suppliers carry 15-lb. and 30-lb. rolls of felt. For most applications, 15-lb. felt works just fine. Install 30-lb. felt if you plan to leave the paper exposed for more than a couple of days because it wrinkles less than 15-lb. And 30-lb. felt doesn't tear as easily, so it's safer to walk on when you're working on steeper pitches.

Start a row by rolling out a short section of paper and securing it with a dozen staples grouped together near the center of the paper (**Photo 4**). That way you'll then be able to roll out a long section and swing it back and forth until your overlap is even. Each row of paper should overlap the one below it at least 2 in. There will be overlap lines printed on the paper to guide you. Overlap seams on the same row 6 in.

Practice on a couple of 10-ft. sections until you get the hang of it, and don't roll out a 25-ft. section of paper on a steep roof or when it's windy. If you're fastening the paper with a staple hammer, try to get a staple in every square foot of the paper (**Photo 5**). That may seem like a lot, but insufficiently stapled paper can tear out under your feet, which could result in a fall. Don't walk on any paper that isn't completely stapled down. Fasten the felt with cap staples/nails if you're working on a windy day or are working



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## Avoid extreme temperatures

Avoid roofing your house in below-freezing temperatures. The shingles won't stick together, which makes them prone to wind damage. A couple of cold days won't cause trouble, but after weeks and months, the adhesive strips on the shingles can attract dust and fail to seal even when the weather does warm up. And try to avoid working on sunny days when the temperature is above 90 degrees. The ice-and-water underlayment gets overly sticky and difficult to work with, and the shingles get soft and are easily scuffed by feet and tools.



## 9 INSTALL STARTER SHINGLES

Run the row of starter shingles 1/2 in. past the drip edge. Position them so the adhesive strip is toward the bottom and facing up. Place nails 2 to 3 in. up from the bottom of the eave.

on a roof with a pitch steeper than 6/12.

When you reach the top of the roof, run your last row long (**Photo 6**), and drape the paper over the peak (top ridge) onto the other side. When you reach the top on the other side of the roof, run that paper up and over as well. That way you'll end up with a watertight ridge. Your local building official may want to come out to inspect your roof at this point, but sometimes you can get by with snapping a few photos. Ask about the inspection schedule when you pick up your permit.

## Waterproof your valleys

Roof valleys channel a lot of water, so they need extra protection. Start by installing self-stick underlayment on the decking. This process is much easier with two people. Cut the underlayment to size (or in sections for long valleys), and peel off the entire plastic backer. With a person on each end, fold the underlayment in on itself, sticky side out. Then lay it into the valley and unfold it. Try to push it down into the crease of the valley as tightly as possible. If this self-stick ice-and-water underlayment bridges both sides of the decking, leaving a gap underneath, it could tear once you install the metal valley flashing. Run the underlayment past the drip edge at the eaves, and trim off the extra with a utility knife. Once it's smooth, nail it down on the outside edges.

Finish installing felt paper on the rest of the roof, overlapping the self-stick underlayment. Be careful when you trim back the felt paper so you don't slice into the underlayment. **Photo 7** shows the underlayment covering the felt on one



## 10 NAIL ON SHINGLES

Following the manufacturer's nailing instructions is critical; improper nailing is the biggest cause of roof failures in storms. Where and how often you nail your shingles will depend on wind speeds in your area and the pitch of your roof.



## 11 RUN SHINGLES LONG, THEN TRIM THEM OFF

For nice straight lines, run shingles over the edge of the roof. Then snap a chalk line and trim them off with a hook blade in your utility knife. If the overhang is more than a foot, cut some off and use the remainder elsewhere.





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## 12 MAKE PLUMBING VENTS LEAK PROOF

Install a layer of underlayment around vent pipes and caulk with roof sealant before shingling. Run shingles halfway past vents before installing vent flashing.



## 13 ADD THE VENT FLASHING

Drive three nails along the top edge of the flashing and one at each of the lower corners.

side. That's because one side of the valley is relatively small, and our crew felt this method would provide better protection. There'll be judgment calls like this on most roofs, so do as the pros say when there's a unique situation: "Think like a drop of water."

Set your first section of the metal valley flashing in place at the bottom, and run it past the drip edge. Before you nail it into place, set the one above it (if necessary) in place. Overlap the flashing at least 4 in. Not all valleys are built perfectly straight, so you may have to cheat your flashing a bit one way or the other. Crooked valley flashing will be very noticeable from the ground. With all the flashing in place, use a string or sight down the length of the valley to make

sure the flashing is straight. There's only so much that can be done with valleys built severely out of whack, because the flashing does need to fit snugly into the decking. Once you're satisfied with the position of the flashing, nail it to the decking every several feet. Nail the outside edges only.

Run the top of the flashing up past the peak of the house 4 to 6 in. Cut it back to the peak at every crease in the flashing (Photo 8), and then fold it over the peak and nail it down. Cover the end cuts with a small sheet of self-stick underlayment.

Trim the bottom of the flashing with a tin snips. Cut the outside edges of the valley flashing flush with the drip edge, but angle your cut so the middle portion of the flashing extends past the drip

edge a couple of inches. This will keep water farther away from the inside corner of the fascia. You can extend the center out even more but not so far that water overshoots your gutters if you have them.

Be careful not to nail your shingles any closer than 8 in. from the center of the valley. Once all the shingles are installed, snap lines as guides to trim them off. There should be 6 in. of the valley exposed on top (3 in. on each side), and each side of the valley should widen 1/8 in. for every linear foot of the valley run. So, if you have a valley run of 16 ft., your valley exposure would be 6 in. on the top and 10 in. on the bottom.

Another way of dealing with valleys is to use the "weave" method, which we don't cover in this story. The shingles are woven together from both sides of the valley. The benefit of a woven valley is that it doesn't leave an exposed flashing, which results in a cleaner look. The downfall is that leaves and twigs don't get washed away as easily, which can cause little water dams. This is especially true for roofs with low pitches.

## Begin with starter shingles

Water can get in the seams between any two shingles, but that's OK because shingles overlap and the seams are staggered. But if you don't use starter shingles, water will run in between the seams on the first row and right onto the underlayment, increasing the odds of a leak. The starter row shingles are only half as wide as a full shingle. If they were full size, the top half of the first row would have three layers of shingles instead of the two the rest of the roof has, causing a visible hump.

Don't bother snapping lines for the starter shingles; just overlap them 3/4 in. past the drip edge. Fasten them down with five nails about 2 to 3 in. up from the bottom of the eave. Position the starter shingles so the adhesive strip is toward the bottom and facing up (Photo 9). The adhesive strip bonds to the shingle above it, creating a nice tight seal, reducing the chance of wind damage and water infiltration.

Some pro roofers install starter shingles on the gable ends as well. It's not usually required, but it provides a cleaner look. Hang gable-end starter shingles 1/2 in. past the rip edge, and make sure you overlap the starter shingle on the eave by 2 to 3 in.



## Install the shingles

Laying shingles isn't easy, but it's probably the simplest part of roofing a house. Line up the bottom of the first row of shingles with the bottom edge of the starter row, making sure the seams are staggered. With that row complete, you'll need to figure out the reveal (the portion of the shingle that isn't covered by the one above it). Standard reveals vary between 5 and 6-1/2 in. Whatever the reveal is supposed to be, snap a horizontal line that distance from the top of the first row of shingles (see **Figure A**, p. 47).

Your roofing gun should have an adjustable guide to help keep the rows straight. If it doesn't, cut a block of wood the same size as your reveal and use that as a gauge. Slightly wavy rows won't be noticeable from the ground, so only snap lines every several rows to straighten things out. It's easier to work from right to left if you're right-handed. Stagger each row so the seams don't line up. Follow the stagger pattern recommended by the manufacturer of your shingles. Use partial shingles to start subsequent rows.

No one will notice if the last rows are not the same size on both sides of the ridge, but it can be very noticeable if the row that meets the ridge has a 4-in. reveal on one side and a 1-in. reveal on the other. Once you get within 8 ft. of the ridge, measure down to your shingles at each end of the row. If one side is closer to the peak than the other, snap lines for all the remaining rows, making the reveal on one side progressively larger until you make up the difference. Don't adjust any row by more than 3/16 in.

Every shingle brand has its own nailing pattern requirement. The pitch of your roof and the wind conditions in your area also affect how many nails to use and where. Most shingles require four to six nails, about 1 in. in from each side and placed so they get covered at least 1 in. by the shingle above them. The nails should penetrate the decking at least 3/4 in. Most pros use 1-1/4-in. zinc-coated roofing nails.

Nail straight into the shingle, and adjust the setting on your gun or the pressure on your compressor so the nails pull the shingle tight to the decking but stay flush with the surface. Keep a hammer close at hand to take care of nails that get only partially driven in. And never use staples! Even if a buddy



## 14 SHINGLE OVER THE VENT FLASHING

Seal the nail heads, and trim around the stack flashing with a utility knife fitted with hook blades.

### Architectural vs. three-tab shingles

The shingles shown here are commonly called "architectural." Some architectural shingles are partially laminated (two layers), and others are fully laminated, which gives them more of a textured look, similar to wood shakes. Because of the extra material, architectural shingles are heavier. Some can handle winds up to 150 mph, which is twice the wind rating of many three-tab shingles.

Architectural shingles are easier to install because you don't have to worry about lining up the tabs vertically. The life span depends on the quality of the shingle. Both styles are available with 25-year and 30-year warranties. Expect to pay about 15 to 20 percent more for standard architectural shingles than for standard three-tabs.

Whichever you choose, make sure all the bundles have the same "lot" number on the packaging. That means they were all made in the same batch or run. Shingle color can vary noticeably from one batch to another.

has an old roofing stapler with free staples, politely decline. Staples don't have the holding power of nails; they tend to rust out before the shingles go bad; and most manufacturers don't allow staples, so you'll void the warranty.

When you reach the ridge, use the same technique as you did with the felt paper: Wrap the first side over the top, and then wrap the second side over the first. Cut the shingles to size with a utility knife fitted with hook blades. Run the shingles long over hip ridges and rakes, and in the valleys. When you're all done installing the shingles, snap lines and trim the shingles to the line (**Photo 11**).

### Install step and dormer flashing

It's possible to reuse existing step flashing and dormer flashing, but the best way to get a watertight seal is to tear off the siding in those areas and install new flashing. Start by running self-stick underlayment at least 6 in. up onto the walls. This provides an additional barrier

if water does get past the flashing. Cover the front wall first and then work your way up the side wall. Overlap the side-wall underlayment around the corner onto the front wall about 1 in. or so.

Install the shingles right up to the front wall. Cut a couple of inches off the vertical portion of the dormer flashing, and run the horizontal portion past the side wall that same distance. Nail the dormer flashing to both the wall and the shingles.

Make a 1- to 2-in. cut with a tin snips at the bend in the first step flashing. Run a bead of sealant on the corner edge of the dormer flashing, and then run that step flashing past the dormer flashing the same distance you made your cut. Bend the step flashing around the corner onto the dormer flashing with your hammer.

Install your next row of shingles over that first step flashing, then cover that row with a step flashing, and so on. Nail the step flashing to the wall toward the top of the flashing at the end that's





## 15 ADD VENTILATION

If you need more ventilation, cut additional vent holes in the decking with a circular saw and install vent flashing.



## 16 CAP THE RIDGE

Snap chalk lines to help keep the row of ridge cap shingles straight. Install the ridge cap so the prevailing winds blow over the overlap seams, not into them.

closer to the peak, so the next step flashing in line will cover the nail. Don't nail them down through the shingles. For information about flashing around chimneys, search "install chimney flashing" at [familyhandyman.com](http://familyhandyman.com).

## Working around vents as stacks

Installing shingles around attic vents, plumbing vent stacks and furnace stacks is basically the same process. The main difference is that you'll install a piece of self-stick underlayment around all the stacks, but you just need to roll the felt paper over the vent holes and cut out the holes. When installing the felt paper over a stack, it's OK to make an oversize hole. But before you roll out the row of paper above the stack, cut a 2- or 3-ft. section of self-stick underlayment, cut a hole in it

slightly smaller than the diameter of the stack, and slide it over the stack. Make sure the piece is large enough so that the next row of felt paper overlaps the top at least a couple of inches (Photo 12). Caulk around the pipe when you're done.

Install the shingles up and halfway past the vent hole or stack. Next, install your vent or stack flashing over that row of shingles (Photo 13). Nail it down with your roofing gun, top and bottom.

Seal the top nail holes and continue on up with your shingles. Trim the shingles with your utility knife (Photo 14). Some vent and stack flashing is covered in protective plastic, which will have to be removed.

If you're installing the type of stack flashing with a rubber boot that seals around the pipe, spray-paint the pipe a similar color as your roof. You can also

paint electrical masts and other projections (before installing shingles). This simple step adds a lot to the finished look of your roof.

To find out if you have proper attic ventilation, go online and search "attic ventilation calculator." Just type in the dimensions of your attic to learn how many vents you need. If you don't have adequate ventilation, cut in more holes with a circular saw (Photo 15).

## Cap the ridge

Once all your shingles are installed, you'll need to cover (cap) the ridge (and hip ridges if you have a hip roof). The top ridge cap shingles will overlap the hip ridge cap, so start with the hips. Snap a couple of guide lines just a little inside the perimeter of the ridge so the lines get covered up when you're done. Nail each shingle on both sides about 1 in. above the overlap seam (Photo 16). Store-bought architectural-style ridge caps are often two layers thick, to match the look of the shingles. You may need longer nails to fasten the ridge because of all the extra layers of shingles.

Install the top ridge cap so the prevailing winds blow over the overlaps rather than into them. If wind isn't an issue, start at either side, or start at both sides and end in the middle. Rip the top half off the last ridge cap shingle, and nail through the face of it with two nails on the ends of each side.

## Seal it up

Before you put your ladder away, sweep all the debris off the roof, and then seal all the exposed nails on your vents and stack flashing. If you used stack flashing that has the rubber boot, seal the area where rubber meets the pipe. Avoid silicone (it won't hold up) and asphalt-based sealants (they tend to dry out when exposed to direct sunlight). Our roofers prefer a product called Lexel. It's clear like silicone, sticky as model glue and lasts for years. And remember, these areas you sealed require maintenance—they should be inspected every few years.



Our iPad edition includes additional how-to information for roofing around a chimney. It's available at the App Store.



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# HOME CARE + repair

BY RICK MUSCOPLAT

editors@thefamilyhandyman.com

## Make your gas grill look like new

If your gas grill is looking old and gray and the cart is starting to rust, you're probably thinking it's time for a new grill. Sure, it would be cool to own one of those shiny new stainless steel models—if you're willing to spend \$500 or more. But if the cart, base and cover of your current grill are still sound, you can whip it into like-new shape in less than a day.

You just need special paint, some new accessories and elbow grease. The paint and supplies cost less than \$50 at home centers. And you can pick up new handles, knobs, emblems and a new thermometer for about \$25 from a local appliance parts store or online (grillparts.com is one source). You'll have to wait at least 24 hours for the paint to cure, but then you can get back to burger-flipping. Here's how to do the job.

### Buy supplies

Stop at any home center and buy a bottle of heavy-duty degreaser, nitrile gloves, a respirator, a stiff-bristle scrub brush and a wire brush. Also pick up 80-grit and 120-grit sandpaper, brush-on or spray-on rust converter, primer for rusty metal and a few cans of heat-resistant paint (one choice is Krylon High Heat Max, \$15). You'll also need disposable plastic sheeting, a shop vacuum, a palm sander, a bucket and a garden hose.

### Clean and sand and prime

Cleaning a greasy gas grill creates quite a mess. And the last thing you want is to move the grease from the grill to your driveway or garage floor. So do the project outdoors and tarp off the entire work area. Start the job by removing the burners, grates and grease cup. Use your shop vacuum to suck up all the loose crud from the bottom of the grill and any dirt and rust from the propane tank shelf. Next, remove the knobs, emblems and



thermometer (if equipped). Mix up a strong solution of degreaser using the dilution ratios listed on the label. Then grab your scrub brush and gloves and wash the entire grill (Photo 1). If you have a power washer, soak the grill with

degreaser and then blast off the grease and loose paint. Rinse it with water and let it dry in the sun.

Next, mask off the wheels, gas valves, warning labels, manufacturer's nameplate and any other parts that won't be

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA



painted. Then grab your respirator and palm sander and sand the exterior (**Photo 2**). Pretreat the worst rust spots with a rust converter product. Once that dries, prime the rusty areas and bare metal with a primer for rusty metal (**Photo 3**). Let the primer dry.

## Paint the grill and install the new parts

Wipe the entire grill with a tack cloth, then spray-paint it (**Photo 4**). Finish up by installing the new accessories (**Photo 5**). Remove the masking and let the paint dry for the recommended time. Then install the burners and grates and get grilling.



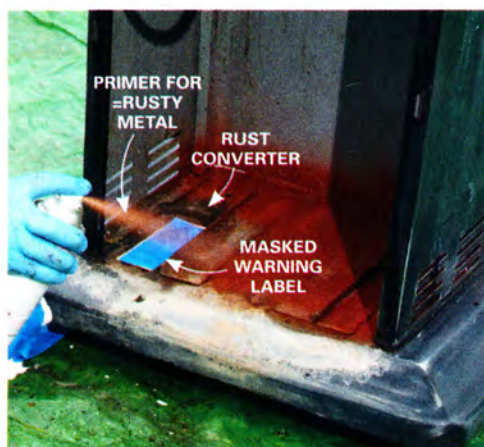
### 1 DEGREASE THE ENTIRE GRILL

Spread degreaser inside the cover and burner area and over the entire exterior. Then scrub the entire grill with a brush. Make sure you remove grease from all the crevices.



### 2 SAND AND WIRE BRUSH

Sand pitted and corroded areas with 80-grit sandpaper. Use a wire brush in the crevices to remove surface rust and chipping paint. Then switch to 120-grit sandpaper and sand the entire grill and cart.



### 3 SPRAY ON PRIMER

Apply rust converter, then spray primer over the converted rust and bare metal areas. Let it "flash" for the recommended time. Then apply a second coat.



### 4 APPLY THE FINISH COAT

Paint the top of the grill lid first. Then spray down each side all the way to the bottom of the cart. Paint the front of the grill last. Apply a second coat after waiting the recommended time.



### 5 INSTALL NEW PARTS

Attach the new cover lift handle or knobs. Snap on the new emblems. Screw in the new thermometer.



# Top Ten TIPS

BY JEFF GORTON

editors@thefamilyhandyman.com

ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY TOM FEENENGA



## Leveling

Whether you're just hanging a picture or building an entire house, getting things level is part of the project. And often there's a tip that'll help you get the job done quicker, easier or more accurately. Here are some of our favorites.



### 1 Smartphone level

This is probably old news to you smartphone veterans out there, but for you newbies, here's the tip. Your phone can work like a small level. You can download a level app, or your phone may already have a leveling app built into the operating system. You wouldn't want to build an addition with a phone level, but it can come in handy for little leveling tasks around the house.





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## 2 Level a row of pictures

Getting a row of pictures to line up at the top can be tricky, especially if the hanging wires are different lengths. Here's a tip from a professional picture hanger. Hook a tape measure to the wire and pull it tight (**Photo 1**). Measure to the top of the picture frame. On the wall, measure down from a level line and mark this distance at the centerline of your new picture location. Align the hook of the picture hanger with the mark and nail it to the wall (**Photo 2**). Repeat this process for all of the pictures, and their tops will be perfectly aligned.



### 1 MEASURE FROM THE WIRE

Measure the distance from the stretched wire to the top of the picture frame.



### 2 MARK FOR THE PICTURE HANGER

Measure down from the level line and mark for the location of the picture-hanging hook.

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### 3 Poor man's laser level

If you need to make a long, level line and don't own a laser, try this method. Mark the desired height of your line on the wall. Hold your level at the mark and adjust it until the bubble is centered. Then make a mark at the opposite end of the level (**Photo 1**). Extend the line by stretching a chalk line and aligning it with both marks (**Photo 2**). If you're working indoors, use dust-off marking chalk, which is easy to erase. Stretch the chalk line and snap it to create a perfectly level line across the wall.



**1 MAKE A LEVEL MARK**  
Align the top of the level with your mark and center the bubble. Mark the opposite end.

LINE UP WITH MARKS

### 2 SNAP A LINE

Line up a chalk line with the two marks and snap a line.

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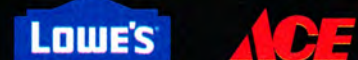
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### 1 CHECK THE OPENING

Lay a level across the opening and shim under one end until the bubble is centered. Measure the thickness of the shims.



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### 2 TRIM THE BOTTOM OF THE JAMB

Transfer the measurement to the appropriate jamb and draw a cutting line with a square. Saw along the line to trim the jamb. Now when you set the door in the opening, the top of the jamb will be level.

### 4 Pre-level your doorjamb

If your floors are going to be carpeted, you don't have to worry about a gap under one of the doorjamb sides. In fact, most trim installers raise the doors so they don't drag on the carpet. This is done by resting the jambs on 3/8-in.-thick shims, or temporary scraps of trim. That raises the whole door so it completely clears the carpet. But if the jambs have to fit tight to tile, wood or vinyl floors, you'll have to cut them to fit an out-of-level floor. The two photos above show how.





## 5 Check old levels before you use them

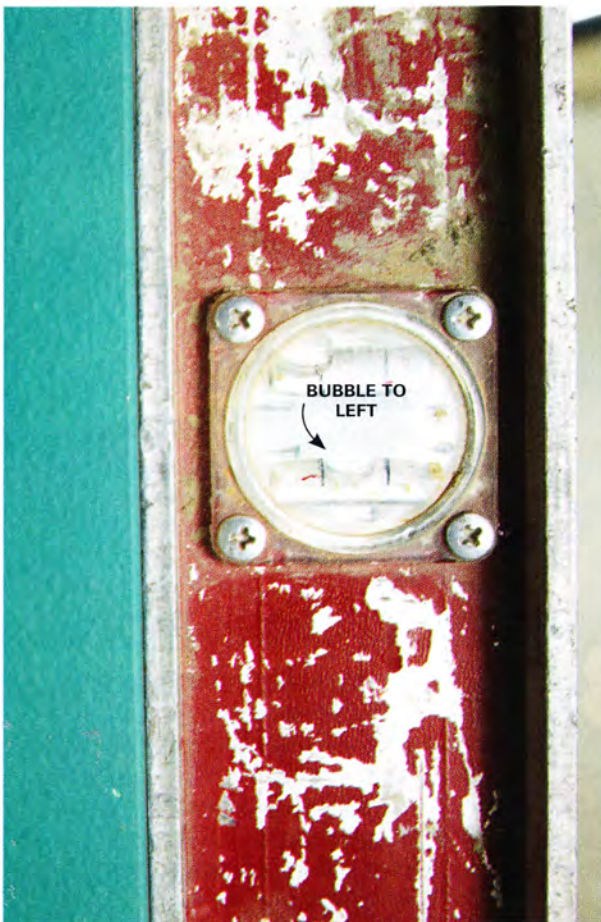
When levels get beaten up like this one, it's likely that some or all of the vials will be out of whack. And if you have a super cheap and/or older one, don't trust it! Before you do any more leveling, test the vials for level (horizontal) and for plumb (vertical). Check the leveling vials by placing your level on a flat surface and piling playing cards under one end until the bubble is centered. Now lift the level and rotate it 180 degrees, end for end, and rest it on the cards in the same location. The bubble should still be centered. If it's not, your leveling vial is inaccurate.

To check for accurate plumb vials, rest your level against a wall and note the location of the bubble between the lines (**Photo 1**). Then rotate the level 180 degrees, edge to edge, keeping the same end facing up (**Photo 2**). The bubble should be in the same spot. If not, your plumb vial is off. Levels like the one shown can be adjusted, but many levels can't. In some cases, one set of vials will be good, and you can simply cross out the bad set with a permanent marker to avoid using it. Or toss a bad level and buy a new one.

## 2 PUT THE OPPOSITE EDGE AGAINST THE CORNER

Now the bubble on this level is lined up with the left-hand line, indicating a bad plumb vial. Adjust the level or mark this vial as bad with a permanent marker.

**1 REST THE LEVEL AGAINST A CORNER**  
The bubble on this level is lined up with the right-hand line.



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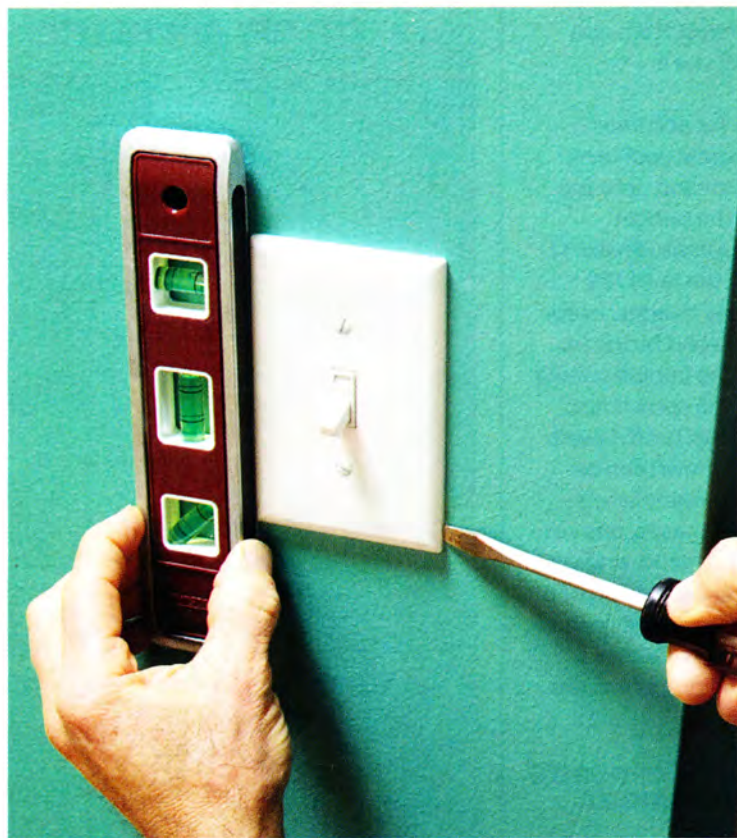
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## 6 Get your first row of tile perfectly level

Tubs and shower bases aren't always level, so starting your first row of tile against them could throw off your whole job. Instead, make level marks on the wall, line up the ends of a straight board with the marks and screw the board to the wall. Rest the first row of tile on the board for a perfectly level tile job. The distance from the top of the shower or tub to the top of the board should be less than the width of a tile. That way you can custom-cut the tiles to accommodate an out-of-level tub or shower and keep consistent grout lines.



## 7 Fix crooked switches and outlets

Here's a handy tip from one of our electrical consultants. The screws that attach an outlet or a switch to the box go in a slot that allows the device to be adjusted. But you don't always have to remove the cover plate to fix crooked switches or outlets. Instead, try pushing a flat-blade screwdriver against the cover plate. Use a screwdriver with a sharp blade. A rounded-over blade will just slip off. You may have to push from more than one corner to fix really crooked devices.



## 8 Easy appliance leveling

Here's a two-part tip for leveling appliances. First, use a magnetic level to free up both hands. Most torpedo levels have a built-in magnet and work great for appliance leveling. The second part of the tip is to lift the front of the appliance with a pry bar to take pressure off the leveling feet. It's much easier to turn the feet when they're off the ground.

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## 9 Extend your level

You could use a plumb bob to transfer layout marks from the floor to the ceiling, but extending your level with a straight board works much faster. Just remember to mark on the correct side of the level.



PHOTOGRAPHY HSP

## 10 Human transit

This tip won't work for leveling house footings, but it's great for approximating exterior grade changes as well as other long-distance leveling that doesn't need to be exact, just close. Hold a level at eye height and center the bubble. Sight along the top of the level to the point you want to check. The distance from your feet to the level is the height of the point you're looking at.

Of course, the elevation you're trying to measure won't usually be the exact distance from your feet to the level, so you'll have to do some math. You might be squatting, sitting down or standing. Whichever, figure out the distance from your eye to the ground and that's the height to the point you're sighting. In this case, we're checking the elevation to the top of the fountain to help us size the pump.

## How Can I check for a Blown Head Gasket?



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# PRO tips

BY MARK PETERSEN

editors@thefamilyhandyman.com



ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY TOM FENENGA

## Building face frame cabinets

A classic way to make cabinets is to build plywood boxes (aka carcasses) and cover the front with a hardwood face frame. Cabinets like this are strong and handsome and relatively easy to build. And we have the experience to prove it. Some editors here at TFH have built dozens of face frame cabinets; a couple of us have

built hundreds. We all recently sat down to compile a list of tips that we felt could help experienced cabinet-makers as well as those just starting their first one.

While these cabinets provide a sturdy support for door hinges, we won't cover door building here; that's a whole story of its own.



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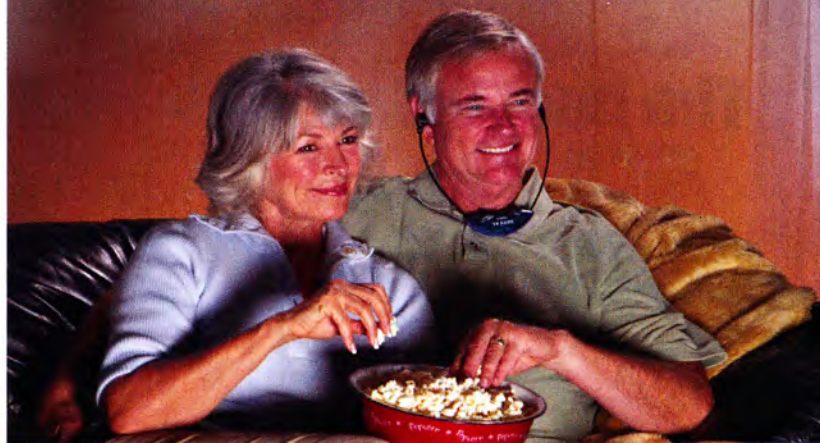
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## Label your face frame parts first

Dry-fit face frame parts so the best side of all the boards will be seen, avoiding stark grain color variations at joints. Label all the pieces with a pencil so the frame goes back together the same way you laid it out. The pencil marks also come in handy when you're ready to sand the assembled frame. You'll know you have flat joints when the pencil marks disappear.

## BUILD THE CABINETS, BUY THE DOORS

Building cabinet doors is doable but can be tricky. It sometimes requires powerful and expensive wood-shaping equipment. And if you have a bunch to build, you'll need a lot of clamps and even more space. Unless you have unlimited free time, consider building your cabinets but buying your doors. You'll find many door makers online (search for "buy cabinet doors"). Cabinet doors can be ordered in a variety of styles and in increments as small as 1/16 in. It's always nice to be able to see and touch, so check out your local cabinet shop as well.



## Assemble the face frame with pocket hole screws

Pocket hole screws are a fast and easy way to join a face frame. You don't need a lot of clamps or wood glue. A mortise-and-tenon joint may make you feel like a true craftsman, but only you will know you spent all that extra time. An entry-level pocket screw jig will cost you less than \$50, but if you plan to build several face frame projects, spend \$140 to get a top-of-the-line jig. For more on pocket screw joinery, go to [familyhandyman.com](http://familyhandyman.com) and search for "pocket screws."





## LEAVE OFF THE BACK UNTIL YOU APPLY FINISH

If you plan to finish your project before you install it, leave the back off until after you've applied the finish. It makes getting into all those nooks and crannies a lot easier, especially in deeper cabinets. Wood glue won't stick to finishes, so if you want to glue on the back, use polyurethane glue.



## Trim some face frames flush

Face frames on furniture look best when they're flush with the cabinet sides. But it's still better to build the face frame a little bigger (about 1/16 in.), and trim it off with a flush trim router bit. Adjust the bit depth so the cutting edges are only slightly deeper than the face frame.



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## Gang up on your components

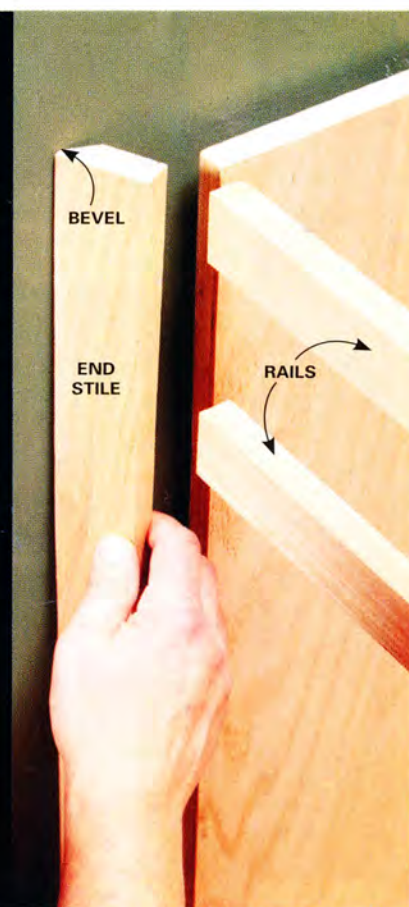
Even with a high-end table saw, it's difficult to reset the fence to exactly replicate previous cuts, so plan ahead and cut all your face frame parts at the same time. Gang-planing your stiles and rails will save time and ensure all the parts are exactly the same width and thickness. Gang-sand board edges by clamping them together. That not only speeds up sanding but also keeps you from rounding over edges. And *always* make more parts than you need. It's better to have a couple of pieces left over than to have to cut, plane and sand one replacement board if you make a miscut. Also, having extra allows you to choose the best boards of the lot.

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## Leave the end stile off to scribe

Leave one end stile off when you install cabinets that butt against walls at both ends. With a complete face frame, you won't be able to push the cabinet into place or scribe and adjust the stile to fit. Cut that last stile a bit oversize to leave room for scribing, and rip a 45-degree back bevel for easier planing to your scribed line. The bevel also makes it easier to twist the stile into place.

Assemble the whole face frame on your workbench with pocket screws, then remove the last stile. That way you'll be guaranteed a perfect fit when you reattach it after planing. Or attach it with a bit of glue and a few brads.



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Tools used:  
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Sheet Membranes



Tools used:

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String-A-Level™



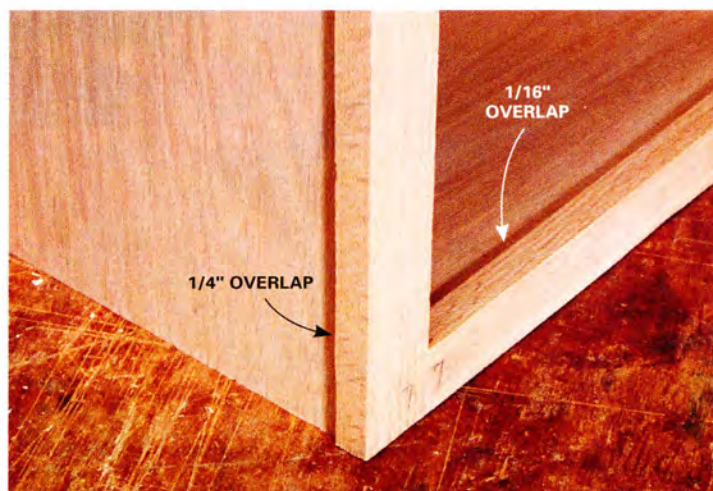
Simultaneously attach and level a continuous stringer on which to stack heavy or large format tile vertically.





## NAIL THE FACE FRAME TO BOXES

One of the easiest ways to attach face frames to carcasses is with a thin bead of wood glue and an 18-gauge brad nailer with 2-in. brads. Be sparing with brads; their main duty is to hold the frame in place while the glue dries. A couple per side and wherever there's a void should do the trick. A little putty will make the brad holes almost invisible.



## Build face frames larger

A main function of a face frame is to hide the exposed plywood laminations. A face frame does a better job of this if it overlaps the box edges a bit. Making the face frame run past all the plywood edges provides a little wiggle room and hides not-so-perfect saw cuts on the plywood. Face frames on sides of kitchen cabinets should overlap 1/4 in. on the outside edge. This makes room for adjustments when installing them next to one another. Build the face frame so that the bottom rail ("rails" are horizontal boards and "stiles" are vertical boards) projects 1/16 in. above the bottom shelf of the cabinet.

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## Don't cut rabbets if they're not needed

It's common practice to cut a rabbet (a notch to receive the 1/4-in. back panel) on the back edge of cabinet carcasses so the back panel will be recessed. But that's not necessary if the cabinet sides won't be visible—the back panel edges won't be either. Save yourself some time and just tack on the back panel with a brad nailer. Make sure to take into account the overall depth of your cabinets—they'll be 1/4 in. deeper if you go this route.

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**DIY TIP GENIUS**

## Don't settle for what's in the home center

Home centers and lumberyards typically have only a few cabinet-grade plywood options in stock, but almost all of them can order what you need. You can order sheets with more plies for stability; pick the orientation of the wood grain; buy sheets with hardwood on one side and melamine on the other; choose marine-grade plywood for outdoor projects ... the options go on and on.

It takes a little planning ahead, and ask about minimum orders, but don't limit yourself to oak if you really want cherry.



## Build a separate base

Most factory-built cabinets have a recessed "toe-kick" that's typically about 4 in. high and deep. But you can also make a separate base that's the total length of the cabinet assembly and build shorter cabinets to make up the difference. With this method, you won't have to mess around with figuring out and cutting toe-kick profiles on your cabinets.

This is also a handy technique when you have an uneven floor because you need to level and shim only one base instead of several individual cabinets. It's important to use dead-straight wood for bases so it'll be flat for setting the cabinets. Once your cabinets are installed, finish off the base front with a strip of 1/4-in. plywood that matches the cabinets.





## BUILD INDIVIDUAL BOXES

Moving and installing long one-piece cabinets can be a tough job, and it may not even be possible to get the assembly into the room. Instead of creating such a monster, build individual cabinet carcasses. Add the face frame after they're all in place.



## CAP END CABINETS

If you cap the end cabinet with 1/4-in. plywood, you don't have to hide the fasteners you used to build your boxes. That means you can use large, sturdy screws without worrying about ugly putty-filled holes. You'll also need an end cap if you choose to build a separate base. Use construction adhesive and a few small brads to fasten the panel in place, and make sure you extend the outside face frame stile an additional 1/4 in. to account for the thickness of the plywood.

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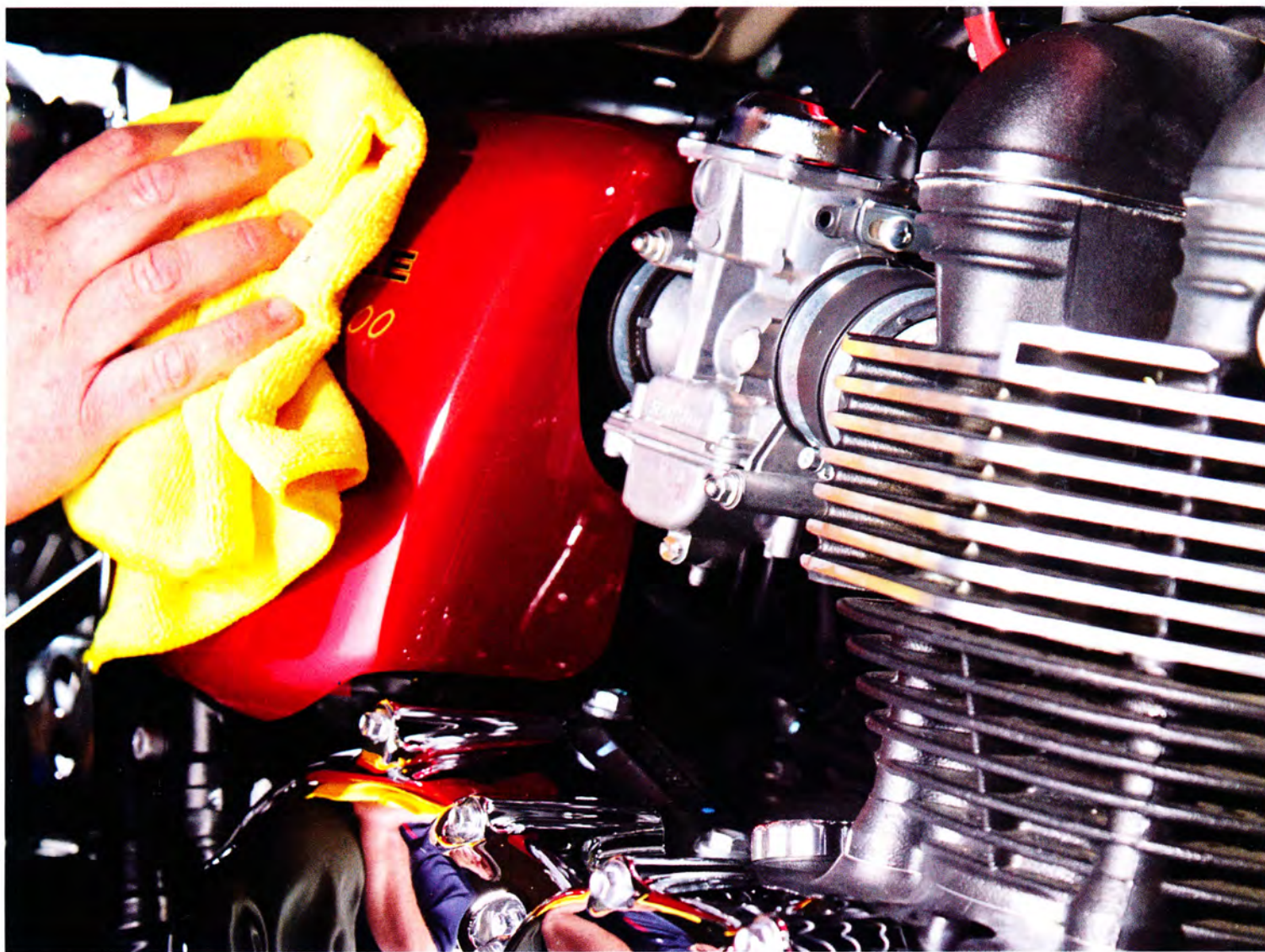
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# CAR + garage

BY RICK MUSCOPLAT

editors@thefamilyhandyman.com



## Pro tips for detailing a motorcycle

Getting your bike professionally detailed can cost a bundle, from \$200 all the way up to \$600 for a complete job with the optional protectant package. So it makes sense that you'd want to do it yourself to save the dough.

To learn the right way to detail a bike, we consulted Renny Doyle, owner of Attention To Details, a school for professional detailers. Renny walked us through his step-by-step method for detailing a motorcycle. His technique may seem like overkill, especially his recommendation for multiple rinse/dry cycles, but that's how he achieves perfection. He can detail a bike in less than four hours. But you'd better plan on a full day. And, you probably won't save any money on the first round because of the investment in cleaners and tools. But after that, you'll detail like

the pros and save money every time.

The products we show are Renny's personal favorites, but other major brands of motorcycle cleaners work just as well. Find these products and tools at auto parts stores and online (detailing.com is one online source).



### MEET THE PRO

Renny Doyle owns a detailing business and runs a school for professional detailers. In fact, he wrote a book on it titled *How to Start a Home-Based Car Detailing Business*. And he was a member of a select team chosen to restore the first 707 Air Force One.



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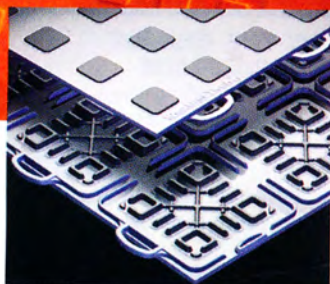
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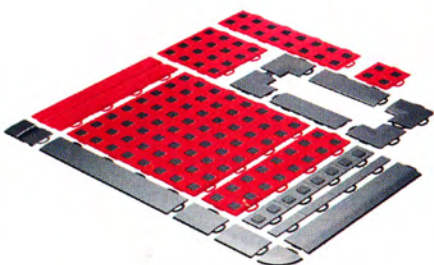
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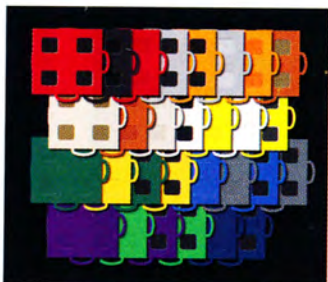
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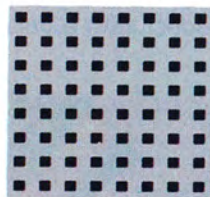
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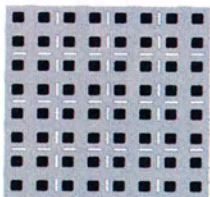
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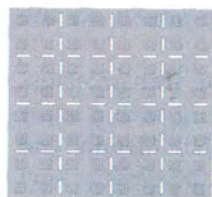
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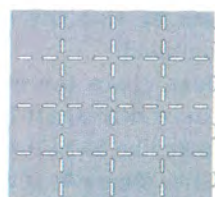
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## Remove the leather and start with a light wash

Work in a shaded area and don't start cleaning until the engine is cool to the touch. Remove the seat and leather saddlebags and set them aside. Then cover the battery with plastic sheeting and seal off the exhaust pipe (or pipes) with plastic wrap and a rubber band.

Next, do a prerinse with plain water to remove surface dust and grit. A fireman's-style garden hose nozzle works great because you can dial in a different spray pattern for each area of the bike. You can also use a pressure washer to rinse the bike, but dial down the pressure to its lowest setting and maintain a healthy distance from the bike to avoid damaging the softer metal and plastic parts. Use a gentle stream around wheel hubs to avoid forcing water into the bearings.

Follow the rinse with a prewash (**Photo 1**). Use a gentle car wash soap (Meguiar's Gold Class Car Wash Shampoo & Conditioner is one choice), a microfiber wash mitt, and separate soap and rinse buckets. The prewash is just to remove the light road dirt and mud. So don't go scrubbing the really dirty and greasy areas with your mitt. Save those for the special cleaners you'll use later on. Rinse off the suds and dry the bike right away to prevent water spots. Rather than hand-wiping the entire bike, use a power blower (such as the Metro SK-1 Motorcycle Dryer; \$75 at homedepot.com) or compressed air, keeping the pressure under 70 psi. Wipe off any remaining water with a waffle-weave microfiber towel.

Next, clean the tires, wheels and spokes with an "aluminum-safe" cleaner like Sonax Full Effect Wheel Cleaner (**Photo 2**).

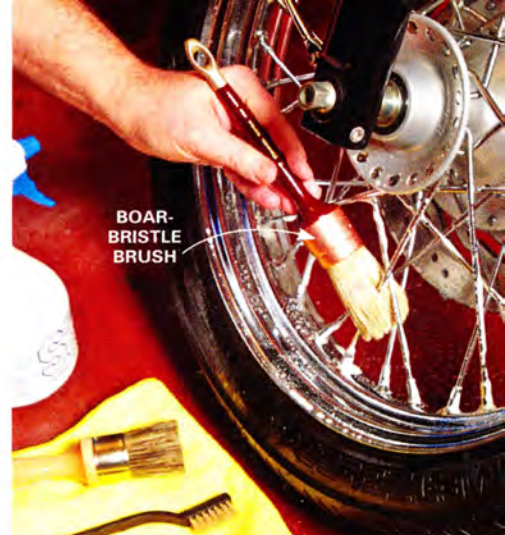
Move up to the dash and clean it with a gentle cleaner like Leather Therapy Wash or Meguiar's D180 Leather Cleaner & Conditioner. Then polish the dash with Meguiar's M205 Ultra Finishing Polish (**Photo 3**). Use the same polish on the windshield.

Next, clean the engine, transmission, chain or driveshaft housing with a spray cleaner like S100 Total Cycle Cleaner and brushes (**Photo 4**). If the S100 product isn't strong enough to remove caked-on grease, dilute a heavy-duty degreaser 4 to 1 with water, or cut a mild degreaser like Simple Green 50/50 with water. Apply the diluted degreaser and expect to put some elbow grease into the job. Don't ever apply



### 1 PREWASH WITH A DAMP MITT AND SUDS

Dip the mitt into soapy water and wring out the excess. Then wipe the damp mitt over the entire bike. Avoid soaking the dash gauges, buttons and switches.



### 2 CLEAN THE WHEELS

Spray the wheels and spokes with wheel cleaner and let it soak for about 30 seconds. Then brush the rim and spokes with a boar-bristle brush. Rinse everything with water and dry with the blower and towel.



### 3 CLEAN AND POLISH THE DASH

Squirt a small dollop of polish onto a microfiber towel and work it into the dash using a random circular motion. Continue wiping until the haze is almost gone. Then wipe off the remaining product with a clean towel.



### 4 CLEAN THE ENGINE AND DRIVETRAIN

Spray cleaner on all engine and drivetrain components and let it penetrate for about one minute. Brush the greasy areas with a boar-bristle brush. Rinse off the cleaner. Blow dry. Repeat if necessary.



### 5 SHINE UP THE CHROME

Apply polish to a cotton rag and polish the chrome until the haze almost disappears. Wipe off any remaining haze with a clean section of the rag.

## Removing dried wax

The best way to remove old dried-on wax is to apply new wax and let it soften the old. But if it's still stuck in crevices, use a household steam cleaner and direct the steam right onto the dried wax. Then wipe it clean with a rag.



James Claeys, Seattle, member of the Bad Chickens Motorcycle Club,  
on a 2014 Indian® Chief® Vintage through Lebec, CA

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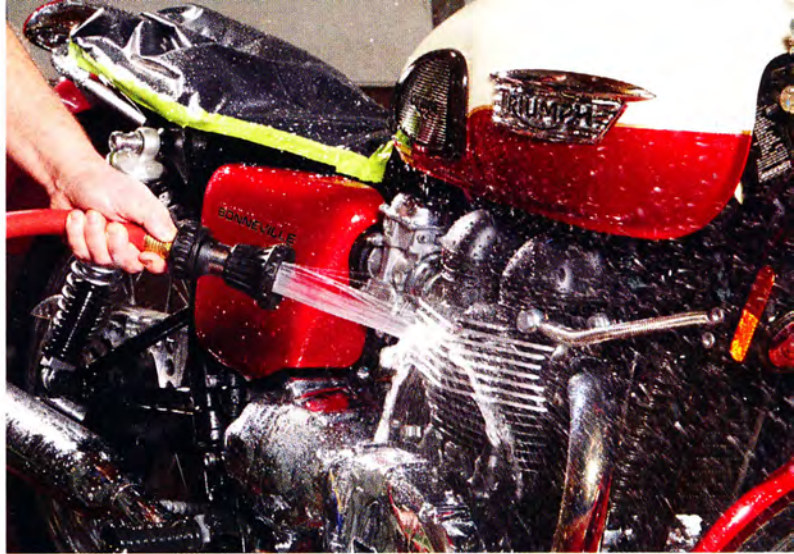
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## 6 CLEAN AND PROTECT THE LEATHER

Apply the leather cleaner to a sponge and gently work it into the leather. Then wipe dry and apply the conditioner with a different sponge. Wipe with a rag and let dry.



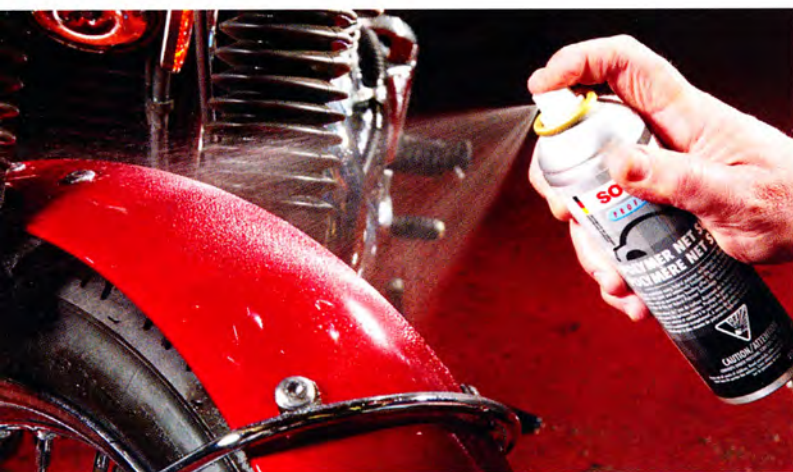
## 7 DO A FULL RINSE

Rinse again with water and blast off the final rinse with a blower or compressed air. Wipe off any remaining water drops to prevent spotting.



## 8 BLOW IT DRY

Starting at the top, blow the water down and to the front and back. Use a compressor set to 70 psi or less, or use a power blower. This blower costs about \$75.



## 9 APPLY PAINT SEALANT

Spray sealant onto the paint and spread evenly with a wax applicator sponge, working in small sections. Immediately buff the paint with a microfiber towel. Don't let the product dry before buffing.

## Avoid these mistakes

- Never use full-strength automotive or household degreaser products. They can permanently stain aluminum and strip off paint. Also avoid dishwashing detergent and household spray cleaners.
- Never let cleaners sit on the parts for more than a few minutes, and always rinse the cleaned areas with water. Never allow cleaners, even diluted degreaser, to dry on the bike.
- Never use scrub pads or coarse wheel brushes anywhere on the bike.
- Work in the shade and dry each component after you rinse it to avoid water spotting.
- Never use tire dressing on your bike. The silicone in those products presents a slipping/safety hazard.



full-strength degreaser to your bike.

Before you polish the chrome, switch out your microfiber towel for a smooth 100 percent cotton rag. You can use an old T-shirt or dish towel as long as you cut off the seams first. Seams that are stitched with synthetic thread can scratch chrome, and the seams can retain grit. Then use the Meguiars M205 polish that you used on the dash (Photo 5).

Clean the leather seat and saddle bags with Leather Therapy Wash and Leather Therapy Restorer & Conditioner, or Meguiar's D180 (Photo 6). These products rejuvenate and condition the leather, and they don't contain any slick additives, so you won't slide off the seat.

Next, use a new batch of soapy water to remove any remaining traces of the cleaners. Then rinse and dry the bike completely (Photos 7 and 8).

Clean and treat rubber foot pegs/rests and pedals with 303 Aerospace Protectant. The product contains UV inhibitors to prevent rubber degradation and dries to a nonslip matte finish. Then seal painted areas with Sonax Polymer Net Shield (Photo 9).

## Remove melted rubber from exhaust pipes



Use household oven cleaner to remove melted boot heel residue from hot exhaust pipes. Test it first on your bike by spraying it in an inconspicuous spot on the chrome. If it doesn't discolor the chrome, run the bike until the pipe is warm. Then spray the oven cleaner directly onto the melted rubber and let it soak in for a few minutes. Wipe it off with a cotton towel.

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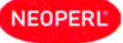
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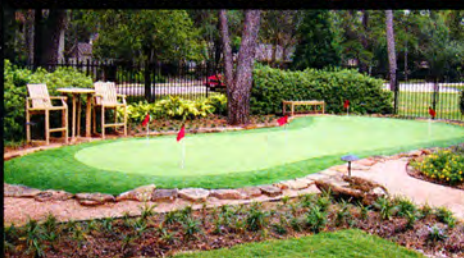
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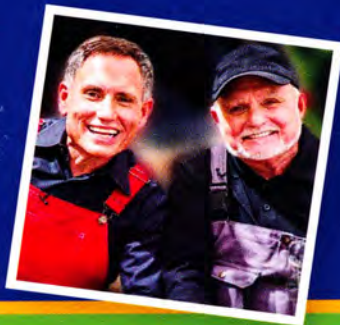
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# On the House

With the Carey Brothers  
Tips of the Month



## THE REMODELER'S REMODEL

After nearly 30 years as home improvement journalists and more than 35 years as remodeling contractors, we decided that it was time for a remodel of our own. Now, we aren't referring to either of our homes; those are ALWAYS being remodeled! We're referring to things that affect you and the way that you can access information from us to help you with YOUR repair and remodeling challenges.

In addition to this column, which has been remodeled with a more up-to-date photo of us, we have updated our nationally syndicated radio program, our media website, our remodeling company website, our APP, our social media outlets and our YouTube channel. Plus, you now you can tune us in on TV.

We launched onthehouse.com in 1995 — that's about ten thousand digital years ago. The website has grown to over 13,000 pages of content. With our most recent 'remodel' we have added new and exciting content, photos, videos and graphics — along with easy navigation. The new website is especially smartphone- and tablet-friendly when making repairs and improvements on the fly.

Want to see what we are up to on the remodeling side? Visit our new and improved remodeling company website at careybros.com. Have a look at some of the projects we have completed, see before and after photos and a behind-the-scenes look at progress shots. Our goal with this site is to inform, inspire and empower. Give it a visit!

Our four-hour weekend radio program is now in its 28th year and you can listen to all of our programming anywhere in the world thanks to our digital broadcast outlets. Check us out at Apple iTunes, Stitcher Smart Radio and our very own On The House App for iOS and Android. The app is free and, in addition to listening to the program live, you'll have access to our full arsenal of home improvement tips and information. You can even use the app along with your smart phone to send us a photo of your problem. And don't forget you can call the radio program at 1-800-737-2474 live any Saturday from 9 AM to 1 PM Eastern and ask your question live. If you're too bashful to be on air, call the number ANYTIME and leave us a message and we'll do our best to answer your question.

If you're social media savvy, you'll want to 'like' us on Facebook, follow us on Twitter and look at our how-to videos at our YouTube channel. We have lots of money-saving tips and try to keep you laughing at the same time.

Finally, you can catch us on the Home & Family TV show, on the Hallmark Channel Monday through Friday. The show airs from a real single family home located on the backlot at Universal Studios, Hollywood. Check local listings for the channel and time in your area or click on the 'television' tab at onthehouse.com.

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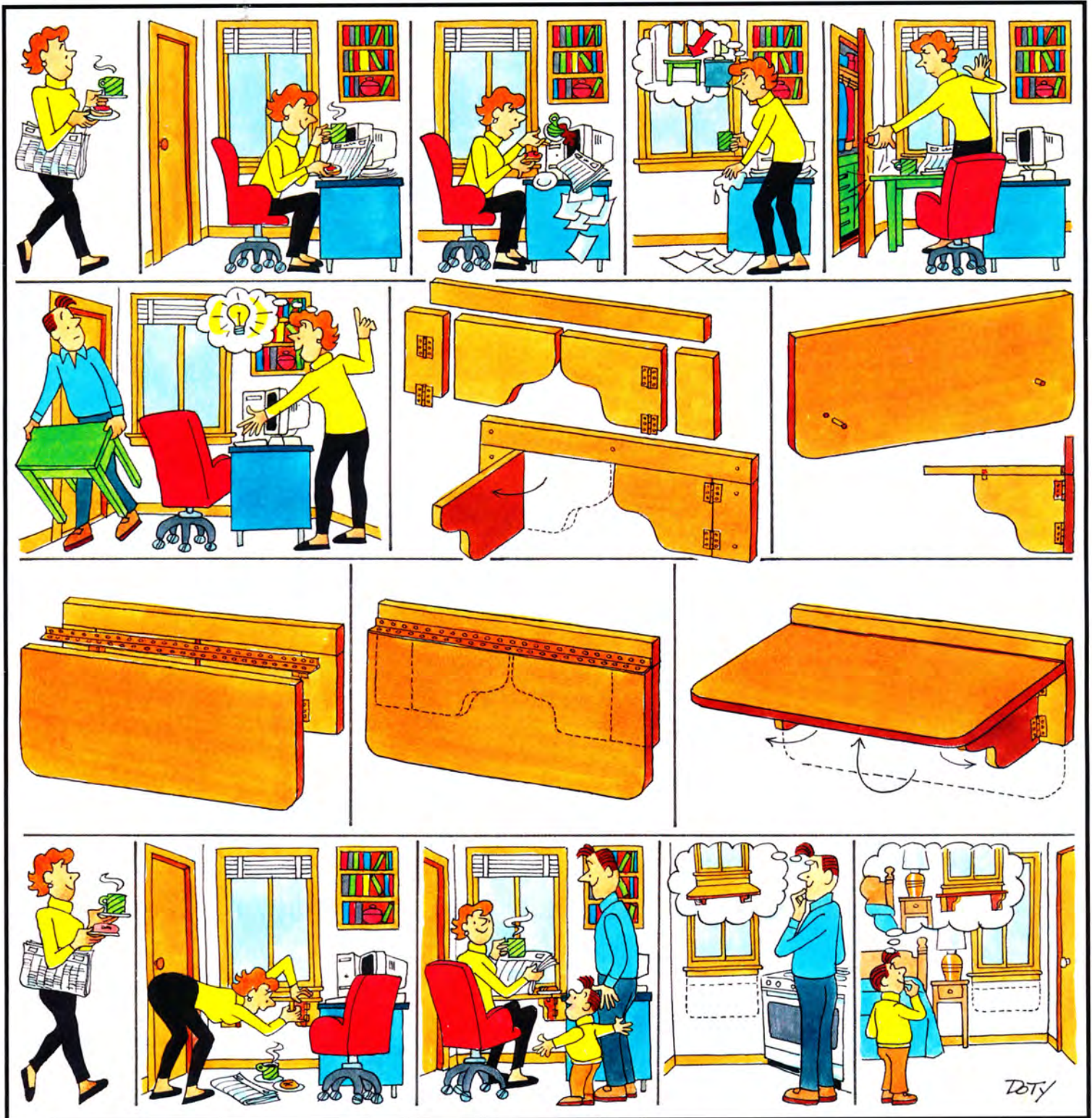


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## FREE

WITH ANY PURCHASE

**FOUR OUTLET POWER STRIP WITH SURGE PROTECTION**

ITEM 91334/69689

Item 91334 shown

**\$6.99** VALUE

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## FREE

WITH ANY PURCHASE

**THUNDERBOLT MAGNUM 24 PIECE AA HEAVY DUTY BATTERIES**

Item 68382 shown

ITEM 68382/61323/61675

52023776

**\$6.99** VALUE

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**"The Perfect Compressor with Powerful, Quiet and Consistent Airflow... Plus We Love the Low Price!" - Street Trucks Magazine**

**2.5 HP, 21 GALLON, 125 PSI VERTICAL AIR COMPRESSOR**

**CENTRALPNEUMATIC**

Item 67847 shown

LOT NO. 67847/61693/61454

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REG. PRICE \$219.99

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**SUPER COUPON!**

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**44", 13 DRAWER INDUSTRIAL QUALITY ROLLER CABINET**

LOT NO. 68784/69387

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Item 68784 shown

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**CHICAGO ELECTRIC POWER TOOLS**

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LOT NO. 69684/98194/61776

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FROM OUR READERS

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## FLASH OF BRILLIANCE

Recently, I helped my brother install a new motion sensor light in his mother-in-law's bedroom bathroom. We adjusted the setting so the light would stay on for five minutes when it was activated and then shut off. In her adjacent bedroom, the bed was positioned so she could easily get up to use the bathroom at night. About a week went by before she started complaining that the light stayed on most of the night.

I stopped by that evening and observed that the light came on even without any apparent motion in the room. I then shut the pocket doors on the bathroom and discovered it worked properly. Shortly, however, I found the culprit. She had placed a small digital picture frame on her dresser. Every time a new photo flashed on, it activated the sensor of the light. I moved the frame to another location, and the problem was solved.

Mark Moran

## PINCUSHION

My wife was quite impressed with my pneumatic brad nailer/stapler when she watched me staple a plywood back onto a bookcase. So much so that she decided to use it (while I wasn't home) to staple fabric over the seats of our dining room chairs. She got right to work, believing she was stapling the fabric to the seat bottom.

When she was finished, she turned the chair right side up and screamed at the sight of dozens of brads sticking out of the seat like the quills on a porcupine. What she hadn't seen was that the tool could shoot nails as well. Sometime after she'd first seen the tool in action, I had loaded it with 2-in. brads to assemble another project.

Brian Eells

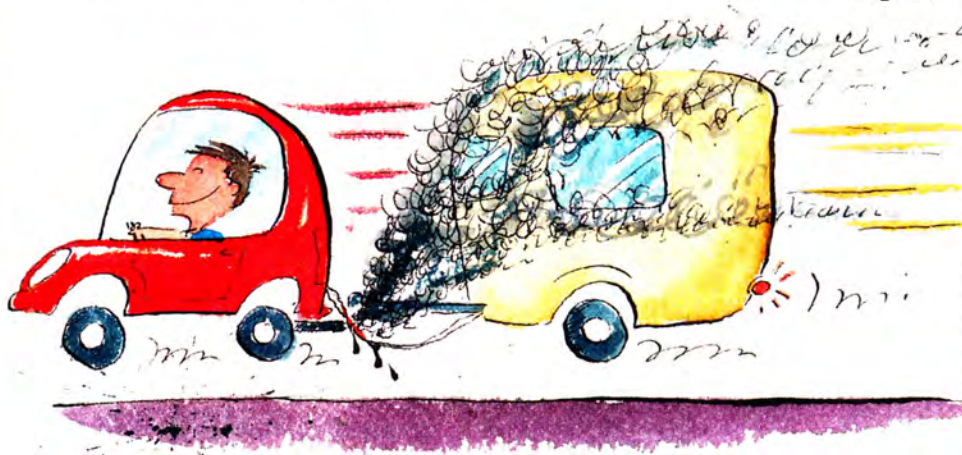
## Hot-melt mystery

Like many others who pull a camper trailer, I have a cable for my trailer lights installed inside my car's trunk that I connect when it's time to tow. When we came home from a recent camping vacation, I noticed the connectors were nearly melted together. But all the lights were still working!

I couldn't find any damaged wires and scratched my head for a week trying to figure out what had happened. When I had the oil changed on the car, I asked the mechanic to check it out. He asked to see exactly how the cable came out of the rear hatch. Within a few seconds he pointed out that the two connectors were dangling right in front of the tailpipe!



Tom Bigelow



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